

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CISCO SYSTEMS, INC.,
Petitioner,

v.

PORTSMOUTH NETWORK CORP.,
Patent Owner.

IPR2024-00503
Patent 7,035,279 B2

Before JUSTIN T. ARBES, CHARLES J. BOUDREAU, and
PETER D. SHAPIRO, *Administrative Patent Judges*.

BOUDREAU, *Administrative Patent Judge*.

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

I. INTRODUCTION

Cisco Systems, Inc. (“Petitioner”) filed a Petition requesting *inter partes* review of claims 1–18 (“the challenged claims”) of U.S. Patent No. 7,035,279 B2 (Ex. 1001, “the ’279 patent”). Paper 2 (“Pet.”). Petitioner filed a declaration of Dr. Nader F. Mir (Ex. 1003) in support of the Petition. Portsmouth Network Corp. (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”).

We have authority to determine whether to institute an *inter partes* review. *See* 35 U.S.C. § 314 (2024); 37 C.F.R. § 42.4(a) (2024). Institution of an *inter partes* review requires that “the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a). For the reasons set forth below, we determine that there is a reasonable likelihood that Petitioner will prevail with respect to at least one challenged claim. Accordingly, we institute an *inter partes* review.

II. BACKGROUND

A. *Real Parties in Interest*

The parties identify themselves as the real parties in interest. Pet. 86; Paper 4, 2 (Patent Owner Mandatory Notices).

B. *Related Matter*

The parties indicate that the ’279 patent is involved in *Portsmouth Network Corp. v. Cisco Systems, Inc.*, No. 2:23-cv-441 (E.D. Tex.) (“the Cisco litigation”). Pet. 86; Paper 4, 2.

C. *The ’279 Patent*

The ’279 patent, titled “Flow Allocation in a Ring Topology,” relates to “methods and systems for efficient allocation of resources for data flow”

in communication networks. Ex. 1001, codes (54), (57), 1:6–9. The ’279 patent explains that, “[i]n preferred embodiments of the present invention, a communication network comprises a plurality of nodes, which are preferably arranged in a ring topology,” and “[t]he nodes are capable of transmitting data around the ring in either a clockwise or a counterclockwise direction, or in other words, . . . over an inner or an outer ring within the network.” *Id.* at 2:19–25. “A dispatcher, preferably in the form of a process running on one of the nodes, learns the topology of the network and tracks the use of network resources by each of the nodes while the network is running.” *Id.* at 2:25–28. The ’279 patent explains that the term “resources,” as used “throughout the specification and claims . . . , refers not only to bandwidth, but also to processing power used to transmit, receive, encrypt or decrypt data, as well as to any other allowable factor that may affect the ability of a network link to convey a data flow between nodes.” *Id.* at 2:12–18. “Whenever a node needs to use network resources to carry a data flow to another node, it first determines whether it already has sufficient resources allocated to it in order to convey the data flow.” *Id.* at 2:28–32. “If the node does not have sufficient resources, it requests an allocation from the dispatcher.” *Id.* at 2:32–33. “Based on the levels of resource use on the links of the inner and outer rings, the dispatcher processes the request and determines whether to allocate the resources and, if so, on which of the rings.” *Id.* at 2:33–37. “Resources are allocated in quanta in order to limit the frequency with which allocation and deallocation operations must be performed.” *Id.* at 5:28–30.

Figure 1 of the '279 patent is reproduced below.

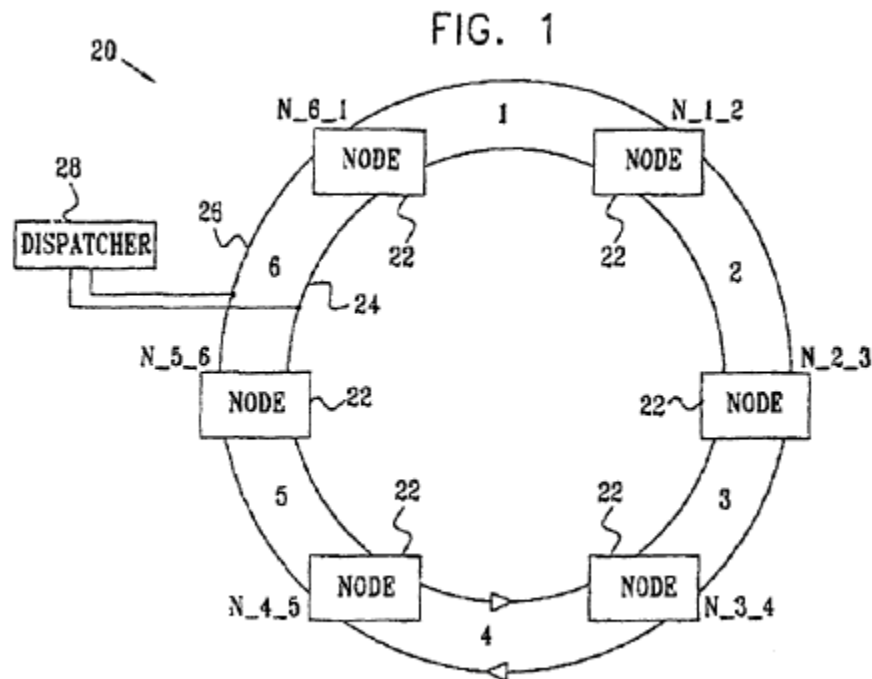


Figure 1, above, is “a block diagram that schematically illustrates a ring network with a dispatcher for controlling data flow, in accordance with a preferred embodiment” of the '279 patent. Ex. 1001, 4:3–6. With reference to Figure 1, network 20 is depicted as including nodes 22, which are connected by links 1–6. *Id.* at 4:32–38. “Each node is identified by the two links that are connected to it, i.e., N_1_2 between links 1 and 2 , and so forth up to N_6_1,” and “[e]ach node can communicate with every other node over either a counterclockwise or a clockwise path around the ring.” *Id.* at 4:38–42. “Following SRP [Spatial Reuse Protocol] convention, these two paths are identified [in Figure 1] as an inner ring 24 and an outer ring 26, each of which is made up of segments corresponding to the physical links between the nodes.” *Id.* at 4:42–45. Also shown in Figure 1, dispatcher 28 “tracks the use of resources in network 20 and allocates resources to nodes 22 as required.” *Id.* at 4:46–47. Although depicted in Figure 1 “as

an entity that is separate from the network nodes,” dispatcher 28
“[a]lternatively . . . may be associated with one of the nodes, typically as a software process running on the node.” *Id.* at 4:47–51.

Figure 3 of the '279 patent is reproduced below.

FIG. 3

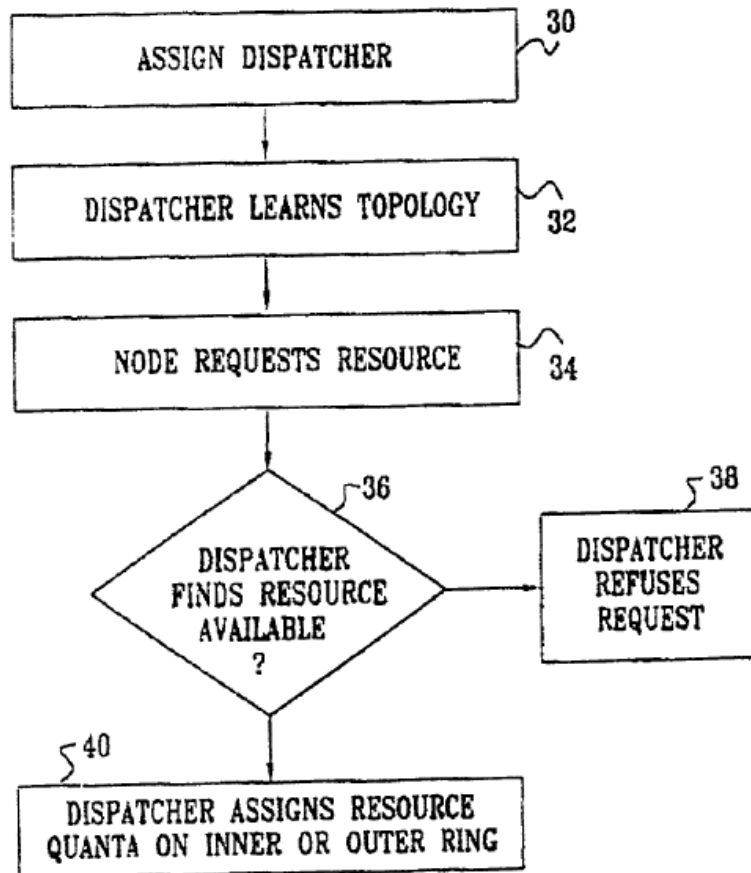


Figure 3, above, is “a flow chart that schematically illustrates a method for assigning network resources to network nodes, in accordance with a preferred embodiment” of the '279 patent. Ex. 1001, 4:9–12, 5:59–61. With reference to Figure 3, the '279 patent explains that the dispatcher entity is chosen or assigned within network 20 in preparation for the illustrated method at assignment step 30. *Id.* at 5:61–63. In the case in which

dispatcher 28 runs on one of nodes 22, as mentioned above, “the dispatcher is preferably chosen by the nodes from among themselves using a suitable network management protocol.” *Id.* at 5:64–67. “At learning step 32, dispatcher 28 learns the topology of rings 24 and 26 using methods known in the art, as specified by SRP (RFC 2892), for example, and builds . . . tables of network information to be used subsequently in flow allocations.” *Id.* at 6:6–10.

According to the ’279 patent, “[w]hen a node receives a request from one of its clients to send data to another node, the node first checks to determine whether it has sufficient resources already allocated to it in order to service the request.” Ex. 1001, 6:11–14. “If the allocated resources are inadequate, the node submits a resource request to the dispatcher, indicating the destination node, at a request step 34.” *Id.* at 6:14–17. At “availability checking step 36,” “[t]he dispatcher then checks whether there are resources available to the node on either the inner or the outer ring.” *Id.* at 6:17–19. According to the ’279 patent, “[t]here must both be sufficient unallocated resources left in the specific node budget and unused resources left on the appropriate segments of at least one of the rings in order for the dispatcher to grant the node’s resource request”; and “[i]f not, the dispatcher refuses the request, at a refusal step 38, and the node returns an appropriate error report to the client application.” *Id.* at 6:19–25. “If resources are available, however, the dispatcher determines on which of the rings to allocate the resources, at an assignment step 40,” and “allocates one or more additional quanta to the node on the selected ring,” allowing the node to carry out the data transmission. *Id.* at 6:29–34. “If both rings have sufficient resources available on all of the relevant segments, then the dispatcher proceeds to choose the ring that has, generally speaking, the lower level of current

resource allocation, . . . and to assign the requested resources on this ring at step 40.” *Id.* at 8:1–6. In one embodiment, the ’279 patent describes that relative resource “usage levels” can be compared for all relevant segments on both rings to select a path for the data flow. *Id.* at 8:9–11.

D. Illustrative Claim

Of the challenged claims, claims 1 and 15 are independent. Claim 1, reproduced below with bracketed reference numerals corresponding to those used by the parties,¹ is illustrative of the claimed subject matter.

1. [1.0] In a communication network that includes a plurality of nodes interconnected by links, the nodes including at least first and second nodes, a method for routing a data flow, comprising:

[1.1] allocating a respective number of quanta of one or more resources in the network to each of the nodes;

[1.2] receiving a request at the first node to use a portion of the resources so as to carry the data flow between the first and second nodes over one of a plurality of paths therebetween, each such path comprising a respective sequence of the links; and

[1.3] in response to the request:

if the resources already allocated to the first node on one of the paths are sufficient, directing the data flow from the first node to the second node over the one of the paths without requesting additional resources; and

[1.4] if the resources already allocated to the first node are insufficient, performing the following steps:

[1.5] requesting an increase in an allocation to the first node of the requested resources;

[1.6] determining, for the links comprised by each of the paths, respective levels of use of the requested

¹ For clarity, the placement of the bracketed reference numerals has been modified slightly from the parties’ placement.

resources due to communications in progress over the network;

[1.7] selecting which of the paths is to carry the data flow responsive to the determined levels of use of the requested resources on the links comprised in each of the paths; and

[1.8] increasing the allocation of the resources to the first node on the selected path by a predetermined quantum.

Ex. 1001, 9:21–53; *see* Pet. 26–50; Prelim. Resp. 3–4.

E. Asserted Grounds of Unpatentability

Petitioner asserts that the challenged claims are unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. § ²	Reference(s)/Basis
1–5, 9–18	103(a)	Kovvali, ³ Kalman ⁴
6	103(a)	Kovvali, Kalman, Masters ⁵

² The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. §§ 102 and 103, effective March 16, 2013. Because the filing date of the application for the ’279 patent was before that date, we refer to the pre-AIA versions of §§ 102 and 103.

³ Kovvali et al., US 6,920,113 B1, issued July 19, 2005, filed Mar. 28, 2000 (Ex. 1005). Petitioner contends that Kovvali is prior art to the ’279 patent under pre-AIA 35 U.S.C. § 102(e). Pet. 14.

⁴ Kalman et al., US 6,680,912 B1, issued January 20, 2004, filed Mar. 3, 2000 (Ex. 1006). Petitioner contends that Kalman is prior art to the ’279 patent under pre-AIA 35 U.S.C. § 102(e). Pet. 14.

⁵ Masters et al., US 5,920,697, issued July 6, 1999, filed July 11, 1996 (Ex. 1007). Petitioner contends that Masters is prior art to the ’279 patent under pre-AIA 35 U.S.C. § 102(b) and (e). Pet. 14.

Claim(s) Challenged	35 U.S.C. § ²	Reference(s)/Basis
7, 8	103(a)	Kovvali, Kalman, RFC 2892 ⁶

Pet. 13.

III. DISCRETIONARY DENIAL

Institution of *inter partes* review is discretionary. *See Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1367 (Fed. Cir. 2016) (“[T]he PTO is permitted, but never compelled, to institute an IPR [*inter partes* review] proceeding.”); 35 U.S.C. § 314(a) (“The Director *may not* authorize an *inter partes* review to be instituted unless the Director determines that the information presented in the petition filed under section 311 and any response filed under section 313 shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” (emphasis added)).

Patent Owner argues that we should exercise our discretion to deny the Petition on two bases: first, in view of the co-pending Cisco litigation in the Eastern District of Texas; and second, under 35 U.S.C. § 325(d) in view of “the same or substantially the same prior art or arguments” allegedly having been “previously . . . presented to the Office.” Prelim. Resp. 17–26. We address these threshold issues before addressing the merits of Petitioner’s substantive arguments.

⁶ D. Tsiang & G. Suwala, *The Cisco SRP MAC Layer Protocol*, Request for Comments 2892, Network Working Group (Aug. 2000) (Ex. 1018). Petitioner contends that RFC 2892 is prior art to the ’279 patent under pre-AIA 35 U.S.C. § 102(a) as a printed publication or as being otherwise available to the public. Pet. 14–15. Petitioner also notes that RFC 2892 is cited and incorporated by reference in the ’279 patent. *Id.* at 15 (citing Ex. 1001, 1:21–24).

A. Discretionary Denial Under 35 U.S.C. § 314(a)

The Board has held that the advanced state of a parallel district court action is a factor that may weigh in favor of denying a petition under § 314(a). *See NHK Spring Co. v. Intri-Plex Techs., Inc.*, IPR2018-00752, Paper 8 at 20 (PTAB Sept. 12, 2018) (precedential); Patent Trial and Appeal Board Consolidated Trial Practice Guide (Nov. 2019), 58 & n.2, *available at* <https://www.uspto.gov/TrialPracticeGuideConsolidated>. We consider the following factors to assess “whether efficiency, fairness, and the merits support the exercise of authority to deny institution in view of an earlier trial date in the parallel proceeding”:

1. whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted;
2. proximity of the court’s trial date to the Board’s projected statutory deadline for a final written decision;
3. investment in the parallel proceeding by the court and the parties;
4. overlap between issues raised in the petition and in the parallel proceeding;
5. whether the petitioner and the defendant in the parallel proceeding are the same party; and
6. other circumstances that impact the Board’s exercise of discretion, including the merits.

Apple Inc. v. Fintiv, Inc., IPR2020-00019, Paper 11 at 5–6 (PTAB Mar. 20, 2020) (precedential) (“*Fintiv*”). In evaluating these factors, we “take[] a holistic view of whether efficiency and integrity of the system are best served by denying or instituting review.” *Id.* at 6.

We also consider “several clarifications” made by the Director of the United States Patent and Trademark Office (“USPTO”). *See* USPTO Memorandum, Interim Procedure for Discretionary Denials in AIA Post-

Grant Proceedings with Parallel District Court Litigation, 2 (June 21, 2022) (“Director’s Memo”), *available at* https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf.⁷

Upon consideration of these factors and the clarifications, which are discussed below, we decline to exercise our discretion to deny the Petition.

1. Whether the Court Granted a Stay or Evidence Exists That One May Be Granted if a Proceeding is Instituted

According to the parties, the district court has not issued a stay in the Cisco litigation, so this factor should be neutral. Pet. 81–82; Prelim. Resp. 17. We agree. *See Sand Revolution II LLC v. Cont’l Intermodal Grp. – Trucking LLC*, IPR2019-01393, Paper 24 at 7 (PTAB June 16, 2020) (informative) (“*Sand*”).

2. Proximity of the Court’s Trial Date to the Board’s Projected Statutory Deadline for a Final Written Decision

Trial is currently set by the district court in the Cisco litigation for June 2, 2025. Pet. 82; Prelim. Resp. 17. Both parties acknowledge that this date is about two months before our statutory deadline for a final written decision. Pet. 82; Prelim. Resp. 17–18.⁸ However, Petitioner argues that

⁷ A copy of the Director’s Memo is filed in this proceeding as Exhibit 1021.

⁸ Patent Owner also cites median-time-to-trial statistics for the Eastern District of Texas, where the Cisco litigation is pending, and states that “[t]he timeframe set by the district court is consistent” with those statistics. Prelim. Resp. 18 (citing Ex. 2001). In particular, Patent Owner provides, “[t]hose statistics indicate that, over the past two years the median time to trial for the district was 18 months after filing,” whereas “[h]ere, trial is conservatively set at 22 months after the case was filed, which is more than the median time to trial in this district.” *Id.* (citing Ex. 1011; Ex. 1014, 1). Because those statistics do not indicate a trial date later than that set by the court, they do not affect our analysis. *See* Ex. 1021, 8–9 (“Parties may

this factor should slightly weigh against discretionary denial because that trial date is less than five months before the final written decision deadline, analogizing to the facts in *Sand*, while Patent Owner argues that it should weigh in favor of discretionary denial. Pet. 82; Prelim. Resp. 18 (citing *Fintiv* at 9). We find this factor weighs slightly in favor of discretionary denial.

First, we do not agree with Petitioner that the facts in *Sand* are directly applicable to factor 2 in this case. In *Sand*, the panel found that the trial date was uncertain for multiple reasons not present here, including the COVID-19 pandemic, and we have no indication of similar uncertainty for the scheduled trial date in the Cisco litigation.⁹ See *Sand* at 8–10.

Regarding Patent Owner’s reliance on our precedential decision in *Fintiv*, we agree that it indicates that this factor weighs in favor of discretionary denial because the trial date is scheduled to occur before the final written decision deadline. However, the trial date here is closer to the deadline for the final written decision, with only a two-month difference here rather than the six-month difference in *Fintiv*, which increases the possibility here that any unforeseen delay in the district court proceeding

present evidence regarding the most recent statistics on median time-to-trial for civil actions in the district court in which the parallel litigation resides for the PTAB’s consideration. . . . The PTAB will weigh [factor 2] against exercising discretion to deny institution under *Fintiv* if the median time-to-trial is around the same time or after the projected statutory deadline for the PTAB’s final written decision.” (footnote omitted)).

⁹ Petitioner also contends that its expeditious filing of the IPR only one month after receiving the infringement contentions also warrants this factor to weigh against discretionary denial. Pet. 82. However, Petitioner’s diligence in filing is more appropriately addressed in factor 3, and we will address it there. See *Fintiv* at 9–12.

could cause the order of those two events to reverse. *Fintiv* at 9 (“If the court’s trial date is at or around the same time as the projected statutory deadline . . . , the decision whether to institute will likely implicate other factors.”). Therefore, we find this factor weighs only slightly in favor of discretionary denial.

3. *Investment in the Parallel Proceeding by the Court and the Parties*

Patent Owner argues that this factor favors discretionary denial because

the parties will have expended significant resources by the time the Board issues an Institution Decision in this case in July 2024. The parties have already exchanged infringement and invalidity contentions for the ’297 Patent, in December 2023 and February 2024, respectively. Fact discovery is already underway under the District Court schedule, and the parties have already produced volumes of documents to each other.

Prelim. Resp. 19–20.

In contrast, Petitioner contends that this factor weighs against discretionary denial because “[t]he co-pending litigation is in its early stages, and the investment in it has been minimal”; a claim construction hearing is not scheduled to take place in the litigation until December 4, 2024; and fact discovery and expert discovery are not set to close until January 13, 2025, and February 18, 2025, respectively. Pet. 83 (citing *PEAG LLC v. Varta Microbattery GMBH*, IPR2020-01214, Paper 8 at 17 (PTAB Jan. 6, 2021)). Furthermore, as noted above (*see supra* note 9), Petitioner argues that the prompt filing of the Petition also warrants this factor weighing against discretionary denial. Pet. 82.

We are not persuaded by Patent Owner’s arguments. The statutory deadline for determining whether to institute an *inter partes* review is

August 8, 2024—three months from the filing of the Preliminary Response on May 8, 2024 (*see* 35 U.S.C. § 314(b)(1)), and none of the relevant deadlines for fact discovery or expert discovery, or the date of the scheduled *Markman* hearing, will have passed by that date. As described by Petitioner, fact and expert discovery do not close until next year, the parties have not yet exchanged preliminary claim constructions, and the *Markman* hearing is not scheduled until December 4, 2024, approximately four months after our deadline for this decision. *See* Pet. 83. We also find that Petitioner’s diligence in filing the Petition only about a month after receiving Patent Owner’s infringement contentions, and only four months after the filing of the original complaint, supports this factor weighing more strongly against exercising our discretion to deny the Petition. *See id.* at 82. Accordingly, in view of the parties’ respective arguments, we find that factor 3 weighs strongly against discretionary denial.

4. *Overlapping Issues with the Parallel Proceeding*

Under this factor, Petitioner stipulates that “[i]f the Board institutes trial, Petitioner will cease asserting in the co-pending litigation the combination of references on which trial is instituted for the claims, to the extent Petitioner even asserts the same combination in the district court.” Pet. 83. We find that this stipulation “mitigates to some degree the concerns of duplicative efforts between the district court and the Board, as well as concerns for potentially conflicting decisions.” *Sand* at 12. More specifically, if we institute, then by stipulation the court in the Cisco litigation will not have to determine whether the challenged claims of the ’279 patent would have been obvious in view of Kovvali, Kalman, Masters, and RFC 2892, and therefore the risk of inconsistent results is also reduced.

Patent Owner argues that this factor should only marginally weigh against discretionary denial because the stipulation is limited in nature.¹⁰ Prelim. Resp. 20. We agree, and therefore find this factor weighs slightly against discretionary denial. *Sand* at 12 n.5 (“Petitioner stipulates only that it will not pursue, in district court, the ‘same grounds’ presented in the Petition in this case. . . . Petitioner could have stipulated that it would not pursue any grounds raised or that could have reasonable been raised in an IPR Doing so might have tipped this factor more conclusively in its favor.”).

5. Whether Petitioner and the Defendant in the Parallel Proceeding are the Same Party

The parties to this proceeding are both in the related district court litigation. Pet. 83; Prelim. Resp. 21. While it is common in IPR proceedings for the petitioner and patent owner to also be parties in a related district court proceeding, this factor weighs somewhat in favor of discretionary denial, given the timing discussed above regarding factor 2.

¹⁰ Patent Owner correctly points out the stipulation here falls short of a *Sotera*-style stipulation. Prelim. Resp. 20. Because the stipulation here does not say “or any grounds that could have reasonably been raised before the PTAB,” it does not qualify as a *Sotera*-style stipulation under the Director’s Memo. See Ex. 1021, 3 (“Consistent with [*Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 (PTAB Dec. 1, 2020) (precedential as to § II.A) (*‘Sotera’*)], the PTAB will not discretionarily deny institution in view of parallel district court litigation where a petitioner presents a stipulation not to pursue in a parallel proceeding the same grounds *or any grounds that could have reasonably been raised before the PTAB.*” (emphasis added)).

6. *Other Circumstances that Impact the Board's Exercise of Discretion, Including the Merits*

Regarding factor 6, Petitioner asserts that “[i]n view of the striking similarities between the ’279 patent claims and Kovvali, Kalman, Masters, and RFC2892, this petition ‘presents compelling evidence of unpatentability,’ and thus this factor weighs against discretionary denial.” Pet. 84 (citing Ex. 1021, 2). Patent Owner counters that “the merits of the petition are weak and include numerous deficiencies, which cannot meet the high compelling merits standard needed to overcome *Fintiv* Factors 1–5 strongly favoring denial of institution.” Prelim. Resp. 22.

Despite both parties raising the issue, it is not necessary for us to make a determination about whether the merits are compelling, as factors 1–5 do not weigh in favor of discretionary denial. *See* Ex. 1021, 3–6; *CommScope Techs. LLC v. Dali Wireless, Inc.*, IPR2022-01242, Paper 23 at 4–5 (Vidal Feb. 27, 2023) (precedential) (“*CommScope*”) (“[I]n circumstances where the Board determines that the other *Fintiv* factors 1–5 do not favor discretionary denial, the Board shall decline to discretionarily deny under *Fintiv* without reaching the compelling merits analysis.”).

7. *Summary of Fintiv Factors and Conclusion on Section 314(a)*

In view of *Fintiv* factors 1–5,¹¹ and taking “a holistic view of whether efficiency and integrity of the system are best served by denying or instituting review,” we conclude that the factors weigh against discretionary denial. *Fintiv* at 6. We are not persuaded that the interests of efficiency and

¹¹ As noted above, in light of our determination that *Fintiv* factors 1–5 do not favor discretionary denial we do not reach *Fintiv* factor 6. *See supra* § III.A.6; *Commscope* at 4–5.

integrity of the system would be best served by invoking our authority under 35 U.S.C. § 314(a) to deny institution.

B. Discretionary Denial Under 35 U.S.C. § 325(d)

Pursuant to 35 U.S.C. § 325(d), in determining whether to institute an *inter partes* review, “the Director may take into account whether, and reject the petition or request because, the same or substantially the same prior art or arguments previously were presented to the Office.” 35 U.S.C. § 325(d). The Board uses a two-part framework in determining whether to exercise its discretion under 35 U.S.C. § 325(d), specifically:

(1) whether the same or substantially the same art previously was presented to the Office or whether the same or substantially the same arguments previously were presented to the Office;
and

(2) if either condition of [the] first part of the framework is satisfied, whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims.

Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH, IPR2019-01469, Paper 6 at 8 (PTAB Feb. 13, 2020) (precedential) (“*Advanced Bionics*”).

In applying the two-part framework, we consider several non-exclusive factors from *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8 (PTAB Dec. 15, 2017) (precedential as to § III.C.5, first paragraph) (“*Becton, Dickinson*”), which provide “useful insight into how to apply the framework” (*Advanced Bionics* at 9): (a) the similarities and material differences between the asserted art and the prior art involved during examination; (b) the cumulative nature of the asserted art and the prior art evaluated during examination; (c) the extent to which the asserted

art was evaluated during examination, including whether the prior art was the basis for rejection; (d) the extent of the overlap between the arguments made during examination and the manner in which Petitioner relies on the prior art or Patent Owner distinguishes the prior art; (e) whether Petitioner has pointed out sufficiently how the examiner erred in its evaluation of the asserted prior art; and (f) the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments. *Becton, Dickinson* at 17–18.

If, after review of factors (a), (b), and (d), we determine that the same or substantially the same art or arguments previously were presented to the Office, we then review factors (c), (e), and (f), which relate to whether the petitioner demonstrates that the Office erred in a manner material to the patentability of the challenged claims. *Advanced Bionics* at 10.

Patent Owner contends that we should exercise our discretion under 35 U.S.C. § 325(d) to deny the Petition under *Advanced Bionics* and *Becton, Dickinson*, alleging that “Petitioner offers no new pertinent art, no non-cumulative arguments for unpatentability, and no plausible showing that the Examiner made a material error of patentability.” Prelim. Resp. 24–26. More particularly, Patent Owner contends that while “Petitioner relies on Kovvali and Kalman in arguing that the independent claims for the ’279 Patent [would have been] obvious,” “Petitioner fails to consider that . . . Kalman was cited to the Examiner in an IDS [(Information Disclosure Statement)], the Examiner acknowledges the IDS, and Kalman is cited on the fact [sic] of the ’279 Patent.” *Id.* at 24 (citing Ex. 1001, 1; Ex. 1002, 127, 195). Patent Owner argues, “*Advanced Bionics* specifically provides that ‘[p]reviously presented art includes . . . art provided to the Office by an applicant, such as on an Information Disclosure Statement (IDS), in the

prosecution history of the challenged patent.” *Id.* at 24–25 (quoting *Advanced Bionics* at 7) (citing *Miltenyi Biomed. GmbH v. Trs. of the Univ. of Pa.*, IPR2022-00853, Paper 18 at 12 (PTAB Feb. 17, 2023); *Google LLC v. Kewazinga Corp.*, IPR2021-00527, Paper 16 at 11 (PTAB Aug. 24, 2021); *Medtronic Corevalve LLC v. Speyside Med., LLC*, IPR2021-00240, Paper 9 at 23 (PTAB July 23, 2021)).

Further, Patent Owner contends, “[a]lthough Kovvali was not presented to the Office, U.S. Patent No. 5,461,611 to Drake (‘Drake’) was presented and thoroughly considered across multiple office actions”; and “[a] comparison of Kovvali to Drake makes clear that Drake teaches a ‘management system for local area networks’ that features an ‘allocator,’ which determined ‘if requested facilities are available, and if so, reserves these facilities for the requesting station,’” “similar to how Petitioner characterizes Kovvali, and the Examiner ultimately concluded that Drake did not disclose all of the claimed features of the ’279 Patent, alone or in combination with other references.” Prelim. Resp. 26 (citing Ex. 2003).

For its part, Petitioner argues that “[t]he combinations of references presented in the grounds below have not previously been presented to the Office.” Pet. 80. More particularly, Petitioner argues, “all the challenges presented in this petition are based in part on Kovvali, which (1) teaches pre-allocating bandwidth so that transmission may occur ‘*without requesting additional resources*’—the feature argued to gain allowance in prosecution—and (2) is neither cumulative nor redundant to the prior art considered in prosecution.” *Id.* at 80–81 (citing Ex. 1002, 190; *Advanced Bionics*). “Neither Kovvali nor Masters were cited or considered by the Examiner during prosecution of the ’279 patent,” Petitioner contends, and “[w]hile RFC2892 and Kalman were before the Examiner, they were never

cited in any rejection, nor even mentioned in any Office action.” *Id.* at 80 (citing Ex. 1002, 85, 195). Further, Petitioner argues, “Petitioner’s analysis . . . shows that the Examiner erred by not rejecting the claims based in part on Kalman and RFC 2892, and therefore discretionary denial is inappropriate under the second prong of [*Advanced Bionics*].” *Id.*

Having considered the parties’ respective arguments, we are not persuaded that “the same or substantially the same prior art or arguments previously were presented to the Office” within the meaning of Section 325(d), and we decline to exercise our discretion to deny the Petition on that basis.

As we discuss in greater detail in the “Analysis” section of this Decision below, Petitioner relies on Kovvali alone as teaching all but two steps recited in independent claim 1, and Petitioner similarly relies on Kovvali alone as teaching all but two limitations of independent claim 15. *See* Pet. 26–50, 63–64. For those additional steps and limitations, Petitioner relies on combined teachings of Kovvali and Kalman. *See id.* at 42–47. As Petitioner points out and Patent Owner acknowledges, however, Kovvali was not previously presented to the Office during prosecution of the application for the ’279 patent. *See id.* at 80; Prelim. Resp. 26.

Moreover, notwithstanding Patent Owner’s assertion that Drake has “similar[ities] to how Petitioner characterizes Kovvali,” Patent Owner identifies only that “Drake teaches a ‘management system for local area networks’ that features an ‘allocator,’ which determined ‘if requested facilities are available, and if so, reserves these facilities for the requesting station.’” Prelim. Resp. 26 (citing Ex. 2003, code (57)). In contrast, Petitioner’s reliance on Kovvali goes significantly beyond such high-level generalizations, providing a detailed mapping of Kovvali’s teachings to, for

example, limitations [1.1]–[1.5] and [1.8] of independent claim 1 and limitations [15.1]–[15.5] and [15.8] of independent claim 15, as well as to the additional limitations recited in each of dependent claims 2, 5, 11–14, and 18, with supporting testimony from Dr. Mir’s declaration. Pet. 27–42, 48–51, 55–56, 59–64, 67 (citing Ex. 1003 ¶¶ 62–103, 120–130, 146–150, 160–185). Notably, Patent Owner does not expressly contest Petitioner’s arguments with respect to those limitations at this stage of the proceeding. *See generally* Prelim. Resp. Nor does Patent Owner cite any evidence of arguments substantially the same as those presented by Petitioner having been presented during prosecution.

Accordingly, on this record and after taking into account *Becton, Dickinson* factors (a), (b), and (d), cited by *Advanced Bionics* as relevant to the first part of the two-part framework set forth therein (*see Advanced Bionics* at 9–10), we are not persuaded that the same or substantially the same art previously was presented to the Office or that the same or substantially the same arguments previously were presented to the Office. Accordingly, we need not proceed to the second part of the framework, and we decline to exercise our discretion to deny institution under 35 U.S.C. § 325(d).

IV. ANALYSIS

A. Legal Standards

A patent claim is unpatentable under 35 U.S.C. § 103 if “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.” The question of obviousness is resolved based on underlying factual determinations, including (1) the scope and

content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when presented, objective evidence of obviousness or nonobviousness, i.e., secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

The obviousness inquiry typically requires an analysis of “whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *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) (requiring “articulated reasoning with some rational underpinning to support the legal conclusion of obviousness”)). A patent claim “is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *Id.* In particular, “[a]lthough the *KSR* test is flexible, the Board ‘must still be careful not to allow hindsight reconstruction of references . . . without any explanation as to *how* or *why* the references would be combined to produce the claimed invention.’” *Trivascular, Inc. v. Samuels*, 812 F.3d 1056, 1066 (Fed. Cir. 2016) (alteration in original) (quoting *Kinetic Concepts, Inc. v. Smith & Nephew, Inc.*, 688 F.3d 1342, 1368 (Fed. Cir. 2012) (emphases added)). An obviousness determination based on a combination of references requires finding “both ‘that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.’” *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367–68 (Fed. Cir. 2016) (quoting *Kinetic Concepts*, 688 F.3d at 1360); see *KSR*, 550 U.S. at 418. Petitioner cannot satisfy its burden of proving obviousness by employing “mere conclusory statements,” but “must instead articulate

specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016); *see also In re NuVasive, Inc.*, 842 F.3d 1376, 1383 (Fed. Cir. 2016) (a finding of a motivation to combine “must be supported by a ‘reasoned explanation’” (citation omitted)).

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3)); *see also Intelligent Bio-Sys.*, 821 F.3d at 1369. Therefore, to prevail in an *inter partes* review, Petitioner must explain how the proposed combinations of prior art would have rendered the challenged claims unpatentable. At this preliminary stage, we determine whether the information presented in the Petition shows there is a reasonable likelihood that Petitioner would prevail in establishing that at least one of the challenged claims would have been obvious over the proposed combinations of prior art. *See* 35 U.S.C. § 314(a).

B. Level of Ordinary Skill in the Art

Determining whether an invention would have been obvious under 35 U.S.C. § 103 requires resolving the level of ordinary skill in the pertinent art at the time the invention was made. *Graham*, 383 U.S. at 17. The person of ordinary skill in the art is a hypothetical person who knows the relevant art. *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). Factors in determining the level of ordinary skill in the art include the types of problems encountered in the art, the sophistication of the technology, and educational level of active workers in the field. *Id.* One or more factors may predominate. *Id.*

Petitioner contends that a person of ordinary skill in the art in the field of the '279 patent in January 2001 “would have had a working knowledge of the network communication technologies that are pertinent to the '279 patent, including network flow allocation in a ring topology.” Pet. 12. More specifically, Petitioner argues, a person of ordinary skill in the art “would have had a master’s degree in computer science, computer engineering, or an equivalent, and two years of professional experience relating to network communications and resource allocations,” where “[a]dditional work experience can substitute for specific educational background, and vice versa.” *Id.* (citing Ex. 1003 ¶ 20).

Patent Owner represents that it “does not dispute Petitioner’s definition” for the purposes of the Preliminary Response. Prelim. Resp. 3. We find Petitioner’s proposal is consistent with the evidence of record, including the asserted prior art and the '279 patent, and, therefore, we likewise adopt Petitioner’s proposed definition of the level of ordinary skill in the art for purposes of this Decision.

C. Claim Construction

In an *inter partes* review, we apply the same claim construction standard as would be used by a district court to construe a claim in a civil action involving the validity or infringement of a patent. 37 C.F.R. § 42.100(b). Under that standard, claim terms are given their ordinary and customary meaning, as would have been understood by a person of ordinary skill in the art at the time of the invention, in light of the language of the claims, the specification, and the prosecution history of record. *Id.*; *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–19 (Fed. Cir. 2005) (en banc); *Thorner v. Sony Comput. Entm’t Am. LLC*, 669 F.3d 1362, 1365–66 (Fed. Cir. 2012). “The Board is required to construe ‘only those terms . . .

that are in controversy, and only to the extent necessary to resolve the controversy.” *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (quoting *Vivid Techs., Inc. v. Am. Sci. Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

At this stage of the proceeding, neither party contends that any formal claim construction is necessary. *See* Pet. 12 (“Petitions submits that, for the purposes of this proceeding and the grounds presented herein, no claim term requires express construction.”); Prelim. Resp. 3 (“Here, at this stage in the proceeding, Patent Owner will apply the ordinary and customary meaning to the ’279 Patent’s claim terms.”). After reviewing the parties’ respective arguments and the evidence currently before us, we agree that we do not need to expressly construe any term to resolve any controversy at this stage of the proceeding, as we are persuaded that Petitioner has demonstrated a reasonable likelihood of prevailing with respect to at least one claim regardless of formal construction.

Nonetheless, we have identified a potential claim construction issue that, although not raised by the parties at this stage of the proceeding, may nonetheless take on dispositive significance over the course of trial, depending on how the record develops going forward. In particular, we note that the conditions set forth in limitations [1.3] and [1.4] of claim 1 appear to be mutually exclusive and to cover the only two possible alternatives (i.e., the already allocated resources are sufficient, or they are not), analogous to the contingent steps recited in the claims at issue in *Ex parte Schulhauser*, No. 2013-007847, 2016 WL 6277792 (PTAB Apr. 28, 2016) (precedential). That is, if the condition recited in limitation [1.3] (i.e., “if the resources already allocated to the first node on one of the paths are sufficient”) is met, the conditional language recited in limitation [1.4] (“if the resources already

allocated to the first node are insufficient”) would of necessity, it would seem, not be met, and accordingly, steps [1.5]–[1.8], the performance of which is premised on the condition in limitation [1.4] being met, would need not be performed. *See Schulhauser*, 2016 WL 6277792, at *3 (“Due to the language in the ‘triggering’ and ‘determining’ steps, logically, the ‘triggering’ and ‘determining’ steps do not need to be performed, after the ‘comparing’ step if the condition precedent recited in each step is not met. . . . If the electrocardiac signal data is not within the threshold electrocardiac criteria, then an alarm is triggered and *the remaining method steps need not be performed.*”); *see also Cybersettle, Inc. v. Nat’l Arbitration Forum, Inc.*, 243 F. App’x 603, 607 (Fed. Cir. 2007) (“If the condition for performing a contingent step is not satisfied, the performance recited by the step need not be carried out in order for the claimed method to be performed.”).

The parties are encouraged during the course of trial to address the applicability and effect of *Schulhauser* with respect to the construction and patentability of the challenged claims.

D. Alleged Obviousness Over Kovvali and Kalman

Petitioner alleges claims 1–5 and 9–18 of the ’279 patent would have been obvious over Kovvali and Kalman. Pet. 16–67. Patent Owner contends in response that Petitioner fails to articulate a valid motivation to combine Kovvali with Kalman and that the cited references fail to render the challenged claims obvious. Prelim. Resp. 5–17. Having considered the arguments and evidence before us, we find, for the reasons explained below, that the record establishes a reasonable likelihood that Petitioner would prevail on at least one claim in this asserted ground of unpatentability.

1. Kovvali

Kovvali, titled “Transport of Isochronous [sic] and Bursty Data on a SONET Ring,” describes methods and apparatus for using synchronous optical network (SONET) technology to efficiently carry data and voice traffic. Ex. 1005, codes (54), (57). Kovvali discloses that “communication according to the SONET standard makes use of a ring architecture in which a number of communication nodes are connected by optical links to form a ring,” where “[e]ach of the nodes are coupled to two neighboring node[s] by optical paths.” *Id.* at 1:48–54. According to Kovvali, “[a] variety of types of SONET rings are used,” including UPSRs (unidirectional path switched rings), in which “all communication between nodes travels in one direction around the ring,” and BLSRs (bi-directional line switched rings), in which “communication travels between nodes on the ring in both directions.” *Id.* at 2:10–16. However, while “[t]raditional SONET equipment has several desirable features,” Kovvali further explains, “the SONET framing structure, virtual tributary approach and payload mapping are not well suited to carrying data at rates that do not match the SONET signal hierarchy, or that exhibit bursty or time-varying rates.” *Id.* at 4:25–34. Accordingly, Kovvali purports to provide “a method and apparatus for using SONET technology to efficiently carry both data and voice traffic by Add/Drop Multiplexing of both isochronous traffic, such as voice and video, and nonisochronous traffic, such as data, in a SONET/SDH fiber-optic ring topology,” where “[a] portion of a SONET/SDH [(synchronous digital hierarchy)] frame structure (STS-1, STM-1 etc.) is shared by a number of nodes connected to an optical SONET/SDH ring (either directly or sitting behind a SONET/ADM [(add/drop multiplexer)])” *Id.* at 4:35–43. “The inherent column structure of the SONET/SDH frame is used to define dynamic channels (flexible

bandwidth channels) between the nodes,” and “[e]ach dynamic channel can be assigned a priority and optionally a minimum bandwidth.” *Id.* at 4:43–47. “The channel to column mapping is varied dynamically for data traffic by a centralized bandwidth manager which serves as an arbiter for requests for bandwidth,” and “[b]oth isochronous traffic and best effort data traffic may be carried in an STS-1 frame thereby allowing over-subscribing and statistical multiplexing of data channels over the unassigned portion of the STS-1 frame.” *Id.* at 4:47–54.

Figure 4 of Kovvali is reproduced below:

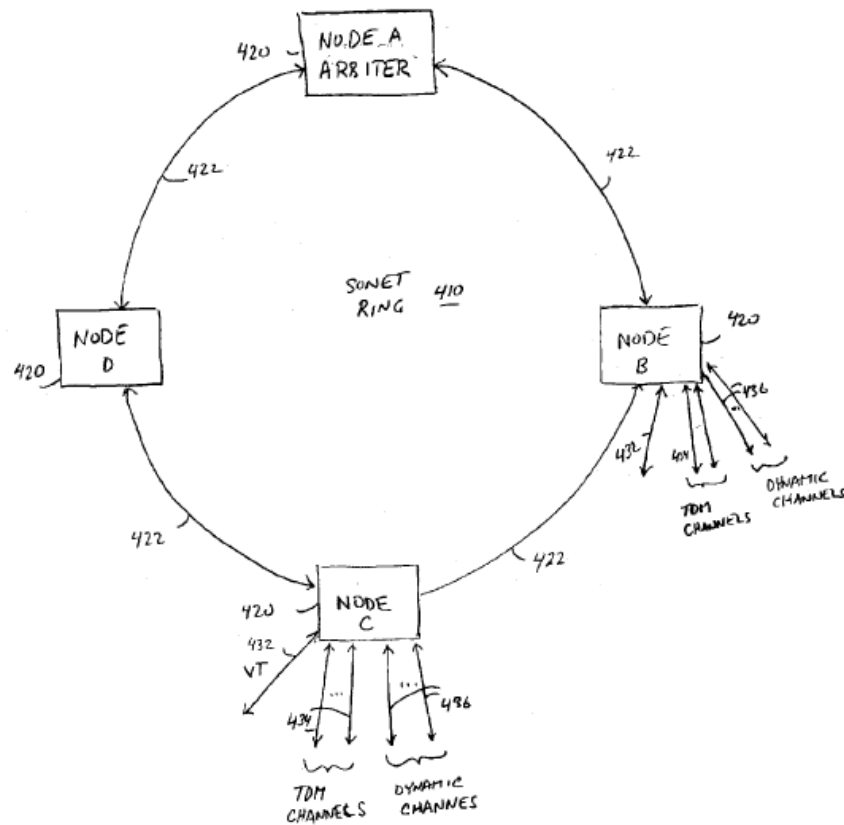


FIG. 4

Figure 4, above, is “a block diagram of a SONET ring in which bandwidth is dynamically managed by an arbiter on the ring.” Ex. 1005, 8:1–2. With

reference to Figure 4, SONET nodes 420 A–D are coupled over optical links 422 in ring 410. *Id.* at 8:19–21. Kovvali explains that although ring 410 is shown in Figure 4 as a unidirectional ring, “[i]n alternative embodiments, other types of rings, such as a BLSR (bi-directional line switched ring) in which communication between nodes on the ring travels in both clockwise and counterclockwise directions, are used.” *Id.* at 8:30–36. With continued reference to Figure 4, Kovvali explains that data may be passed not only over standard rate virtual tributaries 432 between nodes 420 but also over isochronous time division multiplexed (TDM) channels 434 and dynamic channels 436 between nodes. *Id.* at 8:37–41. Moreover, “[d]ynamic channels 436 can be repeatedly assigned to communication between different nodes after SONET ring 410 is provisioned,” and “the data rate assigned to any particular dynamic channel 436 can be dynamically changed, for example to accommodate time-varying data rate requirements of bursty communication between nodes.” *Id.* at 8:47–53. “In order to dynamically manage the TDM and dynamic channels, one node 420 is assigned to be the arbiter node at the time the ring is provisioned,” and “[t]he remaining nodes that make use of the TDM and dynamic channels are client nodes.” *Id.* at 9:1–5. In Figure 4, “node A is the arbiter node and the remaining nodes are client nodes.” *Id.* at 9:5–6. “Requests to assign dynamic channels for communication between particular nodes are sent from a client nodes to the arbiter,” which “responds to the requests by assigning dynamic channels to particular nodes, and by adjusting the allocated rates for the dynamic channels.” *Id.* at 9:6–11.

9:48–10:5. In particular, dynamic frame overhead section 520 is “used to transport dynamic bandwidth management information between nodes 420 and the arbiter node,” TDM section 530 is “used for statically configured isochronous circuits between nodes,” and elastic section 540 “carries channels that are dynamically allocated and that typically carry bursty data.” *Id.* at 9:49–10:1. According to Kovvali, “each dynamic channel is allocated zero or more columns of elastic section 540, and is used for communication between two or more nodes 420,” and “[e]ach . . . is associated with a particular control channel in dynamic frame overhead section 520.” *Id.* at 10:3–7.

2. *Kalman*

Kalman, titled “Selecting a Routing Direction in a Communications Network Using a Cost Metric,” describes communication networks that include two or more rings, “wherein a first ring transmits data in a ‘clockwise’ direction (or direction 0), and the other ring transmits data in a ‘counterclockwise’ direction (or direction 1 opposite to direction 0).” Ex. 1006, codes (54), (57), 1:7–8, 2:61–66. “During normal operations (i.e., all spans operational and undegraded), data between nodes flows on the ring that provides the lowest-cost path to the destination node.” *Id.* at 3:1–3. “If traffic usage is uniformly distributed throughout the network the lowest-cost path is typically the minimum number of hops to the destination node,” such that “both rings are fully utilized during normal operations.” *Id.* at 3:3–7. Further, “[e]ach node determines the lowest-cost path from it to every other node on the ring,” which requires that “each node must know the network topology.” *Id.* at 3:7–9. “The nodes periodically test the bit error rate of the links (or the error rate is constantly calculated) to detect a fault in one of the links,” and “[t]he detection of such a fault sends a broadcast signal to all

nodes to reconfigure a routing table within the node so as to identify the optimum routing of source traffic to the destination node after the fault.” *Id.* at code (57). “Specific techniques are described for identifying a failed link, communicating the failed link to the other nodes, differentiating between protected and unprotected classes of traffic, and updating the routing tables.” *Id.* Further, “all nodes know the status of the network and all independently identify the optimal routing path to each destination node when there is a fault in any of the links.” *Id.* at 3:18–20.

In a preferred embodiment, a given packet/flow between two nodes is transmitted in only a single direction around that network and is removed from the ring by the destination node. *Id.* at 4:40–43. This is illustrated in Figure 3 of Kalman, reproduced below:

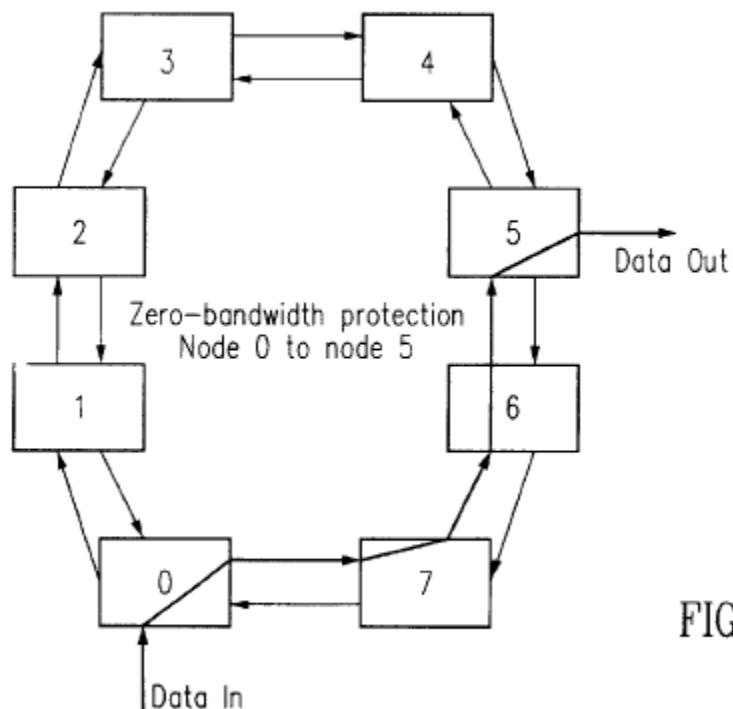


FIG. 3

Figure 3, above, illustrates a network in accordance with an embodiment of Kalman. Ex. 1006, 3:64–67. With reference to Figure 3, Kalman explains

that “node 0 transmits information to node 5 in only the direction indicated by the thick arrows,” whereas “[a] transmission from node 5 to node 0 would only go through nodes 6 and 7 in the opposition direction,” “allow[ing] for optimized ring capacity utilization.” *Id.* at 4:40–48.

Kalman further describes a mechanism which allows a node in a ring network to rapidly re-route paths that cross broken links. Ex. 1006, 7:45–11:6. Specifically, “[f]or each destination node *j*, a cost is assigned to each output direction (0 and 1) from node 0 on the ring,” where “node 0 is the source node.” *Id.* at 7:48–51. “A preferred direction for traffic from nodes 0 to *j* is selected based on the direction with the lowest cost.” *Id.* at 7:51–53. “A table is maintained at each node with the columns Destination Node, direction 0 cost, and direction 1 cost.” *Id.* at 7:64–65. An example is shown as Table 1, below:

TABLE 1			
Preferred direction table at node 0			
Destination Node	Direction 0 cost	Direction 1 cost	Preferred Direction
1	1	7	0
2	2	6	0
3	3	5	0
4	4	4	0
5	5	3	1
6	6	2	1
7	7	1	1

Id. at 7:65–66, 8:21–33. “The computation of the cost on a direction from node 0 (assuming node 0 as the source) to node *j* may take into account a variety of factors, including the number of hops from source to destination in that direction, the cumulative normalized bit error rate from source to destination in that direction, and the level of traffic congestion in that direction,” and “[b]ased on these costs, the preferred output direction for

traffic from the source to any destination can be selected directly.” *Id.* at 7:66–8:7. According to Kalman, “[t]he preferred direction is that with the lower cost to reach destination node j.” *Id.* at 8:34–35. “In the event that the costs to reach node j on direction 0 and on direction 1 are equal, then either direction can be selected.” *Id.* at 8:35–37.

3. *Reasons to Combine*

Petitioner contends that Kovvali and Kalman “provide complementary ideas for the efficient transmission of data in a ring network” and that it would have been within the skillset of a person of ordinary skill in the art to combine them. Pet. 23 (citing Ex. 1003 ¶¶ 50–51; Ex. 1005, code (57); Ex. 1006, 4:20–23. According to Petitioner, the combination would have been obvious for several reasons. *Id.* at 23–24. First, Petitioner argues, the combination “represents merely the use of Kalman’s known technique for selecting a preferred path on a ring network to improve Kovvali’s multi-path ring network for transmitting dynamic frames in the same way.” *Id.* at 23. More specifically, “[f]aced with the choice of transmitting a dynamic frame over one of two paths (e.g. clockwise path or counterclockwise path), a [person of ordinary skill in the art] would look to Kalman for details on how to make the path selection.” *Id.* (citing Ex. 1003 ¶ 51). Second, Petitioner argues, “the application of Kalman’s technique (selecting a preferred path on a ring network) to improve Kovvali’s method (transmitting dynamic frames on a multi-path ring) ready for improvement would yield predictable results,” namely “efficient transmission of dynamic frames in a ring network using a lowest-cost path.” *Id.* at 23–24 (citing Ex. 1003 ¶ 52).

Petitioner further contends, “Kovvali’s multi-path ring network would also be improved because the use of a ring selection technique by a centralized bandwidth manager (i.e. Kovvali’s ‘arbiter’ node) would allow

path selection that accounts for dynamic frame transmissions among all the network nodes across the entire network.” Pet. 24. “By centralizing path selection decisions at the arbiter,” Petitioner argues, “more efficient utilization of available network capacity is achieved.” *Id.* (citing Ex. 1003 ¶ 53). For example, Petitioner contends, “by maintaining information about the current amount of bandwidth allocation throughout the network (e.g. congestion), the centralized arbiter would make use of network capacity efficiently by selecting available paths to service multiple requests according to the particular characteristics of the data they transmit.” *Id.* at 25 (citing Ex. 1003 ¶ 54). Citing evidence that it was known in the art that “[s]chemes that optimize the throughput of one user or one trunk[] do not always maximize the overall performance,” Petitioner further argues that a person of ordinary skill in the art would have been motivated to implement Kalman’s ring selection technique specifically in Kovvali’s centralized arbiter node, “to optimize the use of network resources for all dynamic channels instead of just one.” *Id.* at 25–26 (citing Ex. 1003 ¶ 55; Ex. 1009, 6:1–5¹²).

Finally, Petitioner argues that a person of ordinary skill in the art would have had a reasonable expectation of success in combining the teachings of Kovvali and Kalman, as “Kalman describes that its technique for selecting a preferred path for transmitting data on a network ring may be applied ‘to any network transmitting frames, cells, or using any other protocol,’” and “Kalman also describes that, like Kovvali, the nodes of the network ring are interconnect[ed] by fiber optic cables.” Pet. 26 (citing Ex. 1006, 3:38–41, 11:37–42). “Because Kovvali also describes a ring network transmitting dynamic frames between nodes over an optical

¹² Galand et al., US 6,424,624 B1 (issued July 23, 2002, filed Oct. 7, 1998).

network,” Petitioner argues, a person of ordinary skill in the art “would have understood that the path selection techniques described in Kalman are applicable to Kovvali” and “would also have had an expectation of success from the combination because of the overall similarities between the network architectures and technologies described in Kovvali and Kalman.” *Id.* (citing Ex. 1003 ¶ 56).

Patent Owner responds that Petitioner fails to articulate a valid motivation to combine Kovvali with Kalman, contending that “Kovvali and Kalman are directed to completely different problems and disparate methodologies for managing network communications that cannot be reconciled without hindsight.” Prelim. Resp. 5–9. Patent Owner contends that Petitioner points to no disclosure in either reference that would lead a person of ordinary skill in the art to combine them, further alleging that “both references teach away from the functionalities disclosed in the other reference.” *Id.* at 7.

For example, Patent Owner asserts, “Kovvali is directed to accommodating bursty data” and “teaches a system of communication in a SONET framework in which ‘[s]tatistical multiplexing and over-subscription is achieved by using a centralized bandwidth arbiter,’ resulting in a system that can accommodate bursty data by reorganizing bandwidth as necessary.” Prelim. Resp. 7 (quoting Ex. 1005, 7:32–33). According to Patent Owner, however, “Kovvali does not suggest or teach bi-directional transmission in the SONET framework” but instead “praises the SONET framing structure for its ‘mechanisms for fault management and protection switching,’ which allows communication to switch from one ring to another in the event of a failure.” *Id.* (quoting Ex. 1005, 4:27–30). “In other words,” Patent Owner contends, “Kovvali does not teach using both the

inner and outer ring for network transmissions absent a link failure.” *Id.* at 7–8.

Unlike Kalman, Patent Owner contends, “Kovvali is not concerned with maximizing the efficiency of each available path in the ring network system, but rather with creating a communication network in which resources can be dynamically managed to handle irregular streams of data.” Prelim. Resp. 8. Kalman, on the other hand, according to Patent Owner, is “directed to ‘achiev[ing] fast protection in a ring network while providing for efficient network capacity utilization,’” and “does not suggest the use of a ‘dispatcher’ or ring-leader node, but rather teaches that each node monitors the status of each link that it’s connected to.” *Id.* (alteration in original) (quoting Ex. 1006, 4:20–22) (citing Ex. 1006, 3:10–18). Thus, Patent Owner asserts, “the system teaches that ‘**all nodes** know the status of the network and all independently identify the optimal routing path to each destination node when there is a fault in any of the links,’” and “[t]he use of an arbiter node is not suggested, and in fact, would interfere with Kalman’s goal of fast failure protection by adding in multiple layers of communication into the system.” *Id.* (quoting Ex. 1006, 3:17–20 (emphasis added)).

According to Patent Owner, “Kalman teaches away from the SONET bi-directional protection measures that Kovvali lauds, noting that they ‘are extremely wasteful of capacity,’” and further, Kalman’s structure in which “all nodes know the status of the network and all independently identify the optimal routing path to each destination node when there is a fault in any of the links” “is not compatible with the network structure disclosed in Kovvali, which requires each node to communicate with an arbiter node rather than all other nodes.” Prelim. Resp. 8–9 (quoting Ex. 1006, 2:42–44, 3:18–22). In fact, Patent Owner alleges, “Kovvali specifically teaches that

‘not all nodes on [the] SONET ring . . . need to recognize the internal structure of dynamic frame 510; only nodes that terminate particular channels in the dynamic frame, and the arbiter node, need to recognize the structure,’” “contrary to the teaching in Kalman, which mandates that ‘each node must know the network topology.’” *Id.* at 9 (alterations in original) (quoting Ex. 1005, 9:39–43; Ex. 1006, 3:9). Patent Owner concludes, “Kovvali’s and Kalman’s methods of managing communications over ring networks are actually quite different, and Petitioner fails to identify why and how a [person of ordinary skill in the art] would combine these teachings.” *Id.*

Having considered the parties’ respective arguments and the cited evidence, we are persuaded that Petitioner has sufficiently shown for purposes of institution that a person of ordinary skill in the art would have been motivated to combine the teachings of Kovvali and Kalman in the manner suggested. In view of Kovvali’s disclosure, for example, that a bi-directional line switched ring may alternatively be used in place of the unidirectional path switched ring illustrated in Kovvali’s Figure 4 (*see* Ex. 1005, 8:19–36), we agree with Petitioner’s argument, supported by the declaration testimony of Dr. Mir, that a person of ordinary skill would have been motivated to look to references such as Kalman for details on how to select between paths (*see* Pet. 23 (citing Ex. 1003 ¶ 51)). At this stage of the proceeding, Patent Owner presents only attorney argument in response to Petitioner’s showing.

Contrary to Patent Owner’s teaching-away argument, we find that Kalman’s disclosure that SONET bi-directional protection measures may be “extremely wasteful of capacity” (Ex. 1006, 2:42–44 (quoted at Prelim. Resp. 8)) would provide motivation to modify Kovvali to avoid such

potential waste, e.g., by selecting a preferred path on the ring network for greater efficiency (*see* Pet. 23–24). We do not understand Petitioner’s proposed modification of Kovvali with Kalman’s path selection techniques as requiring wholesale incorporation of Kalman’s decentralized system in which “each node must know the network topology” and individually “determines the lowest-cost path from it to every other node on the ring.” Ex. 1006, 3:7–9. Rather, Petitioner clearly proposes that in the combination, a centralized bandwidth manager (i.e., Kovvali’s “arbiter” node) would continue to be employed. *See* Pet. 24 (“By centralizing path selection decisions at the arbiter, more efficient utilization of available network capacity is achieved.”), 25 (“[B]y maintaining information about the current amount of bandwidth allocation throughout the network (e.g. congestion), the centralized arbiter would make use of network capacity efficiently by selecting available paths to service multiple requests according to the particular characteristics of the data they transmit.”), 25–26 (asserting that a person of ordinary skill in the art “would have been motivated to implement Kalman’s ring selection technique in Kovvali’s centralized bandwidth manager (the ‘arbiter’ node) to optimize the use of network resources for all dynamic channels instead of just one”); Ex. 1003 ¶¶ 53–55.

4. *Analysis of Independent Claim 1*

- a. *Preamble [1.0]: “In a communication network that includes a plurality of nodes interconnected by links, the nodes including at least first and second nodes, a method for routing a data flow, comprising:”*

Petitioner argues that, “[t]o the extent that the preamble is limiting, Kovvali renders it obvious.” Pet. 26–27 (citing Ex. 1003 ¶¶ 57–61). In support of that contention, Petitioner quotes Kovvali’s disclosure of “a method for communicating between multiple nodes of a communication

system in which a series of fixed-length frames pass between the nodes of the system,” where the nodes may be IP-based routers that route a data flow in a ring topology and are coupled over optical links. *Id.* (quoting Ex. 1005, 4:55–58) (citing Ex. 1003 ¶¶ 58–60; Ex. 1005, 4:12–14, 4:35–40, 8:19–21, Fig. 4).

Patent Owner does not contest Petitioner’s arguments with respect to the preamble recitation. *See generally* Prelim. Resp. Based on our review and consideration of the current record, we determine that Petitioner has sufficiently shown that Kovvali teaches the preamble of claim 1, to the extent it is limiting, for purposes of institution.

b. [1.1]: “allocating a respective number of quanta of one or more resources in the network to each of the nodes;”

Petitioner contends that step [1.1] is rendered obvious by Kovvali. Pet. 27–32. In support, Petitioner first cites Kovvali’s teaching of assigning one node to be the “arbiter node” at the time the ring is provisioned, the remaining nodes being “client nodes,” where the arbiter node “assigns dynamic channels to particular nodes,” “provid[es] . . . initial data rate allocations for each of the dynamic channels,” and “adjust[s] the allocated rates for the dynamic channel” in response to requests from client nodes. *Id.* at 27–29 (emphasis omitted) (citing Ex. 1003 ¶¶ 63–65; Ex. 1005, 9:1–11, 12:1–6). Petitioner further argues that “Kovvali teaches that each dynamic channel is allocated zero or more columns (‘*quanta*’) in a frame structure.” *Id.* at 29 (citing Ex. 1003 ¶¶ 66, 71; Ex. 1005, 10:3–5); *see also id.* at 29–31 (citing Ex. 1003 ¶¶ 67–72; Ex. 1005, 2:36–39, 2:55–58, 2:66, 4:43–46, 9:48–66, 12:6–7, Figs. 3, 5A). In particular, Petitioner contends, “Kovvali’s allocation of bandwidth to dynamic channels assigned to nodes is much like

the example of allocating ‘resources’ in the ’279 patent specification, such as ‘bandwidth’ or ‘any other allowable factor that may affect the ability of a network link to convey a data flow between nodes,’” “render[ing] obvious ‘allocating a respective number . . . of one or more resources in the network to each of the nodes.’” *Id.* at 31 (alteration in original) (citing Ex. 1001, 2:12–18; Ex. 1003). Further, Petitioner contends, “it would have been obvious to a [person of ordinary skill in the art] that allocating bandwidth in ‘units of columns’ is allocating bandwidth in ‘*quanta*’ because each column is the smallest discrete unit of bandwidth that can be allocated to a dynamic channel.” *Id.* (citing Ex. 1003 ¶ 74); *see also id.* at 31–32 (citing Ex. 1003 ¶¶ 62, 74–76; Ex. 1005, 2:56–58, 5:28–30).

Patent Owner does not contest Petitioner’s arguments with respect to step [1.1]. *See generally* Prelim. Resp. Based on our review and consideration of the current record, we determine that Petitioner has sufficiently shown that Kovvali teaches this limitation for purposes of institution.

- c. [1.2]: “receiving a request at the first node to use a portion of the resources so as to carry the data flow between the first and second nodes over one of a plurality of paths therebetween, each such path comprising a respective sequence of the links; and”*

Petitioner contends that step [1.2] is rendered obvious by Kovvali. Pet. 32–36. First, Petitioner maps Kovvali’s disclosure that “each dynamic channel . . . is used for communication between two or more nodes 420” to the claim recitation “carry [the] data flow between the first and second nodes.” *Id.* at 32 (alteration in original) (quoting Ex. 1005, 10:3–5) (citing Ex. 1003 ¶ 78). Petitioner then contends, “Kovvali describes that ‘each node 420 functions as an add/drop multiplexer for the . . . dynamic

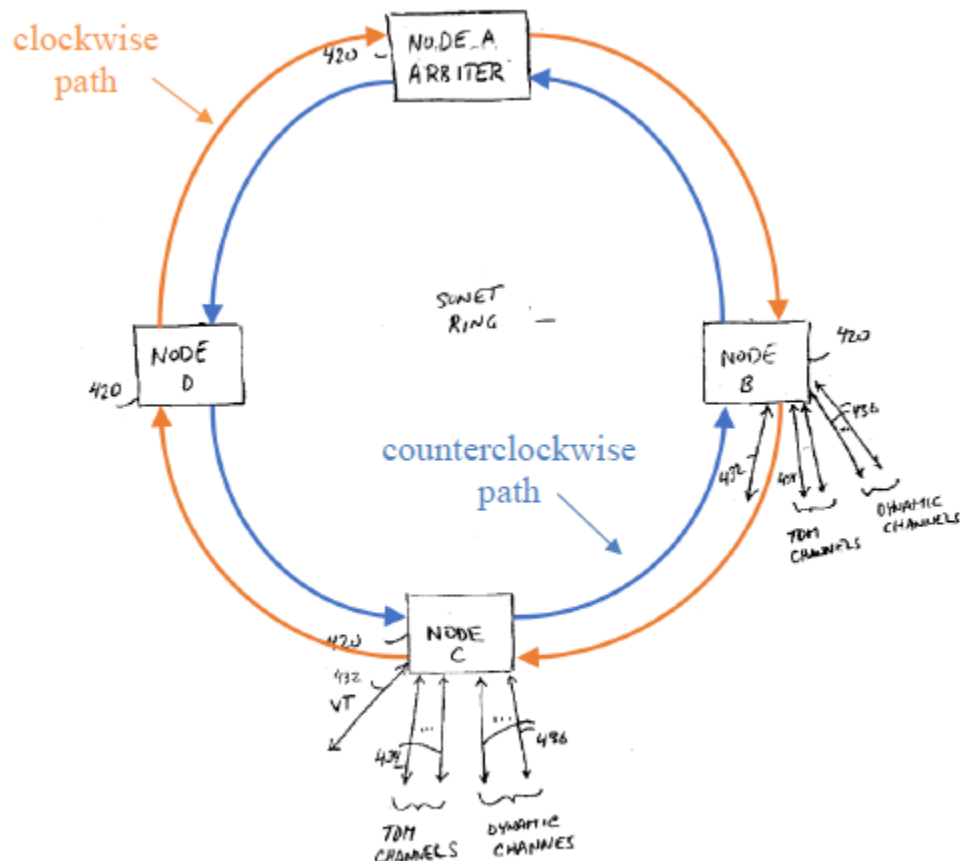
channels,”” referencing Figures 4 and 6 of Kovvali as illustrating receipt by nodes 420 of data from local dynamic channels 436 for transmission. *Id.* at 32–35 (citing Ex. 1003 ¶¶ 79–82; Ex. 1005, 12:20–24, 14:27–37, Figs. 4, 6). Based on those teachings, Petitioner argues, a person of ordinary skill in the art

would have understood that the receipt of data from local dynamic channels by a node (e.g. Node B or Node C) for transmission to another node, renders obvious “*receiving a request at the first node to use a portion of the resources*” because it is a request for the node to process (e.g. queue, schedule, police) and multiplex the data onto the portion of network resources allocated by the arbiter (as discussed in [1.1]) to the node for the respective dynamic channels in the dynamic frame.

Id. at 35 (citing Ex. 1003 ¶ 83).

With respect to the recitation “over one of a plurality of paths therebetween, each such path comprising a respective sequence of the links,” Petitioner cites Kovvali’s disclosure that, while Figure 4 “depicts ‘a UPSR . . . in which all communication between nodes travels in one direction,’ alternative embodiments include other types of rings such as ‘a BLSR . . . in which communication between nodes on the ring travels in both clockwise and counterclockwise directions, with two unidirectional optical links joining each pair of neighboring nodes.’” Pet. 35 (quoting Ex. 1005, 2:10–16) (citing Ex. 1003 ¶ 84; Ex. 1005, 8:33–36). To illustrate,

Petitioner provides the following modified version of Kovvali's Figure 4, depicting use of a BLSR as suggested:



Ex.1005, Fig. 4 (modified and annotated); Ex.1003, ¶85.

Id. at 35–36. Modified Figure 4 above “shows each pair of nodes connected with two unidirectional optical links traveling in opposite directions” in place of the bi-directional links shown in the original figure. *Id.* “As shown in modified Figure 4, . . . the resulting network includes two paths for transmitting data between nodes: a first path with a sequence of links in a clockwise direction (orange) and a second path with a sequence of links in a counterclockwise direction (blue).” *Id.* at 36 (citing Ex. 1003 ¶ 86).

Petitioner concludes, “Kovvali’s disclosure of a node receiving, processing, and multiplexing data from local dynamic channels onto a ring network that is connected to other nodes with two unidirectional optical links traveling in

opposite directions, renders obvious this limitation.” *Id.* (citing Ex. 1003 ¶¶ 77, 87).

Patent Owner does not contest Petitioner’s arguments with respect to step [1.2]. *See generally* Prelim. Resp. Based on our review and consideration of the current record, we determine that Petitioner has sufficiently shown that Kovvali teaches this limitation for purposes of institution.

d. [1.3]: “in response to the request: if the resources already allocated to the first node on one of the paths are sufficient, directing the data flow from the first node to the second node over the one of the paths without requesting additional resources; and”

Referring back to its arguments with respect to steps [1.1] and [1.2] regarding Kovvali’s description of assignment of dynamic channels and data rate allocations by the arbiter node and multiplexing of outbound data by each terminating node for transmission onto the dynamic channel, respectively, Petitioner contends that a person of ordinary skill in the art

would have understood that adding (or multiplexing) data for transmission into the portion of a frame that is already allocated to a dynamic channel, renders obvious “*if the resources already allocated to the first node on one of the paths is sufficient, directing the data flow to the second node . . . without requesting additional resources*” because the data is included in only the portion of the frame that is already allocated to the dynamic channel without requesting additional resources, such as bandwidth.

Pet. 37–38.

Petitioner further contends that “Kovvali explains that a node may take action (e.g. request additional bandwidth) if the data to be transmitted onto a dynamic channel exceeds the allocated bandwidth,” and “it would have been obvious to a [person of ordinary skill in the art], therefore, that no

action would be needed or taken (e.g. the node would not request additional bandwidth) when the existing allocation is sufficient.” Pet. 38 (citing Ex. 1003 ¶ 93). With regard to the remaining recitation “over the one of the paths,” Petitioner contends that person of ordinary skill in the art “would understand that Kovvali’s disclosure of transmitting a frame ‘onto the network’ after multiplexing data for a dynamic channel into a frame” renders this limitation obvious in view of Kovvali’s disclosure that the BSLR network includes both clockwise and counterclockwise paths. *Id.* at 38–39 (citing Ex. 1003 ¶ 94). Petitioner concludes, “Kovvali’s disclosure of a node receiving outbound data that was received locally for transmission onto the dynamic channel, multiplexing the outbound data for transmission into the portion of the frame that is already allocated to the dynamic channel without requesting additional resources, and transmitting the frame onto a BSLR network, renders obvious this limitation.” *Id.* at 39 (citing Ex. 1003 ¶¶ 88, 95).

Patent Owner does not contest Petitioner’s arguments with respect to limitation [1.3]. *See generally* Prelim. Resp. Based on our review and consideration of the current record, we determine that Petitioner has sufficiently shown that Kovvali teaches this limitation for purposes of institution.

e. [1.4]: “if the resources already allocated to the first node are insufficient, performing the following steps:”

As stated in the analysis of limitation [1.3] above, Petitioner contends that “Kovvali explains that a node may take action (e.g. request additional bandwidth) if the data to be transmitted onto a dynamic channel exceeds the allocated bandwidth.” Pet. 38. With respect to limitation [1.4], Petitioner

argues more particularly that “Kovvali explains that data transmitted on the dynamic channels may be ‘bursty’ in nature, and thus a node may take additional steps when it has a large burst of data for transmission.” *Id.* at 39 (citing Ex. 1005, 4:30–34). Accordingly, Petitioner argues, “[i]t would have been obvious to a [person of ordinary skill in the art] that for such bursty traffic, the data to be transmitted would occasionally exceed the bandwidth allocated for it (and thus, ‘*the resources already allocated to the first node are insufficient*’),” and “[a]s explained further below, the prior art renders obvious performing the recited steps.” *Id.* at 39–40 (citing *id.* at 40–50 (discussion of steps [1.5]–[1.8]); Ex. 1003 ¶ 96).

Patent Owner does not contest Petitioner’s arguments with respect to limitation [1.4]. *See generally* Prelim. Resp. Based on our review and consideration of the current record, we determine that Petitioner has sufficiently shown that Kovvali teaches this limitation for purposes of institution.

f. [1.5]: “requesting an increase in an allocation to the first node of the requested resources;”

Petitioner contends that step [1.5] is rendered obvious by “Kovvali’s description of a client node sending a request to an arbiter node for additional bandwidth to accommodate a dynamic channel with an increased data rate requirement.” Pet. 40–42 (citing Ex. 1003 ¶¶ 97–103; Ex. 1005, 4:43–34, 8:49–53, 10:35–38, Fig. 5A). In particular, Petitioner points, first, to Kovvali’s disclosure that data traffic may “exhibit bursty or time-varying rates” and that “the data rate assigned to any particular dynamic channel 436 can be dynamically changed . . . to accommodate time-varying data rate requirements of bursty communication between nodes.” Pet. 40 (quoting Ex. 1005, 4:32–34, 8:49–53) (citing Ex. 1003 ¶¶ 98–99). Further, Petitioner

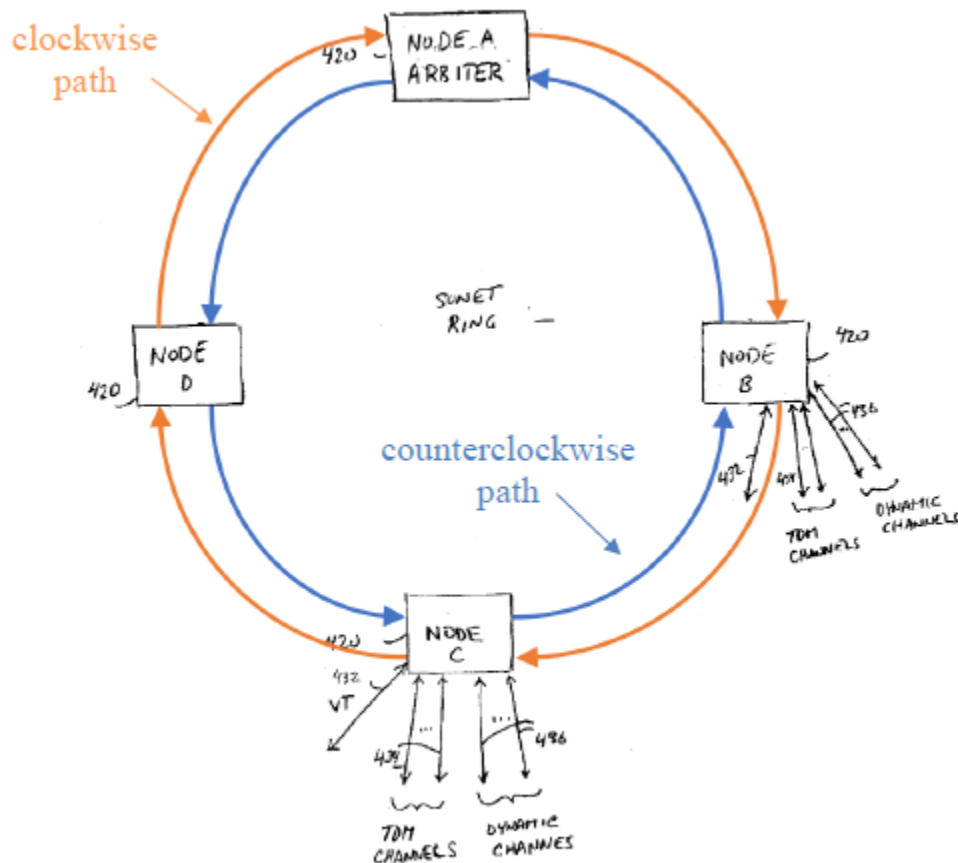
argues that Kovvali more particularly “describes that a client node may request an increase in bandwidth for a bursty channel by setting a ‘request section (REQ) 526’ in a control channel 524 sent to the arbiter,” which in turn “responds to the request by setting a ‘grant section (GNT) 527’ to grant bandwidth to the requested channel.” *Id.* at 40–41 (citing Ex. 1003 ¶¶ 100–101; Ex 1005, 10:35–38, Fig. 5A). Thus, Petitioner contends, “if the bandwidth of a dynamic channel already assigned to a node becomes insufficient because the data rate requirement on the dynamic channel has increased (e.g. the node has a burst of data to be transmitted), it would have been obvious for the client node to send a request to the arbiter node for additional bandwidth.” *Id.* at 41–42 (citing Ex. 1003 ¶ 102).

Patent Owner does not contest Petitioner’s arguments with respect to step [1.5]. *See generally* Prelim. Resp. Based on our review and consideration of the current record, we determine that Petitioner has sufficiently shown that Kovvali teaches this limitation for purposes of institution.

g. [1.6]: “*determining, for the links comprised by each of the paths, respective levels of use of the requested resources due to communications in progress over the network*”

Petitioner contends that step [1.6] is rendered obvious by the combination of Kovvali and Kalman. Pet. 42–47. First, referring back to its arguments with respect to step [1.2], Petitioner reiterates that Kovvali’s teaching of a bi-directional ring network provides two paths for transmitting data between nodes, as illustrated by the clockwise path shown in orange and the counterclockwise path shown in blue in Petitioner’s previously

presented modified version of Figure 4, reproduced again below for reference:

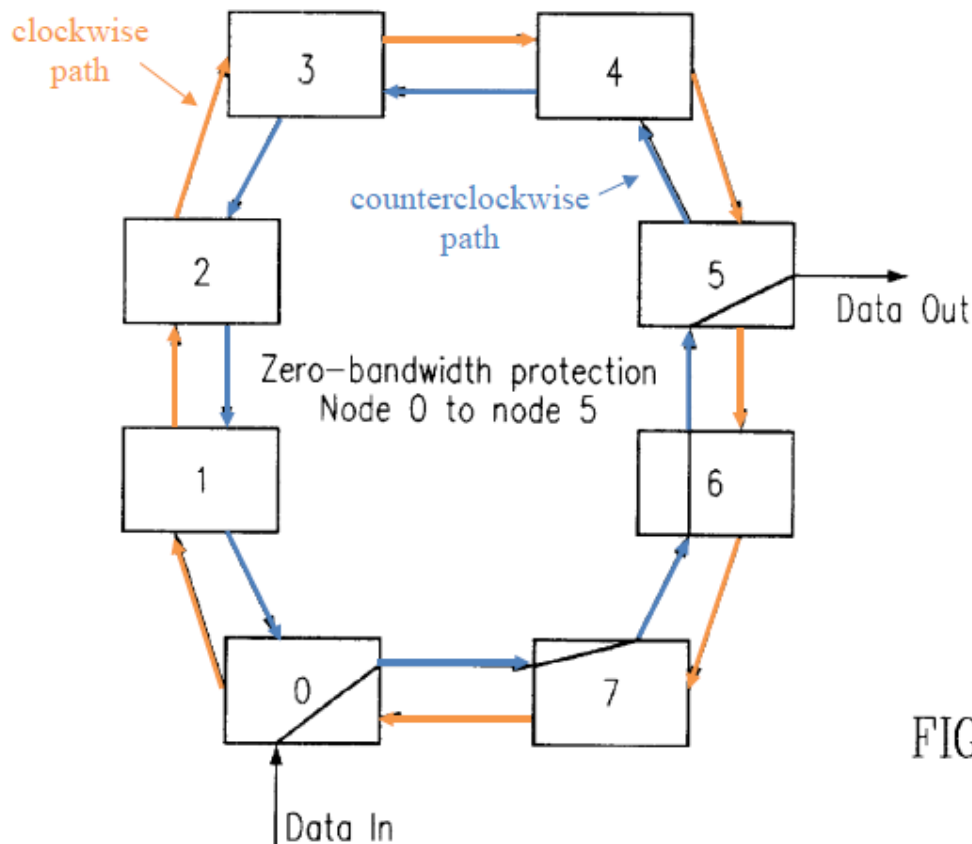


Ex.1005, Fig. 4 (modified and annotated); Ex.1003, ¶85.

Id. at 42–43 (citing Ex. 1005, Fig. 4). With reference to the modified Figure 4 above, Petitioner contends that it would have been obvious to a person of ordinary skill in the art that “when the arbiter receives a request to increase the bandwidth allocated for communications from a first node to a second node, the arbiter would have two path options to choose from for potentially accommodating that bandwidth increase request.” *Id.* at 42–43 (citing Ex. 1003 ¶ 105).

Second, Petitioner contends, “[l]ike Kovvali, Kalman discloses a network that ‘includes two rings, wherein a first ring transmits data in a “clockwise” direction (or direction 0), and the other ring transmits data in a

“counterclockwise” direction (or direction 1 opposite of direction 0).”
Pet. 43 (quoting Ex. 1006, 2:61–63). Petitioner provides the following annotated version of Kalman’s Figure 3 to illustrate:



Ex.1006, Fig. 3 (annotated); Ex.1003, ¶108.

Id. at 44. In the annotated figure above, Petitioner has labeled and colored the clockwise (direction 0) and counterclockwise (direction 1) paths depicted in Figure 3 in orange and blue, respectively. *Id.* Petitioner contends, “Kalman discloses a technique for selecting a ‘preferred direction for traffic’ between two nodes, ‘based on the direction with the lowest cost,’” and “[d]ata between nodes flows on the ring that provides the lowest-cost path to the destination node.” *Id.* at 43 (quoting Ex. 1006, 3:2–3, 7:50–53) (citing Ex. 1003 ¶¶ 106–107; Ex. 1006, 4:24–26).

Petitioner cites Kalman’s disclosure that the computation of cost on a direction from a source node to a destination node “may take into account a variety of factors,” including “the level of traffic congestion in that direction,” as well as Kalman’s disclosure that a table may be maintained to indicate the cost of transmitting data from source to destination nodes in both directions and, hence, the preferred transmission direction from the source to any destination. Pet. 44–46 (quoting Ex. 1006, 7:66–8:5) (citing Ex. 1003 ¶¶ 110–111, 113–115; Ex. 1006, 7:64–65, 8:5–7, 8:21–33 (Table 1), 8:34–35). Additionally citing contemporaneous evidence and Dr. Mir’s testimony, Petitioner argues that a person of ordinary skill in the art “would have been familiar that ‘traffic congestion’ was a common way to refer to the level of use of link bandwidth and/or other resources in a network by the traffic being sent over the network.” *Id.* at 45 (citing Ex. 1003 ¶ 112; Ex. 1008, 8:34–36;¹³ Ex. 1009, 1:36–39). Thus, Petitioner contends, a person of ordinary skill in the art “would have found it obvious for the ‘level of traffic congestion’ disclosed by Kalman to include the level of use of link bandwidth and/or other resources by the dynamic frame resources described in Kovvali.” *Id.* (citing Ex. 1003 ¶ 112).

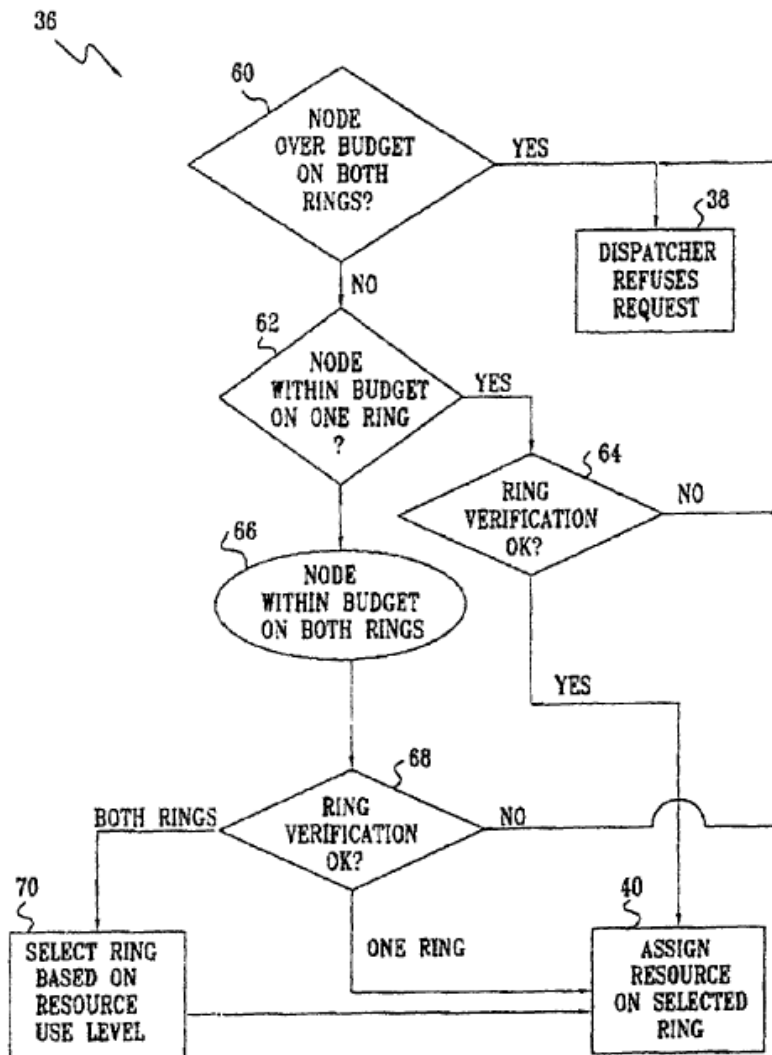
Finally, Petitioner argues that a person of ordinary skill in the art would have been motivated to combine the teachings of Kovvali and Kalman for reasons discussed above (*see supra* § IV.D.3) and “would have appreciated that by having Kovvali’s arbiter direct data transmission toward the least-occupied or less congested portion of the ring network . . . , more efficient utilization of the available network capacity would be achieved.” Pet. 46. Petitioner contends that applying such a strategy “would depend

¹³ Davies et al., US 6,839,767 B1 (issued Jan. 4, 2005, filed Nov. 1, 2000).

upon Kovvali's arbiter node maintaining information about the current amount of bandwidth allocations throughout the network." *Id.* at 47 (citing Ex. 1003 ¶ 116). Therefore, according to Petitioner, the combination of Kovvali and Kalman renders this limitation obvious. *Id.* (citing Ex. 1003 ¶¶ 104, 117).

Patent Owner contends in response that "Petitioner's argument misconstrues this limitation and fails to provide any evidence of either Kovvali or Kalman rendering [it] obvious." Prelim. Resp. 10. As an initial matter, Patent Owner argues, the limitation "does not require assessing which direction the transmission needs to travel for efficiency, but rather a determination of resource availability for 'the links comprised by each of the paths' between the first node and the destination node." *Id.* "In other words," according to Patent Owner, "when a node submits a resource request to the dispatcher, the dispatcher determines whether there are 'sufficient unallocated resources left in the specific node budget and unused resources left on the appropriate segments of at least one of the rings in order for the dispatcher to grant the node's resource request.'" *Id.* at 10–11 (quoting Ex. 1001, 6:19–23). Patent Owner contends that this process is illustrated in Figure 6 of the '279 patent, reproduced below.

FIG. 6



Id. at 11. Figure 6, above, is “a flow chart that schematically illustrates a method by which a dispatcher selects a network ring on which to allocate resources to a node, in accordance with a preferred embodiment” of the ’279 patent. Ex. 1001, 4:21–24.

Patent Owner argues that Figure 6 “schematically shows the steps involved with the dispatcher node in determining whether or not to accommodate a resource request” and “shows a ‘ring verification’ step, in which ‘the dispatcher proceeds to verify that there are sufficient resources available to fill the request on all of the relevant segments of the ring.’”

Prelim. Resp. 11–12 (quoting Ex. 1001, 7:46–49) (citing Ex. 1001, 7:25–27). Patent Owner further argues, “[i]f there are sufficient resources available for each of segments on the chosen ring between the requesting node and the destination node, the dispatcher assigns the requested resources at step 40,” and “[t]hus, this limitation requires that the system determine whether the specific paths have sufficient available resources to accommodate the bandwidth increase request.” *Id.* at 12 (citing Ex. 1001, 7:43–56). According to Patent Owner, however, “Petitioner conflates Kalman’s disclosure that teaches selecting a ‘preferred direction of traffic’ with the ’279 Patent’s disclosure of assessing resource availability in response to a request for bandwidth,” and “Petitioner’s conclusory language tacking on that a [person of ordinary skill in the art] would find it obvious that the arbiter from Kovvali would consider ‘two path options’ for ‘accommodating the bandwidth increase request’ does little to address the deficiencies in its argument.” *Id.*

Patent Owner further contends that “Kovvali’s disclosure provides no teaching that the arbiter component analyzes the resources available ‘for the links comprised by each of the path[s]’” and “no teaching . . . that pertains to path selection based on the availability of resources,” and that, although “Petitioner introduces Kalman to fill in the gaps,” “Kalman does not teach an arbiter component nor does it teach resource allocation for managing network data flow.” Prelim. Resp. 12–13. Rather, Patent Owner argues, “Kalman relates to a technique for selecting a ‘preferred direction for traffic’ between two nodes, ‘based on the direction with the lowest cost.’” *Id.* at 13 (quoting Ex. 1006, 7:50–53). Still further, Patent Owner contends, “Kalman does not teach ‘determining . . . respective levels of use of the requested resources’ because the nodes in Kalman cannot make requests for additional

resource [sic], and thus, the system cannot check for the availability of the requested resources across various file paths.” *Id.* According to Patent Owner, “Kalman’s teachings relate to a ‘network protection and restoration technique’ that ‘efficiently utilizes total bandwidth in the network,’ and where ‘no extra capacity is consumed during “normal” operations,’” and “[n]othing in this disclosure teaches a dynamic allocation of bandwidth as required by the independent claims of the ’279 Patent.” *Id.* at 13–14 (quoting Ex. 1006, 2:48–54, 2:56–61). Finally, Patent Owner contends that the ’279 patent “discusses systems like those in Kalman and notes that . . . these systems ‘comprise protocol[s] . . .’ [that] do ‘not provide any means or basis for updating the costs automatically, which the network is running, in response to network resource constraints.’” *Id.* at 14 (quoting Ex. 1001, 1:59–67).

Based on our review and consideration of the current record, we determine that Petitioner has sufficiently shown that the combination of Kovvali and Kalman teaches this limitation for purposes of institution. Although, as Patent Owner points out, this limitation “does not require assessing which direction the transmission needs to travel for efficiency,” *per se*, but rather a determination of resource availability for “the links comprised by each of the paths” (*see* Prelim. Resp. 10), these are not mutually exclusive determinations, and we are persuaded on this record that the combination of Kovvali and Kalman provides both. Indeed, we find that Kalman expressly discloses that “[t]he computation of the cost on a direction from node 0 . . . to node j may take into account a variety of factors, including . . . the level of traffic congestion in that direction,” and “[b]ased on these costs, the preferred output direction for traffic from the source to any destination”—i.e., the direction the transmission needs to travel for

efficiency, in Patent Owner’s phraseology—“can be selected directly.” Ex. 1006, 7:66–8:7. On this record, we are persuaded by Petitioner’s showing that a person of ordinary skill in the art would have understood “traffic congestion” to refer to “the level of use of link bandwidth and/or other resources in a network by the traffic being sent over the network.” Pet. 45 (citing Ex. 1003 ¶ 112; Ex. 1008, 8:34–36; Ex. 1009, 1:36–39).

Further, notwithstanding Patent Owner’s remaining arguments, for example that “Kovvali’s disclosure provides no teaching that the arbiter component analyzes the resources available ‘for the links comprised by each of the path[s]’”; that “Kalman does not teach an arbiter component nor does it teach resource allocation for managing network data flow”; and that “the nodes in Kalman cannot make requests for additional resource[s]” (Prelim. Resp. 12–13), the asserted ground of unpatentability is based on the combined teachings of Kovvali and Kalman. As our reviewing court has explained, “[n]on-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references.” *In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986) (citing *In re Keller*, 642 F.2d 413, 425 (CCPA 1981)). “Rather, the test is whether the references, taken as a whole, would have suggested [the claimed] invention to one of ordinary skill in the [art].” *Id.* As we explain in our discussion of Petitioner’s proffered reasons to combine (*see supra* § IV.D.3), we are sufficiently persuaded at this stage of the proceeding that a person of ordinary skill in the art would have been motivated to combine the teachings of Kovvali and Kalman, and we are further persuaded that the recited step of “determining, for the links comprised by each of the paths, respective levels of use of the requested resources due to

communications in progress over the network” is taught by that combination.

h. [1.7]: “selecting which of the paths is to carry the data flow responsive to the determined levels of use of the requested resources on the links comprised in each of the paths; and”

Referring back to its argument with regarding step [1.6] that “[t]he combination of Kovvali and Kalman teach[es] selecting a lowest-cost path where the cost accounts for the ‘level of traffic congestion’ on the links of the path,” Petitioner contends that the combination of Kovvali and Kalman likewise render step [1.7] obvious. Pet. 47 (citing Ex. 1003 ¶¶ 118–119; Ex. 1006, 7:66–8:5).

Patent Owner responds that Petitioner “again . . . misinterprets the language of the claim, and presents evidence from Kovvali and Kalman that does not align with the functionality disclosed in the ’279 Patent.” Prelim. Resp. 14. Referring back to its arguments with respect to limitation [1.6], Patent Owner contends that “Kovvali does not teach a dispatcher node that is involved in path selection, but rather teaches a static arbiter that simply receives requests for resources and either allocates them based on availability or denies the request.” *Id.* at 14–15. Further, citing disclosure in the ’279 patent specification of comparing “relative resource usage levels for all of the relevant ring segments on both of the rings” and selecting the ring with lower resource usage “for allocation of the requested resources,” Patent Owner contends that “Kalman, on the other hand, does not involve an assessment of resource usage ratios between the various available file paths to assign requested resources for a transmission,” but is instead “concerned with ‘rapidly rerout[ing] paths that cross broken links.’” *Id.* at 15–16 (citing Ex. 1001, 8:10–11, 8:33–41, Fig. 7; Ex. 1006, 7:45–49). Thus, according to

Patent Owner, “Kalman functions to simply reroute traffic in the most cost-efficient way possible in event of a link breakage, whereas the system and method claimed in the ’279 Patent selects a route for a given transmission based on a more dynamic assessment of resource use across links that make up different paths in order to shift resources between nodes.” *Id.* at 16–17.

Based on our review and consideration of the current record, and for substantially the same reasons as stated in the above analysis with respect to step [1.6] (*see supra* § IV.D.4.g), we determine that Petitioner has sufficiently shown that the combination of Kovvali and Kalman teaches this limitation for purposes of institution. In particular, we find that Kalman expressly discloses basing a preferred output direction for traffic from a source node to a destination node on factors that may include “the level of traffic congestion” in each direction, and we are sufficiently persuaded by Petitioner’s showing that a person of ordinary skill in the art would have understood “traffic congestion” to refer to “the level of use of link bandwidth and/or other resources in a network by the traffic being sent over the network.” Ex. 1006, 7:66–8:7; Pet. 45. Further, we are not persuaded by Patent Owner’s rebuttal based on attacks on Kovvali and Kalman individually.

- i. [1.8]: “*increasing the allocation of the resources to the first node on the selected path by a predetermined quantum.*”

Petitioner contends that step [1.8] is rendered obvious by Kovvali. Pet. 48–50. Referring back to its arguments with respect to step [1.5], Petitioner contends that Kovvali teaches that a client node may request either increased or decreased bandwidth for a corresponding bursty channel from the arbiter by setting a “request section (REQ)” within the dynamic frame

overhead, specifying the amount of requested bandwidth, in response to which the arbiter sets a “grant section (GNT),” specifying the amount of bandwidth granted. *Id.* at 48 (citing Ex. 1005, 10:35–38, 10:46–61; Ex. 1003 ¶¶ 121–122). In view of Kovvali’s teachings, Petitioner argues that a person of ordinary skill in the art “would have understood that when the requested bandwidth is granted by the arbiter, the bandwidth (e.g., the number of columns) allocated to the client node would be increased (or decreased) by the requested amount (*‘a predetermined quantum’*).” *Id.* at 49. More specifically, Petitioner argues, “Kovvali’s signaling mechanism for bandwidth requests and grants does not allow for allocations to be made on a per-bit or per-byte basis; instead, as discussed at [1.1], requests and allocations are made in . . . increments []corresponding to the number of bits in one dynamic frame column[].” *Id.* at 50 (citing Ex. 1003 ¶ 123).

Patent Owner does not contest Petitioner’s arguments with respect to step [1.8]. *See generally* Prelim. Resp. Based on our review and consideration of the current record, we determine that Petitioner has sufficiently shown that Kovvali teaches this limitation for purposes of institution.

j. Conclusion Regarding Independent Claim 1

For the reasons set forth above, we determine that Petitioner has sufficiently shown at this stage of the proceeding that the combination of Kovvali and Kalman teaches each of the limitations of claim 1 and that the information presented in the Petition demonstrates a reasonable likelihood that claim 1 is unpatentable under 35 U.S.C. § 103 over that combination.

E. Remaining Challenges

As set forth in Section II.E. above, Petitioner additionally challenges claims 2–5 and 9–18 as unpatentable over Kovvali and Kalman; claim 6 as

unpatentable over Kovvali, Kalman, and Masters; and claims 7 and 8 as unpatentable over Kovvali, Kalman, and RFC 2892. *See* Pet. 50–80. Patent Owner relies on materially the same arguments for independent claim 15 as for claim 1 and does not present any separate arguments with respect to dependent claims 2–14 and 16–18. *See* Prelim. Resp. 4, 10–17. Because we determine above that Petitioner demonstrated a reasonable likelihood of prevailing in its challenge to at least one claim of the ’279 patent, we institute *inter partes* review on all claims and grounds. *See* 37 C.F.R. § 42.108(a) (“When instituting . . . review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.”).

V. CONCLUSION

After considering the evidence and arguments presented in the Petition, we determine Petitioner has established a reasonable likelihood of prevailing on its assertion that at least one claim of the ’279 patent is unpatentable, and we institute an *inter partes* review on all the challenged claims and on all grounds presented in the Petition. *See* 37 C.F.R. § 42.108(a).

VI. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that pursuant to 35 U.S.C. § 314, *inter partes* review is instituted as to the challenged claims of the ’279 patent and on all grounds of unpatentability presented in the Petition; and

FURTHER ORDERED that *inter partes* review is commenced on the entry date of this Order, and pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial.

IPR2024-00503
Patent 7,035,279 B2

For PETITIONER:

Theodore M. Foster
Brian C. Kwok
David L. McCombs
HAYNES AND BOONE, LLP
ipr.theo.foster@haynesboone.com
brian.kwok.ipr@haynesboone.com
david.mccombs.ipr@haynesboone.com

For PATENT OWNER:

James R. Nuttall
Katherine D. Cappaert
Heather P. Hildreth
STEPTOE LLP
jnuttall@steptoe.com
kcappaert@steptoe.com
hhildreth@steptoe.com