

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VEEAM SOFTWARE CORP.,
Petitioner,

v.

HYBIR INC.,
Patent Owner.

IPR2020-01038
Patent 8,051,043 B2

Before BART A. GERSTENBLITH, GARTH D. BAER, and
JOHN R. KENNY, *Administrative Patent Judges*.

KENNY, *Administrative Patent Judge*.

DECISION
Final Written Decision
Determining Some Challenged Claims Unpatentable
35 U.S.C. § 318(a)

I. INTRODUCTION

Veeam Software Corporation (“Petitioner”) filed a Petition to institute an *inter partes* review of claims 30–40 (the “challenged claims”) of U.S. Patent No. 8,051,043 B2¹ (Ex. 1001, the “’043 patent,” “challenged patent”) pursuant to 35 U.S.C. § 311 *et seq.* Paper 2 (“Pet.”). Hybir, Inc. (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”). With our authorization, Petitioner filed a Reply to the Preliminary Response (Paper 9, “Prelim. Reply”), and Patent Owner filed a Sur-reply (Paper 11, “Prelim. Sur-reply”).

On December 4, 2020, we instituted *inter partes* review of all challenged claims. Paper 14 (“Institution Decision,” “Inst. Dec.”). Patent Owner filed a Patent Owner’s Response (Paper 19, “PO Resp.”). Petitioner filed a Reply to Patent Owner’s Response (Paper 22, “Pet. Reply”), and Patent Owner filed a Sur-reply (Paper 31,² “Sur-reply”).

Pursuant to our request (Paper 29), the parties also filed papers regarding the ordinary meaning of the term inventory. Petitioner filed its Initial Paper Regarding Ordinary and Customary Meaning of Inventory (Paper 33, “Pet. Initial Paper”) and its Responsive Paper Regarding the Ordinary and Customary Meaning of Inventory (Paper 34, “Pet. Resp. Paper”). Patent Owner filed its Initial Paper Regarding Ordinary and

¹ The application that issued as the ’043 patent was filed on May 4, 2007, and claims the benefit of a provisional application filed on May 5, 2006. Ex. 1001, codes (22), (60).

² Patent Owner initially filed Paper 26 as its Sur-reply. Patent Owner subsequently sought and was given permission to file Paper 31 as its corrected Sur-reply. Paper 30.

Customary Meaning of Inventory (Paper 32, “PO Initial Paper”) and its Reply to Petitioner’s Initial Paper (Paper 35, “PO Resp. Paper”).

At the parties’ requests (Papers 24, 25), an oral hearing was held on September 23, 2021, a transcript of which is included in the record.³ Paper 36 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6. For the reasons discussed below, we determine that Petitioner has shown, by a preponderance of the evidence, that claims 30, 32, 33, 35, and 37–40 are unpatentable, but has not proven, by a preponderance of the evidence, that claims 31, 34, and 36 are unpatentable.

A. Related Matters

The parties identify the following related, district court litigation: *Hybir, Inc. v. Veeam Software Corp.*, No. 1-20-cv-10329 (D. Mass.). Pet. 3; Paper 5, 2.

Regarding PTAB proceedings, in IPR2020-01037, Petitioner filed a petition challenging claims 1–29 and 34 of the ’043 patent. In IPR2020-01039 and IPR2020-01040, Petitioner filed petitions challenging related patents.

B. Challenged Patent

The ’043 patent “relates generally to computer data rights and data identity.” Ex. 1001, 1:6–11. The ’043 patent indicates that a common inefficiency of most prior art backup techniques is that they rely on taking an initial image or full backup of the entire contents of an operating system. *Id.*

³ The oral hearings for this proceeding and three related proceedings (IPR2020-01037, IPR2020-01039, and IPR2020-01040) were held together because many of the issues presented by the parties overlap. Paper 27 (Order Granting the Parties’ Requests for Oral Hearing), 1.

at 1:39–42. Another purported inefficiency is that many systems will maintain multiple copies of the same files. *Id.* at 2:1–3. An object of the '043 patent is “to provide a more efficient method and system for managing files, file rights, and file identity.” *Id.* at 2:12–14. Figure 1 of the '043 patent is reproduced below:

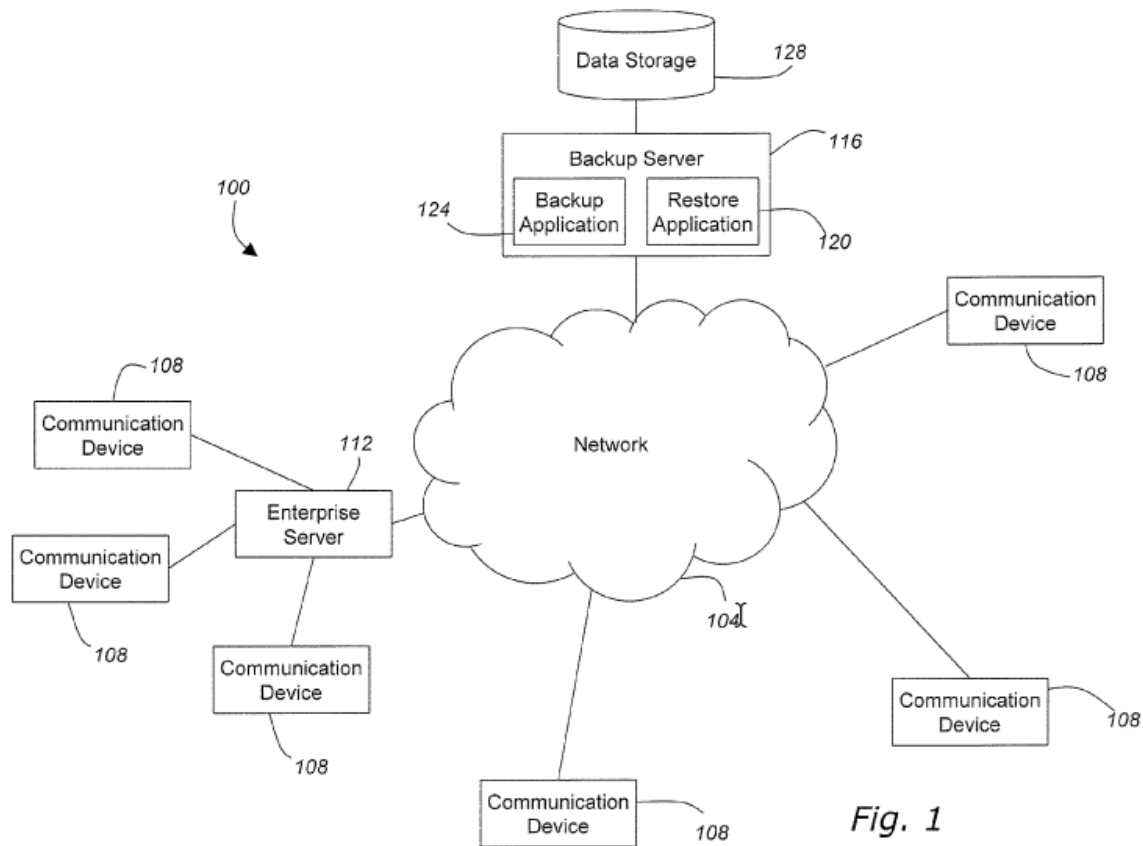


Fig. 1

Figure 1 above shows communication system 100 with network 104, communication devices 108, enterprise server 112, backup server 116, and data storage 128. Ex. 1001, 4:44–50. “[B]ackup server 116 is characterized by the ability to manage a file backup system for a group of users, each of which may be associated with one or more communication devices 108.” *Id.* at 5:23–27. Further, in certain embodiments, “backup server 116 is provided with a backup application 124 to enable users to backup files from their

respective communication devices 108 to either the backup server 116 or to the data storage 128.” *Id.* at 5:27–31.

Figure 2 of the ’043 patent is reproduced below:

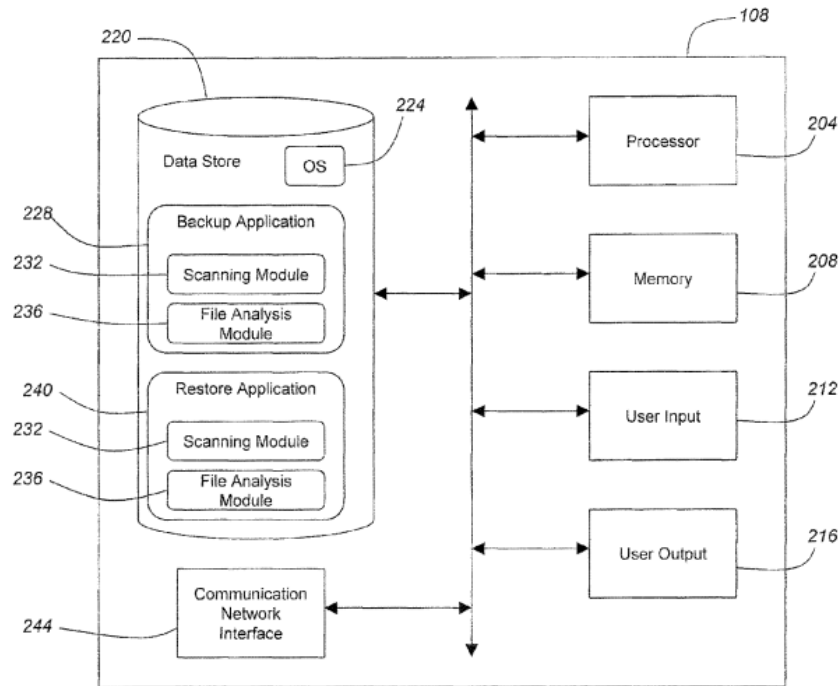


Fig. 2

Figure 2 above is a block diagram of communication device 108. Ex. 1001, 3:51–53. Communication device 108 includes data storage 220, which includes backup application 228, which can backup files from communication device 108 to data storage 128. *Id.* at 7:64–8:1. Backup application 228 includes scanning module 232 and file analysis module 236. *Id.* at 8:1–3. Scanning module 232 “perform[s] an initial scan of local files to make a quick determination as to whether file data has been changed, updated, added, etc.” *Id.* at 8:4–9. File analysis module 236 “perform[s] a more in-depth analysis of files that the scanning module 232 has identified as possibly changed, updated, added, and so on.” *Id.* at 8:18–21.

Figure 3 of the '043 patent is reproduced below:

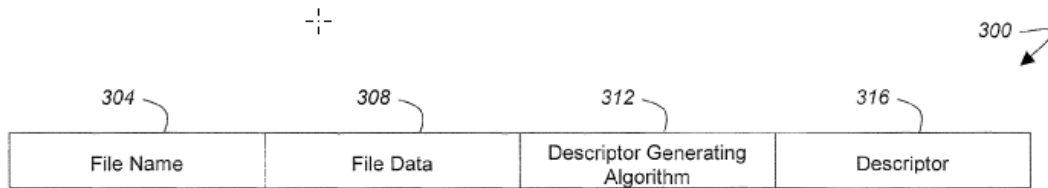


Fig. 3

Figure 3 above shows data structure 300, which is used to manage files and data structures in a backup operation. Ex. 1001, 9:32–35. The data structure includes descriptor generating algorithm field 312 and descriptor 316. *Id.* at 9:35–38. Each stored electronic file may have a descriptor associated with it. *Id.* at 10:23–24. Communication device 108 and backup server 116 can reference a common file by independently generating a descriptor for the file using an agreed upon descriptor generating algorithm. *Id.* at 10:28–30. The “descriptor may be a combination of file metadata (e.g., file storage location and other bibliographic information pertaining to the file) and cryptographic signature or signatures.” *Id.* at 2:37–39.

Figure 5 of the '043 patent is shown below:

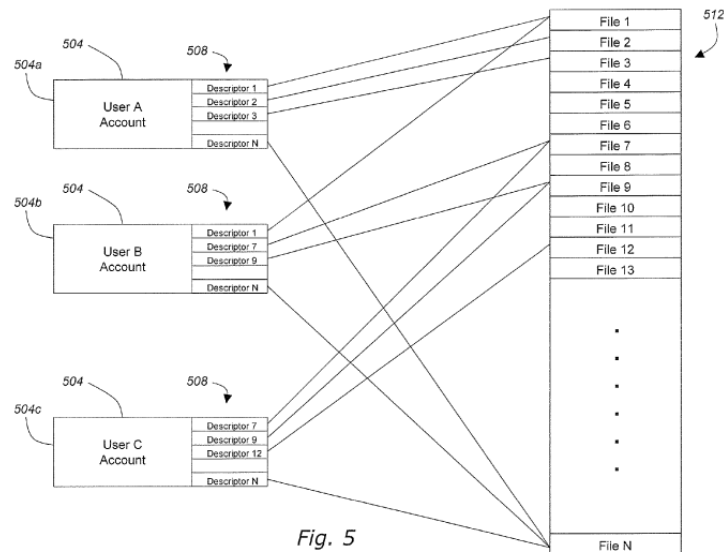


Figure 5 above shows a group-based backup data structure, which is typically maintained on backup server 116. Ex. 1001, 10:61–65. With this structure, backup server 116 maintains inventories 504 for each user account. *Id.* at 10:66–11:1. List 512 can specify the files maintained at the backup server 116 using descriptors, which allows the backup server to reference the list using descriptor mapping. *Id.* at 11:16–22.

Figure 6 of the '043 patent is reproduced below:

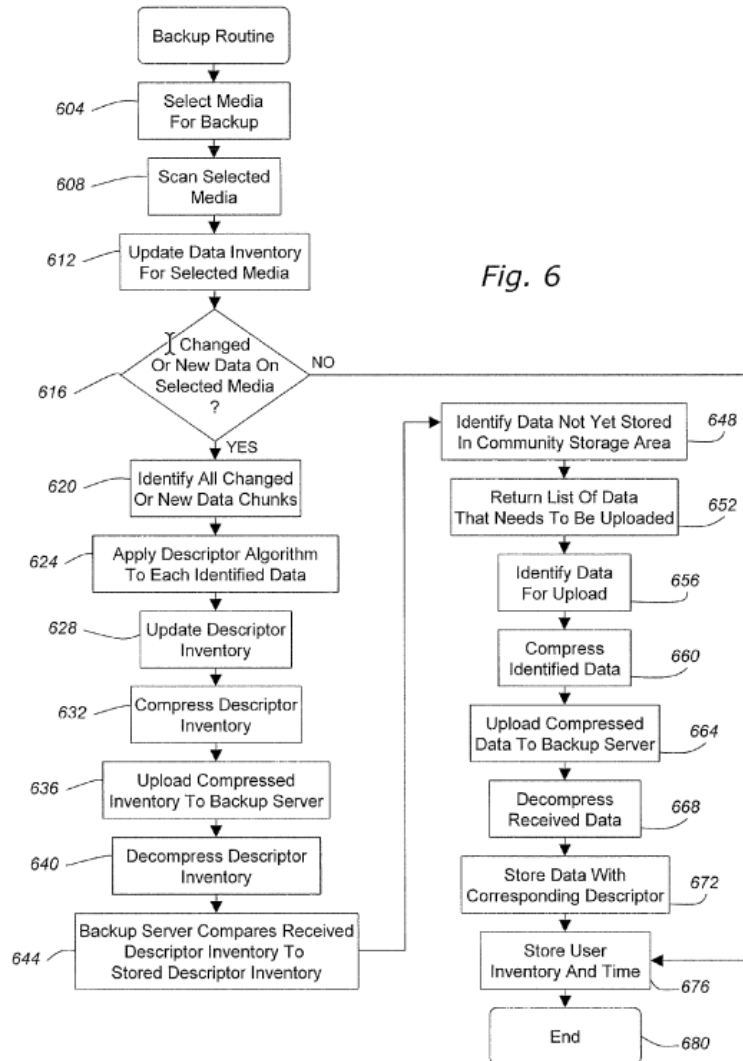


Figure 6 above depicts a backup routine. Ex. 1001, 3:62–64. In step 604, media is selected for backup at communication device 108 or at enterprise server 112. *Id.* at 12:12–15. In step 636, communication device 109 or enterprise server 112 upload a compressed inventory of their files to backup server 116. *Id.* at 13:14–16. In steps 640 and 644, backup server 116 decompresses the inventory and compares it to a stored descriptor list. *Id.* at 13:16–25. In steps 648 and 652, backup server 116 identifies data not yet

stored on backup server 116 and returns a list of the data that needs to be uploaded. *Id.* at 13:25–37.

C. Challenged Claims

Petitioner challenges claims 30–40. Pet. 1. Claims 30, 35, and 40 are independent. Ex. 1001, 22:9–24:35. Claim 30, with bracketed identifiers provided by Petitioner for claim limitations, recites:

30. A method, comprising:

[30A] receiving a request from a remote storage medium to perform a restore operation;

[30B.1] referencing a backup inventory for the remote storage medium, wherein the backup inventory for the remote storage medium comprises a list of descriptors associated with electronic data that was resident on the remote storage medium at a point in time prior to receiving the request to perform a restore operation, [30B.2] wherein the electronic data comprises actual file data, and wherein a descriptor in the list of descriptors comprises a cryptographic signature computed with the actual file data such that the actual file data is uniquely identified by the descriptor;

[30C] retrieving selected electronic data from the backup data storage medium having a descriptor that matches descriptors in the list of descriptors associated with the remote storage medium; and

[30D] providing the selected electronic data to the remote storage medium.

Ex. 1001, 22:9–28; Pet. 75.

D. Asserted Challenges to Patentability and Prior Art

Petitioner challenges claims 30–40 based on the grounds in the table below.

Claim(s) Challenged	35 U.S.C. §	Reference(s)
30–37, 39	103	Field ⁴
38	103	Field, Anderson ⁵
40	103	Field, Anderson, Coombs ⁶

Pet. 5.

Petitioner relies on the Declaration of Dr. Prashant Shenoy, Ph.D. (Ex. 1002) and the Declaration of Dr. Prashant Shenoy, Ph.D in Support of Petitioner’s Reply to Patent Owner’s Response (Ex. 1024). Patent Owner relies on the Declaration of Dr. Jon Weissman, Ph.D. in Support of Patent Owner’s Response (Ex. 2008).

E. Level of Skill in the Art

To determine the level of an ordinarily skilled artisan, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with 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) (quotation omitted).

Petitioner, citing Dr. Shenoy’s testimony, proposes that an ordinarily skilled artisan at the time of the invention would have had “a B.S. degree in

⁴ US 2006/0212439 A1, published Sept. 21, 2006 (Ex. 1004).

⁵ US 2005/0114614 A1, published May 26, 2005 (Ex. 1005).

⁶ US 2004/0030852 A1, published Feb. 12, 2004 (Ex. 1006).

Computer Science, Computer Engineering, Electrical Engineering, or an equivalent field, as well as at least 3–5 years of academic or industry experience in the fields of data backup, data restore, data replication, and/or data synchronization.” Pet. 10 (citing Ex. 1002 ¶¶ 22–23).

As we noted in the Institution Decision, Patent Owner’s Preliminary Response proposed a level of ordinary skill in the art that was very similar to Petitioner’s proposal. Inst. Dec. 20 (citing Prelim. Resp. 21). On the preliminary record at that time, we found both parties’ proposals consistent with the level of ordinary skill in the art reflected by the prior art of record. *Id.* at 20–21 (citing *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995); *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978)). And, on that record, we found that one of ordinary skill in the art at the time of the invention would have a Bachelor of Science degree in Computer Science, Computer Engineering, Electrical Engineering, Software Engineering, or an equivalent field, as well as at least three to five years of academic or industry experience in the fields of data storage, data backup, data restoration, data replication and deduplication, and/or data synchronization. *Id.* at 21.

In its Patent Owner Response, Patent Owner, relying on Dr. Weissman’s testimony, appears to adopt the same level of ordinary skill in the art set forth in the Institution Decision, without explicitly stating so. PO Resp. 21 (citing Ex. 2008 ¶ 18). In particular, Patent Owner proposes, via Dr. Weissman’s testimony, that a person of ordinary skill in the art at the time of the invention would have:

at least have a Bachelor of Science degree in Computer Science, Computer Engineering, Electrical Engineering, Software Engineering, or an equivalent field, as well as at least

3–5 years of academic or industry experience in the fields of data storage, data backup, data restoration, data replication and deduplication, and/or data synchronization.

Ex. 2008 ¶ 18.

As reflected above, Patent Owner agrees with our preliminary finding regarding the level of ordinary skill in the art and Petitioner does not address our preliminary finding in its Reply. Accordingly, we see no reason to disturb that finding, and, therefore, we maintain and reaffirm that one of ordinary skill in the art at the time of the invention would have had a Bachelor of Science degree in Computer Science, Computer Engineering, Electrical Engineering, Software Engineering, or an equivalent field, as well as at least three to five years of academic or industry experience in the fields of data storage, data backup, data restoration, data replication and deduplication, and/or data synchronization.

II. CLAIM CONSTRUCTION

In this *inter partes* review, claims are construed using the same claim construction standard that would be used to construe the claims in a civil action under 35 U.S.C. § 282(b). *See* 37 C.F.R. § 42.100(b) (2019). The claim construction standard includes construing claims in accordance with the ordinary and customary meaning of such claims as understood by one of ordinary skill in the art at the time of the invention. *See id.*; *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–14 (Fed. Cir. 2005) (en banc). In construing claims in accordance with their ordinary and customary meaning, we take into account the specification and prosecution history. *Phillips*, 415 F.3d at 1315–17.

If the specification “reveal[s] a special definition given to a claim term by the patentee that differs from the meaning it would otherwise

possess[.] . . . the inventor’s lexicography governs.” *Phillips*, 415 F.3d at 1316 (citing *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002)). Another exception to the general rule that claims are given their ordinary and customary meaning is “when the patentee disavows the full scope of a claim term either in the specification or during prosecution.” *Uship Intellectual Props., LLC v. United States*, 714 F.3d 1311, 1313 (Fed. Cir. 2013) (quoting *Thorner v. Sony Computer Entm’t Am., LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012)).

Additionally, only terms that are in controversy need to be construed, and these need be construed only to the extent necessary to resolve the controversy. *See Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (holding that “only those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy”); *Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs.* in the context of an *inter partes* review).

In the Institution Decision, we noted that neither party proposed any claim terms for construction at that stage of the proceeding, and we did not construe any claim terms expressly as none of the terms were in dispute. Inst. Dec. 22. In the briefing following institution, Patent Owner proposed a construction for the term “inventory,” *see, e.g.*, PO Resp. 21–28, and it became clear that the parties dispute the meaning of the term. Accordingly, we address the parties’ proposed constructions for “inventory” and the arguments they present for those constructions.

A. The Parties' Proposed Constructions for "Inventory"

Patent Owner contends that "inventory" should be construed as "electronic data that reflects the current state of a storage medium and includes a list of files on the storage medium[,] at least one descriptor identifying the file(s)[,] and the directory structure of the file(s)."⁷ PO Resp. 21 (citing Ex. 1001, 8:11–41, 15:12–24; Ex. 2008 ¶ 68); PO Initial Paper 1.

Petitioner contends that "inventory" should be construed as "an itemized list of electronic data." Pet. Reply 1–2; Pet. Initial Paper 1. In particular, Petitioner contends that "inventory" should be "afforded its ordinary and customary meaning," (Pet. Reply 1–2 (citing Pet. 10)), which, as recited in the challenged claims, is "an itemized list of electronic data." (Pet. Initial Paper 1).

B. The Parties' Arguments

1. Patent Owner's Response⁸

As set forth above, Patent Owner contends that "inventory" should be construed as "electronic data that reflects the current state of a storage medium and includes a list of files on the storage medium[,] at least one descriptor identifying the file(s)[,] and the directory structure of the file(s)." PO Resp. 21 (citing Ex. 1001, 8:11–41, 15:12–24; Ex. 2008 ¶ 68). Patent Owner asserts that the Specification explains that "the file inventory reflects

⁷ Patent Owner's Initial Paper added two commas to the proposed construction, which help identify the specific aspects of Patent Owner's proposal. PO Initial Paper 1. Whether or not the commas are included, the analysis below is effectively the same.

⁸ As noted above, Patent Owner's Response was the first instance either party proposed an express construction of "inventory."

the current state of the drive and may include a description of the hierarchical structure of the drive as well as markers identifying sizes of chunks of files.” *Id.* at 21–22 (citing Ex. 1001, 8:11–13, 13:3–15, 15:10–24; Ex. 2008 ¶ 69). Patent Owner contends that “[t]he electronic data that is part of the inventory includes raw data and metadata” (*id.* at 22 (citing Ex. 1001, 8:27–29; Ex. 2008 ¶ 69)), and “[t]he unique descriptor stored in an inventory is generated from raw data and metadata of a file or portion of a file and the directory structure of the same file / portion of the same file” (*id.* (citing Ex. 1001, 8:29–31, 15:10–11; Ex. 2008 ¶ 69)).

Patent Owner relies on Figure 7 of the ’043 patent, which “is a flow chart depicting aspects of a restore routine.” Ex. 1001, 3:65–67; *see* PO Resp. 22 (citing Ex. 1001, Fig. 7; Ex. 2008 ¶ 69). Patent Owner contends that Figure 7 and the description thereof in the Specification support its construction of inventory. PO Resp. 22–24. In particular, Patent Owner asserts that “a backup inventory stores descriptors, which correspond to the electronic data marked for restoration, as well as directory structures for the restored data.” *Id.* at 23 (citing Ex. 1001, 15:10–11). Patent Owner notes that the Specification states that after the descriptors are marked for restoration, the ““restore application continues by determining if any directories in the inventory are not present in the target media.”” *Id.* (quoting Ex. 1001, 15:12–15). Patent Owner states that “[i]f there are directories stored in the backup inventory and not in the target media, then those directories are created for the target media.” *Id.* (citing Ex. 1001, 15:15–17). Patent Owner refers to the remainder of the restore process, contending that “the backup inventory provides enough data to allow for a complete restore of a client device.” *Id.* at 24 (citing Ex. 2008 ¶ 70).

Additionally, Patent Owner contends that its proposed construction “is consistent with [inventory’s] ordinary meaning.” PO Resp. 24 (citing Ex. 2008 ¶ 71). In particular, Patent Owner points to two extrinsic dictionary definitions of “inventory,” which define “inventory” as “a complete list of items such as property, goods in stock, or the contents of a building” and “a detailed list of all the things in a place,” and an extrinsic definition of “data backup inventory” as a “detailed and often descriptive catalog, aggregate view or list of relevant Data Backup Items that is often somewhat important, sanctioned or approved in its nature.” *Id.* (citing Ex. 2012 (Google webpage showing definition of “inventory” from “Oxford Languages”), 1; Ex. 2013 (webpage showing definition of “inventory” from the Cambridge English Dictionary), 1; Ex. 2014 (webpage showing definition of “data backup inventory” from The International Foundation for Information Technology), 1; Ex. 2008 ¶¶ 71–72)).

Patent Owner contends that Petitioner and Dr. Shenoy assert that “inventory” can consist of “a list of ‘signatures corresponding to the one or more selected files for backup.’” PO Resp. 24 (citing Pet. 31); *id.* at 25–26 (quoting Ex. 2015 (Deposition Transcript of Dr. Shenoy), 97:18–98:13, 98:24–100:2). Patent Owner asserts that Petitioner’s construction “is contradicted by the intrinsic evidence including the claim language itself” because the claims “clearly and repeatedly use the terms inventory and list in different ways.” *Id.* at 26 (citing Ex. 2008 ¶ 76). Although neither Patent Owner nor Dr. Weissman explains the different use of “inventory” and “list,” Patent Owner points to claims 1 and 30 of the ’043 patent, noting that the following language from claims 1 and 30, respectively, makes clear that “a list of descriptors’ is part of, but not identical to the inventory:

“comparing . . . the at least one descriptor of the first inventory to a list of descriptors associated with a second inventory of electronic data” and “referencing a backup inventory for the remote storage medium, wherein the backup inventory . . . comprises a list of descriptors associated with electronic data that was resident on the remote storage medium . . . wherein the electronic data comprises actual file data, and wherein a descriptor in the list of descriptors comprises a cryptographic signature computed with the actual file data.” *Id.* (citing Ex. 2008 ¶ 76; Ex. 1001, claims 1 and 30). Additionally, Patent Owner asserts that “Dr. Shenoy agreed that additional data about the current state of the drive would need to be provided from the client device to the backup server at some point.” *Id.* at 26–27 (citing Ex. 2015, 45:3–15, 46:11–23).

Further, Patent Owner contends that the “use of the language ‘associated with’ indicates that there are more than just a list of descriptors for an inventory of electronic data, *e.g.*, directory structure of the electronic data.” PO Resp. 27 (citing Ex. 2008 ¶ 77). And, Patent Owner contends, because the ordinary meaning of “inventory” includes the terms “detailed” and “complete,” the extrinsic evidence “does not support Dr. Shenoy’s construction of inventory as merely an ‘itemized list.’” *Id.* (citing Ex. 2008 ¶ 77). Patent Owner further asserts that its construction “is consistent with the embodiments described and claimed in the ’043 Patent, in which inventories are transmitted between the communication device and backup server to determine which files to backup or restore in view of the current state of the drive on the communication device.” *Id.* at 27–28 (citing Ex. 1001, claims 30, 31, 35, 36, 40; Ex. 2008 ¶ 78).

2. Petitioner's Reply

In its Reply, Petitioner contends that “inventory” should be “afforded its ordinary and customary meaning” and that Patent Owner propounds “an improperly narrow construction of the term ‘inventory,’ purporting to import *four* separate requirements into this single term.” Pet. Reply 1–2. In particular, Petitioner asserts that Patent Owner’s construction seeks to require that an inventory: (1) reflect the current state of a storage medium, (2) include a list of files on the storage medium, (3) include at least one descriptor identifying the file(s), and (4) include the directory structure of the file(s). *See id.* at 2 (citing Ex. 1025, 39:13–40:13; PO Resp. 21).

First, Petitioner contends that “[i]mportation of these four limitations is improper . . . because the claims themselves define the ‘inventory.’” Pet. Reply 2 (citations omitted).

Second, Petitioner argues that Patent Owner’s construction “is also inconsistent with the ’043 patent specification, which provides no definition for the term ‘inventory’ nor any specific requirements, much less the four propounded by” Patent Owner. Pet. Reply 2–3 (citing Ex. 1024 ¶ 9). Petitioner contends that “the specification uses the term as an open-ended construct, merely providing examples of what data *may* be included in an inventory—not what *must* be.” *Id.* at 3 (citing Ex. 1001, 8:31–34, 11:11–15; Ex. 1024 ¶¶ 9, 12–13). Petitioner provides additional discussion of each clause in Patent Owner’s proposed construction, arguing that each is improper in light of the Specification. *See id.* at 4–15.

Third, Petitioner asserts that Patent Owner “cannot manufacture a construction based on nothing more than cherry-picked extrinsic evidence and unsupported expert testimony.” Pet. Reply 3. Petitioner contends that

even Patent Owner’s “carefully-selected dictionary definitions do not support [Patent Owner’s] proposed construction” because “[n]one of the four proposed requirements are expressed or implied by the words ‘detailed’ or ‘complete.’” *Id.* (citing Ex. 1024 ¶¶ 10–11). Petitioner further argues that Patent Owner “expressly ignores that [Dr. Shenoy’s interpretation of inventory as an itemized list] is derived from the Merriam-Webster dictionary, which defines ‘inventory’ as ‘an itemized list of current goods or assets.’” *Id.* at 3–4 (emphasis omitted) (citing Ex. 1002 ¶ 74, 176, Ex. 1019 (The Merriam-Webster Dictionary), 384; Ex. 1024 ¶ 11).

Further, Petitioner asserts that Patent Owner’s “proposed construction fails at almost every canon of claim construction: it is confusing, makes optional information a requirement, duplicates and renders superfluous claim language, and conflicts with the doctrine of claim differentiation.” Pet. Reply 4. Instead, Petitioner contends that “inventory” should be construed in accordance with its ordinary meaning. *Id.* (citations omitted).

3. Patent Owner’s Sur-reply

In its Sur-reply, Patent Owner contends that “Petitioner incorrectly focuses the weight of its argument on the linguistic aspects of Patent Owner’s claim construction of the term ‘inventory’ rather than the fundamental principles of how one of ordinary skill in the art would have understood the term based on the specification and claims.” PO Sur-reply 1. Patent Owner asserts that it “never characterized its construction as having . . . four requirements nor argued they were entirely independent of one another.” *Id.* Patent Owner contends that “[e]ach aspect of its construction adds meaning while at the same time possibly overlapping to some extent with other aspects.” *Id.* at 2.

In particular, Patent Owner contends that “nothing precludes some potential overlap between portions of a construction. Here, for example, the list of file(s) and the directory structure of the file(s) may be useful, but not necessarily sufficient, in determining the current state of the storage medium.” PO Sur-reply 3. Patent Owner asserts that its construction “captures the data needed in the inventory according to the specification to achieve” the requirements of the claimed deduplication and restoration processes. *Id.* at 4. Patent Owner contends that its construction is “based on the fundamental principle of giving claims their ordinary and customary meaning that would have been accorded by a person of ordinary skill in the art.” *Id.* (citation omitted). Additionally, Patent Owner contends that “patent specifications often use the word ‘may’ even in reference to requirements.” *Id.* Patent Owner walks through each of the four aspects of its construction in response to Petitioner’s arguments. *Id.* at 5–10.

4. Initial and Responsive Papers

In addition to the information provided by the parties in the papers discussed above, each party filed an Initial Paper and Responsive Paper in response to our request for each party to set forth “its contentions regarding the ordinary and customary meaning of the term ‘inventory’ as that term is used in the challenged claims.” Paper 29, 1. In its Initial Paper, Petitioner contends that “the ordinary and customary meaning of the term ‘inventory,’ as recited in the challenged claims, is ‘an itemized list of electronic data.’” Pet. Initial Paper 1. Petitioner contends that the use of “inventory” in the Specification is consistent with the dictionary definition of “inventory” as “an itemized list of current goods or assets.” *Id.* (quoting Ex. 1019, 384) (citing Ex. 1024 ¶ 8). Petitioner also asserts that Patent Owner’s cited

dictionary definitions “further confirm this understanding.” *Id.* at 1–2 (citing Exs. 2012–2014).

Additionally, Petitioner reiterates that “[t]he term ‘inventory’ does not define, describe, or limit the contents of the inventory itself; rather, those limitations are provided by each challenged claim, which describe[s] what information the ‘inventory’ must contain.” Pet. Initial Paper 2. Petitioner contends that “[n]othing, in either the extrinsic or intrinsic evidence, demands that the term ‘inventory’ must reflect a certain amount or type of data, or take on any particular form,” although the claims “do provide additional details.” *Id.* (citing Pet. Reply 3–4; Ex. 1024 ¶¶ 8–13).

In its Initial Paper, Patent Owner contends that its construction “is consistent with the ordinary and customary meaning of the term ‘inventory.’” PO Initial Paper 1. Patent Owner offers six exemplary dictionary definitions of “inventory” that it contends reflect that “inventory” is “more than just a list.” *Id.* at 1–2. In particular, each of Patent Owner’s dictionary definitions includes a version of the phrase “a detailed [or complete] list.” *Id.* at 1; *see id.* at 2 (noting that “inventory” would have been understood as “a ‘complete,’ ‘detailed,’ and ‘often descriptive’ list which includes other data about the items and/or information identified in the inventory”). Patent Owner asserts that “[t]he exact nature of the other data kept in a particular inventory would depend on the nature of the items contained in the inventory, as these definitions reflect.” *Id.* at 2.

Additionally, Patent Owner explains that the “elements of the inventories in the claims are recited to explain which data or storage medium is being described by the inventory and not to add limitations to what is in the inventory, as Petitioner suggests.” PO Initial Paper 3. For example,

Patent Owner points to an element of claim 10 of the '545 patent,⁹ which recites “generating a first inventory for the first set of files, wherein the first inventory reflects a current state of the first remote storage medium, and wherein the first inventory includes the cryptographic signature values generated for each file in the first set of files.” See PO Initial Paper 2–4. Patent Owner contends that the first wherein clause “informs the reader that the current state in the first inventory is for the first remote storage medium and not a different storage medium” and that the second wherein clause “establishes [that the cryptographic signature values] are generated for the first set of files as opposed to a different set of files.” *Id.* at 4.

In its Responsive Paper, Petitioner contends that Patent Owner “never actually explains what the ordinary and customary meaning of ‘inventory’ is” and instead relies on “‘exemplary’ dictionary definitions for the vague proposition that ‘the ordinary and customary meaning of “inventory” is more than just a list.’” Pet. Resp. Paper 1. Petitioner asserts, however, that none of the definitions support Patent Owner’s argument because none define how much “more” is needed for a list to be considered an “inventory” nor do any set forth the numerous requirements included in Patent Owner’s proposed construction. *Id.* Petitioner explains that “[c]onsistent with these definitions, an ‘inventory’ is a specific type of *list* that accounts for *all items* being inventoried, whether that be files selected for backup, files present on a backup server, or—in a different context—items in a grocery store.” *Id.* Petitioner asserts that “[t]he very purpose of an inventory is to account for each subject item, which is why Patent Owner’s cited dictionaries define

⁹ U.S. 9,037,545 B2, which is a continuation of the '043 patent and is challenged in, and is Exhibit 1001 in, IPR2020-01039.

‘inventory’ as an ‘itemized,’ ‘detailed,’ or ‘complete’ list of items.” *Id.* Petitioner contends, however, that “those dictionaries contemplate what [P]atent Owner ignores: the form in which those items are represented may vary, and so the ordinary and customary meaning of the term ‘inventory’ in no way requires use of any particular attributes to represent the subject items.” *Id.* at 1–2 (citing Pet. Initial Paper 2–3).

Additionally, Petitioner contends that Patent Owner’s citations to the Specification “do not suggest a different meaning.” Pet. Resp. Paper 2. “Rather, consistent with the ordinary and customary meaning provided by Petitioner, the [’043] patent allows for various different types of information to be present within an inventory.” *Id.* (citations omitted). Particularly, Petitioner contends that the Specification explains that an inventory *may* include certain information associated with the inventoried items, but that does not mandate that such information is “inherent within the meaning of ‘inventory.’” *Id.* (citations omitted).

In its Responsive Paper, Patent Owner contends that Petitioner’s construction of inventory “reads all meaning out of th[e] word.” PO Resp. Paper 1. Patent Owner asserts that the claims and Specification contradict any argument that an “inventory” is the same as a list. *Id.* Additionally, Patent Owner asserts that “Petitioner’s argument is blatantly inconsistent with the ordinary and customary meaning of the term ‘inventory’ as set forth in various dictionaries as including a ‘detailed,’ ‘complete,’ and ‘often descriptive’ set of data.” *Id.* at 2 (citing Exs. 2012–2014). And, Patent Owner contends that its construction is “supported by both the extrinsic evidence and the patent[itself] as including specific types of additional and detailed information about the items.” *Id.*

C. Discussion

Above, we set forth the standard that applies in this proceeding, and we reiterate that “[t]he words of a claim are generally given their ordinary and customary meaning as understood by a person of ordinary skill in the art when read in the context of the specification and prosecution history.”

Thorner, 669 F.3d at 1365 (citing *Phillips*, 415 F.3d at 1313). “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.” *Id.* (citing *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1580 (Fed. Cir. 1996)). In this case, neither party contends that either exception to the general rule of construing claim terms in accordance with their ordinary and customary meaning applies. We agree with the parties that the term “inventory” should be given its plain and ordinary meaning because the patentee did not act as his own lexicographer by defining the term “inventory” and did not disavow the full scope of the term “inventory.” The parties disagree, however, as to the ordinary and customary meaning of “inventory.” Before turning to the parties’ particular disagreements, we recognize where the parties’ proposed constructions agree. In particular, the parties agree, as do we, that the ordinary and customary meaning of “inventory” includes the terms “electronic data” and “list.” Below, we address the disputed portions of the parties’ proposed constructions, starting with Patent Owner’s.

1. Patent Owner’s Proposed Construction

Patent Owner’s proposed construction has four aspects. Specifically, with that proposed construction, inventory is electronic data that (i) reflects

the current state of a storage medium and (ii) includes a list of files on the storage medium (iii) includes at least one descriptor identifying the file(s) and (iv) includes the directory structure of the file(s). PO Resp. 21 (citing Ex. 1001, 8:11–41, 15:12–24; Ex. 2008 ¶ 68); PO Initial Paper 1. We examine each aspect of Patent Owner’s proposed construction.

a. Reflects the Current State of a Storage Medium

The first aspect of Patent Owner’s proposed construction is that an “inventory” “reflects the current state of a storage medium.” PO Resp. 21; PO Initial Paper 1. To support this argument, Patent Owner relies on the Specification of the ’043 patent and, particularly, the descriptions of an inventory in column 8. PO Resp. 21–22; Sur-reply 6. This portion of the Specification describes the file inventory that scanning module 232 creates when it scans a particular drive or storage medium. Ex. 1001, 8:9–34. In particular, in describing Figure 2, the Specification in column 8 states, “[b]y scanning a particular drive or similar storage medium, the scanning module 232 is capable of creating a *file inventory* for the selected drive. The file inventory reflects the current state of the drive and may include a description of the hierarchical structure of the drive.” *Id.* at 8:9–13 (emphasis added); *see also id.* at 8:31–34.

This disclosure describes a particular trait of the file inventory produced by scanning module 232. This disclosure does not indicate that the term “inventory” should be limited to the file inventory created by scanning module 232, and it would be inappropriate to read a limitation regarding the file inventory produced by scanning module 232 from the Specification into the claim term “inventory.” *See Liebel-Flarsheim Co. v. Medrad, Inc.*, 358

F.3d 898, 904 (Fed. Cir. 2004) (“improper to read a limitation from the specification into the claims.”).

Additionally, neither the claim language nor the dictionary definitions cited by Patent Owner support construing “inventory” itself as reflecting the current state of a storage medium.

Patent Owner cites to the language of claims 1 and 30. PO Resp. 26. Claim 1 recites:

receiving, at a backup server, a first inventory of electronic data stored on a first remote storage medium, wherein the electronic data comprises actual file data to be backed-up from the first remote storage medium, wherein the first inventory comprises at least one descriptor and wherein the at least one descriptor comprises a cryptographic signature computed based on the actual file data.

Ex. 1001, 18:33–64. Claim 30 recites:

referencing a backup inventory for the remote storage medium, wherein the backup inventory for the remote storage medium comprises a list of descriptors associated with electronic data that was resident on the remote storage medium at a point in time prior to receiving the request to perform a restore operation, wherein the electronic data comprises actual file data, and wherein a descriptor in the list of descriptors comprises a cryptographic signature computed with the actual file data such that the actual file data is uniquely identified by the descriptor.

Id. at 22:9–28. The claim language for both claims reflects that the first “inventory” or backup inventory is “of electronic data stored on a first remote storage medium.” The claim language for both claims further describes that the first inventory or backup inventory comprises at least one descriptor. Further, claim 1 describes that the descriptor comprises a cryptographic signature computed based on the actual file data. Claim 30 further describes that the descriptor comprises a cryptographic signature

computed with the actual file data such that the actual file data is uniquely identified by the descriptor. Neither claim defines “inventory” as reflecting the current state of a storage medium.

Considering extrinsic evidence,¹⁰ both parties rely on dictionary definitions.¹¹ A common feature of the definitions proffered by Patent Owner is the use of the adjective “detailed” and the word “list.” See PO Initial Paper 1 (“a complete list,” “a detailed list,” “detailed . . . list,” “detailed . . . list,” “detailed . . . list,” “detailed list”) (citing *inter alia* Exs. 2012–2014). Patent Owner states that these dictionary definitions show that “the ordinary and customary meaning of ‘inventory’ is more than just a list.” *Id.* at 2. Petitioner does not disagree. In fact, Petitioner notes the same commonality across the dictionary definitions the parties rely on—the definitions each include a “list” and a modifier describing the list as “itemized,” “detailed,” or “complete.” Pet. Resp. Paper 1. Petitioner, however, also asserts that none of the dictionary definitions support Patent Owner’s attempt to require that the term “inventory” *must* include all of the information that the Specification indicates *may* be included in an inventory. *Id.* at 2.

The dictionary definitions shed light on the plain and ordinary meaning of “inventory,” but, in particular, none of the definitions proffered

¹⁰ Neither party argues that the prosecution history of the ’043 patent informs as to the meaning of the “inventory.”

¹¹ The parties also rely on competing expert testimony, which testimony is very similar to the parties’ arguments. See, e.g., Ex. 2008 ¶¶ 68–77 (Dr. Weissman’s declaration testimony); Ex. 1024 ¶¶ 6–33 (Dr. Shenoy’s reply declaration testimony).

by Patent Owner¹² support Patent Owner’s proposed construction that “inventory” reflects the current state of a storage medium or that “inventory” should be construed to include any of the other requirements in Patent Owner’s proposed construction. Despite including adjectives such as “detailed,” and “complete,” none of those modifiers suggests, supports, or is consistent with Patent Owner’s proposed construction of “inventory” as “electronic data that reflects the current state of a storage medium.”¹³

Accordingly, we find that the record does not support construing “inventory” to “reflect the current state of a storage medium.”

b. Includes a List of Files on the Storage Medium

As mentioned, both parties propose construing inventory to include or constitute a list. PO Resp. 21; Pet. Reply 1–2; Pet. Initial Paper 1. The parties dispute, however, what the list should constitute. Patent Owner argues that “inventory” requires a list of files on the storage medium, PO Resp. 21, whereas Petitioner argues “inventory” does not require the inclusion of a list of files on the storage medium. Pet. Initial Paper 1.

Patent Owner’s Response does not specifically identify its support for construing inventory to require a list of files on the storage medium. PO Resp. 21–28. The Response, however, cites to the disclosure in the ’043

¹² Neither party argues that the dictionary definition proffered by Petitioner (Ex. 1019) supports construing the term “inventory” as reflecting the current state of the storage medium. The definition in Exhibit 1019 uses the term “current.”

¹³ Nor do any of the definitions reflect that the ordinary and customary meaning of “inventory” includes the other three aspects of Patent Owner’s proposed construction of “inventory”—electronic data that (2) “includes a list of files on the storage medium,” (3) includes “at least one descriptor identifying the file(s),” and (4) includes “the directory structure of the file(s).”

patent that scanning module 232 is capable of producing a file inventory. *Id.* at 21–22 (citing Ex. 1001, 8:11–13). The term being construed, however, is “inventory,” not “file inventory,” and the Specification of the ’043 patent teaches that the contents of its inventories are not limited to files, but can also include other electronic data. Ex. 1001, 15:42–45 (“those files and *other electronic data* listed in the inventory”); *see also* 15:5–6 (“The descriptors from the inventory represent the electronic data at the time the last backup occurred. Those files or electronic data . . .”). So the Specification does not support requiring that an “inventory” be a list of just files on the storage medium: an inventory can list other electronic data. *Id.*

Patent Owner’s Sur-reply points to the ’043 patent’s description of a restore process. Sur-reply 7–8 (citing Ex. 1001, 14:57–66, 15:1–11, 16:18–20). Nothing in that discussion in the Specification, however, requires “inventory” to include a list of files on the storage medium, and Patent Owner’s discussion does not identify any such requirement. Rather, we find that this portion of the Specification supports Petitioner’s argument that inclusion of a list of files is permissible, but not required. First, the cited descriptions are from the Specification’s discussion of the restore/recover routine of Figure 7. Ex. 1001, 14:14–16:20. The Specification explicitly states that “[w]ith reference to FIG. 7, a restore/recover routine will be described *in accordance with at least some embodiments of the present invention.*” *Id.* at 14:14–16 (emphasis added). Thus, on its face, the Specification describes the restore/recover routine of Figure 7 as applicable to *some* embodiments, meaning *not every* embodiment. Second, in the portion Patent Owner relied on, the Specification further describes as “an additional embodiment of the present invention” the ability to generate an

inventory of protected media. *See id.* at 16:18–19. And the Specification expressly states that “[t]his inventory is a list of all files with corresponding descriptors.” *Id.* at 16:19–20. This description reflects that when the patentee intended to refer to a list of files as part of an inventory, the patentee knew how to do so. And, that the patentee did not do so for all embodiments or specifically direct the discussion to the term “inventory” generally, supports Petitioner’s position that an “inventory” *may* include a list of files on the storage medium, but is not required to do so.¹⁴

Further, the dictionary definitions provided by the parties do not support limiting “inventory” to a list of files. Exs. 1019, 2012–2014. None of those dictionary definitions set forth such a requirement. *Id.* Thus, we do not construe “inventory” to require a “list of files on the storage medium.”

c. Includes at Least One Descriptor Identifying the File(s)

The third aspect of Patent Owner’s proposed construction of “inventory” is the inclusion of at least one descriptor identifying the file(s). PO Resp. 21. Patent Owner’s Response does not specifically identify why “inventory” should be construed to require this language. Petitioner’s Reply correctly identifies that claims 1 and 15 expressly recite that “wherein the first inventory comprises at least one descriptor” and “independent claims 30

¹⁴ We also find that the Specification suggests that a list of files is not a required aspect of “inventory.” In particular, in describing the embodiment of Figure 5, the ’043 patent teaches that “included in a user’s inventory may be list of descriptors 508. The list of descriptors 508 for each user are a short-hand representation of the actual files, or portions of files, that have been recently backed up for the user’s communication device 108.” Ex. 1001, 11:11–15. This disclosure suggests that an “inventory” need not require a list of the files themselves, but rather that a list of descriptors could suffice.

and 35 recite ‘wherein the backup inventory for the remote storage medium comprises a list of descriptors.’” Pet. Reply 12–13. In its Sur-reply, responding to Petitioner’s argument that the claims expressly recite this aspect of Patent Owner’s proposed construction of “inventory,” Patent Owner states “Petitioner does not dispute that an inventory includes at least one descriptor, and thus whether it is explicitly in the construction or not, the Board must consider it as a limitation.” Sur-reply 8–9. Patent Owner further states, that claims 1, 15, 30, and 35 “need to refer to the at least one descriptor in each inventory as an antecedent basis to refer to it again later in the claims.” *Id.* at 9.

Patent Owner does not provide any support for why the term “inventory” itself requires “at least one descriptor identifying the file(s).” And, we do not discern any support in the claims, Specification, or dictionary definitions of “inventory” that the term “inventory” must require at least one descriptor identifying the file(s) as proposed by Patent Owner. As discussed above, both claims 1 and 15 describe that the recited first inventory includes at least one descriptor. Patent Owner’s proposed construction renders this recitation superfluous because the term “inventory,” as construed by Patent Owner, would already require at least one descriptor, and constructions that render claim language superfluous are disfavored. *Becton, Dickinson & Co.*, 616 F.3d at 1257; *Curtiss-Wright*, 438 F.3d at 1381.

Thus, on the complete record before us, the evidence (claims, Specification, and extrinsic) does not support Patent Owner’s attempt to require “inventory” to mean that it “includes at least one descriptor

identifying the file(s).” Accordingly, we do not construe “inventory” to require such.

d. Includes the Directory Structure of the Files

The fourth aspect of Patent Owner’s proposed construction of “inventory” is that an “inventory” must include the directory structure of the file(s). PO Resp. 21. Patent Owner points to the language of the challenged claims and identifies two portions of the Specification as allegedly supporting its proposed construction. We address each.

Patent Owner argues that the use of the language “associated with” in the challenged claims indicates that “there is more than just a list of descriptors for an inventory of electronic data, e.g., directory structure of the electronic data.” PO Resp. 27 (citing Ex. 2008 ¶ 77). The cited testimony makes clear that Patent Owner is referring to the use of the phrase “associated with” in the following recitations of claims 1 and 30:

(i) comparing . . . the at least one descriptor of the first inventory to a list of descriptors *associated with* a second inventory of electronic data (claim 1) and

(ii) referencing a backup inventory for the remote storage medium, wherein the backup inventory . . . comprises a list of descriptors *associated with* electronic data that was resident on the remote storage medium . . . wherein the electronic data comprises actual file data, and wherein a descriptor in the list of descriptors comprises a cryptographic signature computed with the actual file data (claim 30).

Ex. 2008 ¶¶ 76–77.

Neither Patent Owner nor Dr. Weissman, however, explain why the recitation “associated with” means that the term “inventory” should be construed to require a directory structure of the electronic data. PO Resp. 27; Ex. 2008 ¶ 77. And we see no reason why the recitation of

“associated with” should lead to such a construction. The phrase “associated with” in these recitations specifies that the recited descriptors are associated with the recited electronic data. It does not define the term “inventory” to include a directory structure.

Turning to the Specification, Patent Owner relies on the disclosure regarding scanning module 232 discussed above: “[b]y scanning a particular drive or similar storage medium, the scanning module 232 is capable of creating a file inventory for the selected drive. The file inventory reflects the current state of the drive and may include a description of the hierarchical structure of the drive.” Ex. 1001, 8:9–13 (emphasis added); see PO Resp. 21 (citing Ex. 1001, 8:11–41, 15:12–24; Ex. 2008 ¶ 68). This disclosure expressly teaches that a file inventory *may* include a description of the hierarchical structure of a drive, not that it must.

Patent Owner suggests that the term “may” as used in the Specification of the ’043 patent is not permissive. Sur-reply 4. Patent Owner contends that “patent specifications often use the word ‘may’ even in reference to requirements.” *Id.* Patent Owner, however, cites no support for this contention. Patent Owner argues, however, that “[e]verything is described in this patent that’s may this, may that. It’s all permissive language.” Tr. 76:18–20. Patent Owner asserts that if we construe “may” as optional (permissive) as opposed to required, then nothing is left of the patent. *See id.* at 76:20–77:2 (“Unfortunately, you can’t take these sentences in isolation and say, well, these are saying permissive, because then nothing is happening in this patent. Practically everything is described in terms of it may be this or it may be that. So there’s nothing definitive about anything here.”). We disagree.

We see nothing in this record that would cause us to interpret the term “may” as mandatory.¹⁵ Thus, we interpret the term “may” in accordance with its ordinary, permissive meaning. *See Netword LLC v. Centraal Corp.*, 242 F.3d 1347, 1358 (Fed. Cir. 2001) (“The specification makes quite clear that those added limitations are merely *permissive*, that is to say, they *may or may not* be associated with the client computer that is clearly defined in the specification” (emphasis added)); *In re Johnston*, 435 F.3d 1381, 1384 (Fed. Cir. 2006) (“these limitations are stated in *the permissive form ‘may.’* As a matter of linguistic precision, *optional elements* do not narrow the claim because they can always be omitted.” (emphasis added)). And, we do not agree that interpreting “may” in accordance with its ordinary and customary meaning deprives the ’043 patent of meaning. That an “inventory” may include the directory structure of the file(s) means exactly that, it may. Nothing in our construction *precludes* an “inventory” from including the directory structure of the file(s). In other words, there may be claims that recite the broader term “inventory” and there may be claims that recite a

¹⁵ The Specification’s use of “may” in several other instances also indicates the permissive (optional) inclusion of items in an inventory. *See* Ex. 1001, 8:27–34 (describing the use of a descriptor algorithm to “create the descriptor that uniquely . . . identifies the file or a portion of the file” and stating that “[t]he results of the application of the descriptor algorithm (e.g., the generated hash corresponding to each file or portion of a file) *may also be added to the inventory to help describe the current state of the drive*” (emphasis added), 10:66–11:12 (noting, in the context of Figure 5, that “backup server 116 may be designed to maintain inventories 504 for each user account” and that “[i]ncluded in a user’s inventory may be a list of descriptors 508” (emphasis added))).

narrower “inventory” if other language in the claim expressly limits the “inventory,” for example, to include one or more of the aspects described in the Specification as optional.

Patent Owner also points to the Specification’s discussion of Figure 7 and the restore/recover routine described to support its proposed requirement that an “inventory” include at least one descriptor identifying the file(s) and the directory structure of the file(s). In particular, Patent Owner points to the statement that:

[o]nce the descriptors have been marked for restoration, the restore application 240 continues by determining if any directories in the inventory are not present in the target media (step 732). If there are any directories in the inventory and not in the media, the restore application 240 creates those directories in the target media (step 736).

See PO Resp. 22–24 (citing, *inter alia*, Ex. 1001, 15:12–17) (asserting that Figure 7 and this description from the Specification supports Patent Owner’s construction); Tr. 79:1–12 (contending that this statement is definitive in that there are directories in this inventory); *see* Ex. 1001, 15:12–17.

We disagree that this statement in the Specification supports Patent Owner’s argument that (a) directories are required to be in the specific inventory referenced and (b) the term “inventory” should be *construed* as requiring “the directory structure of the file(s).” This specific statement says *if* there are any directories in the inventory and not in the media, then directories are created. Nothing in that statement requires the presence of directories in the inventory. The statement is satisfied whether or not directories are included. If there are no directories in the inventory, then there are no directories in the inventory that are not in the target media. Thus, this statement fails to support Patent Owner’s argument that

“inventory” should be construed as *requiring* the directory structure of the file(s).

Additionally, the Specification’s description of Figure 7 explicitly states that the restore/recover routine is described “in accordance with *at least some embodiments* of the present invention.” Ex. 1001, 14:14–16 (emphasis added). Thus, even if we were to read the above-description of Figure 7 as requiring directories in this specific inventory (which we do not), this description expressly applies to “at least some embodiments,” meaning not necessarily *all* embodiments.

The dictionary definitions cited by the parties also do not support Patent Owner’s proposed requirement that “inventory” include the directory structure of the file(s). None of those definitions so limit the term “inventory.” Exs. 1019, 2012–2014.

Therefore, we do not construe the term “inventory” to require the directory structure of the file(s),

2. Petitioner’s Proposed Construction

As mentioned above, Petitioner proposes construing “inventory” as “an itemized list of electronic data.” Pet. Reply 1–2; Pet. Initial Paper 1. This proposed construction is consistent with the Specification of the ’043 patent. The inventories described in the ’043 patent are itemized lists of electronic data. *See, e.g.*, Ex. 1001, 8:9–11; 11:1–15; 14:2–7. Further, Petitioner’s proposed construction is consistent with the language of claims 1 and 15, both of which recite “inventory” and “electronic data.” In addition, Petitioner’s proposed construction is supported by the dictionary definition of inventory as “an itemized list of current goods or assets.” Ex. 1019.

Patent Owner objects to Petitioner’s proposed construction on the grounds that the Specification of the ’043 patent teaches that the term “inventory” should have all of the requirements set forth in Patent Owner’s proposed construction. Sur-reply 3–10; PO Initial Paper 1–4; PO Resp. Paper 1–2. As set forth above, we disagree with that argument by Patent Owner.

Patent Owner also relies on dictionary definitions to oppose Petitioner’s proposed construction. *See* PO Initial Paper 1. As discussed above, a common feature of the definitions proffered by Patent Owner is the use of the adjective “detailed” and the word “list.” *See id.* (“a complete list,” “a detailed list,” “detailed . . . list,” “detailed . . . list,” “detailed . . . list,” “detailed list”) (citing *inter alia* Exs. 2012–2014). Patent Owner states that these dictionary definitions show that “the ordinary and customary meaning of ‘inventory’ is more than just a list.” *Id.* at 2. Petitioner does not disagree. In fact, Petitioner notes the same commonality across the dictionary definitions—they each include a “list” and a modifier describing the list as “itemized,” “detailed,” or “complete.” Pet. Resp. Paper 1. And Petitioner’s proposed construction requires that an inventory must be more than a list—it must be an itemized list. Patent Owner has not argued that there is any difference of significance for this case between construing “inventory” as an itemized list versus a detailed list (aside from using the term “detailed” as a vehicle to argue all four aspects of its proposed construction). And we see none.¹⁶

¹⁶ As noted previously, important to our understanding of “inventory” is Patent Owner’s agreement that “the claimed inventory may not account for

3. Construction

Considering the intrinsic and extrinsic evidence of record, we determine that “inventory” would have been understood by one of ordinary skill in the art in accordance with its plain and ordinary meaning, which, in this context, is an “itemized list of electronic data.”¹⁷

III. ASSERTED GROUNDS

A. Objective Indicia of Nonobviousness

At this stage, neither party has argued objective indicia of nonobviousness. Thus, we do not address objective indicia of nonobviousness in the analyses below.

B. Asserted Obviousness over Field

Petitioner asserts that claims 30–37 and 39 would have been obvious over Field. Pet. 11.

1. Field

Field is directed to a system, methods, and a computer-readable medium for efficiently performing a backup of data in a networking environment. Ex. 1004 ¶ 7.

every file on the system. Instead, the claimed inventory accounts for the data, which may only be a chunk of data, selected by a user to be backed up or restored.” PO Sur-reply 12 (agreeing with Petitioner). In other words, even though the extrinsic definitions modify the term “list” by requiring the list to be “itemized,” “detailed,” and/or “complete,” it is undisputed that the inventory can account for *less than all* files on a remote storage medium or drive.

¹⁷ Construing “inventory” as a “detailed list of electronic data” or a “complete list of electronic data” would not change the analysis that follows. Under each of these plain and ordinary meanings, the result is the same—none requires (a) a list of files on the storage medium, (b) at least one descriptor identifying the file(s), or (c) the directory structure of the file(s), as Patent Owner proposes.

Figure 1 of Field is reproduced below:

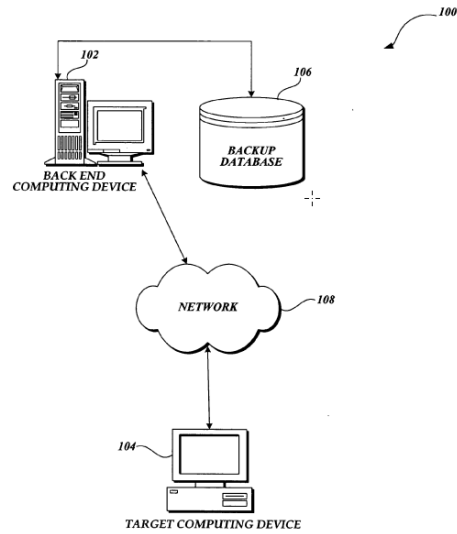


Fig. 1.

Figure 1 above shows a networking environment 100 that includes a back end computing device 102 and target computing device 104. Ex. 1004 ¶ 13. Back end computing device 102 aggregates data received from multiple sources (e.g., client devices) at a single location (e.g., backup database 106), to prevent the unnecessary transmission of data. *Id.* ¶ 22.

Figure 2 of Field is reproduced below:

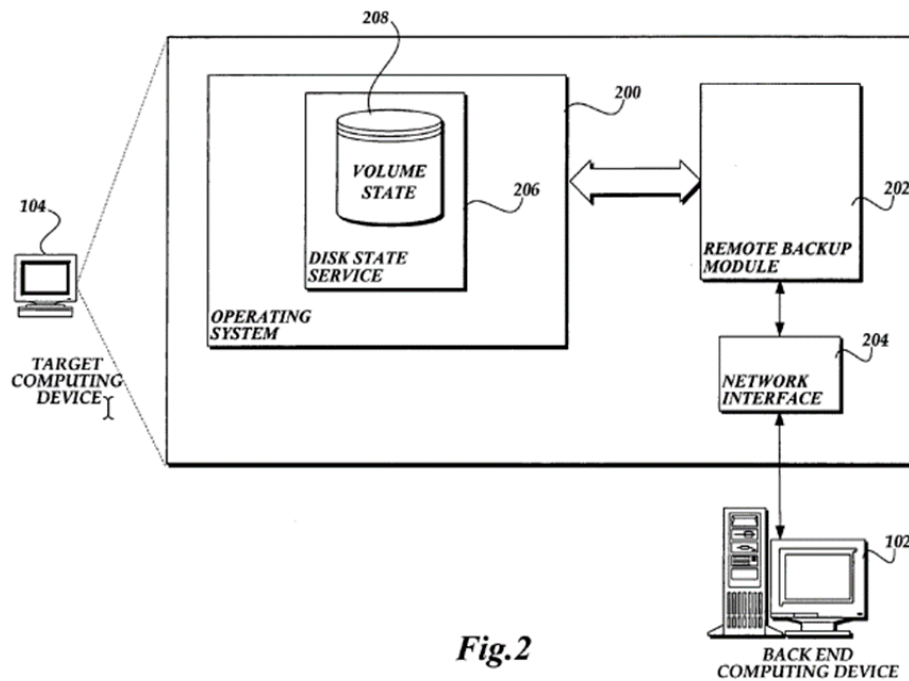


Fig.2

Figure 2 above illustrates components of target computing device 104, including remote back module 202. Ex. 1004 ¶ 14.

Figure 3 of Field is reproduced below:

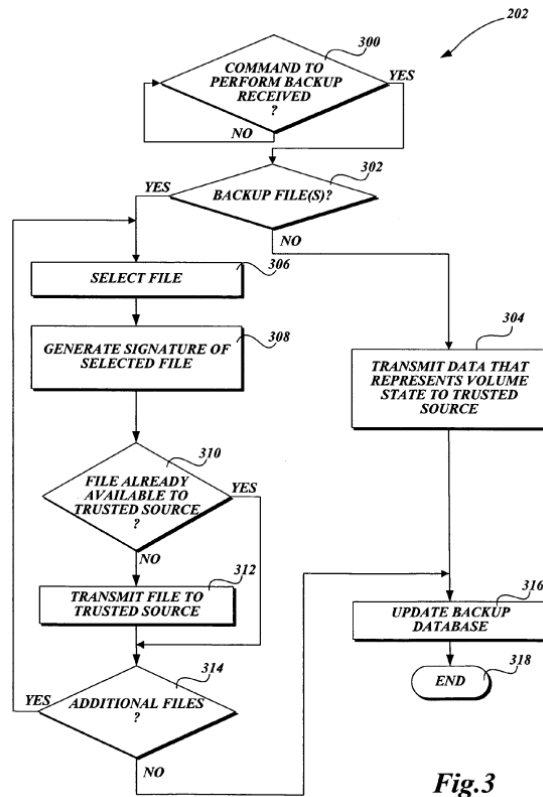


Fig.3

Figure 3 above shows a flow diagram for module 202 that contains blocks 300–318. Ex. 1004 ¶ 15. In block 300, remote backup module 202 waits to receive a command to perform a backup. *Id.* ¶ 32. In block 302, module 202 determines whether the command received requires a backup of one or more files. *Id.* If a backup is required, then the module proceeds to block 306, where it selects a file to be backed up. *Id.* ¶ 33. In block 308, module 202 generates a signature of the selected file. *Id.* ¶ 36. Hashing algorithm “SHA-1” can be used to generate this signature. *Id.*

Alternatively, “other type[s] of algorithms or functions that are capable of generating a signature from file data may be used to generate the signature.” *Id.* In block 310, module 202 determines if the file is already available to a trusted source. *Id.* ¶ 37. In particular, in block 310, “the

remote backup module 202 causes the signature of the selected file to be transmitted to the trusted source and compared to signatures of files previously submitted to the trusted source.” *Id.* If the file is not already available to the trusted source, in block 312, module 202 transmits the file to the trusted source. *Id.* ¶¶ 37–38. In block 314, if there are additional files to be backed up, module 202 returns to block 306. *Id.* ¶ 39.

2. Claim 30

Below, we first address the parties’ arguments for claim 30, starting with Petitioner’s showing in the Petition, which Petitioner provided on a limitation-by-limitation basis. Then, we address Patent Owner’s arguments in the Patent Owner Response, which were not provided on a limitation-by-limitation basis.¹⁸ Then, we address the arguments in Petitioner’s Reply and Patent Owner’s Sur-reply. After which, we provide our analysis.

a. Parties’ Arguments

i. The Petition

(a). Preamble

The preamble of claim 30 recites “[a] method.” Ex. 1001, 22:9. In the Petition, Petitioner argues that Field teaches the preamble of claim 30 by disclosing “efficiently performing a backup of data in a networking environment.” Pet. 15 (citing Ex. 1004, code (57), ¶ 7). Petitioner further argues that Field discloses that “[t]he present invention relates to computing devices and, more particularly, to restoring a computing device to recover lost data.” *Id.* at 17 (quoting Ex. 1004 ¶ 1). Petitioner further argues that Field discloses methods for accomplishing this objective. *Id.* (citing

¹⁸ Many of Patent Owner’s arguments, however, appear to be directed to limitation 30B.1.

Ex. 1004 ¶¶ 1, 24, 37–44, claims 1–3; Ex. 1002 ¶ 69). Petitioner asserts that, for example, claim 2 of Field discloses techniques to restore a file from a backup device to a client device: “in response to receiving a command to restore [a] file, transmitting the file from the second computing device to the first computing device.” *Id.* (quoting Ex. 1004, Claim 2; Ex. 1002 ¶ 69).

(b). [30A] receiving a request from a remote storage medium to perform a restore operation;

Petitioner argues that Field discloses “restoring a computing device to recover lost data.” Pet. 17 (quoting Ex. 1004 ¶ 1). Petitioner further asserts that “Field discloses that ‘[a] command to backup data onto a remote computing device, such as the back end computing device 102 (FIG. 1), may be received in a number of contexts,’ and a ‘computer user may choose to perform a backup in which one or more files will be restored.’” *Id.* (emphasis omitted) (quoting Ex. 1004 ¶ 32). According to Petitioner, “[a]s such, ‘a user may *restore* [a] volume state or file to any one of a number of available versions.’” *Id.* at 17–18 (emphasis added by Petitioner) (quoting Ex. 1004 ¶ 32).

Petitioner asserts that, based on this disclosure, an ordinarily skilled artisan “would have recognized that a request would be received from a client device operated by the user (‘remote storage medium’) when previously backed up files needed to be restored.” Pet. 18 (emphasis omitted) (citing Ex. 1002 ¶ 71). Petitioner further argues that claim 2 of Field recites “receiving a command to restore the file,” and claim 10 of Field recites “a command to restore the volume to the previous state.” *Id.* (citing Ex. 1004, claims 2 and 10). Further, Petitioner asserts that Field discloses that “a user may issue a command to restore the volume to a previous state,” from which an ordinarily skilled artisan would similarly understand that a

user may also issue a command to restore files as opposed to a volume state (in the case that files were previously selected for backup). *Id.* Petitioner also argues that Field discloses that “the backup database is able to identify files that need to be restored to the target computing device when a restore command is issued.” *Id.* (citing Ex. 1004 ¶¶ 9, 10; Ex. 1002 ¶ 71).

(c). [30B.1] referencing a backup inventory for the remote storage medium, wherein the backup inventory for the remote storage medium comprises a list of descriptors associated with electronic data that was resident on the remote storage medium at a point in time prior to receiving the request to perform a restore operation,

Petitioner argues that Field discloses that its “backup database 106 stores files and/or data that represents a volume state on behalf of users who participate in the backup service provided by the present invention.” Pet. 18 (citing Ex. 1004 ¶ 40). Petitioner asserts that as part of Field’s backup process, for files stored in the backup database, Field’s process generates and stores signatures of the files, and these signatures are included in Field’s backup database. *Id.* at 18–19 (citing Ex. 1004 ¶ 37).

Petitioner argues that Field discloses that “[t]he signature of files in the backup database 104 are generated with the same hashing algorithm that was used to generate the signature of the selected file.” Pet. 19 (citing Ex. 1004 ¶ 37). According to Petitioner, Field further explains:

[f]or example, the existing hashing algorithm commonly known ‘SHA-1’ may be used to generate the signature. However, other type of algorithms or functions that are capable of generating a signature from file data may be used to generate the signature used by the module 202 without departing from the scope of the present invention.

Id. (citing Ex. 1004 ¶ 36). Further, Petitioner asserts that Field also discloses that the generated signature “uniquely identifies the file.” *Id.* (citing Ex. 1004 ¶ 37; Ex. 1002 ¶ 73). Petitioner contends that, thus, each file signature provides a “descriptor associated with electronic data.” *Id.* (citing Ex. 1002 ¶ 73).

Petitioner further argues that Field discloses that the backup database “tracks files stored by a trusted source on behalf of a user of the backup service. In this way, the backup database is able to identify files that need to be restored to the target computing device when a restore command is issued.” Pet. 19 (citing Ex. 1004 ¶ 10, claim 1). Petitioner asserts that, for example, Field discloses that “the backup database 104 maintains an entry for each user of the backup service” that, “among other items,” “contains ‘pointers’ to operating system, application program files, and/or user level data that is shared with other users of the backup service.” *Id.* at 19–20 (citing Ex. 1004 ¶ 40). According to Petitioner, these entries can also include other file metadata “identify[ing] the location (e.g., a file path), name, and permissions of files that may be restored by the backup service.” *Id.* at 20 (citing Ex. 1004 ¶ 40). Petitioner argues that, in this manner, the backup database maintains entries for each user that track the files backed up on behalf of that user. *Id.* (citing Ex. 1002 ¶ 74).

Petitioner argues that, accordingly, an ordinarily skilled artisan would have understood that the backup database maintains an “inventory” of the files backed up from a user’s computing device, including information such as the user-specific database entries and associated file signatures for files backed up from a user’s computing device. Pet. 20 (citing Ex. 1002 ¶ 75). Petitioner asserts that, “thus, this information stored in Field’s backup

database provides ‘a backup inventory for the remote storage medium’ that ‘comprises a list of descriptors [(i.e., file signatures)] associated with electronic data.’” *Id.* (citing Ex. 1002 ¶ 75) (emphasis omitted).

Petitioner argues that Field further discloses that “‘a user of the backup service provided by the present invention may automatically backup a computing device at regular intervals’ and, ‘[t]hus, the backup database 104 may contain different versions of the same file(s) and/or volume states representative of data on a computing device at a specific point-in-time.’” Pet. 20 (citing Ex. 1004 ¶ 41) (emphasis omitted). Petitioner asserts that, consequently, at least in this scenario, Field’s backup inventory would represent electronic data (e.g., files) that was resident on the remote storage medium at a point in time prior to receiving the request to perform a restore operation. *Id.* at 20–21 (citing Ex. 1002 ¶ 76).

Petitioner also argues that Field discloses that the backup inventory information stored in Field’s backup database includes the type of data required to restore files and/or a volume state. Pet. 21 (citing Ex. 1004 ¶ 40). According to Petitioner, therefore, an ordinarily skilled artisan would have understood that this information would be referenced as part of Field’s restore process. *Id.* (citing Ex. 1002 ¶ 77; Ex. 1004, claims 2 and 3).

(d). [30B.2] wherein the electronic data comprises actual file data, and wherein a descriptor in the list of descriptors comprises a cryptographic signature computed with the actual file data such that the actual file data is uniquely identified by the descriptor;

Petitioner argues that Field teaches using cryptographic algorithms to generate signatures from actual file data. Pet. 21–22 (citing Ex. 1002 ¶¶ 78–79; Ex. 1004 ¶¶ 36–37). Petitioner further argues that Field’s signatures are

computed with actual file data and uniquely identify a file with their descriptors. *Id.* at 22 (citing Ex. 1002 ¶¶ 78–79; Ex. 1004 ¶ 37).

(e). [30C] retrieving selected electronic data from the backup data storage medium having a descriptor that matches descriptors in the list of descriptors associated with the remote storage medium; and

Petitioner argues that, during Field’s operation to restore files, Field retrieves and transmits files from the backup database that have descriptors that match the descriptors in Field’s backup database that are associated with the remote storage medium. Pet. 23 (citing Ex. 1004 ¶¶ 10, 32, 37; Ex. 1002 ¶ 80). Petitioner asserts that Field discloses that the “computer user may choose to perform a backup in which one or more files will be restored.” *Id.* (quoting Ex. 1004 ¶ 32). Further, Petitioner argues that Field discloses that its backup database tracks files stored by a trusted source on behalf of a user of the backup service, and in this way, the backup database is able to identify files that need to be restored to the target computing device when a restore command is issued. *Id.* (citing Ex. 1004 ¶ 10). Petitioner asserts that each tracked file has an associated file signature (descriptor) stored in Field’s backup database. *Id.* (citing Ex. 1004 ¶ 37). According to Petitioner, because files to be restored must have already been backed up using Field’s backup process, Field teaches that such files, i.e., the list of files tracked for a user by the backup database to be restored, would each have a descriptor that matches descriptors in the list of descriptors associated with the remote storage medium. *Id.* (citing Ex. 1002 ¶ 80).

Petitioner further asserts that claim 2 of Field further discloses restore operations for each file to be restored: “in response to receiving a command to restore the file, transmitting the file from the second computing device to

the first computing device.” Pet. 23–24 (quoting Ex. 1004, claim 2).

Petitioner argues that an ordinarily skilled artisan would have understood that in order to transmit a file from Field’s backup database to the user’s computing device, the file would first need to be retrieved from the backup database for transmission. *Id.* at 24 (citing Ex. 1004, Fig. 1). Petitioner argues that Field teaches performing these restore operations for each of the identified files to be restored. *Id.* (citing Ex. 1004 ¶ 10; Ex. 1002 ¶ 81).

(f). [30D] providing the selected electronic data to the remote storage medium.

Petitioner argues that Field teaches providing selected files to the user’s computing device. Pet. 24 (citing Ex. 1002 ¶ 82; Ex. 1004 ¶ 10). Petitioner quotes the recitation in claim 2 of Field that “in response to receiving a command to restore the file, transmitting the file from the second computing device to the first computing device.” *Id.* (quoting Ex. 1004, claim 2). Petitioner argues that Field’s first computing device is the remote storage medium. *Id.*

ii. Patent Owner Response

In the Patent Owner Response, Patent Owner argues that Field discloses two distinct and separate ways of backing up a storage device as shown in Figure 3, neither of which is a full and complete backup of a storage medium using signatures. PO Resp. 40–41 (citing Ex. 2008 ¶ 112). Patent Owner argues that the first backup method disclosed in Field is a full volume backup where the disk state service is designed to take point-in-time copies of a volume of data. *Id.* at 41–42 (citing Ex. 1004 ¶ 27, Figs. 2, 3; Ex. 2008 ¶¶ 115–117; Ex. 2015, 35:17–24, 40:18–25).

Patent Owner argues that the second type of backup process discussed in Field relates to the backup of individual files. PO Resp. 42 (citing

Ex. 1004, Fig. 3; Ex. 2008 ¶ 118). Patent Owner argues that in Figure 3 of Field, a file is selected for backup and a signature is generated from the file. *Id.* (citing Ex. 1004, Fig. 3; Ex. 2008 ¶ 118). Patent Owner asserts that Field explains that only one signature for one file is transmitted to the trusted source at a time. *Id.* (citing Ex. 2008 ¶ 118). Further, Patent Owner argues that Dr. Shenoy confirmed that only a file signature is transmitted in Field. *Id.* at 42–43 (citing Ex. 2015, 79:8–12). Patent Owner argues that, in Field, it is sufficient to send only the signature, and not include metadata, i.e., filename or directory, since the operating system knows which signature from which file is sent each time. *Id.* at 43 (citing Ex. 2008 ¶ 119). Patent Owner contends that thus, regardless of whether the response is to backup or not backup a file based on the signature, the system knows which file that response is directed to. *Id.* (citing Ex. 2008 ¶ 119).

Patent Owner further argues that Field does not disclose the use of a backup inventory for a restore process. PO Resp. 43 (citing Ex. 2008 ¶ 143). Patent Owner asserts that Field even teaches away from using and transmitting signatures from a backup data storage medium to a remote storage medium during a restore process. *Id.* (citing Ex. 2008 ¶ 144). Patent Owner argues that, instead, for example, claim 2 states “in response to receiving a command to restore the file, transmitting the file from the second computing device to the first computing device.” *Id.* (citing Ex. 1004, claim 2). Patent Owner argues that again, in Field, the selected file is transmitted rather than the selected electronic data having at least one descriptor that was stored in a backup inventory as described and claimed in the '043 patent. *Id.* (citing Ex. 2008 ¶ 144).

Patent Owner argues that, further, Field only discusses restoring files on a one-to-one basis as demonstrated in its claim 2. PO Resp. 44 (citing Ex. 2008 ¶ 145). Patent Owner asserts that, thus, even though Field discusses restoring each identified file, the restoration process is rather lengthy as only one identified file may be restored at a time. *Id.* (citing Ex. 2008 ¶ 145).

Patent Owner argues that, in addition, Field does not teach restoring the directory structure of a client device. PO Resp. 44 (citing Ex. 2008 ¶ 146). Thus, Field can only restore individual files to a remote storage medium that still has enough metadata to know the file names and locations where the files are stored, though even that is not disclosed in Field. *Id.* (citing Ex. 2008 ¶ 146).

Patent Owner argues that, on the other hand, the '043 patent provides for a full restore of a client device including, but not limited to, individual files, portions of files, and directory structures, which is determined by the inventories and descriptors. PO Resp. 44 (citing Ex. 2008 ¶ 147).

iii. Reply

In Petitioner's Reply, Petitioner responds, arguing that Field does teach the use of a backup inventory for a restore process. Pet. Reply 18 (citing Ex. 1004 ¶¶ 10, 40, claim 1). Petitioner argues that Field discloses a backup inventory for a restore process by disclosing that “‘backup database 104 maintains an entry for each user of the backup service,’ which ‘contains “pointers” to operating system, application program files, and/or user level data,’ as well as ‘file metadata “identify[ing] the location (e.g., a file path), name, and permissions of files that may be restored by the backup service.”’” *Id.* (citing Ex. 1004 ¶ 40). Petitioner argues that, thus, an

ordinarily skilled artisan would have understood that Field's backup database maintains an inventory of the files backed up from a user's computing device, including information such as the user specific database entries and associated file signatures for files backed up from a user's computing device. *Id.* (citing Ex. 1002 ¶ 75; Ex. 1024 ¶ 59).

Petitioner also argues that claim 30 (and claim 35) does not recite transmitting signatures/descriptors from the backup storage medium to the client device. Pet. Reply 18–19 (citing Ex. 1024 ¶¶ 60–61). Petitioner also argues that restoring the directory structure of a client device is not a limitation of claim 30 (or of claim 35). *Id.* at 19. Petitioner further argues that Field discloses restoring metadata, including locations where files are stored. *Id.* (citing Ex. 1004 ¶ 40, claim 3; Ex. 1025, 74:19–75:2). Petitioner also argues that whether the restoration process of Field is lengthy is irrelevant. *Id.* (citing Ex. 1024 ¶ 64).

iv. Sur-reply

In its Sur-reply, Patent Owner responds, reiterating its contention that the '043 patent claims require that directory structures be backed up. Sur-reply 16. Patent Owner argues that Field's backup database does not have descriptors that correspond to electronic data and is not used and transmitted by both the storage medium and the backup storage medium. *Id.* at 17. Patent Owner also argues that a backup inventory is not analogous to backup database that maintains an entry for each user of a backup service. *Id.*

b. Discussion

i. Disputed Issues

In light of the parties' arguments, the disputed issues for claim 30 are:
(i) whether Field teaches or suggests a backup inventory for a restore

process, (ii) whether claim 30 requires transmitting signatures/descriptors from the backup storage medium to the client device, (iii) whether the purported length of Field's backup process is relevant, and (iv) whether claim 30 requires restoring the directory structure of a client device. Pet. 15–24; PO Resp. 40–45; Pet. Reply 18–19; Sur-reply 16–17.

First, we find that Field teaches and suggests a backup inventory for a restore process. In Field, backup database 104 maintains an entry for each user of the backup service, which contains pointers to the operating system, application program files, and/or user level data, as well as file metadata identifying the location (e.g., a file path), name, and permissions of files that may be restored by the backup service. Ex. 1004 ¶ 40. This constitutes an itemized list of electronic data, meaning an inventory. *See* Section II.C.3 above; Ex. 1002 ¶ 74. In particular, the operating system, application program files, and user level data are electronic data. Ex. 1002 ¶ 74. The entries maintained by the backup database 104 collectively are an itemized list (they list, by item, the operating system, application program files, and user level data). *Id.*

Field further teaches or suggests using this backup inventory (backup database 104) for a restore operation. Ex. 1002 ¶¶ 71–78. Field teaches that the backup database “tracks files stored by a trusted source on behalf of a user of the backup service. In this way, the backup database is *able to identify files that need to be restored* to the target computing device *when a restore command is issued.*” Ex. 1004 ¶ 10 (emphasis added); Ex. 1002 ¶ 73. Field further discloses that the “backup inventory” information stored in Field's backup database includes the “type of data required to restore files and/or a volume state.” Ex. 1004 ¶ 41; Ex. 1002 ¶ 76. Therefore, an

ordinarily skilled artisan would have understood that this information would be referenced as part of Field's restore process. Ex. 1002 ¶ 77. Further, claim 2 of Field recites "in response to receiving a command to restore the file, transmitting the file from the second computing device to the first computing device." Ex. 1004, claim 2. Further, claim 3 of Field recites, "referencing the backup inventory" information stored in Field's backup database: "wherein the file is restored on the first computing device with the same path, name, and permissions that were associated with the file when transmitted from the first computing device to the second computing device." Ex. 1004, claim 3. These recitations of claims 2 and 3 of Field further teach or suggest using backup database 104 for a restore operation. Ex. 1002 ¶ 76.

As mentioned, Patent Owner contends that Field does not teach the use of a backup inventory for a restore process. PO Resp. 43. To support this contention, Patent Owner argues that Field teaches away from using and transmitting signatures from a backup data storage medium to a remote storage medium during a restore process. *Id.* at 44 (citing Ex. 2008 ¶ 144). Claim 30, however, does not require transmitting signatures from the backup storage medium to the remote storage medium during a restore process.

As mentioned, Patent Owner also argues that Field restores files on a one-to-one basis or purportedly has a long restoration process. PO Resp. 44. Whether Field restores files on a one-to-one basis or has a lengthy restoration process, however, is irrelevant to whether backup database 104 is a backup inventory used in a restore process. Ex. 1024 ¶ 64. Patent Owner provides no reason why backup database 104 cannot be used as a backup

inventory even if files are sent on a one-on-one basis or in a lengthy restore process.

As mentioned, Patent Owner also argues that Field does not teach restoring the directory structure of a client device. PO Resp. 44 (citing Ex. 2008 ¶ 146). Claim 30 does not recite restoring the directory structure of a client device, and we did not adopt Patent Owner’s proposed construction for “inventory” that requires an inventory include the directory structure of files. PO Resp. 22; *see* Section II.C above.

Thus, we resolve the disputed issues concerning claim 30 in favor of Petitioner.

ii. Undisputed Issues

For the portions of Petitioner’s showing that were not directed to the disputed issues above, we have reviewed Petitioner’s arguments and cited evidence and find that Petitioner has proven that Field teaches or suggests the preamble and every limitation of claim 30. Pet. 15–28 (and the exhibits cited therein). Thus, we determine that Petitioner has proven that claim 30 would have been obvious over Field.

3. Claim 35

Claim 35 sets forth limitations that are similar to those in claim 30.¹⁹ Ex. 1001, 22:51–23:8. In the Petition, Petitioner sets forth how Field teaches or suggests the preamble and each limitation of claim 35. Pet. 25–28. In the Patent Owner Response, Patent Owner argues claims 30 and 35 together. PO Resp. 43–45. In Petitioner’s Reply and in Patent Owner’s Sur-

¹⁹ The preamble of claim 35 recites “a device for managing an electronic data backup system.” Ex. 1001, 22:51–52.

reply, Petitioner and Patent Owner also argue claims 30 and 35 together. Pet. Reply 18–19; Sur-reply 14–16.

Thus, the disputed issues for claim 35 are the same as for claim 30. As set forth above, we resolved those disputed issues in favor of Petitioner. For the portions of the preamble and limitations of claim 35 that are not recited in claim 30, we have reviewed Petitioner’s arguments and evidence for claim 35 and are persuaded that Field teaches or suggests the preamble and claim limitations. Pet. 25–28 (and the exhibits cited therein). Thus, we find that Field teaches or suggests all limitations of claim 35. Accordingly, we determine Petitioner has proven that claim 35 would have been obvious over Field.

4. Claims 31 and 36

Claim 31 depends from claim 30 and recites:

receiving a second inventory from the remote storage medium, wherein the second inventory for the remote storage medium comprises a list of descriptors associated with electronic data currently resident on the remote storage medium (“limitation 31A”); and

removing the electronic data corresponding to descriptors included in the second inventory from the selected electronic data prior to providing the selected electronic data to the remote storage medium (“limitation 31B”).

Ex. 1001, 22:29–38. Claim 36 depends from claim 35 and also recites limitations 31A and 31B. *Id.* at 23:9–18. For our analysis of claims 31 and 36, we focus on limitation 31B, which is disputed by the parties.

In the Petition, Petitioner argues that Field teaches limitation 31B. Pet. 28. Petitioner asserts that Field discloses that a “user may interact with [a] user interface and identify the files that will be capable of being restored,” and “a user may restore the volume state or file to any one of a

number of available versions.” *Id.* at 29 (quoting Ex. 1004 ¶ 32). Petitioner asserts that, based on this disclosure, an ordinarily skilled artisan would have understood that the user could select only to restore files that are not currently resident on the client device. *Id.* at 29–30 (citing Ex. 1002 ¶ 85). Petitioner argues that this aligns with the purpose of file restoration, which is generally not needed for files currently resident on a user’s computer. *Id.* at 30 (citing Ex. 1002 ¶ 85). Petitioner contends that, thus, files selected to be restored could exclude the electronic data corresponding to descriptors included in the second inventory. *Id.* (citing Ex. 1002 ¶ 85). Additionally, according to Petitioner, an ordinarily skilled artisan would have understood that using the process taught by Field, a user could choose to restore files from a particular backup (e.g., “any one of a number of available versions”), which would exclude files not included in that backup. *Id.* (citing Ex. 1002 ¶ 86). Petitioner contends that thus, as part of the selection of files to be restored, Field’s process “remov[es] the electronic data corresponding to descriptors included in the second inventory from the selected electronic data,” which occurs “prior to providing the selected electronic data to the remote storage medium.” *Id.* (citing Ex. 1002 ¶ 86).

In the Patent Owner Response, Patent Owner argues that Field does not teach limitation 31B. PO Resp. 45–46. Patent Owner argues that removing electronic data should be performed at the backend side of the system. *Id.* (citing Ex. 2008 ¶ 148).

In Petitioner’s Reply, Petitioner argues that claims 31 and 36 do not require that the removal of electronic data be performed on the backend side. Pet. Reply 19 (citing Ex. 1001, claims 31, 36; Ex. 1024 ¶¶ 65–66). Petitioner further argues that selecting to restore only files that are not

currently resident on the client device removes electronic data as required by the claims. *Id.* at 19–20 (citing Ex. 1024 ¶¶ 65–66).

In Patent Owner’s Sur-reply, Patent Owner argues that in order to determine the electronic data to restore that is not already on the client device requesting the restore, the backup data storage medium (backend side) has to remove the electronic data that corresponds to the descriptors already stored on the client device to avoid the restoration of duplicated data. Sur-reply 17–18.

We find that Petitioner has not proven that Fields teaches, suggests, or otherwise renders obvious limitation 31B. The limitation requires the electronic data corresponding to descriptors that are included *in a second inventory be removed*. Petitioner has not shown that any such electronic data is removed from a second inventory. Petitioner, in fact, does not identify anything in Field that purportedly constitutes the second inventory from which the recited electronic data is removed. Pet. 28–30; Ex. 1002 ¶¶ 84–86; Pet. Reply 19–20; Ex. 1024 ¶¶ 65–66. As limitation 31A sets forth, the recited second inventory is received from the remote storage medium. Petitioner has not identified what constitutes that second inventory received from the remote storage medium. Pet. 28–30; Ex. 1002 ¶¶ 84–86; Pet. Reply 19–20; Ex. 1024 ¶¶ 65–66. Petitioner also has not identified how electronic data corresponding to the descriptors contained in that inventory are *removed*. Pet. 28–30; Ex. 1002 ¶¶ 84–86; Pet. Reply 19–20; Ex. 1024 ¶¶ 65–66. Petitioner merely indicates that a user could decide not to restore certain files, but that is not what is recited in limitation 31B. Pet. 28–30;

Ex. 1002 ¶¶ 85–86; Pet. Reply 19–20; Ex. 1024 ¶¶ 65–66.²⁰ Limitation 31B requires removing electronic data from the received second inventory, not merely deciding not to restore particular files.

Thus, we determine that Petitioner has not proven that claims 31 and 36 would have been obvious over Field.

5. Claims 32 and 37

Claim 32 depends from claim 30 and recites:

wherein at least one electronic file from the selected electronic data was originally uploaded to the backup data storage medium by a second remote storage medium that is different than the remote storage medium (“limitation 32A”).

Ex. 1001, 22:39–42. Claim 37 depends from claim 35 and recites:

wherein at least one electronic file from the selected electronic data was originally uploaded to the backup data storage medium by a second remote storage medium that is different from the remote storage medium which transmitted the request to perform a restore operation (“limitation 37A”).

Id. at 23:19–23. As indicated above, limitation 37A adds the following clause to limitation 32A: “which transmitted the request to perform a restore operation.”

²⁰ At oral argument, Petitioner provided arguments regarding how Field might teach removing electronic data. *See, e.g.*, Tr. 44–50, 122–27. Some of the arguments, however, are not reflected in Petitioner’s briefing or cited expert testimony. We limit our consideration of the arguments at the oral hearing to those that are reflected in the briefing and cited expert testimony, which we have addressed here. *See* Consolidated Office Trial Practice Guide (Nov. 2019), <https://www.uspto.gov/about-us/news-updates/consolidated-trial-practice-guide-november-2019>, 85–86; Paper 27, 3.

In the Petition, Petitioner argues that Figure 4 of Field shows that files previously submitted to the trusted source come from multiple clients.

Pet. 30–31. Petitioner further argues that Field discloses that “the backup database 106 stored files and/or data that represents a volume state on behalf of users who participate in the backup service provided by the present invention.” *Id.* at 31 (quoting Ex. 1004 ¶ 40). Further, Petitioner asserts that the entire point of Field is to reduce the amount of data that needs to be transmitted to and stored by the backup database. *Id.* (citing Ex. 1002 ¶ 89). Petitioner quotes Field’s disclosure that:

a high percentage of files on the target computing device 104 may already be stored in the backup database 106. Thus, the optimization performed by the present invention determines whether a file that was submitted for backup by the target computing device 104 is already stored in the backup database 106.

Ex. 1004 ¶ 24 *quoted by* Pet. 31. Petitioner argues that, therefore, an ordinarily skilled artisan would have understood data already stored in Field’s backup database would have often come from another user’s client device backing up the same data. Pet. 31–32 (citing Ex. 1002 ¶ 90).

In the Patent Owner Response, Patent Owner argues that there is no support for Petitioner’s argument that an ordinarily skilled artisan “would have understood that data already stored in Field’s backup database would have often come from another user’s client device backing up the same data as part of its backup operation.” PO Resp. 47 (citing Pet. 31–32; Ex. 2008 ¶ 154). Patent Owner argues that if a user backs up his or her computer regularly, it is often the user’s data that is already in the backup storage medium. *Id.* (citing Ex. 2008 ¶ 154). Patent Owner further argues that, for a

shared OS or application code, there is one copy that can be accessed by multiple client devices. *Id.*

In its Reply, Petitioner argues that, in Field, user data can be shared with other users. Pet. Reply 20 (citing Ex. 1024 ¶ 68). Petitioner asserts that Field discloses user-level data that is shared with other users of the backup service. *Id.* (citing Ex. 1004 ¶ 40; Ex. 1024 ¶ 68; Ex. 1025, 143:3–5). Petitioner also argues that Field teaches that “files that implement the functionality of the operating system may be provided by a software vendor” or by “an individual user who participates in the backup service.” *Id.* at 21 (quoting Ex. 1004 ¶ 24). Petitioner argues that, in both cases, the files are uploaded by a remote storage medium different from the one that is requesting the restore operation. *Id.* (citing Ex. 1024 ¶ 69).

Patent Owner does not address claims 32 and 37 in its Sur-reply.

We find that Field teaches limitations 32A and 37A. Field discloses that:

a high percentage of files on the target computing device 104 may already be stored in the backup database 106. Thus, the optimization performed by the present invention determines whether a file that was submitted for backup by the target computing device 104 is already stored in the backup database 106.

Ex. 1004 ¶ 24. Field further discloses “user level data that is shared with other users of the backup service.” *Id.* Field teaches that “files that implement the functionality of the operating system may be provided by a software vendor” or by “an individual user who participates in the backup service.” *Id.* (quoting Ex. 1004 ¶ 24). We find that these combined disclosures teach or at least suggest “wherein at least one electronic file from the selected electronic data was originally uploaded to the backup data

storage medium by a second remote storage medium that is different from the remote storage medium which transmitted the request to perform a restore operation.” Ex. 1002 ¶ 90.

As mentioned, Patent Owner argues that if a user backs up his or her computer regularly, it is often the user’s data that is already in the backup storage medium. PO Resp. 47 (citing Ex. 2008 ¶ 154). Even if data on the backup storage medium includes the data of the user performing the restore, that does not preclude a user from obtaining via a restore operation a file that was not provided by that user to the backup storage medium (e.g., shared data or operating system files). Ex. 1002 ¶¶ 86–89; Ex. 1024 ¶¶ 67–69. Thus, although in Field files that were provided to the backup storage medium by the user performing the restore could be the subject of the restore, Field also teaches that the files recited by limitations 32A and 37A could also be restored as part of that process. Ex. 1002 ¶¶ 86–89; Ex. 1024 ¶¶ 67–69.

As mentioned, Patent Owner also argues that, for a shared OS or application code, there is one copy that can be accessed by multiple client devices. PO Resp. 47 (citing Ex. 2008 ¶ 154). Even if this were correct, Field teaches or suggests that that copy can be obtained in a restore operation by a user who did not provide that copy to the backup storage medium. Ex. 1002 ¶¶ 86–89; Ex. 1024 ¶¶ 67–69.

Thus, we find that Petitioner has proven that Field teaches or suggests limitations 32A and 37A. Accordingly, we determine that Petitioner has proven that claims 32 and 37 would have been obvious over Field.

6. Claim 33

Claim 33 depends from claim 32. Ex. 1001, 22:39–42. Patent Owner does not separately argue claim 33 from claim 32. We have reviewed Petitioner’s arguments and evidence regarding the limitation that claim 33 adds to claim 32 and are persuaded that Petitioner has shown that Field teaches or suggests that limitation. *See* Pet. 32–33 (and exhibits cited therein). Thus, we determine that Petitioner has proven that claim 33 would have been obvious over Field.

7. Claim 34

Claim 34 depends from claim 22. Ex. 1001, 22:47–50. In the Petition, Petitioner argues that claim 34’s dependence from claim 22 might have been a typographical error and that Applicant may have intended for claim 34 to depend from claim 32. Pet. 33–34. Petitioner addresses both options. In related case IPR2020-01037, Petitioner argues that claim 34 would have been obvious as currently written (i.e., depending from claim 22). In the instant Petition, Petitioner argues that claim 34 would have been obvious if the dependency were changed to claim 32. *Id.* We gave Patent Owner the opportunity to move to petition the Director to correct the alleged typographical error in claim 34 if Patent Owner believed that claim 34 had such an error. Inst. Dec. 39. Patent Owner did not file such a petition. Therefore, here, we accept claim 34 as written.

Because, as written, claim 34 depends from claim 22, not claim 32, Petitioner’s showing in this proceeding—that claim 34 would have been obvious if it depended from claim 32—is insufficient because Petitioner does not address the limitations of claim 22 or claim 15 (from which

claim 22 depends). Thus, we determine that, in this proceeding, Petitioner has not proven that claim 34 would have been obvious over Field.²¹

8. Claim 39

Claim 39 depends from claim 35 and recites “wherein the cryptographic signature is computed without the metadata (“limitation 39A”). Ex. 1001, 23:26–27.

In the Petition, Petitioner argues that Field discloses that cryptographic algorithms such as “SHA-1” and “other type[s] of algorithms or functions that are capable of generating a signature from file data may be used to generate the signature used by the module 202 without departing from the scope of the present invention.” Pet. 33 (quoting Ex. 1004 ¶ 36). Petitioner asserts that an ordinarily skilled artisan would have understood that algorithms, such as SHA-1 are typically executed based on a file’s content, i.e., “computed without the metadata.” *Id.* (emphasis omitted) (quoting Ex. 1002 ¶ 108). Petitioner contends that Anderson discloses the same “secure hash algorithm (e.g., SHA-1)” that is used in Field, which Anderson explains provides “a signature value characterizing the specific article’s content.” *Id.* (emphasis omitted) (citing Ex. 1002 ¶ 108; Ex. 1005 ¶ 42).

In the Patent Owner Response, Patent Owner argues that the restore operation disclosed in Field does not teach or suggest using and transmitting signatures for a complete restore of a remote storage medium. PO Resp. 47–48 (citing Ex. 2008 ¶ 162). Patent Owner also argues that the restore operation in Field fails to disclose a backup inventory that contains a list of

²¹ In IPR2020-01037, we address Petitioner’s contention that claim 34 (as written) would have been obvious over Field and Anderson.

descriptors that comprise cryptographic signatures computed with actual file data, which descriptors are used to determine the electronic data to restore. *Id.* at 48 (citing Ex. 2008 ¶ 162). Patent Owner contends that, as Field does not teach or suggest a restore operation having a backup inventory containing descriptors comprised of cryptographic signatures, it cannot teach the limitation of claim 39 where the same cryptographic signatures are computed without metadata. *Id.* (citing Ex. 2008 ¶ 162).

In Petitioner's Reply, Petitioner argues that neither claim 39 nor claim 35, from which claim 39 depends, requires a complete restore. Pet. Reply 21. Petitioner also argues that Patent Owner does not dispute that Field discloses signatures computed without metadata. *Id.* at 22.

Patent Owner does not address claim 39 in its Sur-reply.

We find that Petitioner has proven that Field teaches or suggests limitation 39A. As Petitioner notes, Field discloses that "SHA-1" and "other type[s] of algorithms or functions that are capable of generating a signature from file data may be used to generate the signature used by the module 202." Ex. 1004 ¶ 36. We credit Dr. Shenoy's testimony that an ordinarily skilled artisan would have understood that algorithms such as SHA-1 are typically executed based on a file's content, i.e., computed without the metadata. Ex. 1002 ¶ 107 (citing Ex. 1005 ¶ 42).

As for Patent Owner's argument that Field does not teach or suggest a backup inventory that contains a list of descriptors that comprise cryptographic signatures computed with actual file data, we disagree. Field teaches that backup module 202 generates signatures that are compared to the signatures that are available to the trusted source. Ex. 1004 ¶ 35. As mentioned, Field further teaches that backup module 202 uses the algorithm

SHA-1 to generate those signatures. *Id.* ¶ 36. Algorithms, such as SHA-1 are cryptographic hash algorithms. Ex. 1002 ¶ 78. Further, Field teaches that “[t]he signatures of files in the backup database 104 are generated with the same hashing algorithm that was used to generate the signature of the selected file.” Ex. 1004 ¶ 37. Further, Field teaches or suggests using actual file data to generate these signatures. Field teaches that its generated signature uniquely identifies the file. *Id.* Field further teaches that in addition to SHA-1, “other type of algorithms or functions that are capable of generating a signature *from file data* may be used to generate the signature.” *Id.* ¶ 36. Further, we credit Dr. Shenoy’s testimony that SHA-1 is commonly used to generate a signature from file or data content. Ex. 1002 ¶ 78. We credit Dr. Shenoy’s testimony that these disclosures in Field teach a backup inventory that contains a list of descriptors that comprise cryptographic signatures computed with actual file data. *Id.*

Regarding Patent Owner’s argument that Field does not teach a complete restore, claims 39 and 35 (from which claim 39 depends) do not require a complete restore of a remote storage medium.

Thus, we find that Petitioner has shown that Field teaches or suggests limitation 39A. Accordingly, we determine that Petitioner has proven that claim 39 would have been obvious over Field.

C. Asserted Obviousness over Field and Anderson

Petitioner asserts that claim 38 would have been obvious over Field and Anderson. Pet. 5.

1. Anderson

Anderson is directed to “a method and apparatus for differential bandwidth-efficient and storage-efficient backup and restoration.” Ex. 1005

¶ 12. Anderson describes backing up “articles,” such as “user data, (e.g., text, photos, music, movies, etc.), applications . . . command scripts, byte codes, [and] configuration data.” *Id.* ¶ 15.

Figure 9 of Anderson is reproduced below:

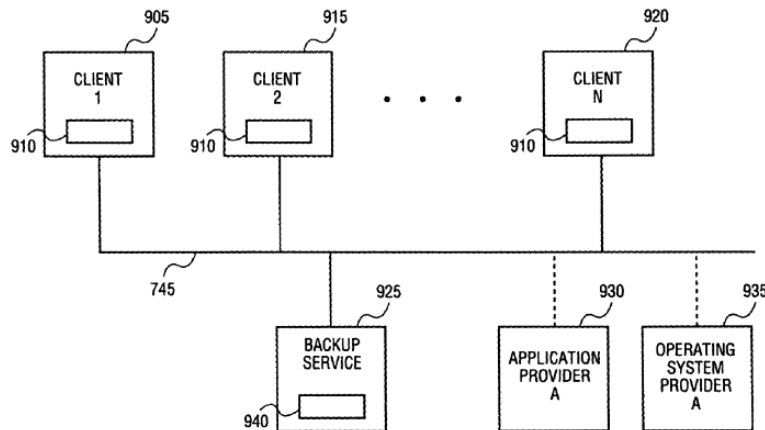


FIG. 9

Figure 9 above illustrates an embodiment where multiple clients (1–N) can connect with backup service system 925. Ex. 1005 ¶ 11.

When backing up data, the client generates a content identifier (CI) for each article that is stored on the client system. Ex. 1005 ¶ 63. A content identifier includes a signature of the article’s contents. *Id.* ¶ 42. A signature value characterizing the specific article’s content is generated using a well known cryptographic hash algorithm, e.g., a “secure hash algorithm” such as “SHA-1.” *Id.* ¶ 42. “By using one or more content-signaturing mechanisms to generate CI values, the CI uniquely identifies, for all practical purposes, the contents of a particular article, not just on the user’s system, but across the sample space of all computer systems.” *Id.* ¶ 43.

Anderson explains that after a client generates a CI for each article stored on the client system:

The client's system transmits the CIs to the backup service. Since these CIs identify articles uniquely, the backup service can determine whether a CICD [Client-Invariant Content Descriptor²²] corresponding to the CI exists on the backup service's designated storage device. If the backup service determines that it already has a CICD for an article's CI, there is no need for the client system to upload the article contents for backup on the server. If the CICD is not present on the backup service's designated storage device, the client transfers the article's contents and possibly additional data, to the backup service.

Id. at ¶ 63.

2. Claim 38

Claim 38 depends from claim 35 and further recites “the cryptographic signature is also computed with the metadata” (“limitation 38A”). Ex. 1001, 23:24–25.

a. Parties' Arguments

In the Petition, Petitioner argues that Field discloses generating signatures of files selected for backup using cryptographic algorithms. Pet. 41 (quoting Ex. 1004 ¶ 36). Petitioner further argues that Field discloses that the signatures of files in the backup database 104 are generated with the same hashing algorithm that was used to generate the signature of the selected file. *Id.* (quoting Ex. 1004 ¶ 37). Petitioner argues that an ordinarily skilled artisan would understand that the file data from which the signature was generated can include both file content and

²² A Client-Invariant Content Descriptor “includes a CI, article contents and can also include commonly shared metadata (e.g., article location (e.g., path name), access permissions, article size, etc.). In one embodiment, a content signaturing mechanism identifier is included in [a] CICD . . . to reflect the algorithm used to generate the CI.” Ex. 1005 ¶ 57.

metadata. *Id.* (citing Ex. 1002 ¶ 138). Petitioner argues that Anderson discloses the use of cryptographic signatures that take into account both file data and file metadata. *Id.* at 41–42 (citing Ex. 1005 ¶ 42). Petitioner further argues that Anderson discloses incorporating metadata into its signature-generating algorithm to create a more robust signature. *Id.* at 42 (quoting Ex. 1005 ¶ 46). Petitioner further argues that an ordinarily skilled artisan would have been motivated to use Anderson’s augmented signature-generating algorithm in relatively large environments in which many different clients and files were subject to the backup process, such as in a large enterprise environment as discussed by Field. *Id.* (citing Ex. 1002 ¶¶ 138–139; Ex. 1004 ¶ 40).

Petitioner further argues that both Field and Anderson are directed to efficient data backup across multiple client devices. Pet. 38 (citing Ex. 1004, code (57); Ex. 1005 ¶ 12). Petitioner further argues that both Field and Anderson disclose similar processes for backing up files, including selecting files to be backed up on a client device, generating content signatures for files based on file data, determining whether files to be backed up are already stored at a backup device, and obviating the need to send file content to the backup device when the file content has already been previously transmitted by the same or a different client device. *Id.* (citing Ex. 1004 ¶¶ 31–41, Fig. 3; Ex. 1005 ¶¶ 63, 94–106; Ex. 1002 ¶¶ 122–31).

Petitioner further argues that an ordinarily skilled artisan would have been motivated to include file metadata as an input to Field’s signature-generating algorithm in certain implementations, in addition to the file content. Pet. 39 (citing Ex. 1002 ¶ 132).

In the Patent Owner Response, Patent Owner argues that Field fails to disclose a backup inventory that contains a list of descriptors, which comprise cryptographic signatures computed with actual file data, that are used to determine the electronic data to restore. PO Resp. 53 (citing Ex. 2008 ¶ 159). Patent Owner argues that the restore operation disclosed in Field does not teach or suggest using and transmitting signatures for a complete restore of a remote storage medium and thus cannot teach limitation 38A. *Id.* (citing Ex. 2008 ¶ 159).

Patent Owner also argues that just because Field and Anderson are in the same general field does not mean that it would have been obvious to combine them. PO Resp. 52 (citing Ex. 2008 ¶ 111). Patent Owner asserts that Field and Anderson discuss different backup processes, which undermines Petitioner's motivation to combine their teachings. *Id.* (citing Ex. 2008 ¶ 112). According to Patent Owner, Anderson is designed to perform a full backup system using file signatures, e.g., content identifiers that identify multiple articles. *Id.* (citing Ex. 2008 ¶ 112). Patent Owner argues that, on the other hand, Field teaches two distinct and separate ways of backing up a storage device, neither of which is a full and complete backup of a storage medium using signatures. *Id.* (citing Ex. 2008 ¶ 112).

Patent Owner also argues that Petitioner's proffered motivation to combine is weak because there is no suggestion in Field of any concern for the robustness of a signature. PO Resp. 54 (citing Ex. 2008 ¶ 160). Patent Owner argues that instead Petitioner teaches a file-by-file backup process that selects only one file at a time. *Id.* (citing Ex. 2008 ¶ 160). Patent Owner argues that this means there is only one file signature generated from that file to compare to the signatures already stored on the trusted source.

Id. (citing Ex. 2008 ¶ 160; Ex. 1004 ¶ 2). According to Patent Owner, computing a cryptographic signature with metadata is unnecessary in Field, and there is no motivation to add this step in view of Field’s technological solution. *Id.* (citing Ex. 2008 ¶ 160).

In Petitioner’s Reply, Petitioner argues that Field need not expressly disclose the modification to modify it. Pet. Reply 23. Petitioner also argues that it is irrelevant whether Field backs up files one at a time because Field’s backup process still applies to large environments where many different clients and files are involved, like Anderson’s. *Id.* In such environments, Petitioner argues that augmenting Field’s signature-generating algorithm with content-related metadata, as disclosed in Anderson, improves collision resistance while still preventing duplicate data from being stored. *Id.* at 23–24 (Ex. 1024 ¶¶ 71–72).

In its Sur-reply, Patent Owner does not address claim 38.

b. Discussion

i. Combination of Field and Anderson

We find that an ordinarily skilled artisan would have been motivated to combine Field and Anderson in the manner proposed by Petitioner and would have had a reasonable expectation of success in so doing.

Both Field and Anderson are in the same general field of electronic data backup and restoration, and both specifically address problems of processing and network efficiency. Ex. 1004, code (57), ¶ 23 (“[T]he present invention performs optimizations designed to reduce the amount of time and network bandwidth required to backup a computing device.”), ¶ 38 (“[T]he remote backup module 202 is able to backup data using less network bandwidth and other resources than is found in the prior art.”); Ex. 1005 ¶ 12

(“The Embodiments discussed herein generally relate to a method and apparatus for differential bandwidth-efficient and storage-efficient backup and restoration.”); Ex. 1002 ¶ 135.

Both Field and Anderson are directed to efficient data backup across multiple client devices. Ex. 1004, code (57); Ex. 1005 ¶ 12. Field and Anderson disclose similar processes for backing up files, including selecting files to be backed up on a client device, generating content signatures for files based on file data, determining whether files to be backed up are already stored at a backup device, and obviating the need to send file content to the backup device when the file content was previously transmitted by the same or a different client device. *See* Ex. 1004 ¶¶ 31–41, Fig. 3; Ex. 1005 ¶¶ 63, 94–106; Ex. 1002 ¶¶ 122–131. An ordinarily skilled artisan would have naturally looked to Anderson for additional implementation details for Field’s backup and restore processes. Ex. 1002 ¶ 134.

Although Field discloses that its file signatures are generated “from file data,” (Ex. 1004 ¶ 36), Field does not disclose whether that file data is only file content, or metadata in addition to the file content. Ex. 1002 ¶ 132. Based on the teachings of Anderson, an ordinarily skilled artisan would have been motivated to include file metadata as an input to Field’s signature-generating algorithm in certain implementations, in addition to the file content. *Id.*

Anderson discloses the use of signature algorithms that take into account both file data and file metadata. Anderson discloses that its CIs for articles (e.g., files) are “generated using a cryptographic hash algorithm, such as a message digest algorithm (e.g., MD5) or secure hash algorithm (e.g., SHA-1). Ex. 1002 ¶ 132. Anderson further discloses incorporation of

metadata into its signature-generating algorithm to create a more robust signature:

[f]or example, a content signature generated by an MD5 secure hash algorithm may be augmented with article size information (appropriately formatted by a content signaturing mechanism) to produce a more robust CI. It is preferable to employ a CI derived only from the contents (e.g., cryptographic hash of the article contents) or metadata concerning the contents (e.g., content length).

Ex. 1005 ¶ 46; Ex. 1002 ¶ 132.

An ordinarily skilled artisan would recognize that augmenting the signature-generating algorithm with metadata such as file size creates a more robust signature, reducing the potential for signature value collisions.

Ex. 1002 ¶ 133. Further, an ordinarily skilled artisan would have been motivated to use such an augmented signature generating algorithm in relatively large environments in which many different clients and files were subject to the backup process. *Id.* This would motivate an ordinarily skilled artisan to use such signatures in Field's embodiment in which: "the present invention is implemented in an enterprise-type organization." Ex. 1004 ¶ 43; Ex. 1002 ¶ 133. An ordinarily skilled artisan would have had a reasonable expectation of success implementing such a signature-generating algorithm in Field because this would involve nothing more than employing the well-known hashing techniques, disclosed in both Field and Anderson, using certain metadata along with file content as inputs to the cryptographic hash algorithm, which was within the skill of an ordinarily skilled artisan. Ex. 1002 ¶ 133.

As discussed above, Patent Owner contends that just because Field and Anderson are in the same general field does not mean that it would have

been obvious to combine them. PO Resp. 52 (citing Ex. 2008 ¶ 111).

Although we accept that contention, Petitioner has not merely shown that Field and Anderson are in the same general field. Petitioner has shown that Field and Anderson specifically address problems of processing and network efficiency. Ex. 1004, code (57), ¶¶ 23, 38; Ex. 1005 ¶ 12; Ex. 1002 ¶ 135.

Petitioner has further shown both are directed to data backup across multiple client devices. Ex. 1004, code (57); Ex. 1005 ¶ 12; Ex. 1002 ¶ 135.

Petitioner has also shown that Field and Anderson disclose similar processes for backing up files, including selecting files to be backed up on a client device, generating content signatures for files based on file data, determining whether files to be backed up are already stored at a backup device, and obviating the need to send file content to the backup device when the file content was previously transmitted by the same or a different client device. Ex. 1002 ¶ 135. Further, Petitioner has provided a specific motivation for modifying Field based on Anderson's teachings: augmenting Field's signature-generating algorithm with metadata such as file size creates a more robust signature, reducing the potential for signature value collisions. *Id.* ¶ 132.

As discussed above, Patent Owner argues that Field and Anderson discuss different backup processes, which allegedly undermines Petitioner's motivation to combine their teachings. PO Resp. 52–53 (citing Ex. 2008 ¶ 112). Patent Owner argues that Anderson is designed to perform a full backup system using file signatures, e.g., content identifiers that identify multiple articles, whereas Field teaches two distinct and separate ways of backing up a storage device, neither of which is a full and complete backup of a storage medium using signatures. *Id.* at 53 (citing Ex. 2008 ¶ 112). We

do not agree, however, that an ordinarily skilled artisan would view the teachings of Anderson as inapplicable to Field because Anderson is directed to a full backup system using file signatures and Field's full backup system purportedly does not use signatures.

The motivation to modify Field to produce more robust signatures does not depend on whether a full backup is performed or a partial backup is performed. It has to do with the fact that Field is disclosed as applicable to large organizations that could have many different clients and files, like Anderson, and for that reason augmenting Field's signature generating algorithm with content-related metadata, as disclosed in Anderson, would improve collision resistance and prevent duplicate data from being stored. Ex. 1024 ¶¶ 70–72; Ex. 1005 ¶ 46. Further, we do not agree that Anderson's backup system can only perform full backups. Anderson discloses backing up a contour that “can comprise every article on the client device *or a proper subset of articles* on the client device.” Ex. 1005 ¶ 19 (emphasis added); Ex. 1024 ¶ 45.

As discussed above, Patent Owner argues there is no suggestion in Field of any concern for the robustness of a signature and that Field teaches a file-by-file backup process that selects only one file at a time. PO Resp. 54 (citing Ex. 2008 ¶ 160). Patent Owner argues that the latter means that there is only one file signature generated from that file to compare to the signatures already stored on the trusted source and computing a cryptographic signature with metadata is unnecessary in Field, and there is no motivation to add this step in view of Field's technological solution. *Id.* (citing Ex. 2008 ¶ 160; Ex. 1004 ¶ 2). We disagree. Field does not need to suggest the use of a more robust signature for Petitioner's proposed

combination; Anderson does that. Further, Petitioner’s proffered motivation to modify Field to provide a more robust signature does not depend on any simultaneous transmission of signatures. Ex. 1024 ¶¶ 70–72. It has to do with the fact that Field is disclosed as applicable to large organizations that would have many different clients and files, like Anderson’s, and for that reason augmenting Field’s signature generating algorithm with content-related metadata, as disclosed in Anderson, would improve collision resistance and prevent duplicate data from being stored. *Id.*; Ex. 1005 ¶ 46.

We find that an ordinarily skilled artisan would have been motivated to combine Field and Anderson in the manner proposed by Petitioner and would have had a reasonable expectation of success in so doing. Ex. 1002 ¶¶ 120–134; Ex. 1024 ¶¶ 43–58.

ii. Limitation 38A

We find that Field and Anderson teach limitation 38A, which, as mentioned, reads “the cryptographic signature is also computed with the metadata.” Ex. 1001, 23:24–25.

Field discloses generating signatures of files selected for backup using cryptographic algorithms:

In an exemplary embodiment of the present invention, a hashing algorithm is used, at block 308, to process the selected file and generate the signature. For example, the existing hashing algorithm commonly known “SHA-1” may be used to generate the signature. However, other type[s] of algorithms or functions that are capable of generating a signature from file data may be used to generate the signature used by the module 202 without departing from the scope of the present invention.

Ex. 1004 ¶ 36. Field also discloses that “[t]he signatures of files in the backup database 104 are generated with the same hashing algorithm that was used to generate the signature of the selected file.” *Id.* ¶ 37. An ordinarily

skilled artisan would have understood that the “file data” from which the signature is generated can include both file content and file metadata.

Ex. 1002 ¶ 138. As discussed above, Anderson discloses the use of cryptographic signature algorithms that take into account both file data and file metadata. Ex. 1002 ¶ 138. Anderson discloses that its CIs for articles (e.g., files) are “generated using a cryptographic hash algorithm, such as a message digest algorithm (e.g., MD5) or secure hash algorithm (e.g., SHA-1). In this embodiment using well-known cryptographic hash algorithms, a signature value characterizing the specific article’s content is generated.” Ex. 1005 ¶ 42.

As discussed above, Anderson further discloses incorporation of metadata into its signature generating algorithm to create a more robust signature. Ex. 1005 ¶ 46. An ordinarily skilled artisan would have been motivated to use such an augmented signature generating algorithm in Field’s environment. Ex. 1002 ¶¶ 138–139; Ex. 1004 ¶ 40. Thus, an ordinarily skilled artisan would have modified Field’s cryptographic signature generating algorithm so it would compute a file’s signature using a file’s metadata. Ex. 1002 ¶¶ 138–139; Ex. 1004 ¶ 40. Accordingly, Field and Anderson disclose that “the cryptographic signature is also computed with the metadata.” Ex. 1002 ¶¶ 138–139; Ex. 1004 ¶ 40.

As discussed above, Patent Owner argues that the restore operation in Field fails to disclose a backup inventory that contains a list of descriptors that comprise of cryptographic signatures computed with actual file data and that are used to determine the electronic data to restore. PO Resp. 53 (citing Ex. 2008 ¶ 159). Patent Owner asserts that as Field does not teach or even suggest a restore operation having a backup inventory containing descriptors

comprised of cryptographic signatures, it cannot teach the limitation where the same cryptographic signatures are computed with metadata. *Id.* (citing Ex. 2008 ¶ 159). As set forth in Section III.B.2 above, we find that Field does teach a backup inventory that contains a list of descriptors that comprise cryptographic signatures computed with actual file data and that backup inventory is used to determine electronic data to restore.

As discussed above, Patent Owner also argues that the restore operation disclosed in Field does not teach or suggest using and transmitting signatures for a complete restore of a remote storage medium. PO Resp. 53 (citing Ex. 2008 ¶ 153). Neither claim 38, nor claim 35 from which claim 38 depends, however, recites a complete restore.

We find that Petitioner has proven that Field and Anderson teach limitation 38A. Thus, we find that Petitioner has proven that claim 38 would have been obvious over Field and Anderson.

D. Asserted Obviousness over Field, Anderson, and Coombs

Petitioner asserts that claim 40 would have been obvious over Field, Anderson, and Coombs. Pet. 5.

1. Coombs

Coombs is directed to “[a] method and system of data backup for a computer system.” Ex. 1006, code (57). Coombs discloses that its disclosure “relates to the backup of data in a data processing system, including backup data management and restore.” *Id.* ¶ 2.

Coombs discloses periodic full and incremental backups of user files. Ex. 1006 ¶ 35. For example, Coombs discloses that:

An incremental backup is a copy at a particular point in time of data files to be backed up from primary storage device 22 and that were changed or added to primary storage device 22

subsequent to a previous backup. The incremental backup may be performed relative to a full backup or [] another incremental backup.

Id. Coombs further discloses: “[w]hether performing a full or incremental backup, the entire file structure at the primary data storage device is scanned to establish a list of every file and their file attributes,” and “[f]or an incremental backup, the contents of only those files that have a last-changed date that is newer than the corresponding last-change date for the respective files determined from the parent backup index are stored.” *Id.* ¶ 45.

2. Claim 40

Petitioner sets forth its arguments and evidence as to why an ordinarily skilled artisan would have been motivated to combine Coombs with Field and Anderson. Pet. 42–49. Further, Petitioner separately sets forth—for the preamble and each limitation of claim 40—the arguments and evidence that it contends show that Field, Anderson, and Coombs teach or suggest the preamble and each limitation. *Id.* at 50–73.

Patent Owner disputes that an ordinarily skilled artisan would have been motivated to combine Field, Anderson, and Coombs to achieve the claimed invention. PO Resp. 55–60. Further, Patent Owner disputes that Field, Anderson, and Coombs teach the use of a first and a second inventory during a backup or restore process as recited in claim 40. *Id.* at 60–61.

We focus our discussion here on these disputed issues.

a. Motivation to Combine

i. Parties’ Arguments

(a). Petition

In the Petition, Petitioner argues that an ordinarily skilled artisan would have been motivated to combine Field and Anderson with a

reasonable expectation of success for the same reasons as set forth for claim 38. Pet. 44. Petitioner asserts that Field discloses that each signature of files selected for backup “is transmitted to the back end computing device where it is compared to signatures of files already available to the trusted source.” *Id.* (quoting Ex. 1004 ¶ 8). Petitioner argues that Field also explains that files that are determined to be duplicative of files already stored at Field’s backup database are not transmitted by the client device. *Id.* (citing Ex. 1004 ¶ 38).

Petitioner argues that an ordinarily skilled artisan would have recognized that Field would need some method of informing the client device not to transmit files in the cases where signatures indicate the files are duplicative. Pet. 44 (citing Ex. 1002 ¶ 153). Petitioner asserts that this would have motivated an ordinarily skilled artisan, looking to implement Field’s teachings, to seek out references that disclose how a backup server can notify a client that a file is already stored on the backup server. *Id.* at 45 (citing Ex. 1002 ¶ 153). Petitioner asserts that if Anderson’s backup process “determines that files do not need to be transmitted,” the process “completes and a message is sent to the client informing the client that there is no need to transmit article contents to the server.” *Id.* (quoting Ex. 1005 ¶ 98) (emphasis omitted).

Petitioner further argues that an ordinarily skilled artisan would have found it obvious to employ Anderson’s “message” in the process of Field when a file “was previously made available to the trusted source” to inform the client device that no further action is necessary. Pet. 45 (citing Ex. 1002 ¶ 154). Petitioner argues that an ordinarily skilled artisan would have had a reasonable expectation of success employing Anderson’s “message” in the

process of Field because this operation would be a simple addition to Field's disclosed process, to the extent not already employed, merely adding a well-known transmission of an informative message to the client device. *Id.* at 45–46 (citing Ex. 1002 ¶ 154).

Petitioner asserts that, based on the disclosure of Anderson, an ordinarily skilled artisan would have been motivated to transmit a message to the client device in Field's backup process to inform not only the client device itself, but also the user of the client device, when a file “was previously made available to the trusted source” and does not need to be retransmitted. *Id.* (quoting Ex. 1004 ¶ 38) (citing Ex. 1002 ¶ 155).

Petitioner argues that additionally an ordinarily skilled artisan would have been motivated to look to Anderson for details regarding how to inform client devices in Field when files need to be transmitted to the backup service. Pet. 46 (citing Ex. 1002 ¶ 156). Petitioner asserts that Anderson explains that “[a]rticles [(e.g., files)] that are not stored at the designated storage device (as determined by indexing the database/catalog with the associated CIs) are added to the article request list.” *Id.* (citing Ex. 1005 ¶ 98). Petitioner argues that an ordinarily skilled artisan would have been motivated to incorporate Anderson's request list operation into Field's backup process at least for purposes of reducing network bandwidth. Pet. 47 (citing Ex. 1002 ¶ 157).

Petitioner further argues that Field teaches “the present invention performs optimizations designed to reduce the amount of time and network bandwidth required to backup a computing device.” Pet. 59 (citing Ex. 1004 ¶¶ 22, 23). Petitioner asserts that, based on this express motivation of Field, as part of transmitting signatures for the selected files to be backed up, an

ordinarily skilled artisan would have found it obvious to transmit the generated signatures for the selected files to the back end computing device at the same time to reduce network bandwidth (e.g., overhead). *Id.* (citing Ex. 1002 ¶¶ 180–82).

Petitioner further argues that Anderson teaches concurrently transmitting multiple content identifiers at the same time for files (i.e., “articles”) selected to be backed up. Pet. 60 (citing Ex. 1002 ¶ 182). Petitioner asserts that Anderson discloses that a “client generates a CI [(content identifier)] for each article that is stored on the client system,” and then “[t]he client’s system transmits the CIs to the backup service.” *Id.* (quoting Ex. 1005 ¶ 63) (citing *id.* ¶ 97, Fig. 7 (block 720)). According to Petitioner, consistent with Field’s goal of “reduc[ing] . . . network bandwidth[,]” an ordinarily skilled artisan would have been motivated to concurrently transmit Field’s generated signatures as in Anderson because it would further reduce the amount of network overhead in Field’s backup process. *Id.* (quoting Ex. 1004 ¶ 23) (citing Ex. 1002 ¶ 182).

Petitioner also argues that an ordinarily skilled artisan would have had a reasonable expectation of success incorporating Anderson’s request list operations into Field’s backup process. Pet. 47 (citing Ex. 1002 ¶ 158). Petitioner also argues that an ordinarily skilled artisan would have had a reasonable expectation of success in concurrently transmitting Field’s signatures. Pet. 60–61 (citing Ex. 1002 ¶ 182).

Petitioner argues that Field also discloses that “a user of the backup service provided by the present invention may automatically backup a computing device at regular intervals” and “a command to perform a backup may be generated automatically as part of an archival process.” Pet. 48

(quoting Ex. 1004 ¶¶ 32, 41). According to Petitioner, Field does not explicitly disclose how its system automatically determines which files need to be backed up, but Coombs does, and such techniques were well-known at the time of the '043 patent. *Id.* (citing Ex. 1002 ¶ 159). Petitioner argues that an ordinarily skilled artisan looking to implement the teachings of Field using an automatic backup process would have needed to understand techniques for determining which files needed to be automatically backed up. *Id.* Petitioner asserts that this would have motivated an ordinarily skilled artisan to seek out other references that describe such determinations, such as Coombs. *Id.* (citing Ex. 1002 ¶ 159).

Petitioner argues that, in the same field of endeavor as Field and Anderson, Coombs discloses “[a] method and system of data backup for a computer system” in which “[f]ull and incremental backups of data stored to a first storage device coupled to the computer system are stored to a backup storage device coupled to the computer system.” Pet. 48–49 (quoting Ex. 1006, Abstract). According to Petitioner, Coombs explains that “[a]n incremental backup is a copy at a particular point in time of data files to be backed up from primary storage device 22 and that were changed or added to primary storage device 22 subsequent to a previous backup.” *Id.* (quoting Ex. 1006 ¶ 35). Further, Petitioner argues that as part of performing an “incremental backup,” Coombs discloses, “the entire file structure at the primary data storage device is scanned” to identify files that were changed or added since the last backup. *Id.* (quoting Ex. 1006 ¶ 45).

Petitioner argues that an ordinarily skilled artisan would have recognized that Coombs’s process of scanning a client device to determine which files changed since the last backup would have naturally allowed

Field to perform its automatic backup at regular intervals. Pet. 49 (citing Ex. 1002 ¶ 161). Petitioner further argues that an ordinarily skilled artisan would have had a reasonable expectation of success implementing the techniques of Coombs because no architectural changes would be required in Field's process, as this determination of which files to backup would simply occur at the start of Field's backup process. *Id.* (citing Ex. 1002 ¶ 161).

(b). Patent Owner Response

In the Patent Owner Response, Patent Owner argues that, during cross-examination, Dr. Shenoy contradicted Petitioner's arguments that Field can transmit multiple signatures and confirmed that only one file signature is able to be transmitted to the trusted source at a time in Field. PO Resp. 56 (citing Ex. 2015, 79:8–12; Ex. 2008 ¶ 120). Patent Owner asserts that Petitioner's arguments are thus premised on an incorrect assumption that Field could be modified to transmit multiple signatures at the same time and to compare said multiple signatures at the same time to determine which of the multiple files should be transmitted to the trusted source. *Id.* (citing Ex. 2008 ¶ 120). Patent Owner contends that in Field if more than one signature is transmitted from the trusted source to a client device during a backup or restore operation, then the operating system is unable to identify which files to backup and restore or where such files should be stored, since metadata, e.g., file name or directory, is not transmitted with the file signature. *Id.* (citing Ex. 2008 ¶ 120). Patent Owner further asserts that Field teaches a file-by-file backup and restore process for individual files and there is no evidence that Field can successfully transmit multiple signatures and then backup and restore multiple files at the same time. *Id.*

(citing Ex. 2008 ¶ 122). Patent Owner argues that thus there would have been no motivation to combine the multiple signatures from Anderson into Field. *Id.* at 56–57 (citing Ex. 2008 ¶ 122).

Patent Owner argues that, contrary to Field, the '043 patent teaches a full backup and restore of a file system using descriptors transmitted as part of an inventory having sufficient data to reflect the current state of a drive. PO Resp. 57 (citing Ex. 2008 ¶ 123).

Patent Owner also argues that there is no motivation to combine Field and Anderson to teach transmitting the second inventory to inform the client device which files to backup. PO Resp. 57 (citing Ex. 2008 ¶ 165). Patent Owner asserts that an ordinarily skilled artisan would not have been motivated to combine Field and Anderson in this manner because a message that the selected file is already stored on a backup storage medium would create an unnecessary step and would be more inefficient than Field's process. *Id.* at 57–58 (citing Ex. 2008 ¶ 166). Patent Owner argues that Field uses signatures in a file-by-file-based backup system only and teaches away from using signatures in a full backup of a system. *Id.* at 58 (citing Ex. 2008 ¶ 166). Patent Owner argues that instead Field teaches a file-based backup system that performs a backup of one selected file at a time where one signature of one file is sent at a time, and not of a group of selected files. *Id.* (citing Ex. 2008 ¶ 166). According to Patent Owner, thus, in Field, if a selected file is already stored on the server, then the system immediately moves to see if additional files are to be backed up as shown in Figure 3 of Field. *Id.* (citing Ex. 1004, Fig. 3; Ex. 2008 ¶ 166).

Patent Owner also asserts that Petitioner's motivation to combine statements are conclusory as it would be inefficient and unnecessary for

Field to first report to the client device that the individual file was already stored on the system. PO Resp. 59 (citing Ex. 2008 ¶ 128). Patent Owner argues that Field's stated solution is to perform optimizations designed to reduce the amount of time and network bandwidth required to backup a computing device. *Id.* Patent Owner contends that reporting a message or transmitting a second inventory to the client device to inform the client device that a file is already stored is unnecessary and there is no motivation to add this step in view of Field's technological solution. *Id.* (citing Ex. 2008 ¶ 128). Patent Owner asserts that, instead, as only one selected file at a time undergoes the Field backup process, the client device knows whether the next step is to transmit the file (if a message is received) or to check if additional files were selected for backup (no message received). *Id.* (citing Ex. 2008 ¶ 128). According to Patent Owner, as such, an ordinarily skilled artisan would not have been motivated to combine Field and Anderson to teach a more inefficient system. *Id.* (citing Ex. 2008 ¶ 128).

Patent Owner argues that, furthermore, the backup and restore operation in Coombs does not teach the use of inventories similar to Field as well as signatures, in determining which files, portions of files, or data structures to backup or restore. PO Resp. 59 (citing Ex. 2008 ¶ 114). Further, Patent Owner asserts that an ordinarily skilled artisan would not have been motivated to combine Coombs with Field as Field relies on file signatures to provide an efficient file-by-file-based backup process and Coombs does not. *Id.* (citing Ex. 2008 ¶ 114).

(c). Reply

Petitioner argues that the '043 patent claims do not require transmitting all file signatures at the same time. Pet. Reply 24. Petitioner

argues that it would nevertheless have been obvious to transmit all file signatures at the same time. *Id.* (citing Ex. 1005 ¶ 53). Petitioner argues that, although Patent Owner challenges whether this could be done in Field, Dr. Weissman acknowledged that this could be accomplished given the high skill in the art. *Id.* (citing Ex. 1025, 112:11–22, 113:5–114:9; Ex. 1024 ¶¶ 53–55).

Petitioner further argues that claim 40 does not require transmitting a message that a selected file is already stored on the backup storage medium. Pet. Reply 24–25 (citing Ex. 1001, claim 4). Petitioner argues that claim 40 requires “transmitting the second inventory” to the client device, which includes signatures identifying files “not found . . . in the backup system”; that is, files which have not been stored on the backup storage medium. *Id.* at 25 (citing Ex. 1024 ¶¶ 76–77). Petitioner asserts that Patent Owner does not challenge that Anderson discloses this operation or the motivation to incorporate such operation into Field’s backup process. *Id.*

Petitioner further argues that Coombs’s scanning techniques are readily applicable to Field’s backup process, regardless of whether Coombs discloses an “inventory” with Patent Owner’s proposed construction. Pet. Reply 25 (citing Ex. 1024 ¶ 58).

(d) Sur-reply

Patent Owner argues that Petitioner ignores that Field, Anderson, and Coombs disclose different backup processes. Sur-reply 15. Patent Owner contends that Anderson does not teach a file-based backup where one file at a time is backed up, but rather a full backup system using content identifiers that identify various data. *Id.* According to Patent Owner, Coombs claims a backup process that consists of automatic “full” and “incremental” backups

of data stored in a first storage device such as system configuration files and user files. *Id.* (citing Ex. 1006 ¶ 35). Patent Owner further argues that Field teaches away from using a signature file method for full volume backups of a system. *Id.* (citing Ex. 2017 ¶ 13). According to Patent Owner, Field's volume-based backup does not use signatures of files to protect against duplicated data from being stored and restored. *Id.* (citing Ex. 2017 ¶ 13). Further, Patent Owner asserts that Field's file-based backup fails to disclose the transmittance of multiple signatures and the ability to backup multiple files at the same time unlike in Anderson. *Id.* (citing Ex. 2017 ¶ 14).

Patent Owner further asserts that it never alleged that the '043 Patent claims only teach a full backup of a system. Sur-reply 16. Patent Owner argues that the '043 Patent claims teach a backup process where not only files are being backed up, but directory structures as well, which in turn allows for a complete backup of the selected electronic data. *Id.* Patent Owner further asserts that the electronic data may consist of complete files, chunks of data, and even complete systems, which allows for a full restore. *Id.* According to Patent Owner, on the other hand, Field's two backup processes teach away from performing full backups of electronic data. *Id.* Patent Owner asserts that specifically, Field's file-based process identifies one file to backup at a time and uses a signature of that file to determine whether to backup that file. Further Patent Owner asserts that Field's file-based backup does not perform a backup of the directory structure of the system to allow for a complete backup or restore of one, specific file. *Id.* Patent Owner argues that Field is incapable of doing so. *Id.*

Patent Owner further argues that backing up all files on a device using Field's file-based backup process is a tedious and inefficient process as a

user would only be able to backup one file at a time. Sur-reply 16. Patent Owner asserts that doing such a backup would defy the goals of Field, which includes creating an efficient backup system. *Id.* According to Patent Owner, thus, an ordinarily skilled artisan would be discouraged from using Field when having to backup all files on a device using Field's file-based backup process. *Id.*

ii. Discussion

We find that Petitioner has proven that an ordinarily skilled artisan would have been motivated to combine Field, Anderson, and Coombs in the manner proposed by Petitioner and would have had a reasonable expectation of success in so doing.

We find that an ordinarily skilled artisan would have found it obvious to employ Anderson's "message" in the process of Field when a file "was previously made available to the trusted source" to inform the client device that no further action is necessary. Ex. 1002 ¶ 153. Although Field does not explicitly disclose how its "back end computing device" informs a client that a file has already been stored in the backup database, Field requires some method of doing so. *Id.*; Ex. 1004, Fig. 3. Incorporating Anderson's "message" into Field would result in Field's "back end computing device" instructing the client device not to transmit the file to the back end computing device and allows the backup process on the client device to complete (or proceed further as necessary), freeing up computing resources, rather than having Field wait to determine whether files need to be submitted to the backend computing device. Ex. 1002 ¶ 153. We further find that an ordinarily skilled artisan would have had a reasonable expectation of success employing Anderson's "message" in the process of Field because this

operation would be a simple addition to Field's disclosed process, to the extent not already employed, merely adding a well-known transmission of an informative message to the client device. *Id.* Field already discloses communication between the back end computing device and the target computing device (the device backing up files), so this would not involve any new techniques. *Id.*; Ex. 1004 ¶ 42.

We further find that an ordinarily skilled artisan would have been motivated to transmit a message to the client device in Field's backup process to inform not only the client device itself, but also the user of the client device, when a file was previously made available to the trusted source and does not need to be retransmitted. Ex. 1004 ¶ 38; Ex. 1002 ¶ 155. This would be a simple addition to Field's disclosed process, merely adding a well-known transmission of an informative message. Ex. 1002 ¶ 155. Such a message would prevent the user from wondering whether the backup process has successfully completed. *Id.* In other words, the user would not feel the need to reattempt backup, as might commonly be done without any assurance that the backup process completed successfully. *Id.*

Additionally, we find that an ordinarily skilled artisan would have been motivated to look to Anderson for details regarding how to inform client devices in Field when files need to be transmitted to the backup service. Ex. 1002 ¶ 155. In particular, Field discloses that files selected for backup that do not exist in the backup database are "transmitted to the remote computing device associated with the trusted source." Ex. 1004 ¶ 38; Ex. 1002 ¶ 155. Field does not explicitly disclose the exact mechanism used to inform the client device when files need to be transmitted from the client device. Ex. 1002 ¶ 156. Anderson discloses such a mechanism in the

form of an article request list. Ex. 1002 ¶ 156; Ex. 1005 ¶ 89. Anderson explains that “[a]rticles [(e.g., files)] that are not stored at the designated storage device (as determined by indexing the database/catalog with the associated CIs) are added to the article request list.” Ex. 1005 ¶ 98; Ex. 1002 ¶ 156. Anderson then discloses that “the backup service transmits the article request list (including CIs only, as there is no need to send any metadata back) to the client's system.” Ex. 1005 ¶ 98; Ex. 1002 ¶ 156.

We find that an ordinarily skilled artisan would have been motivated to incorporate Anderson's request list operation into Field's backup process at least for purposes of reducing network bandwidth. Ex. 1002 ¶ 156. Field seeks to provide “a system that performs a backup of user data on a remote computing device . . . without requiring excessive network bandwidth.” Ex. 1004 ¶ 6, *see also id.* ¶ 23; Ex. 1002 ¶ 156. An ordinarily skilled artisan would have understood that by generating a request list that is transmitted to the client, Field would only need to send a single message to the client informing which files need to be transmitted to the back end computing device, rather than a separate message for each file. Ex. 1002 ¶ 156. Further, because the request list only includes file signatures, the size of the message can be minimized since the size of a signature is the fraction of the size of the actual file. *Id.*; Ex. 1004 ¶ 38 (“a signature of the file, which is a fraction of the size of a complete file”). Further, because the client receives a single list of files to be transmitted to the backup server, transmission of the required files to the back end computing device in Field can be optimized, for example by using a single or batch transmission. Ex. 1002 ¶ 156.

We find that an ordinarily skilled artisan would have had a reasonable expectation of success incorporating Anderson's request list operations into Field's backup process. Ex. 1002 ¶ 157. Doing so would apply a known technique (i.e., generation of a list of items and transmission of the list in a message) to the backup process of Field and would yield predictable results. *Id.* Rather than compare and transmit each file separately, Field's process (as depicted in Figure 3) could instead compare at the back end computing device each of the generated signatures of selected files before any files are transmitted from the client to the back end computing device (step 312). *Id.* This would allow the client to receive the request list and subsequently transmit the required files at the same time. *Id.* Field already discloses communication between the back end computing device and the target computing device (the device backing up files), so this would not involve any new techniques. *Id.*; Ex. 1004 ¶ 42.

Further, we find that Field discloses that "a user of the backup service provided by the present invention may automatically backup a computing device at regular intervals" and "a command to perform a backup may be generated automatically as part of an archival process." Ex. 1004 ¶¶ 32, 41; Ex. 1002 ¶ 158. Field, however, does not explicitly disclose how its system automatically determines which files need to be backed up, but Coombs does, and such techniques were well-known at the time of the '043 patent. Ex. 1002 ¶ 158. An ordinarily skilled artisan looking to implement the teachings of Field using an automatic backup process would have needed to understand techniques for determining which files needed to be automatically backed up. *Id.* This would have motivated an ordinarily

skilled artisan to seek out other references that describe such determinations, such as Coombs. *Id.*

We find that Coombs discloses “[a] method and system of data backup for a computer system” in which “[f]ull and incremental backups of data stored to a first storage device coupled to the computer system are stored to a backup storage device coupled to the computer system.”

Ex. 1006, code (57). Coombs explains that “[a]n incremental backup is a copy at a particular point in time of data files to be backed up from primary storage device 22 and that were changed or added to primary storage device 22 subsequent to a previous backup.” *Id.* Further, as part of performing an “incremental backup,” Coombs discloses, “the entire file structure at the primary data storage device is scanned” to identify files that were changed or added since the last backup. *Id.*; Ex. 1002 ¶ 159.

We find that an ordinarily skilled artisan would have recognized that Coombs’s process of scanning a client device to determine which files changed since the last backup would have naturally allowed Field to perform its automatic backup at regular intervals. Ex. 1002 ¶ 160. At the time of the ’043 patent, this was a traditional way to examine each file for changes. *Id.* An ordinarily skilled artisan would have had a reasonable expectation of success implementing the techniques of Coombs because no architectural changes would be required in Field’s process, as this determination of which files to backup would simply occur at the start of Field’s backup process. *Id.* These techniques could be employed at the start of Field’s backup process without affecting any other steps. *Id.* Further, identifying files that changed since the last backup also aligns with Field’s goal of reducing network bandwidth by only attempting to backup files that have changed, rather than

having to transmit signatures of all files across the network for each backup, which is required for Field to perform its comparison of each file signature to signatures of files already available to the trusted source at the back end computing device. *Id.*; Ex. 1004 ¶ 8. For these reasons, an ordinarily skilled artisan would have recognized that Coombs provides details beneficial to Field's automated backup process and would have applied Coombs's teachings to Field's process. Ex. 1002 ¶ 160.

As discussed above, Patent Owner argues that, during cross-examination, Dr. Shenoy contradicted Petitioner's arguments that Field can transmit multiple signatures and confirmed that only one file signature is able to be transmitted to the trusted source at a time. PO Resp. 56 (citing Ex. 2015, 79:8–12; Ex. 2008 ¶ 120). We disagree. The cited testimony reads as follows:

Q. . . . So is there anything else being sent in Field aside from the signature in this sentence?

A. In this particular sentence, it does say that it is causing the signature of a selected file. That is what is being sent.

Ex. 2015, 79:8–12. In that testimony, Dr. Shenoy does not opine whether Field's process could be modified to send more than one signature at time. He merely testifies that one particular sentence in Field discloses sending one signature at a time.

As discussed above, Patent Owner argues that an ordinarily skilled artisan would not have been motivated to combine Field and Anderson to transmit a message that a selected file is already stored on a backup storage medium because that would create an unnecessary step and be more inefficient than Field's process. PO Resp. 57–58 (citing Ex. 2008 ¶ 166). Claim 40 actually does not require that its method transmit a message that a

selected file is already stored on the backup storage. Claim 40 recites “generating a second inventory, the second inventory including the cryptographic signatures found in the first inventory and not found in the list containing all cryptographic signatures identifying actual data currently stored in the backup system” and “transmitting that second inventory from the backup server to the client device.” Ex. 1001, 23:28–24:36. Thus, this transmitted second inventory sets forth what is not stored on the backup storage, rather than what is stored on the backup storage. Petitioner has shown that Field and Anderson teach these recited steps. Pet. 66–71 (and the exhibits cited therein). Further, we disagree with Patent Owner’s argument that, with Field’s process, it would be undesirable to have the backup server transmit a message to the client device indicating whether a selected file is already stored on the backup storage medium. *See* Ex. 1024 ¶ 153.

Patent Owner also argues that there is no motivation to combine Field and Anderson to teach transmitting the second inventory to inform the client device which files to backup. PO Resp. 57 (citing Ex. 2008 ¶ 165). Patent Owner asserts that an ordinarily skilled artisan would not have been motivated to combine Field and Anderson in this manner because a message that the selected file is already stored on a backup storage medium would create an unnecessary step and would be more inefficient than Field’s process. *Id.* at 57–58 (citing Ex. 2008 ¶ 166). We disagree. Although Field does not explicitly disclose how its back end computing device informs a client that a file has already been stored in the backup database, Field requires some method of doing so. Ex. 1024 ¶ 153. Incorporating Anderson’s “message” into Field would result in Field’s back end

computing device instructing the client device not to transmit the file to the back end computing device and allowing the backup process on the client device to complete (or proceed further as necessary), freeing up computing resources, rather than waiting to determine whether files need to be submitted to the back end computing device. *Id.*

As discussed above, Patent Owner argues that Field uses signatures in a file-by-file-based backup system only and teaches away from using signatures in a full backup of a system. PO Resp. 58 (citing Ex. 2008 ¶ 166). We disagree. A reference may be said to teach away when a person of ordinary skill, upon reading the reference . . . would be led in a direction divergent from the path that was taken by the applicant.” *In re Haruna*, 249 F.3d 1327, 1335 (Fed. Cir. 2001) (quoting *Tec Air, Inc. v. Denso Mfg. Mich. Inc.*, 192 F.3d 1353, 1360 (Fed. Cir. 1999)); *see In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004) (holding that, to teach away, the prior art must “criticize, discredit, or otherwise discourage the solution claimed”). Patent Owner fails to identify, and we do not discern, any indication in Field that criticizes, discredits, or otherwise discourages one of ordinary skill in the art from using signatures with a full backup. That one backup (file-by-file) involves generating signatures, where the other backup (volume state) does not, does not mean that Field teaches away from using signatures in a full backup simply because it is not disclosed. Patent Owner’s argument would effectively mean that any lack of disclosure is a teaching away, which it is not. Further, the claims do not require a full backup of a system, and Anderson discloses the use of its teachings for both full and partial backups, disclosing backing up a contour that “can comprise every article on the

client device or a proper subset of articles on the client device.” Ex. 1005, ¶ 19; Ex. 1024 ¶ 45.

As discussed above, Patent Owner argues that the backup and restore operation in Coombs does not teach the use of inventories similar to Field as well as signatures, in determining which files, portions of files, or data structures to backup or restore. PO Resp. 59 (citing Ex. 2008 ¶ 114). Petitioner, however, does not rely upon Coombs for the recited inventories, and Patent Owner has not addressed the applicability of Coombs’s scanning techniques, which Petitioner does rely upon. Pet. 48–49; PO Resp. 59. As set forth above, Petitioner has shown that an ordinarily skilled artisan would apply those scanning techniques to Field’s process as modified by Anderson’s teachings. Ex. 1002 ¶ 160.

As discussed above, Patent Owner further argues that backing up all files on a device using Field’s file-based backup process is a tedious and inefficient process as a user would only be able to backup one file at a time. Sur-reply 16. Nothing in claim 40, however, requires every file to be backed up on a device. Further, Petitioner has proposed modifying Field with Anderson to concurrently transmit Field’s generated signatures, demonstrated a motivation for so doing, and shown that an ordinarily skilled artisan would have a reasonable expectation of success in so doing. Ex. 1002 ¶ 182.

In sum, we find that an ordinarily skilled artisan would have combined Field, Anderson, and Coombs in the manner proposed by Petitioner and would have had a reasonable expectation of success in so doing.

b. Inventory

The disputed issue between the parties regarding whether the combination of Field, Anderson, and Coombs teaches or suggests every limitation of claim 40 is whether that combination of references teaches or suggests the use of a first and second inventory during a backup and restore process. In the Patent Owner Response, Patent Owner argues:

Similar to other claims above, claim 40 includes an “inventory” limitation. (Ex. 2008 ¶ 168.) Petitioner has failed to show that Ground 3 teaches the use of a first and second inventory during a backup or restore process as claimed in claim 40. (*Id.*) More specifically, Petitioner has not shown that Field, Anderson, or Coombs teaches a backup or restore process that uses an inventory of electronic data to determine whether to restore or backup the electronic data that is part of said inventory. (*Id.*) Thus, Field, Anderson, and Coombs in combination fail to teach all the elements of claim 40. (*Id.* ¶ 169.)

PO Resp. 60–61.

Claim 40 recites “generating, at the first client device, a first inventory” and “transmitting the first inventory from the client device to the backup server.” Claim 40 also recites “generating a second inventory” and “transmitting the second inventory from the backup server to the client device.”

In Petitioner’s proposed combination of Field, Anderson, and Coombs, Field’s process generates a collection of signatures and, as modified due to Anderson’s, that process transmits the collection of signatures at one time from the client to the backup server. Pet. 55–61 (and the exhibits cited therein). Petitioner argues that this collection of signatures is the recited “first inventory.” *Id.* (and the exhibits cited therein).

In Petitioner’s proposed combination of Field, Anderson, and Coombs, Field’s process, as modified by Anderson’s teachings, generates a list of cryptographic signatures for the files not found on Field’s backup server and transmits that list to the client device. Pet. 66–72 (and exhibits cited therein). Petitioner argues that this collection of signatures is the recited “second inventory.” *Id.*

As mentioned above, Patent Owner argues that Petitioner has not shown that Field’s process generates a first and second inventory, but Patent Owner does not specifically address Petitioner’s arguments regarding the collection of signatures identified at pages 55–61 and 66–72 of the Petition.²³

We find that the combination of Field, Anderson, and Coombs teaches or suggests the recited first and second inventories. Both collections of signatures are itemized lists of electronic data. The first collection of signatures that is transmitted from the client device to the backup server is a collection of the signatures of the files designated for backup. Ex. 1002 ¶ 177. The second collection of signatures that is transmitted from the backup server to the client device is a collection of signatures that were designated to be backed up but were not on the backup server. *Id.* ¶¶ 199–200. Both are itemized lists of electronic data. The first collection itemizes the list of files for backup (i.e., there is one descriptor per file). The second collection of signatures itemizes the list of files from the first collection that

²³ Patent Owner’s cited testimony from Dr. Weissman also does not specifically address Petitioner’s arguments regarding the collection of signatures addressed in pages 55–61 and 66–72 of the Petition. Ex. 2008 ¶¶ 168–169.

were not on the backup storage medium (i.e., there is one descriptor per each of those files). As such, both collections are inventories. *See* Section II.C above. Thus, we find that Petitioner has proven that Field, Anderson, and Coombs teach the recited first and second inventories.

c. Other Limitations

As mentioned above, Petitioner separately sets forth the arguments and evidence that it contends show that Field, Anderson, and Coombs teach or suggest the preamble and each limitation of claim 40. Pet. 50–73. With respect to those limitations, Patent Owner only disputed that Field, Anderson, and Coombs teach or suggest the recited first and second inventories. We addressed that disputed issue in Section III.D.2.b above. For the remaining limitations and recitations of claim 40, we have reviewed the arguments and evidence set forth by Petitioner and are persuaded that Field, Anderson, and Coombs, teach or suggest each of those limitations. *See* Pet. 50–73 (and the exhibits cited therein). Thus, we determine that Petitioner has proven that claim 40 would have been obvious over Field, Anderson, and Coombs.

IV. CONCLUSION

As set forth in the following table, Petitioner has proven that claims 30, 32, 33, 35, and 37–40 are unpatentable, but has not proven that claims 31, 34, and 36 are unpatentable:

Claim(s)	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
30–37, 39	103	Field	30, 32, 33, 35, 37, 39	31, 34, 36
38	103	Field, Anderson	38	

Claim(s)	35 U.S.C. §	Reference(s)/ Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
40	103	Field, Anderson, Coombs	40	
Overall:			30, 32, 33, 35, 37–40	31, 34, 36

V. ORDER

It is:

ORDERED that claims 30, 32, 33, 35, and 37–40 have been shown, by a preponderance of the evidence, to be unpatentable;²⁴

FURTHER ORDERED that claims 31, 34, and 36 have not been shown, by a preponderance of the evidence, to be unpatentable; and

FURTHER ORDERED that because this is a Final Written Decision, the 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.

²⁴ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).

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