

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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AMAZON.COM, INC., and  
BLIZZARD ENTERTAINMENT, INC.,  
Petitioner,

v.

AC TECHNOLOGIES S.A.,  
Patent Owner.

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Case IPR2015-01802  
Patent 7,904,680 B2

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Before MATTHEW R. CLEMENTS, PETER P. CHEN, and  
JEFFREY W. ABRAHAM, *Administrative Patent Judges*.

CLEMENTS, *Administrative Patent Judge*.

FINAL WRITTEN DECISION  
*35 U.S.C. § 318(a) and 37 C.F.R. § 42.73*

## I. INTRODUCTION

Amazon.com, Inc. and Blizzard Entertainment, Inc. (collectively, “Petitioner”) filed a Petition requesting *inter partes* review of claims 1–15 (“the challenged claims”) of U.S. Patent No. 7,904,680 B2 (Ex. 1002, “the ’680 patent”). Paper 1 (“Pet.”). AC Technologies S.A. (“Patent Owner”) filed a Preliminary Response. Paper 8 (“Prelim. Resp.”). On March 8, 2016, we instituted an *inter partes* review of claims 1–15 (“the instituted claims”) of the ’680 patent on certain grounds of unpatentability alleged in the Petition. Paper 10 (“Dec. to Inst.” or “Inst. Dec.”)

After institution of trial, Patent Owner filed a Patent Owner Response (Paper 17, “PO Resp.”), to which Petitioner filed a Reply (Paper 21, “Pet. Reply”).

We held a consolidated hearing on December 5, 2016, for this case and related Cases IPR2015-01801, IPR2015-01803, IPR2015-01804, and IPR2015-01805; and a transcript of that hearing is part of this record. Paper 31 (“Tr.”).

We have jurisdiction under 35 U.S.C. § 6(b). This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we determine that Petitioner has shown, by a preponderance of the evidence, that claims 1, 3, 5, and 7–15 of the ’680 patent are unpatentable.

### A. *Related Proceedings*

The ’680 patent is involved in several cases pending in the Western District of Texas, and in one case pending in the Northern District of California. Pet. 2; Paper 7, 2–3; Paper 29, 1–2. Petitioner also has filed other petitions seeking *inter partes* review of the ’680 patent in IPR2015-

01803 (pending) and of related patents in IPR2015-01801 (pending), IPR2015-01804 (pending) and IPR2015-01805 (pending). Pet. 2; Paper 7, 3; Paper 29, 2.

*B. The '680 patent*

The '680 patent relates generally to a data access and management system as well as to a method for data access and data management for a computer system. Ex. 1002, 1:21–23. In particular, it relates to a system and a method for optimising the access to data and the processing of that data in distributed and networked computer structures. *Id.* at 1:23–26. According to the '680 patent, conventional distributed systems built on the client/server model were vulnerable to failure of the server, failure of network areas connecting the server to the clients, and different “lags” between the server and various clients. *Id.* at 1:28–62.

To address these and other problems, the '680 patent describes a distributed system in which data is stored in a redundant manner depending on parameters of data transmission between computer units and data storage means, and the computer units access one of the data storage means as a function of the data transmission parameters. *Id.* at 2:21–27. Figure 2 is reproduced below.

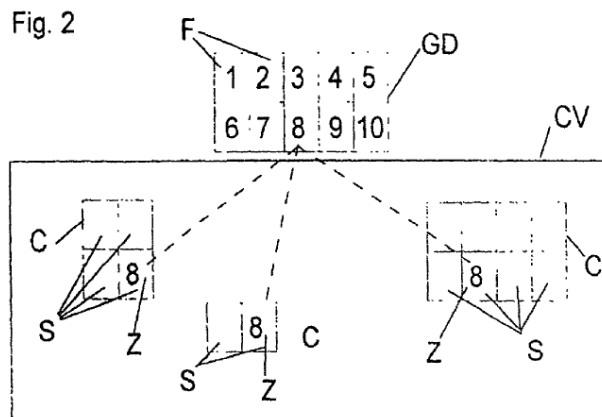


Figure 2 shows a schematic representation of a data structure and its division and assignment to cells. *Id.* at 6:53–55. Data quantity GD is divided into individual data subsets referred to as fields F. *Id.* at 7:1–3. A single field F is stored in several cells Z in a redundant manner. *Id.* at 8:1–2. A cluster C comprises one or more cells Z. *Id.* at 7:13–14. Each memory location of a cluster is referred to as a slot S. All clusters C are combined for the representation of GD to form a cluster compound CV. *Id.* at 7:18–20.

Figure 1 is shown below.

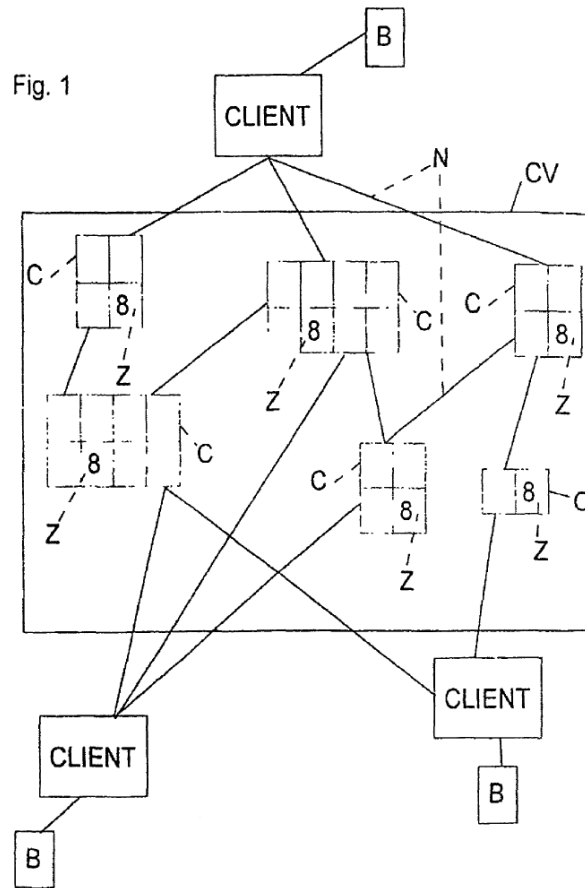


Figure 1 shows a schematic representation of a preferred embodiment. *Id.* at 6:50–52. Figure 1 depicts clients CL connected to clusters C via network N. *Id.* at 7:53–64. User B connects to a client CL generally through only one connection, which, according to the '680 patent, is usually a telephone line.

*Id.* at 9:54–58. The system can be used to provide computer games over the Internet. *Id.* at 3:63–4:7, 9:48–51.

*C. Illustrative Claim*

Of the instituted claims, claims 1, 3, 5, 7, 10, and 13 are independent.

Claim 1 is illustrative and is reproduced below:

1. A data management system comprising:

at least two data storage units;

at least one computer unit that stores at least one complete file, each file including a plurality of individual pieces, the pieces containing parts of the files, wherein at least one piece is stored in a redundant manner in the at least two data storage units;

a controller to enable data transmission between the data storage units and the computer unit;

wherein at least one of the data storage units and computer unit measures a data transmission performance between at least one of the data storage units and the computer unit, the at least one piece being stored by the computer unit in a redundant manner in the data storage units as a function of the measured data transmission performance, and the computer unit accessing the at least one of the data storage units as a function of the measured data transmission performance; and

wherein at least one of the at least two data storage units measures a data transmission performance between at least two of the at least two data storage units and the data storage units copy pieces that are redundantly stored in the system from one of the data storage units to another of the data storage units independently of an access of the computer unit based on the data transmission performance measured between the data storage units.

Ex. 1002, 25:64–26:24.

*D. The Instituted Grounds of Unpatentability*

We instituted *inter partes* review of the '680 patent based upon the following grounds (Dec. to Inst. 26):

Reference	Basis	Claims challenged
Rabinovich <sup>1</sup>	35 U.S.C. § 103	1–15
Rabinovich	35 U.S.C. § 102	1, 3, 5, and 7–15

II. ANALYSIS

*A. Claim Construction*

We interpret claims of an unexpired patent using the broadest reasonable construction in light of the specification of the patent in which they appear. *See* 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S.Ct. 2131, 2142–46 (2016). In applying a broadest reasonable construction, claim terms generally are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *See In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

In our Decision on Institution, we determined that “computer unit” is not limited to a client computer and, instead, encompasses any computing device. Dec. to Inst. 7–9. We also construed “means for storing at least one complete file,” “controller,” “second data storage means for storing data,” and “control means.” *Id.* at 10–13. Neither party disputes our determinations or proposes additional terms for construction. Based on the

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<sup>1</sup> Rabinovich, M., et al., “Dynamic Replication on the Internet,” Work Project No. 3116-17-7006, AT&T Labs Research Technical Memorandum HA6177000-980305-01TM (March 5, 1998). Exhibit 1006.

record developed during this proceeding, we continue to apply these constructions.

In addition, we find it necessary to construe the term “pieces” in order to resolve the disputes between the parties.

*“pieces”*

Claim 1 recites “each file including a plurality of individual pieces, the pieces containing parts of the files.” Ex. 1002, 25:67–26:1. The other independent claims recite limitations commensurate in scope. Neither party proposes explicitly a construction of the term “piece.” Petitioner argues that “files are inherently composed of pieces in the form of bits that make up bytes, the bytes themselves being pieces of the file.” Pet. 32. Patent Owner argues that construing “piece” to cover “bits and bytes” of a file “would read out the ‘pieces’ limitation from the claim entirely” (PO Resp. at 29–30) and that “one of ordinary skill in the art would not read the ‘pieces’ limitation of the claim to include bits and bytes” (*id.* at 30).

The claims themselves define “piece” by requiring that a “file” have a “plurality of individual pieces,” but do not establish a lower bound—i.e., a minimum number of bits or bytes—to qualify as a “piece.” Patent Owner identifies no support in the ’680 patent for its contention that “piece” or “pieces” excludes a byte or bytes of a file, relying instead solely on the testimony of Dr. Paul S. Jacobs. *Id.* (citing Ex. 2006 ¶¶ 38, 39). We are not persuaded by Dr. Jacobs’s conclusory testimony. Because “piece” and “pieces” are limited by the claims only to being a subset of a file and because a byte or collection of bytes of a file is a subset of that file, we are persuaded that the broadest reasonable interpretation of “piece” and “pieces” in light of the Specification of the ’680 patent encompasses a byte or bytes.

*B. Principles of Law*

To prevail in this *inter partes* review of the challenged claims, Petitioner must prove unpatentability by a preponderance of the evidence. 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d).

To establish anticipation, a party must show by a preponderance of the evidence that a prior art reference expressly or inherently describes each claim limitation arranged as in the claim said to be anticipated. *Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1334–35 (Fed. Cir. 2008), as further amplified by *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1371 (Fed. Cir. 2008).

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

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

*C. Level of Ordinary Skill in the Art*

Petitioner’s declarant, Dr. Ratner, testifies that a person of ordinary skill in the art at the time of the alleged invention “would have had an undergraduate degree in Computer Science or a related field, such as

Electrical Engineering, and two to three years of experience working in the field, or an equivalent level of experience.” Ex. 1005 ¶ 17; Pet. 16. Patent Owner does not challenge this definition or present its own.

Accordingly, we credit the testimony of Dr. Ratner regarding the level of ordinary skill in the art, and find that a person of ordinary skill in the art would have had an undergraduate degree in Computer Science or a related field, such as Electrical Engineering, and two to three years of experience working in the field, or an equivalent level of experience. This level of ordinary skill is reflected not only by the information presented by the parties, but also by the prior art of record. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (the prior art itself can reflect the appropriate level of ordinary skill in the art).

*D. Whether Rabinovich is a Printed Publication*

In the Decision on Institution, we determined that for the preliminary stage of this proceeding, Petitioner had shown Rabinovich to be a printed publication. Dec. on Inst. 13–19. We noted:

Here, Petitioner presents testimony from Dr. Rabinovich that indicates Rabinovich was posted to a specific URL no later than December 1998, which is more than one year before the earliest priority date (January 11, 2000) of the ’680 patent. Ex. 1004 ¶¶ 2, 4, 6, and 8. Dr. Rabinovich testifies that he authored an article that was published in the December 1998 IEEE Bulletin, cited Rabinovich in footnote 16 of that article, and included the URL on his webpage from which the general public could download Rabinovich. *Id.* Petitioner provides a copy of Dr. Rabinovich’s article published in the December 1998 IEEE Bulletin as Exhibit 1011, which includes a citation to Rabinovich in footnote 16, and states that the article is available at a specific URL. Ex. 1011, 13 n.16. Dr. Rabinovich further testifies that his practice was, “for each cited article identified as being

available on my website at a specific URL, [to] confirm the cited article's actual availability at that URL." Ex. 1004 ¶ 6.

Our review of the evidence on the present record, including the footnote in the December 1998 IEEE Bulletin article and Dr. Rabinovich's testimony, indicates that, at this stage, Petitioner has shown sufficiently that Rabinovich was publicly accessible to one of ordinary skill in the art as of December 1998. In particular, the fact that the 1998 IEEE Bulletin article expressly cites Rabinovich in footnote 16, which indicates that Rabinovich is a technical report from AT&T labs and is available at a specific URL, suggests that a person of ordinary skill in the art interested in the subject matter at issue, exercising reasonable diligence, could have located Rabinovich. *See Blue Calypso, LLC. v. Groupon, Inc.*, No. 2015-1391, -1393, -1394, slip op. at 32 (Fed. Cir. March 1, 2016).

*Id.* at 16–17 (footnote omitted).

In the Patent Owner Response, Patent Owner discusses *Cornell Univ. v. Hewlett-Packard Co.*, No. 01-cv-1974, 2008 U.S. Dist. LEXIS 39343 (N.D.N.Y. May 14, 2008). PO Resp. 41–42. According to Patent Owner,

[i]n [*Cornell*], the case cited by the Federal Circuit to suggest an article is prior art because another article cited to it, the Court found a published article's in-context citation to a master's thesis supported a finding that the master's thesis was prior art – and the context was critical. In particular, there was no dispute in *Cornell* that the master's thesis, while unpublished, could be found in the university's collections.

*Id.* at 41. Patent Owner argues that, unlike in *Cornell*, there is no evidence in the present record demonstrating that Rabinovich was ever available on Dr. Rabinovich's personal website. *Id.* at 41–42. Patent Owner further argues that in *Cornell*, the disputed prior art reference “set forth the common subject matter between” the patent at issue and the disputed reference, whereas “the IEEE publication at issue here provides no such context” for

common subject matter of the challenged patent and the alleged publication. *Id.* at 42–43. Patent Owner asserts, “because the IEEE article cites Rabinovich in the context of algorithms unrelated to the patented subject matter, it would cause a [person of ordinary skill in the art] to ignore Rabinovich—not to seek it out. . . . The IEEE article is not a research aid that would guide someone to Rabinovich.” *Id.*

In its Reply, Petitioner contends:

Dr. Rabinovich’s testimony establishes that Rabinovich was publicly available at least by December 1998. Dr. Rabinovich’s consistent, professional practice was to personally re-publish his AT&T technical memoranda on the webpage that he managed on AT&T’s publicly accessible website whenever he cited to those memoranda in later publications. (Ex. 1004 at ¶¶ 2, 6, 8; Ex. 2004 at 5:5-9:25.).

...

Patent Owner argues a [person having ordinary skill in the art] would not have located Rabinovich because Rabinovich and the December 1998 Article relate to data replication instead of segmented file transfer. This argument is based upon a mischaracterization of the invention and additionally fails because the scope of relevant prior art is defined by the problem facing the inventor, not the solution reached.

Reply 19–20 (footnote omitted).

Petitioner also argues that in *Cornell* the unpublished Master’s thesis was ruled prior art because it was cited in an IEEE article circulated to many researchers in the relevant field and the IEEE article acted as a “road map” in setting forth the common subject matter between the patent at issue and the Master’s thesis in a way that would “guide a person of ordinary skill interested in the subject matter” to the thesis. *Id.* at 21. Petitioner contends the December 1998 IEEE article serves as such a roadmap to Rabinovich:

The 1998 Article was published in a “Special Issue on Data Replication” of the IEEE Bulletin focusing on “technique[s] for ensuring high availability ... and performance of distributed database systems,” “fault tolerance,” and “synchronization mechanisms.” (Ex. 1011 at cover, 1-2.) The December 1998 Article itself “examines issues that arise in Web content replication, paying special attention to challenges in dynamic replication.” (*Id.* at 21.) Most importantly, the passage in the December 1998 Article that cites to Rabinovich identifies an algorithm in Rabinovich (“[fn16]”) for optimizing access to data using the rank of replicated data combined with the proximity of the replicated data in order to increase performance. (*Id.* at 26.) Footnote 16 contains the URL to Rabinovich. Thus, the December 1998 Article provided a roadmap directing persons of interest, such as the IEEE members to whom the Bulletin was distributed, to Rabinovich.

Reply 21–22 (footnote omitted).

We agree with and adopt Petitioner’s reasoning and determine Rabinovich to be a printed publication. We credit the unrebutted testimony of Dr. Rabinovich regarding the consistency of his professional practice in 1998 for republication of his AT&T technical memoranda on a webpage that he managed on AT&T’s publicly accessible website. Furthermore, we find the December 1998 IEEE article corroborates the public availability of Rabinovich on that website, and would have been a roadmap, for one of ordinary skill in the art of data management and optimized access to data, to be guided to Rabinovich. *See* Reply 19–22. As Petitioner points out, Patent Owner’s own declarant states that Rabinovich and the December 1988 IEEE article “are ‘similar[.]’ in that they both address ‘problems in network connectivity caused by multiple clients accessing servers.’” (Ex. 2006 at 12).” *Id.* at 21. Additionally, the passage in the December 1998 IEEE article that cites to Rabinovich refers to an algorithm in Rabinovich

for optimizing access to data in order to increase performance. *Id.*

Accordingly, we find that footnote 16 of the IEEE article, which contains the URL to Rabinovich, would have guided one of ordinary skill directly to Rabinovich.

We are, therefore, persuaded, that Rabinovich is a printed publication under 35 U.S.C. § 102.

*E. Claims 1–15 —  
Obviousness over Rabinovich (Ground 1)*

Petitioner argues that claims 1–15 are unpatentable under 35 U.S.C. § 103 as obvious over Rabinovich. Pet. 31–45. For the reasons explained below, Petitioner has not established, by a preponderance of the evidence, that claims 1–15 would have been obvious over Rabinovich.

*1. Rabinovich (Ex. 1006)*

Rabinovich describes

a protocol suite for dynamic replication and migration of Internet objects. It consists of an algorithm for deciding on the number and location of object replicas and an algorithm for distributing requests among currently available object replicas. Our approach attempts to place replicas in the vicinity of a majority of requests while ensuring at the same time that no servers be overloaded. The request distribution algorithm uses the same simple mechanism to take into account both server proximity and load, without actually knowing the latter. The replica placement algorithm executes autonomously on each node, without the knowledge of other object replicas in the system.

Ex. 1006, 1.

2. The Parties' Contentions

In light of the arguments and evidence of record, Petitioner has not established a reasonable likelihood that claims 1–15 are unpatentable as obvious over Rabinovich.

Independent claim 1 recites “at least two data storage units.” Petitioner relies upon Rabinovich’s teaching of hosts. Pet. 31 (citing Ex. 1006, 5, 7, Fig. 1 (h1, h2, h3, s); Ex. 1005 ¶¶ 231–233).

Independent claim 1 also recites “at least one computer unit.” Petitioner relies upon Rabinovich’s teaching of clients as the recited “computer unit.” Pet. 32 (citing Ex. 1006, 6, 7, Figure 1; Ex. 1005 ¶¶ 235–236).

Independent claim 1 further recites, “the data storage units copy pieces that are redundantly stored in the system from one of the data storage units to another of the data storage units *independently of an access of the computer unit* based on the data transmission performance measured between the data storage units.” Ex. 1002, 26:18–24 (emphasis added). Every other independent claim includes a limitation of commensurate scope. *Id.* at 26:49–55 (claim 3), 27:17–23 (claim 5), 27:48–53 (claim 7), 28:37–42 (claim 10), 29:25–30:3 (claim 13).

Petitioner argues that “the host/server will create a new replica of the stored object in a new server,” “[b]ased in part on the loads of both hosts/servers and measures of proximity to requesting clients,” and that “[t]he determination of where to make a new replica is independent of an access by a client at that time and without contacting the clients.” Pet. 35–36 (citing Ex. 1006, 2, 10–17; Ex. 1005 ¶¶ 257–260).

As to the meaning of “independently of an access,” Petitioner argues the ’680 patent describes two ways in which the copying is done “independently” of an access by the computer unit. First, the ’680 patent “identifies no role for the client computer” when a storage host periodically checks its past transmission performance metrics to decide whether to copy data to a new host, or when data is actually copied from one storage device to another. Reply 11. Second, according to Petitioner, “[c]opying is not initiated as a result of specific access requests from the computer unit.” *Id.*; Tr. 13:18–20.

In view of this, Petitioner argues that a storage device can copy “independently of an access” even if its decision to copy or its decision where to copy is based, in part, on data transmission performance measurements made during, or based on, prior access by the computer unit. Tr. 9:19–23, 11:6–12 (“[R]elying upon past communications with the client is not making it dependent upon an access of the computer unit, because . . . the data storage units . . . check their parameters periodically. And they decide whether to move the data . . . independent of any involvement of the computer unit.”).

Petitioner further argues that “[i]f copying decisions based on measured transmission data do not qualify as being made ‘independently of an access’ by the computer unit, then there is no disclosure in the patent of independent copying.” *Id.* at 12, 15 (“[T]here is no disclosure in the ’680 Patent of any technique for shifting data from one storage device to another based on ‘data transmission parameters’ other than those collected during prior requests for the data from a computer unit.”); Tr. 12:19–24 (arguing that “independent of an access” does not exclude looking at parameters

related to past communications with clients because that would go against the purpose of the patent).

Petitioner argues that Rabinovich replicates data “independently of an access of a computer unit” in the same manner as the ’680 patent. Reply 13–15. Petitioner contends that replication is performed “periodically” by a storage host and is not initiated in response to any specific access request for data by a computer unit. *Id.* at 13. Petitioner acknowledges that Rabinovich uses a count of prior accesses from the client, but notes that “it doesn’t take a count to trigger this.” Tr. 14:22–23. Rather, “it’s possible that the count might not have changed at all since . . . you’ve run this algorithm. The count hasn’t changed. There’s been no new accesses.” *Id.* at 14:16–19. Petitioner also contends that Rabinovich uses data parameters that are similar or identical to those used by the ’680 patent when determining whether and where to replicate data, and that Rabinovich, like the ’680 patent, updates the data transmission parameters for each storage device as the requests are received. *Id.* at 13–16.

Patent Owner argues that “independent of an access” means that “the data storage units cannot consider any access from the computer unit.” Tr. 33:14–16. Patent Owner contends that the host in Rabinovich “explicitly takes into account access by the clients” in its replication step. PO Resp. 33 (emphasis omitted). According to Patent Owner, Rabinovich discloses that a host will only replicate an object when the number of accesses of that object by the client exceeds a certain threshold. *Id.* Specifically, Patent Owner contends that hosts record accesses by the client as  $cnt(s, x_s)$ , and that Rabinovich’s replication step proceeds only if the ratio of  $cnt(s, x_s)$  to  $aff(x_s)$

is greater than a threshold value  $m$ . *Id.* at 34. At the Hearing, counsel for Patent Owner stated

the Rabinovich algorithm only performs the replication and copying step if the access count here is non zero. This is pointed out directly in Rabinovich's algorithm. Even though the algorithm itself is run periodically, the first step of the algorithm checks to see if the access count is divided by the affinity is less than the threshold. If the access count is zero, that's certainly less. . . . So the replication is . . . not performed.

Tr. 34:17–35:5; *see also id.* at 38:8–12 (arguing that “if the only way this [copy operation] is going to be triggered is a situation where a computer unit conducts an access, then there is a dependency on the access for the copy operation”), 41:8–13 (arguing that copying in Rabinovich only occurs “when a computer unit conducts an access and turns the count to a non zero number”).

Patent Owner argues that Petitioner's contention that Rabinovich's hosts copy “independently of an access” because a replica is made “independently of an access by a client *at that time and without contacting the clients*” attempts to read additional limitations into the claim language. PO Resp. 34. According to Patent Owner, even though Rabinovich's replication occurs *after* the client accesses the object, the decision to replicate still “depends” on the client access. *Id.* at 35 (“Essentially, Rabinovich teaches the hosts record the accesses made by the clients and use the recorded number of accesses to control replication, which is dependent of access.”).

### 3. Analysis

There is no dispute that Rabinovich's algorithm for replication considers the parameter  $cnt(s, x_s)$  in determining whether to replicate data

object  $x_s$ . Rabinovich defines  $cnt(s, x_s)$  as the “total access count for  $x_s$ ,” which is equal to  $cnt(x_s)$ . Ex. 1006, 11. According to Dr. Ratner, “[t]he metric  $cnt(s, x_s)$  measures the total number of times in that window that replica  $x_s$  has been served to a client computer.” Ex. 1005 ¶ 253. As Patent Owner points out, Rabinovich teaches replicating object  $x_s$  if the ratio of  $cnt(s, x_s)$  over  $aff(x_s)$  is greater than  $m$ , i.e., a non-zero value. PO Resp. 34; Ex. 1006, 12, Fig. 4. In view of this, we agree with Patent Owner that if  $cnt(s, x_s)$  has a value of zero, meaning that object  $x$  has not been served to any client computer, then the ratio of  $cnt(s, x_s)$  to  $aff(x_s)$  will be zero, i.e., less than  $m$ , and Rabinovich will not carry out its replication step. This means that Rabinovich will not replicate object  $x_s$  until  $x_s$  has been accessed by a client computer at least once, such that the access count for  $x_s$  is greater than zero. In this regard, we agree with Patent Owner that Rabinovich object  $x_s$  is not “sen[t], from the at least one data storage device to the another data storage device . . . independently of an access of the at least one client computer” because Rabinovich teaches explicitly that object  $x_s$  is not sent unless there has been at least one access from the client computer.

We are not persuaded by Petitioner’s argument that Rabinovich replicates data “independently of an access of a computer unit” in the same manner as the ’680 patent. Reply 13–15. The ’680 patent does not expressly define the phrase “independently of an access of a computer unit.” The ’680 patent does, however, explain that the data storage means processes data units independently from the computer unit. *See, e.g.*, Ex. 1002, 2:50–51 (“[I]t is to be preferred that the data storage means process the stored data independently from the computer unit.”). The ’680 patent also teaches that interactions between the computer unit and data storage

units are considered in determining replication of data between data storage devices. For example the '680 patent states:

All cells Z and/or clusters C and/or clients CL periodically check their applicable parameters for data transmissions. In periodic intervals or subsequently to specified actions, all cells Z and/or clusters C and/or clients CL check the parameters for data transmissions, which are applicable to the used cells Z. If the checked parameters do not meet specified limits, or if other cells Z and/or clusters C comprise better data transmission parameters, the checking cells Z will try to shift its data to these other cells Z and/or clusters C in order to improve the data transmission parameters applicable for this data. In this manner, the inventive cluster compound CV optimises itself automatically during operation with respect to data transmissions.

*Id.* at 9:3–15. The '680 patent further explains that

[i]n order to carry out the data access and the data management in a more efficient manner each cell may comprise additional data which relates to parameters of data transmissions between the individual data storage means and the computer unit, and/or neighbouring cells, and/or cells which comprise data which is stored in the system in a redundant manner.

*Id.* at 2:66–3:5, 4:59–64. Thus, the '680 patent does disclose considering parameters of data transmission between the computer unit and data storage device as part of data replication (shifting) between data storage units.

We, therefore, agree with Petitioner that “independently of an access” can encompass replication that is performed periodically and with no active role for the client computer in deciding whether to copy data or in copying the data itself. We also agree that a storage device can act “independently of an access” even if it considers data transmission performance measurements made during, or based on, prior access by the computer unit. In those

respects, Rabinovich's teachings are similar to the teachings of the '680 patent.

Unlike Rabinovich, however, the '680 patent does not require that a parameter of data transmission between a client computer and data storage device, such as an access count, be above a certain threshold before replication can occur. Rather, as noted above, the '680 patent explains that as an alternative to instances where "checked parameters do not meet specified limits," data may be replicated to other data storage units "if other cells Z and/or clusters C comprise better data transmission parameters" Ex. 1002, 9:8–13. Therefore, although Rabinovich's hosts can decide autonomously, i.e., at any time and without contacting a client, when to initiate its replication algorithm, that algorithm will not "send[], from the at least one data storage device to the another data storage device, a copy of the received piece of data," as required by the claims, unless at least one access by a client (i.e., computer unit) has taken place. As a result, despite the many similarities between Rabinovich and the '680 patent, Rabinovich's requirement that object  $x_s$  have an access count greater than zero before it will replicate object  $x_s$  leads us to conclude that Rabinovich fails to disclose copying data between data storage devices "independently of an access" of the computer unit. We find that this outcome is consistent with the teachings of the '680 patent in view of the disclosure in the '680 patent regarding replicating data based on whether checked parameters do not meet specified limits, or if other cells Z and/or clusters C comprise better data transmission parameters.

On this record, we are not persuaded that Petitioner has established that Rabinovich teaches copying data from one storage device to another

“independently of an access of the computer unit,” as required by each of the independent claims.

4. Conclusion

We are not persuaded that Petitioner has established, by a preponderance of the evidence, that claims 1–15 are unpatentable under 35 U.S.C. § 103 as obvious over Rabinovich.

*F. Claims 1, 3, 5, and 7–15 —  
Anticipation by Rabinovich (Ground 2)*

Petitioner argues that, under a broad construction of “computer unit,” which we have adopted for purposes of this Decision, claims 1, 3, 5, and 7–15 are unpatentable under 35 U.S.C. § 102 as anticipated by Rabinovich. Pet. 45–56. For the reasons explained below, Petitioner has established, by a preponderance of the evidence, that claims 1, 3, 5, and 7–15 are anticipated by Rabinovich.

1. Analysis

We are persuaded by Petitioner’s arguments and cited evidence that Rabinovich discloses each of the recited limitations of claims 1, 3, 5, and 7–15. Pet. 45–48. Pet. 45–56. Because of differences in the claim language, we address claims 1, 3, and 5 separately from claims 7–15.

Petitioner’s contentions largely refer to its contentions for Ground 1. Independent claim 1, for example, recites “at least two data storage units.” Petitioner refers to its contentions for Ground 1 (Pet. 46), where it relies upon Rabinovich’s teaching of hosts (*id.* at 31 (citing Ex. 1006, 5, 7, Fig. 1 (h1, h2, h3, s); Ex. 1005 ¶¶ 231–233)).

Independent claim 1 also recites “a controller to enable data transmission between the data storage units and the computer unit.”

Petitioner refers to its contentions for Ground 1 (Pet. 47), where it contends that Rabinovich discloses a “controller” because “Rabinovich would necessarily have such software that controls communication between the servers and the clients” (Pet. 33 (citing Ex. 1005 ¶ 234<sup>2</sup>)). In this regard, Petitioner’s expert, Dr. David H. Ratner, testifies that the “controller” limitation is met by Rabinovich’s teaching of “the redirector and network connecting client computer, distributor, redirector and host server that performs the function of enabling transmission of Internet object data content between a data storage units [host servers] and a computer unit [the user’s client computer].” Ex. 1005 ¶ 243. Rabinovich teaches that “a *redirection service* keeps the *mapping database* that maps URLs to replica sets,” and that the database is partitioned among multiple redirectors. Ex. 1006, 33. “Redirectors implement the request distribution algorithm of Figure 2 for their portion of the URL namespace. In response to the above query, the redirector chooses a physical replica for the requested object and sends its ID (a ‘physical URL’) back to the distributor.” *Id.* at 34. We are persuaded that Rabinovich’s redirector is a “controller to enable data transmission between the data storage units and the computer unit” for the reasons argued by Petitioner.

Independent claim 1 also recites:

wherein at least one of the at least two data storage units measures a data transmission performance between at least two of the at least two data storage units and the data storage units copy pieces that are redundantly stored in the system from one of the data storage units to another of the data storage units independently of an access

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<sup>2</sup> We understand Petitioner’s citation to paragraph 234 to be a typographical mistake because the “controller” limitation is discussed in paragraph 243—not 234—of Dr. Ratner’s Declaration.

of the computer unit based on the data transmission performance measured between the data storage units.

Ex. 1002, 26:16–24. Petitioner refers to its contentions in Ground 1 (Pet. 48), where it argues that “each host/server will periodically measure the data transmission performance between themselves and other hosts/servers in the system for each of the data objects stored, to decide whether to redundantly store the object based on the measured performance” (Pet. 35 (citing Ex. 1006, 11; Ex. 1005 ¶¶ 253–256)). Specifically, Petitioner argues that “the host/server will create a new replica of the stored object in a new server,” “[b]ased in part on the loads of both hosts/servers and measures of proximity to requesting clients,” and that “[t]he determination of where to make a new replica is independent of an access by a client at that time and without contacting the clients.” *Id.* at 35–36 (citing Ex. 1006, 2, 10–17; Ex. 1005 ¶¶ 257–260).

Petitioner’s contentions differ from its contentions for Ground 1 with respect to elements 1[b] and 1[d]. Pet. 45–48.

Element 1[b] of independent claim 1 recites “at least one computer unit that stores at least one complete file, each file including a plurality of individual pieces, the pieces containing parts of the files, wherein at least one piece is stored in a redundant manner in the at least two data storage units.” Instead of relying on Rabinovich’s client to be the claimed “computer unit,” as it did in Ground 1, Petitioner argues that Rabinovich’s host discloses a computing device, as encompassed by a broad construction of “computer unit.” Pet. 46–47 (citing Ex. 1006, 11). With respect to storing a complete file, Petitioner argues that “[w]hen the object is a file, such as an Internet webpage, then a complete file is stored.” Pet. 47. Petitioner contends that Rabinovich’s objects are inherently composed of

pieces—i.e., bits and bytes that are assembled into packets for transmission—and that “[t]he sheer existence of replicas means that objects are redundantly stored in the hosts/servers.” *Id.* (citing Ex. 1006, 1, 24 (Table 2); Ex. 1005 ¶ 325).

Element 1[d] of independent claim 1 recites:

wherein at least one of the data storage units and computer unit measures a data transmission performance between at least one of the data storage units and the computer unit, the at least one piece being stored by the computer unit in a redundant manner in the data storage units as a function of the measured data transmission performance, and the computer unit accessing the at least one of the data storage units as a function of the measured data transmission performance

Ex. 1002, 26:6–15. Because Petitioner is relying on Rabinovich’s hosts, rather than its clients, as the recited “computer unit,” it argues that this limitation is met by Rabinovich’s disclosure of hosts “determin[ing] whether to replicate or migrate data based upon the data transmission performance measurements between itself and other hosts/servers (the “data storage units”) for each of the data objects stored.” *Id.* at 48 (citing Ex. 1006, 2, 10–17; Ex. 1005 ¶¶ 330–333).

Notwithstanding Patent Owner’s arguments, which we address below, we are persuaded that Petitioner’s citations support Petitioner’s contentions with respect to claim 1. Having reviewed the arguments and evidence with respect to claims 3, 5, and 7–15 (Pet. 48–56), we also are persuaded that Petitioner’s citations support Petitioner’s contentions with respect to those claims.

Patent Owner argues that (1) Rabinovich does not disclose “wherein at least one piece [of a plurality of individual pieces of one complete file] is

stored in a redundant manner” (PO Resp. 12, 16–30); (2) Rabinovich does not disclose copying “independently of an access of the computer unit” (*id.* at 13–15, 16, 17, 31–37); and (3) Rabinovich does not disclose “storing pieces of a complete file on two separate computer units, receiving pieces of the complete file from both computer units, and receiving additional pieces of data until the complete file is received as required by the arrangement of claims 7, 8, and 9” (*id.* at 37–40). We address each argument in turn.

*a. Pieces*

Patent Owner argues that “a key feature of the patent is dividing a complete file into pieces and then redundantly storing *the pieces of the complete file* (as opposed to merely redundantly storing the complete file) (the ‘pieces limitation’).” PO Resp. 17. According to Patent Owner, the “pieces limitation” is found in every independent claim. *Id.* at 18–19; *see, e.g.*, Ex. 1002, 26:1–3 (claim 1 reciting “wherein at least one *piece* is stored in a redundant manner” (emphasis added)). Patent Owner argues that “these **pieces** are subsets of a complete file—and not the complete file itself.” PO Resp. 19. Patent Owner contrasts the claims of the ’680 patent with claim 30 of related patent U.S. RE40,521E, which recites “storing data” rather than pieces. *Id.* at 20 (emphasis omitted).

We agree, and Petitioner does not dispute (Reply 1–2), that a “piece” of a file must be less than the entire file. Claim 1, for example, explicitly recites “one complete file, each file including a plurality of individual pieces, the pieces containing parts of the files.” Because the claim requires a “plurality” of pieces, each “piece” is necessarily a subset of a “file.”

As Petitioner points out (*id.*), the independent claims all recite storing “at least” before “one piece,” and, therefore, allow for more than one piece,

and thus all of the pieces of an entire file, to be “stored in a redundant manner.” Moreover, the claim recites copying “pieces” plural (*see* Ex. 1002, 26:19), not the “at least one piece [] stored in a redundant manner” recited earlier in the claim. Thus, the copying limitation also permits copying more than one piece, and thus all of the pieces of an entire file. Patent Owner does not dispute that the claims are broad enough to cover copying all of the pieces of an entire file. Tr. 51:1–4. As a result, although we agree that a “piece” is less than a complete file, such an interpretation does not distinguish the claims, which recite “*at least one piece*” and “pieces,” from what is disclosed by Rabinovich.

Patent Owner next argues that “the pieces must already be redundantly stored prior to the other steps of claim 1” because claim 1 first recites “wherein at least one piece is stored in a redundant manner” and later recites “the data storage units copy pieces that are redundantly stored in the system from one of the data storage units to another of the data storage units.” PO Resp. 21–22. Petitioner counters that “[t]he claims do not require the piece of the file to be already redundantly stored before the remainder of the steps of the claim” because “[t]he initial reference in the claim to the piece of the file being redundantly stored refers to the redundant storage that happens during the steps of the claim.” Reply 5 n.4.

Patent Owner’s argument is not persuasive. Claim 1 is a system, not a method, claim. The phrase “wherein at least one piece is stored in a redundant manner” describes a limitation on the recited “at least one piece;” it does not recite a method step. Similarly, the phrase “copy pieces that are redundantly stored in the system” occurs in a wherein clause describing the interaction of the data storage units and the computer unit. It neither recites

a method step nor implies a sequence of events, order of operations, or other chronological relationship between the recited interaction and the point in time at which a “piece” can be described accurately as “stored in a redundant manner.” Because we are not persuaded that the claim language implies a sequence of steps, we also are not persuaded by Patent Owner’s conclusion that “it makes no sense to read Rabinovich as teaching the pieces limitation because it would be superfluous to replicate another copy of an Internet object on a host that already has a copy of the Internet object.” *Id.* at 22.

Patent Owner also argues that “Rabinovich teaches at most that *the file is redundantly stored*, not that *the pieces of the file are redundantly stored*.” PO Resp. 23; *see also id.* at 12 (arguing “nowhere in Rabinovich’s replica placement algorithm (or anywhere else in Rabinovich) is there a step that divides an individual Internet object into any pieces *and then redundantly migrates, replicates, or stores the pieces*”). Specifically, Patent Owner argues that “the claims require *the same pieces that are transferred must also be the pieces that are redundantly stored*” (*id.* at 24), and that Rabinovich does not disclose that “the same packets sent over the Internet are also the blocks or fragments stored on a hard drive” (*id.* at 25).

Petitioner counters that Rabinovich’s objects are broken into “pieces”—i.e., bits, bytes, or collections of bytes—and transmitted in packets to another host that redundantly stores those pieces, and others, to create a replica of the data object. Reply 3 (citing Ex. 1005 ¶¶ 237–241); Tr. 20:23–21:10. Petitioner further points out that “Rabinovich’s disclosure of a replication protocol that uses the TCP/IP protocol to transmit a file in pieces to multiple hosts discloses that the same pieces of the file that are transmitted are redundantly stored.” Reply 4 (citing Ex. 1005 ¶¶ 237–241).

Otherwise, according to Petitioner, “[i]f the pieces were not stored, the hosts would not be able to supply the complete file to clients or other hosts.” *Id.*

We agree with Petitioner. Rabinovich’s data object cannot be stored at a second host without necessarily storing “at least one piece”—i.e., a collection of bytes of that data object—as it is received in the payload of a TCP/IP packets. Patent Owner’s declarant, Dr. Jacobs, testified that “where one copies a file over the internet, if that copy is perfectly successful, then the bits and bytes of the file in the copy would be identical to the bits and bytes of the original file.” Ex. 1020, 43:7–11. This is consistent with Dr. Ratner’s testimony that “files are typically stored on storage devices as organized in drive storage blocks or sectors and organized as bytes. Collectively these pieces make up a file.” Ex. 1005 ¶ 237; Tr. 24:19–22.

Furthermore, Patent Owner’s arguments are not persuasive because they are not commensurate with the scope of the claims. Specifically, Patent Owner asks us to read into the claims limitations on *how* pieces are stored and sent by arguing, for example, that “the claims require storing something less than the whole file” (Tr. 52:22–53:3). The method claims, for example, do not recite “storing . . . the received piece of data *separately from the other pieces of data that complete the file.*” They also do not recite, for example, “storing . . . the received piece of data *in a way that it can be accessed separately from the file of which it is a piece.*” The storing limitation requires only that the received piece of data be stored on a data storage device. The “received piece of data” is “stor[ed]” regardless of the mechanics of how it is stored—e.g., as a block or fragment on a hard drive; as the only piece of that file on that hard drive; as the only piece of that file on that data storage unit; contiguously with other pieces of the same file; in a

way that it can be addressed directly by the file system. None of those mechanics are in the claim language and, even if they were in the Specification, which they are not, it would be improper to read them into the claims. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

Likewise for “sending,” the method claims do not recite, for example, “sending . . . the received piece of data *but not the other pieces of data that complete the file*,” “sending *in one packet* . . . the received piece of data,” or “sending . . . the received piece of data *by itself*.” The sending limitations require only that a copy of the received piece of data on one data storage device be sent to another data storage device. A copy of the “received piece of data” is “sen[t]” regardless of the mechanics of *how* it is sent—i.e., as one packet; as more than one packet; or as only part of a packet that also includes other pieces.

Because the claim language does not recite the limitations on *how* pieces are stored and sent that Patent Owner contends, we are persuaded by Petitioner’s contentions that the “storing” and “sending” limitations are met by Rabinovich’s teaching that objects are broken into “pieces”—i.e., bytes—and transmitted in packets to another host that redundantly stores those pieces, and others, to create a replica of the data object. Pet. 47; Reply 3 (citing Ex. 1005 ¶¶ 237–241); Tr. 20:23–21:10. Petitioner’s evidence and arguments establish persuasively that, in Rabinovich, a host (i.e., “at least one data storage device”) receives at least one byte of an object (i.e., “at least one piece of data”) in a TCP/IP packet, stores that at least one byte (among others), and sends, during the replication process, a copy of that byte (among others) to another host (i.e., “another data storage device”). As

Petitioner notes, “[i]f the pieces were not stored, the hosts would not be able to supply the complete file to clients or other hosts.” Reply 4.

Patent Owner next argues that claim 1 requires “a piece of the complete file already exist on the data storage unit (which Petitioners allege is Rabinovich’s host), and then copying another piece of the complete file to that host,” and that Rabinovich does not teach “copying another copy of the complete file to a host that has already stored a copy of that complete file.”

PO Resp. 25–26. Petitioner counters that

This argument is based upon two errors. First, the claims recite that “the at least one piece” is redundantly stored in the at least two data storage units, and then the same “the at least one piece” is copied to one of the data storage units. (*See, e.g.*, Ex. 1002 at 26:9.) Thus, if Patent Owner’s interpretation were correct—which it is not—the claims would require that a piece of the file already stored in data storage units be copied to one of the same units. Second, even if the piece of the file had to already be redundantly stored and then redundantly stored again, as Patent Owner asserts, the claims do not specify that the second redundant storage would have to be in the same data storage units. There could be, for example, 10 data storage units with the piece redundantly stored in just two and then stored in two others.

Reply 4–5 (footnote omitted). We agree with Petitioner. The relevant limitations of claim 1, for example, require only that “at least one piece is stored in a redundant manner in the at least two data storage units,” and that “the data storage units copy pieces that are redundantly stored in the system from one of the data storage units to another of the data storage units.” This claim language does not require, as Patent Owner contends, that the data storage unit to which “pieces” of a file are copied already store another “piece” of the same file. The claims encompass, as Petitioner points out

(Reply 5), a hypothetical system with ten “data storage units,” in which case the “at least one piece” could be “stored in a redundant manner in [data storage units A and B]” and “[data storage units A and B] copy pieces that are redundantly stored in the system from [data storage unit A or B] to [data storage unit C].” Nothing in the claims requires data storage unit C to be one of the data storage units in which “the at least one piece is stored in a redundant manner.” We, therefore, disagree with Patent Owner’s contention that “the pieces limitation of the claim [] requires some piece of the complete file to exist in the data storage unit prior to copying other pieces of the complete file to the data storage unit.” PO Resp. 26.

Patent Owner also argues that Rabinovich’s “objects” are not “pieces” of a complete file (PO Resp. 26–29), but Petitioner replies that “[t]he Board need not decide this issue” because “Petitioners did not rely upon that basis in their Petition. Instead, Petitioners relied upon the TCP/IP protocol transmitting files in pieces and that bits and bytes also constitute pieces of files” (Reply 5–6). We agree with Petitioner. Because Petitioner’s contentions are not based upon Rabinovich’s “objects” being “pieces,” we need not address this argument by Patent Owner.

Patent Owner also argues that, in our Decision on Institution, we “adopted a third position, that files are inherently comprised of bits and bytes and thus redundantly transferring and storing any file necessarily involves redundantly transferring and storing pieces of the file – the bits and bytes.” PO Resp. 29. According to Patent Owner, “[t]his position is not one advanced [] in Petitioners’ expert testimony and is fundamentally inconsistent with what Petitioners actually argued – that the ‘pieces’ are blocks and packets.” *Id.* Petitioner counters that “[t]his argument was a not

a creation of the Board,” because “Dr. Ratner explained and Petitioners relied upon the fact that files are made up of bits and bytes, and these pieces of the file would be transmitted and stored in the receiving computer.” Reply 6 (citing Pet. 32; Ex. 1005 ¶¶ 237, 290). Petitioner is correct. In our Decision on Institution, we stated that, “Petitioner contends that Rabinovich’s objects are inherently composed of pieces—i.e., bits and bytes that are assembled into packets for transmission—and that ‘[t]he sheer existence of replicas means that objects are redundantly stored in the hosts/servers.’ [Pet. 47] (citing Ex. 1006, 1, 24 (Table 2); Ex. 1005 ¶ 325).” Dec. Inst. 24. As is evident on page 47 of the Petition, Petitioner articulates clearly that, “files are inherently composed of pieces in the form of bits that make up bytes, the bytes themselves being pieces of the file.” Pet. 47. Thus, Petitioner identified bytes—not blocks or packets—as the recited “pieces.” As a result, we are not persuaded by Patent Owner that we adopted, in our Decision to Institute, a position different from what Petitioner articulated.

In view of the foregoing, we determine that Petitioner has demonstrated by a preponderance of evidence that Rabinovich teaches the “pieces limitations” recited in independent claims 1, 3, 5, 7, 10, and 13.

*b. “Independently of an access of the computer unit”*

Petitioner contends that under a construction wherein any computing device can be a “computer unit,” one of Rabinovich’s hosts can be the required “computing unit,” and the servers to which that host replicates data can be the recited “data storage units.” Pet. 46. Petitioner thus argues that “a host in Rabinovich that stores a file may be the ‘computer unit,’ and the servers to which it replicates the data can be the ‘data storage units.’” *Id.*

Additionally, “when one of the recipient servers/‘data storage units’ replicates or migrates the data to another server, that would constitute the data storage unit to data storage unit copying recited in the claims.” *Id.*

As discussed above, claim 1 requires “the data storage units copy pieces . . . from one of the data storage units to another of the data storage units independently of an access of the computer unit.” Petitioner contends that, under a broad construction of “computer unit,” such as the one we adopt here, Rabinovich discloses this limitation based on the algorithms set forth in Rabinovich Figures 4 and 5. Reply 9–10. Specifically, Petitioner contends that because the client is no longer considered the “computer unit,” the fact that the replication algorithm is dependent on the access of the *client* (i.e.,  $cnt(s, x_s)$ ) in Rabinovich is irrelevant to the question of whether replication occurs independently of an access by the computer unit. *Id.* Instead, the relevant inquiry is whether the subsequent replication between hosts (i.e., data storage devices) is independent from an access of the host that initially stores, then replicates the data (i.e., the “computer unit”). *Id.* Petitioner argues that Rabinovich satisfies this limitation because the “hosts receiving the data and functioning as data storage units . . . replicate or migrate the data themselves to other host/data storage units by periodically checking the access count that keeps track of accesses by clients.” *Id.*; Pet. 45–47.

Patent Owner argues that

the problem with [Petitioner’s] argument is that Rabinovich explicitly makes clear that accesses made by the host are included in the access count. It says that for each entity E which can be hosts,  $cnt(E, x_s)$  refer to the access count of E. So the access count of the host itself is also included in the access count.

Tr. 45:24–46:4.

As Petitioner points out, however, the parameter  $E$  in Rabinovich does not represent the number of accesses made by the host. Tr. 81:8–17.

Instead, Rabinovich states that “[f]or each entity  $E$  which can be hosts, areas, or autonomous systems) that appeared on preference paths of some requests to  $x_s$  in the last sampling interval, host  $s$  keeps the count of the number of these appearances,  $cnt(E, x_s)$ , referred to as the *access count* of  $E$ .” Ex.

1006, 11. Rabinovich further explains that “an entity that frequently appears in preference paths may be a good candidate for placing an object replica.”

*Id.*

Dr. Ratner testifies that  $cnt(E, x_s)$  measures “the number of times in a sampling window the replica of  $x$  hosted at server  $s$  has been requested by client computers that are connected to  $s$  by a preference path that includes  $E$ .” Ex. 1005 ¶ 253. Dr. Ratner explains that Rabinovich uses  $cnt(E, x_s)$  “as a measure of possible future demand for a replica of  $x$  on network entity  $E$ ,” and that the algorithm will not replicate to an entity  $E$  unless the potential demand at  $E$  for  $x$  exceeds a certain threshold. *Id.* (also referring to  $cnt(E, x_s)$  as an indicator of “the anticipated load on  $E$  if the replication is performed”). Dr. Jacobs does not contest or even address Dr. Ratner’s testimony on this subject, other than simply discussing that Rabinovich refers to  $cnt(E, x_s)$  as “the *access count* of  $E$ ” and considers that parameter in determining whether and where to replicate data. Ex. 2006 ¶ 45.

We credit Dr. Ratner’s unchallenged testimony that  $cnt(E, x_s)$  refers to a measure of possible future demand for a replica of  $x$  on a network entity  $E$ , i.e., the anticipated load on  $E$  due to  $x$ . Ex. 1005 ¶ 253. This explanation is consistent with Rabinovich’s statement that  $cnt(E, x_s)$  refers to the number of

times E appeared on preference paths of some requests to  $x_s$ . Ex. 1006, 11. Therefore, although Rabinovich refers to  $cnt(E, x_s)$  as “the *access count* of E,” the evidence of record demonstrates that  $cnt(E, x_s)$  in Rabinovich does not represent the number of accesses made by the host. Instead, it is related to the algorithm’s search for a good location to place the replicated object. Ex. 1006, 11. In view of this, we disagree with Patent Owner’s argument that Rabinovich’s algorithm tracks the access count of the hosts themselves, and that the decision to replicate data depends upon this access. Tr. 46:7–9.

To the contrary, Rabinovich discloses that its hosts periodically and autonomously run the replication algorithms. Ex. 1006, 2, 11–14, Figs. 4 and 5. In contrast to the analysis above of Petitioner’s obviousness arguments, here the decision regarding whether or not to replicate data does not depend upon there having been at least one access by a host. Instead, the algorithm uses the “*access count* of E” to determine the best candidates for replication. Although the algorithm still requires an access by a *client*, the client, in this ground, is not the “at least one computer unit” recited in the claim. Instead, the “at least one computer unit” is the first host that receives the replicated object from the client. Because Rabinovich’s algorithm does not “depend” on an access by the first host that receives the replicated object from the client, we are persuaded that Petitioner has demonstrated adequately that the Rabinovich’s servers (i.e., “data storage units”) “copy pieces . . . from one of the data storage units to another of the data storage units independently of an access of the computer unit.”

Patent Owner also argues that the “‘independent of an access’ language reflects the fact that the patented invention copies and stores data in a decentralized way.” PO Resp. 31. Patent Owner contends that

Rabinovich uses a centralized replicator hierarchy for copying functions, including a root replicator that directs multiple area replicators. *Id.* at 35 (citing Ex. 1006, 11, Fig. 3). According to Patent Owner, Rabinovich’s use of a centralized replicator further demonstrates why it does not disclose copying data “independent of an access of the computer unit.” *Id.* at 35–36. Additionally, Patent Owner argues that it is the centralized replicator, not the data storage devices themselves, that performs the copying. *Id.*

Petitioner counters that Rabinovich’s replicator hierarchy “plays no role when a storage host seeks to replicate data to another host in the same area.” Reply 16. According to Petitioner, Patent Owner’s arguments apply only if copy operations extend across storage areas. *Id.* at 18. When copying within the same area, however, Rabinovich teaches that the host itself is responsible for determining to replicate the data, for selecting the area where the data is to be copied, and for carrying out the transfer. *Id.* at 16–17 (citing Ex. 1006, 10, 14–15). Petitioner, therefore, argues that Rabinovich discloses copying data from one storage device to another “independently of an access of the computer unit.” *Id.* at 18.

We are persuaded by Petitioner’s arguments. As Petitioner points out, Rabinovich discloses that “[t]here is one replicator in each internal area,” and “[i]t is also convenient to consider hosts as trivial replicators, with a single subordinate host.” Ex. 1006, 10. Rabinovich further teaches that the hosts themselves run the replication algorithms. *Id.* at 11–14. These teachings demonstrate that Rabinovich discloses copying data between storage devices (i.e., hosts) in a “decentralized way.”

For all of the foregoing reasons, we find Petitioner has established, by a preponderance of evidence, that Rabinovich discloses copying data from

one storage [unit / device] to another “independently of an access of the computer unit.”

*c. Claims 7 and 9*

Patent Owner argues that Rabinovich does not “disclose storing pieces of a complete file on two separate computer units, receiving pieces of the complete file from both computer units, and receiving additional pieces of data until the complete file is received as required by the arrangement of claims 7, 8, and 9.” PO Resp. 40. According to Patent Owner, “[w]hile claim 8 does not explicitly state the second piece of data is received from a second computer unit, reading claims 7 and 8 any other way would not make sense” because “[i]f the computer unit of claim 8 was the same as the computer unit of claim 7, such a reading would render the multiple computer units of claim 7’s preamble superfluous since only one computer unit would then be recited and required by the remaining language of the claims.” *Id.* at 39. Patent Owner concludes that Petitioner’s theory that “the pieces are received from the same computer” is deficient. *Id.* at 40.

Petitioner counters that, “[w]hile Claim 8 references a second piece of data, it does not recite that it is received from a different computer unit” because it says instead only that it is stored by “a” computer unit.” Reply 7. According to Petitioner, under the broadest reasonable interpretation, “a” computer unit “could be the same or a different computer unit from that in Claim 7.” *Id.* at 8 (noting that claim 8 could have recited “a *second* computer unit.”). Thus, concludes Petitioner, Rabinovich’s disclosure of a first piece of data and a second piece of data received from the same host satisfies the limitations of claims 7–9. *Id.* at 8–9.

Claim 7 recites, in relevant part, “receiving in the at least one data storage device at least one piece of data stored by a computer unit.” Claim 8 recites, in relevant part, “receiving in the at least one data storage device a second piece of data stored by a computer unit.” We agree with Petitioner that “a computer unit” in claim 8 can encompass the same computer unit as in claim 7. Corroborating our determination that “a computer unit” should not be interpreted to mean only “a *second* computer unit” or “*another* computer unit” is claim 8’s use of “second” when reciting “*a second* piece of data,” in contrast to its recitation of only “*a* computer unit.” Patent Owner’s arguments about Rabinovich are predicated on its construction of “a computer unit” in claim 8 with which we disagree. Because we disagree that claim 7–9 require “storing pieces of a complete file on two separate computer units, receiving pieces of the complete file from both computer units, and receiving additional pieces of data until the complete file is received” (PO Resp. 40), we are not persuaded by Patent Owner’s argument that Rabinovich does not disclose such an arrangement.

## 2. Conclusion

We are persuaded that Petitioner has established, by a preponderance of the evidence, that claims 1, 3, 5, and 7–15 are unpatentable under 35 U.S.C. § 102 as anticipated by Rabinovich.

### III. CONCLUSION

For the foregoing reasons, we determine that Petitioner has established, by a preponderance of the evidence, that claims 1, 3, 5, and 7–15 of the ’680 patent are unpatentable under 35 U.S.C. § 102.

#### IV. ORDER

Accordingly, it is

ORDERED that claims 1, 3, 5, and 7–15 of the '680 patent are unpatentable; and

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

IPR2015-01802  
Patent 7,904,680 B2

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