

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,
Petitioner,

v.

SANDPIPER CDN, LLC,
Patent Owner.

IPR2025-00806
Patent 8,645,517 B2

Before JEFFREY S. SMITH, SHEILA F. McSHANE, and
MICHAEL T. CYGAN, *Administrative Patent Judges*.

McSHANE, *Administrative Patent Judge*.

JUDGMENT

Final Written Decision
Determining No Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

We have jurisdiction to hear this *inter partes* review under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a). For the reasons discussed herein, we determine that Petitioner has not shown, by a preponderance of the evidence, that claims 1–20 of U.S. Patent No. 8,645,517 B2 (Ex. 1001, “the ’517 patent”) are unpatentable.

A. Procedural Background

Google LLC (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting *inter partes* review of claims 1–20 (the “challenged claims”) of the ’517 patent, along with the Declaration of Bill Lin, Ph.D. (Ex. 1003). Sandpiper CDN, LLC (“Patent Owner”) filed a Preliminary Response, along with the Declaration of Dr. Prashant Shenoy (Ex. 2015). Paper 8 (“Prelim. Resp.”). The proceeding was referred to this panel by the Acting Chief Administrative Judge for determination of whether to institute trial under 35 U.S.C. § 314. Paper 13.

Pursuant to 35 U.S.C. § 314(a), on November 10, 2025, we instituted *inter partes* review on the grounds of:

Claims Challenged	35 U.S.C. § ¹	Reference(s)/Basis
1, 4–9, 12–20	103(a)	Beaumont ² , Hasan ³
2, 3, 10, 11	103(a)	Beaumont, Hasan, Biliris ⁴
1–20	103(a)	Ben-Shaul ⁵
1–20	103(a)	Ben-Shaul, Hasan

Pet. 2; Paper 14 (“Inst. Dec.” or “Dec.”).

Patent Owner filed a Patent Owner Response (“PO Resp.”). Paper 24. Patent Owner also filed the Declaration of Dr. Prashant Shenoy in Support of Patent Owner’s Response. Ex. 2017. Petitioner filed a Reply (“Pet. Reply”) to the Patent Owner Response. Paper 26. Patent Owner filed a Sur-reply to Petitioner’s Reply (“PO Sur-reply”). Paper 28.

An oral hearing was held on August 6, 2026. A transcript of the hearing is included in the record. Paper 34 (“Tr.”).

B. Related Matters

The parties identify *Sandpiper CDN, LLC v. Google LLC*, No. 2:24-cv-03951 (C.D. Cal., May 10, 2024) as a related matter. Pet. 78; Paper 4, 1.

C. The ’517 Patent (Ex. 1001)

The ’517 patent, titled “Policy-Based Content Delivery Network Selection,” issued February 4, 2014. Ex. 1001, codes (45), (54).

¹ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 287–88 (2011), amended 35 U.S.C. §§ 102, 103, was effective March 16, 2013, and the pre-AIA version of § 103 applies. *See* Pet. 6; *infra* Sec. II.D.

² US 2002/0169890 A1, published November 14, 2002 (Ex. 1007).

³ US 7,082,464 B2, filed July 6, 2001 (Ex. 1006).

⁴ US 2002/0078233 A1, published June 20, 2002 (Ex. 1008).

⁵ US 2002/0010798 A1, published January 24, 2002 (Ex. 1005).

The '517 patent relates to “a framework wherein resources of a content provider may be delivered to clients from different domains, a method distributes the requests based on content-provider policies.” Ex. 1001, code (57). *Id.* at 1:15–23. The adaptive global traffic control and management framework is depicted in Figure 1, reproduced below. *Id.* at 2:31–32.

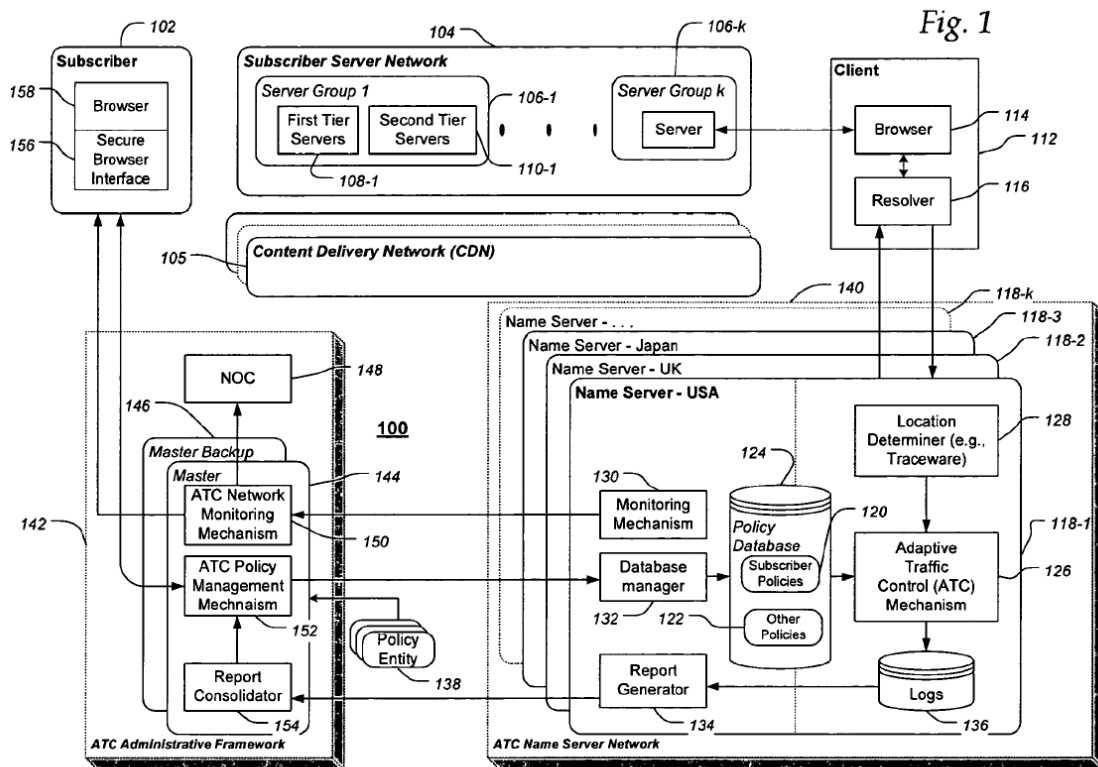


Figure 1, above, depicts the framework of the system, which includes Client 112, Subscriber Server Network 104, and ATC [Adaptive Traffic Control] Name Server Network 140. Ex. 1001, 2:31–32, 3:57–58, 6:45–57. In the system operation, a client may request access to content stored on the subscriber servers (*id.*, 3:57–4:21), and a DNS [Domain Name Server] returns an address of a selected server (*id.*, 4:35–51), so the client can access content by the use of a browser. Servers are selected based upon policies

stored in policy database 124 (*id.*, 4:44–49). The determination of the particular IP address is based on various policies in a policy database 124. *Id.* at 4:44–49.

D. The Challenged Claims

Petitioner challenges claims 1–20 of the ’517 patent. Pet. 2. Claims 1, 9, and 17 are independent claims, claiming, respectively, a method, apparatus, and system. Claim 1 is illustrative of the claimed subject matter and is reproduced below, with bracketed designations added for reference purposes.

[1.pre.i] 1. A method, operable in a framework in which an adaptive traffic control name server network implements policy-based traffic direction,

[1.pre.ii] the name server network comprising at least one domain name server comprising hardware in combination with software and constructed and adapted to provide adaptive policy-based domain name service, the method comprising:

[1.a] (A) providing a graphical user interface (GUI);

[1.b] (B) using said GUI to obtain at least one policy for direction of network traffic, wherein the GUI supports the setting of said at least one policy using a decision tree representing rules; and

[1.c] (C) providing said at least one policy to the name server network,

[1.d] wherein the decision tree comprises one or more resource nodes, and one or more branch nodes, wherein the one or more resource nodes specify one or more answers to be provided in response to a Domain Name Service (DNS) request, and wherein the one or more branch nodes specify one or more decision criteria to be applied, and

[1.e.i] wherein the GUI supports the specification of:

(i) one or more answers for the one or more resource nodes, and

[1.e.ii] (ii) one or more decision criteria for the one or more branch nodes, wherein the one or more criteria are selected from criteria related to: world zones, countries, states, time zones, and blocks of Internet Protocol (IP) addresses, and

[1.f] wherein the one or more resource nodes are selected from: IP addresses, canonical name (CNAME) records, mail exchange (MX) records, name server (NS) records, and load sharing server sets; and

[1.g] wherein the answers are selected from: IP addresses and CNAMEs.

Ex. 1001, 31:24–56.

II. ANALYSIS

A. Level of Ordinary Skill in the Art

In the Institution Decision (Dec. 7), we adopted Petitioner’s proposed level of qualifications where a person of ordinary skill in the art:

would have had at least a bachelor’s degree in computer science, electrical engineering, or a related field, and at least two years of work or research experience in the field of content delivery management or networks. Work experience can substitute for formal education and additional formal education can substitute for work experience.

Pet. 8 (citing Ex. 1003 ¶¶ 50–52). In its Response, Patent Owner states that “[f]or the purposes of this proceeding only, Patent Owner agrees with Petitioner’s proposed definition of a POSA [person of ordinary skill in the art].” PO Resp. 2. Accordingly, for the reasons given in the Decision on Institution, we adopt Petitioner’s proposed level of ordinary skill, that is, it is consistent with the ’517 patent and the prior art before us. *See* Dec. 7; *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001).

B. Claim Construction

In this *inter partes* review, claims are construed using the same claim construction standard that would be used to construe the claims in a civil action under 35 U.S.C. § 282(b). 37 C.F.R. § 42.100(b) (2022). Under the principles set forth by our reviewing court, the “words of a claim ‘are generally given their ordinary and customary meaning,’” as would be understood by a person of ordinary skill in the art in question at the time of the invention. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17).

In the Petition, Petitioner asserted that no claim terms needed to be construed by the Board and all terms should be given their ordinary meaning. Pet. 9. In its Response, Patent Owner asserted that the plain and ordinary meaning of the terms, including those for the terms “policy” and “decision tree,” should be used and no terms required express construction. PO Resp. 2–3. In its Reply, Petitioner did not identify any claim construction issues. *See generally* Pet. Reply., *see also id.* at 6 (appearing to agree with Patent Owner on meaning of “policy”). At the oral hearing Petitioner again asserted that the plain language of limitation [1.b] applies

(see Tr. 19:16–20:22), but nonetheless raised issues that implicate claim interpretation of limitation [1.b], which we address further below.

We determine that we need not expressly construe any claim term and the plain and ordinary meaning of the claim terms apply. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

C. Principles of Law

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when in evidence, objective indicia of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).⁶

D. Priority Date of the ’517 Patent and Prior Art Status

In the Petition, Petitioner contends that the ’517 patent is entitled only to the priority date, at best, of October 26, 2007 because neither the related 2002 Application nor the Provisional Application contain a description of

⁶ No evidence of objective indicia of nonobviousness is presented by the parties. *See generally* Pet.; PO Resp.; Pet. Reply; PO Sur-reply.

“one or more resource nodes [being] . . . mail exchange (MX) records,” which is recited in the independent claims. Pet. 6–7 (citing Ex. 1003 ¶¶ 47–48). In the Institution Decision, we considered priority issues for the ’517 patent and preliminarily determined that its earliest priority date is October 26, 2007. Dec. 9–14.

In the Patent Owner Response, Patent Owner stated that each reference asserted in the Petition was filed before the earliest possible priority date of September 28, 2001, so the Board did not need to decide the priority date of the ’517 patent. PO Resp. 8. Patent Owner did not, however, concede that October 26, 2007 was the priority date of the ’517 patent. *Id.*

Because the asserted prior art references, Ben-Shaul, Biliris, Beaumont, and Hasan, were filed prior to the earliest potential priority date of September 28, 2001, they are prior art to the ’517 patent under § 102(e).

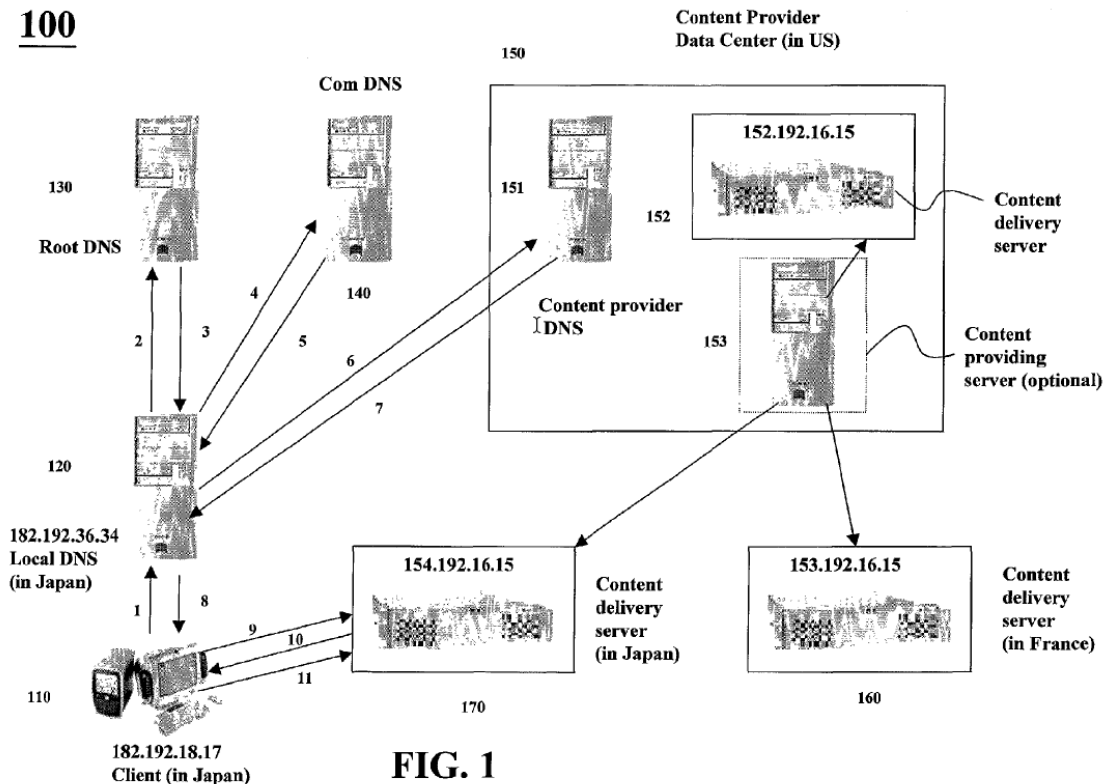
E. Obviousness of Claims 1, 4–9, and 12–20 Over Beaumont and Hasan and of Claims 2, 3, 10, and 11 Over Beaumont, Hasan, and Biliris

Petitioner contends that claims 1, 4–9, and 12–20 would have been obvious over Beaumont and Hasan. Pet. 9–34. Petitioner also asserts that claims 2, 3, 10, and 11 would have been obvious over the combination of Beaumont, Hasan, and Biliris. *Id.* at 35–39. To support its contentions, Petitioner provides explanations as to how the combinations of the prior art disclose each claim limitation. *Id.* at 9–39. Petitioner also relies upon the Declaration of Dr. Lin (Ex. 1003) to support its positions.

We begin our discussion with brief summaries of Beaumont and Hasan, and then address the evidence and arguments presented.

1. *Beaumont* (Ex. 1007)

Beaumont discloses a content delivery system in which a client requests access to content stored on content delivery servers. Ex. 1007, code (57), ¶ 18. In response to the request, a content provider DNS selects a content delivery server to provide the content. *Id.* ¶¶ 18, 19, 22. Figure 1 of Beaumont is reproduced below.



2. Hasan (Ex. 1006)

Hasan discloses a “virtual management system” providing an administrative interface with “devices, facilities, subscribers, log servers, and services” presented as objects. Ex. 1006, code (57). Hasan’s system has multi-function service devices that are connected to a network management server to provide a graphical user interface to an administrative interface device for configuring the devices. *Id.* at 5:63–6:14, 6:37–58, 7:7–26, Fig. 4. Hasan’s GUI provides a hierarchical layout of the system in a tree structure, with the root being the data center, and the branches being the facilities, subscribers, devices and log servers. *Id.* at 8:19–26. An administrator can configure device and service configuration data and policy information using the GUI. *Id.* at 7:7–26.

3. Discussion

a. Claims 1, 9, and 17

i. Petitioner’s Assertions

For the teaching of element [1.pre.i] of claim 1, Petitioner contends that Beaumont discloses a method for using DNS servers, that is, adaptive traffic control name servers, to respond to DNS requests. Pet. 15 (citing Ex. 1007 ¶¶ 4, 5, 17, 23). Petitioner addresses “policy-based traffic direction” (limitation [1.pre.1]), stating that “Beaumont’s method operates in a ‘data network’ (framework) including a content provider DNS server that directs requests (traffic) according to a configurable preference table (policies).” *Id.* For limitation [1.pre.ii], Petitioner asserts that in Beaumont “[t]he content provider DNS server forwards DNS requests according to a preference database and thus ‘provide[s] . . . policy-based domain name service.’” *Id.* at 16 (citing Ex. 1007 ¶¶ 30–31). Petitioner argues that DNS servers are

adaptive because the preferences for directing traffic are updated dynamically and account for current network conditions. *Id.* (citing Ex. 1007 ¶¶ 19, 30, 31). For limitation [1.a], Petitioner argues that that “Beaumont’s DNS server uses a preference table to resolve DNS requests,” where “[t]he table includes custom preferences ‘entered manually’ by users.” *Id.* (citing Ex. 1007, Abstr., ¶¶ 6, 23, 31, 32, 34, 35). Petitioner also asserts that Hasan discloses a GUI for defining “configuration data and policy information” for servers and a person of skill in the art “would have been motivated to incorporate Hasan’s GUI into Beaumont’s network to enable similar user preference configuration, as suggested by Beaumont. within a network.” *Id.* at 17 (citing Ex. 1003 ¶ 75; Ex. 1006, 7:12–21; 6:59–63; Ex. 1007 ¶ 31).

Petitioner contends that for limitation “policy for the direction of network traffic” (limitation [1.b]), [t]he Beaumont-Hasan GUI would enable an administrator to set policies for a selected content delivery server.” Pet. 18 (citing Ex. 1007, 8:30–36, 10:25–34, 10:53–67). Petitioner argues that “[f]or example, selecting a server would launch a menu for assigning the preferences shown in Fig. 3 of Beaumont” where “the combined GUI ‘would support[] the setting of said at least one policy using a decision tree representing rules.’” *Id.* (citing Ex. 1003 ¶ 77; Ex. 1007, ¶¶ 29–31, Fig. 2, 3). Dr. Lin testifies that “[f]or example, given the description in Hasan, selecting a server would bring up a menu enabling an administrator to assign the preferences shown in Fig. 3 of Beaumont[-]Hasan.” Ex. 1003 ¶ 77 (citing Ex. 1006, 10:25–34; Ex. 1007 ¶¶ 29–31, Fig. 2, Fig. 3). Further, for limitation [1.b], Petitioner asserts that “*Beaumont* acknowledges that ‘[a]lthough presented as a table, other data structures such as a tree can be

used’ for its preference database.” *Id.* at 17 (citing Ex. 1007 ¶ 23).
Petitioner refers to Hasan and its tree structure and asserts that it discloses that “[w]hen an object is selected [in the GUI], various management capabilities can be performed on the object,” which a person of ordinary skill in the art would have understood to include defining policy information. *Id.* (citing Ex. 1006, 7:14–21, 8:30–36, 8:49–59). Petitioner contends that the Beaumont-Hasan GUI would enable an administrator to set policies for a content delivery server where, for example, “[f]or example, selecting a server would launch a menu for assigning the preferences shown in Fig. 3 of Beaumont.” *Id.* at 18 (citing Ex. 1003 ¶ 77; Ex. 1007 ¶¶ 29–31, Fig. 2, Fig. 3).

In Reply, Petitioner further asserts:

As the Petition explains, and as noted above, *Beaumont* enables users to manually enter preference values, which define a rule for how DNS requests should be resolved. Pet., 16; *supra*, § III.A.1. The rule imposed by the preference ordering is a policy as claimed. Pet., 16, 19–21; Lin, ¶¶ 74, 80, 82, 85 *supra*, § III.A.1.

Pet. Reply 10.

For limitation [1.c], which recites “providing said at least one policy to the name server network,” Petitioner argues that “once set using the combined GUI, the preferences and/or rules would be stored in the network’s content provider DNS servers” and would be provided to the name server network. Pet. 18 (citing Ex. 1003 ¶ 78; Ex. 1007 ¶ 32).

For the portion of limitation [1.d] that recites “wherein the one or more resource nodes specify one or more answers to be provided in response to” a DNS request, Petitioner asserts that in the combined Beaumont-Hasan system, in the tree structure, the higher level branches represent design criteria such as “server health (e.g., working or down), destination domains

(e.g., 182.192)” and the subbranches represent individual content servers that fulfill the decision criteria and are the “answers” provided in response. Pet. 19 (citing Ex. 1003 ¶ 79; Ex. 1006, 8:19–29; Ex. 1007, Fig. 2).

Petitioner asserts that “*Beaumont* teaches that its content provider DNS server selects a content delivery server closest to a client” by, for example, “using an ‘estimated distance from each mapped content delivery server to that destination domain.’” *Id.* (citing Ex. 1007 ¶¶ 19, 23, 24). Petitioner further contends that “[i]n other words, *Beaumont*’s system first identifies working servers sharing the destination domain of the client (182.192) and then selects a server from within that set to handle the request *based on a* distance or other preferences.” *Id.* (citing Ex. 1003 ¶ 80; Ex. 1007 ¶ 31).

Specific to the limitation portion “wherein the one or more branch nodes specify one or more decision criteria to be applied,” Petitioner argues that a person of ordinary skill in the art “would have recognized the locations or domains defined by the higher-level branches ‘specify one or more decision criteria to be applied,’ because the content delivery servers are selected based on sharing a high-level domain (and thus location) with the requesting client” where, for example, “*Beaumont*’s DNS server selects from content delivery servers represented in rows R2, R3, and R4 in FIG. 2 because they ‘are mapped to the same destination domain, 182.192.’” *Id.* at 18–20 (citing Ex. 1003 ¶¶ 81–82; Ex. 1007 ¶¶ 24, 28). In Reply, Petitioner further asserts that “the Petition indeed contemplates the preference values as decision criteria, explaining that *Beaumont*’s system ‘selects a server from within [a] set to handle the request based on a distance or other preference.’” Pet. Reply 15 (citing Pet. 19).

For limitation [1.e.1], which recites “wherein the GUI supports the specification of: (i) one or more answers for the one or more resource nodes,” Petitioner contends that “[c]ontent servers within a destination domain may be selected based on manually entered preferences” and “[w]hen incorporated into Beaumont’s network, Hasan’s GUI would enable users to specify these preferences.” Pet. 20 (citing Ex. 1003 ¶ 85; Ex. 1006, 6:28–31, 8:61–64, 9:1–9; 17:11–13, 17:41–55; 1007 ¶¶ 28, 31). Petitioner asserts that “[b]ecause these preferences define which server address is returned (Beaumont, [0023], [0025]), and the GUI supports the specification of the preferences, the GUI supports specification of one or more answers for the one or more resource nodes.” *Id.* at 20–21 (citing Ex. 1003 ¶ 85).

For the teaching of limitation [1.e.ii], Petitioner contends that the GUI supports the specification of design criteria where the “criteria are selected from criteria related to: world zones, countries, states, time zones,” and blocks of IP addresses, by Beaumont’s disclosure of destination domains illustrated as blocks of IP address and suggesting geographic criteria such as world zones, countries, or states as design criteria. Pet. 21 (citing Ex. 1003 ¶ 88; Ex. 1007 ¶ 24, Fig. 2 (col. C2)).

ii. Prior Art Teaching of “Policy”

We find that the evidence does not support that the Beaumont-Hasan combination teaches the claimed “policy.” Claim 1 recites that the GUI is used “to obtain at least one policy” (limitation [1.b]). The Petition contends that the Beaumont-Hasan GUI would enable an administrator to set policies for a content delivery server where, “[f]or example, selecting a server would launch a menu for assigning the preferences shown in Fig. 3 of Beaumont.”

Pet. 18 (citing Ex. 1003 ¶ 77; Ex. 1006, 8:30–36, 10:25–34, 10:53–67; Ex. 1007 ¶¶ 29–31, Fig. 2, Fig. 3). Figure 3 of Beaumont is reproduced below.

	371	372	373	374	375 (optional)	376 (optional)	377 (optional)	378 (optional)	379 (optional)
	Delivery Server	Destination	Preference	Number of lost	Number of	Estimated	number of times	Health	Time-To-Live
310	Address	Domain		packet	connection	distance	being selected		(minutes)
320	152.192.16.15	182.192	1	100	1	100	100	Working	1
321	153.192.16.15	182.192	2	200	2	90	90	Down	2
322	154.192.16.15	182.192	9	900	9	10	10	Working	9
330	155.192.17.15	155.192	8	800	8	20	20	Working	8
340	156.192.17.15	156.192	1	100	1	10	10	Working	1
350	157.192.17.15	156.192	5	500	5	50	50	Working	5
360	158.192.17.15	156.192	3	300	3	70	70	Working	3

FIG. 3

Figure 3, above, is a preference table with column 373 indicating the preference number. Ex. 1007 ¶¶ 12, 30. Beaumont discloses that preference numbers can be assigned to a content delivery server, for instance, where the highest retrieved preference number is selected. *Id.* ¶ 31. Beaumont further discloses that “[a] preference number as illustrated is entered manually.” *Id.*

Petitioner consistently asserts in its Petition that it is Beaumont’s DNS server that directs the request according to the preference table and that it is the configurable preference table that is the “policy.” Pet. 15–16 (“Beaumont’s method operates in a ‘data network’ (framework) including a content provider DNS server that directs requests (traffic) according to a *configurable preference table (policies)*” (emphasis added) (citing Ex. 1007 ¶¶ 6, 7, 17, 23, Fig. 1)). Dr. Lin testifies that “Beaumont discloses providing policies to the content provider DNS servers to be stored in the form of a

table on a disk.” Ex. 1003 ¶ 101. The Petition also makes clear that Petitioner relies solely upon the manual data entry in Beaumont’s preference table to for teaching the GUI to obtain a policy of limitation [1.b]. Pet. 16 (“Beaumont’s DNS server uses a preference table to resolve DNS requests,” where “[t]he table includes custom preferences ‘entered manually’ by users” (citing Ex. 1007 ¶¶ 6, 23, 31, 32, 24, 31, 34, 35)). Dr. Lin testifies that “selecting a server would bring up a menu enabling an administrator to assign the preferences shown in Fig. 3 of Beaumont[-]Hasan.” Ex. 1003 ¶ 77. Accordingly, the evidence supports that the Petition relies upon the manual entry of preference numbers in Beaumont’s preference table as the claimed policy.

In its Reply, Petitioner states that “Patent Owner concedes that Beaumont discloses . . . rules ‘for selecting the best content delivery server’” and that “Patent Owner mistakenly argues that the Petition ‘points solely to Beaumont’s ‘configurable preference table.’” Pet. Reply 6–7 (citing PO Resp. 19, 21, 42). We do not agree with Petitioner’s assertions about Patent Owner’s alleged “concessions;” Patent Owner makes reference to rules in Beaumont, but distinguishes those rules from information stored in the preference table. PO Resp. 21 (citing Ex. 1007 ¶¶ 31–32). Further, Patent Owner clearly demonstrates its understanding that the Petition relies on Beaumont’s preference table for the policy teaching. *See* PO Resp. 17, 19–21; Ex. 2017 ¶¶ 87–91.

Petitioner also attempts in the Reply to suggest that there is something other than Beaumont’s disclosure of preference numbers in the preference table for the teaching of policy, with such as the statements like “[t]he Petition relies on the underlying rules in Beaumont, which are evidenced by

the preference table,” “[t]he Petition’s discussion of the claimed ‘policies’ points to the underlying policies implemented in Beaumont, which are informed by the preference values,” and that the Petition’s statement that Beaumont’s DNS server directs traffic “according to a configurable preference table (policies)” “merely previews that *Beaumont*’s policies are *configurable*.” Pet. Reply 7 (citing Pet. 15). We do not agree with Petitioner’s suggestion that there is something other in Beaumont, which Petitioner does not identify, that is relied upon in the Petition for the teaching of policy. As discussed above, the Petition explicitly relies on the configurable preference table for the teaching of the claimed policy. Pet. 15 (“provider DNS server that directs requests (traffic) according to a *configurable preference table (policies)*” (emphasis added)); *see also id.* at 26 (“Beaumont discloses providing policies to the content provider DNS servers to be stored as a table”); Ex. 1003 ¶ 77. Moreover, in the Petition the only support for the use of the GUI to set policies in Beaumont is the menu for assigning preferences in Figure 3. Pet. 18.

Further, in the Reply, Petitioner states that “*Beaumont enables users to manually enter preference values, which define a rule* for how DNS requests should be resolved” and “[t]he rule imposed by the preference ordering is a policy as claimed.” Pet. Reply 10 (emphasis added). These statements explicitly state that Petitioner is relying on the Beaumont’s manual entry of the preference values, which define a rule that is a policy. This is consistent with Patent Owner’s argument that the claimed “policy” are rules. PO Resp. 17–18. The understanding of “policy” and “rules” as equivalents is also consistent with the ’517 patent Specification and both experts agree with that understanding. *See* PO Resp. 17–18 (citing Ex.

1001, 1:43–2:7; Ex. 2017 ¶¶ 59, 81–85; Ex. 2018, 33:6–34:21, 146:10–20 (Dr. Lin testifying: “policy and rules are the same thing”). The equivalence of rules and the claimed policy was also acknowledged by Petitioner at oral hearing. Tr. 29:19–20. Thus, consistent with the above assertions and testimony, Petitioner clearly states in its Reply that it is the manual entry of preference values in the preference table in Beaumont “define[s] a rule,” that is, the policy. Pet. Reply 10.

Further, the record is clear that Beaumont alone in the Beaumont-Hasan combination is relied upon for the teaching of the claimed “policy.” As discussed above, the record is replete with Petitioner’s assertions relating to Beaumont’s alleged teaching of policy. This was also confirmed by Petitioner at oral hearing:

JUDGE CYGAN: For the policy, you’re not relying on Hasan, correct?

MS. ARNER: For the policy?

JUDGE CYGAN: Correct.

MS. ARNER: No. Other than the fact that Hasan talks about generally, you can group servers to make application of policy easier. *No, the policy is coming from Beaumont.*

Tr. 18:15–21 (emphasis added).

We agree with Patent Owner that Beaumont fails to teach the claimed policy. More specifically, Patent Owner argues that Beaumont’s preference table merely contains preference numbers that are separate and distinct from the underlying rules that apply the preferences. PO Resp. 25. Dr. Shenoy testifies that the preference table in Beaumont is not a policy, nor does it contain policies, but rather it is merely “a data structure that stores data.” Ex. 2017 ¶ 87 (citing Ex. 1007 ¶¶ 23, 32). The evidence of record supports that the preference table is a data structure which stores data. For instance,

Figure 2 of Beaumont, which is an illustrative preference table, is identified as a “preference database table.” Ex. 1007 ¶¶ 11, 23.

Patent Owner further contends that Beaumont’s preference table “has none of the structure of the claimed policy, which is characterized by rules, such as a conditional and an action,” “[n]or does the preference table of Beaumont function like the claimed policy.” PO Resp. 19–20 (citing Ex. 1001, 8:55–56, 15:28–32, 16:5–7; Ex. 2015 ¶ 64). Patent Owner argues that Beaumont’s preference table does not store any software or other component for implementing a rule. *Id.* at 20 (citing Ex. 2017 ¶¶ 88–89). Instead, Dr. Shenoy testifies:

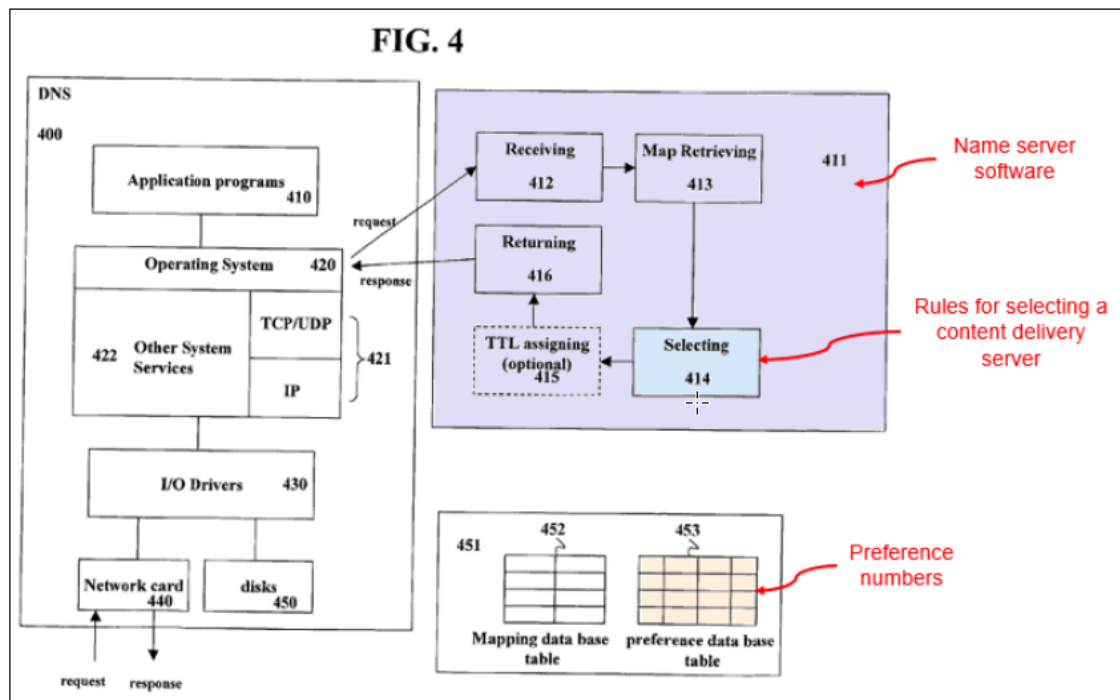
Beaumont discloses ‘rule[s] for selecting the best content delivery server’ and a ‘selecting module’ that implements software instructing Beaumont’s DNS to ‘retrieve[] from preference database 453 a preference number associated with each retrieved mapped address and the requester identifier,’ and ‘select[] an address based on the retrieved preference numbers.’

Ex. 2017 ¶ 89 (citing Ex. 1007 ¶¶ 31–32). We credit Dr. Shenoy’s testimony as it is supported by the evidence of record and it stands un rebutted by anything other than attorney argument⁷. Beaumont describes the use of rules, including selection rules, but there is nothing to suggest that the rules are in the preference table. Instead, Beaumont discloses that its selection rules use the data in the preference table as the basis to make selections. Ex. 1007 ¶ 31. As Dr. Shenoy testifies, Beaumont discloses preference numbers that are “retrieved” and, in particular, “selecting module 414 retrieves from preference database 453 a preference number associated

⁷ Petitioner did not file an expert report to rebut Dr. Shenoy’s Declaration in Support of Patent Owner’s Response (Ex. 2017).

with each retrieved mapped address and the requester identifier.” *Id.* ¶¶ 31–32.

In further support, Patent Owner refers to annotated Figure 4 of Beaumont, reproduced below. PO Resp. 24.



EX1007, FIG. 4 (annotated).

Annotated Figure 4 of Beaumont, above, depicts portion 414 (purple), which is name server software, and portion 453 (tan), which is preference database that contains preference numbers. Ex. 1007 ¶ 32. Dr. Shenoy testifies that the preference values in the preference table do not govern the conduct of the DNS server in response to a request, rather it is the rule specified by the software. Ex. 2017 ¶ 96. Dr. Shenoy testifies that the rules are specified in software, that is, in the selecting module, but not in the preference table. *Id.* ¶ 90. Dr. Shenoy further testifies that the rules are implemented as software via selecting module 414 where the software is recorded in a second memory before being loaded into the main memory. *Id.* ¶ 95.

We agree with Patent Owner that the evidence supports that it is the software loaded into the selecting module that contains the rules that retrieve data from the preference table. We do not discern any disclosures in Beaumont, and Petitioner does not point us to any, that indicates that the preference table contains software, and instead the preference table is described merely as a database. Beaumont discloses that separate server software, which includes the selecting module 414, is loaded into memory (Ex. 1007 ¶ 33). Thus, we credit Dr. Shenoy’s testimony that it is the rules or policy specified software associated with the selecting module that are used to instruct the retrieval of data from preference database 453 in order to select addresses. *Id.* ¶ 32 (“selecting module 414 retrieves from preference database 453 a preference number associated with each retrieved mapped address and the requester identifier.”) With that, we find that Petitioner has not demonstrated that Beaumont’s relied-upon preference table data teaches or suggests the claimed policy.

Patent Owner also disputes that Petitioner’s demonstration of the teaching that a GUI is used to set policies. PO Resp. 27–31. In its Reply Petitioner argues that “Beaumont enables users to manually enter preference values, which define a rule for how DNS requests should be resolved” and “[t]he rule imposed by the preference ordering is a policy as claimed.” Pet. Reply 10. Dr. Shenoy testifies that Beaumont discloses an interface for manually inputting preference numbers that are stored in its preference table, but “these preference numbers are not policies or rules—they are merely integers.” Ex. 2017 ¶ 94. Further, Dr. Shenoy testifies, and we agree, when “preference numbers are manually input, the user can influence which servers will be selected by giving greater preference to certain servers,”

however, the underlying rule would remain the same because “the rule is still to select the server with the highest preference number.” *Id.* ¶ 96.

Accordingly, although Petitioner relies upon the disclosure of the assignment of preferences shown in Figure 3 of Beaumont with a GUI as support for setting a policy (Pet. 18), this does not set a policy.

Petitioner next argues that the premise that tables cannot reflect an underlying policy conflicts with the ’517 patent. Pet. Reply 7. Petitioner refers to Figure 10(e) of the ’517 patent and contends that, like Beaumont, in this figure the policies are illustrated as tables, where traffic is directed based on load share values. Pet. Reply 7. Petitioner also refers to Figure 10(j) of the ’517 patent and contends that it represents load share values for another policy in a table. *Id.* at 8. Petitioner alleges that, although Patent Owner asserts that preference numbers are merely integers input by the user and are not policy, “by changing the preference numbers in Beaumont, the user changes the rule—servers are selected differently because of the user’s input.” *Id.* Petitioner further refers to Figure 9(a) of the ’517 patent, reproduced below, and asserts that it “shows a user interface ‘through which a subscriber may define load share and shed fraction policies.’” *Id.* at 9.

The screenshot shows a window titled "MODIFY STATIC SERVER(S)". Inside, there is a table with the following columns: "NICKNAME (OPTIONAL)", "IP ADDRESS", "TTL", "LOAD SHARE", "SHED FRACTION", and "ON LINE". The table contains five rows of data. The first two rows are pre-filled with "NEW YORK" and "LONDON", while the others are empty. At the bottom of the window, there are buttons for "OK", "CANCEL", and "DELETE", followed by a label "CHECKED STATIC SERVER(S)".

NICKNAME (OPTIONAL)	IP ADDRESS	TTL	LOAD SHARE	SHED FRACTION	ON LINE
NEW YORK	10.0.0.1	5m	1.0	0.2	☒
LONDON	10.0.0.2	5m	1.0	0.3	☒
		5m	1.0	0.0	☒
		5m	1.0	0.0	☒
		5m	1.0	0.0	☒

OK CANCEL DELETE CHECKED STATIC SERVER(S)

FIG. 9(a)

Figure 9(a) of the '517 patent, reproduced above, is a graphical interface where load and overflow policies may be set for a static server. *See* Ex. 1001, 22:4–10. Petitioner asserts that in Figure 9(a) the user enters integers or decimals to configure policies like Beaumont and “Patent Owner cannot demand more of the prior art than is disclosed in its own specification.” Pet. Reply 9 (citing Ex. 1001, 24:8–18, 27:60–64; *Lockwood v. American Airlines, Inc.*, 107 F.3d 1565, 1570 (Fed. Cir. 1997)).

We do not agree with Petitioner that because tables are used in the '517 patent this means that Beaumont's Figure 3 preference value inputs are sufficient to teach the claimed policy. As Patent Owner argues, and we agree, in the '517 patent, users interact with GUIs, as shown in, for instance, Figures 9(a), 10(e), and 10(f), to define policies that specify rules or logic, which is consistent with claim 1's limitation of “us[ing] said GUI to obtain at least one policy for the direction of network traffic.” where “the GUI supports the setting of said at least one policy using a decision tree representing rules.” *See* PO Sur-reply 10–11. The '517 patent discloses that the GUIs shown in Figures 10(a), 10(c), 10(e), and 10(j) depict windows for specifying resources and parameters to be applied in policies. *See, e.g.*, Ex. 1001, 24:66–25:25, 25:29–54. Figures 10(b), 10(d), 10(f)-(i) show the corresponding decision trees with the logic and rules for server selection. *See id.* Figures 10(c) and 10(d) of the '517 patent are reproduced below.

RESOURCES FOR "US_INT_SPLIT1:1"[MODIFIED]

 RESOURCES

 IP ADDRESS(ES)

NICKNAME	IP ADDRESS	TTL
LONDON	10.2.2.2	1D
NEW YORK	10.0.0.1	1D

 CNAME(S)

NICKNAME	CNAME	TTL
SYDNEY	CUSTOMER.FOOTPRINT.NET	5M

 STATIC SERVER(S)

 DYNAMIC SERVER(S) LOAD SHARE(S)

NICKNAME	IP ADDRESS	TTL	SERVER STATUS	URL DOWN		DEFAULT	
			URL	LOAD SHARE	SHED FRACTION	LOAD SHARE	SHED FRACTION
LONDON	10.0.0.3	5M	HTTP:///*;***@10.0.0.1/	0	0	1	0

 OVERFLOW SERVER(S)

NICKNAME	IP ADDRESS/CNAME	TTL	LOAD SHARE
CDN_SERVICE	CUSTOMER.FOOTPRINT.NET	5M	1

 MANAGED SERVER(S) MONITORING LOAD FEEDBACK

FIG. 10(c)

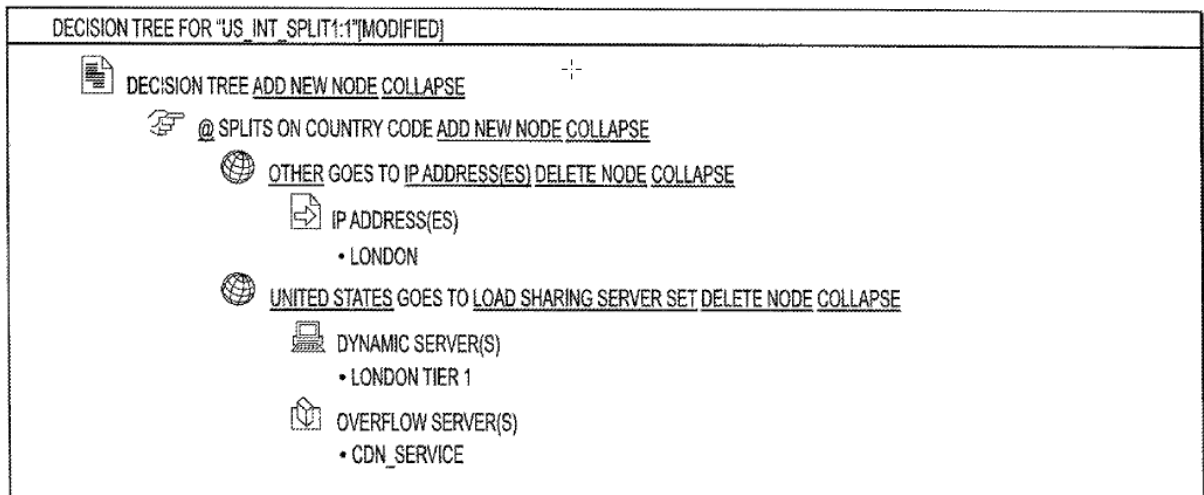


FIG. 10(d)

Figures 10(c) and 10(d) depict a resource window and a decision tree, respectively, in the '517 patent. Ex. 1001, 25:29–54. We agree with Patent

Owner that in the '517 patent policies are set using decision tree GUIs to specify the logic to be applied with the use of resource windows for setting resources and parameters, as claim 1 reflects in its recitations, in view of the disclosures of the patent. *See id.* at 25:29–34 (Figures 10(c) and 10(d) depicting “decision tree constructed based on a set of resources”), 6:59–64 (policies entered using GUIs). Similarly, the interface of Figure 9(a) is used to define a load-share policy. *See id.* at 22:4–8. Thus, consistent with claim 1, the '517 patent applies user-selected policies into a decision tree that comprises the policies that the user wants to apply. PO Sur-reply 5–6. In contrast, Figure 3 of Beaumont is not used to set policy, rather it is only used to specify variables that are used by policy software. As discussed above, it is Beaumont's DNS that contains the rules (policies) in software. The variables entered in Figure 3 of Beaumont are in a preference database, and it is the rules or policy in software associated in the selecting module that are used to instruct the retrieval of the variable data from preference database 453 that are set by the input of Figure 3. *See Ex. 1007 ¶¶ 23, 31–33.* The policies in Beaumont are fixed in software and there is no suggestion that they are user-configurable, which differs from claim 1 and the disclosures of the '517 patent, as discussed above. *See id.*

At oral hearing, Petitioner pivoted to a new view that “it doesn't say anything about in the claim that the user specifically sets the policy from scratch or sets the hierarchy or anything like that.” Tr. 23:26–24:2. Further, Petitioner contended that “[w]hat the claim says is that there has to be a decision tree representing rules” and “the GUI supports the specification of it using this decision tree.” *Id.* at 24:2–3, 24:17–19. Petitioner further stated that

The GUI supports the setting of the policy using a decision tree representing rules. That's the second half of that claim, and that's where the claim refers to the decision tree, and the decision tree includes those two things -- decision criteria and answers. That is how the claim explains how the GUI is used to obtain the policy.

Tr. 25:8–13. As discussed above, the Petition and Petitioner's Reply assert that it is the setting of the preference order in the preference table of Beaumont by a GUI that is the claimed "using said GUI to obtain at least one policy for direction of network traffic." We view Petitioner's statements first made at oral hearing that it is the decision tree that includes the decision criteria and answers set by a GUI to be the claimed policy represent new impermissible argument. Our rules require that a petition include "[a] full statement of the reasons for the relief requested" and the Consolidated Trial Practice Guide states that "Petitioner may not submit new evidence or argument in reply that it could have presented earlier, e.g. to make out a prima facie case of unpatentability." 37 C.F.R. §§ 42.22(a)(2), 42.23(b); Consolidated Trial Practice Guide.⁸ Accordingly, on this basis, we would disregard Petitioner's arguments first made at oral hearing on the alleged teaching of policy.

However, even if we were to consider Petitioner's arguments made on policy at oral argument, we note that the arguments may raise claim construction issues. Notably, no claim construction issues were briefed and both parties agreed that plain and ordinary meaning of terms should be used. *See* Pet. 9; Prelim. Resp. 2; PO Resp. 2–3; Pet. Reply. Although Petitioner

⁸ USPTO, Patent Trial and Appeal Board Consolidated Trial Practice Guide November 2019, <https://www.uspto.gov/TrialPracticeGuideConsolidated> ("CTPG").

asserted at oral hearing that the plain language of limitations applies (Tr. 17:7–18:9), Petitioner nonetheless raised issues that implicate claim construction of limitation [1.b], arguing that what “the claim requires is that the GUI supports the specification of it using th[e] decision tree” (*id.* at 24:17–19). In response to a question of whether limitation [1.b] requires using the GUI to obtain a policy, Petitioner responded that “[t]he GUI supports the setting of the policy using a decision tree representing rules,” where the decision tree includes the decision criteria and answers. *Id.* at 26:6–12. We do not agree with Petitioner on this interpretation because the limitation [1.b] phrase “using said GUI to obtain at least one policy for direction of network traffic,” requires that the GUI is used to obtain the policy under the plain meaning of the term.

Further, even if we were to assume with the Petitioner that limitation [1.b] were to be construed to mean that the policy is represented by rules using design criteria and answers and the GUI only has to “support the specification of it using this decision tree” (Tr. 24:10–19), we do not find that Beaumont teaches this. Petitioner relies only on the preference values of the preference table to teach three different claim elements: (1) the “policy;” (2) the “design criteria;” and (3) the “answers.” *See* Pet. Reply 10 (“Beaumont enables users to manually enter preference values, which define a rule . . . [t]he rule imposed by preference ordering is a policy as claimed); Pet. Reply 15 (“the Petition indeed contemplates the preference values as design criteria”); Pet. 20–21 (“[b]ecause these preferences define which server address is returned . . . the GUI supports specification of one or more answers.”); Tr. 68:11–13 (“JUDGE SMITH: How is this not mapping policy decision criteria and answer to the preference value? MS. ARNER: It is, is

the short answer.”). We do not find that relying only on Beaumont’s preference values for these elements is sufficient to teach all of the elements. This is because, as we discussed above, we agree with Patent Owner and Dr. Shenoy that preference values in the preference table do not govern the conduct of the DNS server to implement policy-based traffic direction as the claim requires. *See e. g.*, Ex. 2017 ¶ 96. Rather, other rules in software direct the network traffic in Beaumont, not the preference value data.

Additionally, again assuming we adopt Petitioner’s view of the interpretation of limitation [1.b], we find that Petitioner’s assertions fail because Petitioner impermissibly relies on the same parameter of Beaumont, the preference values, for teaching three separate and distinct elements of the claim. As discussed above, Petitioner relies on the preference values of the preference table of Beaumont for the teaching of the claimed separate elements of “policy,” “design criteria,” and “answers.” Pet. 20–21; Pet. Reply 10, 15; Tr. 80:4–6. As Patent Owner asserts, “[w]here a claim lists elements separately, the clear implication of the claim language is that those elements are distinct components of the patented invention.” PO Sur-reply 19 (*quoting Becton, Dickinson & Co. v. Tyco Healthcare Grp., LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010)). To the extent that Petitioner attempted to rebut the implication that the claim elements are distinct at the oral hearing (*see* Tr. 68:17–69:7), we agree with Patent Owner that the elements are distinct. *Id.* at 75:26–77:15.⁹ That is, we agree with Patent Owner’s arguments that the branch nodes with design criteria, the resource nodes with answers, and the policy are distinct elements. *See id.* Figure 3 and

⁹ Because Petitioner late-raised this claim interpretation issue, we will consider Patent Owner’s arguments made at the oral hearing.

annotated Figure 10(b) of the '517 patent, reproduced below, depict decision trees.

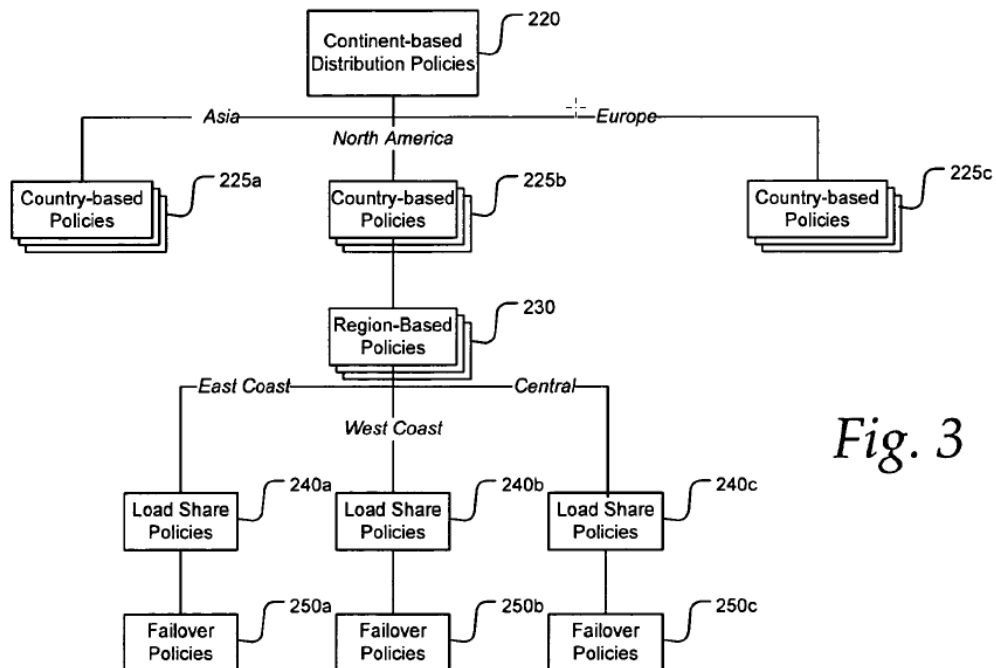


Fig. 3

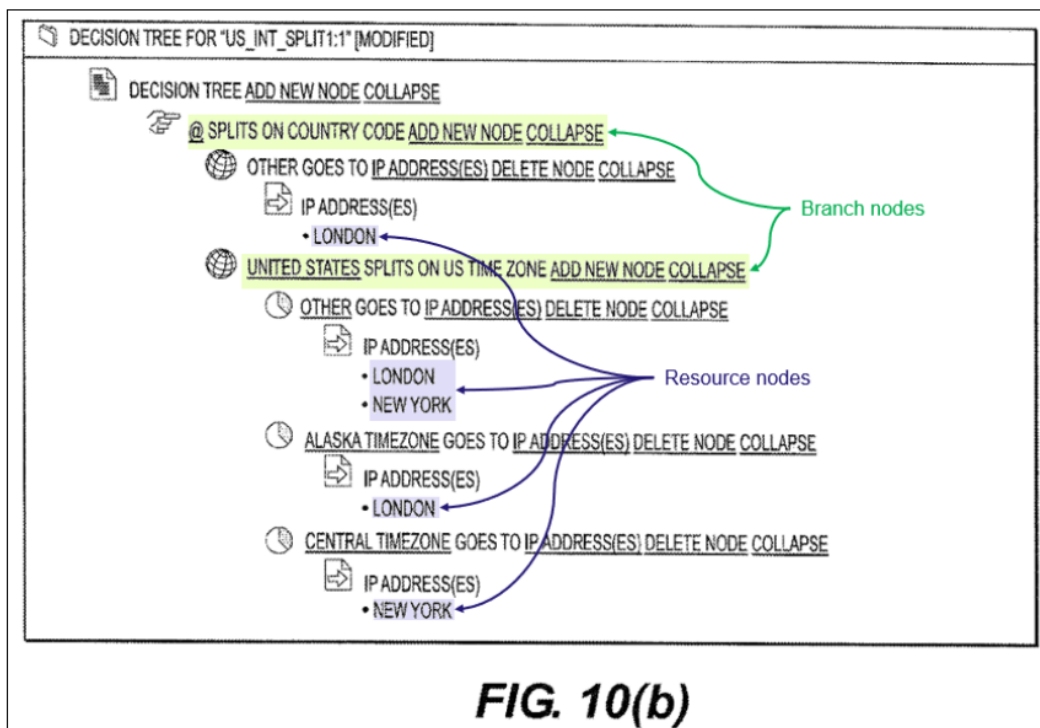


FIG. 10(b)

Figure 3 and annotated Figure 10(b) of the '517 patent, above, depict decision trees. Figure 3 depicts branch nodes, such as those based on continents like “Asia,” “Europe,” and “North America,” that specify design criteria and resource nodes such as elements 225a and 225c containing answers, where the branches and resource nodes are distinct elements. *See* Tr. 76:16–25; Ex. 1001, 9:6–9 (“At the branches of this tree (referred to as branch nodes) the user specifies the various decision criteria that the user wants to apply” representing the ATC rules that the user (content provider/subscriber) wants to apply), 9:3–6 (“At the leaves of this tree (referred to as resource nodes) a user specifies the answers (IP addresses or CNAMEs) that the user wants ATC to provide in response to a DNS request.”). Annotated Figure 10(b) of the '517 patent also depicts separate and distinct branch and resource nodes. We also agree with Patent Owner that the policies are used to construct the decision tree, so “policy” is a distinct element. Tr. 77:3–7; Ex. 1001, 8:55–56 (“The ATC policies 200 may be hierarchically constructed to form a decision tree.”), 9:1–3. Accordingly, we find that Petitioner has impermissibly relied upon the same disclosure of Beaumont to teach the distinct elements of “policy,” “design criteria,” and “answers.”

Thus, we agree with Patent Owner that the combination of Beaumont and Hasan does not teach or suggest the claimed “policy” and therefore Petitioner has not demonstrated by a preponderance of the evidence that claim 1 would have been obvious over the combination. Claims 9 and 17 are independent claims that contain similar evidence and argument regarding “policy” limitations, and Petitioner relies on similar argument and evidence to that of claim 1 for those teachings. *See* Pet. 26–28, 31–32. We similarly

find that Petitioner has not demonstrated that claims 9 and 17 would have been obvious over the combination of Beaumont and Hasan by a preponderance of the evidence for similar reasons to those discussed above for claim 1.

b. Claims 4–8, 12–16, and 18–20

Petitioner does not identify any additional teachings relating to the teaching for claimed “policy” in the argument and evidence for dependent claims 4–8, 12–16, and 18–20. Pet. 23–26, 30–31, 34. Thus, by virtue of dependency from the independent claims, we find that Petitioner has not demonstrated that claims 4–8, 12–16, and 18–20 would have been obvious over the combination of Beaumont and Hasan by a preponderance of the evidence.

c. Claims 2, 3, 10, and 11

Petitioner asserts that dependent claims 2, 3, 10, and 11 would have been obvious over the combination of Beaumont, Hasan, and Biliris. Pet. 35–39. Biliris is directed to content delivery networks having an architecture where content requests are shared among multiple content distribution networks to better balance loads. Ex. 1008, code (57), ¶¶ 6, 7.

Petitioner does not identify any additional teachings relating to a teaching for the claimed “policy” in the argument and evidence for dependent claims 2, 3, 10, and 11. Pet. 37–39. Thus, by virtue of dependency from the independent claims, we find that Petitioner has not demonstrated by a preponderance of the evidence that claims 2, 3, 10, and 11 would have been obvious over the combination of Beaumont, Hasan, and Biliris.

F. Obviousness of Claims 1–20 Over Ben-Shaul, With or Without Hasan

Petitioner contends that claims 1–20 would have been obvious over Ben-Shaul, with or without Hasan. Pet. 39–74. To support its contentions, Petitioner provides explanations as to how the combination of the prior art discloses each claim limitation. *Id.* Petitioner also relies upon the Declaration of Dr. Lin (Ex. 1003) to support its positions.

We begin our discussion with a brief summary of Ben-Shaul, and then address the evidence and arguments presented.

1. Ben-Shaul (Ex. 1005)

Ben-Shaul discloses a “centralized and differentiated content and application delivery system” allowing delivery of content “based on regional and temporal preferences, client identity and content priority.” Ex. 1005, code (57). Ben-Shaul’s network includes edge servers and EdgeDNS servers, as shown in Figure 5 of Ben-Shaul, reproduced below, which depicts a content delivery system of an embodiment. *Id.* ¶ 155.

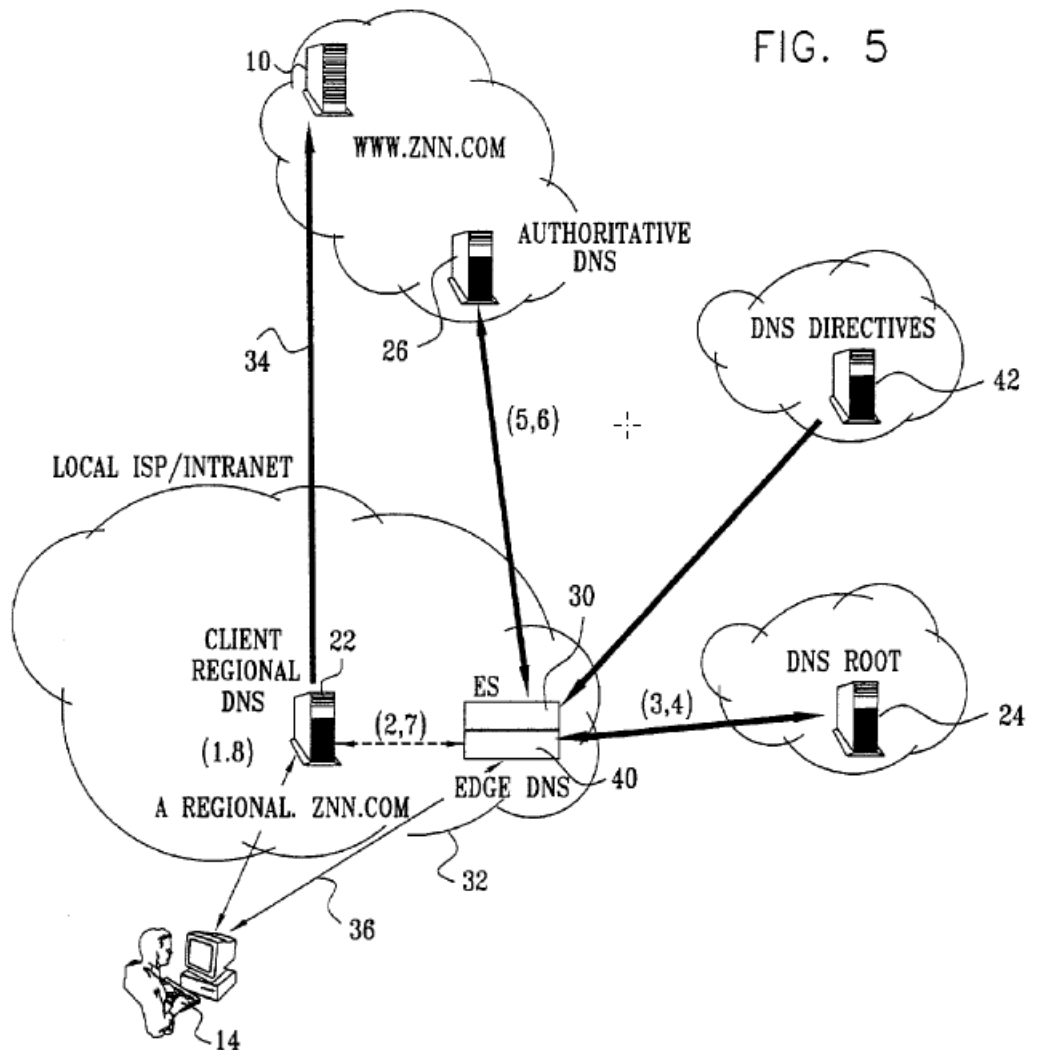


Figure 5, above, depicts an embodiment of Ben-Shaul's system, which includes client 14, Edge DNS server 40, and edge server (ES) 30. Ex. 1005 ¶ 177. "The Edge DNS is responsible to return the IP address of either the edge server or another server for resources that whose URL resides in these domains," where "[t]he control over which resources zones are directed to the edge servers may be controlled via the edge server policy." *Id.* ¶ 41.

2. Discussion

a. Claims 1, 9, and 17

Petitioner contends that Ben-Shaul uses a network of EdgeDNS servers for dynamically responding to DNS requests where, operating in a framework, “the EdgeDNS servers (adaptive traffic control name servers) direct user content requests (traffic) based on specified policies.” Pet. 43 (citing Ex. 1005 ¶¶ 39, 119, 148, 171, 177). Petitioner argues that Ben-Shaul’s EdgeDNS servers provide policy-based domain name service, where the EdgeDNS servers each receives DNS requests and “is responsible to return the IP address” of the appropriate content server based on “edge server policy.” *Id.* at 45–46 (citing Ex. 1005 ¶¶ 41, 177). Petitioner alleges that “*Ben-Shaul*’s policy is set through one or more GUIs provided to system users.” *Id.* at 46 (citing Ex. 1005 ¶¶ 182, 186) (graphical “CDML (“Content Delivery Markup Language”) editor 50”), ¶ 313 (front edge tool with “edge server graphical representation” to view server hierarchical map or sorted list allowing user “select[ing] and manipul[at]ing”), ¶ 349 (front edge tool’s “[GUI] editor used for editing the edge server directives”), ¶ 478 (describing edge manager GUI for “creating the hierarchical groups of edge servers”); Ex. 1003 ¶ 158.

Petitioner further alleges that “*Ben-Shaul*’s front edge tool GUI is for direction of network traffic and supports the setting of policies using a decision tree representing rules.” Pet. 47. Petitioner relies upon Ben-Shaul’s front edge tool, which Petitioner asserts to “enable[] ‘predefin[ing] meaningful groups of edge servers’ (content servers) ‘to simplify the application of policies applicable to a set of related edge servers.’” *Id.* (citing Ex. 1005 ¶ 309). Petitioner alleges that “[t]he front edge tool is a

GUI supporting grouping content servers in a hierarchical tree (supporting the setting of at least one policy).” *Id.* at 47–48 (citing Ex. 1005 ¶¶ 309–313, 352). Petitioner contends that “[b]ecause the front edge tool is for ‘simplify[ing] the application of policies,’ including policies related to network traffic, it is for direction of network traffic.” *Id.* at 48 (citing Ex. 1005 ¶¶ 309, 39; Ex. 1003 ¶ 162). Petitioner also asserts that the front edge tool’s hierarchical map is a “decision tree,” and a person of skill “would have understood that the hierarchical map is a ‘decision’ tree representing rules because directives apply based on inclusion of edge servers within the groups.” *Id.* (citing Ex. 1005, Fig. 10; Ex. 1003 ¶ 163)

Petitioner additionally contends that a person of ordinary skill in the art would have been motivated to combine the various GUIs described in Ben-Shaul, and the combined GUI would teach limitation [1.b]. Petitioner argues that “Ben-Shaul explains that the EdgeDNS servers redirect end-user requests to particular content servers based on ‘DNS and HTTP redirections policies’ implemented in CDML.” *Id.* at 48–49 (citing Ex. 1005 ¶¶ 38, 39). Petitioner asserts that “[t]hese policies are thus for ‘direction of network traffic’ (*id.*), and are set through a graphical CDML editor (GUI).” *Id.* at 49 (citing Ex. 1005 ¶¶ 182, 189; Ex. 1003 ¶ 164). Petitioner contends that the Ben-Shaul discloses that “policies set through CDML editor 50 may ‘nest[]’ in a hierarchy.” *Id.* at 48–49 (citing Ex. 1005 ¶ 196).

As to the alleged combined GUIs, Petitioner asserts that “[t]o the extent they are separate, it would have been obvious to implement Ben-Shaul’s front edge tool and CDML editor as a single GUI.” Pet. 49 (citing Ex. 1005 ¶ 165). Petitioner argues that “[b]oth tools are used to edit CDML code (Ben-Shaul, [0350], [0431]), both are implemented at the same origin

server (*id.*, [0211], [0182]), and both are used to shape policy for direction of network traffic (*id.*, [0038]–[0039], [0182], [0189], [0196]–[0197], [0309]–[0312]).” *Id.* Petitioner asserts that “[c]ombining the tools into a single GUI (‘the Ben-Shaul single GUI’) would streamline policy setting, and a POSITA would have understood the benefits of providing policy setters with a single easy-to-use interface such as the front edge tool’s tree structure.” *Id.* (citing 1005, Fig. 10; Ex. 1003 ¶ 165). Petitioner further asserts that “[i]n the Ben-Shaul single GUI, policy setters could both define groups of servers as described in relation to the front edge tool (Ben-Shaul, [0309]–[0313]) and set the policy for network traffic direction applicable to each group of servers as described in relation to the CDML editor (*id.*, [0038]–[0039], [0182], [0189], [0196]–[0197]).” *Id.* at 49–50 (citing Ex. 1003 ¶ 165).

Patent Owner argues that Ben-Shaul operates differently than Petitioner contends and Ben-Shaul’s edge servers do not provide DNS services as claimed and its GUIs are not used to write DNS policies, rather they are only used to write edge server policies that control operation of the edge servers. *See* PO Resp. 1–2, 45–47; PO Sur-reply 20–22. Patent Owner also contends that Ben-Shaul’s EdgeDNS is a “conventional DNS name server” that uses a dynamic cache replacement technique. PO Resp. 48–52. Dr. Shenoy testifies that in Ben-Shaul the EdgeDNS stores resource records mapping IP addresses to servers, and in response to a DNS request, the EdgeDNS accesses resource records to determine the IP address mapped to the requested domain and if the EdgeDNS does not have a resource record for the requested domain, it queries another DNS server for this information. Ex. 2017 ¶ 162, *see also* ¶¶ 158–161 (citing Ex. 1005 ¶¶ 176, 361–362, 373–

374, 398–399). Dr. Shenoy testifies that the EdgeDNS provides conventional DNS services by determining which servers are mapped to the requested domain as specified in its stored resource records and it “does not apply any location-based policies when resolving these requests, nor does it consider any information regarding edge server groupings”—“[it] simply accesses its stored resource records and returns the IP address specified in the appropriate record.” *Id.* ¶ 163.

Patent Owner also alleges that Ben-Shaul does not teach a decision tree that includes resource nodes that specify answers to be provided in response to a DNS request. PO Resp. 52–58 (citing Ex. 2017 ¶¶ 167–204). More specifically, Patent Owner contends that Petitioner argues that three different GUIs teach the claimed decision tree: (1) Ben-Shaul’s front edge tool, (2) the “Ben-Shaul single GUI,” and (3) the combined Ben-Shaul-Hasan GUI, “[b]ut none of these GUIs teach a decision tree with resource nodes specifying answers to be provided in response to a DNS request.” *Id.* at 53–58.

We agree with Patent Owner that Ben-Shaul, with or without Hasan, does not teach any that any policy is used to resolve DNS requests and, further, the combination does not use a GUI to set a decision tree that specifies decision criteria to be applied or answers to be provided in response to a DNS request. We agree with Dr. Shenoy that in Ben-Shaul the EdgeDNS is merely a conventional DNS name server that uses dynamic cache replacement and does not use a policy with a decision tree because Dr. Shenoy’s testimony is supported by Ben-Shaul. *See* Ex. 2017 ¶¶ 156–172. Ben-Shaul discloses that its EdgeDNS is “a conventional DNS Name Server” that uses dynamic cache replacement to route requests to edge

servers that hosts the requested content. Ex. 1005 ¶¶ 359–361, 423. With caching, the EdgeDNS replaces its resource record entries, where, for instance, the EdgeDNS caches resource records by mapping domains to the IP address of the EdgeDNS’s corresponding edge server by the client regional DNS server 22 writing the mapping to the EdgeDNS. *Id.* ¶ 176. Ben-Shaul states that “the client regional DNS server 22 conducts a periodic write of a regional domain name (a.regional.znn.com) DNS resolution with a binding to a local edge server IP address” where “[t]he writing is done into the resolution cache of the EdgeDNS 38.” *Id.* Thus, as Dr. Shenoy testifies, in Ben-Shaul “when resolving DNS requests, the EdgeDNS generally provides conventional DNS services by determining which servers are mapped to the requested domain as specified in its stored resource records.” Ex. 2017 ¶ 163. We also agree with Dr. Shenoy (*id.* ¶¶ 164–166) that Ben-Shaul’s disclosures support that an edge server can instruct its corresponding EdgeDNS to replace its stored DNS records where domains are mapped to the edge server IP address instead of the origin server address (see Ex. 1005 ¶¶ 360–361, 387–388, 414, 423). Thus, Ben-Shaul does not teach or suggest resolving DNS requests using a decision tree.

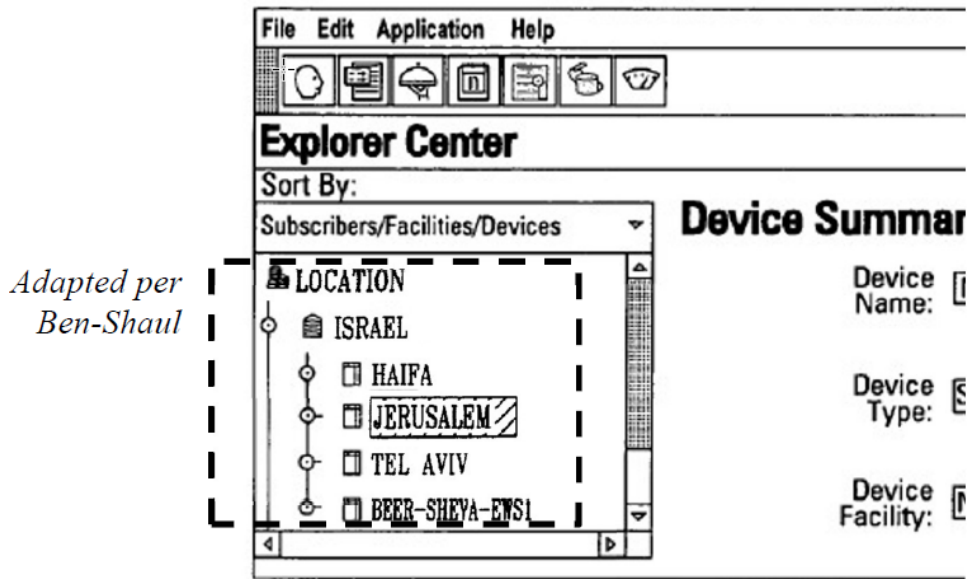
We also agree with Patent Owner that the prior art does not disclose the claimed decision tree as claimed or that it includes resource nodes that specify answers to be provided in response to a DNS request. As Patent Owner asserts, Petitioner argues that three GUIs teach the claimed decision tree: (1) Ben-Shaul’s front edge tool, (2) the “Ben-Shaul single GUI,” and (3) the combined Ben-Shaul-Hasan GUI. Pet. 48, 50–52; Ex. 1003 ¶¶ 162–168. As to Ben-Shaul’s GUIs, Petitioner asserts that it is the “hierarchical map” provided by the GUIs that represents the decision tree with rules,

where the “leaves” of the hierarchical map are answers “because an IP address for a selected server is provided as an answer to a DNS request.” *See* Pet. 53 (citing Ex. 1005 ¶ 41); Ex. 1003 ¶¶ 163, 165, 175. But, as Dr. Shenoy testifies, and we agree, Ben-Shaul’s GUIs, including the front edge tool and the Ben-Shaul single GUI, do not enable users to specify policies for responding to DNS requests because they are used to write edge server policies and are not used to write EdgeDNS policies as Petitioner contends. *See* Ex. 2017 ¶ 171; Pet. 45 (Petitioner asserts “*Ben-Shaul’s* EdgeDNS servers “provide . . . policy-based domain name service.”). Ben-Shaul disclosures support Dr. Shenoy’s testimony, stating that the front edge tool is used for “monitoring and managing edge servers” and defining edge server profiles and the CDML instruction files are “for the edge server.” Ex. 1005 ¶¶ 170, 211, 215, 220, 221, 350. We further agree with Dr. Shenoy’s testimony that Ben-Shaul’s CDML editor does not specify policies for responding to DNS requests or, more specifically, DNS redirection policies, nor does the EdgeDNS execute CDML policies because the EdgeDNS implements BIND software for DNS implementation. Ex. 2017 ¶¶ 173–174. This testimony is supported by Ben-Shaul’s disclosures. *See* Ex. 1005 ¶¶ 9–14, 170, 182, 188, 193–208, 379–382. Accordingly, the evidence of record does not support that in Ben-Shaul a GUI is used to obtain a policy for the direction of network traffic as claimed or setting a policy using a decision tree.

Further, we agree with Dr. Shenoy’s testimony that, contrary to Petitioner’s assertions (Pet. 53–54; Ex. 1003 ¶ 175), Ben-Shaul does not provide edge server locations or groups in response to DNS requests. Ex. 2017 ¶¶ 177–178. We agree with this testimony because, as discussed

above, Ben-Shaul's EdgeDNS only checks its stored resource records to identify a server by determining which servers are mapped to the requested domain as specified in its stored resource records and it does not consider edge server locations or groups. Further, we agree with the testimony that the leaves of the hierarchical maps represent edge servers and the front edge tool is used for "purposes of monitoring and managing the edge servers" because it is supported by the evidence of record. *Id.* ¶ 183; Ex. 1005 ¶¶ 211, 313 (front edge tool provides an edge server graphical representation (a hierarchical map of edge servers, as shown in Figure 10)). Accordingly, the evidence of record does not support that Ben-Shaul's front edge tool or single GUI discloses a decision tree or includes resource nodes that specify answers to be provided in response to a DNS request.

Further, we agree with Dr. Shenoy's testimony that Hasan does not cure Ben-Shaul's deficiencies because, while it may provide a layout of data objects, it does not provide a decision tree specifying answers to be provided in response to DNS requests. Ex. 2017 ¶ 185 (citing Ex. 1006, 6:54–56; 8:19–22). Consistent with this, in the combination Petitioner relies on the combination of Hasan and Ben-Shaul as depicted in the annotated Figure, reproduced below, that shows a combination of Figure 6A of Hasan and Figure 10 of Ben-Shaul. Pet. 50–51.



The annotated Figure, above, is a combination of Figure 6A of Hasan and Figure 10 of Ben-Shaul. Pet. 50–51. As depicted in the annotated Figure, Petitioner relies on Ben-Shaul only for the teaching of the GUI for setting the policy directives. *Id.* at 50. However, as discussed above, Ben-Shaul does not teach resource nodes in a decision tree that specifies answers to be provided in response to a DNS request.

We find Petitioner’s arguments in Reply relating to the above issues to be unpersuasive. *See* Pet. Reply 18–26. Petitioner asserts that Patent Owner’s argument that the GUIs in Ben-Shaul write edge server policies and not EdgeDNS policies is incorrect because, while Ben-Shaul does disclose its front-edge tool can edit edge server directives, Ben-Shaul’s EdgeDNS policies are also implemented through DNS directives that can be edited using a front edge tool. Pet. Reply 20 (citing Ex. 1005 ¶¶ 136, 176, 182, 349). Petitioner also contends that “the front edge tool allows users to define groups of edge servers and thus specify which directives apply to which servers.” *Id.* (citing Pet. 53). Petitioner also points to paragraph 176

of Ben-Shaul, that states that the configuration of the EdgeDNS is controlled by DNS directives that originate from policy control servers. *Id.* at 21 (citing Ex. 1005 ¶ 176). We do not agree with these arguments because Ben-Shaul only discloses that the directives control EdgeDNS configuration and coordination with DNS infrastructure, but there is no teaching or suggestion that the directives are used to resolve DNS requests or are set by a GUI. *See* Ex. 1005 ¶¶ 176–177; Ex. 2017 ¶ 207. We also note that no expert testimony was provided in support of its Reply and Petitioner provides only attorney argument in support of its rebuttal assertions. In contrast, Patent Owner provides the testimony of Dr. Shenoy, which we credit because it is supported by Ben-Shaul’s disclosures as discussed above. *See id.*

Petitioner further asserts that Ben-Shaul teaches that CDML is used for “specification of the DNS and HTTP redirections policies” (i.e., direction of network traffic by the EdgeDNS servers), which would be included in the functionality of the combined GUI. Pet. Reply 20 (citing Ex. 1005 ¶ 39; Pet. 48–49, 55). Ben-Shaul, however, only discloses that the CDML may be partitioned into six different specifications which may include a specification of DNS and HTTP redirection policies. *See* Ex. 1005 ¶ 39. However, as Patent Owner asserts, there is no disclosure in Ben-Shaul that this specification is implemented in resolving DNS requests or that it is implemented in the EdgeDNS server at all. *See* PO Sur-reply 21–22; Tr. 64:22–65:3. Further, we do not discern, nor does Petitioner direct us to disclosures, that there are implementations in Ben-Shaul for resolving DNS requests or that there is implementation in the EdgeDNS server. Instead, we credit Dr. Shenoy’s testimony that explains that the EdgeDNS is not

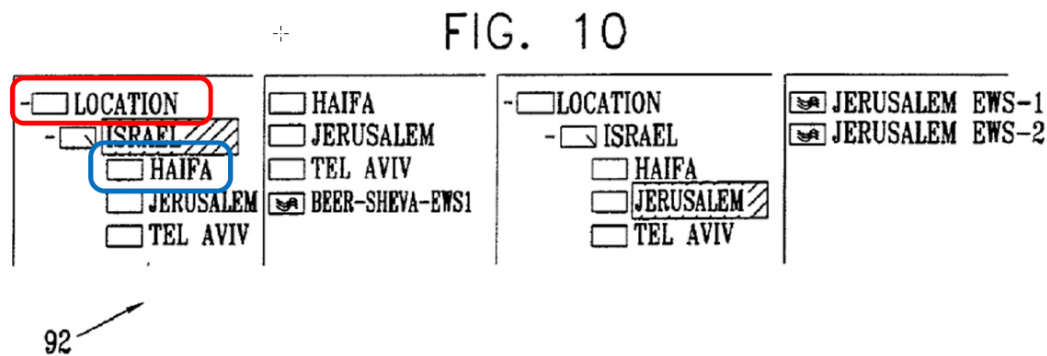
configured to execute such CDML policies and does not apply them in resolving DNS requests because, as discussed above, we agree that the Edge-DNS uses BIND software for responding to DNS requests based on the evidence of record. Ex. 2017 ¶¶ 173–176; Ex. 1005 ¶¶ 9–14, 170, 379–382.

Petitioner also refers to Ben-Shaul’s disclosures of the EdgeDNS’ tasks of “accept[ing] and handl[ing] queries from clients, manag[ing] a local cache of DNS queries, [and] maintain[ing] zones.” Pet. Reply 21 (citing Ex. 1005 ¶ 359). This disclosure, however, does not address using DNS resolution policies that consider edge server locations or groupings. *See* PO Sur-reply 23. Petitioner also refers to Ben-Shaul’s disclosure that its “EdgeDNS is responsible to return the IP address of . . . the edge server,” and argues that the EdgeDNS differentiates based on regions and groups, where the EdgeDNS “suppl[ies] different responses to a given request or query, depending on the location of the query, and the status of the edge server in the zone from which the request was made.” Pet. Reply 22 (citing Ex. 1005 ¶¶ 39, 41, 42, 44, 309, 360). Petitioner asserts that Dr. Lin confirmed at deposition that the EdgeDNS server performs regional and group differentiation to select the Edge server. *Id.* at 23 (citing Ex. 2018, 230:7–15, 231:10–20, 233:11–21). But Petitioner relies in part on disclosures that it is edge server that differentiates based on regions and groups, not EdgDNS functionality. *See* Ex. 1005 ¶ 44, *see id.* ¶ 42 (paragraph 44 is a “type[] of edge-level differentiation”); Ex. 2017 ¶¶ 180, 181. Further, as Dr. Shenoy explains, edge servers that serve a particular region instruct the corresponding EdgeDNS servers to modify their DNS records to map certain domains to the edge server IP address instead of the

origin server address, then DNS requests from the given region are then forwarded to the corresponding EdgeDNS by the local client regional DNS server, and the EdgeDNS retrieves and returns the edge server IP address it has stored for the requested domain. Ex. 2017 ¶¶ 156–166; Ex. 1005 ¶¶ 171, 176, 360–361, 373–374, 423. The evidence supports that the EdgeDNS simply returns the mapped IP address and does not resolve the request by applying a policy that considers edge server location or groupings.

Petitioner further contends that Patent Owner’s argument that the front edge tool is merely a hierarchical view that allows users to browse the edge server map is incorrect because Ben-Shaul discloses that administrators may “construct hierarchies of edge servers, which are later used by profile editors in order to apply a particular service directive to a collection of edge servers.” Pet. Reply 23 (citing Ex. 1005 ¶ 309). This Ben-Shaul disclosure, however, is directed to edge servers and instead is consistent with Dr. Shenoy’s testimony. *See* Ex. 1005 ¶ 309 (“predefine[ing] meaningful groupings of edge servers,” “construct hierarchies of edge servers.”).

Petitioner also argues that the “hierarchical maps” of edge servers depicted by the different asserted GUIs constitute the claimed decision tree that is used to define policies for directing DNS requests, relying on Figure 10 of Ben-Shaul as the claimed GUI. *See* Pet. Reply 18–19, 24. Petitioner’s annotated Figure 10 is reproduced below. Pet. 53.



Annotated Figure 10, above, is a hierarchical view of a list of edge servers. Ex. 1005 ¶ 160. In the Petition, Petitioner argues that these hierarchical maps “specify one or more decision criteria to be applied,” as claimed, because “a DNS request is [] directed to an edge server based on that server’s association with the group,” and that they also “specify one or more answers to be provided in response to a [DNS] request,” as claimed, because an IP address of a server “may be returned based on its location” within a group. Pet. 53–55. Further in Reply, Petitioner asserts that “[m]embership in a group determines what directives apply to what servers—that is why these groups are created” where “requests are directed to particular edge servers based on their group associations” and “users can dynamically create, remove, add, delete, move, and rename edge servers and downstream nodes, allowing a user to alter the directives dynamically.” Pet. Reply 24 (citing Ex. 1005 ¶ 312). As discussed above, however, the evidence of record supports that the EdgeDNS does not use edge server location or groupings when resolving DNS requests; rather the EdgeDNS retrieves and returns the edge server IP address it has stored for the requested domain, so the hierarchical maps of edge servers depicted by the different asserted GUIs are not relevant. Further, Petitioner argues that “[m]embership in a group determines what directives apply to what servers.”

Id. at 24. However, as discussed above, these are service directives and are not DNS policies—Petitioner does not direct us to any disclosures in Ben-Shaul showing that directives are used to resolve DNS requests or are applied to edge server groups using a GUI. *See* Ex. 1005 ¶¶ 309, 313; Ex. 2017 ¶¶ 150–155.

Accordingly, based on the evidence of record, we find that Ben-Shaul, with or without Hasan, fails to teach or suggest: a GUI used to obtain a policy for the direction of network traffic; a GUI to support setting a decision tree; and the resource nodes of the decision tree that specify answers to be provided in response to a DNS request as claimed. Thus, Petitioner has not demonstrated by a preponderance of the evidence that claim 1 would have been obvious over Ben-Shaul, with or without Hasan. Claims 9 and 17 are independent claims that contain similar evidence and argument regarding the limitations at issue, and Petitioner relies on similar argument and evidence to that of claim 1 for those teachings. *See* Pet. 66–69, 71–74. We similarly find that Petitioner has not demonstrated by a preponderance of the evidence that claims 9 and 17 would have been obvious over the combination of Ben-Shaul, with or without Hasan, for similar reasons to those discussed above for claim 1.

b. Claims 2–8, 10–16, and 18–20

Petitioner does not identify any additional teachings relating to all the limitations at issue for dependent claims 2–8, 10–16, and 18–20. Pet. 59–66, 70–71, 74. Thus, by virtue of dependency from the independent claims we find that Petitioner has not demonstrated that claims 2–8, 10–16, and 18–20 would have been obvious over Ben-Shaul, with or without Hasan, by a preponderance of the evidence.

III. CONCLUSION

The outcome for the challenged claims of this Final Written Decision follows.¹⁰ In summary:

Claim(s)	35 U.S.C §	Reference(s)/Basis	Claim(s) Shown Unpatentable	Claim(s) Not Shown Unpatentable
1, 4–9, 12–20	103(a)	Beaumont, Hasan		1, 4–9, 12–20
2, 3, 10, 11	103(a)	Beaumont, Hasan, Biliris		2, 3, 10, 11
1–20	103(a)	Ben-Shaul		1–20
1–20	103(a)	Ben-Shaul, Hasan		1–20
Overall Outcome				1–20

IV. ORDER

It is, therefore,

ORDERED that Petitioner has not demonstrated by a preponderance of the evidence that claims 1–20 of the '517 patent are unpatentable;

FURTHER ORDERED that because this is a Final Written Decision, parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

¹⁰ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).

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