

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AMAZON WEB SERVICES, INC.,
Petitioner,

v.

KOVE IO, INC.,
Patent Owner.

IPR2020-00276
Patent 7,233,978 B2

Before BRYAN F. MOORE, BARBARA A. PARVIS, and
KAMRAN JIVANI, *Administrative Patent Judges*.

JIVANI, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314, 37 C.F.R. § 42.4

I. INTRODUCTION

A. *Background and Summary*

On December 12, 2019, Amazon Web Services, Inc. (“Petitioner”) filed a petition for *inter partes* review of claims 1, 3, 6, 10, 14, 17, 23, 24, 30, and 31 of U.S. Patent No. 7,233,978 (“the ’978 patent”). Paper 2 (“Pet.”

or “Petition”). Kove IO, Inc. (“Patent Owner”) filed a Preliminary Response. Paper 11 (“Prelim. Resp.”).

We have authority to determine whether to institute an *inter partes* review under 35 U.S.C. § 314 and 37 C.F.R. § 42.4(a). An *inter partes* review may be instituted if “the information presented in the petition filed under section 311 and any response filed under section 313 shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a). Additionally, a decision to institute under 35 U.S.C. § 314 may not institute on fewer than all claims challenged in the Petition. *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018).

Upon consideration of the Petition and supporting evidence, we determine that the Petition fails to demonstrate a reasonable likelihood that Petitioner would prevail in establishing the unpatentability of at least one challenged claim of the ’978 patent. Accordingly, we do not institute *inter partes* review requested in the Petition for the following reasons.

B. The Challenged Patent (Ex. 1001)

The ’978 patent relates to “managing global search and retrieval of information across a network.” Ex. 1001, 1:30–33. By way of background, the ’978 patent teaches, “[d]ata records can reside in many different places.” *Id.* at 1:37. In a distributed database, which the ’978 patent describes as “one where data is stored and retrieved among multiple machines connected by a network,” “each machine in which some portion of the data in a distributed database may reside is called an application server.” *Id.* at 1:59–63. The ’978 patent continues, “[o]ne commonly asked question in an application server environment is: Where is data associated with a particular

entity in a distributed database? The data location is a key question when a distributed database has highly dynamic, and even spontaneous, data distribution properties.” *Id.* at 1:63–67.

The ’978 patent describes that in networked environments, “there are a large number of data repositories and any particular entity does not have data in all of the data repositories, a mechanism is needed that would permit queries to be directed only at data repositories with relevant information.” *Id.* at 2:1–5.

Against this backdrop, the ’978 patent describes that users may enter queries to servers which “maintain location information in the form of a list of location associations with an entity.” *Id.* at 4:52–57. “The location may be address information for the application server(s) containing information relevant to the identifier or address information for the application server(s) through which data relevant to the identifier may be accessed.” *Id.* at 4:57–61. In response to the query, the “server preferably returns a list of all locations for the specified entity. The client then can directly access the various locations” to retrieve the data associated with the “entity.” *Id.* at 4:61–67. The server described by the ’978 patent “is only concerned with the location of that data, rather than the endpoint referent data itself.” *Id.* at 5:44–47.

Figure 18, reproduced below, provides a basic illustration of the mechanism employed.

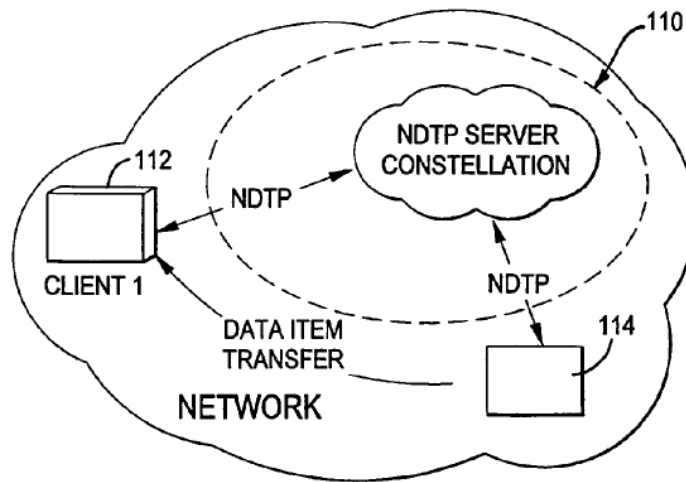


Figure 18 displays a Network Distributed Tracking Protocol (NDTP) server 110, client requestor 112, and application server 114, on which the data requested is located. *Id.* at 18:42–47.

According to the '978 patent, the “Network Distributed Tracking Protocol (NDTP) efficiently tracks the location of data associated with an individual entity in a distributed database.” *Id.* at 7:55–57. The '978 patent discloses the NDTP server doing so by using an identifier that “is assumed to be unique to a particular entity.” *Id.* at 7:62–64. “The NDTP identifier might be a unique customer identifier, for example, a Social Security Number.” *Id.* at 7:66–8:3. In one embodiment, the '978 patent describes entities as automobile vehicles “and the identifier assigned to the vehicles may be the unique vehicle identification number (VIN) assigned by automobile manufacturers.” *Id.* at 22:48–52.

The '978 patent also describes application to “the physical location and availability of portable devices belonging to a particular user,” such as cellular devices. *Id.* at 23:14–17. In such application, “an NDTP server location store may use the electronic serial number (ESN) of, for example,

cellular phones as identifiers, and the cellular tower translation encoding or latitude longitude of the phone as the location.” *Id.* at 24:16–21.

With respect to the locations storing related data, the “location might be an Internet machine name, and a TCP/IP port number for a relational database server, or an HTTP Universal Resource Locator (URL), or some concatenation of multiple components.” *Id.* at 8:10–13. The entity and location identifiers may be defined using “any format, size, encoding, etc.” *Id.* at 24:65–25:3. The system provides that “an identifier may be associated with any number of locations.” *Id.* at 8:13–17. Thus, “where the location information relates to locations of application servers containing data or routing information for finding data, . . . [w]hen a query is performed for an identifier, the NDTP server supplies the set of application servers in which data may be found for that identifier.” *Id.* at 8:17–25.

The ’978 patent addresses “NDTP server scaling with the NDTP’s redirection mechanism, which . . . allows arbitrary distribution of the data set across completely independent machines.” *Id.* at 15:47–51. This permits a client permanently to store only a single NDTP server address, but be able to retrieve all the necessary location data that may not be stored at that server. *Id.* at 16:18–23. This also permits the location data to be distributed among servers. *Id.* at 16:54–67. In a distributed configuration, a client either continues to seek location data from NDTP servers based on redirect responses (*id.* at 18:60–19:3), or the servers assemble multiple server responses into a single response to return to the requesting client (*id.* at 19:5–20. Additional configurations are possible. *Id.* at 19:26–50. Also, the “NDTP server supports on-the-fly addition and removal of data repositories and application servers from its deployed topology.” *Id.* at 7:33–35.

Significantly, the '978 patent describes its NDTP system and protocol as “provid[ing] a specialized database designed to solve general naming and addressing needs.” *Id.* at 23:61–63. “[I]t supports an architecture in which information about where data associated with particular application entities can be managed and obtained independently of the data itself.” *Id.* at 23:66–24:1. The '978 patent differentiates its NDTP system from the Domain Name System as follows:

One way to understand this is as a highly dynamic domain name service (DNS) for data. DNS maintains a mapping between names and machines. NDTP and its associated servers maintain a mapping between identifiers and locations. The identifier/location mapping maintained by NDTP servers is much more dynamic (suitable for frequent updates), than the domain name/IP address mapping maintained by DNS. NDTP may be viewed in this respect as fully generalized name service suitable for any kind of service and not restricted to a specialized service.

Id. at 24:2–11.

C. Challenged Claims

Petitioner challenges claims 1, 3, 6, 10, 14, 17, 23, 24, 30, and 31 of the '978 patent. Pet. 14–15. Thus, Petitioner challenges all independent claims of the '978 patent, namely claims 1, 10, 14, 17, and 31. Claim 1 is representative of the claimed subject matter and is reproduced below.

1. A system having a plurality of location servers for managing location information and providing location information to location queries, the system comprising:
 - a first location server containing a first set of location information corresponding to at least one entity, the location information comprising an identifier and at least one location string associated with the identifier, wherein the identifier identifies an entity

and the location string specifies a location of data pertaining to the entity

a second location server comprising a second set of location information, wherein at least a portion of the second set of location information differs from the first set of location information; and

programming logic stored on each of the location servers responsive to a location query identifying a desired entity to return a location message, the location message comprising at least one location of data pertaining to the desired entity, if the location server receiving the location query contains location information for the desired entity.

D. Asserted Grounds of Unpatentability

Petitioner asserts unpatentability as follows (Pet. 14–15):

Claims Challenged	35 U.S.C. §	Reference(s)/Basis
1, 3, 6, 10, 14, 31	§ 102(b)	RFC1034 ¹
6	§ 103(a)	RFC1034
17, 23, 30	§ 103(a)	RFC1034, Neimat ²
24	§ 103(a)	RFC1034, Neimat, Venkatasubramanian ³

Petitioner submits the Declaration of Dr. Jon Weissman. (Ex. 1002) in support of its arguments.

¹ P. Mochapetris, “Domain Names - Concepts And Facilities,” Request for Comment No. 1034, Network Working Group, Nov. 1987. (Ex. 1003) (“RFC1034”).

² U.S. Patent No. 5,542,087 (issued July 30, 1996) (Ex. 1004).

³ N. Venkatasubramanian and S. Ramanathan, “Load Management in Distributed Video Servers,” *Proceedings of 17th International Conference on Distributed Computing Systems*, IEEE, Baltimore, MD, USA, 1997, pp. 528–35.

E. Real Parties in Interest

Petitioner identifies itself as a real party-in-interest, as well as Amazon.com, Inc., Amazon.com Services, Inc., Amazon Digital Services, LLC, and AWSHC, Inc. Pet. 61. Petitioner also asserts “[n]o other parties have controlled, directed, funded, or participated in the preparation of this Petition, and therefore no other parties are understood to be a real party-in-interest here.” *Id.*

Patent Owner states, “Patent Owner Kove IO, Inc. is a real party-in-interest for this proceeding. In addition, for completeness, Patent Owner identifies Arctide, LLC.” Paper 4, 2.

Neither party disputes the identifications of real parties-in-interest in the record before us. *See generally* Pet., and Prelim. Resp.

F. Related Matters

Petitioner and Patent Owner identify as a related matter the patent litigation pending between them in United States District Court for the Northern District of Illinois, case 1:18-cv-08175 (N. D. Ill.), filed December 12, 2018. Pet. 62; Prelim. Resp. 17; Paper 4, 2. According to the parties, this litigation includes an assertion of the ’978 patent claims that are challenged here. *Id.*

II. CLAIM CONSTRUCTION

Because the Petition was filed after November 13, 2018, we construe the challenged claims using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. § 282(b).

37 C.F.R. § 42.100(b) (2019).⁴ This rule adopts the same claim construction standard used by Article III federal courts, which follow *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc), and its progeny. Under this standard, the words of a claim are generally given their “ordinary and customary meaning,” which is the meaning the term would have to a person of ordinary skill at the time of the invention, in the context of the entire patent including the specification. *See Phillips*, 415 F.3d at 1312–13.

Petitioner indicates it “does not ask the Board to construe any claim terms at this time” and that it “applies the ordinary and customary meaning of the claim terms in light of the specification.” Pet. 16. Conversely, Patent Owner proposed constructions of the claim terms “identifier,” “location,” “location server,” and “location information.” Prelim. Resp. 17–32.

We address below the scope of the claimed “identifier.” In light of our analysis of Petitioner’s asserted grounds, we further determine that we need not reach construction of the terms “location,” “location server,” and “location information,” and therefore, decline to construe these terms. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)) (“[W]e need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy.’”).

Each independent claim of the ’978 patent recites the use of an “identifier.” For instance, independent claim 1 recites “a first set of location

⁴ *See* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (final rule).

information corresponding to at least one entity, the location information comprising an identifier.” Ex. 1001, 25:27–29. Independent claim 1 further recites “the identifier identifies an entity.” *Id.* at 25:31. Independent claim 31 similarly recites “manipulating an identifier . . . wherein the identifier uniquely specifies an entity.” *Id.* at 28:51–52. Independent claim 10 recites responding “to a location query for a desired identifier” by searching “location information corresponding to a plurality of entities.” *Id.* at 26:27–37. Independent claim 14 also recites responding to a “location query requesting an entity’s location” by searching location information including “a plurality of identifiers.” *Id.* at 26:58–63. Independent claim 17 recites a “location store comprising a plurality of identifiers, each identifier associated with at least one location.” *Id.* at 27:35–37.

Patent Owner proposes construing the claimed identifier as: “a unique encoding that identifies an individual entity, and with which zero or more data location specifiers are associated in a location server.” Prelim. Resp. 18, 20–24. Patent Owner further states that its proposed construction “requires that there be a 1-to-1 relationship between an identifier and the entity that it is identifying.” *Id.* at 34.

We address first Patent Owner’s inclusion within its proposed construction of the phrase “a unique encoding . . . with which zero or more data location specifiers are associated in a location server.” The United States Court of Appeals for the Federal Circuit instructs that a patentee is free to act as their own lexicographer in order “to define the specific terms used to describe his or her invention, [however,] this must be done with reasonable clarity, deliberateness, and precision.” *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). Here, we find the ’978 patent contains an

express definition of the claimed “identifier.” The ’978 patent begins its detailed description section of the Specification with a series of definitions. Ex. 1001, 4:19–43. In particular, the ’978 patent states, “[t]he following terms are used to describe the operation of the presently preferred distributed database system.” *Id.* at 4:19–20. Among the terms defined in this passage, the ’978 discloses, “[a]n ‘entity identifier’ or an ‘identifier’ is a unique encoding, which may be a string in one embodiment, with which zero or more data location specifiers are associated in an NDTP server.” *Id.* at 4:25–28. We find the foregoing statements reasonably clear, deliberate, and precise so as to give one of ordinary skill in the art notice of the patentee’s intent to limit the scope of the claimed “identifier” to “a unique encoding . . . with which zero or more data location specifiers are associated in a location server.” Therefore, we agree with Patent Owner’s incorporation of this definition in its proposed construction. We further observe that in a footnote excluded from the Petition’s brief claim construction section, Petitioner recognizes, “[t]he specification recites that identifiers are unique encodings, such as strings, with which zero or more data location specifiers are associated in an NDTP server.” Pet. 20 n.7 (citing Ex. 1001, 4:25–28).

We turn next to Patent Owner’s inclusion within its proposed construction of the phrase “identifies an individual entity.” Whereas the earlier discussed phrase describes the relationship between the identifier and its associated data location specifiers, this phrase describes the relationship between the identifier and an entity. Patent Owner’s proposed inclusion of this phrase is supported by the ’978 patent’s disclosure that the claimed identifier “is assumed to be unique to a particular entity.” Ex. 1001, 7:62–64. This understanding is reinforced by the examples of identifiers set forth

in the Specification, namely, a unique customer identifier such as a Social Security Number (SSN), a vehicle identification number (VIN), and an electronic serial number (ESN) of a cellular phone. *Id.* at 7:66–8:3, 22:48–52, 24:16–21. We find that one of ordinary skill in the art would readily understand these examples as instances in which a given identifier identifies only one entity, and therefore, these examples confirm Patent Owner’s understanding that the claimed identifier identifies an individual entity.

Returning to the claim language, we observe that recitation of the singular term “an identifier” supports the foregoing understanding, particularly where the recitation relates to the relationship between an identifier and the entity it identifies. For instance, as Patent Owner correctly contends, claims 1 and 31 each recite “the identifier identifies **an** entity.” Prelim. Resp. 23–24. It is well established that the “indefinite article ‘a’ or ‘an’ in patent parlance carries the meaning of ‘one or more.’” *KCJ Corp. v. Kinetic Concepts, Inc.*, 223 F.3d 1351, 1356 (Fed. Cir. 2000); *Baldwin Graphic Sys., Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1342 (Fed. Cir. 2008). Here, however, the language immediately surrounding the phrase “an identifier” in both independent claims 1 and 31 recites “at least one location” and “at least one entity.” Ex. 1001, 25:28–30, 28:51–52, 28:55. This surrounding usage suggests Patent Owner’s intention to use the explicit phrase “at least one” when describing a quantity of one or more, and not rely upon on the implied understanding of the indefinite article “an.”

Finally, although we agree with Patent Owner’s proposed construction for the reasons set forth above, we disagree based on the record before us with Patent Owner’s argument that its construction requires “a 1-to-1 relationship between an identifier and the entity that it is identifying.”

Prelim. Resp. 34. Rather, we understand the claim language and passages of the Specification cited above as relating to the notion that a given identifier must resolve to a single entity, i.e., at most, a many-to-1 relationship. We do not decide whether the claim language in light of the Specification requires that a given entity must be identified by one and only one identifier, i.e., a 1-to-1 relationship, because this determination would not alter the outcome of our analysis of Petitioner's asserted grounds, as set forth below. *See Nidec Motor Corp.*, 868 F.3d 1013 at 1017.

Accordingly, for the foregoing reasons, we construe the claim term "identifier" to mean "a unique encoding that identifies an individual entity, and with which zero or more data location specifiers are associated in a location server."

III. ANALYSIS OF ASSERTED GROUNDS

A. *Legal Standards*

Petitioner bears the burden of proving unpatentability of the challenged claims, and the burden of persuasion never shifts to Patent Owner. *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). At this stage of the proceeding, Petitioner must establish that there is a reasonable likelihood that it will prevail with respect to at least one of the challenged claims. 35 U.S.C. § 314(a).

A claim is anticipated only if each and every element as set forth in the claims is found, either expressly or inherently described in a single prior art reference. *Verdegaal Bros., Inc. v. Union Oil. Co. of Cal.*, 814 F.2d 628, 631 (Fed. Cir. 1987). The elements must be arranged as recited in the challenged claim, but this is not an *ipsissimis verbis* test, i.e., identity of terminology is not required. *In re Bond*, 910 F.2d 831, 832 (Fed. Cir. 1990).

A claim is unpatentable as obvious in light of the asserted prior art if the differences between the claimed subject matter and the prior art are such that the subject matter as a whole would have been obvious at the time of the invention to a person having ordinary skill in the art. *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) when in evidence, objective evidence of non-obviousness, i.e., so-called secondary considerations such as commercial success, long felt but unsolved needs, and failure of others. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). The obviousness inquiry further requires an analysis of “whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (requiring “articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”)).

B. Level of Ordinary Skill in the Art

The level of skill in the art is a factual determination that provides a primary guarantee of objectivity in an obviousness analysis. *Al-Site Corp. v. VSI Int’l Inc.*, 174 F.3d 1308, 1324 (Fed. Cir. 1999) (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966); *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991)).

Petitioner argues that one of ordinary skill in the art at the time of the invention of the ’978 patent “would typically have had a bachelor’s degree in computer science (or a similar field) and at least two years of experience working with distributed software systems, or at least seven years of

experience working with distributed systems (or in a similar field), or equivalent.” Pet. 11–12. Patent Owner does not propose a differing view. Prelim. Resp. 16–17.

We regard Petitioner’s formulation of the level of skill as consistent with the Specification and the asserted prior art. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (prior art itself may reflect an appropriate level of skill). Thus, we adopt Petitioner’s proposal for the purposes of this Decision only.

C. Overview of the Asserted Prior Art

1. RFC1034 (Ex. 1003)

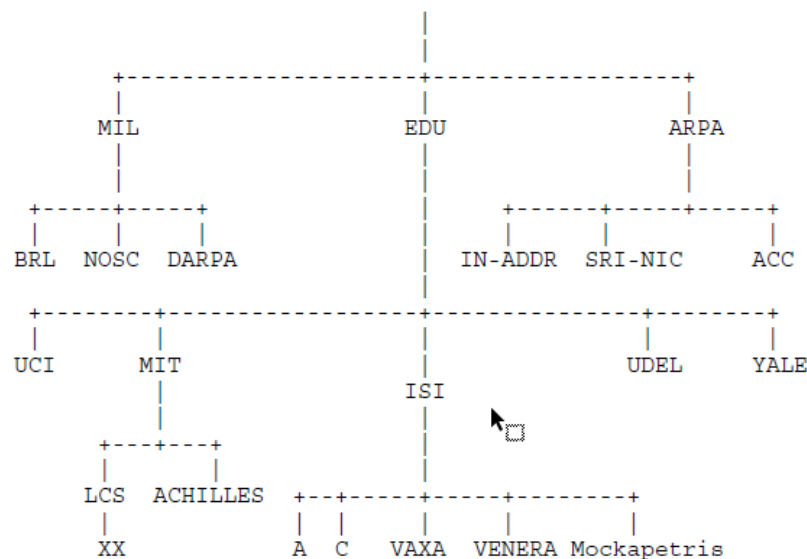
RFC1034 provides an introduction to concepts and facilities, but not implementation and specification, of the Domain Name System (DNS), for Internet mail and host address support. Ex. 1003, 1. The development of DNS was driven by an increase in the number host computers, and the subsequent increase in network traffic to copy a single file that mapped each computer to its network identifier, as well as an increase in sophistication of applications on those computers. *Id.* at 1–2.

RFC1034 describes distributed database problems in the host name scenario, where “a particular name server may be presented with a query that can only be answered by some other server.” *Id.* at 4. RFC1034 prefers an approach it labels “‘iterative,’ in which the server refers the client to another server and lets the client pursue the query,” but is open to the approach it labels “‘recursive,’ in which the first server pursues the query for the client at another server.” *Id.*

RFC1034 describes “a tree structured name space and data associated with the names.” *Id.* at 6. Using this, “queries for address resources return

Internet host addresses.” *Id.* RFC1034 describes the use of “name servers,” which each have “complete information about a subset of the domain space, and pointers to other name servers that can be used to lead to information from any part of the domain tree.” *Id.*

An example of a high-level portion of the tree-structured Internet domain name space is reproduced below in an unlabeled figure in Section 3.4, page 10, of RFC1034.



In the unlabeled figure, above, appearing in the section named “Example name space,” is a root domain which “has three immediate subdomains: MIL, EDU, and ARPA. The LCS.MIT.EDU domain has one immediate subdomain named XX.LCS.MIT.EDU.” *Id.* at 10. Each node in the tree has a set of resource information, referred to as “resource records,” (“RR”) which include information such as the domain name where the resource record is found, the type and class of resource, a time-to-live value for the data, the data itself, such as domain name (usually a pointer to other information in the database), or IP address. *Id.* at 11–13.

An example of resource records, with class and time-to-live data omitted, is provided as follows:

ISI.EDU.	MX	10	VENERA.ISI.EDU.
	MX	10	VAXA.ISI.EDU.
VENERA.ISI.EDU.	A	128.9.0.32	
	A	10.1.0.52	
VAXA.ISI.EDU.	A	10.2.0.27	
	A	128.9.0.33	

Id. at 14. In this example above, ISI.EDU has two “mail exchange” records, which point to sub-domains, each of which has two IP addresses associated with it. *See id.* at 12–13.

In the DNS system, the “response by the name server either answers the question posed in the query, refers the requester to another set of name servers, or signals some error condition.” *Id.* at 16. Further, a “given name server will typically support one or more zones, but this gives it authoritative information about only a small section of the domain tree. It may also have some cached non-authoritative data about other parts of the tree.” *Id.* at 19. The “authoritative data for a zone is simply all of the RRs attached to all of the nodes from the top node of the zone down to leaf nodes or nodes above cuts around the bottom edge of the zone.” *Id.* at 20. Thus, “a zone can be completely described in terms of a set of RRs. Whole zones can be transferred between name servers by transferring the RRs.” *Id.*

2. *Neimat (Ex. 1004)*

Neimat concerns “generating a correct memory address from a character or digit string such as a record key.” *Ex. 1004*, 1:6–9. Petitioner asserts that *Neimat* discloses “the particular method of scaling capacity or transaction rate capability recited.” *Pet. 44*.

Neimat describes a system that “generate[s] a correct memory address from a character or digit string such as a record key value, and which is adapted for use in distributed or parallel processing architectures such as computer networks, multiprocessing systems, and the like.” Ex. 1004, 4:41–46. In Neimat’s system, “[r]ecords of the database are stored at memory locations or ‘buckets’ provided by file servers. In accordance with a preferred embodiment of the present invention, a number of servers is large, for example in a range of 10 to 10,000 servers.” *Id.* at 4:53–57. Then, “the client initiating the operation provides a record key value, [f]rom the record key value, the method of the present invention provides a correct memory address needed to perform the database operation.” *Id.* at 5:23–29.

Neimat discloses that “[i]f memory location 0 becomes full, then what is known as a ‘collision’ occurs.” *Id.* at 13:26–27. If that condition occurs, “locations available for storage [are] gradually increased as needed by a process of ‘splitting’ a respective predetermined one of the memory locations or ‘buckets.’” *Id.* at 13:28–32. Then, Neimat’s system proceeds by “moving approximately half of the records from the respective predetermined memory location to the respective new memory location.” *Id.* at 13:32–37.

3. Venkatasubramanian (Ex. 1005)

Venkatasubramanian, a conference paper, defines various policies for load management in distributed video servers. Ex. 1005, 1. The paper proposes “a predictive placement policy that determines the degree of replication necessary for popular videos using a cost-based optimization procedure based on a priori predictions of expected subscriber requests.” *Id.* The paper concludes that “[p]erformance evaluations indicate that a load

management procedure which uses a judicious combination of the different policies performs best for most server configurations.” *Id.*; *see also id.* at 535 (concluding that “policies that utilize a combination of the predictive placement, adaptive scheduling, eager replication, and lazy dereplication policies perform well in most server configurations”). The paper provides an example which “illustrates a case in which localization (i.e., minimizing the number of copies) of a video object, V_i , actually leads to improved server throughput.” *Id.* at 529. The paper points out, though, that “if additional requests are received for V_1 , replication becomes essential. In general, the exact load management mechanism has to be decided depending upon the current utilization of resources in the data sources of the video server and the expected subscriber requests including buffer memory and CPU processing power.” *Id.*

D. Asserted Anticipation of Claims 1, 3, 6, 10, 14, and 31 by RFC1034

1. Claim 1

Independent claim 1 recites, in relevant part, “a first set of location information corresponding to at least one entity, the location information comprising an identifier.” Ex. 1001, 25:27–29. Independent claim 1 further recites “the identifier identifies an entity.” *Id.* at 25:31.

Petitioner contends RFC1034 discloses the claimed identifier and entity. Pet. 19–20, 22–23. In particular, Petitioner contends the claimed “[i]dentifier corresponds to DNS domain names. Hosts and mailboxes are identified by identifiers—their domain names.” (Ex. 1003, 1, 6, 7, 8; Ex. 1002 ¶ 75). Thus, Petitioner alternatively contends that a “host” meets the claimed entity with its corresponding domain name as the claimed identifier or a “mailbox” meets the claimed entity with its corresponding

domain name as the claimed identifier. Pet. 23 (“In RFC1034, the ‘identifier’ (domain name) identifies an ‘entity’ (host or mailbox).”).⁵

With regard to Petitioner’s host theory, Petitioner states, “[f]or example, venera.isi.edu is such a domain name for a host.” Pet. 20. Petitioner’s declarant, Dr. Weissman, in turn states, “[h]ost computers and mailbox entities are identified by a unique domain name.” Ex. 1002 ¶ 75 (citing Ex. 1003, 6, 7, 8). Petitioner and Dr. Weissman reproduce a table from RFC1034 in support of their argument.

For example, we might show the RRs carried in a message as:

ISI.EDU.	MX	10 VENERA.ISI.EDU.
	MX	10 VAXA.ISI.EDU.
VENERA.ISI.EDU.	A	128.9.0.32
	A	10.1.0.52
VAXA.ISI.EDU.	A	10.2.0.27
	A	128.9.0.33

Ex. 1002 ¶ 88; Pet. 20. As discussed above, the table above represents a resource record from RFC1034, with highlighting applied in Dr. Weissman’s declaration. *Id.* Relying on this table, Dr. Weissman contends, “[a] person of ordinary skill understands that the IP address is used by Internet routers to locate the specific entity in question.” *Id.*

Absent from Petitioner’s arguments is clear explanation of how a “host” as disclosed in RFC1034 meets the claimed entity and how a domain name (i.e., the “identifier”) identifies a single host. The Petition’s cursory treatment of these claim elements refers only to a “host” without detailing what is described by RFC1034’s use of “host.” Pet. 19–20, 22–23. Dr. Weissman clarifies that Petitioner’s theory refers to “host computer”

⁵ Petitioner further contends that an RFC1034 “resource” or “object” may also meet the claimed entity, but offers no analysis of how either is identified by an identifier as claimed. Pet. 19–20.

(Ex. 1002 ¶ 75); however, Dr. Weissman’s clarification does not resolve the failure of Petitioner to account for the required relationship between a host computer (i.e., entity) and a domain name (i.e., identifier). Pet. 19–20, 22–23; Ex. 1002 ¶¶ 75, 88. We construed above the claim term “identifier” to mean “a unique encoding that identifies an individual entity, and with which zero or more data location specifiers are associated in a location server.” See *supra* Section II. As Patent Owner correctly contends, Petitioner and Dr. Weissman fail to explain how a given domain name identifies only one host computer of RFC1034. Prelim. Resp. 35. To the contrary, the resource record for the domain name on which Petitioner and Dr. Weissman rely, venera.isi.edu, describes only that the domain resolves to two IP addresses, namely 128.9.0.32 and 10.1.0.52, which Petitioner cites as meeting the claimed “at least one location string,” not the claimed “entity.” Ex. 1003, 14; Pet. 20, 28. Petitioner’s brief discussion of this disclosure does not explain how the domain venera.isi.edu allegedly identifies only a single host.

Petitioner’s mailbox theory similarly fails to account for the required relationship between a mailbox (i.e., entity) and a domain name (i.e., identifier). Petitioner states, “[i]n the above example, venera.isi.edu is the domain name associated with email addresses ending in ‘isi.edu.’” Pet. 19. The disclosure of RFC1034, however, does not support Petitioner’s assertion. RFC1034 describes returning the record reproduced below in response to a “mailer trying to send mail to Mockapetris@ISI.EDU [by asking] the resolver for mail information about ISI.EDU, resulting in a query for QNAME=ISI.EDU, QTYPE=MX, QCLASS=IN” (Ex. 1003, 17):

ISI.EDU.	MX	10 VENERA.ISI.EDU.
	MX	10 VAXA.ISI.EDU.

The response record reproduced above shows the domain name ISI.EDU to be associated with two mail exchanges, namely venera.isi.edu and vaxa.isi.edu. *Id.* Thus, contrary to Petitioner’s argument, RFC1034 describes that in response to requesting “mail information about ISI.EDU . . . [t]he response’s answer section would be” both venera.isi.edu and vaxa.isi.edu, not only venera.isi.edu, as Petitioner contends. *Id.* Petitioner’s theory fails to account for vaxa.isi.edu and explain how the entity/identifier relationship is allegedly disclosed in light thereof.

Petitioner and Dr. Weissman, thus, fail to account for the identifier recited in claim 1. Accordingly, we determine Petitioner has failed to show a reasonable likelihood of success in challenging claim 1 as anticipated by RFC1034.

2. Claims 3, 6, 10, 14, and 31

Claims 3 and 6 depend ultimately from independent claim 1. Petitioner relies on RFC1034 to meet the identifier recited in these claims, as discussed above in the context of claim 1. Pet. 30–32. Accordingly for the same reasons discussed above, we determine Petitioner has failed to show a reasonable likelihood of success in challenging these claims as anticipated by RFC1034.

Claims 10, 14, and 31 are each independent and each recite an “identifier.” Ex. 1001, 26:27–37 (claim 10 recites responding “to a location query for a desired identifier” by searching “location information corresponding to a plurality of entities”), 26:58–63 (claim 14 recites responding to a “location query requesting an entity’s location” by searching location information including “a plurality of identifiers”), 28:51–52 (claim 31 recites “manipulating an identifier . . . wherein the identifier

uniquely specifies an entity”). Petitioner relies on RFC1034 to meet the identifier recited in these claims, as discussed above in the context of claim 1. Pet. 32–39. Accordingly for the same reasons discussed above, we determine Petitioner has failed to show a reasonable likelihood of success in challenging these claims as anticipated by RFC1034.

E. Asserted Obviousness of Claims 6, 17, 23, 24, and 30 Alone or in Combination with Various Other References

Petitioner’s obviousness allegations regarding claim 6 do not address the claimed identifier and thus do not repair the deficiencies discussed above in the context of claim 1. Pet. 41. Accordingly for the same reasons discussed above, we determine Petitioner has failed to show a reasonable likelihood of success in challenging this claim as obvious over RFC1034.

Independent claim 17 recites a “location store comprising a plurality of identifiers, each identifier associated with at least one location.” Ex. 1001, 27:35–37. Claims 23, 24, and 30 depend ultimately from claim 17. Petitioner’s obviousness argument for these claims relies on RFC1034 to meet the recited identifier in the same manner discussed above in the context of claim 1. Pet. 44, 51, 58. Accordingly for the same reasons discussed above, we determine Petitioner has failed to show a reasonable likelihood of success in challenging these claims as obvious over RFC1034 and Neimat, and, in the case of claim 24, over RFC1034, Neimat, and Venkatasubramanian.

IV. CONCLUSION

Having reviewed the record before us, we are not persuaded that Petitioner has demonstrated a reasonable likelihood of prevailing with respect to any one of the challenged claims and, therefore, we do not institute the requested *inter partes* review.

V. ORDER

It is, therefore,

ORDERED that the Petition is *denied*; and

FURTHER ORDERED that the requested *inter partes* review is not instituted with respect to any claim of the '978 patent.

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