

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CISCO SYSTEMS, INC.,
Petitioner,

v.

UMBRA TECHNOLOGIES LTD.,
Patent Owner.

IPR2024-00344
Patent 11,146,632 B2

Before ST. JOHN COURTENAY III, MICHAEL R. ZECHER, and
GREGG I. ANDERSON, *Administrative Patent Judges*.

COURTENAY, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

Cisco System, Inc. (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting an *inter partes* review of claims 1–7 (“the challenged claims”) of U.S. Patent No. 11,146,632 B2 (Ex. 1001, “the ’632 patent”). Petitioner also filed a Declaration of Dr. A.L. Narasimha Reddy with the Petition. *See* Ex. 1003. UMBRA Technologies Ltd (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”).

After a conference call with the parties held on Monday, June 10, 2024, we entered an Order on June 11, 2024 authorizing Petitioner to file a five-page preliminary reply (“Reply”) to Patent Owner’s Preliminary Response, and further authorizing Patent Owner to file a five-page preliminary sur-reply (“Sur-Reply”), each of which should be narrowly tailored to address whether the preamble language of “data beacons” should be treated as limiting. The Preliminary Reply was timely filed on June 17, 2024 (Paper 10), and the Preliminary Sur-Reply was timely filed on June 25, 2024 (Paper 11).

We have authority to determine whether to institute an *inter partes* review. *See* 35 U.S.C. § 314 (2018); 37 C.F.R. § 42.4(a) (2022). Under 35 U.S.C. § 314(a), we may not authorize an *inter partes* review unless the information in the petition and the preliminary response “shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.”

Upon consideration of the Petition, the Preliminary Response, the Preliminary Reply, the Preliminary Sur-Reply, and the evidence of record, for the reasons given below we determine the information presented in the Petition and the Preliminary Reply to Patent Owner’s Preliminary Response demonstrates there is a reasonable likelihood that Petitioner would prevail in

establishing the unpatentability of at least one challenged claim of the '632 patent.

Accordingly, we institute an *inter partes* review of claims 1–7 of the '632 patent based upon the sole asserted ground of unpatentability set forth in the Petition over Agarwala in view of the knowledge of a POSITA (“Person of Ordinary Skill in the Art”). Pet. 17.

I. INTRODUCTION

A. *Real Parties in Interest*

Petitioner identifies Cisco Systems, Inc. as the real party-in-interest. Pet. 63. Patent Owner identifies itself, UMBRA TECHNOLOGIES LTD., as the real party-in-interest. Paper 4, 2.

B. *Related Matters*

The parties identify the following related district court cases involving the '632 patent: *Umbra Technologies Ltd. (UK) et al. v. Cisco Systems, Inc.*, Case No. 1:23-cv-00903-DII (W.D. Tx.); *Umbra Technologies Ltd. (UK) et al. v. VMware, Inc.*, Case No. 1:23-cv-00904-DII (W. D. Tx.). Pet. 63; Paper 4, 2.

C. *The '632 patent*

The '632 patent is entitled “Data Beacon Pulser(s) Powered by Information Slingshot,” and “relates generally to networks, and more particularly, to the topology, configuration and operation of a data beacon pulser (DBP).” Ex. 1001, code (54), 1:29–31 (capitalization omitted). According to the '632 patent, a “DBP offers fast, efficient, and dependable one-way casting/multi-casting of information globally.” *Id.* at 1:31–33.

The '632 patent describes drawbacks associated with prior art technologies, such as that “Internet Protocol (IP) over Ethernet becomes

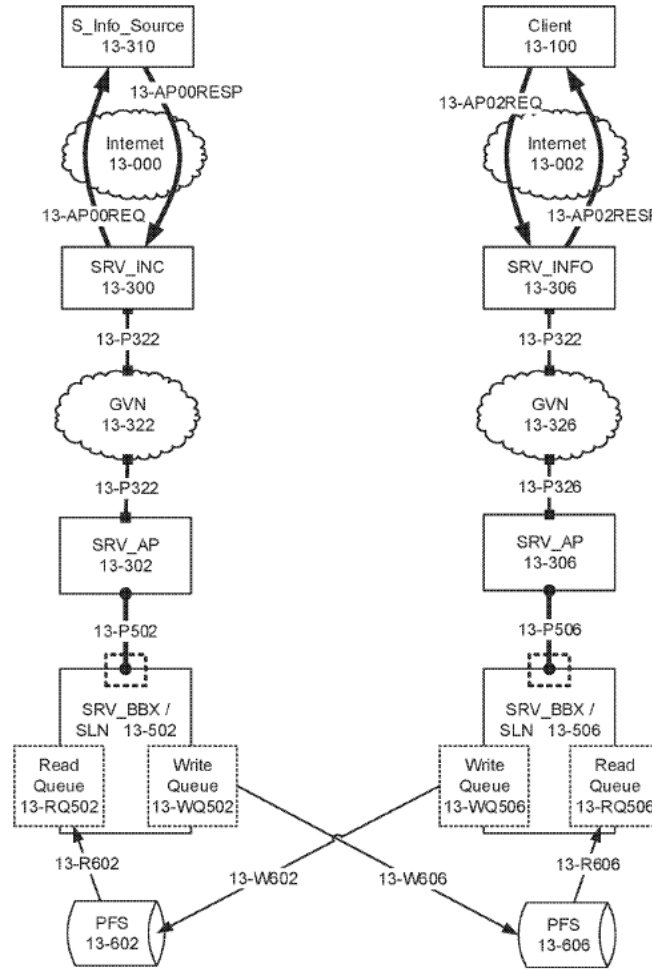
extremely inefficient over long distances and its utility decreases when there is congestion, poor routing, slower speeds, peering between different markets, or the presence of other events.” Ex. 1001, 3:40–44. However, the ’632 patent discloses that its purported invention “overcomes the distance issues associated with TCP/IP and UDP/IP because the underlying protocol of Slingshot powering DBP does not have the same congestion and inefficiencies problems over distance.” *Id.* at 5:21–24. The ’632 patent describes the prior art problem of UDP/IP dropping packets without the receiver or sender “being aware of this loss,” while the “Data Beacon Pulser addresses this by offering reliability and speed superior to UDP/IP and TCP/IP over distance.” *Id.* at 5:28–32. More specifically, the ’632 patent discloses that “DBP provides one-way Beacon transfer from source to target as regular, constant flashes/pulses [which] address the limitations of client-server (C-S) or peer-to-peer (P2P) round-trip times.” *Id.* at 6:1–4.

The ’632 patent discloses that “the system can include a first node and a second node.” Ex. 1001, 7:30–32.

Each node includes a read queue, a write queue and a parallel file system. Data is written from the write queue on the first node to the parallel file system on the second node and from the write queue on the second node to the parallel file system on the first node. The read queue on each node receives data from the parallel file system on the node itself.

Id. at 7:32–39.

Figure 13 of the ’632 patent, reproduced below, illustrates an example of the DBP mechanism framework and flow, which shows “how DBP can utilize Slingshot to make information from a source region 13-310 available to a client 13-100 in another region in as timely a fashion as possible.” Ex. 1001, 16:8–12.



An exemplary embodiment of the Data Beacon Pulser (DBP) is depicted above in Figure 13 of the '632 patent.

At this stage, we understand Figure 13 and the associated description in column 16 to provide written description support for the '632 patent claim [1.1] “first node” at S_info_Source 13-310 (upper left), the [1.1] “first read queue” at Read Queue 13-RQ502 (lower left), the [1.1] “first write queue” at 13-WQ502 (lower left), and the [1.1] “first parallel file system” at PFS 13-602 (bottom left).

Similarly, Figure 13 and the associated description in column 16 provides written description support for the '632 patent claim [1.2] “second

node” at Client 13-100 (upper right), the [1.2] “second read queue” at Read Queue 13-RQ506 (lower right), the [1.2] “second write queue” at 13-WQ506 (lower right), and the [1.2] “second parallel file system” at PFS 13-606 (bottom right). Lower-left-to-lower-right diagonal dataflow arrow 13-W606 of Figure 13 provides written description support for “wherein” clause [1.3] “wherein the first node writes first data from the first write queue to the second parallel file system”; and lower-right diagonal (up) dataflow arrow 13-R606 of Figure 13 provides written description support for “wherein” clause [1.4] “wherein the second node reads the first data from the second parallel file system and places the first data in the second read queue.”

The ’632 patent discloses that the “technology powering a data beacon pulser (DBP) is based on slingshot technology as described in U.S. Provisional Application Nos. 62/296,257 and 62/266,060 and in PCT US/16/65856 entitled ‘SYSTEM AND METHOD FOR INFORMATION SLINGSHOT OVER A NETWORK TAPESTRY AND GRANULARITY OF A TICK.’” Ex. 1001, 1:41–46.

D. Illustrative Claim

Petitioner challenges claims 1–7 of the ’632 patent. Pet. 1, 17.

Claim 1, the sole independent claim, is illustrative of the challenged claims, and recites the following (Petitioner’s bracketing and identifiers added):

[1.0] A network system for providing data beacons, comprising:

[1.1] a first node comprising a first read queue, a first write queue, and a first parallel file system;

[1.2] a second node comprising a second read queue, a second write queue, and a second parallel file system;

[1.3] wherein the first node writes first data from the first write queue to the second parallel file system; and

[1.4] wherein the second node reads the first data from the second parallel file system and places the first data in the second read queue.

Ex. 1001, 23:2–12.

E. Prior Art

Petitioner submits the following asserted reference as evidence:

Name ¹	Reference	Copyright, Issue, or Publication Date	Exhibit(s)
Agarwala	U.S. Pat. No. 9,582,421 B1	Feb. 28, 2017	Ex. 1005

a. Summary of Agarwala (Ex. 1005)

Agarwala is titled “Distributed Multi-Level Caching for Storage Appliances.” Ex. 1005, code (54) (capitalization omitted). Agarwala relates “to a distributed multi-layer caching in a distributed storage system.” *Id.* at 1:11–13.

Agarwala describes cost and performance drawbacks with prior art distributed multi-tier caches in proprietary computer storage appliances. Ex. 1005, 1:17–44. To address these drawbacks, Agarwala discloses a “distributed multi-layer cache in a distributed storage system . . . where the

¹ First named author or inventor only.

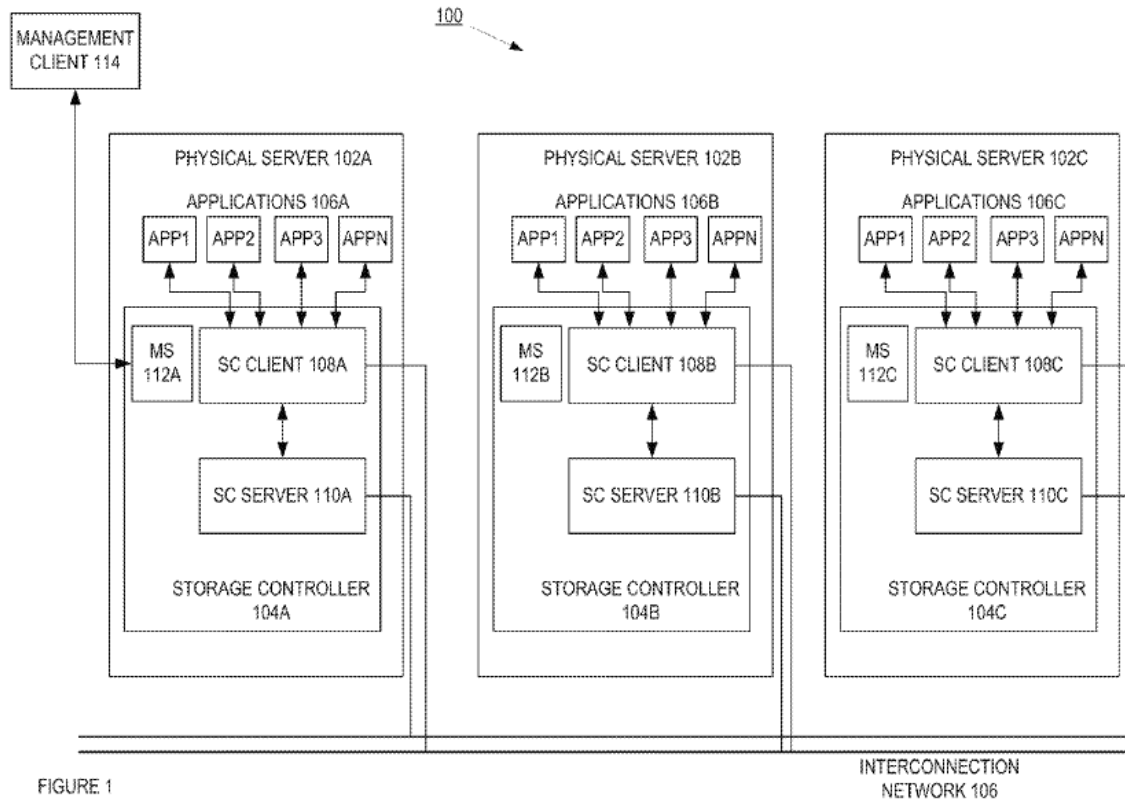
storage controller functions of the distributed storage system are separated from that of distributed storage system storage media.” *Id.* at 1:48–51.

Agarwala discloses a storage system titled “StorFS,” which “includes a Deduplicated Object Cache Layer (DOCL), where the DOCL is a multi-level de-duplicated cache that provides a simple and fast access to recently added and/or accessed objects.” Ex. 1005, 3:4–8. “The DOCL uses a set of techniques to index the objects for fast lookup, track their hotness, read/write objects from/to SSDs [(“solid state drives”)] efficiently and without deteriorating their life significantly.” *Id.* at 3:15–18.

[T]he DOCL is a multi-layer cache that includes DRAM [(“dynamic random access memory”)] and fast storage devices (SSD, PCIe Flash); a small overhead for cache metadata, where metadata is in the cache with high probability if the associated data is in the cache; and does not require garbage cleaning overhead for the fast storage devices.

Id. at 3:20–26. “In the StorFS system, the stored files are stripped across multiple caching vNodes.” *Id.* at 3:45–46. Thus, “file I/O [(“input/output”)] requests are directed to the appropriate DOCL cache in the distributed system of cluster nodes, thereby presenting a view of a globally unified cache.” *Id.* at 3:46–49.

Figure 1 of Agarwala, reproduced below, is an illustration of an embodiment of a high-level view of the StorFS system.



In Figure 1 of Agarwala (reproduced above), the StorFS system 100 includes storage nodes 102A-C coupled by an interconnection network 116, and includes a storage controller (“SC”) client (also called dispatcher) 108A–C, a SC server 110A–C, or both. *Id.* at 3:60–4:3. “The SC client 108A-C processes input/output (I/O) requests from the applications that are local to its physical storage node and routes them to the appropriate SC servers for processing.” *Id.* at 4:6–9. Further, “[t]his allows the StorFS system to scale up and parallelize/distribute the workload to many different storage nodes,” thus “providing higher combined performance.” *Id.* at 5:39–45.

F. The Asserted Sole Ground of Unpatentability

Petitioner challenges claims 1–7 of the ’632 patent based upon the following sole proposed ground of unpatentability:²

Grounds ³	Claim(s) Challenged	35 U.S.C. §	Reference(s)
1	1–7	103 ⁴	Agarwala in view of the knowledge of a POSITA

Pet. 17. Patent Owner disputes that Petitioner has sufficiently shown its asserted sole ground of unpatentability renders the challenged claims obvious. *See generally* Prelim. Resp.

II. LEVEL OF ORDINARY SKILL IN THE ART

We consider the asserted grounds of unpatentability in view of the understanding of a POSITA. In assessing the level of ordinary skill in the art, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with

² A single prior art reference may render an invention obvious notwithstanding the failure to describe all claim limitations. *See, e.g., B.F. Goodrich Co. v. Aircraft Braking Sys. Corp.*, 72 F.3d 1577, 1582 (Fed. Cir. 1996) (holding that the difference between the claimed invention and the sole reference would have been obvious); *In re O’Farrell*, 853 F.2d 894, 902 (Fed. Cir. 1988) (“[A]ppellants’ claimed invention would have been obvious in light of the Polisky reference alone.”).

³ Sole ground of unpatentability as listed at page 17 of the Petition.

⁴ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. § 103, effective on March 16, 2013. The ’632 patent claims the benefit of filing dates after the effective date of the applicable AIA amendments. *See* Ex. 1001, (code 60). Therefore, we refer to the AIA version of 35 U.S.C. § 103.

which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (quoting *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986)). “[O]ne or more factors may predominate.” *Id.*

Relying on the declaration testimony of Dr. Reddy, Petitioner contends that an ordinarily skilled artisan for the ’632 patent “would have been familiar with network communications and distributed storage systems, including network file systems,” and “would have a working knowledge of techniques for accessing data (reading and writing data) in distributed network storage systems, including parallel files systems.” Pet. 11–12 (citing Ex. 1003 ¶ 37). Petitioner further asserts:

A POSITA would have gained knowledge of these concepts through a mixture of training and work experience, such as by having a Bachelor’s degree in computer science and four years of experience; or by obtaining a Master’s degree in computer science, but having only one to two years of experience; or by having no formal education but experience in storage systems of at least eight years.

Id. at 12.

At this stage, Patent Owner does not specifically address the level of skill of the ordinary artisan. *See generally* Prelim. Resp.

For purposes of this Decision, we adopt Petitioner’s definition of the level of ordinary skill in the art. On the present record, we are satisfied that this definition comports with the level of skill necessary to understand and implement the teachings of the ’632 patent and the asserted prior art. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (explaining that the prior art itself can reflect appropriate level of ordinary skill in art).

III. CLAIM CONSTRUCTION

In interpreting the claims of the '632 patent, we “us[e] the same claim construction standard that would be used to construe the claim[s] in a civil action under 35 U.S.C. [§] 282(b).” *See* 37 C.F.R. § 42.100(b) (2023). Accordingly, our claim construction standard is the same as that of a district court. *See id.* Under the standard applied by district courts, claim terms are generally given their plain and ordinary meaning, as would have been understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire patent disclosure. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005) (en banc). “There are only two exceptions to this general rule: (1) when a patentee sets out a definition and acts as his own lexicographer, or (2) when the patentee disavows the full scope of a claim term either in the specification or during prosecution.” *Thorner v. Sony Comput. Entm’t Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012).

Petitioner contends “no specific construction of any claim term is required.” Pet. 11. However, Patent Owner urges that the language “for providing *data beacons*,” as recited in the preamble of claim 1, is limiting. Prelim. Resp. 1–11 (emphasis added).

In reply, Petitioner maintains that the Board need not construe the recitation of “data beacons” in the preamble of claim 1. Reply 4. Patent Owner responds in the Sur-Reply that “Petitioner’s suggestion that the terms ‘data beacon pulser’ and ‘data beacon’ are somehow **not** tied together” is in error because “the '632 patent clearly explains that the *data beacon* is the signal created by the *pulser*. Stated differently, the *pulser* is the apparatus and the *data beacon* is the signal sent by the apparatus.” Sur-Reply 1.

We construe claim terms only as relevant to the parties' contentions and only to the extent necessary to resolve the issues in dispute. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999); *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).

Based upon the Petition, the Preliminary Response and the preliminary briefing granted to the parties (Reply, Sur-Reply), we have reviewed the claim 1 preamble language "for providing data beacons," which Patent Owner argues precludes institution. Prelim. Resp. 1–11. This preamble claim construction issue is dispositive regarding our decision on institution for the following reason: Except for the preamble of claim 1, Patent Owner does not substantively traverse Petitioner's proposed sole ground over Agarwala and the knowledge of a POSITA for claims 1–7 regarding any specific limitations.

Accordingly, we find it necessary to do a preliminary claim construction for the claim 1 preamble language "for providing ***data beacons***." (emphasis added). Our reviewing court provides initial guidance: "[W]hether to treat a preamble as a claim limitation is determined on the facts of each case in light of the claim as a whole and the invention described in the patent." *Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 952 (Fed. Cir. 2006) (quoting *Storage Tech. Corp. v. Cisco Sys., Inc.*, 329 F.3d 823, 831 (Fed. Cir. 2003)).

*1. Preamble Language "for providing ***data beacons***" (Claim 1)*

At the outset, we note the plural term "data beacons" is only recited in the preamble of claim 1. Patent Owner initially argues the claims were

allowed by the Examiner due to this preamble recitation, and therefore it is limiting. Prelim. Resp. 2.

In support, Patent Owner argues “it is well settled that ‘[n]o litmus test defines when a preamble limits claim scope, [] but dependence on a particular disputed preamble phrase for antecedent basis may limit claim scope because it indicates a reliance on both the preamble and claim body to define the claimed invention.’” Prelim. Resp. 7 (quoting *Shoes by Firebug LLC v. Stride Rite Children’s Grp., LLC*, 962 F.3d 1362, 1367 (Fed. Cir. 2020) (internal quotations and citations omitted)).

But *Shoes by Firebug* cuts against Patent Owner, because Patent Owner has not shown any dependence on a particular disputed preamble phrase (“for providing data beacons”) for antecedent basis purposes. Prelim. Resp. 7. We note that our reviewing court provides additional guidance: “when the limitations in the body of the claim ‘rely upon and derive antecedent basis from the preamble, then the preamble may act as a *necessary component* of the claimed invention.’” *Bicon*, 441 F.3d at 952 (quoting *Eaton Corp. v. Rockwell Int’l Corp.*, 323 F.3d 1332, 1339 (Fed. Cir. 2003) (emphasis added)).

Turning to claim 1, we find no explicit antecedent basis reference from any language in the body of claim 1 to the preamble language “data beacons” (e.g., “said data beacons” or “the data beacons”):

[1.0] A network system *for providing **data beacons***, comprising:

[1.1] a first node comprising a first read queue, a first write queue, and a first parallel file system;

[1.2] a second node comprising a second read queue, a second write queue, and a second parallel file system;

[1.3] wherein the first node writes first data from the first write queue to the second parallel file system; and

[1.4] wherein the second node reads the first data from the second parallel file system and places the first data in the second read queue.

Ex. 1001, 23:1–10 (emphasis added). Nor do we find any explicit antecedent basis reference from any language in dependent claims 2–7 to the claim 1 preamble language “data beacons.” Because the limitations in the body of claim 1 do not rely upon and derive antecedent basis from the “data beacons” language recited in the preamble of claim 1, at this stage Patent Owner has not established that the preamble language “data beacons” is a *necessary component*. Thus, the Federal Circuit’s “antecedent basis” preamble case law weighs in favor of Petitioner. *See, e.g., Bicon*, 441 F.3d at 952.

Our reviewing court additionally guides that, if a preamble “recites *essential structure* or steps, or if it is ‘necessary to give life, meaning, and vitality’ to the claim,” then the preamble can limit the scope of a claim. *Catalina Mktg. Int’l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002) (citation omitted) (emphasis added).

But Patent Owner’s express statement that the “specification makes clear that the *data beacon* is the *signal* created by the pulser” (Sur-Reply 1 (some emphasis omitted, capitalization omitted)), forecloses any dispute regarding whether the preamble term “data beacons” recites *essential*

structure in the preamble of claim 1. It does not, because according to Patent Owner, the data beacon is a “signal.”⁵ *Id.*

Petitioner also cites to the Manual of Patent Examining Procedure (“MPEP”) and contends the preamble language “*for providing data beacons*” (emphasis added) is a statement of intended use:

If the body of a claim fully and intrinsically sets forth all of the limitations of the claimed invention, and the preamble merely states, for example, the purpose or intended use of the invention, rather than any distinct definition of any of the claimed invention’s limitations, then the preamble is not considered a limitation and is of no significance to claim construction.

Reply 2–3 (quoting MPEP § 2111.02(II) (9th ed. Rev. 07.2022, rev. February 2023)).

Petitioner further contends: “[Patent Owner’s] assertion that the preamble is limiting because the feature was relied upon during prosecution, and that the specification makes clear that providing data beacon functionality is the fundamental purpose of the invention, *is without factual support.*” Reply 3 (emphasis added).

Patent Owner disagrees:

The [prosecution] file history shows that the preamble recitation “network system *for providing data beacons*” was given limiting effect. In the notice of allowance, the Examiner explained that, although the body of the independent claim appeared to recite “somewhat non-complex subject matter,” the preamble’s *data beacon* recitation rendered the claim patentable. Since the data beacon recitation was relied upon to distinguish over the prior art, it is limiting.

⁵ Patent Owner additionally states: “Stated differently, the *pulser* is the apparatus and the *data beacon* is the signal sent by the apparatus.” Sur-Reply 1.

Prelim. Resp. 1.

In reviewing the limited prosecution history argued by Patent Owner (Prelim. Resp. 1), we note that the '632 patent was issued by the Examiner in a first office action, i.e., without any rejection over prior art ever being made. Ex. 1002 (“Notice of Allowance”). Thus, the “prosecution history” argued by Patent Owner is *de minimis* because Patent Owner never amended any claim to distinguish over any cited prior art. We find the absence of a prosecution history that includes claims rejected over prior art (and corresponding claim amendments) weighs in favor of Petitioner at this stage.

In the “Examiner’s Statement of Reasons for Allowance,” the Examiner concludes:

The application filed on October 23, 2018 is eligible for a First Action Allowance due to the novelty of the claimed subject matter. Both East and InnovationQ Plus IP.com software for both patents and non-patent literature were used in the prior art searches. Although independent Claim 1 appears at first to be somewhat non-complex subject matter, it was found to be novel in the art.

Ex. 1002, 9.⁶

In support, the Examiner notes:

In addition, a search for the term “data beacon pulser,” which is disclosed in the specification as the technology upon which the invention is based, was not found in any prior art other than that of the inventor. A broader search for “data beacon” in the same paragraph as variations of the term “pulse” yielded the reference, Crinon et al. (US 20120196646 A 1) and related references by the same inventors. *However, those references deal with mobile networks, and do not disclose any*

⁶ All references to the prosecution history of the '632 patent refer to the page number inserted by the Petitioner in the bottom, right-hand corner of each page in Exhibit 1002.

information about read queues, write queues, or parallel file systems. Examiner also reviewed the prior art references provided as being relevant in the PCT International Search Report, but did not find that the references teach the claimed subject matter with the required level of specificity.

Ex. 1002, 10 (emphasis added).

Patent Owner contends that, in light of the prosecution history, the claim 1 preamble language “data beacons” requires “[O]ne-[W]ay [C]asting or [M]ulti-[C]asting.” Prelim. Resp. 8. *See also* Sur-Reply (Part II, pp. 3–4). In the Sur-Reply 3–4, Patent Owner merely reproduces Petitioner’s argument (“there is no recitation in the body of the claim that requires one-way casting or multi-casting” (citing Pet. 2–3)), and Patent Owner succinctly responds by stating: “the Notice of Allowance plainly relied upon the *data beacon* term in finding that the claims distinguished over the prior art.” Sur-Reply 4.

But we find claims 1–7 of the ’632 patent are silent regarding the argued terms “[O]ne-[W]ay [C]asting or [M]ulti-[C]asting.” Sur-Reply 3. We decline Patent Owner’s invitation to read limitations from the ’632 patent Specification into the claims.⁷

Petitioner argues in the Reply (4–5) that the Board need not construe the preamble language “data beacons” because:

⁷ We emphasize that patentability is based upon the claims. “It is the claims that measure the invention.” *SRI Int’l v. Matsushita Elec. Corp. of Am.*, 775 F.2d 1107, 1121 (Fed. Cir. 1985) (en banc) (emphasis omitted). A basic canon of claim construction is that one may not read a limitation into a claim from the written description. *Renishaw PLC v. Marposs Societa’ per Azioni*, 158 F.3d 1243, 1248 (Fed. Cir. 1998).

The architecture shown in FIG. 13 of the '632 Patent is substantially identical to the architecture shown in FIG. 2 of Agarwala, including each node having a read/write queue and a parallel file system, where the read/write queue of a first node writes data from the write queue to a parallel file system of a second node, and the second node [sic. – “node”] reads the data from the parallel file system of the second node and places it in the read queue of the second node.

Reply 4 (citing Pet. 1–4).

In the Sur-Reply (Part III, pp. 4–5), Patent Owner responds to Petitioner’s preliminary reply argument (Reply 4) that the purported similarity between the architectures of Agarwala and the '632 patent is not a reason to avoid interpreting the term *data beacon*. Patent Owner urges: “This argument is irrelevant to the issue at hand. What Agarwala teaches has no bearing on how or whether claim 1 is construed.” Sur-Reply 5.

We agree with Patent Owner on at least this point. Sur-Reply 5. Moreover, our reviewing court guides that the specification “is always highly relevant to the claim construction analysis. Usually, it is dispositive; it is the single best guide to the meaning of a disputed term.” *Phillips*, 415 F.3d at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). The court in *Phillips* further guides that “[t]he specification acts as a dictionary when it expressly defines terms used in the claims or when it defines terms by implication.” *Id.* at 1321.

And therein lies the principal issue to be addressed by the parties during trial. We find no express definition for the preamble language “data beacons” within the claims or within the '632 patent.

As emphasized by Petitioner (Reply 1), the literal term “data beacons” is only mentioned twice in the '632 patent outside of claim 1: (1) in the Abstract: “Systems and methods for providing data beacons are disclosed.”

(Ex. 1001, code (57)), and as identically described, (2) in the Summary of the Disclosure: “Systems and methods for providing data beacons are disclosed” (Ex. 1001, 7:30–31).

As noted by Petitioner in the Reply, Patent Owner “proposes a construction of the term ‘*data beacon*’ to mean ‘*a signal delivered via a one-way casting or one-way multicasting.*’” Reply 1 (citing Prelim. Resp. 11). As per our discussion above, we agree with Petitioner that none of these features (*one-way casting or one-way multicasting*) are recited in any of the challenged claims 1–7. *See* Reply 2.

At this stage, Petitioner persuasively argues:

To support its construction, [Patent Owner] reaches into the Specification and relies on the description of “***data beacon pulsers***” powered by a technology the patent calls “Information Slingshot”. EX- 1001 1:29-37 (“DBP offers fast, efficient, and dependable one way casting/multi-casting of information globally”); 3:36-38 (“Slingshot one-way sending (U.S. Provisional Patent No. 62/266,060 referenced herein) offers certain advantages to the reliable movement of data at near wire-speed”) and 5:21-51 (“It provides advantages over the current state of the art such as UDP one-way multi-casting vs DBP utilizing slingshot”). POPR 8-10. However, [Patent Owner] fails to provide any evidence that ties the term “data beacon pulser” to the recited ***data beacon***. Specifically, [Patent Owner] argues that the use of slingshot provides several benefits including that it does not require responses or acknowledgements, and that it provides performance benefits over longer distances regarding speed and reliability. POPR 8-10. *However, none of these features are recited in any of the Challenged Claims.*

Reply 1–2 (some emphasis omitted and added).

We preliminarily find Patent Owner’s express statement that the “specification makes clear that the ***data beacon*** is the ***signal*** created by the pulser” (Sur-Reply 1 (some emphasis omitted, capitalization omitted)) is an

admission that a *data beacon* (signal) as recited in claim 1 is not the same as the (not literally claimed) *data beacon pulser* (apparatus) that generates the data beacon signal. *See supra* n.6: “Stated differently, the *pulser* is the apparatus and the *data beacon* is the signal sent by the apparatus.” (quoting Sur-Reply 1).

Petitioner additionally urges that the body of claim 1 fully and intrinsically sets forth all of the limitations of the claimed invention. Reply 2–4 (Part B). Patent Owner responds in the Sur-Reply that nothing in the body of claim 1 requires one-way casting and thus the body of the claim does not fully define the structure of a *data beacon* as alleged by Petitioner. *See* Sur-Reply 3 (Part II, pp. 3–4).

But as noted above, we find Patent Owner has admitted that the preamble language “data beacon” is a *signal* created by the (not literally claimed) *data beacon pulser*, and is not a structure. *See* Sur-Reply 1. Moreover, at this stage, we preliminarily agree with Petitioner that the body of claim 1 of the ’632 patent defines a structurally complete invention and claim 1 uses the preamble only to state a purpose or intended use for the invention. On this point, our reviewing court provides controlling authority: “[A] preamble is not limiting ‘where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention.’” *Catalina Mktg.*, 289 F.3d at 808 (quoting *Accord Rowe v. Dror*, 112 F.3d 473, 478 (Fed. Cir. 1997)). *Accord Am. Med. Sys., Inc. v. Biolitec, Inc.*, 618 F.3d 1354, 1358–59 (Fed. Cir. 2010) (“A preamble is not regarded as limiting . . . ‘when the claim body describes a structurally complete invention such that deletion of the preamble phrase does not affect the structure or steps of the claimed invention.’”) (quoting *Catalina*, 289 F.3d at 809).

2. Summary

Based on the preliminary record, we determine that the preamble language “for providing data beacons” recited in claim 1 should not be treated as limiting. As noted *infra*, we leave it to the parties to focus the arguments during trial to further develop the claim 1 preamble claim construction issue (re: “for providing data beacons”).

IV. PRINCIPLES OF LAW

“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 except in certain limited circumstances not present here. *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).

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

evidence of nonobviousness.⁸ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). “[W]hen a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result.” *KSR*, 550 U.S. at 416 (citing *United States v. Adams*, 383 U.S. 39, 50–51 (1966)). An obviousness inquiry is not limited to the prior art’s preferred embodiment. *See, e.g., Pfizer, Inc. v. Apotex, Inc.*, 480 F.3d 1348, 1370 (Fed. Cir. 2007). We also recognize that prior art references must be “considered together with the knowledge of one of ordinary skill in the pertinent art.” *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994) (citing *In re Samour*, 571 F.2d 559, 562 (CCPA 1978)).

V. ALLEGED OBVIOUSNESS OVER AGARWALA

Petitioner contends that claims 1–7 of the ’632 patent are unpatentable under 35 U.S.C. § 103 as obvious over Agarwala in view of the knowledge of a POSITA. Pet. 28–59. Patent Owner opposes, arguing that Petitioner has not shown Agarwala teaches the preamble language “for providing data beacons,” as recited in sole independent claim 1. *See* Prelim. Resp. 11–15. We have also considered the Declaration by Dr. Reddy, as cited by Petitioner in support of institution. *See* Ex. 1003.

⁸ Patent Owner does not present arguments or evidence of secondary considerations (i.e., objective indicia of non-obviousness) in its Preliminary Response. *See generally* Prelim. Resp. Therefore, secondary considerations do not constitute part of our analysis herein.

A. *Claim 1*

1. *Preamble [1.0]*

The preamble of claim 1 recites: “[a] network system for providing ***data beacons***, comprising.” Ex. 1001, 23:2–3 (emphasis added).

Petitioner contends “Agarwala discloses that its StorFS system writes and read data across nodes (*providing data beacons*).” Pet. 29. Petitioner further contends, “[w]ith respect to providing data beacons, the body of claim 1 does not refer to ‘data beacons’ and instead only recites that ‘first data’ is written (e.g., [1.3] from the first write queue to the second parallel file system) and read (e.g., [1.4] from the second parallel file system to the second read queue).” Pet. 29 (emphasis omitted); *see also* Ex. 1003 ¶¶ 63–67 (Dr. Reddy Declaration). In particular, the Declaration proffers an explanation why “a POSITA [would have] understood that Agarwala’s StorFS system is a network system for providing data beacons.” Ex. 1003 ¶¶ 65–67 (emphasis omitted).

Patent Owner disagrees and contends that “[e]very corner of Patent Owner’s as-filed patent application describes systems for delivering data beacons.” Prelim. Resp. 1. According to Patent Owner, “the preamble recitation ‘network system for providing data beacons’ is fundamental to the invention and limiting.” *Id.* at 5. Patent Owner also contends the “intrinsic evidence shows that the term data beacon refers to a signal delivered via one-way casting or one-way multi-casting.” *Id.* at 8 (emphasis omitted). Based upon this premise, Patent Owner contends the “Petition fails to meaningfully address the data beacon limitation and provides no explanation how the asserted reference, Agarwala, discloses a data beacon system as that term is properly interpreted.” *Id.* at 2 (emphasis omitted).

But as addressed in our claim construction section III *supra*, claim 1 is silent regarding the “one-way casting or one-way multi-casting” argued by Patent Owner. Prelim. Resp. 8. And Patent Owner mentions Petitioner’s Declaration (Ex. 1003) only once on page 13 of the Preliminary Response: “Neither the Petition nor the supporting declaration asserts that Agarwala or any of the other cited prior art uses one-way casting or multi-casting (i.e. one-way casting to multiple recipients). The Petition should be denied for this reason.” Prelim. Resp. 13. Thus, Patent Owner does not substantively traverse the Declaration (Ex. 1003) by rebutting the specific paragraphs relied upon by Petitioner to buttress Petitioner’s arguments as advanced in the Petition.

For the reasons given *supra* under heading III (“Claim Construction”), we preliminarily disagree with Patent Owner that the preamble term “for providing data beacons” should be accorded limiting effect. Therefore, at this stage, we preliminarily find Petitioner has shown that the combination of Agarwala and the knowledge of a POSITA teaches preamble [1.0].

2. Limitation [1.1]

Limitation [1.1] of claim 1 recites: “a first node comprising a first read queue, a first write queue, and a first parallel file system.” Ex. 1001, 23:4–5.

Petitioner argues that “Agarwala discloses that its storage system—the “StorFS system”—includes storage nodes 102A-C coupled by an interconnection network 116 (a first storage node of which is a *first node*).” (citing Ex. 1005 3:59–62; Fig. 1). Pet. 30–31; *see also* Ex. 1003 ¶¶ 68–92. Petitioner further argues that each storage node 102A–C contains a storage controller server 110A–C, which, in turn, contains a write cache and a read

cache. Pet. 31–32. Lastly, Petitioner argues that Agarwala’s StorFS system implements a parallel file system by including a file system and persistent storage. *Id.* at 37–43.

Patent Owner does not specifically address limitation [1.1] in the Preliminary Response. *See generally* Prelim. Resp. And Patent Owner does not substantively traverse the Declaration (Ex. 1003) by rebutting the specific paragraphs relied upon by Petitioner to buttress Petitioner’s arguments as advanced in the Petition.

We preliminarily find Petitioner has shown that the combination of Agarwala and the knowledge of a POSITA teaches limitation [1.1].

3. *Limitation [1.2]*

Limitation [1.2] of claim 1 recites: “a second node comprising a second read queue, a second write queue, and a second parallel file system.” Ex. 1001, 23:5–6.

Petitioner contends “Agarwala discloses this limitation for the reasons discussed in limitation [1.1]. As illustrated in FIG. 3, a *second storage node* (orange) contains a *write queue* (red), *read queue* (blue), and *parallel file system* (purple).” Pet. 43–44 (referring to Fig. 3 of Agarwala (Ex. 1005) as reproduced on page 44 of the Petition). *See also* Ex. 1003 ¶ 93.

Patent Owner does not specifically address limitation [1.2] in the Preliminary Response. *See generally* Prelim. Resp. And Patent Owner does not substantively traverse the Declaration (Ex. 1003) by rebutting the specific paragraphs relied upon by Petitioner to buttress Petitioner’s arguments as advanced in the Petition.

We preliminarily find Petitioner has shown that the combination of Agarwala and the knowledge of a POSITA teaches limitation [1.2].

4. *Limitation [1.3]*

Limitation [1.3] of claim 1 recites: “wherein the first node writes first data from the first write queue to the second parallel file system; and”
Ex. 1001, 23:7–8.

Petitioner argues that “Agarwala discloses a *first node*, as described above in [limitation] [1.1], that sends data from the write log (*writes first data from the first write queue*) of the first node to persistent storage in another storage controller server (*to the second parallel file system*).”

Pet. 45. Petitioner notes that, “[f]or example, this write occurs at least as part of Agarwala’s asynchronous replication of data to mirror nodes, where data is written from the write log of Agarwala’s write cache in one storage node to other storage nodes to ‘efficiently replicate data across the cluster.’” *Id.* (citing Ex. 1004 ¶¶ 41, 43, 59). As further evidence, Petitioner refers to an annotated reproduction of Figure 3 of Ex. 1004. Note: Exhibit 1004 is Agarwala’s provisional application No. 61/739,685 (“the ’685 provisional application”), filed on Dec. 19, 2012. *See also* Ex. 1005, code (60); 1:5–7 (“Applicant [(Agarwala)] claims the benefit of priority of prior, provisional application Ser. No. 61/739,685, filed Dec. 19, 2012, the entirety of which is incorporated by reference.”). As additional evidence, Petitioner cites to paragraphs 39, 47, 50, 51, 59, and 87 of the ’685 provisional application. Pet. 40 (citing Ex. 1004); *see also* Ex. 1003 ¶¶ 94–97.

Patent Owner does not specifically address limitation [1.3] in the Preliminary Response. *See generally* Prelim. Resp. And Patent Owner does not substantively traverse the Declaration (Ex. 1003) by rebutting the specific paragraphs relied upon by Petitioner to buttress Petitioner’s arguments as advanced in the Petition.

We preliminarily find Petitioner has shown that the combination of Agarwala and the knowledge of a POSITA teaches limitation [1.3].

5. *Limitation [1.4]*

Limitation [1.4] of claim 1 recites: “wherein the second node reads the first data from the second parallel file system and places the first data in the second read queue.” Ex. 1001, 23:9–11.

Petitioner argues “Agarwala discloses that after data is written into the persistent storage of a second storage node, it will be read from persistent storage and added to the read cache (*the second node reads the first data from the second parallel file system and places the first data in the second read queue*).” Pet. 48. Relying upon Dr. Reddy’s testimony, Petitioner contends: “A POSITA understood that this read occurs following replication of the data from a first node to a second mirror node as part of an asynchronous replication.” *Id.* (citing Ex. 1003 ¶ 98). Petitioner further contends: “For example, Agarwala discloses that when there is a read cache miss for data object, the data object is read from the persistent storage (*second parallel file system*) into the read cache (*second read queue*).” *Id.* (citing Ex. 1005, 10:44–51; Ex. 1004 ¶¶ 61–62; Fig. 9). *See also* Ex. 1003 ¶¶ 98–100.

Patent Owner does not specifically address limitation [1.4] in the Preliminary Response. *See generally* Prelim. Resp. And Patent Owner does not substantively traverse the Declaration (Ex. 1003) by rebutting the specific paragraphs relied upon by Petitioner to buttress Petitioner’s arguments as advanced in the Petition.

We preliminarily find Petitioner has shown that the combination of Agarwala and the knowledge of a POSITA teaches limitation [1.4].

6. *Conclusion for Claim 1*

Having considered the arguments and evidence presented by both the Petitioner and Patent Owner, we determine that Petitioner has established a reasonable likelihood that it would prevail in showing that the subject matter of independent claim 1 would have been obvious over the sole proposed ground of unpatentability over the combination of Agarwala and the knowledge of a POSITA.

As noted *supra*, we leave it to the parties to focus the arguments during trial to further develop the claim 1 preamble claim construction issue (re: “for providing data beacons”).

B. *Claims 2–7*

Patent Owner does not separately and substantively argue claims 2–7 of the ’632 patent. *See generally* Prelim. Resp.

Because Petitioner has demonstrated a reasonable likelihood of success in demonstrating that at least one claim of the ’632 patent is unpatentable, we institute on all challenged claims 1–7 under the sole ground raised in the Petition. *See* 37 C.F.R. § 42.108(a) (2023). Therefore, at this stage of the proceeding, it is not necessary for us to provide an assessment of dependent claims 2–7 under the sole ground over the combination of Agarwala and the knowledge of a POSITA.

We have reviewed the record and find Petitioner’s evidence (Pet. 49–59) and arguments on the obviousness of these claims are sufficient at this juncture.

VI. CONCLUSION

After considering the arguments presented in the Petition, the Preliminary Response, the Preliminary Reply, the Preliminary Sur-Reply, and the evidence of record, we determine that Petitioner has demonstrated at least a reasonable likelihood of success in proving that at least one claim of the '632 patent is unpatentable as obvious over the combination of Agarwala and the knowledge of a POSITA.

Accordingly, we institute an *inter partes* review of all challenged claims (i.e., claims 1–7) on the sole ground set forth in the Petition. Our determinations at this stage of the proceeding are based on the evidentiary record currently before us. This decision to institute trial is not a final decision as to the patentability of any claim for which we have instituted an *inter partes* review. *See Trivascular, Inc. v. Samuels*, 812 F.3d 1056, 1068 (Fed. Cir. 2016) (noting that “there is a significant difference between a [P]etitioner’s burden to establish a ‘reasonable likelihood of success’ at institution, and actually proving invalidity by a preponderance of the evidence at trial”). We will base any final decision on the full record developed during trial.

VII. ORDER

In consideration of the foregoing, it is hereby

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review is instituted for claims 1–7 of the '632 patent on the sole unpatentability ground asserted in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial, which commences on the entry date of this decision.

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