

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,
Petitioner,

v.

SANDPIPER CDN, LLC.,
Patent Owner.

Case IPR2025-00806
Patent No. 8,645,517

DECLARATION OF BILL LIN, PH.D.

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I. INTRODUCTION

1. I have been retained by Google LLC (“Google”), as an independent expert for the above-identified *inter partes* review proceeding involving U.S. Patent No. 8,645,517 (“the ’517 patent”).

2. I am over 21 years of age and, if I am called upon to do so, I would be competent to testify as to the matters set forth herein.

3. Although I am being compensated for my time in connection with this proceeding at my standard hourly consulting rate and reimbursed for reasonable out-of-pocket expenses, no part of my compensation depends on the outcome of this proceeding, and I have no other interest in this proceeding.

4. I have been asked to provide my opinion whether the claims of the ’517 patent would have been obvious to a person of ordinary skill in the art at the time of the earliest claimed priority date of the ’517 patent. My opinions are set forth below.

5. Throughout this declaration, I refer to specific pages, figures, and/or line numbers of various exhibits. These citations are illustrative and are not intended to suggest that they are the only support for the propositions for which they are cited.

II. SUMMARY OF OPINIONS

6. This declaration analyzes claims 1–20 of the ’517 patent. Below, I set forth the opinions I have formed, the conclusions I have reached, and the bases for

my opinions and conclusions. I believe the statements contained in this declaration to be true and correct to the best of my knowledge.

7. Based on my experience and my knowledge of the art at the time of the applicable priority date, it is my opinion that claims 1–20 of the '517 patent would have been obvious based on the asserted grounds discussed below.

III. QUALIFICATIONS AND BACKGROUND

8. I believe that I am well qualified to serve as a technical expert in this matter based upon my qualifications, discussed in detail below.

9. I am currently a Full Professor of Electrical and Computer Engineering and the Associate Dean for Strategic Programs at the University of California, San Diego (UCSD).

10. I received a Bachelor of Science in Electrical Engineering and Computer Sciences from University of California, Berkeley in May 1985. I received a Master of Science in Electrical Engineering and Computer Sciences in May 1988 and a Ph.D. in Electrical Engineering and Computer Sciences in May 1991, both from the University of California, Berkeley.

11. I joined UCSD in 1997, and I have been a tenured professor since 1999. My teaching and research focus on computer architecture and computer network problems, including the design of high-performance switches and routers, high-speed packet processors, wireless networks, data networks, and various hardware

accelerators for networking applications. I regularly teach a senior-level design course on the design of advanced processors, and I have taught graduate courses and advanced special topics in computer architecture and computer networks.

12. At UCSD, I am a Principal Investigator in the UCSD Center for Networked Systems (CNS). CNS brings together researchers to work on a range of challenges in the design of future networked systems. My contribution to CNS has been expertise in the design of computer architecture solutions for packet processing, computer networking, and network measurements. I am also a Principal Investigator in the UCSD Center for Wireless Communications (CWC). CWC brings together researchers to work on a range of challenges in the design of future wireless communications systems. My contribution to CWC has been expertise in the design of computer architecture solutions for wireless networking and mobile computing.

13. Prior to joining UCSD, I was the Head of the Systems and Communications Group at IMEC in Leuven, Belgium, where I led a team of researchers who worked on a range of computer design problems, including specialized processors for wireless communications and computer networking. I also previously held positions at Hewlett Packard, Hughes Electronics, and Western Digital.

14. During my career, I have received or worked on research efforts that received millions of dollars in research funding from both government agencies and industry, including funding for research in packet processing, computer networks, network measurements, and wireless communications.

15. I have served as an Associate or Guest Editor for several journals published by the Association for Computing Machinery (“ACM”) and the Institute of Electrical and Electronics Engineers (“IEEE”). I have also served as General Chair of several ACM/IEEE conferences, and on the Organizing or Steering Committees of many ACM/IEEE conferences, and I have served on the Technical Program Committees of numerous ACM/IEEE conferences. I am the author of over 200 top-tier peer-reviewed publications in the field of computer engineering dating to the 1980s, including journal articles, conference papers, book chapters, technical reports, and invited papers. A number of these publications have received best paper awards or distinguished paper citations. I have also given numerous invited and keynote talks around the world.

16. I am a named inventor on five patents in the fields of computer design and computer networking.

17. My complete qualifications and professional experience are described in my curriculum vitae, filed as a separate Exhibit (EX-1004).

IV. MATERIALS CONSIDERED

18. In forming my opinions, I read and considered the '517 patent and its prosecution history, the exhibits listed in the Exhibit List filed with the petition for *inter partes* review of the '517 patent, as well as any other materials referenced herein. In preparing this declaration, I have reviewed at least the following documents:

<u>Exhibit</u>	<u>Description</u>
1001	U.S. Patent No. 8,645,517 to Gaillard et al. (“’517 patent”)
1002	Prosecution History of U.S. Application No. 10/552,912
1005	U.S. Patent Pub. No. 2002/0010798 to Ben-Shaul et al. (“ <i>Ben-Shaul</i> ”)
1006	U.S. Patent No. 7,082,464 to Hasan et al. (“ <i>Hasan</i> ”)
1007	U.S. Patent Pub. No. 2002/0169890 to Beaumont et al. (“ <i>Beaumont</i> ”)
1008	U.S. Patent Pub. No. 2002/0078233 to Biliris et al. (“ <i>Biliris</i> ”)
1009	Balachander Krishnamurthy et al., <i>On the Use and Performance of Content Distribution Networks</i> , Proceedings of the 1st ACM SIGCOMM Workshop on Internet measurement, November 2001 (“ <i>Krishnamurthy</i> ”)
1010	Zhuoqing Morley Mao et al., <i>A Precise and Efficient Evaluation of the Proximity between Web Clients and their Local DNS Servers</i> , Proceedings of the 2002 USENIX Annual Technical Conference, June 2002 (“ <i>Mao</i> ”)
1011	U.S. Provisional Patent App. No. 60/325,177 to Stolorz et al. (“ <i>Provisional App.</i> ”)

<u>Exhibit</u>	<u>Description</u>
1012	U.S. Patent Pub. No. 2003/0065762 to Stolorz et al. (“2002 Application”)
1013	U.S. Patent Pub. No. 2008/0215718 to Stolorz et al. (“2007 CIP”)
1014	Prosecution History of U.S. Application No. 10/259,497

19. I reserve the right to supplement and amend any of my opinions in this declaration based on documents, testimony, and other information that becomes available to me after the date of this declaration.

V. LEGAL STANDARDS

20. I am not a lawyer. My understanding of the legal standards to apply in reaching the conclusions in this declaration is based on discussions with counsel for Petitioner, my experience applying similar standards in other patent-related matters, and my reading of the documents submitted in this proceeding. In preparing this declaration, I have tried to faithfully apply these legal standards to the challenged claims.

21. I have been informed that there are two ways in which prior art may render a patent claim unpatentable. First, I have been informed that the prior art can “anticipate” a claim. Second, I have been informed that the prior art can render a claim “obvious” to a person of ordinary skill in the art. I understand that a claim is

patentable if it was not anticipated and would not have been obvious by the prior art at the effective filing date of the patent.

22. I have been informed that a dependent claim is a patent claim that refers back to another patent claim. I have been informed that a dependent claim includes all of the limitations of the claim to which it refers.

23. I have been asked to provide my opinions as to whether the cited prior art teaches or renders obvious claims 1–20 of the '517 patent from the perspective of a person of ordinary skill in the art at the '517 patent's earliest claimed priority date, as described in more detail below.

24. I have been informed that in *inter partes* review proceedings, such as this one, the party challenging the patent bears the burden of proving unpatentability by a preponderance of the evidence. I understand that a preponderance of the evidence means “more likely than not.”

25. For purposes of this declaration, I have been asked to provide my opinions on issues regarding unpatentability. I have been informed of the following legal standards, which I have applied in forming my opinions.

A. Level of Ordinary Skill in the Art

26. I have been informed a person of ordinary skill in the art is determined by considering several factors, including the (i) type of problems encountered in the art; (ii) prior art solutions to those problems; (iii) rapidity with which innovations

are made; (iv) sophistication of the technology; and (v) educational level of active workers in the field.

27. I have been instructed to assume a person of ordinary skill in the art is not a specific real individual, but rather a hypothetical individual having the qualities reflected by the factors discussed above.

B. Claim Construction

28. I understand that the United States Patent and Trademark Office interprets claim terms in an *inter partes* review proceeding under the same claim construction standard that is used in a United States federal court. I understand that under this standard, the meaning of claim terms is considered from the viewpoint of one of ordinary skill in the art at the time of the invention.

29. I have been informed that claim terms are generally given their ordinary and customary meaning as understood by one of ordinary skill in the art in light of the specification and the prosecution history pertaining to the patent. I understand, however, that claim terms are generally not limited by the embodiments described in the specification.

30. I understand that in addition to the claims, specification, and prosecution history, other evidence may be considered to ascertain the meaning of claim terms, including textbooks, encyclopedias, articles, and dictionaries. I have

been informed that this other evidence is often less significant and less reliable than the claims, specification, and prosecution history.

C. Anticipation

31. I have been informed that under 35 U.S.C. § 102, a patent claim is “anticipated” and thus unpatentable if the claimed subject matter was patented or described in a printed publication before the effective filing date of the claimed invention. I have been informed that this is referred to as unpatentability by anticipation. I have been informed that a patent claim is anticipated under § 102 if a single prior art reference discloses all limitations of the claimed invention.

D. Obviousness

32. I have been informed that obviousness under 35 U.S.C. § 103, a patent claim is unpatentable if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious to a person having ordinary skill in the art to which said subject matter pertains at the time the invention was made. I have been informed that this is referred to as unpatentability by obviousness.

33. I have been informed that a proper obviousness analysis includes the following:

- a. determining the scope and content of the prior art;

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- b. ascertaining the differences between the prior art and the claims at issue;
 - c. resolving the level of ordinary skill in the pertinent art; and
 - d. considering evidence of secondary indicia of non-obviousness (if available).

34. I have been informed that the relevant time for considering whether a claim would have been obvious to a person of ordinary skill in the art is the time of invention. For my obviousness analysis, I have generally assumed that the date of invention for the challenged claims is September 28, 2001, although, as I state herein, the publications to which the '517 patent claims priority do not provide a written description of at least some elements. My analysis would not change under the actual priority date of October 26, 2007.

35. I have been informed that a reference may be modified or combined with other references or with a person of ordinary skill in the art's own knowledge if the person would have found the modification or combination obvious. I have also been informed that a person of ordinary skill in the art is presumed to know all the relevant prior art, and the obviousness analysis may take into account the inferences and creative steps that a person of ordinary skill in the art would employ.

36. I have been informed that whether a prior art reference renders a patent claim obvious is determined from the perspective of a person of ordinary skill in the art. I have also been informed that, while there is no requirement that the prior art contain an express suggestion to combine known elements to achieve the claimed invention, and while a suggestion to combine known elements to achieve the claimed invention may come from the prior art as a whole or individually and may consider the inferences and creative steps a person of ordinary skill in the art would employ, as filtered through the knowledge of one skilled in the art, obviousness grounds cannot be sustained by mere conclusory statements and must include some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.

37. In determining whether a prior art reference could have been combined with another prior art reference or other information known to a person having ordinary skill in the art, I have been informed that the following principles may be considered:

- a. a combination of familiar elements according to known methods is likely to be obvious if it yields predictable results;
- b. the substitution of one known element for another is likely to be obvious if it yields predictable results;

-
- c. the use of a known technique to improve similar items or methods in the same way is likely to be obvious if it yields predictable results;
 - d. the application of a known technique to a prior art reference that is ready for improvement to yield predictable results;
 - e. any need or problem known in the field and addressed by the reference can provide a reason for combining the elements in the manner claimed;
 - f. a person of ordinary skill often will be able to fit the teachings of multiple references together like a puzzle; and
 - g. the proper analysis of obviousness requires a determination of whether a person of ordinary skill in the art would have a “reasonable expectation of success”—but not “absolute predictability” of success—in achieving the claimed invention by combining prior art references.

38. I have been informed that, when a work is available in one field, design alternatives and other market forces can prompt variations of it, either in the same field or in another. I have been informed that if a person of ordinary skill in the art could have implemented a predictable variation and would have seen the benefit of

doing so, that variation is likely to have been obvious. I have been informed that, in many fields, there may be little discussion of obvious combinations, and in these fields market demand—not scientific literature—may drive design trends. I have been informed that, when there was a design need or market pressure and there are a finite number of predictable solutions, a person of ordinary skill in the art would have had a good reason to pursue those known options.

39. I have been informed that the law permits the application of “common sense” in examining whether a claimed invention would have been obvious to a person skilled in the art. For example, I have been informed that combining familiar elements according to known methods and in a predictable way may suggest obviousness when such a combination would yield nothing more than predictable results. I understand, however, that a claim is not obvious merely because every claim element is disclosed in the prior art and that a party asserting obviousness must still provide a specific motivation to combine or modify the references as recited in the claims and explain why one skilled in the art would have reasonably expected to succeed in doing so.

40. I have been informed that there is no rigid rule that a reference or combination of references must contain a “teaching, suggestion, or motivation” to combine references. But I also understand that the “teaching, suggestion, or

motivation” test can be a useful guide in establishing a rationale for combining elements of the prior art. I have been informed that this test poses the question as to whether there is an express or implied teaching, suggestion, or motivation to combine prior art elements in a way that realizes the claimed invention, and that the “teaching, suggestion, or motivation” test seeks to counter impermissible hindsight analysis.

41. I am not aware of any evidence of secondary considerations that would support a determination of non-obviousness of the claimed subject matter in the ’517 patent.

42. I have been informed that, in an obviousness analysis, prior art must be analogous prior art to the patent being considered. I have been informed that a prior art reference is considered to be analogous, or in the same field of art, if the reference is either (1) in the same field of endeavor as the challenged patent, regardless of the problems the challenged patent and the prior art address, or (2) reasonably pertinent to the particular problem being solved by the challenged patent.

VI. TECHNOLOGY BACKGROUND AND THE STATE OF THE PRIOR ART

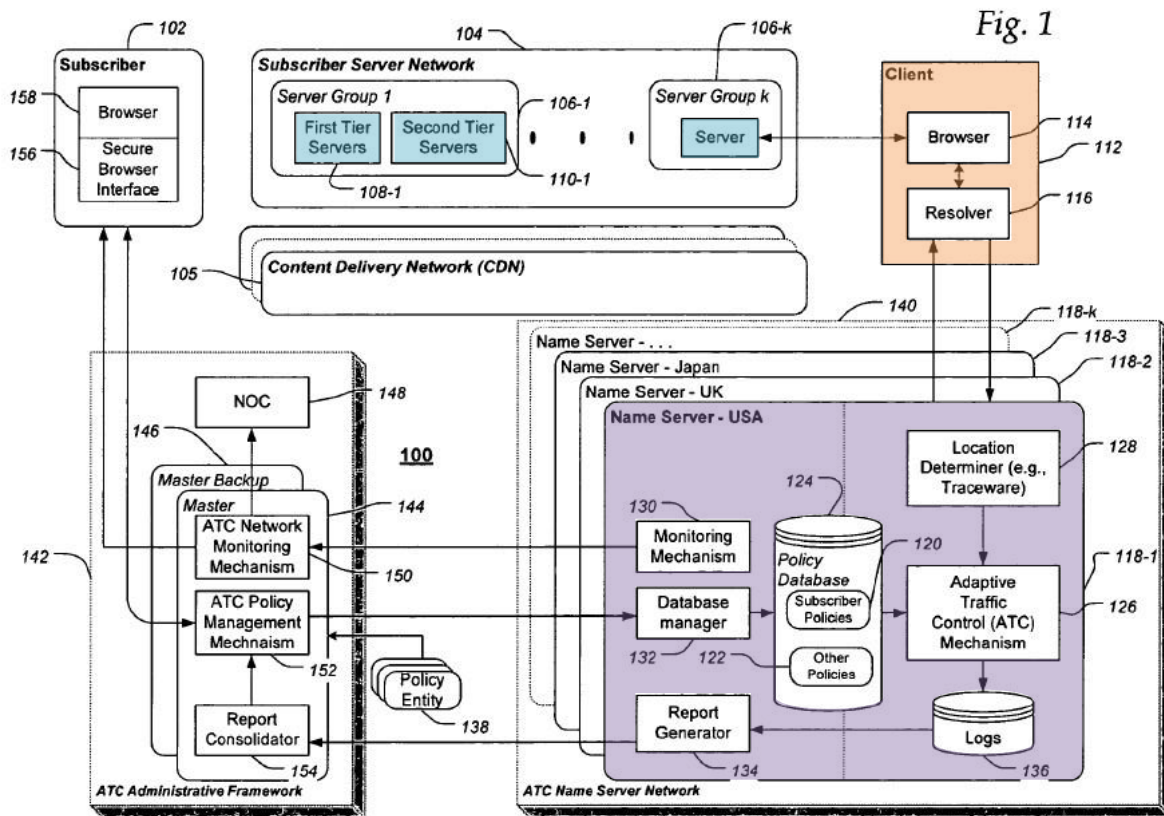
43. Content delivery networks (CDNs) are geographically dispersed servers for delivering content to end-users. *Krishnamurthy*, Abstract; *Mao*, Abstract; *Biliris*, [0003]. CDNs reduce demand on origin servers by replicating their content

on CDN servers. *Krishnamurthy*, Abstract; *Mao*, Abstract; *Biliris*, [0003]. When an end-user client requests content from the origin server, the CDN locates a CDN server that stores a cached copy of that content. *Krishnamurthy*, §I; *Mao*, Abstract, §I; *Biliris*, [0003]. CDNs typically route end-user requests using Domain Name Service (DNS) servers. *Krishnamurthy*, §II; *Mao*, §I. DNS servers take domain names from the end-user requests and return an IP address for a server mapped to that domain. *Krishnamurthy*, §II; *Beaumont*, [0004]; *Ben-Shaul*, [0007]. Multiple servers may be mapped to a single domain, and the DNS server returns the IP address of the CDN server that is best suited to respond to the end-user request. *Ben-Shaul*, [0007]; *Beaumont*, [0004]; *Krishnamurthy*, §II. Many CDNs allow administrators to define custom policies for selecting the best-suited CDN servers. *Krishnamurthy*, §V.A; *Mao*, §4.2; *Beaumont*, [0016].

VII. OVERVIEW OF THE '517 PATENT

A. The Claims and Specification

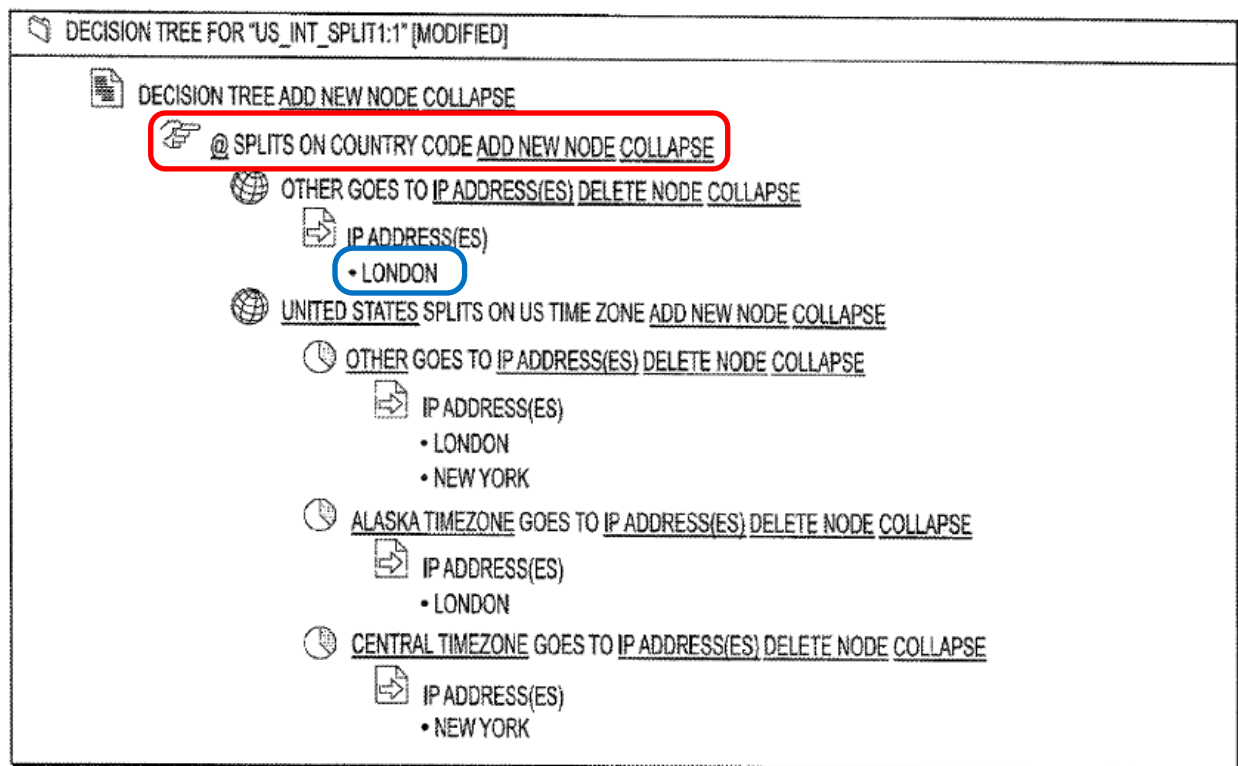
44. The '517 patent discloses a framework in which “resources of a content provider may be delivered to clients from different domains ... based on content-provider policies.” EX-1001, Abstract. As I illustrate below with color-coded highlighting in Fig. 1, the '517 patent's framework includes a network of subscriber **servers**, a **client**, and various **DNS servers**:



EX-1001, Fig. 1. The **client** accesses the subscriber server network through a URL request to access content stored on the **servers**. *Id.*, 3:57–4:21. The **DNS server** resolves the request, returning an address of a selected **server**. *Id.*, 4:35–51. The **client** then accesses the content from the **server** via a browser 114. *Id.*

45. The **DNS server** selects a particular **server** for responding to a request based on policies stored in a policy database 124. *Id.* The '517 patent explains these policies is constructed as a hierarchical decision tree, where “the branches of this tree (... **branch nodes**) ... specif[y] the various decision criteria that the user wants to apply.” *Id.*, 9:1–12. “[T]he leaves of this tree (... **resource nodes**)” within the

branches “specif[y] the answers (IP addresses or CNAMEs) ... to provide in response to a DNS request.” *Id.* The subscriber (e.g., the person or entity whose content is delivered) may set these policies at the branch and resource level via an administrative master agent 144 accessed through a web-based graphical user interface:



Id., Fig. 10(b); 9:1–8; 17:33–45. In this example, a **branch node** is defined “at the top level according to a split between the United States and rest of the world” and, based on the decision tree, a request “initiated from non-U.S. geographical regions is directed to a **resource [node]** named ‘London.’” *Id.* Accordingly, in this example, the location where the request is initiated dictates server selection. *Id.*

B. Prosecution History

46. From the cover of the patent, I understand that the '517 patent was filed on December 24, 2010, as U.S. Application 12/978,537. EX-1001, cover. I have reviewed the prosecution history of the '517 patent and I understand the patent was initially rejected based on references not raised in the present IPR proceeding. EX-1002, 64–72. The Applicant responded that the primary reference applied by the Examiner lacked a hierarchical GUI to set a policy for responding to DNS requests as claimed. *See id.*, 54–55. Specifically, the Applicant urged that the reference's policy editor did not teach resource nodes specifying the answer to be provided in response to a DNS request. *Id.*, 54-58. The Office then allowed the claims. *Id.*, 34–40.

C. Priority Date

47. From the cover of the patent, I understand that the '517 patent claims priority through two branches of a patent family whose earliest member is a September 28, 2001, provisional. EX-1001, cover. That provisional spawned a 2002 non-provisional application (U.S. Application 10/259,497, filed September 30, 2002 (the "2002 Application")). *Id.* In 2007, the Applicant subsequently filed both a continuation (U.S. Application No. 11/932,162, filed October 31, 2007 (the "2007 Continuation")) and a continuation-in-part (U.S. Application 11/976,648, filed

October 26, 2007 (the “2007 CIP”)) claiming priority to the 2002 Application. However, in my opinion, the 2007 CIP provides the earliest possible support for its claims and the patent is thus entitled to priority as of, at best, October 26, 2007.

48. I have reviewed each of the priority documents referenced above. Neither the 2002 Application nor the provisional application describe “one or more resource nodes [being] ... mail exchange (MX) records,” as recited in each of independent claims 1, 9, and 17. *See generally* EX-1011, EX-1012. Nowhere in either of these applications is the concept of mail exchange or MX records discussed. *See generally* EX-1011, EX-1012. None of the figures of these applications indicate the resource nodes may be mail exchange records. *See generally* EX-1011, EX-1012. Indeed, the term “mail exchange” never appears in the Provisional Application or the 2002 Application. *See generally* EX-1011, EX-1012. Rather, this term was first introduced in the 2007 CIP application. *Compare* EX-1012 *with* EX-1013.

49. Accordingly, in view of the lack of written description support, the earliest possible priority date of the ’517 is October 26, 2007.

VIII. LEVEL OF ORDINARY SKILL IN THE ART

50. In rendering the opinions set forth in this declaration, I have been asked to consider the ’517 patent’s claims and the prior art through the eyes of a person of ordinary skill in the art (which I may also refer to as “one skilled in the art,” “skilled artisan,” “POSITA,” “POSA” or similar variation). I have considered factors such

as the educational level and years of experience of those working in the pertinent art, the types of problems encountered in the art, the teachings of the prior art, patents and publications of other persons or companies, and the sophistication of the technology.

51. Taking the factors described in the Legal Standards – Level of Ordinary Skill in the Art section into consideration, it is my opinion that a person of ordinary skill in the art (“POSITA”) at the time of the alleged invention of the ’517 patent 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.

52. Based on my educational background and experience, I was at least a person of ordinary skill in the art at the earliest possible priority date of the ’517 patent. My opinions would not change if a later priority date is assumed.

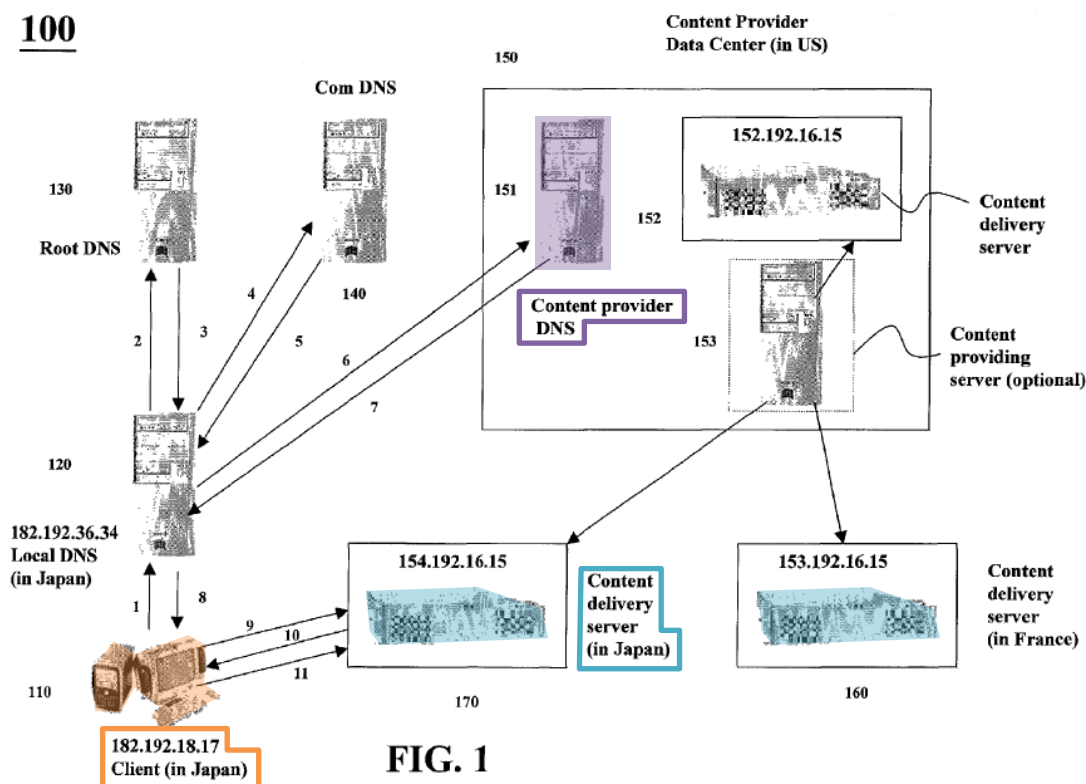
IX. CLAIM CONSTRUCTION

53. For purposes of this IPR proceeding, I apply the plain and ordinary meaning of claim terms in the ’517 patent, consistent with the disclosure and prosecution history. In my opinion, no claim terms require explicit construction to resolve the proposed grounds at this time.

X. OVERVIEW OF THE PRIOR ART

A. Beaumont

54. Like the '517 patent, U.S. Patent Pub. No. 2002/0169890 to Beaumont et al. ("*Beaumont*") deals with content delivery networks. *Beaumont*, Abstract. *Beaumont* discloses a content delivery system in which a **client 110** (e.g., an end-user) may request access to content stored on one or more **content delivery servers 160 and 170**. *Id.*, Abstract, [0018]. To fulfill the request, a mapping request is sent to a **content provider DNS 151**:



Id., Fig. 1, [0018]. The content provider DNS selects a content delivery server that will provide the content. *Id.*, [0018], [0019], [0022].

55. To select an appropriate content delivery server, the content provider DNS uses a mapping database to identify content delivery servers mapped to the domain of the client. *Id.*, [0022], [0024]. The content provider then uses a preference database to select a particular content delivery server. *Id.*, [0023]. As one example, the preference database may store data allowing the content provider DNS to select the content server closest to the client. *Id.*, [0007], [0019]. As another example, *Beaumont* envisions that the preference database may include other selection rules, such as customizable preference values 373:

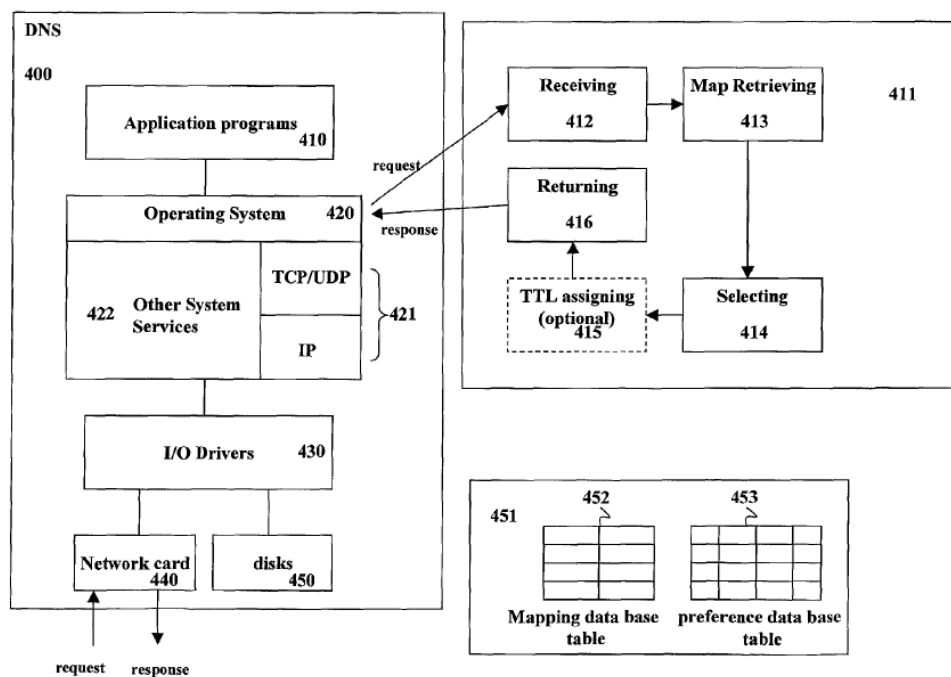
	371	372	373	374	375 (optional)	376 (optional)	377 (optional)	378 (optional)	379 (optional)
							number		
310	Delivery Server Address	Destination Domain	Preference	Number of lost packet s	Number of connection s	Estimate d distance	of times being selected per hour	Health	Time-To- Live (minute s)
320	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

Id., Fig. 3; [0006], [0031]–[0035]. For example, preference numbers can be assigned to each content delivery server and the content delivery server with the highest preference number may be selected. *Id.*, [0031].

56. In the example from Fig. 3 shown above, the system may identify servers 152.192.16.15, 153.192.16.15, and 154.192.16.15 as belonging to the same

destination domain as the client (182.192) and may select **server 154.192.16.15** as having the highest preference value. *Id.*, [0028]. *Beaumont* teaches that rules and values may be “entered manually” into the preference table. *Id.*, [0031], [0034].

57. The mapping and preference databases are stored at the content provider DNS in a disk 451 (of disks 450):

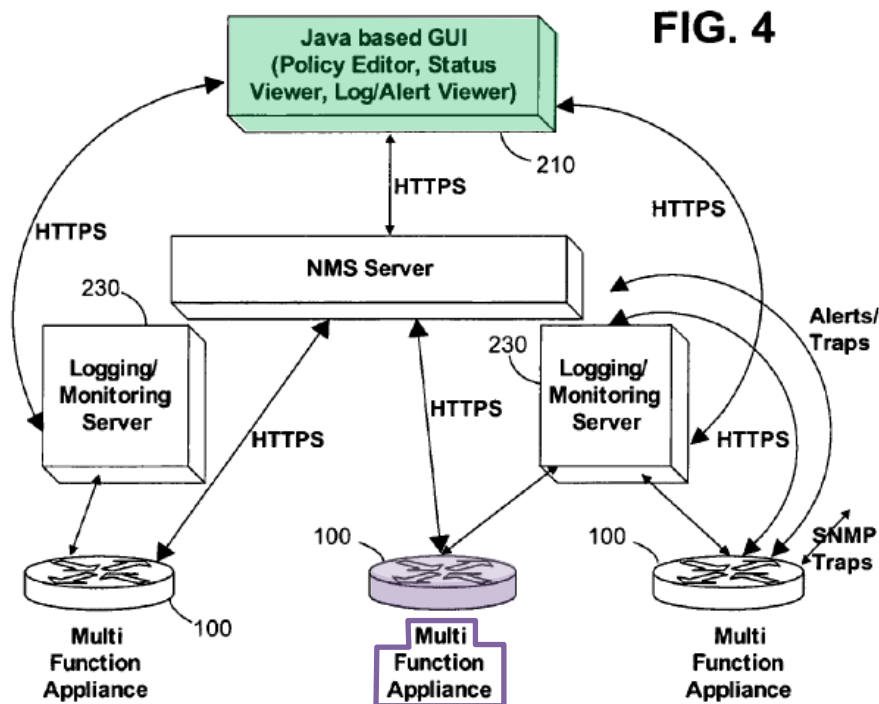


Id., Fig. 4, [0032]. The content provider DNS further includes a network card 440 for communicating with other components of the network. *Id.*, [0032].

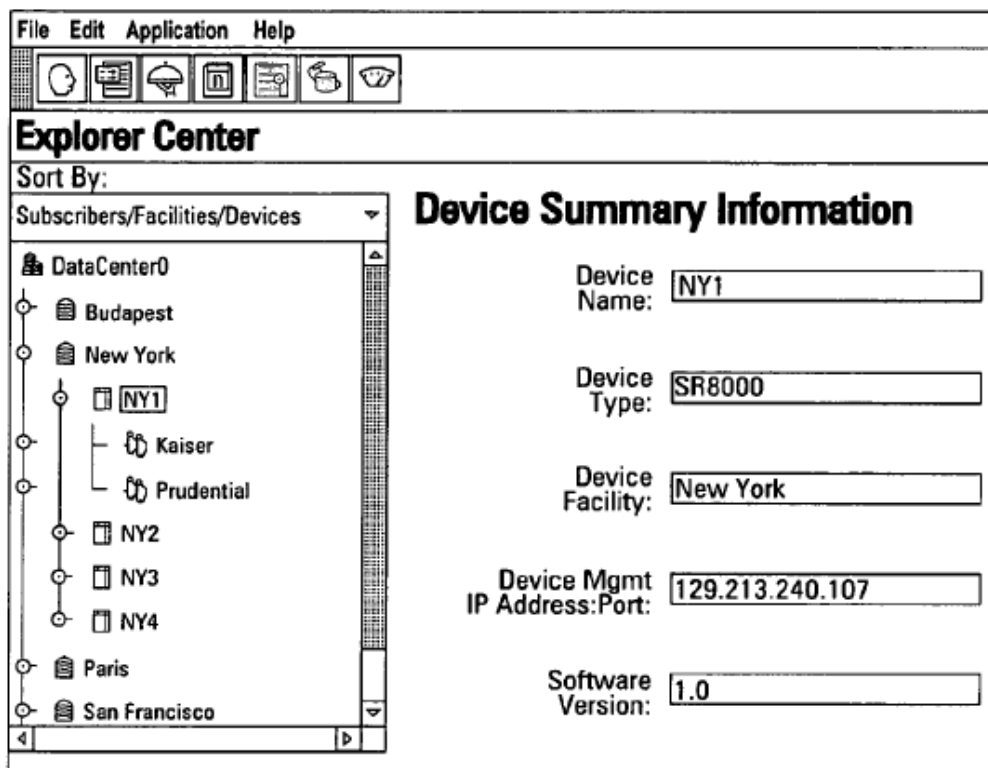
B. Hasan

58. U.S. Patent No. 7,082,464 to Hasan et al. (“*Hasan*”) discloses a “virtual management system” providing an administrative interface in which “devices, facilities, subscribers, log servers, and services” may be presented as objects. *Hasan*,

Abstract. For example, *Hasan's* virtualization topology may be implemented in a system including **multi-function service devices 100** capable of providing a multitude of services to the subscribers:



Hasan, Fig. 4, 5:63–6:14. These multifunction appliances are connected to a “network management server (NMS) 200 ... [that] provide[s] a **graphical user interface** to [an] administrative interface device 75 to allow a system administrator to configure appliances.” *Id.*, 6:37–58, 7:7–26. *Hasan's* GUI provides a “hierarchical layout” of the system in a “familiar tree structure, with the root being the data center, and the branches being the facilities, subscribers, devices and log servers,” as shown for example in Fig. 6A:



Id., 8:19–29.

59. “[U]sing the GUI, an administrator can configure device and service configuration data and policy information.” *Id.*, 7:7–26. For example, “[w]hen an object is selected, various management capabilities can be performed on the object.” *Id.*, 8:30–46. *Hasan* also discloses various “reporting facilities” capable of presenting “logs for various events detected by the infrastructure service equipment” (*id.*, 15:9–12), which may be presented via the GUI (*id.*, 6:59–63).

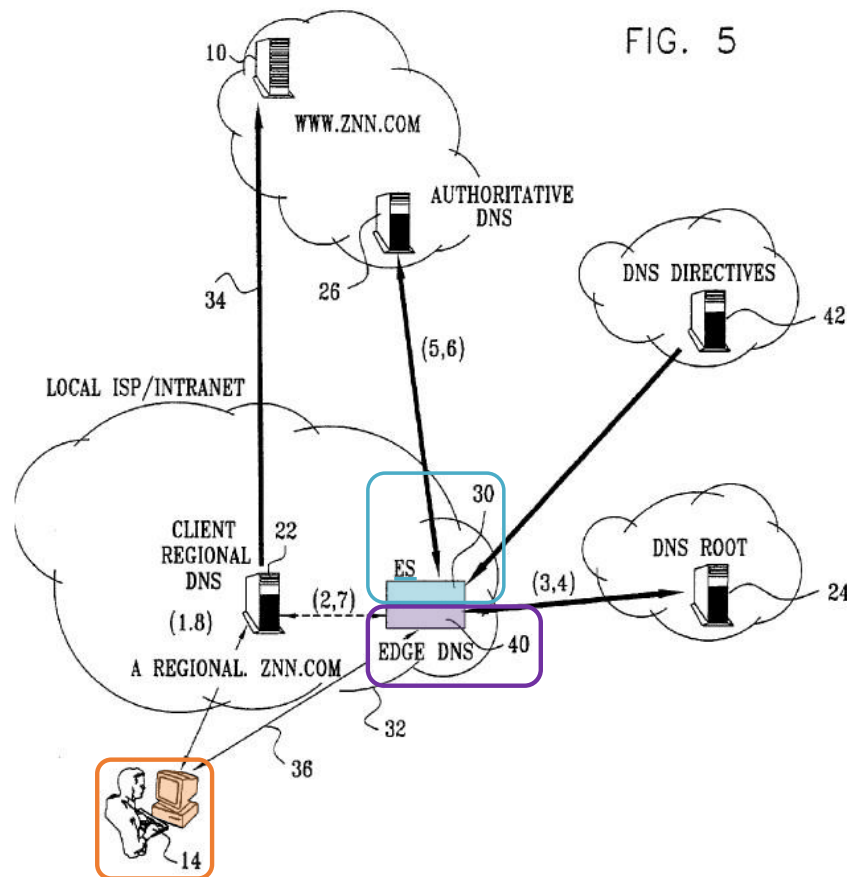
C. Biliris

60. U.S. Patent Pub. No. 2002/0078233 to Biliris et al. (“*Biliris*”) deals with content delivery networks. *Biliris*, Abstract. *Biliris* discloses a content distribution

architecture in which content requests are shared among multiple content distribution networks. *Id.* Accordingly, the share of content requests can be distributed to better balance the load across content distribution networks and servers. *Id.*, [0006], [0007]. *Biliris* describes a DNS outsourcing mechanism, in which a DNS name server resolves requests for part or all of a company's website. *Id.*, [0004], [0016], [0025]. For example, requests for a web page www.xyz.com may be served by the customer, but the subdomain img.xyz.com may be served by a DNS server of a specified content distribution network. *Id.*, [0025], [0026]. Accordingly, *Biliris*'s architecture allows for redirecting queries based on subdomains indicated in the request. *Id.*, [0025], [0027].

D. Ben-Shaul

61. U.S. Patent Pub. No. 2002/0010798 to Ben-Shaul et al. ("*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." *Ben-Shaul*, Abstract. *Ben-Shaul*'s network includes **edge servers** and **EdgeDNS servers**:



Id., Fig. 5. The **edge servers** are configured to deliver content based on requests from a **client** for selected objects. *Id.*, [0171]. The **EdgeDNS server** is responsible for resolving DNS requests and returning the IP address of a selected **edge server**. *Id.*, [0041].

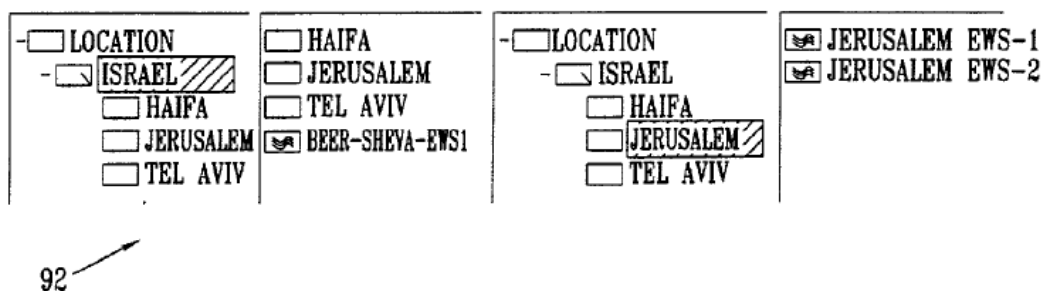
62. *Ben-Shaul's* DNS requests are resolved based on various policies. *Id.*, [0040], [0041], [0048], [0177]. These policies are defined through one or more directives (e.g., DNS directives) stored on a policy control server. *Id.*, [0072], [0176], [0177]. These directives may be reflected in service profiles defining which directives apply to which server. *Id.*, [0234], [0308]. For example, users may specify

groups of edge servers that define how requests are distributed. *Id.*, [0044], [0081], [0170], [0173], [0309]. *Ben-Shaul* explains that its content delivery policies are encoded in a “new content delivery markup language (CDML),” which is referenced throughout the publication. *Id.*, [0031], [0182].

63. *Ben-Shaul* also discloses various graphical user interfaces for specifying these directives. For example, *Ben-Shaul* discloses a “highly graphical” CDML editor “that ease[s] the construction of CDML code” and thus the DNS directives (policies). *Id.*, [0189], [0182], [0188]. This CDML editor “can operate at various levels of granularity, ranging from a single object, to an entire site.” *Id.*, [0182]. The CDML editor “includes a directory of the name space, such that a given policy applies to all documents within the name space of the directory.” *Id.*

64. *Ben-Shaul* further describes a front edge tool for defining service profiles containing directives. *Id.*, [0170], [0201], [0211]. The front edge tool includes a “hierarchical view” interface, presenting servers in a hierarchy of nodes, allowing administrators to define groups of edge servers:

FIG. 10



Id., Fig. 10, [0309], [0311], [0312]. The front edge tool further includes a directives editor for editing edge server directives. *Id.*, [0349].

65. *Ben-Shaul* further discloses various “statistics collection and reporting” features for collecting and merging relevant statistics from its servers. *Id.*, [0054], [0191], [0282]. This may include collecting log information, such as “connections, requests, replies, errors, cache actions, translations, etc.” *Id.*, [0499].

66. U.S. Patent No. 6,976,090 (the “’090 patent”), which issued from the same patent application as *Ben-Shaul*, was considered during examination of the earlier 2002 Application. EX-1014, 185–196. However, the Examiner in that case cited to different portions of *Ben-Shaul* and in reference to different claims. *Id.* For example, the Examiner generally asserted that *Ben-Shaul* discloses a “domain name server” recited in claim 1 of the 2002 application, citing a “constellation of DNS servers” shown in prior art Figs. 1 and 2. *Id.*, 185 (citing ’090 patent, 2:5). Accordingly, the Examiner did not consider the EdgeDNS servers discussed below. The Applicant agreed, arguing in response that “[i]n *Ben-Shaul*, any and all policy decisions are made at the edge servers, not in the DNS servers.” *Id.*, 169. Accordingly, there is no evidence the Examiner properly considered the EdgeDNS servers described in *Ben-Shaul*, much less in reference to the specific claims of the

'517 patent. And in any event, *Ben-Shaul* was not considered in combination with the additional reference cited in Ground 3. EX-1002, 65–72.

XI. CLAIMS 1–20 ARE UNPATENTABLE

67. As I outline below, the '517 claims recite a combination of well-known prior art elements that perform their known functions to produce predictable results.

A. Ground 1: The Combination of *Beaumont* and *Hasan* Renders Obvious Claims 1, 4–9, and 12–20

1. Rationale for Combining *Beaumont* and *Hasan*

68. In my opinion, a POSITA would have been motivated to combine *Ben-Shaul* and *Hasan* and would have had a reasonable expectation of success in doing so.

69. *Beaumont* and *Hasan* are both concerned with network traffic management. *Hasan*, 6:44–45; *Beaumont*, [0017]. In view of *Beaumont*'s teaching that a user could manually enter preferences for applying rules (*Beaumont*, [0031]), a POSITA would have been motivated to implement *Hasan*'s “platform independent” teachings in *Beaumont* to allow manual entry of policy and rules through *Hasan*'s GUI.

70. *Beaumont* teaches that its system allows preferences to be “entered manually.” *Beaumont*, [0017], [0031]. While *Beaumont* does not describe a specific interface, *Hasan* discloses a GUI for exactly this type of policy specification. *Hasan*,

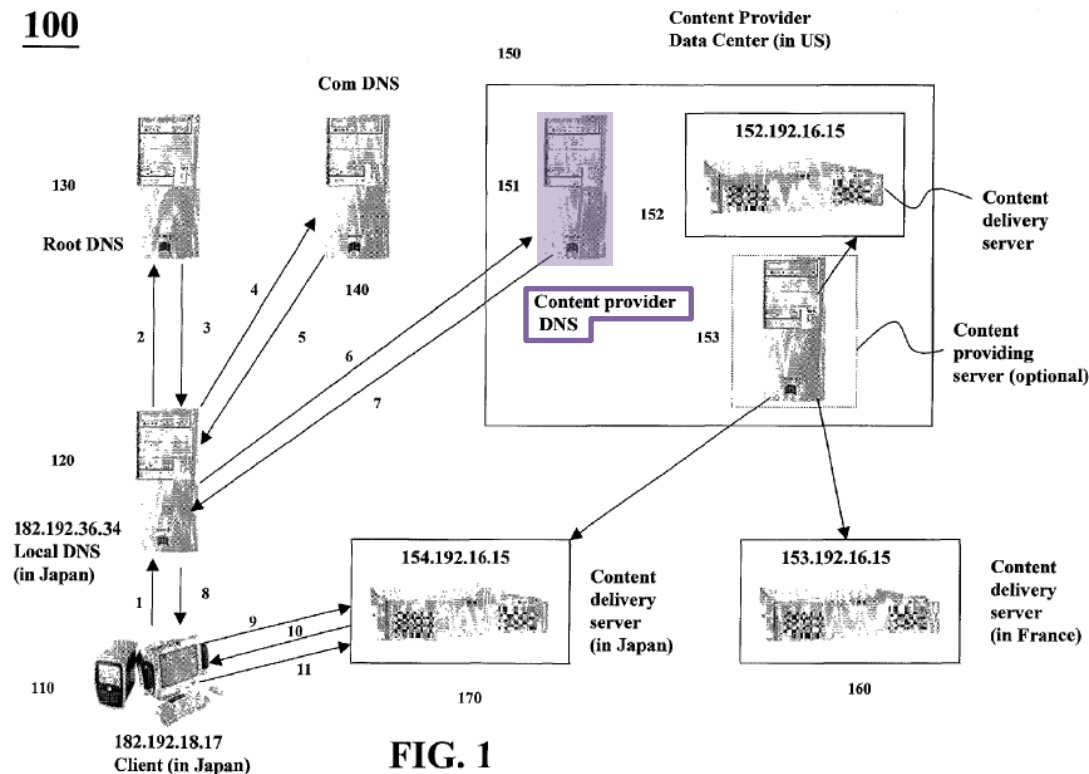
8:19–29 Its Java-based, “platform independent” GUI takes the form of a “familiar tree structure.” *Id.*, Abstract, 8:19–29, 18:9–20. And *Hasan*’s GUI allows administrators to “configure device and service configuration data and policy information.” *Id.*, 7:7–26.

71. In my opinion, combining the teachings of *Beaumont* and *Hasan* would have been straightforward. Like *Hasan*, *Beaumont* suggests a “tree” hierarchy to organize information, and a POSITA would have understood *Hasan*’s GUI to be an appropriate option for *Beaumont*’s interface. *Beaumont*, [0023]; *Hasan*, 3:66–4:8, 8:19–29. A POSITA would have recognized that applying *Hasan*’s teaching to *Beaumont* would have been a straightforward use of a known technique to enhance a similar device or method in the same way.

2. Independent Claim 1

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

72. In my opinion, the combination of *Beaumont* and *Hasan* discloses [1.pre.i]. *Beaumont* discloses a method for using various DNS servers (adaptive traffic control name servers) to respond to DNS requests. *Beaumont*, [0004]–[0005], [0017], [0023]. *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., Fig. 1, [0006], [0023]. The DNS servers are “adaptive” in that the preferences used to direct traffic are updated dynamically (*id.*, [0019], [0030]) and account for current network conditions (*id.*, [0031]).

- b. [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:”

73. In my opinion, the combination of *Beaumont* and *Hasan* discloses [1.pre.ii]. *Beaumont* expressly states its DNS servers (“at least one domain name server”) “comprise[] hardware ... and software.” *Id.*, [0032], Fig. 4. The content provider DNS server forwards DNS requests according to values in a preference

database, which reflect “assigning rules” and thus “provide[s] ... policy-based domain name service.” *Id.*, [0030]–[0031]. *Beaumont*’s DNS servers are “adaptive” at least because they distribute requests based on dynamically changing preferences and current network conditions (e.g., “number of connections,” “number of times ... selected”). *Id.*, [0030]–[0031].

c. [1.a]: “(A) providing a graphical user interface (GUI)”

74. In my opinion, the combination of *Beaumont* and *Hasan* discloses [1.a]. *Beaumont* discloses a DNS server that uses a preference database to resolve DNS requests. *Beaumont*, Abstract, [0006], [0023], [0031], [0032], [0034], [0035]. The preference table enables users to set custom preferences, which may be “entered manually” by users. *Id.*, [0031]. In view of these customizable user preferences, a POSITA would have understood that *Beaumont* at least suggests providing a user interface to permit the user to enter and define preferences.

75. *Hasan* discloses a GUI for enabling users to define “configuration data and policy information” for servers within a network. *Hasan*, 7:14–21; 6:59–63. *Hasan*’s GUI is provided as a Java-based interface and thus would be accessible by a wide variety of devices. *Id.*, 6:59–67, Fig. 4. A POSITA would have been motivated to incorporate *Hasan*’s GUI into *Beaumont*’s network to enable similar

configuration of user preferences, as suggested by *Beaumont*. *Beaumont*, [0031].
Supra §XI.A.1.

- d. **[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”**

76. In my opinion, the combination of *Beaumont* and *Hasan* discloses [1.b]. *Beaumont* acknowledges that “[a]lthough presented as a table, other data structures such as a *tree* can be used” for its preference database. *Beaumont*, [0023]. *Hasan*’s GUI provides this “tree structure,” “presenting a plurality of network items as objects within the interface.” *Hasan*, 3:58–65, 8:19–29. “When an object is selected [in the GUI], various management capabilities can be performed on the object.” *Id.*, 8:30–36. In my opinion, a POSITA would have understood that these management capabilities include defining policy information. *Id.*, 7:14–21, 8:49–59. As I explain in further detail above, a POSITA would have been motivated to combine *Hasan*’s GUI teachings with *Beaumont*. *Supra* §XI.A.1.

77. The *Beaumont-Hasan* GUI would enable an administrator to select a content delivery server (e.g., in Japan) and set policies for that server. *Hasan*, 8:30–36, 10:25–34, 10:53–67; *Beaumont*, [0031]. For 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*,

10:25–34; *Beaumont*, Figs. 2, 3, [0029]–[0031]. A POSITA would thus have recognized the combined GUI to “support[] the setting of said at least one policy using a decision tree representing rules” because it is presented in a “familiar tree structure” and would allow users to set server preferences and rules.

e. [1.c]: “(C) providing said at least one policy to the name server network”

78. In my opinion, the combination of *Beaumont* and *Hasan* discloses [1.c]. *Beaumont* explains that its preferences are stored at the content provider DNS servers in a disk 451. *Beaumont*, [0032]. Incorporating *Hasan*’s GUI would have no effect on the storage of the preference table in *Beaumont*’s network. Thus, once set using the combined GUI, the preferences and/or rules would be stored in the network’s content provider DNS servers and thus would be “provided ... to the name server network.”

f. [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”

79. In my opinion, the combination of *Beaumont* and *Hasan* discloses [1.d]. The combined *Beaumont-Hasan* system I described above incorporates *Hasan*’s GUI, which provides “a hierarchical layout” in a “familiar tree structure, with ... the

branches being the facilities, subscribers, devices and log servers.” *Hasan*, 8:19–29. When used in *Beaumont*’s network, **higher-level branches** (“branch nodes”) in the GUI represent decision criteria such as server health (e.g., working or down). See, e.g., *Beaumont*, Figs. 2, 3. Destination domains (e.g., 182.192) and **subbranches** (“resource nodes”) represent individual delivery (content) servers that fulfill the decision criteria and are thus “answers” that may be provided in response to a DNS request:

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

Id., Fig. 3.

80. For example, *Beaumont* teaches that its content provider DNS server selects a content delivery server closest to a client. *Beaumont*, [0019]. The DNS server does so by using an “estimated distance from each mapped content delivery server to that destination domain ... to select a working content delivery server.” *Id.*, [0023], [0024]. In other words, *Beaumont*’s system first identifies working

servers sharing the destination domain of the client. *Id.*, [0031]. In the example above, the system may select a domain “182.192.” *Id.*, Fig. 3. The system then selects a server from within the set of servers within this domain to handle the request. *Id.*, [0031]. This selection may be based on various factors described in *Beaumont*, such as a preference number, a number of lost packets, a number of connections, an estimated distance, a number of times the server is selected, a server health, or other preferences and/or various combinations thereof. *Beaumont*, [0030]–[0031], Fig. 3.

81. In my opinion, a POSITA would have recognized the locations or domains defined by the higher-level branches “specify one or more decision criteria to be applied,” as recited in the claim. The content delivery servers are selected based on sharing a high-level domain (and thus location) with the requesting client. *Beaumont*, [0024], [0028]. For example, *Beaumont* explains its DNS server may select 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.*, [0028]. In the tree structure of the combined GUI, these content delivery servers would be grouped under the same destination domain and the destination domain would thus act as a decision criterion. *Hasan*, 8:49-67. Indeed, Fig. 6A of *Hasan*, for example, shows a hierarchical layout with devices (i.e., servers) grouped by locations. *Id.*, Fig. 6A.

82. As another example, the preference numbers shown in column 373 likewise represent decision criteria as they are used to select a server from within the set of servers within this domain to handle the request. *Id.*, [0031]. In other words, within a given domain, the specific server is selected based on these preference numbers. These preference numbers therefore also act as a decision criteria.

83. The content delivery servers in the GUI represent “one or more answers to be provided in response to a Domain Name Service (DNS) request” in the same way described in the ’517 patent: these servers are selected for handling the request. *Beaumont*, [0023], [0024], [0026]; EX-1001, 10:13-19.

g. [1.e.i]: “wherein the GUI supports the specification of: (i) one or more answers for the one or more resource nodes, and”

84. In my opinion, the combination of *Beaumont* and *Hasan* discloses [1.e.i]. As I explained above, the content delivery servers represent “one or more answers” in the *Beaumont-Hasan* GUI because these servers are selected for handling a request. *Supra* §XI.A.2.f.

85. Content servers within a destination domain may be selected based on manually entered preferences. *Beaumont*, [0028], [0031]. When incorporated into *Beaumont*’s network, *Hasan*’s GUI would enable users to specify these preferences. *Hasan*, 8:61–64, 9:1–9; 17:11–13, 17:41–55. For example, *Hasan* explains an administrator can configure individual devices ... via the interface.” *Id.*, 6:28–31.

Because these preferences define which server address is returned 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.*, 6:28–31; *Beaumont*, [0023], [0025].

- h. [1.e.ii]: “wherein the GUI supports the specification of: ... (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”**

86. In my opinion, the combination of *Beaumont* and *Hasan* discloses [1.e.ii]. As I explained above, *Beaumont* discloses various criteria that would be presented as branch nodes in the *Beaumont-Hasan* GUI. *Supra* §XI.A.2.f.

87. *Beaumont* further discloses that these criteria may include a “destination domain.” *Beaumont*, [0023]. *Beaumont* illustrates the various domains as blocks of IP addresses. *Id.*, Fig. 2, col. C2, [0023].

88. *Beaumont* also suggests using geographic criteria (such as world zone, countries, or states) as decision criteria. *Id.*, [0024]. As *Beaumont* acknowledges, mapping address blocks to geographical areas was known. *Id.* The content provider DNS “finds the corresponding geographical area according to the IP address space mapping, and selects a content delivery server in the same geographic area” as the client. *Id.*

89. *Hasan*'s GUI enables users to add or remove objects to various subbranches. *Hasan*, 8:22–25, 8:31–36, 17:11–13. When incorporated in *Beaumont*'s network, the combined GUI would thus allow designating which content delivery servers belong to which IP address block or which geographic zone. For example, adding or removing objects would allow including servers in different blocks or groupings. By supporting the specification of groupings of servers, the GUI supports specification of decision criteria for the one or more branch nodes. *Id.*

90. Further, *Beaumont* envisions that various rules may be applied by the content delivery DNS, and it further suggests that the DNS server may weight these rules. *Beaumont*, [0031]. *Hasan* expressly discloses using its GUI to alter policies. *Hasan*, Fig. 4, 6:59–63. A POSITA would have been motivated to implement the *Hasan* GUI in *Beaumont* to allow the user/policy setter to specify decision criteria by, for example, adjusting the weight given to each decision-making criterion or adding additional criteria (such as considering both a country and a state).

- i. **[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”**

91. In my opinion, the combination of *Beaumont* and *Hasan* discloses [1.f]. *Beaumont* explicitly states its content delivery servers (i.e. “resource nodes”) are identified by IP addresses. *Beaumont*, [0023] (“[t]he preference database table

illustratively contains the addresses of content delivery servers”), Figs. 2 and 3; see also [0003], [0017]. When the GUI from *Hasan* is incorporated into *Beaumont*, a POSITA would have understood that the content delivery servers would similarly be represented as IP addresses. See *Hasan*, 8:49–67.

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

92. In my opinion, the combination of *Beaumont* and *Hasan* also discloses [1.g]. *Beaumont* explicitly states its responses to DNS requests (“answers”) are provided as IP addresses. *Beaumont*, [0003] (“the server returns a response to the client using ... IP addresses”), [0004], [0030] (“in response to a mapping request, a content provider DNS returns a message comprising the mapped address identifying a content delivery server”). *Hasan*’s GUI could have easily been implemented in *Beaumont*’s system, which would not have affected the form of DNS responses described in *Beaumont*. See *Hasan*, 8:61–64, 17:41–55.

3. Claim 4: “further comprising: (D) generating reports based on information gathered from the name server network; and (E) providing said reports”

93. In my opinion, the combination of *Beaumont* and *Hasan* discloses claim 4. *Hasan* discloses various “reporting facilities” to “make available logs for various events detected by the infrastructure service equipment.” *Hasan*, 15:9–12. It describes “[l]ogging and monitoring servers ... to ... provide standard format output

reports to the administrator.” *Id.*, 6:64–67. And it teaches that this logged information is provided in the GUI. *Id.*, 10:53–67, 11:11–15.

94. When incorporating *Hasan*’s GUI into *Beaumont*, a POSITA would have been motivated to include these report logging and viewing aspects. As *Hasan* explains, its reporting facilities improve usability of the system, and they would similarly improve *Beaumont*’s system. *Hasan*, 15:9–30. These facilities would present relevant information about the DNS servers to administrators. For example, *Hasan* describes logging events such as “detection of ‘anomalous’ conditions ..., detection of security threats, congestion notification, alerts, etc.” *Id.* *Beaumont* similarly contemplates tracking server health. *Beaumont*, [0026] (describing tracking health status of content servers. A POSITA would have understood that extending this tracking to the DNS servers and providing that information through the GUI would allow network policy setters to better control network traffic in the network.

4. Claim 5: “wherein the information gathered from the name server network comprises: DNS log summaries from the at least one domain name server in the name server network”

95. In my opinion, the combination of *Beaumont* and *Hasan* discloses claim 5. As I explained, *Beaumont* and *Hasan* disclose generating and providing reports based on information gathered from the name server network. *Supra* XI.A.3.

96. In view of the disclosures of *Beaumont* and *Hasan*, a POSITA would have been motivated to include DNS log summaries from the content provider DNS in the reports. As I explained above, *Hasan* discloses “reporting facilities” to “make available logs for various events detected by the infrastructure service equipment.” *Supra* §XI.A.3; *Hasan*, 15:9–12. This includes “accumulat[ing] the raw event information reported by the infrastructure devices” and “convert[ing] the raw information] into useful reports.” *Id.* A POSITA would have understood these “useful reports” reflecting accumulated data over time to be “summaries.” When implemented in *Beaumont*’s network, the infrastructure devices detecting and reporting events would include DNS servers. Therefore, the reports would include “DNS log summaries” as they are summaries of events reported from the content provider DNS server. A POSITA would have been motivated to include this collected information in the combined GUI as I explained for claim 4. *Supra* §XI.A.3.

5. Claim 6: “wherein the information includes a number of requests directed to particular servers in a given time period”

97. In my opinion, the combination of *Beaumont* and *Hasan* discloses claim 6. As I explained above, *Beaumont* and *Hasan* disclose generating and providing reports, including log summaries, based on information gathered from the name server network. *Supra* XI.A.3, XI.A.4. In view of the disclosures of *Beaumont*

and *Hasan*, a POSITA would have been motivated to include the number of requests made to each content provider DNS server in a particular time period in the log summaries.

98. *Hasan* teaches that its GUI enables users to “set up a polling interval to query attribute values.” *Hasan*, 13:51-53. A POSITA would have recognized that, through this polling interval, *Hasan*’s reports would include recorded activity “in a given time period.” In other words, the polling interval represents a time period during which information is collected. And *Beaumont* teaches logging the “number of times a content delivery server has been selected” (i.e., a “number of requests directed to particular servers”) “within a given period (for example, one hour)” (i.e., “in a given time period”). *Beaumont*, Fig. 3, [0031].

99. As I explained above, a POSITA would have been motivated to track similar information regarding the content provider DNS servers in the *Beaumont-Hasan* system in order to allow network policy setters to better control network traffic in the network. *Supra* §XI.A.3. By reporting the number of requests made in a particular time period, policy setters would be better able to identify potential failure points in the system and would be able to allocate network resources more efficiently.

6. Claim 7: “wherein the reports are made available via a secure web-based GUI”

100. In my opinion, the combination of *Beaumont* and *Hasan* discloses claim 7. As I explained above, *Beaumont* as modified by *Hasan* discloses a web-based GUI for visualizing reported data. §§XI.A.2.c, XI.A.3. *Hasan*’s GUI is “secure” because access is restricted to specific administrators. *Hasan*, 8:41–47, 10:31–34, 13:17–20. For example, an administrator having subscriber privileges has access only to information for that subscriber. *Id.*, 9:14–16. These security features enable secure viewing of reported data in a convenient manner. *Hasan*, 5:41–53. When incorporating the GUI from *Hasan* into *Beaumont*’s network, a POSITA would have thus been motivated to include these features to achieve the same or similar benefits in *Beaumont*’s system.

7. Claim 8: “wherein the act (C) comprises: providing said at least one policy to the name server network as an XML file”

101. In my opinion, the combination of *Beaumont* and *Hasan* discloses claim 8. *Beaumont* discloses providing policies to the content provider DNS servers to be stored in the form of a table on a disk. *Beaumont*, [0032]. But *Beaumont* does not explicitly state the format the file is provided in. *Hasan*, however, discloses that “[p]olicy information is stored in XML format.” *Hasan*, 4:60–64, 13:44–50.

102. A POSITA would accordingly have found it obvious that XML would be a suitable format for providing policies to the content provider DNS servers, as

disclosed by *Hasan*. Indeed, there would have only been a finite set of file-type options available for providing policies to the name server network. A POSITA would have recognized XML as one of these options.

8. Independent Claim 9

- a. [9.pre.i]: “An administrative agent, operable in a framework in which an adaptive traffic control name server network implements policy-based traffic direction”**

103. In my opinion, the combination of *Beaumont* and *Hasan* discloses [9.pre.i]. As I explained for [1.pre.i], *Beaumont* discloses a “framework in which an adaptive traffic control name server network implements policy-based traffic direction.” *Supra* §XI.A.2.a. *Hasan* further discloses an administrative agent operable in this framework.

104. *Hasan*’s administrative interface device 75 (administrative agent) enables system administrators to “configure individual devices, log servers, or services.” *Hasan*, 6:28–31. Thus, when incorporated into *Beaumont*’s content delivery system, the administrative interface device would be operable in the framework. A POSITA would have been motivated to incorporate *Hasan*’s administrative interface device 75 into *Beaumont* because it would enable users to securely access the GUI. *Hasan*, 6:2–8, 13:39–43

- b. [9.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, said administrative agent comprising hardware in combination with software and constructed and adapted to:”

105. In my opinion, the combination of *Beaumont* and *Hasan* discloses [9.pre.ii]. As I explained for [1.pre.ii], *Beaumont* discloses a “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.” §XI.A.2.b.

106. A POSITA would have understood that *Hasan*’s administrative access interface (i.e., “administrative agent”) is also implemented via hardware and software. *Hasan*, 4:39–58 (“combination of both hardware and software”), 5:63–6:14 (“administrative application running in a platform independent process”); 6:28–36. And a POSITA would have been motivated to include *Hasan*’s administrative access interface for the reasons I explained above. *Supra* §XI.A.1.

c. [9.a]: “(a) provide a graphical user interface (GUI)”

107. As I explained for [1.a], *Beaumont* in view of *Hasan* teaches providing a graphical user interface. §XI.A.2.c. *Hasan*’s GUI is provided via its administrative access interface (i.e., “administrative agent”). *Hasan*, 5:63–6:14, 6:44–46, 13:39–43. Accordingly, *Beaumont* in view of *Hasan* also teaches [9.a].

- d. **[9.b]: “(b) use 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”**

108. As I explained for [1.b], *Beaumont* in view of *Hasan* teaches “us[ing] 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.” §XI.A.2.f. The administrative access interface (i.e., “administrative agent”) uses the GUI to obtain and set a policy as claimed. *Hasan*, 6:28–36, 6:44–46. Accordingly, *Ben-Shaul* in view of *Hasan* also teaches [9.b].

- e. **[9.c]: “(c) provide said at least one policy to the name server network”**

109. As I explained for [1.c], *Beaumont* in view of *Hasan* teaches “provid[ing] said at least one policy to the name server network.” §XI.A.2.e. When combined with *Hasan*, this policy would be received through *Hasan*’s administrative access interface (administrative agent). *Hasan*, 6:59–63. Accordingly, a POSITA would thus have understood the policy is provided via the administrative access interface. *Beaumont* in view of *Hasan* thus also teaches [9.c].

- f. **[9.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”

110. As I explained for [1.d], *Beaumont* in view of *Hasan* teaches [9.d].

§XI.A.2.f.

g. [9.e.i]: “wherein the GUI supports the specification of: (i) one or more answers for the one or more resource nodes”

111. As I explained for [1.e.i], *Beaumont* in view of *Hasan* teaches [9.e.i].

§XI.A.2.g.

h. [9.e.ii]: “wherein the GUI supports the specification of: ... (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”

112. As I explained for [1.e.ii], *Beaumont* in view of *Hasan* teaches [9.e.ii].

§XI.A.2.h.

i. [9.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”

113. As I explained for [1.f], *Beaumont* in view of *Hasan* teaches [9.f].

§XI.A.2.i.

j. [9.g]: “wherein the answers are selected from: IP addresses and CNAMEs.”

114. As I explained for [1.g], *Beaumont* in view of *Hasan* teaches [9.g].

§XI.A.2.j.

9. Claim 12: “wherein said administrative agent comprises hardware in combination with software and constructed and adapted to: (d) generate reports based on information gathered from the name server network; and (e) provide said reports”

115. As I explained for claim 4, *Beaumont* in view of *Hasan* teaches claim 12. §XI.A.3.

10. Claim 13: “wherein the information gathered from the name server network comprises: DNS log summaries from the at least one domain name server in the name server network”

116. As I explained for claim 5, *Beaumont* in view of *Hasan* teaches claim 13. §XI.A.4.

11. Claim 14: “wherein the information includes a number of requests directed to particular servers in a given time period”

117. As I explained for claim 6, *Beaumont* in view of *Hasan* teaches claim 14. §XI.A.5.

12. Claim 15: “wherein the reports are made available via a secure web-based GUI”

118. As I explained for claim 7, *Beaumont* in view of *Hasan* teaches claim 15. §XI.A.6.

13. Claim 16: “wherein said at least one policy is provided to the name server network as an XML file”

119. As I explained for claim 8, *Beaumont* in view of *Hasan* teaches claim 16. §XI.A.7.

14. Independent Claim 17

- a. [17.pre.i]: “A system comprising: (A) an adaptive traffic control 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”

120. As I explained for [9.pre.ii], *Beaumont* in view of *Hasan* teaches an adaptive traffic control name server network as claimed. *Supra* §XI.A.8.b.

- b. [17.pre.ii]: “A system comprising: ... (B) an administrative agent comprising hardware in combination with software and constructed and adapted to:”

121. As I explained for [9.pre.i], *Beaumont* in view of *Hasan* teaches an administrative interface device (administrative agent). *Supra* §XI.A.8.a.

- c. [17.a]: “(a) provide a graphical user interface (GUI)”

122. As I explained for [9.a], *Beaumont* in view of *Hasan* teaches [17.a]. §XI.A.8.c.

- d. [17.b]: “(b) use 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”

123. As I explained for [9.b], *Beaumont* in view of *Hasan* teaches [17.b].

§XI.A.8.d.

e. [17.c]: “(c) provide said at least one policy to the name server network”

124. As I explained for [9.c], *Beaumont* in view of *Hasan* teaches [17.c].

§XI.A.8.e.

f. [17.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”

125. As I explained for [9.d], *Beaumont* in view of *Hasan* teaches [17.d].

§XI.A.8.f.

g. [17.e.i]: “wherein the GUI supports the specification of: (i) one or more answers for the one or more resource nodes”

126. As I explained for [9.e.i], *Beaumont* in view of *Hasan* teaches [17.e.i].

§XI.A.8.g.

h. [17.e.ii]: “wherein the GUI supports the specification of: ... (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”

127. As I explained for [9.e.ii], *Beaumont* in view of *Hasan* teaches [17.e.ii].

§XI.A.8.h.

- i. [17.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”

128. As I explained for [9.f], *Beaumont* in view of *Hasan* teaches [17.f].

§XI.A.8.i.

- j. [17.g]: “wherein the answers are selected from: IP addresses and CNAMEs.”

129. As I explained for [9.g], *Beaumont* in view of *Hasan* teaches [17.g].

§XI.A.8.j.

- 15. **Claim 18: “wherein said administrative agent comprises hardware in combination with software and constructed and adapted to: (d) generate reports based on information gathered from the name server network; and (e) provide said reports”**

130. As I explained for claim 4, *Beaumont* in view of *Hasan* teaches claim 18. §XI.A.3.

- 16. **Claim 19: “wherein the information gathered from the name server network comprises: DNS log summaries from**

the at least one domain name server in the name server network”

131. As I explained for claim 5, *Beaumont* in view of *Hasan* teaches claim 19. §XI.A.4.

17. Claim 20: “wherein the information includes a number of requests directed to particular servers in a given time period”

132. As I explained for claim 6, *Beaumont* in view of *Hasan* teaches claim 20. §XI.A.5.

B. Ground 2: The Combination of *Beaumont*, *Hasan* and *Biliris* Renders Obvious Claims 2, 3, 10, and 11

1. Rationale for Combining *Beaumont*, *Hasan*, and *Biliris*

133. As I explained for Ground 1, a POSITA would have been motivated to combine *Beaumont* and *Hasan*. *Supra* §XI.A.1. A POSITA would have been motivated to implement *Hasan*’s “platform independent” teachings in *Beaumont* to allow manual entry of policy and rules through *Hasan*’s graphical user interface. *Hasan*, 6:44–45; *Beaumont*, [0017], [0031].

134. In my opinion, a POSITA would have also been motivated to combine *Biliris* with *Beaumont* and *Hasan* and doing so would have been straightforward. Like *Beaumont* (and the *Beaumont-Hasan* combination), *Biliris* distributes requests among content delivery servers, resolves requests based on a client’s domain, and

returns answers based on a content server's IP address. *Biliris*, [0013], [0014], [0025]–[0026]; *see also Beaumont*, [0003]–[0004], [0018], [0022], [0024], [0030].

135. *Biliris* further teaches that network traffic can be handled even more effectively by distributing requests not just at the content provider level but also at the subdomain level. *Biliris*, [0013]. *Biliris* explicitly acknowledges that DNS servers may be assigned to an entire domain, similar to the content provider DNS of *Beaumont*. Compare *Biliris*, [0025] (“entire domain (e.g. xyz.com) could ... be served by the CDN”) with *Beaumont*, [0018] (“content provider DNS 151 ... is the local DNS for domain ‘foo.com’”). However, *Biliris* further envisions a DNS server handling a portion of the domain, such as subdomain img.xyz.com, to improve load distribution. *Biliris*, [0006], [0007], [0025]. A POSITA would have been motivated to incorporate *Biliris*'s subdomain-level distribution into *Beaumont*'s system to achieve these benefits.

136. A POSITA would have had a reasonable expectation of success in implementing *Biliris*'s subdomain delegation into *Beaumont*'s architecture. Indeed, *Beaumont* already describes domain-level delegation. *Beaumont*, [0018]. *Bliris* extends this to the subdomain level. *Biliris*, [0025]. Applying *Biliris*'s teaching to *Beaumont-Hasan* would have been nothing more than a straightforward use of a

known technique to enhance a similar system or method in the same manner. *Hasan* would improve the combination for the same reasons discussed above. § XI.A.1.

2. Claim 2: “wherein the at least one policy relates to direction of network traffic based on sub-domains of a domain of a subscriber”

137. In my opinion, the combination of *Beaumont*, *Hasan*, and *Biliris* discloses claim 2. *Beaumont*’s network uses a content provider DNS that resolves requests for a particular domain. For example, when a “client 110 requests content provided by content provider, ‘www.foo.com,’” the client’s local DNS is referred to “content provider DNS 151 which is the local DNS for domain ‘foo.com.’” *Beaumont*, [0018]. Accordingly, the content provider DNS would also handle all requests for subdomains within that domain. *See id.*, [0003], [0023].

138. Like *Beaumont*, *Biliris* describes a content delivery network including DNS servers for directing network traffic. *Biliris*, [0014], [0025]. *Biliris* explains its DNS server can serve “an entire domain (e.g. xyz.com)” (similar to *Beaumont*) or can serve part of the site. *Id.*, [0025]. For example, “www.xyz.com may be served by the customer but img.xyz.com might be resolved by the CDN.” *Id.*, [0025], [0004]. Accordingly, *Biliris* discloses redirecting DNS queries (i.e., “network traffic”) based on sub-domains of a domain of a subscriber. *Id.*, [0025]. A POSITA would have understood that the direction of queries based on sub-domains would be accomplished via a policy. *Biliris*, [0027], [0032], claim 2.

139. A POSITA would have been motivated to combine *Biliris*'s teachings with *Beaumont* and *Hasan* (*supra* §XI.A.1) and in the combined *Beaumont-Hasan-Biliris* system, at least one policy would direct network traffic based on sub-domains as disclosed by *Biliris*.

3. Claim 3: “wherein the at least one policy that relates to direction of network traffic based on sub-domains of a domain of the subscriber relates to one or more of the sub-domains: “ftp”, “download”, “www”, and “images””

140. In my opinion, the combination of *Beaumont*, *Hasan*, and *Biliris* discloses claim 3.

141. As I explained, *Beaumont-Hasan-Biliris* teaches that at least one policy relates to direction of network traffic based on sub-domains of a domain of a subscriber. *Supra* §XI.B.2. One such sub-domain would be “images.”

142. *Biliris* expressly discloses a policy relating to an “images” sub-domain. *Biliris*, [0004]. For example, *Biliris* explains a domain “‘www.xyz.com’ may be served by the ‘xyz’ company’s own server but ‘images.xyz.com’ might be resolved by the CDN.” *Id.*, see also [0025]–[0027] (discussing redirection of “img.xyz.com”). As I explained above, a POSITA would have been motivated to combine *Biliris*'s teachings with *Beaumont* and *Hasan*. In the combined *Beaumont-Hasan-Biliris* system, at least one policy would direct network traffic based on the “images” sub-domain as disclosed by *Biliris*.

4. Claim 10: “wherein the at least one policy relates to direction of network traffic based on sub-domains of a domain of a subscriber”

143. As I explained for claim 2, *Beaumont* in view of *Hasan* and *Biliris* teaches claim 10. *Supra* §XI.B.2.

5. Claim 11: “wherein the at least one policy that relates to direction of network traffic based on sub-domains of a domain of the subscriber relates to one or more of the sub-domains: ‘ftp’, ‘download’, ‘www’, and ‘images’”

144. As I explained for claim 3, *Beaumont* in view of *Hasan* and *Biliris* teaches claim 11. *Supra* §XI.B.3.

C. Grounds 3A and 3B: *Ben-Shaul* Renders Obvious Claims 1–20 and the Combination of *Ben-Shaul* and *Hasan* Renders Obvious Claims 1–20

1. Rationale for Combining *Ben-Shaul* and *Hasan*

145. As I explain below, *Ben-Shaul* discloses or at least suggests every feature of independent claims 1, 9, and 17 of the ’517 patent.

146. Additionally, the combination of *Ben-Shaul* and *Hasan* likewise discloses each of these claimed features.

147. *Ben-Shaul* teaches specifying content delivery policies at “various levels of granularity, ranging from a single object, to an entire site.” *Ben-Shaul*, [0182].

148. *Hasan* discloses a GUI for exactly this type of policy specification. *Hasan* provides a Java-based, “platform independent” GUI that takes the form of a “familiar tree structure.” *Hasan*, Abstract, 8:19–29, 18:9–20. And *Hasan*’s GUI allows administrators to “configure device and service configuration data and policy information.” *Id.*, 7:7–26.

149. *Ben-Shaul* too describes the use of a Java-based GUI employing a hierarchical tree structure (*e.g.*, *Ben-Shaul*, [0170], [0349]), and a POSITA would have been motivated to utilize *Hasan*’s GUI teachings with *Ben-Shaul* so that network administrators could easily configure *Ben-Shaul*’s DNS directives at “various levels of granularity,” using an intuitive and familiar tree-structure interface. *Ben-Shaul*, [0182]; *Hasan*, 8:19–29. *Hasan* emphasizes the “platform-independent” nature of its GUI and its benefits, and a POSITA would thus have understood *Hasan*’s GUI for configuring network objects to be a suitable option for the “highly graphical” tools referenced in *Ben-Shaul* for policy setting, particularly in view of *Ben-Shaul*’s directive to utilize GUIs to ease policy construction. *Hasan*, 6:15–27, 8:30–47; *Ben-Shaul*, [0182].

150. Combining *Hasan*’s GUI teachings with *Ben-Shaul* would have been straightforward. Both references describe editing policies via webpages. *See, e.g.*, *Ben-Shaul*, [0182]; *Hasan*, 6:59–63. And a POSITA would have understood the

combination to be a mere combination of known elements according to their known uses. Furthermore, applying *Hasan*'s teaching to *Ben-Shaul* would have been a straightforward use of a known technique to enhance a similar device or method in the same way.

2. Independent Claim 1

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

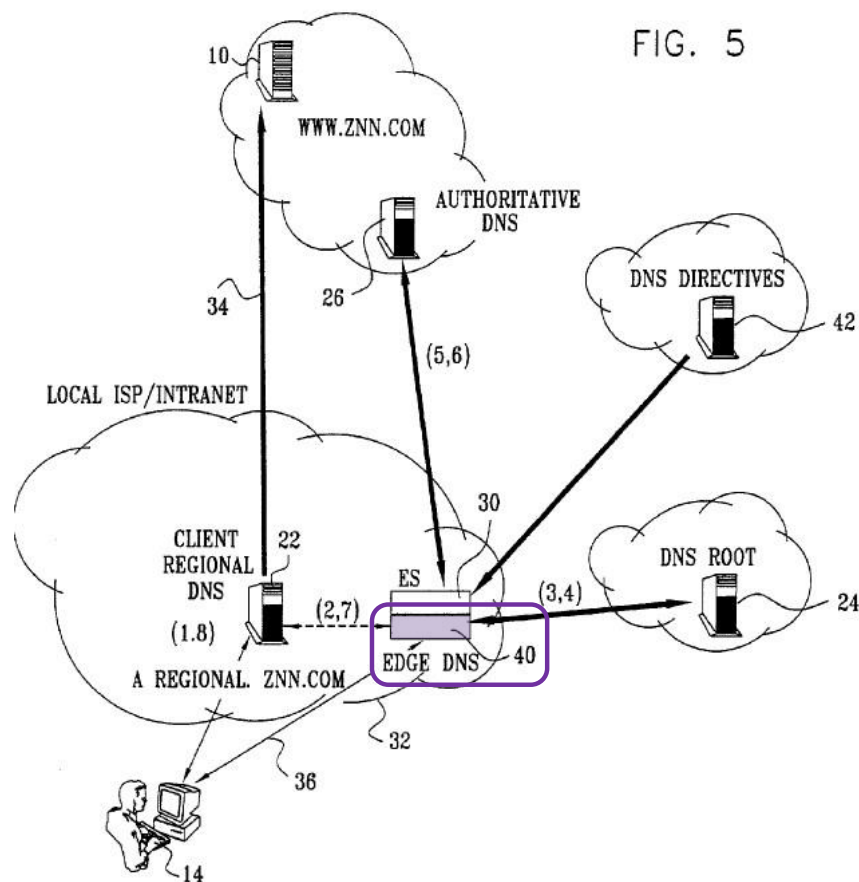
151. In my opinion, *Ben-Shaul*, alone or in view of *Hasan*, discloses this limitation.

152. Like the '517 patent, *Ben-Shaul* discloses a method for using a network of EdgeDNS servers for dynamically responding to DNS requests. *Ben-Shaul*, [0119], [0171], [0177]. *Ben-Shaul*'s method operates in a “framework” in which the EdgeDNS servers (adaptive traffic control name servers) direct user content requests (traffic) based on specified policies. *Ben-Shaul*, [0039], [0119], [0148], [0171], [0177]. *Ben-Shaul* teaches that these policies may be dynamic, making the EdgeDNS's servers “adaptive” in that they respond to changing network conditions and/or changing user directives. *Id.*, [0065], [0070], [0170], [0234]; Combining *Ben-Shaul* with *Hasan* would not alter these teachings.

b. [1.pre.ii]: “the name server network comprising at least one domain name server comprising hardware in combination with software and constructed and

153. In my opinion, *Ben-Shaul*, alone or in view of *Hasan*, discloses this limitation.

FIG. 5



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hardware. *Ben-Shaul*, [0077]; see *id.*, Fig. 13. And *Ben-Shaul* provides specific examples of software executed by the EdgeDNS's hardware in the form of pseudocode fragments, demonstrating the EdgeDNS "compris[es] hardware in combination with software". *Ben-Shaul*, [0361]–[0364].

155. *Ben-Shaul*'s EdgeDNS servers "provide ... policy-based domain name service." Each EdgeDNS receives domain name service (DNS) requests and "is responsible to return the IP address" of the appropriate content server based on "edge server policy." *Id.*, [0041], [0177]. A POSITA would have understood this form of DNS resolution to be a domain name server. And as I explain further below, the EdgeDNS' domain name service is based on policy. This service is also "adaptive" in that requests are handled dynamically based on network conditions. *Id.*, [0065].

156. Combining *Ben-Shaul* with *Hasan* as I describe would not alter these teachings.

c. [1.a]: "(A) providing a graphical user interface (GUI)"

157. In my opinion, *Ben-Shaul* alone or in view of *Hasan* teaches [1.a].

158. **First**, *Ben-Shaul* teaches [1.a]. *Ben-Shaul* explains that the EdgeDNS's (name server's) determination of what content server should fulfill a user request is dictated by "edge server policy" that originates from policy control servers 42. *Ben-Shaul*, [0041], [0176]–[0177]. *Ben-Shaul* further teaches that policy is set through

one or more “graphical editor(s)” or GUIs provided to system users. For example, *Ben-Shaul* explains that policy is embedded in CDML code. *Id.*, [0182]. *Ben-Shaul*’s system includes a “CDML editor 50,” which it describes as a “graphical editor that eases the construction of CDML code.” *Id.*, [0182]; *see id.*, [0186] (describing “highly graphical user interface” of CDML editor 50). *Ben-Shaul* also describes a “front edge tool 86” that “provides an edge server graphical representation” and allows users to “select and manipulate” server hierarchies and groupings. *Id.*, [0313]; *see id.*, [0349] (describing “directives editor 122, a part of the front edge tool, [as] a graphical user interface (GUI) editor used for editing the edge server directives”), [0478] (describing “edge manager 124” for “creating the hierarchical groups of edge servers and for configuring and monitoring the status of the edge servers,” indicating “[t]he edge manager 124 is a GUI editor.”). Accordingly, *Ben-Shaul* discloses the GUI of [1.a].

159. **Second**, *Ben-Shaul* in view of *Hasan* teaches [1.a]. *Hasan* discloses a “GUI includ[ing] management applications such as a policy editor, a status editor, and a log/alert viewer.” *Hasan*, 6:59–63, Fig. 6A. This GUI is used to “configure device and service configuration data and policy information.” *Id.*, 7:14–21; 6:59–63. As I explained above, a POSITA would have been motivated to incorporate *Hasan*’s GUI into *Ben-Shaul* to provide a “familiar tree structure” in setting policy

directives in *Ben-Shaul*. *Supra* §XI.C.1. *Hasan*'s GUI is provided as a Java-based interface and thus would be accessible by a wide variety of devices. *Hasan*, 6:59–67, Fig. 4. Combining *Ben-Shaul* with *Hasan* in this manner would not impact the teachings of *Ben-Shaul* discussed with respect to other limitations.

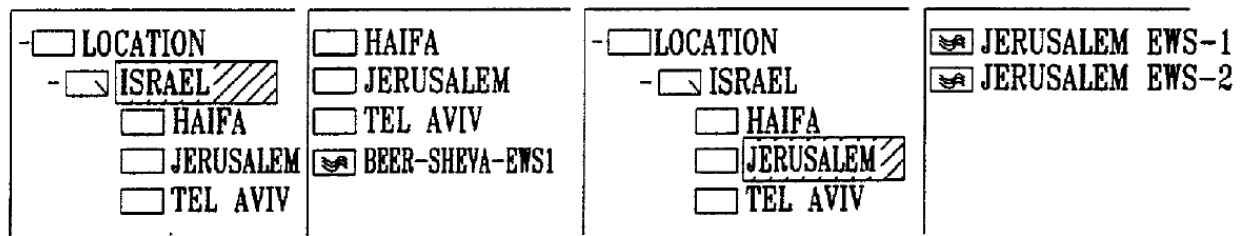
- d. **[1.b]: “(B) using said GUI to obtain at least one policy for direction of network traffic wherein the GUI supports the setting of said at least one policy using a decision tree representing rules; and”**

160. In my opinion, *Ben-Shaul* alone or in view of *Hasan* teaches [1.b].

161. **First**, *Ben-Shaul* teaches [1.b]. As I explained above, *Ben-Shaul* describes one or more GUIs used to set policy governing resolution of domain-name requests. *Supra* § XI.C.2.c.

162. At least *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. *Ben-Shaul* explains that its front edge tool 86 is used to “predefine meaningful groups of edge servers [content servers], in order to simplify the application of policies applicable to a set of related edge servers.” *Ben-Shaul*, [0309]. Front edge tool 86 is a GUI that supports grouping content servers in a hierarchical tree (supporting the setting of at least one policy) in which individual “edge servers are leaves” (*id.*, [0311]), as shown in view 92 of front edge tool 86, below:

FIG. 10



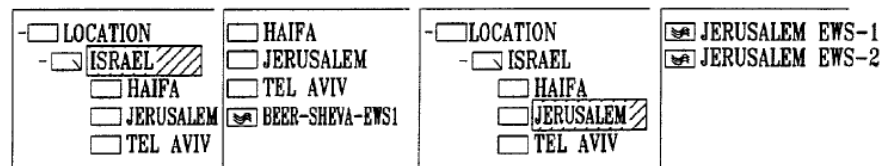
92 →

Id., Fig. 10, [0309]–[0313]; *see also id.*, [0352] (describing additional GUI, edge manager 124, for configuration of server hierarchies). Because front edge tool 86 is for “simplify[ing] the application of policies,” which includes those related to network traffic, it is for direction of network traffic. *See id.*, [0309]. For example, *Ben-Shaul* explains that its policies include redirection and load balancing policies, which a POSITA would have understood relate to direction of network traffic. *Id.*, [0039]

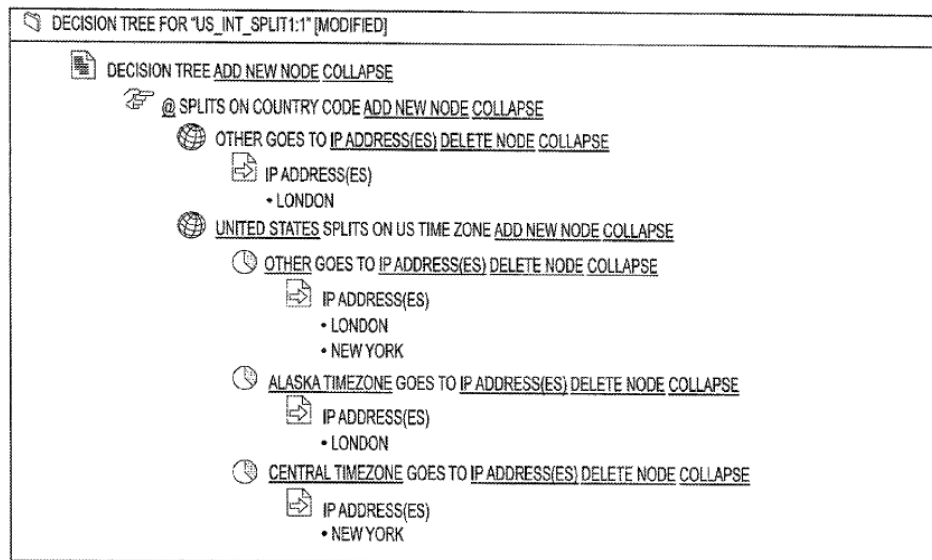
163. And a POSITA would have further understood that the front edge tool’s hierarchical map is a “decision tree.” *Id.*, Fig. 10. For example, *Ben-Shaul* explains that a logical group of servers may be modified along with any “subtrees” of the group, indicating the group is represented as a tree. *Id.*, [0309], [0312]. A POSITA would have understood that the hierarchical map is a “decision” tree representing rules because directives apply to edge servers based on whether the edge servers are included within the groups. *Id.*, [0309]. Indeed, the DNS described in *Ben-Shaul* is

generally structured as an inverted tree. *Id.*, [0170] (“the full domain name of any node in the DNS tree is the sequence of labels on the path from the node to the root”), *id.*, (DNS is “[a]n inverted tree of labels The root of the tree is (empty label name). Each node can have an unlimited number of children.”). Accordingly, a hierarchical map of the DNS would likely represent a decision tree. And Fig. 10 of *Ben-Shaul* is very similar to the illustrations of the decision tree in the ’517 patent:

FIG. 10



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Compare *Ben-Shaul*, Fig. 1 with EX-1001, Fig. 10(b).

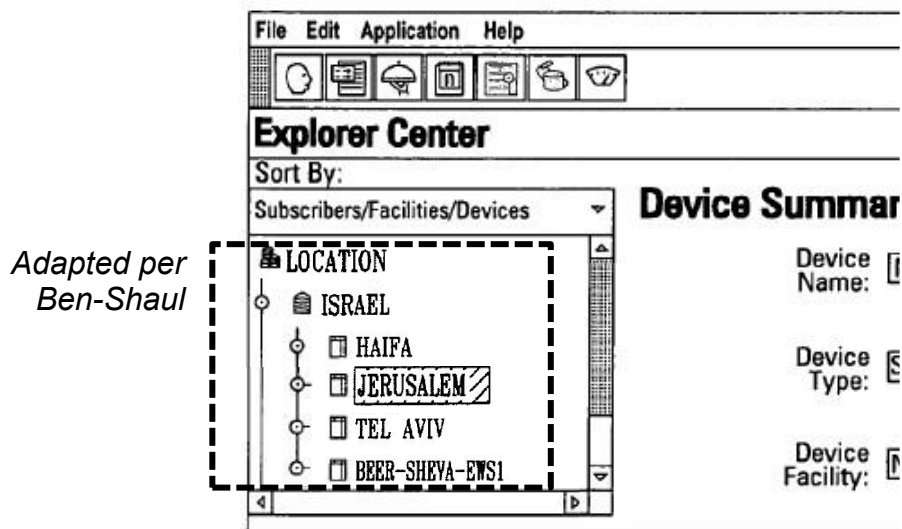
164. As another example, to the extent the various GUIs described in *Ben-Shaul* are separate, a POSITA would also have been motivated to combine them and this combined GUI would teach this limitation. For example, *Ben-Shaul* explains that the EdgeDNS servers redirect end-user requests to particular content servers based on “DNS and HTTP redirections policies” implemented in CDML. *Ben-Shaul*, [0038]–[0039]. These policies are thus for “direction of network traffic” because a POSITA would understand that “DNS and HTTP redirections policies” directly relate to direction of network traffic. And these policies are set through CDML editor 50, a “graphical editor” (GUI). *Id.*, [0182], [0189]. *Ben-Shaul* explains that the policies set through CDML editor 50 may “nest[]” in a hierarchy. *Id.*, [0196]. As an example, it describes a “tree” of policies, with, for example, region as a first branch and time as a second branch. *Id.*, [0197]. A POSITA would have understood that this nested structure is a decision tree representing rules. The tree is applied to determine policy based on, e.g., region and then time. *Id.*

165. Due to the similarity in function and implementation of the graphical user interfaces described in *Ben-Shaul*, they may be the same (or at least part of the same) GUI. Both 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]). To the extent they are separate, it would have been obvious to implement *Ben-Shaul*’s front edge tool 86 and CDML editor as a single GUI. Combining the tools into a single GUI (“the *Ben-Shaul* single GUI”) would streamline policy setting. A POSITA would have recognized the benefits of providing policy-setters with a single easy-to-use interface such as the front edge tool’s tree structure. *Id.*, Fig. 10. In the *Ben-Shaul* single GUI, policy-setters could both define groups of servers as described in relation to front edge tool 86 (*Ben-Shaul*, [0309]–[0313]) and set the policy for network traffic direction applicable to each group of servers as described in relation to CDML editor 50 (*id.*, [0038]–[0039], [0182], [0189], [0196]–[0197]). The *Ben-Shaul* single GUI would accordingly include the capability to define “meaningful grouping[s] of edge servers” defining which “policies [are] applicable to a set of related edge servers” and thus would “support[] the setting of said at least one policy using a decision tree representing rules” for the same reasons the front edge tool does. *Ben-Shaul*, [0309]. And the *Ben-Shaul* single GUI would be “us[ed] ... to obtain at least one policy for direction of network traffic” because it enables editing of the directives in CDML code. *Id.*, [0182].

166. **Second**, *Ben-Shaul* in view of *Hasan* teaches [1.b]. Like *Ben-Shaul*, *Hasan* describes a GUI used to edit policy. *Hasan*, 6:59–63; *supra* §XI.C.2.c. As I

explained above, a POSITA would have been motivated to incorporate *Hasan*'s GUI into *Ben-Shaul* to provide a "familiar tree structure" in setting policy directives in *Ben-Shaul*. *Supra* §XI.C.1. And a POSITA would have recognized that *Hasan*'s "familiar tree structure" GUI could readily be implemented for setting policy directives in *Ben-Shaul*. For example, *Hasan*'s GUI could be used to set policy for the network described in Fig. 10 of *Ben-Shaul*, as I show in the combined figure below:



Hasan, Fig. 6a; *Ben-Shaul*, Fig. 10.

167. In the combined *Ben-Shaul-Hasan* GUI, the policy-setter could select an object, e.g., "Jerusalem" and edit the policy applicable to that server (or group of servers). *Hasan*, 8:30–37, 10:25–34, 10:53–67. The combined GUI would thus provide the functionality for editing *Ben-Shaul*'s CDML-based policies, thus

enabling the GUI to be “us[ed] ... to obtain at least one policy for direction of network traffic.”

168. Further, *Hasan* teaches that its GUI allows users to add or remove objects to various subbranches of the hierarchy. *Hasan*, 17:11–13. Accordingly, through the combined *Ben-Shaul-Hasan* GUI users could define groups of edge servers. And including edge servers within these groups would affect which policies apply to which servers, as described in *Ben-Shaul*. *Ben-Shaul*, [0173]. Accordingly, a POSITA would recognize that the combined GUI “supports the setting of said at least one policy” through defining which policies apply to which servers. And the combined GUI uses “a decision tree representing rules” because it is a listing of applicable policies presented in a “familiar tree structure.” Combining *Ben-Shaul* with *Hasan* in this manner would not impact the teachings of *Ben-Shaul* discussed with respect to other limitations. *Hasan*, 8:19–29

e. [1.c]: “(C) providing said at least one policy to the name server network”

169. In my opinion, *Ben-Shaul* alone or in view of *Hasan* teaches [1.c].

170. The policies defined in *Ben-Shaul* may be stored “in the origin web server 46 under a special CDML directory, or in a policy control server 42.” *Ben-Shaul*, [0188]. Each EdgeDNS server receives the policy directives from policy control server 42 and is therefore provided “at least one policy.” *Id.*, [0177].

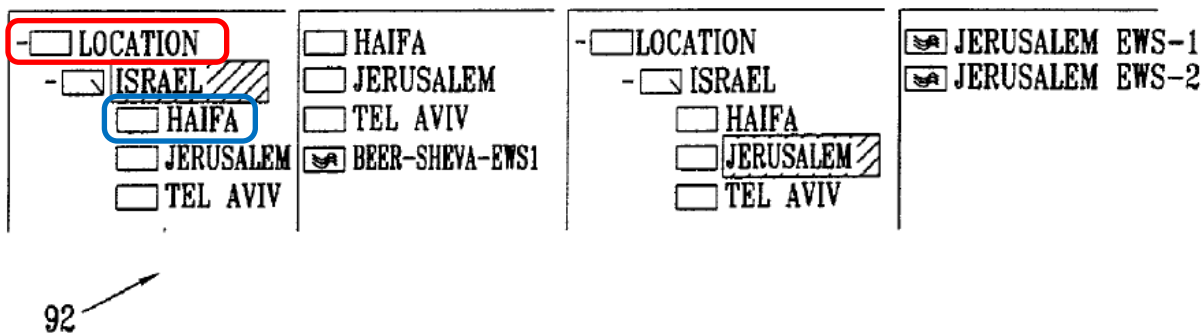
- f. [1.d]: “wherein the decision tree comprises one or more resource nodes, and one or more branch nodes, wherein the one or more resource nodes specify one or more answers to be provided in response to a Domain Name Service (DNS) request, and wherein the one or more branch nodes specify one or more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

171. In my opinion, *Ben-Shaul* alone or in view of *Hasan* teaches [1.d].

172. **First**, *Ben-Shaul* teaches [1.d]. *Ben-Shaul* discloses that its front edge tool uses the same form of decision tree described in the '517 patent. *Supra* §§X.D, VII.A. As I explained above, both the front edge tool 86 itself and the *Ben-Shaul* single GUI would utilize this structure. *Supra* §XI.C.2.d.

173. Both the front edge tool and the *Ben-Shaul* single GUI allow administrators to construct hierarchies of edge servers (i.e., a “decision tree”) for effecting directives. *Ben-Shaul*, [0309]; *supra* §XI.C.2.d. In this tree, “the **edge servers** are leaves [(“resource nodes”)] and **internal nodes** [(“branch nodes”)] represent logical aggregations of nodes”:

FIG. 10



Ben-Shaul, [0311], Fig. 10. Administrators may construct, for example, a group based on region, as shown in Fig. 10 (*id.*, [0039], [0309]) such that policies are applied to any edge server within the group (*id.*, [0285], [0289], [0308], [0309]).

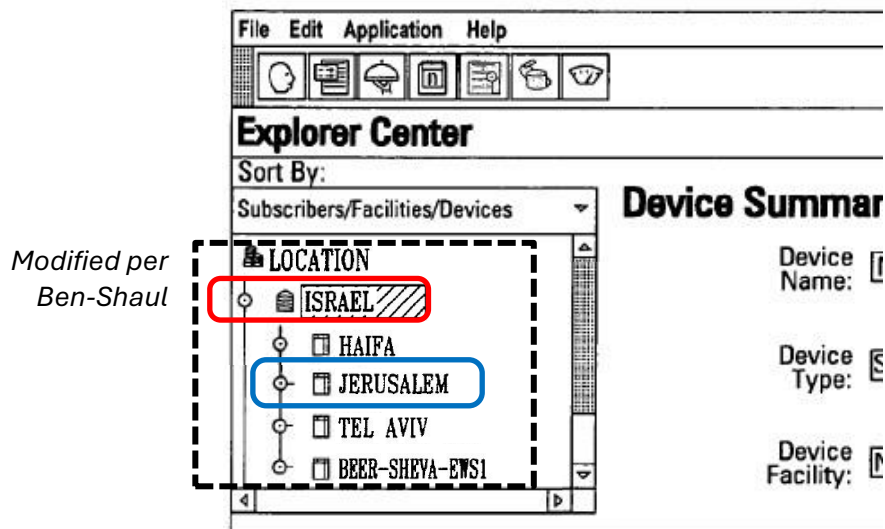
174. The groups defined by the internal nodes “specify one or more decision criteria to be applied,” because they “represent logical aggregations of nodes” based on a particular decision criteria. *Id.*, [0310]–[0311]. For example, the group may represent a location or other criteria. *Id.*, [0082]. A DNS request is thus directed to an edge server based on that server’s association with a location or other group membership. *Id.*, [0044].

175. The edge server “leaves” “specify one or more answers to be provided in response to a Domain Name Service (DNS) request” because an IP address for a selected server is provided as an answer to a DNS request. For example, *Ben-Shaul* explains the “EdgeDNS ... return[s] the IP address of ... the edge server.” *Ben-Shaul*, [0041]. In the example above, the IP address for the server “Haifa” (one or more answers”) may be returned based on its location in Israel (“one or more decision criteria”). *Id.*, Fig. 10.

176. **Second**, the combination of *Ben-Shaul* and *Hasan* teaches [1.d]. As I explained above, a POSITA would have been motivated to combine *Hasan*’s GUI teachings with *Ben-Shaul* to provide a GUI for setting policies. *Supra* §XI.C.1. The

combined *Ben-Shaul-Hasan* GUI includes a decision tree with resource nodes and branch nodes as claimed.

177. As *Hasan* explains, its GUI may show “a hierarchical layout of [a] data center, its facilities, subscriber, devices and/or log servers” in “the familiar tree structure, with ... the branches being the facilities, subscribers, devices and log servers.” *Hasan*, 8:19–29. In the combined GUI, **higher-level branches** (“branch nodes”) may represent regions or groups, such as Israel, where **subbranches** (“resource nodes”) are edge servers, as I illustrated below in Fig. 6a of *Hasan* modified based on the example in Fig. 10 of *Ben-Shaul*:



Hasan, Fig. 6A; *Ben-Shaul*, Fig. 10, [0044].

178. A POSITA would have recognized the edge server leaves “specify one or more answers to be provided in response to a Domain Name Service (DNS) request” because each edge server leaf specifies the IP address for an edge server,

for example, in a particular city. *Ben-Shaul*, [0041]–[0042], [0044] (describing “differentiat[ing] delivery based on the location or the organization membership of the edge server”). The higher-level branches “specify one or more decision criteria to be applied,” because DNS requests may be routed according to group characteristics of edge servers such as “region, language, interest, organization type, security level, edge server specification and capabilities, communication speeds, subgroups, type of events, etc.” *Id.*, [0039], [0044].

179. Combining *Ben-Shaul* with *Hasan* in this manner would not impact the teachings of *Ben-Shaul* discussed with respect to other limitations.

g. [1.e.i]: “wherein the GUI supports the specification of: (i) one or more answers for the one or more resource nodes, and”

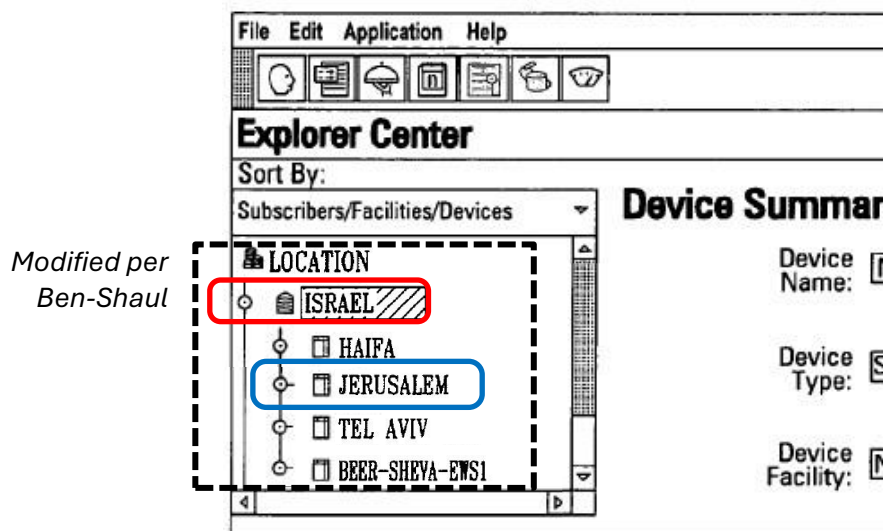
180. In my opinion, *Ben-Shaul* alone or in view of *Hasan* teaches [1.e.i].

181. As I explained above, in both *Ben-Shaul* and *Ben-Shaul* as modified by *Hasan*, the edge server leaves represent “one or more answers” because an IP address for a selected server is provided as an answer to a DNS request. *Supra* §XI.C.2.f.

182. **First**, regarding *Ben-Shaul* alone, both the front edge tool 86 and the *Ben-Shaul* single GUI (*supra* § XI.C.2.d) support specification of a particular edge server (the one or more answers) for the one or more resource nodes. For example, the front edge tool 86 and the *Ben-Shaul* single GUI allow policy-setters to

“construct hierarchies of edge servers” (*Ben-Shaul*, [0309]) and “manipulate the hierarchies in an easy and intuitive manner” (*id.*, [0313]) using the GUI. These modifications would include identifying the edge server that should be returned under particular conditions. *Id.*, [0041], [0055], [0119], [0177], [0313], Fig. 10).

183. **Second**, the combined *Ben-Shaul-Hasan* GUI supports the specification of these answers because it allows the user to specify an edge server IP address to be returned based on, for example, that edge server’s location. *Hasan*, 8:19–46; *Ben-Shaul*, [0044]; *supra* §XI.C.2.f. *Hasan*’s GUI enables users to add or remove objects (e.g., edge servers) from various subbranches, which allows specification of “answers” in those subbranches. *Hasan*, 17:11–13. For example, as I illustrate in the image below, the policy-setter could specify which servers are available as “answers” under each “country”:



Hasan, Fig. 6A; *Ben-Shaul*, Fig. 10, [0044].

- h. [1.e.ii]: “wherein the GUI supports the specification of: ... (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”**

184. In my opinion, *Ben-Shaul* alone or in view of *Hasan* teaches [1.e.ii].

185. **First**, both *Ben-Shaul*’s front edge tool 86 and the *Ben-Shaul* single GUI (*supra* § XI.C.2.d) further support the specification of one or more decision criteria through the definition of the edge server groups. *Id.*, [0313]. For example, these groups allow for “[r]egional and group differentiation,” allowing a URL to be translated “depending on the region or organization in which the request is made.” *Ben-Shaul*, [0044], [0082]. These groups are decision criteria because policy application hinges on which of the groups is implicated. *Supra* § XI.C.2.f. *Ben-Shaul* expressly discloses decision criteria based on world zones (*id.*, [0082] (describing “edge server group[s] includ[ing] ... [a] geographical region”)) and countries (*id.*, Fig. 10 (showing an example group designation based on the location “Israel”)). As another example, *Ben-Shaul* discloses a policy using local time as a primary determinant *Id.*, [0196]–[0197]. A POSITA would have understood that, in this example, time zones are used as a decision criteria because the “local time” is used in applying the policy. The criteria further includes “internet location,” which a POSITA would understand to include blocks of IP addresses. *Id.*, [0044].

186. **Second**, the combined *Ben-Shaul-Hasan* GUI would allow for defining groups based on at least the same decision criteria described in *Ben-Shaul* and thus *Ben-Shaul* combined with *Hasan* also discloses [1.e.ii]. *Hasan*, Fig. 6A.

- i. [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”

187. In my opinion, *Ben-Shaul* alone or in view of *Hasan* teaches [1.f].

188. **First**, in the hierarchical structure of *Ben-Shaul*’s front edge tool and single GUI, the “leaves” (“resource nodes”) are edge servers. *Ben-Shaul*, [0311]; see EX-1001, 9:30–31; see also *supra* §XI.C.2.e. *Ben-Shaul* expressly discloses representing the edge servers as IP addresses because within the front edge tool, administrators may “add [and] ... remove edge servers” and “modify ... edge server properties, e.g., IP address[es].” *Ben-Shaul*, [0328]. The functionality would persist in the *Ben-Shaul* single GUI. *Ben-Shaul* also expressly identifies CNAME and MX as alternative record types. *Id.*, [0011].

189. **Second**, the combined *Ben-Shaul-Hasan* GUI applies *Hasan*’s GUI teachings to *Ben-Shaul*, and accordingly, the combined system would likewise represent edge servers as IP addresses, CNAMEs, NS records, or MX records as suggested in *Ben-Shaul*. See *Hasan*, 8:61–64, 17:41–55.

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

190. *Ben-Shaul* alone or in view of *Hasan* teaches [1.g].

191. As I explained, the resource nodes in *Ben-Shaul* (in both the front edge tool 86 and the single GUI) and the combined *Ben-Shaul-Hasan* GUI are composed of individual servers that may be represented by IP addresses or CNAMEs. *Supra* §XI.C.2.i. Indeed, *Ben-Shaul* explicitly discloses IP addresses as answers to DNS requests. *Ben-Shaul*, [0009], [0015]–[0016], [0041], [0119], [0177], [0373]. For example, *Ben-Shaul* explains the “EdgeDNS is responsible to return the IP address of ... the edge server.” *Id.*, [0041]. A POSITA would similarly use IP addresses to answer DNS requests when combining *Ben-Shaul* and *Hasan* because incorporating the GUI from *Hasan* would not affect these aspects of *Ben-Shaul*. *Hasan*, 8:61–64, 17:41–55.

192. *Ben-Shaul* further discloses or at least suggests CNAMEs as answers to DNS requests, indicating that IP addresses are “type ‘A’ records” (*Id.*, [0373]) and identifying CNAME as another common form of resource record (*Id.*, [0011], [0170]). A POSITA would have recognized that CNAME could equally be used to represent an answer to a DNS request.

3. Claim 2: “wherein the at least one policy relates to direction of network traffic based on sub-domains of a domain of a subscriber”

193. In my opinion, *Ben-Shaul* alone or in view of *Hasan* teaches claim 2.

194. *Ben-Shaul* discloses policies set through a GUI. *Supra* §XI.C.2.d. As one example, these policies allow for a “subdomain delegation” process, in which “responsibility ... for some part of [a] domain” is assigned “to other Authoritative Name Servers.” *Ben-Shaul*, [0170]. For example, the EdgeDNS may typically act as an authoritative DNS server for a particular zone. *Id.*, [0177]. However, through subdomain delegation, portions of the zone may be delegated to other DNS servers. *Id.* Accordingly, a zone would contain “all the domain names and data of a domain, except for domain names and data in delegated subdomains of that domain.” *Id.* These policies therefore relate to direction of network traffic based on subdomains. *Id.*, [0041], [0053], [0177].

195. A POSITA would have understood subdomain delegation functions to be the type of policies configured through the GUI, irrespective of whether that GUI was *Ben-Shaul*’s front edge tool, the *Ben-Shaul* single GUI, or the *Ben-Shaul-Hasan* GUI. As discussed above, policies in *Ben-Shaul* are defined using CDML code, which is editable through a GUI. §XI.C.2.d; *Ben-Shaul*, [0182]. And *Ben-Shaul* explains the subdomain delegation directives are included in this CDML code. *Id.*, [0496]. For example, *Ben-Shaul* provides a sample CDML file, including a

subdomain delegation directive. *Id.*, [0203]–[0204]. Accordingly, a POSITA would have understood this delegation to be configurable through the GUI.

4. Claim 3: “wherein the at least one policy that relates to direction of network traffic based on sub-domains of a domain of the subscriber relates to one or more of the sub-domains: ‘ftp’, ‘download’, ‘www’, and ‘images’”

196. In my opinion, *Ben-Shaul* alone or in view of *Hasan* teaches claim 3.

197. *Ben-Shaul* discloses policies enabling users to delegate direction of traffic for lists of subdomains designated by a user. *Id.*, [0204], [0170] (subdomain “test.versedge.com”). A POSITA would have understood that these custom lists could encompass any sub-domain specified by the user. Accordingly, subdomains such as “ftp,” “download,” “www,” and “images” are all well within the disclosure of *Ben-Shaul*. Indeed, *Ben-Shaul* at least suggests delegating subdomains for images (*id.*, [0057]) and ftp sites (*id.*, [0100]). And *Ben-Shaul* explicitly lists “www” as an example subdomain in the address “www.intra.versedge.com.” *Ben-Shaul*, [0203]. For the same reasons discussed in claim 2, a POSITA would have understood these policies configured through the GUI, irrespective of whether that GUI was *Ben-Shaul*’s front edge tool, the *Ben-Shaul* single GUI, or the *Ben-Shaul-Hasan* GUI.

5. Claim 4: “further comprising: (D) generating reports based on information gathered from the name server network; and (E) providing said reports”

198. In my opinion, *Ben-Shaul* alone or in view of *Hasan* teaches claim 4.

199. **First**, *Ben-Shaul* teaches claim 4. *Ben-Shaul* describes “statistics collection and reporting” features for collecting and merging relevant statistics from servers. *Ben-Shaul*, [0054], [0191], [0282]. A POSITA would have understood that these features would apply equally to the EdgeDNS servers (the name server network), particularly in view of *Ben-Shaul*’s discussion of the need to track the status of the EdgeDNS (name) servers in order to implement recovery operations if a server fails. *Id.*, [0369]). A POSITA would have recognized that the same logging process described in *Ben-Shaul* for other servers, such as the edge servers, could be equally applied to the EdgeDNS servers in order to facilitate this status monitoring, and a POSITA would have been motivated to do so in view of *Ben-Shaul*’s description.

200. *Ben-Shaul* discloses that the server reports include various log information, such as “connections, requests, replies, errors, cache actions, translations, etc.,” which a POSITA would understand to include “information gathered from the name server network.” *Id.*, [0499].

201. *Ben-Shaul* further discloses “sen[d]ing (i.e., ‘providing’) the] report to the origin web server.” *Id.*, [0282], [0500]. This origin website includes a “computer graphics interface program” to “accept and process” the logged information, indicating these reports are accessible to users. *Id.*, [0282].

202. **Second**, *Ben-Shaul* in view of *Hasan* teaches claim 4. *Hasan* discloses various “reporting facilities” to “make available logs for various events detected by the infrastructure service equipment.” *Hasan*, 15:9–12. For example, *Hasan* describes “[l]ogging and monitoring servers ... provided in the data center to record events ... and provide standard format output reports to the administrator.” *Id.*, 6:64–67. And this logged information is viewable through *Hasan*’s tree structure GUI. *Id.*, 10:53–67, 11:11–15. *Hasan* thus discloses “generating reports based on information gathered from [a] network; and ... providing said reports.” When combined with *Ben-Shaul*, this network would be a name server network, as discussed above. *Supra* §XI.C.2.d.

203. When incorporating *Hasan*’s GUI teachings into *Ben-Shaul*, a POSITA would have been motivated to include these report logging and viewing aspects to enable a user to view relevant information in an intuitive manner. For example, *Hasan*’s GUI includes a “log event application, which reports log events and alerts within the scope of the object selected in the component tree pane.” *Hasan*, 10:53–67. Accordingly, an administrator in *Ben-Shaul*’s system would be enabled to view log information associated with a particular edge server in the combined GUI. And as discussed above, *Ben-Shaul*’s network already supports collecting and reporting log information. *See, e.g., Ben-Shaul*, [0054], [0191], [0282]. Accordingly,

combining *Ben-Shaul* and *Hasan* would have amounted to application of known techniques to achieve predictable results.

6. Claim 5: “wherein the information gathered from the name server network comprises: DNS log summaries from the at least one domain name server in the name server network”

204. In my opinion, *Ben-Shaul* alone or in view of *Hasan* teaches claim 5. As I explained above, *Ben-Shaul* alone or in combination with *Hasan* describes logging and reporting edge server information. *Supra* §XI.C.5.

205. A POSITA would have been motivated to include DNS log summaries in this log information. In *Ben-Shaul*, for example, information gathered from servers includes “connections, requests, [and] replies.” *Ben-Shaul*, [0499]. *Ben-Shaul* further discloses summarizing this logged information. For example, rather than “ship[ping] raw data,” *Ben-Shaul* explains the server may “process and summarize the statistics data before sending it.” *Id.*, [0500]. As I explained above, the same logging process described in *Ben-Shaul* for other servers, such as the edge servers, could be equally applied to the EdgeDNS servers. *Supra* §XI.C.5. Accordingly, a POSITA would have recognized that the summaries would include data collected by *Ben-Shaul*’s EdgeDNS servers, thus reflecting DNS log summaries. *Id.*

206. Further, *Hasan* likewise discloses “accumulat[ing] ... raw event information reported by the infrastructure devices” and “convert[ing the raw

information] into useful reports,” which a POSITA would have understood to be a summary. *Hasan*, 9:15–40. When implemented in *Ben-Shaul*’s network, these infrastructure devices would include EdgeDNS servers. A POSITA would have been motivated to incorporate these DNS log summaries of *Hasan* into *Ben-Shaul* to enable viewing of “useful reports” in an intuitive manner.

7. Claim 6: “wherein the information includes a number of requests directed to particular servers in a given time period”

207. In my opinion, *Ben-Shaul* alone or in view of *Hasan* teaches claim 6.

208. As described above, *Ben-Shaul* alone or in combination with *Hasan* describes generating reports based on information gathered from the network. *Supra* §XI.C.5. *Ben-Shaul* suggests logging requests received at each edge server (requests directed to particular servers). *Ben-Shaul*, [0499]. *Ben-Shaul* further explains the logged information is reported periodically (e.g., at configurable intervals). *Id.*, [0282]. Because the reports would include the requests logged during the reporting interval, a POSITA would have recognized that the reported information in *Ben-Shaul* (whether alone or in view of *Hasan*) represents a number of requests in a given time period (i.e., the reporting interval). *Hasan*, 13:51-53.

8. Claim 7: “wherein the reports are made available via a secure web-based GUI”

209. In my opinion, *Ben-Shaul* alone or in combination with *Hasan* teaches claim 7. As I explained above, *Ben-Shaul* alone or in combination with *Hasan* describes generating reports based on information gathered from the network. *Supra* §XI.C.5.

210. Further, *Ben-Shaul* suggests transmitting these reports to an origin web server or site. *Ben-Shaul*, [0282]. This origin website includes a “computer graphics interface program” (a “web-based GUI”) to “accept and process” the logged information. *Id.* For example, administrators may configure the “reporting frequency and the level of detail of the reports.” *Id.* A POSITA would have understood that to limit access to these reports to only administrators, it would be beneficial for the GUI to be secure, and techniques for securing access were well-known in the art. Indeed, *Ben-Shaul* describes “secured authenticated access to profile data that resides in the repository of the origin web site.” *Ben-Shaul*, [0517], [0337].

211. Further, *Hasan* similarly provides a “Java based graphical user interface” accessible using a web browser, which is therefore a “web-based GUI.” *Hasan*, 6:59–63, 13:39–43, 21:30–31. *Hasan*’s GUI is “secure” because access is restricted to specific administrators. *Hasan*, 8:41–47, 10:31–34, 13:17–20. For example, an administrator having subscriber privileges has access only to

information for that subscriber. *Id.*, 9:14–16. To the extent not already disclosed in *Ben-Shaul*, a POSITA would have been motivated to incorporate the secure web-based GUI of *Hasan* to enable secure viewing of reported data in a convenient manner.

9. Claim 8: “wherein the act (C) comprises: providing said at least one policy to the name server network as an XML file”

212. In my opinion, *Ben-Shaul* alone or in view of *Hasan* teaches claim 8.

213. *Ben-Shaul*’s policies are specified in a content delivery markup language (CDML), which is based on XML. *Ben-Shaul*, [0037], [0074], [0196]. *Ben-Shaul* explicitly confirms its policy directives are stored in XML files. *Id.*, [0432]–[0433]. Accordingly, a POSITA would understand that the policies are “provid[ed] . . . to the name server network as an XML file.” *Id.* However, even to the extent this is not explicitly disclosed, a POSITA would have recognized that providing the policies to the EdgeDNS servers as XML files would be a simple and straightforward distribution method. *Id.*, [0432]–[0433]. Indeed, *Ben-Shaul* explains that XML files may be generated “for use” by various servers. *Ben-Shaul*, [0432]. Combining *Ben-Shaul* with *Hasan* would not alter these teachings. *Hasan*, 13:44–50.

10. Independent Claim 9

- a. [9.pre.i]: “An administrative agent, operable in a framework in which an adaptive traffic control name**

server network implements policy-based traffic direction”

214. In my opinion, *Ben-Shaul* alone or in view of *Hasan*, discloses this limitation.

215. As I explained for [1.pre.i], *Ben-Shaul*, alone or in view of *Hasan*, discloses a “framework in which an adaptive traffic control name server network implements policy-based traffic direction.” *Supra* §XI.C.2.a.

216. *Ben-Shaul* further discloses an administrative agent operable in this framework. Its system includes an origination component 116 (i.e., “administrative agent) that “resides in the origin web server 46.” *Ben-Shaul*, [0345]. The origination component includes the directives editor 122 (part of the front edge tool) and thus is used to implement the hierarchical GUI discussed for [1.b]. *Ben-Shaul*, [0349], [0431], [0434]; *see also id.*, [0182] (describing similar content delivery manager in conjunction with the CDML editor). Combining *Ben-Shaul* with *Hasan* would not alter these teachings.

- b. **[9.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, said administrative agent comprising**

**hardware in combination with software and
constructed and adapted to:”**

217. In my opinion, *Ben-Shaul* alone or in view of *Hasan* discloses this limitation.

218. As I explained for [1.pre.ii], *Ben-Shaul*, alone or in view of *Hasan*, discloses a “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.” *Supra* §XI.C.2.b.

219. Further, *Ben-Shaul* discloses that its administrative agent (e.g., the origination component) is implemented at the origin server and thus includes hardware in combination with software. *Ben-Shaul*, [0281] (referring to “hardware and operating system platforms of the origin server”), Fig. 12. Combining *Ben-Shaul* with *Hasan* would not alter these teachings.

c. [9.a]: “(a) provide a graphical user interface (GUI)”

220. As I explained for [1.a], *Ben-Shaul* alone or in view of *Hasan* teaches providing a graphical user interface. *Supra* §XI.C.2.c. In either *Ben-Shaul* or the combined *Ben-Shaul-Hasan* systems, this GUI is provided by the administrative agent (e.g., origination component, *supra* § XI.C.10.a) and thus *Ben-Shaul* alone or in view of *Hasan* also teaches [9.a]. *Ben-Shaul*, [0346].

**d. [9.b]: “(b) use 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”

221. As I explained for [1.b], *Ben-Shaul* alone or in view of *Hasan* teaches “us[ing] 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.” *Supra* §XI.C.2.d. In either *Ben-Shaul* or the combined *Ben-Shaul-Hasan* systems, the origination component (administrative agent) uses the GUI to obtain and set a policy as claimed, and thus *Ben-Shaul* alone or in view of *Hasan* also teaches [9.b]. *Ben-Shaul*, [0349].

e. [9.c]: “(c) provide said at least one policy to the name server network”

222. As I explained for [1.c], *Ben-Shaul* alone or in view of *Hasan* teaches “provid[ing] said at least one policy to the name server network.” §XI.C.2.e. *Ben-Shaul*’s origination component (administrative agent) “is responsible for creating and deploying the directives” (policies), and thus *Ben-Shaul* alone or in view of *Hasan* also teaches [9.c]. *Ben-Shaul*, [0345]–[0346].

f. [9.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”

223. As I explained for [1.d], *Ben-Shaul* alone or in view of *Hasan* teaches [9.d]. §XI.C.2.f.

- g. [9.e.i]: “wherein the GUI supports the specification of: (i) one or more answers for the one or more resource nodes”**

224. As I explained for [1.e.i], *Ben-Shaul* alone or in view of *Hasan* teaches [9.e.i]. §XI.C.2.g.

- h. [9.e.ii]: “wherein the GUI supports the specification of: ... (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”**

225. As I explained for [1.e.ii], *Ben-Shaul* alone or in view of *Hasan* teaches [9.e.ii]. §XI.C.2.h.

- i. [9.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”**

226. As I explained for [1.f], *Ben-Shaul* alone or in view of *Hasan* teaches [9.f]. §XI.C.2.i.

j. [9.g]: “wherein the answers are selected from: IP addresses and CNAMEs.”

227. As I explained for [1.g], *Ben-Shaul* alone or in view of *Hasan* teaches [9.g]. §XI.C.2.j.

11. Claim 10: “wherein the at least one policy relates to direction of network traffic based on sub-domains of a domain of a subscriber”

228. As I explained for claim 2, *Ben-Shaul* alone or in view of *Hasan* teaches claim 10. §XI.C.3.

12. Claim 11: “wherein the at least one policy that relates to direction of network traffic based on sub-domains of a domain of the subscriber relates to one or more of the sub-domains: ‘ftp’, ‘download’, ‘www’, and ‘images’”

229. As I explained for claim 3, *Ben-Shaul* alone or in view of *Hasan* teaches claim 11. §XI.C.4.

13. Claim 12: “wherein said administrative agent comprises hardware in combination with software and constructed and adapted to: (d) generate reports based on information gathered from the name server network; and (e) provide said reports”

230. As I explained for claim 4, *Ben-Shaul* alone or in view of *Hasan* teaches claim 12. §XI.C.5.

14. Claim 13: “wherein the information gathered from the name server network comprises: DNS log summaries from

the at least one domain name server in the name server network”

231. As I explained for claim 5, *Ben-Shaul* alone or in view of *Hasan* teaches claim 13. §XI.C.6.

15. Claim 14: “wherein the information includes a number of requests directed to particular servers in a given time period”

232. As I explained for claim 6, *Ben-Shaul* alone or in view of *Hasan* teaches claim 14. §XI.C.7.

16. Claim 15: “wherein the reports are made available via a secure web-based GUI”

233. As I explained for claim 7, *Ben-Shaul* alone or in view of *Hasan* teaches claim 15. §XI.C.8.

17. Claim 16: “wherein said at least one policy is provided to the name server network as an XML file”

234. As I explained for claim 8, *Ben-Shaul* alone or in view of *Hasan* teaches claim 16. §XI.C.9.

18. Independent Claim 17

a. [17.pre.i]: “A system comprising: (A) an adaptive traffic control 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”

235. As I explained for [9.pre.ii], *Ben-Shaul* alone or in view of *Hasan* teaches an adaptive traffic control name server network as claimed. §XI.C.10.b.

- b. [17.pre.ii]: “A system comprising: ... (B) an administrative agent comprising hardware in combination with software and constructed and adapted to:”**

236. As I explained for [9.pre.i], *Ben-Shaul* alone or in view of *Hasan* teaches an administrative agent residing in an origin server. §XI.C.10.a.

- c. [17.a]: “(a) provide a graphical user interface (GUI)”**

237. As I explained for [9.a], *Ben-Shaul* alone or in view of *Hasan* teaches [17.a] §XI.C.10.c.

- d. [17.b]: “(b) use 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”**

238. As I explained for [9.b], *Ben-Shaul* alone or in view of *Hasan* teaches [17.b]. §XI.C.10.d.

- e. [17.c]: “(c) provide said at least one policy to the name server network”**

239. As I explained for [9.c], *Ben-Shaul* alone or in view of *Hasan* teaches [17.c]. §XI.C.10.e.

- f. [17.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”

240. As I explained for [9.d], *Ben-Shaul* alone or in view of *Hasan* teaches [17.d]. §XI.C.10.f.

- g. [17.e.i]: “wherein the GUI supports the specification of: (i) one or more answers for the one or more resource nodes”**

241. As I explained for [9.e.i], *Ben-Shaul* alone or in view of *Hasan* teaches [17.e.i]. §XI.C.10.g.

- h. [17.e.ii]: “wherein the GUI supports the specification of: ... (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”**

242. As I explained for [9.e.ii], *Ben-Shaul* alone or in view of *Hasan* teaches [17.e.ii]. §XI.C.10.h.

- i. [17.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”**

243. As I explained for [9.f], *Ben-Shaul* alone or in view of *Hasan* teaches [17.f]. §XI.C.10.i.

j. [17.g]: “wherein the answers are selected from: IP addresses and CNAMEs.”

244. As I explained for [9.g], *Ben-Shaul* alone or in view of *Hasan* teaches [17.g]. §XI.C.10.j.

19. Claim 18: “wherein said administrative agent comprises hardware in combination with software and constructed and adapted to: (d) generate reports based on information gathered from the name server network; and (e) provide said reports”

245. As I explained for claim 4, *Ben-Shaul* alone or in view of *Hasan* teaches claim 18. §XI.C.5.

20. Claim 19: “wherein the information gathered from the name server network comprises: DNS log summaries from the at least one domain name server in the name server network”

246. As I explained for claim 5, *Ben-Shaul* alone or in view of *Hasan* teaches claim 19. §XI.C.6.

21. Claim 20: “wherein the information includes a number of requests directed to particular servers in a given time period”

247. As I explained for claim 6, *Ben-Shaul* alone or in view of *Hasan* teaches claim 20. §XI.C.7.

XII. CONCLUSION

248. For the reasons set forth above, in my opinion, a person of ordinary skill in the art would have found claims 1–20 of the ’517 patent obvious.

249. In signing this declaration, I understand that the declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I acknowledge that I may be subject to cross-examination in this case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

250. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: 4/11/2025

By: _____



Bill Lin, Ph.D.