Trials@uspto.gov
571.272.7822

Paper No. 53
Filed: June 20, 2018

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

EMC CORPORATION, LENOVO (UNITED STATES) INC.,
NETAPP, INC.,
Petitioner,

v.

INTELLECTUAL VENTURES I LLC,
Patent Owner.

Case IPR2017-00374
Patent 8,275,827

Before JEFFREY S. SMITH, GEORGIANNA W. BRADEN, and DANIEL J. GALLIGAN, *Administrative Patent Judges*.

BRADEN, *Administrative Patent Judge*.

FINAL WRITTEN DECISION

35 U.S.C. § 318

I. INTRODUCTION

We have jurisdiction to hear this inter partes review under 35 U.S.C. § 6, and this Final Written Decision is issued pursuant to 35 U.S.C. § 318(a). For the reasons that follow, we determine that Petitioner has shown by a preponderance of the evidence that claims 1, 3–9, 13, and 15, 16, and 18–21 of U.S. Patent No. 8,275,827 (Ex. 1001, "the '827 patent") are unpatentable.

A. Procedural History

EMC Corporation, Lenovo (United States) Inc., and NetApp, Inc. ("Petitioner") filed a Petition (Paper 5, "Pet.") to institute an *inter partes* review of the challenged claims of the '827 patent. Intellectual Ventures I LLC ("Patent Owner") timely filed a Preliminary Response (Paper 9, "Prelim. Resp.").

Pursuant to 35 U.S.C. § 314(a), we originally instituted an *inter partes* review of claim 1, 3–9, 13, and 15–21 under 35 U.S.C. § 103(a) as unpatentable over OceanStore.[1] *See* Paper 11 ("Dec. to Inst."), 39–40. On April 24, 2018, the Supreme Court held that 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 (2018). Thereafter, we modified the institution decision to institute on all of the challenged claims and all of the grounds presented in the Petition. Accordingly, this *inter partes* review also includes review of (1) claims 1, 3–9, 13, and 15–21 as

[1] Kubiatowicz, John et al., *OceanStore: An Architecture for Global-Scale Persistent Storage*, ASPLOS-IX proceedings: Ninth International Conference on Architectural Support for Programming Languages and Operating Systems, pages 190–201 (2000) (Ex. 1003, "OceanStore").

unpatentable under 35 U.S.C. § 102(a) in view of OceanStore and (2) claims 4, 6, 7, 16, 18, and 19 as unpatentable under 35 U.S.C. § 103(a) in view of OceanStore and Condor[2]. *See* Paper 51, 2; *see also* Ex. 3001 (email "advis[ing] the Board that Patent Owner will waive its right to file a [Patent Owner Response] and will not request an oral hearing on the newly instituted grounds in this proceeding. Both parties have conferred and believe this closes the record and allows the Board to issue a final written decision based on the current record.").

After institution of trial, Patent Owner filed a Patent Owner Response (Paper 24, "PO Resp."), to which Petitioner filed a Reply (Paper 32, "Reply"). Patent Owner also filed Objections to Evidence (Papers 14, 17, 35) and a Motion for Observation on Cross-Examination (Paper 36). Petitioner responded to Patent Owner's Motion for Observation on Cross-Examination. Paper 40. In addition, and with our authorization, Patent Owner filed a list of alleged improper reply arguments (Paper 41) to which Petitioner filed a Response (Paper 42).

An oral argument was held on March 5, 2018, together with co-pending Case IPR2017-00429. A transcript of the oral argument is included in the record. Paper 52 ("Tr.").

B. Related Proceedings

The parties inform us that the challenged patent is the subject of two district court proceedings in the District of Massachusetts, captioned *Intellectual Ventures I LLC et al. v. Lenovo Group Ltd.* (1:16-cv-10860-IT)

[2] Litzkow, M.J., et al., *Condor – A Hunter of Idle Workstations*, Computer Sciences Technical Report #730 (1987) (Ex. 1017, "Condor").

and *Intellectual Ventures I, LLC et al. v. NetApp, Inc.* (1:16-cv-10868-IT). Pet. 2; Paper 7, 1 (Patent Owner's Mandatory Notices).

C. The '827 Patent

The '827 patent was filed on April 13, 2001, and is titled "Software-Based Network Attached Storage Services Hosted on Massively Distributed Parallel Computing Networks." Ex. 1001, Title. It describes systems and methods for software-based network attached storage (NAS) services hosted on a massively-distributed network of devices. *Id.* at Abstract. The '827 patent discloses that the term "NAS device" generally refers to "a specialized file server that connects to the network to provide storage capacity to network-connected users" (*id.* at 2:18–20), and, in the context of the '827 patent, "broadly refers to a device that makes data storage resources available to network-connected user devices" (*id.* at 2:31–34). The '827 patent further discloses that a NAS device typically takes the form of a standalone dedicated hardware device that contains its "own storage, processing, connectivity, and management resources." *Id.* at 2:12–14. According to the '827 patent, ordinary desktop computers often sit idle for long periods of time but have the same specifications (e.g., a Pentium processor, a hard drive, and an Ethernet connection) and often greater functional capabilities than dedicated NAS devices. *Id.* at 2:46–55. The '827 patent proposes making these otherwise unused storage resources available to other devices connected to the network. *Id.* at 2:66–3:1, 42:36–41.

In one embodiment, the '827 patent describes a distributed NAS system, shown in Figure 21 reproduced below, that includes user devices 152 and NAS client devices 108. *Id.* at 43:6–15.

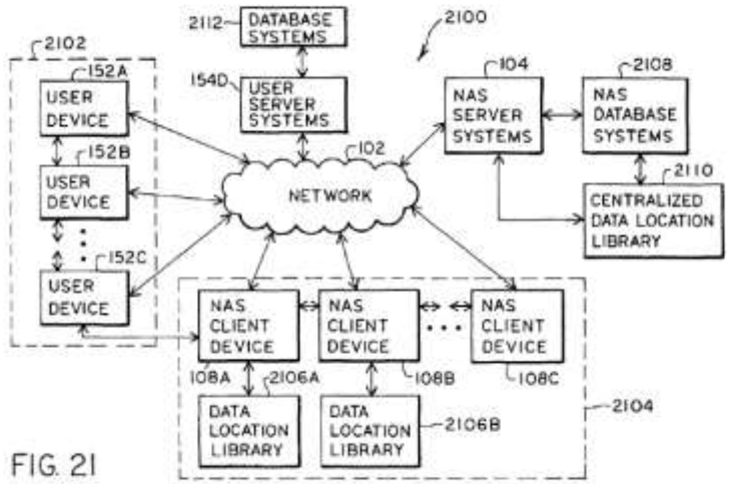

FIG. 21

> Figure 21 provides a block diagram for an embodiment for a distributed processing system that provides network attached storage (NAS) services. Ex. 1001, 42:29–31.

As illustrated above in Figure 21 of the ’827 patent, the server systems may include user server systems 154D, which have attached database systems 2112, and NAS server systems 104 with attached NAS database systems 2108 and centralized data location library 2110. Ex. 1001, 43:22–26. To provide NAS functionality, the ’827 patent describes client devices 108A, 108B, . . . 108C as running a client agent that provides NAS functionality by running a NAS component as one of the projects for the distributed device. *Id.* at 43:26–30. According to the ’827 patent, some of these NAS devices, such as NAS client devices 108A and l08B, may store distributed data location information, such as data location libraries 2106A and 2106B. *Id.* at 43:30–33.

The ’827 patent discloses that the NAS client devices within client device fabric 2104 can act as stand-alone NAS devices and user devices within user device fabric 2102 can directly access them as such. *Id.* at 43:44–46. Additionally, at least some of the NAS client devices within client device fabric 2104 include data location information or libraries that are used to provide links or directions to data distributed on various NAS client devices 108A, 108B, . . . 108C. *Id.* at 43:59–63. These links help provide a NAS device fabric from which user server systems 154D and user devices 152A, 152B, . . . 152C within user device fabric 2102 can draw storage resources. *Id.* at 43:63–66.

The ’827 patent also contemplates that server systems 104 facilitate the NAS functionality, for example, by providing centralized management, control, and support for the NAS architecture. *Id.* at 44:24–27. According to the ’827 patent, NAS servers systems 104 may include, for example, file storage database systems 2108 and centralized data location library 2110. *Id.* at 44:27–29. Additionally, the ’827 patent discloses that the user devices, which can be any type of computer devices, are configured to access data stored on the NAS client devices. *Id.* at 44:60–64.

D. Illustrative Claims

As noted above, an *inter partes* review was instituted as to claims 1, 3–9, 13, and 15–21 with claims 1 and 13 being independent. Claims 1 and 13 are illustrative of the challenged claims and are reproduced below:

1. A computer-implemented method comprising:

> configuring a distributed processing system of a plurality of distributed devices coupled to a network, wherein the plurality of distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system,
>
> wherein the respective client agents for particular distributed devices of the plurality of distributed devices have corresponding software-based network attached storage (NAS) components configured to assess unused or under-

> utilized storage resources in selected distributed devices of the plurality of distributed devices;
>
> representing with the corresponding software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused and under-utilized storage resources for the selected distributed devices;
>
> processing one or more of data storage or access workloads for the distributed processing system by accessing data from or storing data to at least a portion of the available amount of storage resources to provide NAS service to a client device coupled to the network; and
>
> enabling at least one of the selected distributed devices to function as a location distributed device to store location information associated with data stored by the selected distributed devices through use of the respective client agents for the particular distributed device.

Ex. 1001, 46:28–56.

> 13. A system comprising:
>
> a plurality of distributed devices configured to be coupled to a network, wherein the distributed devices include respective client agents configured to process respective portions of workloads for the distributed processing system, the respective client agents including respective instances of a software-based network attached storage (NAS) component, wherein the NAS component is configured to:
>
> assess unused storage resources of the distributed devices;
>
> allocate respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices;
>
> represent that the selected distributed devices comprise respective NAS devices having the respective available amounts of storage resources;

> process workloads associated with data storage and access by accessing data from and storing data into portions of the storage resources in the selected distributed devices to provide NAS service to a client device: and
>
> wherein the respective client agents are configured to enable at least one of the selected distributed devices to function as a location distributed device to store location information for data stored by the selected distributed devices.

Id. at 47:28–48:7.

II. DISCUSSION

A. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are interpreted according to their broadest reasonable construction in light of the specification of the patent in which they appear.[3] 37 C.F.R. § 42.100(b); *see Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) ("We conclude that the regulation represents a reasonable exercise of the rulemaking authority that Congress delegated to the Patent Office."). Under that standard, and absent any special definitions, we give claim terms their ordinary and customary meaning, as would be understood by one of ordinary skill in the art at the time of the invention. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). An inventor, however, may provide a meaning for a term that is different from its ordinary meaning by defining the term in the specification with "reasonable clarity, deliberateness, and precision." *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

[3] We are not aware of any evidence of record in this proceeding that would lead to a different outcome under the *Phillip* claim construction standard. *See Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed.Cir.2005).

Limitations, however, are not to be read from the specification into the claims. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993). In addition, the Board may not "construe claims during [an *inter partes* review] so broadly that its constructions are unreasonable under general claim construction principles." *Microsoft Corp. v. Proxyconn, Inc.*, 789 F.3d 1292, 1298 (Fed. Cir. 2015), *overruled on other grounds by Aqua Prods., Inc. v. Matal*, 872 F.3d 1290 (Fed. Cir. 2017).

Thus, when construing the claims at issue (1) we look at the language of the claims themselves, (2) we consult the patent's specification to help clarify the meaning of claim terms, because the claims "must be read in view of the specification, of which they are a part," *Trading Techs. Int'l, v. eSpeed, Inc.*, 595 F.3d 1340, 1352 (Fed.Cir.2010) (quoting *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (en banc), *aff'd*, 517 U.S. 370 (1996)), and (3) we review "the patent's prosecution history in proceedings in which the patent has been brought back to the [US Patent and Trademark Office] for a second review" (*Microsoft Corp.*, 789 F.3d at 1298).

The parties dispute the proper construction of the limitation "[r]epresenting with the corresponding software-based NAS component that the selected distributed devices respectively comprise NAS devices" as recited in claims 1 and 13. *See* Pet 11–12; PO Resp. 8–11; Reply 3–8. Specifically, the parties proposed the following constructions:

Petitioner	"using the corresponding software-based NAS components of the selected distributed devices to mimic dedicated NAS devices"

Patent Owner	"using the corresponding software-based NAS components of the selected distributed devices to cause each selected distributed device to separately appear to network-connected user devices as a dedicated NAS device"

Patent Owner argues the explicit language of the claims requires that each distributed device includes its own NAS device. PO Resp. 8. Patent Owner notes that the term "respectively" has "a well-settled meaning of '[s]eparately or individually and in the order already mentioned.'" *Id.* at 9 (citing Exhibit 2001, 1219). According to Patent Owner, the word "respectively" as used in claims 1 and 13 modifies the clause "selected distributed devices." *Id.* Thus, Patent Owner argues that the explicit and plain language of the claims requires a representation that each of the "selected distributed devices," separately or individually, appears to the network-connected user devices as a "NAS device." *Id.* Patent Owner further argues that its construction is consistent with the specification of the '827 patent because "[t]he '827 patent defines a 'NAS device' as 'a device that makes data storage resources available **to network-connected user devices**.'" *Id.* (quoting Ex. 1001, 2:31–34). Patent Owner contends that "[w]hen this definition of NAS device is applied, the '*representing*' phrase requires a representation that each individual 'selected distributed device' comprises 'a device that makes data storage resources available to network-connected user devices.'" *Id.*

Patent Owner relies on the testimony of its declarant, Prashant Shenoy, Ph.D. ("Dr. Shenoy") to support its position. PO Resp. 9 (citing Ex. 2003 ¶ 34). Dr. Shenoy testifies that "[a]n integrated system that appears as a single device would not satisfy this requirement, as each individual distributed device would not separately make, or appear to make its resources available to network-connected user devices." Ex. 2003 ¶ 34. Dr. Shenoy concludes that "the plain language of the claims requires each individual 'selected distributed device' to 'bring[] **its** resources to the network **with the appearance of a dedicated NAS device**.'" *Id.* (alteration in original) (quoting Ex. 1001, 42:59–65).

We agree with Patent Owner regarding the ordinary meaning of the term "respectively." Specifically, we understand that the word "respectively" can be an adverb that means for each "separately or individually, and in the order already mentioned." The use of "respectively" as an adverb in the English language requires parallelism. *See* Ex. 2001; Ex. 3002. In other words, there must be a direct one-to-one correspondence and specific referents must be *individually* identified before there can be a "parallel list" of attribute values applicable to *each, in that order*. The term "respectively" also can be an attributive adjective that means "concerning or appropriate to each of several individually." Ex. 3002. In the present case, the term "respectively" appears to modify "the selected distributed devices." Because specific referents are not individually identified, we understand the term to act as an attributive adjective modifying each of several selected distributed devices.

Although we agree with Patent Owner regarding the use of the term "respectively," we do not understand its use to require "the selected distributed devices to cause each selected distributed device to separately appear to network-connected user devices as a dedicated NAS device." We cannot construe individual terms in isolation. Rather, we must consider the claim as a whole in view of the specification. Specifically, we must consider the implications of other terms recited in claims 1 and 13 (e.g., "location information") and how the claims are supported by the disclosed embodiments.

As a general rule, "there is a strong presumption against a claim construction that excludes a disclosed embodiment." *See In re Katz Interactive Call Processing Patent Litig.*, 639 F.3d 1303, 1324 (Fed. Cir. 2011). Several exceptions to this presumption apply. For example, a claim may be interpreted to exclude embodiments "where those embodiments are clearly disclaimed in the specification . . . or prosecution history." *Oatey Co. v. IPS Corp.*, 514 F.3d 1271, 1277 (Fed. Cir. 2008). Similarly, where the disputed term is not present in the other independent claims of the patent-in-suit, it is permissible to construe the term so as to exclude an embodiment. This is because the other claim terms "leave[] open the possibility that claims not at issue in [the claim construction] encompass omitted embodiments." *Helmsderfer v. Bobrick Washroom Equip., Inc.*, 527 F.3d 1379, 1383 (Fed. Cir. 2008). Otherwise, "where claims can reasonably [be] interpreted to include a specific embodiment, it is incorrect to construe the claims to exclude that embodiment, absent probative evidence [to] the contrary." *Oatey Co.*, 514 F.3d at 1277.

In this case, the disclosure in the '827 patent teaches at least three embodiments using the selected distributed devices in a variety of ways, including as "stand-alone" devices (Ex. 1001, 43:44–47), as part of a "NAS device fabric" (*id.* at 43:59–63, 44:9–12), and in a "server assisted implementation" (*id.* at 44:24–27). Specifically, the '827 patent discloses that "a large number of desktop PCs in the enterprise (Intranet) or on the

Internet can each act as a NAS device by running a client agent program and NAS component that brings its resources to the network with the appearance of a dedicated NAS device or **as part of an integrated system that appears as a single or dedicated NAS device**." *See* Ex. 1001, 42:59–65 (emphasis added). The '827 patent further discloses:

> A relatively simple implementation is to have the devices simply mimic the functionality of stand-alone NAS devices, while a more complex implementation is to provide a storage fabric across the Intranet or Internet where hundreds or thousands of devices work cooperatively as NAS devices in conjunction with server systems that assist in controlling and managing the storage function of the NAS fabric."

See Ex. 1001, 42:66–43:5. Yet, Patent Owner's construction intentionally reads out the embodiments covering a NAS fabric and the "server assisted implementation" of the devices. Patent Owner specifically argues:

> [T]he explicit language of the claims excludes this embodiment by requiring the representation that the "selected distributed devices **respectively** comprise NAS devices." ('827 patent, 46:41–46 (emphasis added).) Instead, the claim language recites the embodiment described first in this passage—that each individual NAS device "brings **its** resources to the network **with the appearance of a dedicated NAS device**." ('827 patent, 42:59–65 (emphasis added).)

PO Resp. 11. Patent Owner's position is contrary to the recited claims when considered as a whole and runs counter to prevailing case law. *See Oatey Co.*, 514 F.3d at 1277; *Helmsderfer, Inc.*, 527 F.3d at 1383.

Both independent claims 1 and 13 recite "enabl[ing] at least one of the selected distributed devices to function as a location distributed device to store *location information* associated with data stored by the selected distributed devices." As Petitioner argues, the NAS fabric embodiment disclosed in the '827 patent is "the ***only*** embodiment in which [Patent Owner's declarant], Dr. Shenoy, could identify disclosure of the recited 'location information' that was required to secure allowance of the claims." Reply 5 (citing Ex. 1053, 43:16–44:16); *see* Ex. 1053:57:7–21. According to Dr. Shenoy, one reason that a "stand-alone implementation does not require the data location library to be used" is "presumably because it's a stand-alone implementation, and clients connect to the stand-alone NAS devices directly." Ex. 1053, 53:18–54:8. Thus, Patent Owner's argument that each selected distributed device must appear separately to network-connected user devices as a dedicated NAS device improperly imports selected limitations from the specification into the claim and ignores additional required elements recited in the claims. *See In re Van Geuns,* 988 F.2d 1181, 1184 (Fed.Cir.1993).

Accordingly, we do not agree with Patent Owner's position because Patent Owner's proposed construction narrows unnecessarily the scope of the challenged claims. Furthermore, as detailed below, even if we accepted Patent Owner's proposed construction, it would not alter our determination regarding the patentability of the challenged claims. No further construction is necessary for our analysis.

B. Principles of Law

A claim is unpatentable under 35 U.S.C. § 102 if a prior art reference discloses every limitation of the claimed invention, either explicitly or inherently. *Glaxo Inc. v. Novopharm Ltd.,* 52 F.3d 1043, 1047 (Fed. Cir. 1995). If the prior art reference does not expressly set forth a particular element of the claim, that reference still may anticipate if that element is "inherent" in its disclosure. *In re Robertson*, 169 F.3d 743 (Fed. Cir. 1999). To establish inherency, extrinsic evidence, when relied upon, "must make clear that the missing descriptive matter is necessarily present," or inherent, in the single anticipating reference. *Continental Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1268 (Fed. Cir. 1991). "Inherency, however, may not be established by *probabilities* or *possibilities*. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." *Id.* at 1269 (quoting *In re Oelrich*, 666 F.2d 578, 581 (CCPA 1981)) (emphasis added). Inherent anticipation, however, does not require recognition in the prior art. *Schering Corp. v. Geneva Pharmaceuticals*, 339 F.3d 1373, 1377 (Fed. Cir. 2003) ("*Continental Can* does not stand for the proposition that an inherent feature of a prior art reference must be perceived as such by a person of ordinary skill in the art before the critical date.").

A claim is unpatentable under 35 U.S.C. § 103(a) 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 at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) objective evidence of nonobviousness, i.e., secondary considerations. *See Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17–18 (1966).

"[I]t is error to reach a conclusion of obviousness until all [the *Graham*] factors are considered." *Apple v. Samsung Elecs. Co., Ltd.*, 839

F.3d 1034, 1048 (Fed. Cir. 2016) (en banc) (citations omitted). "This requirement is in recognition of the fact that each of the *Graham* factors helps inform the ultimate obviousness determination." *Id.*

"In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable." *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify "with particularity . . . the evidence that supports the grounds for the challenge to each claim")). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat'l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review). Furthermore, Petitioner cannot satisfy its burden of proving obviousness by employing "mere conclusory statements." *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

Thus, to prevail in an *inter partes* review, Petitioner must explain how the proposed combinations of prior art would have rendered the challenged claims unpatentable. At this final stage, we determine whether a preponderance of the evidence of record shows that the challenged claims are anticipated by or would have been obvious over the cited prior art.

We analyze the instituted grounds of unpatentability in accordance with the above-stated principles.

C. Level of Ordinary Skill in the Art

In determining whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham*, 383 U.S. at 17. "The importance of resolving the level of ordinary skill in the art lies in the necessity of maintaining objectivity in the obviousness inquiry." *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991). The person of ordinary skill in the art is a hypothetical person who is presumed to have known the relevant art at the time of the invention. *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). The level of ordinary skill in the art may be reflected by the prior art of record. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). Factors that may be considered in determining the level of ordinary skill in the art include, but are not limited to, the types of problems encountered in the art, the sophistication of the technology, and educational level of active workers in the field. *GPAC*, 57 F.3d at 1579. In a given case, one or more factors may predominate. *Id.* Generally, it is easier to establish obviousness under a higher level of ordinary skill in the art. *Innovention Toys, LLC v. MGA Entm't, Inc.*, 637 F.3d 1314, 1323 (Fed. Cir. 2011) ("A less sophisticated level of skill generally favors a determination of nonobviousness . . . while a higher level of skill favors the reverse.").

Petitioner argues that a person of ordinary skill in the art relevant to the '827 patent would have had "at least a bachelor's degree in computer science or electrical engineering and 3–5 years of professional experience in computer systems design, or a master's or doctorate and 1–2 years of professional experience in computer systems design, or equivalent academic experience." Pet. 4. According to Petitioner, "[s]uch a person would have been familiar with computer systems architecture and design, and would have been aware of design trends relating to distributed processing systems." *Id.* Petitioner's declarant, John D. Kubiatowicz, Ph.D. ("Dr. Kubiatowicz"), proffers the same level of skill as that argued by Petitioner. Ex. 1002 ¶ 20.

Patent Owner contests Petitioner's definition of a person of ordinary skill in the art, specifically arguing that "Petitioners' proposed requirements, especially with regard to work experience, are higher than can be reasonably supported." PO Resp. 5–6. Patent Owner notes that Petitioners' declarant, Dr. Kubiatowicz, testified on cross-examination that "somebody coming directly out of college, likely, would need a couple of extra years to understand this," and that "a little bit of professional experience might help them -- would help them understand the details involved in this case." *Id.* at 6 (citing Ex. 2002, 25:13–14; 26:2–5). Patent Owner's declarant, Dr. Shenoy, testified that, at the time "of the '827 patent, one of ordinary skill in the art would have had a bachelor's degree in computer science, computer engineering, electrical engineering, or equivalent, with 1–2 years of work experience in the field of computer networking, storage systems, or a related field." Ex. 2003 ¶ 19. According to Dr. Shenoy, "[l]ack of experience can be remedied by additional education or vice versa." *Id.*

Based on our review of the '827 patent, the types of problems and solutions described in the '827 patent and cited prior art, and the testimony of Dr. Kubiatowicz and Dr. Shenoy, we adopt and apply Patent Owner's definition of a person of ordinary skill in the art, specifically that a person of ordinary skill in the art at the time of the claimed invention would have had "a bachelor's degree in computer science, computer engineering, electrical engineering, or equivalent, with 1–2 years of work experience in the field of computer networking, storage systems, or a related field." We also determine that such a person would have been familiar with computer systems architecture and design, and would have been aware of design trends relating to distributed processing systems.

D. *Alleged Anticipation of Claims 1, 3–9, 13, and 15–21 of the '827 Patent by OceanStore*

Petitioner contends claims 1, 3–9, 13, and 15–21 of the '827 patent are unpatentable under 35 U.S.C. § 102(a) as anticipated by OceanStore. Pet. 19–47. Prior to our Decision to Institute, Patent Owner disputed Petitioner's contentions. Prelim. Resp. 7–32. As discussed previously, following the issuance of *SAS Institute*, we modified our Decision to Institute to include all of the challenged claims and all of the grounds presented in the Petition. Paper 51. For reasons that follow, we determine Petitioner has failed to establish by a preponderance of the evidence that the challenged claims of the '827 patent are unpatentable under 35 U.S.C. § 102(a) as anticipated by OceanStore.

1. *Overview of OceanStore*

OceanStore is an article titled "OceanStore: An Architecture for Global-Scale Persistent Storage." Ex. 1003, Title. OceanStore is directed to "a utility infrastructure designed to span the globe and provide continuous access to persistent information." *Id.* at Abstract. OceanStore discloses that for improved performance, "data is allowed to be cached anywhere, anytime." *Id.* According to OceanStore, "information must be divorced from location." *Id.* at 190 (emphases removed). Specifically, OceanStore sought to accomplish these goals by taking advantage of the excess, or unused, storage resources on desktop workstations and the like:

> In a time when desktop workstations routinely ship with tens of gigabytes of spinning storage, the management of data is far more expensive than the storage media. OceanStore hopes to take advantage of this excess of storage space to make the management of data seamless and carefree.

Id. at 191. In OceanStore, computers that store data are referred to as "nodes" or "servers." *Id.* at 191. Computers that access data are referred to as "clients." *Id.* A data unit in OceanStore is referred to as a "persistent object." Ex. 1003, 191. Each "persistent object" is named by a globally unique identifier (GUID). *Id.* OceanStore clients access data by connecting to one or more "pools" of nodes. *Id.* An OceanStore "pool" is a number of OceanStore nodes grouped together. *Id.* One embodiment disclosed in OceanStore is shown in Figure 1, reproduced below.

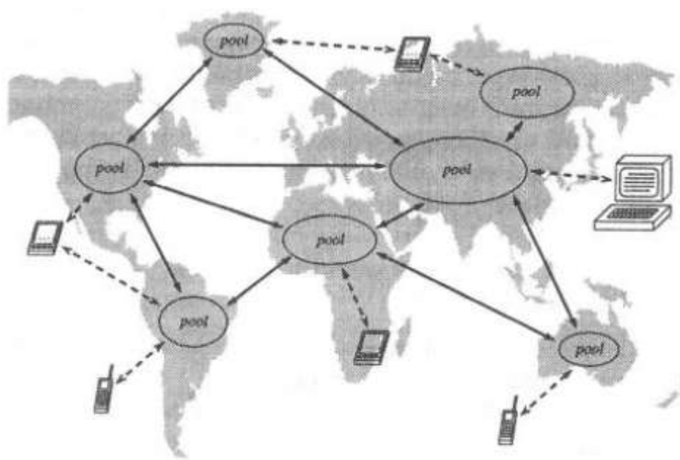

Figure 1 depicts the OceanStore system, made up of pools connected to each another. OceanStore 191.

As shown in Figure 1, above, the pools are also connected to each other, which allows data to "flow freely" between the pools. *Id.*

OceanStore indicates its system uses two different algorithms for locating data across its distributed network of nodes. The first method, is "a fast probabilistic algorithm" that uses "attenuated bloom filters." *Id.* at 193. The second method, is a "slower, reliable hierarchical method" (*id.*) that uses a "randomized hierarchical distributed data structure" (*id.* at 194). At a high-level, both algorithms work similarly. *Id.* Each node contains routing information, and routing of messages happens in two stages. *Id.* When a client needs to access data, the client sends a message to a node specifying the object it wishes to access via its GUID. *Id.* In the first stage, each node, based on its routing table, routes the message, until it finally reaches the node that actually stores the requested object. Ex. 1003, 194. In the second stage, after the node that has the requested object is identified, messages can be directly sent to that node without having to route through the other nodes. *Id.* at 193.

2. *Analysis of Cited Art as Applied to Independent Claims 1 and 13*

a. *Preamble to Claims 1 and 13*

Preamble language that merely states the purpose or intended use of an invention generally is not treated as limiting the scope of a claim. *See Boehringer Ingelheim Vetmedica, Inc. v. Schering-Plough Corp.*, 320 F.3d 1339, 1345 (Fed. Cir. 2003); *Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997). When the limitations in the body of the claim rely upon or derive essential structure from the preamble, however, then the preamble acts as a necessary component of the claimed invention and is limiting. *See Eaton Corp. v. Rockwell Int'l Corp.*, 323 F.3d 1332, 1339 (Fed. Cir. 2003).

The preamble of claim 1 recites a "computer-implemented method comprising," and the preamble of claim 13 recites a "system comprising." Ex. 1001, 46:28, 47:28. Petitioner first contends the preamble of claim 1 does not limit the claim under the claim's broadest reasonable interpretation. Petitioner then contends that nonetheless, OceanStore teaches a "computer-implemented method" as required by claim 1 and is a system as required by claim 13. Pet. 27 (citing Ex. 1002 ¶ 94), 44–45 (citing Ex. 1002 ¶ 135).

Petitioner specifically points out that OceanStore software is used on the servers (or pools) in the network depicted in Figure 1. *Id.* (Ex. 1003, 191; Ex. 1002 ¶ 95).

Patent Owner does not address the preambles of independent claims 1 and 13. *See generally* Prelim. Resp. and PO Resp. The burden remains, however, on Petitioner to demonstrate unpatentability. *See Dynamic Drinkware*, 800 F.3d at 1378.

OceanStore is a utility infrastructure designed for computers that are geographically dispersed and allowed for continuous access to persistent information stored on remotely located storage devices. *See* Ex. 1003, Abstract. OceanStore discloses support of legacy computer coding languages by providing familiar computer interfaces such as the Unix file system interface. *Id.* at 191. Based on the record before us, we agree with Petitioner and find that OceanStore discloses a "computer implemented method" and a system. *See id.*; Ex. 1002 ¶ 95.

b. "configuring a distributed processing system of a plurality of distributed devices coupled to a network, wherein the plurality of distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system"

Petitioner contends OceanStore teaches this limitation as recited by claim 1 with similar language recited in claim 13. Pet. 27 (citing Ex. 1002 ¶ 96), 45 (citing Ex. 1002 ¶ 136). According to Petitioner, OceanStore describes a widely-distributed network of devices including desktop workstations and servers with excess storage space to provide a "utility infrastructure designed to span the globe." *Id.* (citing Ex. 1003, Abstract, 190–191, Fig. 1; Ex. 1002 ¶ 96). Petitioner then argues that the software in

OceanStore would be considered an "agent" running on the networked, distributed devices. *Id.* at 27–28.

Petitioner relies on the testimony of its declarant, Dr. Kubiatowicz, to support its position. Dr. Kubiatowicz testifies that, as described in the '827 patent, a "client agent" includes core agent 1502, project component 1504, and user interface component 1510, and that each component provides a function. Ex. 1002 ¶¶ 29–31 (citing Ex. 1001, 33:19–21, 41:54–57, 42:5–7, 42:18–28), ¶¶ 96–96.

Patent Owner does not address this limitation of independent claims 1 and 13. Nonetheless, the burden remains on Petitioner to demonstrate unpatentability. *See Dynamic Drinkware*, 800 F.3d at 1378.

In OceanStore, computers that store data are referred to as "nodes" or "servers." *Id.* at 191. OceanStore clients access data by connecting to one or more "pools" of nodes. *Id.* One embodiment disclosed in OceanStore indicates that the pools are also connected to each other, which allows data to "flow freely" between the pools. *Id.* Thus, based on the record before us, we find that OceanStore discloses "configuring a distributed processing system of a plurality of distributed devices coupled to a network, wherein the plurality of distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system," as recited in claim 1 and similarly recited in claim 13.

> *c. "wherein the respective client agents for particular distributed devices of the plurality of distributed devices have corresponding software-based network attached storage (NAS) components configured to assess unused or under-utilized storage resources in selected distributed devices of the plurality of distributed devices"*

Petitioner contends OceanStore discloses this limitation as recited by claim 1 and similarly recited in claim 13. Pet. 29 (citing Ex. 1002 ¶ 100), 45 (citing Ex. 1002 ¶ 137). Petitioner argues that "a person of ordinary skill in the art would appreciate that the various server functionality discussed in OceanStore would be implemented by software." *Id.* (citing Ex. 1002 ¶ 100). In particular, Petitioner argues that "a person of skill in the art would appreciate that an OceanStore software-based component would assess the unused, i.e., excess, storage resources of the device (e.g., desktop workstation with excess storage space) when making this excess storage available for use by other devices on the network, as depicted in Figure 1." Pet. 30 (citing Ex. 1002 ¶ 101; Ex. 1003, 190–191).

Patent Owner contests Petitioner's position. Prelim. Resp. 18–21. Patent Owner specifically argues that Petitioner's reliance on "a single, aspirational sentence" from OceanStore to show the disclosure of the claim limitation is insufficient. According to Patent Owner, the sentence "OceanStore hopes to take advantage of this excess of storage space to make the management of data seamless and carefree" does not disclose expressly that OceanStore "assess[es] unused or under-utilized storage resources" as required by claim 1 and 13. *Id.* at 19 (citing Pet. 30; Ex. 1003, 191). Patent Owner argues that neither Petitioner nor Dr. Kubiatowicz demonstrate that OceanStore necessarily assesses the unused or under-utilized resources of a device, and the fact that OceanStore may assess resources is not sufficient to establish inherency. *Id.* (citing *Continental Can*, 948 F.2d at 1268–69 ("The mere fact that a certain thing may result from a given set of circumstances is not sufficient.")).

We agree with Patent Owner. Based on the record before us, we are not satisfied Petitioner has shown adequately for an anticipation challenge that OceanStore discloses "wherein the respective client agents for particular distributed devices of the plurality of distributed devices have corresponding software-based network attached storage (NAS) components configured to assess unused or under-utilized storage resources in selected distributed devices of the plurality of distributed devices" as recited in claim 1 and similarly recited in claim 13. Although it appears OceanStore discloses distributed routing in order to find and fulfill a request for an entity with a GUID (global unique identifier) (*see* Ex. 1003, 193), there does not appear to be an explicit disclosure that any software-based network attached storage (NAS) component on a distributed device assesses unused or under-utilized storage resources in selected distributed devices. Nor does Petitioner adequately explain how such an assessment would be inherent in the disclosure of OceanStore.

We note that Petitioner cites to the prosecution history of the '827 patent while making arguments regarding claim construction. *See* Pet. 12 n2. Although the '827 patent prosecution history states that its "client agent programs must be capable of assessing what capabilities are spare and/or unused (unused or under-utilized)" (Ex. 1015, 8), such a statement by the patent applicant does not relieve Petitioner of its burden to point out where such a feature is found in the prior art reference that forms the basis of its anticipation challenge.

Accordingly, we determine Petitioner has not established by a preponderance of the evidence that OceanStore describes this limitation of claims 1 and 13.

d. Summary

Petitioner has failed to demonstrate that OceanStore describes every limitation of claims 1 and 13. Accordingly, we determine Petitioner has failed to establish by a preponderance of the evidence that claims 1 and 13 are anticipated under 35 U.S.C. § 102(a) based on OceanStore.

3. Analysis of Cited Art as Applied to Dependent Claims 3–9 and 15–21

Petitioner contends dependent claims 3–9 and 15–21 of the ’827 patent are unpatentable under 35 U.S.C. § 102(a) in view of OceanStore. Pet. 36–44, 46. For the same reason as discussed above in regard to independent claims 1 and 13 above, we determine Petitioner has failed to establish by a preponderance of the evidence that claims 3–9 and 15–21 of the ’827 patent are anticipated under 35 U.S.C. § 102(a) based on OceanStore.

E. Alleged Obviousness of Claims 1, 3–9, 13, and 15–21 of the ’827 Patent in View of OceanStore

Petitioner contends that claims 1, 3–9, 13, and 15–21 of the ’827 patent are unpatentable under 35 U.S.C. § 103(a) in view of OceanStore. Pet. 47. Most of Petitioner’s arguments for its obviousness challenge to the ’827 patent appear to address potential deficiencies in OceanStore related to the “client agents” on the “distributed devices,” which include “software-based network attached storage (NAS) components" recited in independent claims 1 and 13. *Id.* Petitioner also appears to rely on its OceanStore anticipation arguments for the remaining elements of its obviousness challenge. *Id.*

Patent Owner disputes Petitioner's contentions, arguing that Petitioner provides no analysis or discussion that OceanStore would have rendered the challenged claims obvious. PO Resp. 22–23. For reasons that follow, we determine Petitioner has establish by a preponderance of the evidence that claims 1, 3–9, 13, 15, 16, and 18–21 of the '827 patent would have been obvious under 35 U.S.C. § 103 in view of OceanStore. We further determine Petitioner has failed to establish by a preponderance of the evidence that claim 17 would have been obvious in view of OceanStore.

1. *Overview of OceanStore*

See supra Section II.D.1.

2. *Analysis of Cited Art as Applied to Independent Claims 1 and 13*

a. *Preamble to Claims 1 and 13*

As discussed previously, based on the entirety of the record before us, we find that OceanStore teaches a "computer-implemented method" and is a system.

b. *"configuring a distributed processing system of a plurality of distributed devices coupled to a network, wherein the plurality of distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system"*

As discussed previously, based on the entirety of the record before us, we find OceanStore teaches or suggests "configuring a distributed processing system of a plurality of distributed devices coupled to a network, wherein the plurality of distributed devices include respective client agents configured to process respective portions of a workload for the distributed processing system" as recited in claim 1 and similarly recited in claim 13.

c. *"wherein the respective client agents for particular distributed devices of the plurality of distributed devices have corresponding software-based network attached storage (NAS) components configured to assess unused or under-utilized storage resources in selected distributed devices of the plurality of distributed devices"*

Petitioner reiterates its anticipation arguments in contending that OceanStore renders obvious this limitation as recited by claim 1 and similarly recited in claim 13. Pet. 29 (citing Ex. 1002 ¶ 100), 45 (citing Ex. 1002 ¶ 137), 47. Petitioner argues that "a person of ordinary skill in the art would appreciate that the various server functionality discussed in Ocean Store would be implemented by software." *Id.* at 29 (citing Ex. 1002 ¶ 100). In particular, Petitioner argues that "a person of skill in the art would appreciate that an OceanStore software-based component would assess the unused, i.e., excess, storage resources of the device (e.g., desktop workstation with excess storage space) when making this excess storage available for use by other devices on the network, as depicted in Figure 1." Pet. 30 (citing Ex. 1002 ¶ 101, 155; Ex. 1003, 190–191). Petitioner further cites to the prosecution history of the '827 patent to support its position that a person of ordinary skill in the art would understand that the NAS components relying on spare and/or unused capabilities of existing storage resources are configured to assess the capabilities of the unused or under-utilized storage resources, because the '827 patent prosecution history states that its "client agent programs must be capable of assessing what capabilities are spare and/or unused (unused or under-utilized)." *Id.* at 12 n.2 (citing Ex. 1015, 8).

Patent Owner originally contested Petitioner's position with regard to its anticipation challenge (Prelim. Resp. 18–21) arguing that Petitioner provides no analysis or discussion for it obviousness challenge (*id.* at 32–33). Patent Owner did not maintain its arguments against Petitioner's position in its Patent Owner Response.

As discussed previously, we agreed with Patent Owner that OceanStore does not disclose expressly or inherently "assess[ing] unused or under-utilized storage resources" as required by claim 1 and 13. We conclude, however, Petitioner has demonstrated that the teachings of OceanStore would have rendered the claim limitations obvious to a person of ordinary skill in the art. Specifically, on the entirety of the record, we agree with Petitioner's argument, as supported by Dr. Kubiatowicz's declaration, that "a person of skill in the art would appreciate that an OceanStore software-based component would assess the unused, i.e., excess, storage resources of the device (e.g., desktop workstation with excess storage space) when making this excess storage available for use by other devices on the network, as depicted in Figure 1." *See* Pet. 30; Ex. 1002 ¶ 101 (citing Ex. 1003, 190–191), ¶ 155. Put differently, although the disclosure is not express or inherent, OceanStore teaches or suggest an assessment to an ordinarily skilled artisan based on Dr. Kubiatowicz's testimony. Additionally, the prosecution history of the '827 patent makes the point that for the NAS device to rely on unused capabilities of storage devices, the NAS device has to assess the unused capabilities of the device.

See Ex. 1015, 8 ("it would have been obvious to one of ordinary skill in the art that the client agent programs must assess unused or under utilized capabilities for it to be able to configure the devices . . . using their spare and/or unused capabilities"). Accordingly, we conclude Petitioner has shown by a preponderance of the evidence this limitation in claims 1 and 13 would have been obvious in view of OceanStore.

d. "representing with the corresponding software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused or under-utilized storage resources for the selected distributed devices"

Petitioner contends OceanStore discloses this limitation as recited by claim 1 and similarly recited in claim 13. Pet. 31 (citing Ex. 1002 ¶ 102), 45 (citing Ex. 1002 ¶ 138). Petitioner argues that "Ocean Store software causes the pool devices (e.g., desktop workstation with excess storage space, servers, and/or other pool devices) to represent, or mimic, dedicated NAS devices." *Id.* (citing Ex. 1002 ¶ 102). Petitioner relies on the declaration of Dr. Kubiatowicz, who testifies that the '827 patent provides scant detail as to what is meant by the "representing" requirement of the claim and further testifies that "a person of skill in the art would appreciate the OceanStore software causes the pool devices to appear as 'a device that makes data storage resources available to network-connected user devices' as depicted in Figure 1 and described throughout the document." Ex. 1002 ¶ 104 (citing Ex. 1001, 2:32–35).

Petitioner, therefore, argues that "the pool devices are made to mimic dedicated NAS devices via the use of the OceanStore software components executing on them, allowing end user[s] to request or store objects on the

OceanStore pool devices (e.g., desktop workstation with excess storage space, servers, and/or other pool devices)." Pet. 32 (citing Ex. 1002 ¶ 104). That is, according to Petitioner, "the OceanStore software provided the functionality for the pool devices, such as desktop workstations with excess storage, to instead appear, function and act as storage servers on the network, providing storage resources to user devices connected to the network." *Id.* (citing Ex. 1002 ¶ 104). Petitioner further notes that OceanStore discloses "facades" to its API that provide "a traditional, familiar interface," including transactional database and UNIX file system interfaces. *Id.* (citing Ex. 1003, 197–198; Ex. 1001, 2:22–31; Ex. 1002 ¶ 103).

Patent Owner contests Petitioner's position. PO Resp. 16–22. Patent Owner first contends that the NAS component must "represent[] with the corresponding software-based NAS component that the selected distributed devices respectively comprise NAS devices." *Id.* at 17. According to Patent Owner, the OceanStore system appears as a single NAS device with a user accessing data and storage through a single, logical interface that makes the data and storage available to users. *Id.* at 17–18 (citing Ex. 2003 ¶ 39). Patent Owner relies on the testimony of Petitioner's declarant, Dr. Kubiatowicz, to support its position. *See* PO Resp. 18. Specifically, Dr. Kubiatowicz testified that "a user could have their data stored among multiple pools." Ex. 2002, 140:9–12. Patent Owner, thus, argues there is no need for each OceanStore node to include and appear as its own NAS device, as users can access data stored across multiple pools via a single interface without directly accessing each pool and relevant OceanStore node. PO Resp. 18–19 (citing Ex. 2003 ¶¶ 39–40). Therefore, according to Patent

Owner, "OceanStore's representation of a single NAS device fails to meet the proper construction of the 'representing' limitation, requiring '**each** selected distributed device to **separately appear** to network-connected user devices as a dedicated NAS device.'" *Id.* at 18–19.

Patent Owner further contends that the single, collective NAS device provided by OceanStore also does not meet Petitioners' proposed construction of "using the corresponding software based NAS components of the selected distributed devices to mimic dedicated NAS devices." *Id.* at 19. Patent Owner argues that Petitioner's construction still requires multiple "dedicated NAS devices" to meet the claim limitation. *Id.* Patent Owner then argues Dr. Kubiatowicz's testimony during cross-examination supports its position regarding Petitioner's claim construction:

> Q: You would agree that a single NAS device could not meet the limitations of the claims of the '827 patent? Yes or no?
>
> A: So I -- so the read on this claim language is potentially a little loose, in the sense that it's, you know, the selected devices comprise NAS devices. But, I will-- you know, I will stipulate that having more than one NAS device when you're done here, seems like it's the closest read on the claim language.
>
> Q. I am just trying to understand what you're understanding is and you are kind of giving me these wishy-washy answers.
>
> A. Fine. It requires more than one NAS device."

Ex. 2002, 81:11–25.

We do not agree with Patent Owner for several reasons. First, "NAS device" as defined in the '827 patent "broadly refers to a device that makes data storage resources available to network-connected user devices. A 'dedicated NAS device' is a device whose primary operational purpose is for providing NAS services." *See* Ex. 1001 2:31–34. In OceanStore, multiple storage resources are provided by an aggregation of "pools" of storage, ***each of which*** can cache or serve data to the user devices. Ex. 1003, 191. Moreover, ***each pool device*** makes it storage available for use by others as depicted in Figures 2 and 3. *Id.* at 192, 193. OceanStore also provides "facades" to its underlying client user that provide a "traditional, familiar interface" such as "UNIX file system, a transactional database, and a gateway to the World Wide Web." *Id.* at 197–198. Moreover, OceanStore allows a user's email to migrate closer to his client and use locally cached email, thereby indicating that the OceanStore clients see more than a single NAS device. *Id.* at 192, 199. Additionally, a user of the OceanStore can choose several directories as "roots" and secure those directories through external methods, such as a public key authority. *Id.* at 192. Again, this indicates that the client device sees more than a single NAS device.

Accordingly, based on the entirety of the record before us and the claim constructions for "representing" proposed by either party, we find that OceanStore discloses "representing with the corresponding software-based NAS component that the selected distributed devices respectively comprise NAS devices having an available amount of storage resources related to the unused or under-utilized storage resources for the selected distributed devices" as recited in claim 1 and similarly recited in claim 13.

e. "allocat[ing] respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices"

Petitioner contends OceanStore discloses the limitation "wherein the NAS component is configured to: . . . allocate respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices; represent that the selected distributed devices comprise NAS devices having the respective available amounts of storage resources," as recited in claim 13. Pet. 45 (citing Ex. 1002 ¶ 138). Petitioner specifically states that "claim element 13[d] is satisfied for the same reasons as element 1[d]" noting that "OceanStore software would allocate the excess storage [e.g., on a desktop workstation] for use by OceanStore users (i.e., making it available for other devices to use) but would reserve other workstation storage for purely local use, e.g., to store computer programs, local operation system and the like." *Id.* at 45 (citing Ex. 1002 ¶¶ 104, 138; Ex. 1003, 198). Petitioner then argues "that 'allocating' available storage for particular uses was well-known and entirely conventional." Reply 14 (citing Ex. 1053, 38:6–15; *id.* 83:4–18).

Petitioner relies on Dr. Kubiatowicz to support it position. *Id.* (citing Ex. 1002 ¶ 138). Dr. Kubiatowicz testifies in regard to claim 1's limitation [d] that, "the OceanStore software makes the distributed devices in the 'pools' and forming the 'ocean' (including but not limited to 'desktop workstations' with excess capacity) appear to be, or mimic, NAS devices having an available amount of storage related to the unused, or excess, storage for those distributed devices." *Id.* ¶ 104. According to Dr. Kubiatowicz, "[i]t does so, by making available and providing those excess data storage resources to other network connected devices, and by not appearing as mere workstations acting in isolation without providing any storage resources to other users." *Id.* ¶ 104 (citing Ex. 1003, 198). Dr. Kubiatowicz, therefore, asserts that "a person of skill in the art would appreciate the OceanStore software causes the pool devices to appear as 'a device that makes data storage resources available to network-connected user devices' as depicted in Figure 1 and described throughout the document." *Id.* (citing Ex. 1001, 2:32–35).

Dr. Kubiatowicz further testifies that "one of ordinary skill would clearly understand that you need to allocate data in order to represent that you have an available amount of unused or under-utilized storage." Ex. 2002, 108:2–14. According to Petitioner, "OceanStore thus discloses the 'allocating' limitations at least at the same level as the '827 patent, which is to say that nothing unique about 'allocating' is described in the '827 patent, or ***needed*** to be described given a [person of ordinary skill in the art]'s knowledge." Reply 16.

Patent Owner contests Petitioner's position, arguing we should not rely on Petitioner's anticipation arguments to evaluate obviousness, but rather we should observe that no evidence has been presented about how OceanStore renders obvious claim 1. PO Resp. 22–23. We decline to do so. Although a majority of the Petition is allocated to arguing that claims 1 and 13 are unpatentable as anticipated, we determine that such a presentation is not a basis for an adverse finding. Moreover, Petitioner provides arguments regarding the application of OceanStore under 35 U.S.C. § 103 to the challenged claims. Pet. 47.

Patent Owner further contends Petitioner provides no explanation as to how any statements or arguments made supporting claim element 1[d] are relevant to the "*allocating*" limitation of claim 13. PO Resp. 23. According to Patent Owner, Dr. Kubiatowicz's testimony is conclusory and offers no explanation of how the disputed limitation is disclosed in OceanStore. *Id.* at 23–24. Patent Owner contends that OceanStore provides no teaching or suggestion for the "*NAS component*" to "*allocate respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices.*" *Id.* at 24. Patent Owner's declarant, Dr. Shenoy, testifies that one of ordinary skill would not understand that OceanStore exclusively allocates storage for exclusive use by OceanStore users prior to representing those storage resources to users. Ex. 2003 ¶ 61. Dr. Shenoy further testifies that exclusive allocation of resources in OceanStore could have undesirable effects on users of local machines whose resources are being allocated. *Id.* Patent Owner then argues "the OceanStore software may check available storage . . . and dynamically allocate only sufficient space to store the data," but OceanStore does not allocate "the assessed unused storage resources prior to making them available to OceanStore users." PO Resp. 27. According to Patent Owner, OceanStore "does not exclusively '*allocate*' represented storage '*in selected distributed devices*.'" *Id.*

We have reviewed the entirety of the record, including Dr. Kubiatowicz's testimony, the cited portion of OceanStore, and the '827 patent specification. Although the term "allocating" is recited specifically in claim 13, there is no specific method of allocating either required by the claim or by disclosed in the specification of the '827 patent. We note the

Patent Owner's declarant, Dr. Shenoy, confirmed that the claims do not recite any particular manner of allocating. Ex. 1053, 83:4–18. Patent Owner's contentions are not commensurate with the scope of "allocating" as claimed.

Petitioner's declarant, Dr. Kubiatowicz, testified that "one of ordinary skill would clearly understand that you need to allocate data in order to represent that you have an available amount of unused or under-utilized storage." Ex. 2002, 108:2–14. Here, Dr. Kubiatowicz explains that OceanStore software makes excess storage available for other devices to use and, thus, teaches the claimed "allocat[ing]." Ex. 1002 ¶ 138. Indeed, the purpose of OceanStore is to provide storage space in servers around the world, allowing data to be "cached anywhere." Ex. 1003, 190 (Abstract). Based on the evidence of record, we credit the testimony Dr. Kubiatowicz and determine that a person of ordinary skill in the art would have understood OceanStore as teaching or at least suggesting "wherein the NAS component is configured to: . . . allocate respective available amount of unused storage resources in selected distributed devices of the plurality of distributed devices," as recited in claim 13. *Cf. In re Epstein*, 32 F.3d 1559, 1568 (Fed. Cir. 1994) ("appellant did not provide the type of detail in his specification that he now argues is necessary in prior art references supports the Board's finding that one skilled in the art would have known how to implement the features of the references.").

f. Summary

Accordingly, having analyzed the entirety of the record, we determine Petitioner has established by a preponderance of the evidence that claims 1 and 13 would have been obvious under 35 U.S.C. § 103(a) in view of OceanStore.

3. Analysis of Cited Art as Applied to Dependent Claims 3, 6–9, 15, and 18–21

Petitioner contends that dependent claims 3, 6–9, 15, and 18–21 of the ’827 patent are unpatentable under 35 U.S.C. § 103(a) in view of OceanStore. Pet. 36–44, 46, 47. Specifically, for claims 3 and 15 that require “receiving an access request from the client device and directing the client device to data requested on at least one of the selected distributed devices,” Petitioner argues OceanStore meets the claim because, when its pool device receives a request, it uses OceanStore’s data location algorithms (i.e., both the local and global algorithms) to either return data to the client or direct the request to another node based on location information. Pet. 36 (citing Ex. 1002 ¶ 113).

For claims 6 and 18 that require storing, with the centralized server, location information associated with the data stored in the selected distributed devices, Petitioner contends a person of ordinary skill in the art would appreciate that the local server from claim 4 “becomes another OceanStore server (or node) and as such would store and maintain the routing information used and discussed above in connection with data location.” Pet. 41–42 (citing Ex. 1002 ¶ 124).

For claims 7 and 19, which require “utilizing the centralized server to receive and route the data for storage to the selected devices based upon individual capabilities of the selected distributed devices indicated in a capabilities database,” Petitioner argues that OceanStore envisions servers in airports and small cafes, for example, to provide connectivity to the

OceanStore network and caching services for objects stored in other OceanStore devices. *Id.* at 42 (citing Ex. 1002 ¶ 125). Citing the testimony of Dr. Kubiatowicz, Petitioner asserts that "a person of skill in the art would appreciate that users would connect to the airport server when attempting to read or update objects on a pool device (i.e., either the airport cache or any other distributed device on the network)." *Id.* at 42 (citing Ex. 1002 ¶ 126).

Patent Owner disputes Petitioner's contentions, arguing that these dependent claims are not obvious in view of OceanStore for the same reasons as claims 1 and 13. PO Resp. 40–41.

After considering the parties' arguments and evidence, we agree with Petitioner's positions and adopt its arguments as our own. Accordingly, we determine Petitioner has shown by a preponderance of the evidence that dependent claims 3, 6–9, 15, and 18–21 of the '827 patent are unpatentable under 35 U.S.C. § 103(a) in view of OceanStore.

4. Analysis of Cited Art as Applied to Dependent Claims 4 and 16

Claims 4 depends indirectly from claim 1, while claim 16 depends indirectly from claim 13, and each further require "manag[ing] the NAS service for the [at least one of the particular] distributed devices at least in part utilizing a centralized server." Ex. 1001, 46:65–67, 48:15–17.

Petitioner contends that dependent claims 4 and 16 of the '827 patent are unpatentable under 35 U.S.C. § 103(a) in view of OceanStore. Pet. 37–40, 46. Petitioner specifically alleges that OceanStore discloses three examples using centralized servers. *Id.* First, Petitioner argues that OceanStore discloses installing servers at local premises to act as a local cache node for local users and to provide better performances for local users. Pet. 37–38 (citing Ex. 1002 ¶ 118; Ex. 1003, 190), 46. Second, Petitioner argues that OceanStore discloses using management services through a group of servers that act as a centralized server. *Id.* at 39. According to Petitioner, OceanStore discusses using a tier of server machines to do "server-side" computations on data in conjunction with its distributed update model. *Id.* at 39 (citing Ex. 1003, 195; Ex. 1002 ¶ 119). Third, Petitioner argues that OceanStore discloses a level of "event handlers" that summarize local events and store these summaries in a local database. *Id.* at 40 (citing Ex. 1003, 198; Ex. 1002 ¶ 120). According to Petitioner, after processing and responding to its own events, each node "'forwards an appropriate summary of its knowledge to a parent node for further processing on the wider scale.'" *Id.* (quoting Ex. 1003, 198; Ex. 1002 ¶ 120). Petitioner explains that "[t]he 'parent node' is identified by a GUID like every other node in the OceanStore." *Id.* (citing Ex. 1003, 198).

Patent Owner disputes Petitioner's contentions. PO Resp. 28–37. Patent Owner first argues that OceanStore criticizes and teaches away from the use of centralized servers. *Id.* at 30. Whether a reference teaches away from a claimed invention is a question of fact. *In re Harris*, 409 F.3d 1339, 1341 (Fed. Cir. 2005). For a reference to "teach away," it must criticize, discredit, or otherwise discourage the claimed solution. *See In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004). Although OceanStore enumerates certain disadvantages plaguing centralized servers (Ex. 1003, 190), it nonetheless provides specific examples of how such servers can be used in connection with it decentralized system (*id.* at 190, 195, 198). Accordingly, we find that OceanStore does not teach away from using centralized servers.

Patent Owner then argues that OceanStore's use of airport servers acting as local cache nodes for users at an airport or café means the server is simply a local cache server and not a centralized cache server for the distributed nodes of OceanStore. PO Resp. 32 (citing Ex. 2003 ¶ 48). Patent Owner further argues that even if the airport and café servers were managed by the "confederation of companies" that Petitioners discuss, the plurality of servers would still be managed by different utility providers, rather than being commonly controlled and managed. *Id.* According to Patent Owner, the claimed "centralized server" requires "a single server or a single group of servers that are commonly controlled and managed."[4] *Id.* at 28 (citing Ex. 2003 ¶ 44).

Next, Patent Owner argues that OceanStore's use of a tier of server machines to do 'server-side' computations on data in conjunction with its distributed update model fails to qualify as a centralized server and Petitioner fails to explain how it could constitute the "centralized server" of the claims. *Id.* at 34. According to Patent Owner, the "primary tier" of servers assisting with updates are untrusted in part because they may be managed and controlled by different utility providers. *Id.* (citing Ex. 2003 ¶ 52). Patent Owner contends that the primary tier of replicas would typically be separately managed distributed servers that communicate to "choose the final commit order for updates." *Id.* at 34–35 (citing Ex. 2003 ¶ 52; Ex. 1003, 195). Patent Owner, thus, concludes that "[t]his differs from the single server or commonly controlled and managed group of servers

[4] We note this proposed construction of "centralized server" differs from Patent Owner's proposed construction in related IPR2017-00439. *See* IPR2017-00439, Paper 21, 41–42 ("centralized server" must "form[ ] a known, physical 'center' from the perspective of the distributed devices," and that it "must be physically separate from the client devices (claimed 'distributed devices') that it serves."

described in every embodiment the ’827 patent.” *Id.* at 35 (citing Ex. 2003 ¶ 52).

Lastly, Patent Owner argues that Petitioner does not explain how distributed parent nodes provide “centralized” management of the NAS service for distributed OceanStore nodes. *Id.* at 36 (citing Ex. 2003 ¶ 54). Rather, to the contrary, Patent Owner contends that the parent nodes are distributed to process events from nearby nodes. *Id.* According to Patent Owner, “[t]here is no indication that these parent nodes are commonly controlled and managed, nor would they be in a distributed architecture consisting of a ‘confederation of companies.’” *Id.* (citing Ex. 2003 ¶ 54; Pet. 37). Patent Owner, thus concludes that the purpose of OceanStore’s distributed hierarchy is to enable cooperation between separately controlled, distributed devices and fails to meet the claimed limitation of a “centralized server.” *Id.*

After considering the entirety of the record, we find OceanStore discloses the recited “centralized server.” Specifically, we find that OceanStore’s disclosure that “airports or small cafes could install servers on their premises to give customers better performance” meets the claimed limitation. We credit the testimony of Dr. Kubiatowicz, who explains that a person of ordinary skill in the art would have understood that such a server would “monitor and manage usage” in addition to serving as a local cache, “in exchange for a dividend from the utility provider.” Ex. 1002 ¶ 118, *cited in* Pet. 38; s*ee also* Ex. 1003, 190–191 (describing goals of “exploit[ing] caching close to . . . clients” and that “data can be cached *anywhere, anytime*”). As Petitioner notes, “[m]onitoring and managing usage, as well as serving as a local cache, are both within the functions the ’827 patent describes as performed by the centralized servers." Reply 21; *see* Ex. 1001, 44:24–35, *cited in* Pet. 37 (describing provision of "centralized management, control and support" by "indexing, monitoring, backup, security, and other services"). Moreover, as Patent Owner notes, a single airport node would "act as its own local cache server for nearby users" (PO Resp. 32), thereby managing the claimed NAS service for the users and distributed devices in the airport.

Accordingly, we determine Petitioner has shown by a preponderance of the evidence that dependent claims 4 and 16 would have been obvious under 35 U.S.C. § 103(a) in view of OceanStore.

5. Analysis of Cited Art as Applied to Dependent Claim 5

Claim 5 depends from claim 4 and further requires "download[ing] the software-based NAS component to the selected distributed devices." Ex. 1001, 47:1–3.

Petitioner contends that dependent claim 5 of the '827 patent is unpatentable under 35 U.S.C. § 103(a) in view of OceanStore. Pet. 41; Reply 23–26. Specifically, Petitioner argues that OceanStore meets the recited limitation because "OceanStore software is written as downloadable Java, and deployed to devices in the pool providing storage services." Pet. 41 (citing Ex. 1003, 199, 198 ("These interfaces exist as libraries or 'plugins' to existing browsers or operating systems")); Ex. 1002 ¶ 122).

Petitioner relies on the testimony of its declarant, Dr. Kubiatowicz, to support its position. Dr. Kubiatowicz testifies as follows:

> OceanStore software is written as downloadable Java, and deployed to devices in the pool providing storage services. (Ex. 1003, p. 199.) A person of skill in the art would appreciate that, when a new device first comes into service as an OceanStore

> server ("distributed device," *e.g.*, a desktop workstation with excess storage space or any other pool device participating in the network), it needs to have an up-to-date version of the Java virtual machine and any supporting libraries installed; typically these items were downloaded from the Sun Java site at the time. Then, the Java code for OceanStore would be downloaded from the OceanStore release servers and installed in the correct local directory on the distributed device. This process could be either done manually or through automatic scripts to update remote devices when newer versions of the OceanStore were released. A person of ordinary skill in the art would appreciate that a system of this magnitude would involve downloading code from an appropriate revision-control system.

Ex. 1002 ¶ 122. Petitioner further contends that Patent Owner's declarant, Dr. Shenoy, supports its position. During his deposition, Dr. Shenoy testified as follows:

> Q. So is it your opinion that in April of 2001, a person of ordinary skill, knowing that a particular software program had been written in Java, would have no idea whether or not that piece of software could or could not be downloaded?
>
> A: That's not what I said. As I had said previously, you can download -- at that time, you could have downloaded data software or anything else, for that matter, over the network. Downloading was not -- not an issue. You could certainly download things, because the Internet existed. Networks existed. The issue was what was common practice at that time, what were some of the impediments to making software distribution over a network in a downloadable form more prevalent. Today, this is fairly common. This is how you download apps to your phone or your tablet or your PC. In those days, it was not, because networks had issues. And people were still using dialup modems, and DSL was just becoming popular. So the state of the art was very different at that time, and it was common practice to use physical media, like CDs or floppy disks, to distribute and install software. That doesn't mean it was

> impossible to download software at all. It was just inconvenient, based on what was common at that time.

Ex. 1053, 100:12–101:18. Based on the testimony of the two declarants and citations to several references that discuss the downloadable nature of Java programs, Petitioner argues that a person of ordinary skill in the art at the time of the invention "would have certainly understood that using Java software teaches, or at least strongly suggests, that such software could be, and in fact was most likely intended to be, downloaded. Java was known as platform independent and was designed for wide deployment via downloadable software, for example via the Internet." Reply 25 (citing Ex. 1002 ¶ 122; Ex. 1056 ¶ 57; Ex. 1054 (Not Just Java (1997)) 72 ("when you browse a Java program, the program is downloaded onto your system and executed); *id*. 73 (contrasting "the old way of distributing software [of] mailing a floppy disk" with the "reasons why it is useful to download a program").

Patent Owner disputes Petitioner's contentions. PO Resp. 37–40. Patent Owner specifically argues that OceanStore provides no information about whether the libraries and plugins are downloaded "*to the selected distributed devices*." *Id.* at 38 (citing Ex. 2003 ¶ 57). Patent Owner then argues that Petitioner's declarant, Dr. Kubiatowicz, only provides speculative and conclusory statements unsupported by the OceanStore reference, and therefore, does not support Petitioner's position. *Id.* According to Patent Owner, OceanStore merely describes a prototype that "'is written in Java with a state machine-based request model for fast I/O.'" *Id.* at 38–39 (quoting Ex. 1003, 199). Patent Owner contends that "[n]owhere does OceanStore describe an implementation written as '**downloadable** Java,' nor does OceanStore discuss downloading any software components to OceanStore nodes." *Id.* at 39 (emphasis in original). Patent Owner argues that "[e]ven if Dr. Kubiatowicz['s] statements were true, this knowledge would not be accessible to one of ordinary skill reading the OceanStore paper and must be attributed to Dr. Kubiatowicz's specialized knowledge of OceanStore as the lead author." *Id.* (citing Ex. 2003 ¶ 58).

Patent Owner relies on the testimony of its declarant, Dr. Shenoy, to support its position. Dr. Shenoy testifies that, at the time of the '827 patent, software was typically distributed through some type of physical media, such as a compact disk (CD), digital video disk (DVD), or floppy disk variation. Ex. 2003 ¶ 59. According to Dr. Shenoy, "[s]oftware downloads were rare due to bandwidth limitations, and thus one of ordinary skill would expect distribution by physical media to avoid these limitations." *Id.*

After considering the entirety of the record, and crediting the testimony of Dr. Kubiatowicz, as supported by evidence demonstrating the knowledge of Java's downloadable nature at the time of the '827 patent, we agree with Petitioner with regarding to claim 5. Specifically, we find OceanStore discloses that the software is written in Java and deployed to devices in the pool and that it communicates with applications through a Unix file system interface. *See* Ex. 1003, 199 ("The system is written in Java with a state machine-based request model for fast UO. Initially, OceanStore will communicate with applications through a UNIX file system interface . . . .) (citation omitted). Given the known ability for downloading Java in view of OceanStore's instruction to implement the "introspection" monitoring and analysis mechanisms (*see id.* at 198), we determine that a preponderance of the evidence shows that the subject matter of claim 5 would have been obvious to a person of ordinary skill in the art in view of OceanStore.

6. Analysis of Cited Art as Applied to Dependent Claim 17

Claim 17 depends from claim 16 and further requires that "the centralized server system is further configured to enable download of the NAS component to the selected distributed devices." Ex. 1001, 48:18–20.

Petitioner contends that dependent claim 17 of the '827 patent is unpatentable under 35 U.S.C. § 103(a) in view of OceanStore. Pet. 46; Reply 23–26. Specifically, Petitioner argues that the download of a java program "in enabled" by OceanStore's release servers. Reply 25–26; Tr. 50:10–51:6. Petitioner's declarant, Dr. Kubiatowicz testifies that "[a person of ordinary skill in the art at the time of the invention] would [have] appreciate[d] that OceanStore 'would involve downloading code from an appropriate revision-control system'" such as "'from the OceanStore release servers.'" Ex. 1002 ¶ 122. Thus, Petitioner concludes that a "[a person of ordinary skill in the art at the time of the invention] would [have] appreciate[d] that Java comes from a centralized server of one or more machines to manage releases of code." Reply 26.

Patent Owner disputes Petitioner's contentions arguing Petitioner fails to show how "**the centralized server system** is further configured to enable download of the NAS component to the selected distributed devices." PO Resp. 40 (emphasis in original). Patent Owner contends Dr. Kubiatowicz's testimony that "the Java code for OceanStore would be downloaded from the **OceanStore release servers**" makes no connection between the OceanStore release servers and any of the components Petitioner points to with respect to claim 16 to meet the recited "*centralized server system*." *Id.* (citing Ex. 1002 ¶ 122 (emphasis added by Patent Owner)); *see also* Tr. 39:1–12 ("And when you look at the argument in the petition or in Dr. Kubiatowicz['s] declaration, petitioner's position seems to be that the centralized server in claim 17 is now no longer one of those three options we talked about before: the airport server, the tier of server side machines, or the event handlers. It's now the OceanStore release servers, which as I understand it is the server is on the internet or wherever they may be located that would store the software for download.")). Patent Owner notes that claim 17 depends from claim 16, which provides antecedent basis to the "*centralized server system*" of claim 17. PO Resp. 40. According to Patent Owner, Petitioner fails to explain how the same "centralized server system" of claim 16 "enable[s] download of the NAS component to the selected distributed devices," and any attempt to substitute a new device for the "centralized server system" in claim 17 is improper. *Id.*

After considering the entirety of the record, we find Petitioner has failed to demonstrate by a preponderance the evidence that the limitations of claim 17 would have been obvious. Claim 17 depends directly from claim 16, which recites "utilizing a centralized server system." Ex. 1001, 48:15–17. Claim 17 then states, "wherein the centralized server system . . . ." *Id.* at 48:18–20. Thus, we determine that the "centralized server system" of claim 16 provides antecedent basis for the "centralized server system" recited in claim 17. We would expect, therefore, for the "centralized server system" of claim 16 to be the "centralized server system" of claim 17.

The Petition specifically enumerates three examples of centralized servers in its arguments regarding claims 4 and 16. Those enumerated servers are: (1) airports and cafés installing servers to provide better performance, achieving OceanStore's stated goal of "exploiting caching close to clients" (Pet. 37–38; Reply 17); (2) tiers of servers providing "server-side" computations, such as updating objects to keep them encrypted in an untrusted distributed infrastructure (Pet. 39; Reply 18); and (3) event handlers summarizing stored local events and forwarding that information to parent nodes that provide optimization services (Pet., 40; Reply 18). At no time during its analysis of claim 4, does the Petition discuss OceanStore's release servers. *See* Pet. 41, 46; Tr. 50:10–51:6. Additionally, although Dr. Kubiatowicz cites to the release servers in his discussion of claim 17, he makes no mention of them in his analysis of claims 4 and 16. *See* Ex. 1002 ¶¶ 118–120. Nor does Dr. Kubiatowicz explain sufficiently how OceanStore's release servers constitute the "central server systems" of claims 4 and 16. *See id.* ¶¶ 118–122, 143–146.

As previously noted in "an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable." *Harmonic Inc., v. Avid Tech., Inc.*, 815 F.3d at 1363. Under 35 U.S.C. § 312(a)(3), a petition must identify "with particularity . . . . the evidence that supports the grounds for the challenge to each claim." We find Petitioner has failed to show by a preponderance of the evidence that claim 17 would have been obvious in view of OceanStore because it fails to explain explicitly how OceanStore's release servers meet the "central server system" limitation of claim 16, from which claim 17 depends.

F. Alleged Obviousness of Dependent Claims 4, 6, 7, 16, 18, and 19 in view of OceanStore and Condor

Petitioner contends dependent claims 4, 6, 7, 16, 18, and 19 of the ’827 patent are unpatentable under 35 U.S.C. § 103(a) in view of OceanStore and Condor. Pet. 48–53. Patent Owner originally disputes Petitioner’s contentions. Prelim. Resp. 33–39. Pursuant to 35 U.S.C. § 314(a), we originally instituted an *inter partes* review of claim 1, 3–9, 13, and 15–21 under 35 U.S.C. § 103(a) as unpatentable over OceanStore. *See* Paper 11 (“Dec. to Inst.”), 39–40.

As discussed previously, in view of the Supreme Court’s *SAS Institute* decision, we modified our institution decision to institute on all challenged claims and all grounds presented in the Petition. *See* Paper 51, 2; *see also* Ex. 3001 (email “advis[ing] the Board that Patent Owner will waive its right to file a [Patent Owner Response] and will not request an oral hearing on the newly instituted grounds in this proceeding. Both parties have conferred and believe this closes the record and allows the Board to issue a final written decision based on the current record.”). For reasons that follow, we determine Petitioner has not shown by a preponderance of the evidence that claims 4, 6, 7, 16, 18, and 19 of the ’827 patent are unpatentable under 35 U.S.C. § 103(a) in view of OceanStore and Condor.

1. Overview of OceanStore

See supra Section II.D.1.

2. Overview of Condor

Condor is a publication titled “Condor – A Hunter of Idle Workstations.” Ex. 1017, Title. Condor is directed to a scheduling system that operates in a workstation environment. *Id.* at Abstract. Condor discloses "maximiz[ing] the utilization of workstations with as little interference as possible between the jobs it schedules and the activities of the people who own workstations." *Id.* It teaches identifying idle workstations and scheduling background jobs on them so that, when the owner of a workstation resumes activity at a station, Condor checkpoints the remote job running on the station and transfers it to another workstation. *Id.* According to Condor, the "system guarantees that the job will eventually complete, and that very little, if any, work will be performed more than once." *Id.*

Condor contemplates a "wide spectrum of scheduling structures" that use scheduling coordinators that "follow[] the principle that workstations are autonomous computing resources and they should be managed by their own users." Ex. 1017, 4, 6. Condor states that "[t]his also helps to keep the responsibilities of the coordinator simple." *Id.* at 6. According to Condor, "[s]implicity is important so that a central site is not required to maintain a great amount of information about each workstation." *Id.* Condor contemplates that either a centralized, static coordinator could assign background jobs to execute at available remote workstations (*id.* at 4–5) or a distributed approach could be used where assignment of available processors is accomplished by each workstation cooperating to conduct a scheduling policy (*id.* at 4–5).

One embodiment disclosed in Condor is shown in Figure 1, reproduced below.

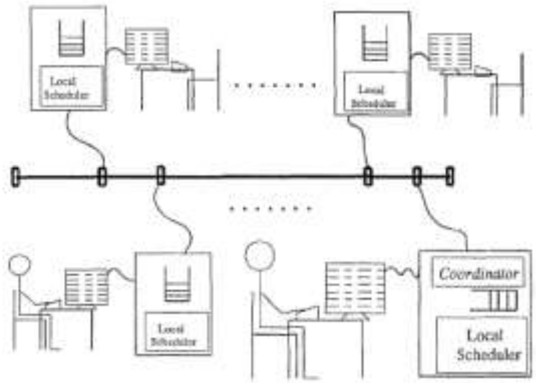

Figure 1 illustrates the Condor scheduling system.

Figure 1, above, shows one version of the Condor background job scheduler that lies between a centralized, static approach and the fully distributed approach. Condor explains that "[t]his approach uses the efficiency of scheduling with a central node to avoid the overhead of messages to decide which workstations should be allocated available capacity." *Id.* at 5. Condor discloses that its system can be extendible to a large number of workstations and eases the required recovery when a centralized coordinator fails. *Id.* at 6–7. According to the teachings of Condor, "[l]ocal schedulers are not affected if a remote site discontinues service." *Id.* at 7. Condor discloses that "[i]f the site on which the coordinator is executing fails, remotely executing jobs initiated and executing on other machines are not affected. Only the allocation of new capacity to requesting users is affected." *Id.* Condor explains that because "the coordinator has few duties, its recovery at another site is simplified in relation to a fully centralized strategy." *Id.* In order to balance the burden of coordination, Condor states that the central coordinator can be moved to other locations. *Id.*

3. Analysis of Cited Art as Applied to the Challenged Dependent Claims

Claim 4 depends from claim 3, and further requires "managing the NAS service for the at least one of the particular distributed devices at least in part utilizing a centralized server." Ex. 1001, 46:65–67. Claim 6 depends from claim 4, and requires the method of claim 4 to further comprise "storing, with the centralized server, location information associated with the data stored in the selected distributed devices." *Id.* at 47:4–6. Claim 7 depends from claim 6, and requires the method of claim 6 to further comprise "utilizing the centralized server to receive and route the data for storage to the selected devices based upon individual capabilities of the selected distributed devices indicated in a capabilities database." *Id.* at 47:7–12. Dependent claims 16, 18, and 19 recite substantially similar limitations as claims 4, 6, and 7 but depend from independent claim 13. *Id.* at 48:15–29.

Petitioner contends these dependent claims would have been obvious in view of the combined teachings of OceanStore and Condor. Pet. 49 (citing Ex. 1002 ¶ 159). In particular, for claim 4, Petitioner argues that "Condor teaches 'managing' the use of 'resources of the workstation [that] are under utilized [sic]' at least in part using a 'central coordinator.'" *Id.* (brackets in original) (citing Ex. 1017, 1, 5–6; Ex. 1002 ¶ 159). According to Petitioner, "the central coordinator is held on one of the workstations that also has its own local scheduler and background job queue." *Id.* (citing Ex. 1017, 6; Ex. 1002 ¶ 159). Petitioner argues that the central coordinator "allocates capacity from idle workstations to local schedulers on workstations that have background jobs waiting." *Id.* Petitioner further argues the central coordinator knows "not only which workstation's processor is available, . . . but [also] how much disk space is available on each workstation." *Id.* at 52–53 (citing Ex. 1017, 16; Ex. 1002 ¶ 164).

For dependent claim 6, Petitioner contends, "Condor teaches 'storing' 'location information associated with the data' stored on the distributed devices with a 'central coordinator.'" Pet. 51 (citing Ex. 1017, 1, 5–6; Ex. 1002 ¶ l64). According to Petitioner, the central coordinator "allocates capacity from idle workstations to local schedulers on workstations that have background jobs waiting." *Id.* (citing Ex. 1017, 6; Ex. 1002 ¶ l64). Petitioner further argues that the central coordinator knows "not only which workstation's processor is available . . . but [also] how much disk space is available on each workstation." *Id.* (citing Ex. 1017, 16; Ex. 1002 ¶ l64). For claim 7, Petitioner argues that "Condor teaches 'utilizing' a central coordinator to 'receive and route data for storage' based upon a 'capabilities database.'" *Id.* at 52 (Ex. 1002 ¶ 167). Petitioner relies on Condor's disclosure of a central coordinator that "allocates capacity from idle workstations to local schedulers on workstations that have background jobs waiting," and which knows "not only which workstation's processor is available . . . but [also] how much disk space is available on each workstation." *Id.* (Ex. 1017, 6; Ex. 1002 ¶ 167).

Petitioner supports its position with the declaration of Dr. Kubiatowicz, who testifies that the challenged dependent claims would have been obvious in light of the combination of OceanStore and Condor. Ex. 1002 ¶¶ 160, 165, 168. Dr. Kubiatowicz specifically testifies that "the advantages and disadvantages of both centralized and distributed approaches to coordination and management were well known even at the time Condor was published." *Id.* ¶ 160 (citing Ex. 1017, 5 ("Both the centralized and the distributed approaches have well known advantages and disadvantages.")). Dr. Kubiatowicz specifically testifies that it would have been obvious to a person of ordinary skill in the art that both approaches have advantages that could have been exploited using well known techniques, as well as disadvantages that could have been avoided using well known techniques, just like Condor's central coordinator. Ex. 1002 ¶ 161. According to Dr. Kubiatowicz, "[i]ncorporating Condor's explicit teaching of a "central coordinator" into OceanStore would have been obvious to one of ordinary skill in the art, would have yielded predictable results, and would have involved tools and techniques that were well known at the time." *Id.* ¶ 162.

Patent Owner originally contested Petitioner's position, arguing that Petitioner fails to provide an adequate rationale as to why a person of skill in the art would combine an entirely distributed system from OceanStore with a centralized system from Condor, especially in light of OceanStore's criticism of centralized approaches (i.e., teaching away from using centralized servers), such as those required in claims 4 and 6. Prelim. Resp. 33–36. Patent Owner specifically argued that Petitioner provides no analysis regarding the combination of OceanStore and Condor but, rather, offers only conclusory statements that merely are reiterated by Dr. Kubiatowicz. *Id.* at 36–37.

Patent Owner based its characterization of Condor as a centralized system on Condor's use of a "centralized, static coordinator" for tracking idle workstations and coordinating which workstations will perform specific tasks. *Id.* at 34. Yet, Condor explicitly contemplates use of a distributed coordinator for its systems. Ex. 1017, 4–5. We do not agree with Patent

Owner's position that OceanStore teaches away from use of centralized servers. *See* Prelim. Resp. 36. To establish teaching away, the prior art reference must criticize, discredit, or otherwise discourage the solution claimed. *See In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004). Although OceanStore emphasizes that "information must be divorced from location" and "[c]entralized servers are subject to crashes, DoS attacks, and unavailability due to regional network outages," it also states that local businesses "could install servers on their premises to give customers better performance." Ex. 1003, 190. Such disclosures do not teach away because they does not criticize, discredit, or otherwise discourage the use of local or centralized servers; instead, OceanStore appears to offer an alternative to reliance solely on centralized server systems.

We agree, however, with Patent Owner that Petitioner fails to offer sufficient explanation as to why a person of ordinary skill in the art would have combined the teachings of OceanStore and Condor. Rather, Petitioner appears to argue that, based on the advantages described by Condor (Ex. 1017, 5), and using well-known techniques with unspecified predictable results, a person of ordinary skill in the art would have had sufficient reason to combine these disparate elements taught in the prior art references to render the challenged claims obvious. Pet. 50–53. Yet, Petitioner fails to identify what particular advantages or efficiencies would have prompted a person of ordinary skill in the art to combine Condor's scheduler with OceanStore's system.

Petitioner must articulate a *reason why* a person of ordinary skill in the art would combine the prior art references. *In re NuVasive*, 842 F.3d 1376, 1382 (Fed. 2016); *Metalcraft of Mayville, Inc. v. The Toro Company*, 848 F.3d 1358, 1366 (Fed. Cir. 2017) ("[I]t is insufficient to simply conclude the [prior art] combination would have been obvious without identifying any reason why a person of skill in the art would have made the combination."); *see Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1073 (Fed. Cir. 2015) ("obviousness concerns whether a skilled artisan not only *could have made* but *would have been motivated to make* the combinations or modifications of prior art to arrive at the claimed invention") (emphasis in original). Conclusory statements alone, even those provided by a declarant, are inadequate to demonstrate a rationale for why a person of ordinary skill in the art would combine the teachings from prior art references. *NuVasive*, 842 F.3d at 1383. Instead, Petitioner's arguments must be supported by a "reasoned explanation." *Id.* (citing *In re Lee*, 277 F.3d 1338, 1342, 1345 (Fed. Cir. 2002)). We understand that a person of ordinary skill is a person of ordinary creativity, not an automaton, but "[w]ithout any explanation as to how or why the references would be combined to arrive at the claimed invention, we are left with only hindsight bias that *KSR* warns against." *Metalcraft*, 848 F.3d at 1367 ("'[t]he obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation,' we also recognize that we cannot allow hindsight bias to be the thread that stitches together prior art patches into something that is the claimed invention." (quoting *KSR*, 550 U.S. at 419, 421)).

Accordingly, on this record, we determine Petitioner has failed to provide an adequate rationale to combine the teachings of OceanStore and Condor.

III. SUPPLEMENTAL EVIDENCE

Patent Owner objected to certain evidence submitted by Petitioner. Papers 14, 17, 35. Petitioner served and moved to file certain supplemental evidence to cure Patent Owner's objections. Paper 18; *see* 37 C.F.R. § 42.63(a) ("All evidence must be filed in the form of an exhibit."). Patent Owner opposed Petitioner's motion, to which Petitioner filed a Reply. Papers 19, 20. Patent Owner did not move to exclude any evidence.

Petitioner's Motion to Supplement Evidence was filed timely and the cited evidence is relevant to the proceeding and Patent Owner's objections. Accordingly, we grant Petitioner's Motion to Supplement Evidence.

IV. CHALLENGE TO PETITIONER'S REPLY ARGUMENTS

With Board authorization (Paper 37), Patent Owner filed a list of alleged improper reply arguments (Paper 41), to which Petitioner filed a Reply (Paper 42). Patent Owner lists several portions of Petitioner's Reply and evidence allegedly beyond the scope of what can be considered appropriate for a reply. *See* Paper 41 (citing Reply).

We have considered Patent Owner's listing, but we disagree that the cited portions of Petitioner's Reply and reply evidence are beyond the scope of what is appropriate for a reply. Replies are a vehicle for responding to arguments raised in a corresponding Patent Owner Response. Petitioner's arguments and evidence are not beyond the proper scope of a reply because we find that they fairly respond to Patent Owner's arguments raised in Patent Owner's Response. *See Idemitsu Kosan Co., LTD. v. SFC Co. LTD*, 870 F.3d 1376, 1381 (Fed. Cir. 2017) ("This back-and-forth shows that what [Patent Owner] characterizes as an argument raised 'too late' is simply the by-product of one party necessarily getting the last word. If anything, [Patent Owner] is the party that first raised this issue, by arguing—at least implicitly—that [a reference] teaches away from non-energy-gap combinations. [Petitioner] simply countered, as it was entitled to do."); *Anacor Pharms., Inc. v. Iancu*, 889 F.3d 1372, 1380 (Fed. Cir. 2018) ("In addition, the petitioner in an inter partes review proceeding may introduce new evidence after the petition stage if the evidence is a legitimate reply to evidence introduced by the patent owner . . . .").

V. CONCLUSION

For the foregoing reasons, we conclude Petitioner has shown by a preponderance of the evidence that claims 1, 3–9, 13, 15, 16, and 18–21 of the '827 patent are unpatentable under 35 U.S.C. § 103 as obvious in view of OceanStore. We find, however, Petitioner has failed to demonstrate by a preponderance of the evidence (1) that claims 1, 3–9, 13, and 15–21 of the '827 patent are anticipated under 35 U.S.C. § 102(a) by OceanStore; (2) that claim 17 of the '827 patent would have been obvious under 35 U.S.C. § 103(a) in view of OceanStore; and (3) a sufficient rationale to combine the teachings of OceanStore and Condor.

VI. ORDER

For the reasons given, it is

ORDERED that, by a preponderance of the evidence, claims 1, 3–9, 13, 15, 16, and 18–21 of the '827 patent are unpatentable; and

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

PETITIONER:

Peter Dichiara
peter.dichiara@wilmerhale.com

Michael Smith
michaelh.smith@wilmerhale.com

Christopher Centurelli
christopher.centurelli@klgates.com

Benjamin Weed
benjamin.weed.ptab@klgates.com

PATENT OWNER:

Byron Pickard
bpickard-ptab@sternekessler.com

Daniel Block
dblock-ptab@sternekessler.com

Tim Seeley
tims@intven.com

James Hietala
jhietala@intven.com

Steven Pappas
spappas-ptab@sternekessler.com