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Paper No. 49
Filed: March 16, 2016

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CISCO SYSTEMS, INC., QUANTUM CORPORATION,
and ORACLE CORPORATION,
Petitioners,

v.

CROSSROADS SYSTEMS, INC.,
Patent Owner.

Case IPR2014-01463[1]
Patent 7,934,041 B2

Before NEIL T. POWELL, KRISTINA M. KALAN, J. JOHN LEE, and KEVIN W. CHERRY, *Administrative Patent Judges*.

POWELL, *Administrative Patent Judge*.

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

I. INTRODUCTION

We have jurisdiction to hear this *inter partes* review under 35 U.S.C. § 6(c). This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons discussed below, we determine that

[1] Case IPR2015-00854 has been joined with this proceeding.

Petitioners have shown by a preponderance of the evidence that claims 1–53 of U.S. Patent No. 7,934,041 B2 (Ex. 1001, "the '041 patent") are *unpatentable*.

A. Procedural History

Cisco Systems, Inc. and Quantum Corporation filed a Petition (Paper 3, "Pet.") requesting institution of an *inter partes* review of claims 1–53 of the '041 patent. On December 19, 2014, Crossroads Systems, Inc. ("Patent Owner") filed a Preliminary Response (Paper 7, "Pelim. Resp."). In a Decision to Institute (Paper 9, "Dec. Inst.") issued March 17, 2015, we instituted an *inter partes* review of claims 1–53 on the following grounds of unpatentability:

1. Claims 1–14, 16–33, 35–50, and 53 under 35 U.S.C. § 103(a) for obviousness over CRD-5500 Manual[2] and HP Journal[3]; and
2. Claims 15, 34, 51, and 52 under 35 U.S.C. § 103(a) for obviousness over CRD-5500 Manual, HP Journal, and Fibre Channel Standard[4].

After institution of trial, Patent Owner filed a Patent Owner Response (Paper 19, "PO Resp.") and Petitioners filed a Reply (Paper 32, "Pet. Reply"). On March 6, 2015, in IPR2015-00854, Oracle Corporation filed a

[2] CMD Technology, Inc., CRD-5500 SCSI RAID Controller User's Manual (1996) (Ex. 1004).
[3] Petitioners cite the following articles in Exhibit 1006 as one reference: Meryem Primmer, *An Introduction to Fibre Channel*, 47 HEWLETT-PACKARD J. 94–98 (1996) and Judith A. Smith & Meryem Primmer, *Tachyon: A Gigabit Fibre Channel Protocol Chip*, 47 HEWLETT-PACKARD J. 99–112 (Oct. 1996) (Ex. 1006).
[4] American National Standards Institute, Inc., *Fibre Channel Physical and Signaling Interface (FC-PH) X3.230* (June 1, 1994) ("Fibre Channel Standard") (Ex. 1007).

Petition requesting *inter partes* review of claims 1–53 of the '041 patent, along with a motion for joinder. *Oracle Corp. v. Crossroads Sys., Inc.*, Case IPR2016-00854, Papers 1 & 3 (PTAB). On September 15, 2015, we granted Oracle Corporation's motion for joinder and joined IPR2015-00854 to this proceeding. Case IPR2015-00854, Paper 14. Oral hearing was held on October 30, 2015.[5]

Petitioners submitted the Declaration of Andrew Hospodor, Ph.D., dated September 5, 2014 (Ex. 1003, "Hospodor Declaration"), in support of their Petition.

Patent Owner submitted the Declaration of Dr. John Levy, Ph.D., dated May 26, 2015 (Ex. 2027, "Levy Declaration"). Patent Owner also submitted other declarations in support of its contentions of secondary considerations of non-obviousness. *See* Ex. 2039; Ex. 2043.

Patent Owner filed a Motion to Exclude (Paper 37) and Reply in support of its Motion to Exclude (Paper 43). Petitioners filed an Opposition to Patent Owner's Motion to Exclude (Paper 41).

B. Related Proceedings

The '041 patent is the subject of multiple district court proceedings. Pet. 1; Paper 6, 2–3. The '041 patent belongs to a family of patents that are the subject of multiple *inter partes* review petitions, including IPR2014-01197, IPR2014-01207, IPR2014-01209, IPR2014-01226, IPR2014-01544, IPR2015-00822, and IPR2015-00852.

[5] A transcript of the oral hearing ("Tr.") is included in the record as Paper 48.

II. DISCUSSION

A. The ’041 Patent

The ’041 patent relates to a storage router and method for providing virtual local storage on remote Small Computer System Interface (“SCSI”) storage devices to Fiber Channel (“FC”) devices. Ex. 1001, 1:44–47. SCSI is a storage transport medium that provides for a “relatively small number of devices to be attached over relatively short distances.” *Id.* at 1:51–54. FC is a high speed serial interconnect that provides “capability to attach a large number of high speed devices to a common storage transport medium over large distances.” *Id.* at 1:56–59. Computing devices can access local storage through native low level, block protocols and can access storage on a remote network server through network interconnects. *Id.* at 1:65–2:10. To access the storage on the remote network server, the computing device must translate its file system protocols into network protocols, and the remote network server must translate network protocols to low level requests. *Id.* at 2:12–20. A storage router can interconnect the SCSI storage transport medium and the FC high speed serial interconnect to provide devices on either medium access to devices on the other medium so that no network server is involved. *Id.* at 3:58–4:1.

Figure 4 of the ’041 patent is reproduced below:

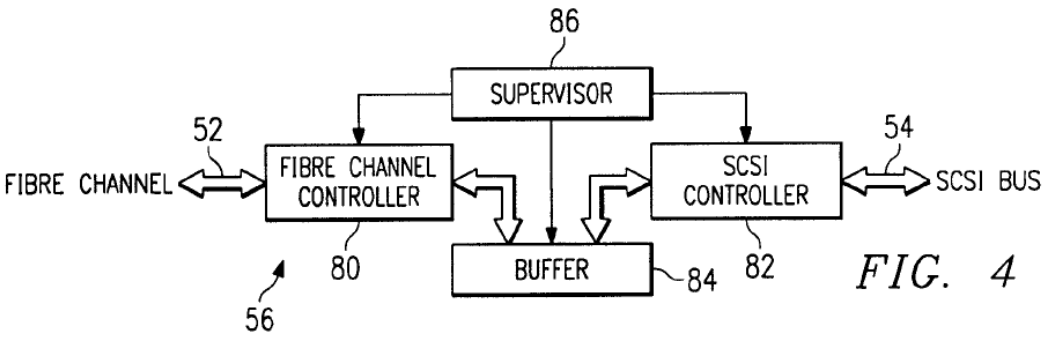


FIG. 4

Figure 4 is a block diagram of an embodiment of a storage router. *Id.* at 3:22–23, 5:34–35. Storage router 56 can comprise FC controller 80 that interfaces with FC 52 and SCSI controller 82 that interfaces with SCSI bus 54. Buffer 84 connects to FC controller 80 and SCSI controller 82, and provides memory work space. *Id.* at 5:35–37. Supervisor unit 86 connects to FC controller 80, SCSI controller 82, and buffer 84. *Id.* at 5:37–39. Supervisor unit 86 controls operation of storage router 56 and handles mapping and security access for requests between FC 52 and SCSI bus 54. *Id.* at 5:39–44.

Claims 1, 20, and 37 are the independent claims at issue in this trial, and claim 1 is reproduced below:

> 1. A storage router for providing virtual local storage on remote storage devices, comprising:
>
> a first controller operable to interface with a first transport medium, wherein the first medium is a serial transport media; and
>
> a processing device coupled to the first controller, wherein the processing device is configured to:
>
> maintain a map to allocate storage space on the remote storage devices to devices connected to the first transport medium by associating representations of the devices connected to the first transport medium with representations of storage space on the remote storage devices, wherein each representation of a device connected to the first transport medium is associated with one or more representations of storage space on the remote storage devices;
>
> control access from the devices connected to the first transport medium to the storage space on the remote storage devices in accordance with the map; and

> allow access from devices connected to the first transport medium to the remote storage devices using native low level block protocol.

Id. at 9:35–56.

B. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are given their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); *In re Cuozzo Speed Tech., LLC*, 793 F.3d 1268, 1278–79 (Fed. Cir. 2015), *cert. granted sub nom. Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 890 (2016). Under the broadest reasonable construction standard, claim terms 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. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Any special definition for a claim term must be set forth with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). Only those terms which are in controversy need be construed, and only to the extent necessary to resolve the controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

In our Decision to Institute, we construed "native low level block protocol" and "remote." Dec. Inst. 8–9. Neither party contests our construction for "native low-level block protocol" and "remote." We adopt our previous constructions and analysis for those terms based on the full record after trial. *See id.* at 8–9. Thus, we construe "native low-level block protocol" as "a protocol in which storage space is accessed at the block level, such as the SCSI protocol." *Id.* at 8. We also construe "remote" as "indirectly connected through a storage router to enable connections to

storage devices at a distance greater than allowed by a conventional parallel network interconnect." *Id.* at 8–9.

In the Patent Owner Response, Patent Owner asserts that

> Each of the independent claims includes a "map: limitation: "a [storage router] . . . configured to[] maintain a map to allocate storage space on the remote storage devices to devices connected to the first transport medium, by associating representations of the devices connected to the first transport medium with representations of storage space on the remote storage devices . . . " (Claims 1 and 20); "maintaining a map at the storage router to allocate storage space on the remote storage devices to devices connected to the first transport medium by associating representations of the devices connected to the first transport medium with representations of storage space on the remote storage devices . . ." (Claim 37).

PO Resp. 5. Patent Owner proposes a construction for the "map" limitations. *Id.* at 5–10.

Patent Owner also identifies certain limitations of independent claims 1, 20, and 37 as "control[ing] access" limitations, stating that "[e]ach of the independent claims also recites 'control[ling] access from the devices connected to the first transport medium to the storage space . . . in accordance with the map.'" *Id.* at 10. Patent Owner proposes a construction of the "control[ling] access" limitations. *Id.* at 10–12.

"map" limitations

Patent Owner submits that in the "map" limitations, the map "specifically identifies the host and storage so that the storage router can allocate storage to particular hosts." PO Resp. 10. Patent Owner argues that this understanding is consistent with the testimony of Petitioners' expert, and the intrinsic evidence. *Id.* at 6–8. Patent Owner asserts that "'allocate

storage space on the remote storage devices to devices connected to the first transport medium by associating representations of the devices connected to the first transport medium with representations of storage space on the remote storage devices' as claimed means the 'map' must identify within the map the **precise** host to which storage has been allocated within the map." *Id.* at 7 (citing Ex. 2027 ¶¶ 36–38). According to Patent Owner, it is not enough to map between a storage device and an intermediate identifier associated with a particular device because the identifier is not directly and immutably associated with the device itself—in other words, mapping to an identifier is insufficient unless the identifier is associated with a particular device and *cannot* be associated with any other device. *See id.* at 16–21 (arguing that mapping to a channel identifier does not suffice, even if the channel is connected to only one host device, because the channel identifier *could* be associated with another device if another device were connected to that channel).

Petitioners object that, for two reasons, Patent Owner's proposed construction is not the broadest reasonable construction. First, Petitioners argue that the claims recite a "map" with "representations" of no specific type and that the specification of the '041 patent simply teaches associating hosts and storage. Pet. Reply 3. Petitioners argue that the specification contains no implementation details and is silent as to the specific manner in which such associations are created. *Id.* Thus, Petitioners contend that Patent Owner's requirement of a particular map with specific characteristics cannot be the broadest reasonable construction. *Id.* Second, Petitioners assert that Patent Owner seeks a construction that not only must the mapping

include precise identifiers, but that those identifiers must be intrinsically tied to a host. *Id*. at 3–4.

The construction proposed by Patent Owner is overly narrow. Although Patent Owner emphasizes that the map must identify specific host devices, it does not explain persuasively why the claim language should be construed to exclude doing so via intermediate identifiers. *See* PO Resp. 5–10. Patent Owner does not identify any disclosure in the '041 patent's specification that clearly disavows mapping to a device indirectly, or mapping to a device via an intermediate identifier that could identify a different host if the system were configured differently. *See Gillette Co. v. Energizer Holdings, Inc.*, 405 F.3d 1367, 1374 (Fed. Cir. 2005) (holding that "words of manifest exclusion or explicit disclaimers in the specification are necessary to disavow claim scope" (internal quotations omitted)). Patent Owner's discussion of Figure 3, for example, is insufficient to compel a narrow construction of the term because Patent Owner analyzes only a preferred embodiment of the invention. *See* PO Resp. 8–10; *see, e.g.*, *In re Am. Acad. of Sci. Tech Ctr.*, 367 F.3d 1359, 1369 (Fed. Cir. 2004) (holding that limitations should not be imported from preferred embodiments into the claims absent a clear disclaimer of claim scope in the specification).

Moreover, the '041 patent specifically discusses mapping with identifiers that are not immutable. For example, the specification discusses addressing devices on an FC loop using an AL_PA (arbitrated loop physical address) identifier, and the possibility of "FC devices changing their AL-PA due to device insertion or other loop initialization." Ex. 1001, 8:51–56; *see* Tr. 54:5–55:15 (counsel for Patent Owner acknowledging an AL_PA is a "temporarily assigned ID" that can point to different devices); Pet. Reply 4–

8 (discussing evidence supporting the use of intermediate identifiers, including testimony by Patent Owner's proffered expert).

For the reasons above, we are not persuaded that the broadest reasonable interpretation of the "map" limitations mandates mapping directly or immutably to a host device itself, or excludes mapping to devices using intermediate identifiers.

The '041 patent is related to a number of other patents, including U.S. Patent No. 6,425,035 B2 ("the '35 patent") and U.S. Patent No. 7,051,147 ("the '147 patent"). The '041 patent, the '035 patent, and the '147 patent are related to one another because each is a continuation of one or more patent applications that are continuations of application No. 09/001,799, filed on December 31, 1997, now U.S. Patent No. 5,941,972. We note that a district court in a related case construed the claim terms "map" and "mapping" in the '035 patent as follows:

> To create a path from a device on one side of the storage router to a device on the other side of the router. A "map" contains a representation of devices on each side of the storage router, so that when a device on one side of the storage router wants to communicate with a device on the other side of the storage router, the storage router can connect the devices.

Ex. 1010, 12. In IPR2014-01226 and IPR2014-01544 we concluded that the district court's construction reproduced above is the broadest reasonable interpretation of certain claim limitations in the '035 patent and the '147 patent similar to the "map" limitations in the '041 patent. *Cisco Sys., Inc. v. Crossroads Sys., Inc.*, Case IPR2014-01266, slip op. at 10 (PTAB Jan. 29, 2016) (Paper 51); *Cisco Sys., Inc. v. Crossroads Sys., Inc.*, Case IPR2014-01544, slip op. at 8–9 (PTAB Jan. 29, 2016) (Paper 50). After considering the evidence of record, we determine the above claim construction from the

district court also corresponds to the broadest reasonable interpretation of the "map" limitations of claims 1, 20, and 37 of the '041 patent and adopt it for purposes of this Decision.

"control access"/"controlling access" limitations

Patent Owner also seeks to have us construe the various limitations that include the language "control access" or "controlling access." PO Resp. 10–12. Patent Owner contends that "'[c]ontrol[ling] access' refers to the use of 'access controls' that limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." *Id.* at 10. In other words, Patent Owner asserts that "controlling access is device specific in that it involves controlling a particular device's access to specified storage according to the map." *Id.* at 12 (citing Ex. 2027 ¶ 43). Patent Owner argues that, as described in the specification of the '041 patent, the storage router implements access controls according to the map so that the allocated storage can only be accessed by the host(s) associated with that storage in the map. *Id.*

Petitioners disagree with Patent Owner's understanding of the meaning of these limitations. Pet. Reply 8–10. In particular, Petitioners argue that Patent Owner seeks to impermissibly narrow the "control access" limitations by arguing that to meet these limitations the prior art must additionally provide different storage access to different hosts. *Id.* at 8. Petitioners also submit that "Patent Owner seeks to read into the 'control access' limitation a requirement that access to storage by particular hosts must be maintained between physical reconfigurations of the hosts." *Id.* at 9. Thus, Petitioners argue that the "control access" limitations "should be at least as broad as the District Court's construction of 'limit a device's

access to a specific subset of storage devices or sections of a single storage device according to a map." *Id.* at 10.

We agree with Petitioners that the "control access"/"controlling access" limitations are not as limited as Patent Owner contends. Patent Owner fails to point us to any express or implicit disclaimer in the specification of the '041 patent that would limit "control access"/"controlling access" to using only device-specific access controls that can only limit a particular device's access to specified storage. For example, the discussion of Figure 3 of the '041 patent is insufficient to compel a narrow construction of the term because it analyzes only a preferred embodiment of the invention. *See Thorner v. Sony Computer Entm't Am. LLC*, 669 F.3d 1362, 1366–67 (Fed. Cir. 2012) ("To constitute disclaimer, there must be a clear and unmistakable disclaimer . . . It is likewise not enough that the only embodiments, or all of the embodiments, contain a particular limitation.").

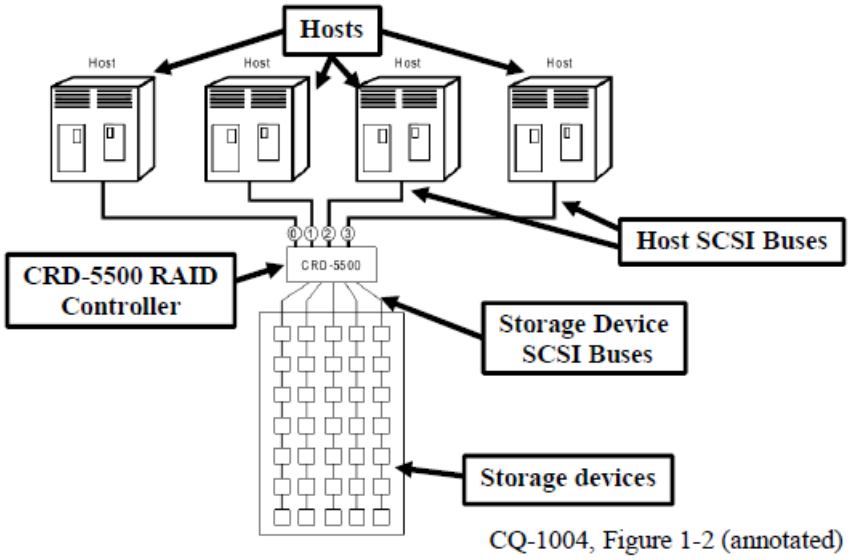
Thus, we agree with Petitioners that the broadest reasonable interpretation of the terms "control access"/"controlling access" is "limit a device's access to a specific subset of storage devices or sections of a single storage device according to a map." Ex. 1026, 14, 40; Ex. 2027 ¶ 34.

C. Obviousness of Claims 1–14, 16–33, 35–50, and 53 over CRD-5500 Manual and HP Journal

CRD-5500 Manual (Ex. 1004)

The CRD-5500 Manual describes the features and operation of the CRD-5500 SCSI RAID Controller. Ex. 1004, 9. In general, the CRD-5500 RAID controller routes commands and data between hosts (i.e., initiators) and storage devices (i.e., targets) coupled to the controller. *Id.* at 9, 12.

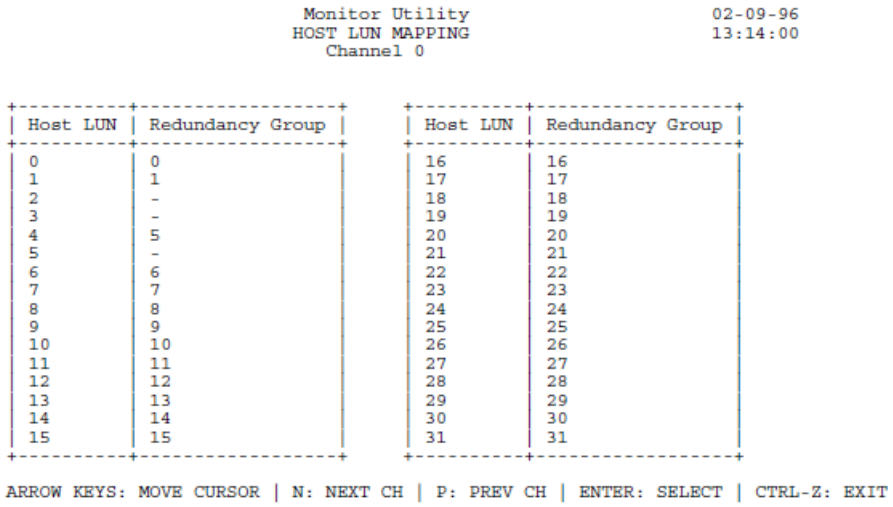
Figure 1-2, as annotated by Petitioners, illustrates the architecture of the storage network in which the CRD-5500 RAID controller operates:



CQ-1004, Figure 1-2 (annotated)

Figure 1-2 shows the architecture of a network using the CRD-5500 with hosts attached to SCSI buses on one side of the controller and storage devices also attached to SCSI buses on the other side. *Id.* at 10–13.

The CRD-5500 Manual describes a Host LUN (Logical Unit Number) Mapping feature that allows a user to assign redundancy groups to a particular host. *Id.* at 10. The logical unit number is the number that the host uses to address the drive. *Id.* at 18. A redundancy group is defined as each RAID (Redundant Array of Independent Disks) set or partition of a RAID set (i.e., storage space). *Id.* at 19. The CRD-5500 Manual describes that the Host LUN Mapping feature is part of the Monitor Utility included in the firmware of the controller. *Id.* at 40, 44. The CRD-5500 Manual includes a screen shot of the Monitor Utility's Host LUN Mapping feature:



Monitor Utility 02-09-96
HOST LUN MAPPING 13:14:00
Channel 0

Host LUN	Redundancy Group	Host LUN	Redundancy Group
0	0	16	16
1	1	17	17
2	-	18	18
3	-	19	19
4	5	20	20
5	-	21	21
6	6	22	22
7	7	23	23
8	8	24	24
9	9	25	25
10	10	26	26
11	11	27	27
12	12	28	28
13	13	29	29
14	14	30	30
15	15	31	31

ARROW KEYS: MOVE CURSOR | N: NEXT CH | P: PREV CH | ENTER: SELECT | CTRL-Z: EXIT

Id. at 44. This screen shot shows a table matching the various Host LUNs to different redundancy groups for the host on Channel 0 of a CRD-5500. *Id.* Each "host channel" corresponds to an I/O module that provides an external interface port for the CRD-5500. *Id.* at 21; Ex. 2027 ¶ 68.

HP Journal

Volume 47, issue 5 of the Hewlett-Packard Journal includes a number of articles that address the growing problem in 1997 of "I/O channels becom[ing] bottlenecks to system performance." Ex. 1006, 5. Specifically, one article in the issue provides an introduction to the Fibre Channel I/O interface and describes it as "a flexible, scalable, high-speed data transfer interface that can operate over a variety of both copper wire and optical fiber at data rates up to 250 times faster than existing communications interfaces." *Id.* at 94. The article additionally provides many reasons a Fibre Channel communication link is superior to a SCSI bus (e.g., longer distances and higher bandwidth, smaller connectors). *Id.* It further notes that SCSI commands may be "encapsulated and transported within Fibre Channel frames" to support existing storage hardware. *Id.* at 94–95.

The HP Journal describes a Fibre Channel protocol chip made by HP called "Tachyon." *Id.* at 99–112. The article states that the Tachyon chip implements the Fibre Channel standard and "enables low-cost gigabit host adapters on industry-standard buses." *Id.* at 101.

Analysis

1. Reason to Combine the CRD Manual and the HP Journal

Applicable to all of the challenged claims, the Petition provides a detailed analysis of why a person of ordinary skill in the art would have been motivated to combine the CRD Manual and the HP Journal[6] in the manner asserted by Petitioners. Pet. 17–21 (citing Ex. 1003 ¶¶ 48–57). Specifically, Petitioners contend: (1) the CRD Manual explains that the disclosed CRD-5500 controller has a modular design capable of accepting various I/O modules; (2) the HP Journal describes the benefits of FC technology over SCSI technology; (3) the HP Journal discloses the replacement of SCSI with FC, including the use of SCSI commands with FC frames. *Id.* For example, the HP Journal discusses various advantages of FC over SCSI as a transport medium technology, including advantages in bandwidth and addressability, and explains how some FC controllers are compatible with SCSI devices. *Id.*; *see, e.g.*, Ex. 1006, 94–95, 99–101. Patent Owner does not dispute in its

[6] These portions of the *HP Journal* relied on by Petitioners share a common author (Meryem Primmer), and similar subject matter (FC technology and its implementation), as well as the same apparent publication date in the same issue of the journal. Patent Owner did not dispute that one of ordinary skill would have combined the teachings of the different articles in the *HP Journal*. Based on the full record after trial, we agree and consider the articles collectively, as the parties have done throughout the proceeding.

Patent Owner Response that a person of ordinary skill[7] would have had reason to combine the teachings of these references.

Based on the full record after trial, Petitioners have articulated a sufficient reason to combine the CRD Manual and the HP Journal with rational underpinnings supported by the evidence. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

2. Claims 1–14, 16–33, 35–50, and 53

a. Claim 1

Petitioners explain how the CRD Manual and the HP Journal, in combination, render obvious each of the limitations of independent claim 1. Pet. 21–29; Pet. Reply 10–20. Petitioners contend the CRD Manual teaches a storage router, the CRD-5500 controller, which routes data between host computers ("a device") and SCSI disk drives ("remote storage devices"). Pet. 22–23; Ex. 1004, 9–11. With respect to the "first controller operable to interface with a first transport medium, wherein the first transport medium is a serial transport medium," Petitioners rely on teachings from the combination of the CRD Manual and the HP Journal, as follows. Pet. 23–24. First, the CRD Manual discloses multiple "I/O modules," which interface with SCSI buses that connect to the hosts and the disk drives. Ex. 1004, 9, 21, 24, 32. Second, the HP Journal discusses the Tachyon FC controller chip, which enables interfacing with a high-speed FC connection. Ex. 1006, 101, 111. The HP Journal further discloses that the Tachyon controller is designed to be compatible with SCSI commands as well. *Id.*

[7] The level of ordinary skill in the art is reflected by the prior art of record. *See Okajima v. Boudreau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001).

at 101. Based on these disclosures and the testimony of their proffered expert, Dr. Andrew Hospodor, Petitioners argue:

> [T]he CRD-5500 Controller's ability to accept different I/O modules that interface with different transport media to communicate with hosts, as taught by the CRD Manual, in view of the Fibre Channel I/O module and Fibre Channel transport medium (which is a serial transport medium), as taught by the HP Journal, render obvious 'a first controller operable to interface with a first transport medium, wherein the first medium is a serial transport media' as recited in the claim.

Pet. 23–24 (citing Ex. 1003, 40–46).[8] Dr. Hospodor explains that "one of ordinary skill in the art would have been motivated to replace the SCSI I/O host modules in the CRD-5500 RAID controller with a Fibre Channel I/O module based on the Tachyon chip." Ex. 1004, 33.

Next, the Petition identifies the central processor, system circuitry, and firmware disclosed in the CRD Manual as teaching the recited "processing device." Pet. 24 (citing Ex. 1004, 9, 11, 21; Ex. 1003, 46–48). As to the requirements that the "processing device is configured to: maintain a map to allocate storage space . . . [and] control access . . . in accordance with the map," Petitioners rely on the CRD Manual's discussion of the Host LUN Mapping feature. *Id.* at 24–27. Specifically, the CRD Manual describes a feature of its Monitor Utility used to "map LUNs on

[8] Patent Owner argues that Dr. Hospodor's testimony should be accorded "diminished" weight due to his alleged bias and certain deposition testimony that Patent Owner believes undermines his credibility. PO Resp. 55–59. All of these considerations were taken into account, and Dr. Hospodor's testimony was accorded the weight appropriate in light of the full record. Further, we determine that Dr. Hospodor was a credible witness overall, despite the issues identified by Patent Owner, because his testimony generally was supported by the record as explained in this Decision.

each host channel to a particular redundancy group." Ex. 1004, 44. A host channel corresponds to an I/O module, which is assigned to a host. *Id.* Each host channel has multiple LUNs, each of which can be mapped to a specific redundancy group. *Id.* Redundancy groups may be one or more disk drives, or partitions thereof. *Id.* at 19. Thus, Petitioners assert the CRD Manual teaches maintaining Host LUN Mapping settings that map hosts (the recited "devices") and redundancy groups (the recited "remote storage devices"). Pet. 25 (citing Ex. 1003, 48–53). With respect to the processing device controlling access, Petitioners identify the CRD Manual's discussion of using host LUN mapping settings to make certain redundancy groups available to certain host channels while blocking access to other host channels. *Id.* at 27 (citing Ex. 1004, 9, 44 Ex. 1003, 54–55).

With respect to the limitation that "the processing device is configured to . . . allow access from devices connected to the first transport medium to the remote storage devices using native low level block protocol," Petitioners cite the CRD Manual's disclosure of using SCSI messages on host and drive channels, as well as the HP Journal's disclosure of transmitting SCSI commands "encapsulated and transported within Fibre Channel frames." *Id.* at 27–28 (citing Ex. 1004, 57; Ex. 1006, 94–95; Ex. 1003, 55–57; Ex. 1001, 5:59–63). Specifically, Petitioners assert that

> Thus, the CRD-5500 Controller allowing access from hosts to disk drives on a SCSI bus using SCSI I/O commands, as taught by the CRD Manual, in view of the encapsulation of SCSI I/O commands within Fibre Channel communications, as taught by the HP Journal, renders obvious "allow access from devices connected to the first transport medium to the remote storage devices using native low level, block protocol" as recited in the claim.

Id. at 28 (citing Ex. 1003, 55–57).

Based on the full record after trial, we find that the combination of the CRD Manual and the HP Journal, as described above with Petitioners' citations and arguments, which we adopt, teach or suggest each limitation of claim 1 of the '041 patent. Patent Owner's counterarguments are unpersuasive.

First, Patent Owner argues the asserted combination does not teach the "map" limitation of claim 1. PO Resp. 23–33; *see also id.* at 12–21 (arguing the CRD Manual fails to teach mapping). According to Patent Owner, the CRD Manual fails to teach the recited mapping because the Host LUN Mapping feature only maps storage devices to host channels, not to the specific hosts themselves. *Id.* at 13–14, 23–27 (citing Ex. 2027 ¶¶ 53, 55, 68, 75–76, 82, 84–86). This argument, however, relies on the overly narrow claim construction rejected above, and is unpersuasive as a result. For example, Patent Owner addresses Figure 1-2 of the CRD Manual, which is reproduced below:

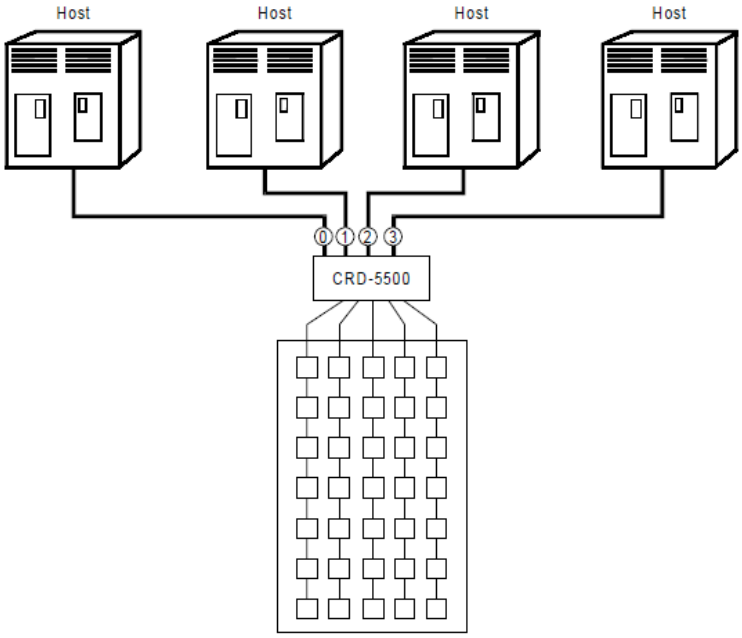


Figure 1-2 of the CRD Manual depicts a configuration of the CRD-5500 controller where each of four different hosts is assigned to a different channel, i.e., channel 0 through channel 3. Ex. 1004, 10. These hosts may then access redundancy groups via the CRD-5500 controller. *Id.*

The specific configuration depicted in Figure 1-2 meets the mapping limitation because each host channel is dedicated to a single host—thus, in effect, mapping to a host channel is tantamount to mapping to a particular host. *See* Pet. Reply 12–13 (citing Ex. 1004, 44; Ex. 1025, 129:16–17). The CRD Manual explicitly refers to mapping to hosts and host channels interchangeably, which Patent Owner acknowledges at least with respect to Figure 1-2. *See* Ex. 1004, 9; PO Resp. 30–31; Pet. Reply 11. The analysis presented by Patent Owner regarding other configurations different from that in Figure 1-2—i.e., configurations where two hosts are connected to the same host channel (PO Resp. 19–21, 31)—does not cancel or negate the configuration disclosed by Figure 1-2. Similarly, whether the Figure 1-2 configuration would teach the mapping limitation if it were hypothetically altered by switching cables is irrelevant. *See* PO Resp. 18–19. As discussed above, the broadest reasonable interpretation of the mapping limitation is not limited only to mapping directly and immutably to a specific host device, and does not exclude categorically the use of intermediate identifiers. Consequently, Patent Owner has not shown persuasively why the configuration disclosed in the CRD Manual falls outside the scope of the claim language.

Patent Owner additionally contends that the CRD Manual fails to teach the "control access" limitation of claim 1. *Id.* at 33–39. Making arguments similar to its arguments relating to the mapping limitation, Patent

Owner purports to show how the redundancy group access controls of the CRD Manual can be defeated by changing the disclosed configuration in Figure 1-2, i.e., by rewiring the hosts such that multiple hosts are connected to the same host channel. *Id.* at 37–38. Patent Owner has not persuasively demonstrated, however, that the purported inadequacy of the access control method disclosed for the Figure 1-2 configuration when directly applied to a different configuration, shows that the CRD Manual fails to teach implementing access controls at least for the configuration of Figure 1-2.

Although Patent Owner argues that Petitioners rely on such a configuration because they propose combining the CRD Manual with the HP Journal, Patent Owner inaccurately characterizes Petitioners' contentions as bodily incorporating only one aspect of the HP Journal's teachings—placing all hosts on a single FC arbitrated loop—while ignoring the HP Journal's other teachings regarding implementing such FC loops. *See* PO Resp. 34–38; *see also In re Keller*, 642 F.2d 413, 425 (CCPA 1981) ("The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art."). As noted in the Petition (Pet. 17), the HP Journal provides detailed disclosures on the implementation of FC arbitrated loops, including configurations with multiple host devices. *See* Pet. Reply 13–20; Ex. 1006, 100–111. The record as a whole supports Petitioners' contention that a person of ordinary skill would have found it obvious to combine the teachings of the CRD Manual and the HP Journal to arrive at a system utilizing FC loops, which

maps redundancy groups to particular hosts and implements access controls as taught by the CRD Manual, but applying FC addressing capabilities taught by the HP Journal in lieu of the host channel-based implementation of the CRD Manual. *See* Pet. Reply 13–20; Ex. 1003 ¶¶ 48–57.

In sum, based on the full record after trial, we find that a preponderance of the evidence supports Petitioners' contention that the combination of the CRD Manual and the HP Journal teaches or suggests each limitation of claim 1 of the '041 patent.

b. Claims 20 and 37

Petitioners presented evidence and argument to support their contention that the combination of the CRD Manual and the HP Journal teaches each limitation of independent claims 20 and 37. Pet. 17–21, 42–47, 50–53. Claims 20 and 37 each contain a "map" limitation and a "control access" or "controlling access" limitation similar to those of claim 1 discussed above. The disputes regarding claims 20 and 37 are substantially the same as those regarding claim 1 discussed above. *See id.*; PO Resp. 5–39; Pet. Reply 2–20. For the reasons explained above in connection with claim 1, we find Petitioners' evidence and arguments regarding claims 20 and 37 more persuasive than Patent Owner's. Based on the full record after trial, a preponderance of the evidence supports Petitioners' contention that the combination of the CRD Manual and the HP Journal teaches or suggests each limitation of claims 20 and 37 of the '041 patent, as set forth in the Petition. We are persuaded by Petitioners' contentions with respect to claims 20 and 37, and we adopt them as the basis for our decision.

c. Claims 6, 25, and 42

Claims 6, 25, and 42 depend from claims 1, 20, and 37, respectively. Claims 6 and 25 each recite

> wherein the native low level block protocol is received at the storage router via the first transport medium and the processing device uses the received native low level block protocol to allow the devices connected to the first transport medium access to storage space specifically allocated to them in the map.

Ex. 1001, 10:3–8, 11:27–32. Claim 42 recites similar limitations. *Id.* at 12:39–45. Petitioners present evidence and argument to support their contention that the combination of the CRD Manual and the HP Journal teaches each limitation of claims 6, 25, and 42. Pet. 31–33, 48, 54. For example, regarding allowing devices connected to the first transport medium to access specifically allocated storage space, Petitioner notes the CRD Manual discloses using a map to allocate specific redundancy groups to hosts. *Id.* at 32–33. The Petition identifies portions of both the CRD Manual and the HP Journal as teaching devices, including workstations in an FC loop, connected to a first transport medium. *Id.* at 43–44; Pet. Reply 13–16 (discussing use of AL_PA in the combination). We find this explanation of the combination using AL_PA in mapping persuasive to show that the combination teaches the limitations of claims 6, 25, and 42.

Patent Owner argues that the asserted prior art does not teach the limitations of claims 6, 25, and 42 because it contends, as it did for claim 1, that the CRD Manual teaches associating storage devices (or subsets thereof) with host channels, and not host devices directly. *See* PO Resp. 39–41. For the same reasons as discussed above for claims 1, 20, and 37, this argument is unpersuasive.

Based on the full record after trial, a preponderance of the evidence supports Petitioners' contention that the combination of the CRD Manual and the HP Journal teaches or suggest each limitation of claims 6, 25, and 42 of the '041 patent. We are persuaded by Petitioners' contentions with respect to claims 6, 25, and 42, and we adopt them as the basis for our decision.

d. Claims 13, 32, and 49

Claims 13, 32, and 49 depend indirectly from claims 1, 20, and 37, respectively. Each of claims 13, 32, and 49 recites "wherein the storage router is operable to route requests to the same logical unit number from different devices connected to the first transport medium to different subsets of storage space on the remote storage devices." Ex. 1001, 10:31–35. Petitioners present evidence and argument to support their contention that the combination of the CRD Manual and the HP Journal teaches these limitations. Pet. 38–39, 49, 55–56. Petitioners explain, for example, that the CRD Manual discloses examples that would allow a person of ordinary skill in the art to set up routing such that different hosts referencing the same LUN result in the requests being routed to different subsets of storage space on remote storage devices. *Id.* at 38–39. The Petition identifies portions of both the CRD Manual and the HP Journal as teaching devices, including workstations in an FC loop, connected to a first transport medium. *Id.* at 43–44; Pet. Reply 13–16 (discussing use of AL_PA in the combination). In combination with the HP Journal's disclosure of using workstations in an FC AL_PA, Petitioners' explanation that the CRD Manual allows using the same LUN to route requests from different hosts to different storage

persuades us that the limitations of claims 13, 32, and 49 would have been obvious.

Patent Owner argues that, in the examples provided by the CRD Manual, using the same LUN to route requests from different hosts to different storage "requires that the host devices be connected to different channels as shown in Figure 1-2." PO Resp. 42. Patent Owner further argues that

> [O]ne of ordinary skill in the art would not consider a request by Host 1 to LUN 4 and a request by Host 2 to LUN 4 in the configuration of Figure 1-2 to be 'requests to the same logical unit number from different devices connected to the first transport medium' because the requests are directed to logical unit numbers on different busses, not the same logical unit number on the same bus.

Id. at 43. Patent Owner also argues that "as discussed above, the Host LUN Mapping lacks any information about the hosts and, lacking such, cannot distinguish between specific hosts." *Id.*

We find these arguments unpersuasive because they attack the CRD Manual individually, rather than addressing the CRD Manual in combination with the HP Journal. Petitioners explain that in the system resulting from the combination of the CRD Manual and the HP Journal, "a Tachyon chip in a CRD-5500 would ***distinguish between requests from different hosts on an arbitrated loop***." Pet. Reply 20–21. This vitiates Patent Owner's arguments that the CRD Manual does not, by itself, teach differentiating between specific hosts.

Based on the full record after trial, a preponderance of the evidence supports Petitioners' contention that the limitations of claims 13, 32, and 49 would have been obvious over the combination of the CRD Manual and the

HP Journal. We are persuaded by Petitioners' contentions with respect to claims 13, 32, and 49, and we adopt them as the basis for our decision.

e. Claims 14, 33, and 50

Claims 14, 33, and 50 depend from claims 1, 20, and 37, respectively. Each of claims 14, 33, and 50 recites "wherein the representations of devices connected to the first transport medium are unique identifiers." Ex. 1001, 10:36–38, 11:61–63, 13:6–8. Petitioners present evidence and arguments that the combination of the CRD Manual and the HP Journal teaches this limitation. Pet. 39–40, 49–50, 56. We agree that cited evidence teaches or suggests this claim limitation. For example, Petitioners assert that the CRD Manual teaches four different channel numbers, specifically channels 0, 1, 2, and 3, that can be unique identifiers for hosts. *Id.* at 39–40. The Petition identifies portions of both the CRD Manual and the HP Journal as teaching devices, including workstations in an FC loop, connected to a first transport medium. *Id.* at 43–44; Pet. Reply 13–16 (discussing use of AL_PA in the combination). We are persuaded that the disclosures of channel numbers in the CRD Manual and the use of a FC AL_PA in the HP Journal teach unique identifiers, as recited in claims 14, 33, and 50.

Patent Owner argues that the CRD Manual does not teach unique identifiers, asserting that it teaches channel numbers that "do not uniquely identify the host devices connected to the Channel." PO Resp. 45–46. We find this argument unpersuasive for multiple reasons. First, contrary to Patent Owner's argument, in the system shown in Figure 1-2 of the CRD Manual, the channel numbers do uniquely identify the hosts, as each channel contains one host. Patent Owner does not provide evidence or reasoning persuading us that the "map" limitations of claims 1, 20, and 37, or the

limitations of claims 14, 33, and 50, require directly mapping to or identifying hosts. Additionally, Patent Owner's argument improperly attacks the CRD Manual individually, overlooking the disclosure in the HP Journal of using an AL_PA on a FC. Petitioner explains that the Fibre Channel system disclosed by the HP Journal uses unique identifiers. Pet. Reply 22.

Based on the full record after trial, a preponderance of the evidence supports Petitioners' contention that the limitations of claims 14, 33, and 50 would have been obvious over the combination of the CRD Manual and the HP Journal. We are persuaded by Petitioners' contentions with respect to claims 14, 33, and 50, and we adopt them as the basis for our decision.

f. Claims 2–5, 7–12, 16–19, 21–24, 26–31, 35, 36, 38–41, 43–48, and 53

Each of claims 2–5, 7–12, 16–19, 21–24, 26–31, 35, 36, 38–41, 43–48, and 53 depends directly or indirectly from one of claims 1, 20, and 37. Petitioners present evidence and arguments that claims 2–5, 7–12, 16–19, 21–24, 26–31, 35, 36, 38–41, 43–48, and 53 would have been obvious in view of the CRD Manual and the HP Journal. Pet. 29–31, 33–38, 40–42, 47–50, 53–56. We have reviewed the evidence and arguments presented and determine that Petitioners have demonstrated, by a preponderance of the evidence, that all of the limitations of each of claims 2–5, 7–12, 16–19, 21–24, 26–31, 35, 36, 38–41, 43–48, and 53, considered as a whole, would have been obvious in view of the CRD Manual and the HP Journal, on the basis set forth in the Petition. We are persuaded by Petitioners' contentions with respect to claims 2–5, 7–12, 16–19, 21–24, 26–31, 35, 36, 38–41, 43–48, and 53, and we adopt them as the basis for our decision.

Patent Owner argues that Petitioners have not demonstrated unpatentability of claims 2–5, 7–12, 16–19, 21–24, 26–31, 35, 36, 38–41, 43–48, and 53 because Petitioners have not demonstrated unpatentability of independent claims 1, 20, and 37. PO Resp. 47–48. We find this argument unpersuasive because, as explained above, we are persuaded that Petitioners have demonstrated unpatentability of independent claims 1, 20, and 37.

D. Obviousness of Claim 15, 34, 51, and 52 over CRD-5500 Manual, HP Journal, and Fibre Channel Standard

Fibre Channel Standard

The Fibre Channel Standard "describes the point-to-point physical interface, transmission protocol, and signaling protocol of a high-performance serial link for support of the higher level protocols associated with HIPPI, IPI, SCSI, and others." Ex. 1007, 1. The Fibre Channel Standard explains that "[t]he Fibre Channel (FC) is logically a bidirectional point-to-point serial data channel, structured for high performance capability. Physically, the Fibre Channel can be an interconnection of multiple communication points, called N_Ports, interconnected by a switching network, called a Fabric, or a point-to-point link." *Id.* at 49. The Fibre Channel Standard discloses that "[e]ach N_Port shall have a native N_Port Identifier which is unique within the address domain of a Fabric." *Id.* at 132. Regarding naming, the Fibre Channel Standard discloses that "[t]he application of Name_Identifiers in Network_Header for heterogeneous (FC to Non-FC) networks and homogeneous (FC to FC) networks is summarized in table 42." *Id.* at 148. Table 42 of the Fibre Channel Standard is reproduced below.

Table 42 - Network addresses		
NAA	**Name_Identifier**	**Network**
IEEE	WWN	Heterogeneous
CCITT - individual address	WWN	Heterogeneous
CCITT - group address	WWN	Heterogeneous
IP	WWN	Heterogeneous
IEEE extended	FCN	FC Networks
Local	FCN	FC Networks

Note:
WWN - Worldwide Name (worldwide unique address)
FCN - Fibre Channel Name (Fibre Channel unique address)

Table 42 of the Fibre Channel Standard provides information regarding network addresses.

Analysis

1. Claims 15, 34, and 51

Claims 15, 34, and 51 depend from claims 14, 33, and 50, respectively. Each of claims 15, 34, and 51 recites "wherein the unique identifiers are world wide names." Ex. 1001, 10:39–40, 11:64–65, 13:9–10. Petitioners present evidence and arguments that claims 15, 34, and 51 would have been obvious in view of the CRD Manual, the HP Journal, and the Fibre Channel Standard. Pet. 56–59; Pet. Reply 22. Petitioners assert that the CRD Manual discloses uniquely identifying hosts. *Id.* at 58. Petitioners reiterate their assertion that, as discussed in connection with independent claims 1, 20, and 37, it would have been obvious to "replace the SCSI I/O host modules in the CRD-5500 Controller with a Fibre Channel I/O host module, so as to communicate with the hosts via a Fibre Channel link." *Id.* Petitioners assert that this would have created a heterogeneous network, and that "the Fibre Channel Standard teaches that in a 'heterogeneous network' (Fibre Channel to Non-Fibre Channel) nodes (*e.g.*, hosts) are represented by unique identifiers that are 'worldwide names.'" *Id.* at 58–59. In view of

this, Petitioners assert that "wherein the unique identifiers are world wide names" would have been obvious in view of the CRD Manual, the HP Journal, and the Fibre Channel Standard. *Id.* at 59. We have reviewed the evidence and arguments presented by Petitioners, and we are persuaded that Petitioners have demonstrated, by a preponderance of the evidence, that claims 15, 34, and 51 would have been obvious in view of the CRD Manual, the HP Journal, and the Fibre Channel Standard, on the basis set forth in the Petition.

Patent Owner argues that Petitioners' position regarding claim 15 is inconsistent with its position regarding claim 14. PO Resp. 48. Patent Owner notes that, when addressing claim 14, Petitioners identify the channel numbers of the CRD Manual as being unique identifiers. *Id.* Patent Owner argues that the channel numbers of the CRD Manual are not world wide names. *Id.* Patent Owner further argues that "the fact that a Fibre Channel device can be identified by world wide name according to the Fibre Channel standard is irrelevant to the CRD-5500" because "the CRD-5500 Manual does not teach specifying the attached hosts on a channel." *Id.* at 48–49.

Patent Owner's arguments are unpersuasive because they attack the references individually. The argument that the channel numbers disclosed by the CRD Manual are not world wide names is unpersuasive because Petitioners rely on the Fibre Channel Standard as teaching use of world wide names in systems like the one that results from combining the CRD Manual with the teachings of the HP Journal. The argument that the CRD Manual does not teach specifying the attached hosts on a channel is also unpersuasive. First, contrary to Patent Owner's arguments, we are persuaded that in the system shown in Figure 1-2 of the CRD Manual, the

channel numbers uniquely identify hosts attached to the channels. Second, Petitioners' observation that the Fibre Channel Standard discloses using world wide names in heterogeneous systems like the combination of the CRD Manual and the HP Journal provides reason to combine the references' disclosures by using world wide names as unique identifiers.

Additionally, we do not agree with Patent Owner's argument that Petitioners take inconsistent positions with respect to claims 14 and 15. In addressing claims 14 and 15, Petitioners identify one combination of prior art as rendering claim 14 obvious and another combination of prior art as rendering claim 15 obvious. *See* Pet. 13, 56–59. We do not find inconsistent Petitioners' assertions that one obvious combination of prior art would have one unique identifier (*e.g.*, channel numbers) and another obvious combination of prior art would have a different unique identifier (*e.g.*, world wide names).

Based on the full record after trial, a preponderance of the evidence supports Petitioners' contention that the limitations of claims 15, 34, and 51 would have been obvious over the combination of the CRD Manual, the HP Journal, and the Fibre Channel Standard. We are persuaded by Petitioners' contentions with respect to claims 15, 34, and 51, and we adopt them as the basis for our decision.

2. Claim 52

Claim 52 depends indirectly from independent claim 37. Petitioners present evidence and arguments that claim 52 would have been obvious over the CRD Manual, the HP Journal, and the Fibre Channel Standard. Pet. 56–58, 59. We have reviewed the evidence and arguments presented and determine that Petitioners have demonstrated, by a preponderance of the

evidence, that claim 52 would have been obvious over the CRD Manual, the HP Journal, and the Fibre Channel Standard, on the basis set forth in the Petition. We are persuaded by Petitioners' contentions with respect to claim 52, and we adopt them as the basis for our decision.

Patent Owner argues that Petitioners have not demonstrated unpatentability of claim 52 because Petitioners have not demonstrated unpatentability of claim 37. PO Resp. 47–48. We find this argument unpersuasive because, as explained above, we are persuaded that Petitioners have demonstrated unpatentability of independent claim 37.

E. Objective Indicia of Non-Obviousness

Factual inquiries for an obviousness determination include secondary considerations based on objective evidence of non-obviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). Notwithstanding what the teachings of the prior art would have suggested to one of ordinary skill in the art at the time of the invention, the totality of the evidence submitted, including objective evidence of non-obviousness, may lead to a conclusion that the challenged claims would not have been obvious to one of ordinary skill in the art. *In re Piasecki*, 745 F.2d 1468, 1471–72 (Fed. Cir. 1984).

Secondary considerations may include any of the following: long-felt but unsolved needs, failure of others, unexpected results, commercial success, copying, licensing, and praise. *See Graham*, 383 U.S. at 17; *Leapfrog Enters., Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007).

To be relevant, evidence of non-obviousness must be commensurate in scope with the claimed invention. *In re Kao*, 639 F.3d 1057, 1068 (Fed.

Cir. 2011) (citing *In re Tiffin*, 448 F.2d 791, 792 (CCPA 1971)); *In re Hiniker Co.*, 150 F.3d 1362, 1369 (Fed. Cir. 1998). In that regard, in order to be accorded substantial weight, there must be a nexus between the merits of the claimed invention and the evidence of secondary considerations. *In re GPAC Inc.*, 57 F.3d 1573, 1580 (Fed. Cir. 1995). "Nexus" is a legally and factually sufficient connection between the objective evidence and the claimed invention, such that the objective evidence should be considered in determining non-obviousness. *Demaco Corp. v. F. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387, 1392 (Fed. Cir. 1988). The burden of producing evidence showing a nexus lies with the patent owner. *Id.*; *Prometheus Labs, Inc. v. Roxane Labs, Inc.*, 805 F.3d 1092, 1101–02 (Fed. Cir. 2015).

1. Long-Felt Need

Patent Owner presents arguments regarding long-felt need in its Response. PO Resp. 50–51. Patent Owner's evidence of long-felt need includes selected quotes from an article by an expert used by Petitioners in a co-pending lawsuit, and citations to testimony by the same expert to the effect that "before [Patent Owner's] invention, there was no such thing as a storage router and that the term 'storage router' did not exist." *Id.* at 51 (citing Ex. 2038, 14; Ex. 2029, 103:18–24, 104:15–105:1, 136:6–14).

"Establishing long-felt need requires objective evidence that an art-recognized problem existed in the art for a long period of time without solution." *Ex parte Jellá*, 90 USPQ2d 1009, 1019 (BPAI 2008) (precedential).

We have reviewed the cited testimony (Ex. 2029, 103:18–24, 104:15–105:1, 136:6–14), and find it insufficient to establish a long-felt need. The

testimony is directed to whether the term "storage router" was used in the art in the late 1990s. *See, e.g.*, *id.* at 104:24–105:1. It does not address what the needs or problems of the art were at that time. Thus, we do not find that the testimony supports sufficiently Patent Owner's contention of long-felt need.

The article cited by Patent Owner (Ex. 2038), which suggests that a problem might have existed in file system performance generally, also does not establish that there was long-felt need for the claimed invention. Patent Owner presented no evidence as to how long this problem had been recognized, the extent of the problem, whether it remained unresolved at the time of the invention, or whether the invention resolved this need. *See Perfect Web Techs., Inc. v. InfoUSA, Inc.*, 587 F.3d 1324, 1332–33 (Fed. Cir. 2009). As such, we find that Patent Owner has not shown adequately that there was any long-felt need for the claimed invention.

2. Commercial Success

Patent Owner submits evidence of the number of products it has sold, revenue from those sales, and the relative sales of its various products as allegedly demonstrating the commercial success of the claimed invention. PO Resp. 51–53 (citing Ex. 2043; Ex. 2044). In particular, it identifies the relative sales of certain products where two versions were sold, one with "access controls" and one without them, as allegedly establishing a nexus between their commercial success and the claimed invention of the '147 patent. *Id.* (citing Ex. 2043 ¶¶ 2–6; Ex. 2044).

Evidence of commercial success "is only significant if there is a nexus between the claimed invention and the commercial success." *Ormco Corp. v. Align Tech., Inc.*, 463 F.3d 1299, 1311–12 (Fed. Cir. 2006). As a threshold matter, a sufficient nexus between Patent Owner's commercial

product and the features of its claimed invention has not been established. The evidence does not show sufficiently that the items listed in Exhibit 2044 embody the claimed invention, or that sales of the listed products resulted from novel, non-obvious features of the claimed invention rather than other features. *See Ormco Corp.*, 463 F.3d at 1312–13 (evidence did not show that commercial success was due to claimed and novel features).

Even if Patent Owner had established a nexus between its marketed technology and the invention claimed in the patent, its commercial success argument would not be persuasive. Patent Owner's declarant's statements that certain products include "mapping" or "access controls" (Ex. 2043 ¶¶ 5–6) are insufficient to show commercial success of the claimed invention. An important component of the commercial success inquiry is determining market share associated with the alleged success, relative to all competing products. *In re Applied Materials, Inc.*, 692 F.3d 1289, 1300 (Fed. Cir. 2012). Even sales volume, if provided without market share information, is only weak evidence, if any, of commercial success. *Id.* at 1299. Here, the fact that Patent Owner sold a certain number of these devices and that they made up a certain share of its own sales is insufficient to establish commercial success without some context about the larger market. *See In re Baxter Travenol Labs.*, 952 F.2d 388, 392 (Fed. Cir. 1991).

3. Licensing

Patent Owner argues that "[a]s shown in Exhibit 2050, a large number of licensees have taken licenses directed specifically to Crossroads' '972 patent family." PO Resp. 53 (citing Ex. 2050). Patent Owner submits that "[t]he total license payments through FY2014 are over $60 million" and that "[p]rominent members of the industry have paid millions of dollars to

Crossroads in exchange for a license." *Id.* Patent Owner concludes that because these companies were willing to pay millions of dollars to license the invention claimed in the '972 patent family, the claims are not obvious. *Id.* at 54.

"While licenses can sometimes tilt in favor of validity in close cases, they cannot by themselves overcome a convincing case of invalidity without showing a clear nexus to the claimed invention." *ABT Sys., LLC v. Emerson Elec. Co.*, 797 F.3d 1350, 1361–62 (Fed. Cir. 2015); *see also Iron Grip Barbell Co. v. USA Sports, Inc.*, 392 F.3d 1317, 1324 (Fed. Cir. 2004) ("Our cases specifically require affirmative evidence of nexus where the evidence of commercial success presented is a license, because it is often 'cheaper to take licenses than to defend infringement suits.'"); *SIBIA Neurosciences, Inc. v. Cadus Pharm. Corp.*, 225 F.3d 1349, 1358 (Fed. Cir. 2000) ("[T]he mere existence of these licenses is insufficient to overcome the conclusion of obviousness, as based on the express teachings in the prior art that would have motivated one of ordinary skill to modify [other prior art].").

Indeed, the mere existence of several licenses, without more specific information about the circumstances surrounding the licensing, is often not a good indicator of nonobviousness. In *EWP Corp. v. Reliance Universal Inc.*, 755 F.2d 898, 907–08 (Fed. Cir. 1985), the Court of Appeals for the Federal Circuit stated that such licensing programs "are not infallible guides to patentability. They sometimes succeed because they are mutually beneficial to the licensed group or because of business judgments that it is cheaper to take licenses than to defend infringement suits, or for other reasons unrelated to the unobviousness of the licensed subject matter."

Here, we lack sufficient information about the circumstances surrounding these licenses to be able to assess whether they truly weigh in favor of non-obviousness. Patent Owner directs us to no testimony from any licensee regarding why the licensee took a license from Patent Owner. It is unknown how much of the decision to take a license stems from a business cost-benefit analysis with regard to defending an infringement suit or from another business reason, rather than from acknowledged merits of the claimed invention. Patent Owner does not provide any information about how many entities refused to take a license, or why they refused.

In addition, as Patent Owner admits, these licenses are directed to an entire family of patents. Without more evidence, we are unable to determine whether the claimed subject matter of the '041 patent was the motivator for taking the license. Given these circumstances, we determine that Patent Owner has failed to establish an adequate nexus between the claimed invention of the '041 patent and the licenses. Thus, we find Patent Owner's evidence of licensing does not weigh in favor of non-obviousness.

F. Conclusion as to Asserted Grounds of Unpatentability

Having considered all of the evidence and contentions of the parties regarding the obviousness of claims 1–53, including secondary evidence and indicia of non-obviousness presented by Patent Owner, we determine that Petitioner has established by a preponderance of evidence that claims 1–53 are unpatentable under the asserted grounds. The relatively weak secondary evidence of non-obviousness, diminished further by Patent Owner's failure to show an adequate nexus to the claimed invention, is insufficient to overcome the relatively strong evidence of obviousness presented by Petitioner. *See Ohio Willow Wood Co. v. Alps South, LLC*, 735 F.3d 1333,

1344 (Fed. Cir. 2013) (requisite nexus between secondary indicia and invention must be shown for evidence to be accorded substantial weight, and where a claimed invention represents no more than the predictable use of prior art elements according to established functions, evidence of secondary indicia is often inadequate to establish non-obviousness).

III. PATENT OWNER'S MOTION TO EXCLUDE

We have reviewed Patent Owner's Motion to Exclude ("PO Mot. to Exclude," Paper 37), Petitioners' Opposition to the Motion ("Pet. Opp. Mot. to Exclude," Paper 41), and Patent Owner's Reply in Support of the Motion (Paper 43). We *deny* the motion to exclude.

Patent Owner seeks to exclude certain cross examination testimony of Dr. Levy because "it was obtained pursuant to objectionable questioning and, further, mischaracterizes his testimony." PO Mot. to Exclude 1. In the alternative, Patent Owner requests that we consider additional portions of Dr. Levy's testimony pursuant to the Rule of Completeness (Fed. R. Evid. 106). *Id.* Petitioners respond that these objections were not preserved, that the Rule of Completeness is inapplicable to these proceedings because the entirety of the transcript of Dr. Levy's deposition is part of the record, that these objections go to the weight that should be given the evidence not its admissibility, and that Patent Owner's allegations of mischaracterizations are baseless. Pet. Opp. Mot. to Exclude 1–12. We agree with Petitioners that Patent Owner's objections go to the weight that should be given the evidence, not its admissibility. Moreover, as the entirety of Dr. Levy's deposition is in the record of this proceeding, we have considered the additional passages of Dr. Levy's testimony that Patent Owner identifies as

well as the rest of his testimony. Accordingly, Patent Owner's Motion to Exclude is *denied*.

IV. PATENT OWNER'S MOTION TO SEAL

Patent Owner filed several exhibits (Exhibits 2040, 2042, 2044, and 2045) under seal, along with a Motion to Seal (Paper 17) and a protective order (Paper 18). We previously granted Patent Owner's Motion for Entry of the Default Protective Order. Paper 38. Petitioners oppose Patent Owner's Motion to Seal. Paper 22. Patent Owner filed a reply. Paper 25. For the reasons discussed below, Patent Owner's Motion to Seal is *granted*.

Petitioners argue that there is a strong public interest in unsealing these exhibits because Patent Owner relies on these exhibits in support of its arguments of patentability. Pet. Opp. Mot. Exclude 2. However, we did not see any need to rely on any of these exhibits in this Decision. We have reviewed the exhibits at issue and agree with Patent Owner that they contain confidential sales and licensing information. Given the sensitive nature of this information and the fact that we did not rely on it in rendering our Decision, we agree with Patent Owner that good cause has been shown to seal the information.

However, we note that confidential information subject to a protective order ordinarily becomes public 45 days after final judgment in a trial, unless a motion to expunge is granted. 37 C.F.R. § 42.56; Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,761 (Aug. 14, 2012). In view of the foregoing, the confidential documents filed in the instant proceeding will remain under seal, at least until the time period for filing a notice of appeal has expired or, if an appeal is taken, the appeal process has

concluded. The record for the instant proceeding will be preserved in its entirety, and the confidential documents will not be expunged or made public, pending appeal. Notwithstanding 37 C.F.R. § 42.56 and the Office Patent Trial Practice Guide, neither a motion to expunge confidential documents nor a motion to maintain these documents under seal is necessary or authorized at this time. *See* 37 C.F.R. § 42.5(b).

V. CONCLUSION

For the reasons expressed above, we determine that Petitioners have shown by a preponderance of the evidence that:

(1) CRD-5500 Manual and HP Journal renders claims 1–14, 16–33, 35–50, and 53 of the '041 patent unpatentable as obvious; and

(2) CRD-5500 Manual, HP Journal, and Fibre Channel Standard renders claims 15, 34, 51, and 52 of the '041 patent unpatentable as obvious.

VI. ORDER

For the reasons given, it is:

ORDERED that claims 1–53 of the '041 patent have been shown to be *unpatentable*;

FURTHER ORDERED that Patent Owner's Motion to Exclude is *denied*;

FURTHER ORDERED that Patent Owner's Motion to Seal is *granted*;

FURTHER ORDERED that the information sealed during this *inter partes* review remain under seal, and the record preserved, until the time

period for filing a notice of appeal of this Decision has expired or, if an appeal is taken, the appeal process has concluded; 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.

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