

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CISCO SYSTEMS, INC.,
Petitioner,

v.

PORTSMOUTH NETWORK CORP.,
Patent Owner.

IPR2024-00505
Patent 6,917,986 B2

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

SHAPIRO, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. *Background and Summary*

Petitioner Cisco Systems, Inc. filed a Petition (Paper 2, “Pet.”) requesting *inter partes* review of claims 1, 2, 4–7, 9–14, 16–19, and 21–24 of U.S. Patent No. 6,917,986 B2 (Ex. 1001, “the ’986 patent”) pursuant to 35 U.S.C. § 311(a). Patent Owner Portsmouth Network Corp. filed a Preliminary Response (Paper 6, “Prelim. Resp.”) pursuant to 35 U.S.C. § 313.

Pursuant to 35 U.S.C. § 314(a), the Director may not authorize an *inter partes* review unless the information in the petition and any preliminary response “shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” See 37 C.F.R. § 42.4(a) (2024) (“The Board institutes the trial on behalf of the Director.”). For the reasons that follow, we institute an *inter partes* review as to claims 1, 2, 4–7, 9–14, 16–19, and 21–24 of the ’986 patent on all grounds of unpatentability asserted in the Petition.

B. *Related Matters*

The parties indicate that the ’986 patent is the subject of a parallel proceeding, *Portsmouth Network Corp. v. Cisco Systems, Inc.*, 2:23-cv-00441 (E.D. Tex) (“the Cisco case”) and *Portsmouth Network Corp. v. Juniper Networks, Inc.*, 23-cv-12201-PGL (D. Mass). See Pet. 104; Paper 4, 2 (Patent Owner’s Mandatory Notices). Petitioner filed petitions challenging certain unrelated patents asserted in the Cisco case. IPR2024-00503, Paper 2; IPR2024-00506, Paper 2; IPR2024-00954, Paper 2. In addition, Juniper Networks, Inc. has filed a petition challenging all claims of the ’986 patent. IPR2024-00893, Paper 2.

C. The '986 Patent

The '986 patent, titled “Fast Failure Protection Using Redundant Network Edge Ports,” issued July 12, 2005, from U.S. Application No. 10/036,518, filed on Jan. 7, 2002. Ex. 1001. The '986 patent relates to “methods and devices [for] enabling rapid reconfiguration in response to network topology changes” or “rapid recovery from network failures.” *Id.* at 3:58–63. The goal of the '986 patent was to find a way to recover rapidly from a failure in a network that uses a spanning tree protocol to avoid loops in redundant network paths. *Id.* at 2:65–3:14, 3:58–69.

More specifically, the background section of the '986 patent describes:

To protect against failures of network equipment and communication media, it is common to provide multiple, redundant paths between switches in the network. For example, [] switches are typically connected . . . by dual links. These links may be in the form of connections between each of a pair of ports on one [] switch with a corresponding pair of ports on [another] switch. . . . [T]hese configurations are meant to ensure the connection between the [first switch] and [a second] switch will be maintained even if there is a failure in one of the ports

Id. at 2:7–22. “A problem with redundant topologies, however, is that the multiple paths between points in the network can create loops that disrupt the proper functioning [B]roadcast packets may be forwarded repeatedly by the switches in the loop, causing a serious problem of network congestion, known as a ‘broadcast storm.’” *Id.* at 2:23–29. “In order to avoid these problems, the 802.1D standard defines a communication protocol, known as the spanning tree protocol (STP), for managing the creation and updating of the network topology. STP ensures that all data

paths in a network of bridges^[1] are free of loops by disabling forwarding of packets through certain [ports].” *Id.* at 2:30–36. “The spanning tree algorithm defines one bridge in the network as the root bridge. Each LAN connected to the network has a bridge port that connects it to the root bridge.” *Id.* at 2:48–50. Therefore, “[e]ach bridge has a port defined as its root port, which uniquely connects that bridge to the root bridge [or switch].”² *Id.* at 2:55–56. The other ports on the switch (bridge) that do not connect to the root switch “are put into the blocking state.” *Id.* at 2:56–58. “Frames destined to cross the network will thus travel from the designated bridge of the originating LAN along a root path toward the root bridge. If the destination bridge does not lie along the root path, the frame will be routed through the root bridge.” *Id.* at 2:58–62. The ’986 patent specification goes on to describe that networks implementing an STP can take a long time to recover from a link failure:

Although STP is effective in removing network loops, it is very slow in adapting to topology changes that may occur when a network link fails or is subsequently restored. Responding to a failure typically necessitates recalculating the spanning tree to accommodate the topology change and accordingly transferring [the] bridge ports from the blocking to the forwarding state. The [] 802.1D standard specifies a procedure for responding to topology changes, which include reducing the aging time for filtering database entries to 15 sec.

¹ A network switch that connects various components of networks together is a type of bridge, one that has multiple ports on it which, in turn, can each be connected to a port on another switch, local area networks (LANs), wide area networks (WANs), or other devices. Ex. 1001, 1:26–28.

² Note that the connection from the root port on a switch to the root switch (bridge) does not necessarily have to be a direct connection but can be a path going through other switches. Ex. 1001, 2:47–64. The path from a particular switch towards the root switch is called the root path or designated path. *Id.*

Using this procedure with default STP timing parameters . . . it still takes 30 sec to transfer ports from the blocking state to the forwarding state.

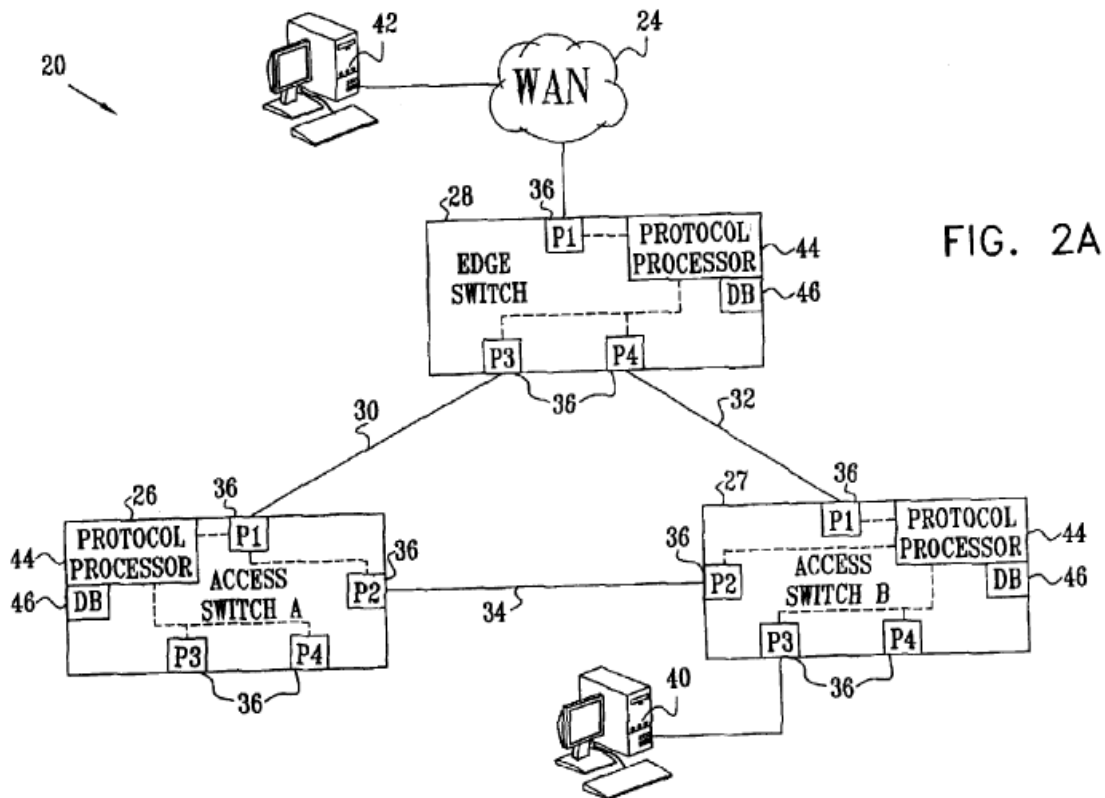
Id. at 2:65–3:10.

Accordingly, the '986 patent describes that it “is an object of some aspects of the present invention to provide methods and devices enabling rapid reconfiguration in response to network topology changes.” Ex. 1001, 3:57–59. In order to do this, the '986 patent describes a preferred embodiment as follows:

[A]n edge switch . . . is attached by redundant links to one or more access switches. The edge switch selects one of its access ports . . . to be its active access port, while placing its remaining access port(s) in the blocking state. . . . When the edge switch detects a failure in its active link to the access switches, it immediately chooses one of the blocked links to serve as the new active link and blocks the failed port. In order to inform the access switches and other downstream equipment that they should now transmit their upstream traffic through the new active link, the edge switch sends dummy frames through the new active link to the access switches. . . . Upon receiving these dummy frames, the access switches . . . rebuild their own filtering database so that upstream traffic is immediately directed to the new active link.

Id. at 3:65–4:28.

Figure 2A, illustrating a preferred embodiment, is reproduced below:



“FIG. 2A is a block diagram that schematically shows details of the interconnection of switches 26, 27 and 28, in accordance with a preferred embodiment of the present invention.” Ex. 1001, 7:53–56. “[W]hen users 40 and 42 attempt to communicate over network 20, all the traffic between them will pass through switch 26, via links 30 and 34.” *Id.* at 8:62–64. “The method [of the invention] is invoked when processor 44 of switch 28 senses a failure at port P3 . . . the primary port, i.e., the port that is used originally at switch 28.” *Id.* at 9:14–18.

“Upon sensing the failure, processor 44 of edge switch 28 blocks its port P3 and activates its port P4 instead.” Ex. 1001, 9:25–27. “Now edge switch 28 and access switch 27 can immediately begin exchanging traffic over link 32.” *Id.* at 9:34–35. “The filtering database maintained by the

switches are no longer accurate [Switch 28] will not begin sending traffic over links 34 and 32 . . . until its filtering database has been updated. Communication is delayed for as long as the database entries are incorrect.” *Id.* at 9:35–41. “In order to shorten this delay, edge switch 28 sends dummy frames downstream to access switch 27 via link 32.” *Id.* at 9:42–43. “When switch 27 receives the dummy frame, it also forwards it to switch 26.” *Id.* at 9:56–57. “Once the dummy frame has been sent, switches 26, 27 and 28 update their filtering database to reflect the change in the active link from link 30 to link 32” *Id.* at 9:62–64. Sending the dummy frames allows all of the switches to rapidly update their filtering databases after a port failure and switchover so the network can recover more quickly. *Id.* at 4:24–31.

The ’986 patent describes what constitutes access switches, core switches, and edge switches. Access switches have “ports that connect to LANs and/or to other network endpoints, such as user computer systems.” Ex. 1001, 1:31–33. A core switch “interconnect[s] the access switches into a Wide Area Network (WAN), by direct connection between the core switch and access switches and/or by connection to other core switches.” *Id.* at 1:33–36. Edge switches are “[c]ore switches that are directly connected to access switches.” *Id.* at 1:36–38.

Applying these definitions to Figure 2A, switches 26 and 27 are access switches because they are connected to network endpoints or LANs as shown in Figure 2A’s depiction of switch 27 being connected to end user/computer system 40. Ex. 1001, Fig. 1, 7:52–61. Switch 28 is an “edge switch” because it is a “core switch” that is “directly connected to access switches”—i.e., it is directly connected to access switches 26 and 27, and also

connected to WAN 24, so it connects the access switches to the WAN. *Id.* at 1:36–38.

D. Illustrative Claim

Challenged claims 1, 12, 13, and 24 of the '986 patent are independent. Dependent claims 2, 4–7, and 9–11 depend, directly or indirectly, on claim 1. Dependent claims 14, 16–19, and 21–23 depend, directly or indirectly, on claim 13. Claim 1 recites (with letter designations used in the Petition to refer to the various limitations):

1. [p] A method for network communication, comprising:

[a] coupling an edge switch in a network to one or more access switches via at least first and second redundant links, respectively connected to first and second ports of the edge switch;

[b] placing the first port in an active state, while placing the second port in a blocking state;

[c] conveying communication traffic over the first link while the first port is in the active state, thereby causing each of the switches to build a respective database for use in forwarding the traffic;

[d] responsive to a failure associated with the first link, placing the second port in the active state and the first port in the blocking state; and

[e] sending dummy traffic from the edge switch over the second link to the one or more access switches, so as to cause each of the one or more access switches to modify its respective database responsive to the second port being in the active state.

E. Evidence

Petitioner relies on the following prior art:

U.S. Patent No. 6,032,194, issued Feb. 29, 2000 (Ex. 1005, “Gai”).

F. Prior Art and Asserted Ground

Petitioner asserts that claims 1–2, 4–7, 9–14, 16–19, and 21–24 would have been unpatentable on the following ground:

Claims Challenged	35 U.S.C. §	References/Basis
1–2, 4–7, 9–14, 16–19, 21–24	103(a) ³	Gai

II. PROCEDURAL CONSIDERATIONS

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

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) (2024) (“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 in view of the Cisco case pending in the Eastern District of Texas. Prelim. Resp. 23–30. According to Patent Owner, the “Cisco trial is expected to take place approximately two months before the projected statutory deadline for a final written decision” which “weighs heavily against institution.” *Id.* at 24.

³ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284 (2011), amended 35 U.S.C. § 103, effective March 16, 2013. Because the application from which the ’986 patent issued was filed before this date, the pre-AIA version of § 103 applies.

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.

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 case, so this factor should be neutral. Pet. 97; Prelim. Resp. 23. 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 case for June 2, 2025. Pet. 97; Prelim. Resp. 24. Both parties acknowledge that this date is about two months before our statutory deadline for a final written decision. Pet. 97–98; Prelim. Resp. 24–25. However, Petitioner argues that 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 heavily in favor of discretionary denial, citing to *Fintiv* at 9. Pet. 97–98; Prelim. Resp. 24–25. We find this factor weighs slightly in favor of discretionary denial.

First, we do not agree with Petitioner that facts in *Sand* are applicable to factor 2 here. 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 Cisco trial date.⁴ *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 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 denying institution.

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

Patent Owner argues that this factor favors discretionary denial because by the deadline for the institution decision,

the parties will have expended significant resources in the district court proceeding. The parties have already exchanged infringement and invalidity contentions for the ’986 patent. Fact discovery has already begun under the district court’s schedule and will conclude January 6, 2025 Furthermore, the parties will have to begin the claim construction process and

⁴ 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. 97. However, Petitioner’s diligence in filing is more appropriately addressed in factor 3, and we will address it there. *See Fintiv* at 9–12.

exchange preliminary claim constructions by August 31, 2024

Prelim. Resp. 25–26.

Patent Owner also contends August 29, 2024 is our deadline for the institution decision, and asserts that fact discovery in the Cisco case will be further along by that date. Prelim. Resp. 25–26. We do not agree. 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). Moreover, 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, and will still be months away.

In contrast, Petitioner contends that this factor weighs against discretionary denial because “[t]he investment in [the litigation] has been minimal. Fact discovery and expert discovery are not set to close until January 13, 2025 and February 18, 2025, respectively,” and “[t]he Markman hearing date is set for December 4, 2024.” Pet. 98. Furthermore, Petitioner argues that the prompt filing of the Petition also warrants weighing this factor against discretionary denial. *Id.*

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. 98. We also find that Petitioner’s diligence supports this factor weighing more strongly against exercising our discretion to deny the Petition. Petitioner filed the Petition on January 30, 2024, about a month after receiving Patent Owner’s infringement contentions, and only four

months after the filing of the original complaint. *See id.* at 97. Therefore, we find that factor 3 weighs strongly against discretionary denial.

4. *Overlapping Issues with the Parallel Proceeding*

Under this factor, Petitioner stipulates “that if the IPR is instituted, Petitioner will not pursue the same ground in the district court litigation.” Pet. 98. 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 case will not have to determine whether the challenged claims of the ’986 patent would have been obvious in view of Gai, 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.⁵ Prelim. Resp. 26–27. 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

⁵ Patent Owner correctly points out the stipulation here falls short of a *Sotera*-style stipulation. Prelim. Resp. 26–27. 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* Director’s Memo at 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)).

pursue any ground[s] raised or that could have reasonably [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. 99; Prelim. Resp. 27–28. 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.

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

Regarding factor 6, Petitioner asserts “the evidence of unpatentability is compelling.” Pet. 99. 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. 28.

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 Director’s Memo at 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 1–5,⁶ 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 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)*

Patent Owner also contends that we should exercise our discretion under 35 U.S.C. § 325(d) to deny the Petition under our precedential decisions in *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 (PTAB Feb. 13, 2020) (precedential) (“*Advanced Bionics*”) and *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*”). Prelim. Resp. 30–34. Specifically, Patent Owner argues that it is undisputed that the sole reference relied on for Petitioner’s obviousness argument, Gai, “was presented to the Office in an [Information Disclosure Statement (IDS)] . . . and was discussed in the background section of the ’986 Patent.” Prelim. Resp. 31 (quoting Pet. 99–100). Patent Owner also argues that “*Gai* fails to disclose sending dummy traffic to one or more access switches.” *Id.* at 32.

For the reasons provided below, we do not exercise our discretion to deny institution under Section 325(d).

⁶ 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.

1. Applicable Framework

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 at 8.

In applying the two-part framework, we consider several non-exclusive factors from *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.

2. *Whether the Same or Substantially the Same Art was Presented to the Office*

As to *Becton, Dickinson* factors (a), (b), and (d), Patent Owner argues that Gai, the sole reference asserted in Ground 1, was presented to and considered by the Office during the prosecution of the '986 patent. Prelim. Resp. 30–31. We agree. Gai appears on the face of the '986 patent, is incorporated by reference into it, and was submitted in an IDS. *See* Ex. 1001, 3:15–41; Ex. 1002, 30 (IDS with Examiner acknowledgment). Petitioner acknowledges that the first part of *Advanced Bionics* is satisfied, so we proceed to the second part of the framework. Pet. 100.

3. *Whether Petitioner has Demonstrated that the Office Erred in a Manner Material to the Patentability of the Challenged Claims*

The second part of the *Advanced Bionics* framework, and *Becton Dickinson* factors (c), (e) and (f), pertain to whether Petitioner has demonstrated a material error by the Office/Examiner. *See Advanced Bionics* at 10. Petitioner argues that “the Examiner erred by not considering the relevant teachings in Gai.” Pet. 99. More specifically, Petitioner asserts that the Examiner erred in two ways:

“First, regarding Gai’s ‘upstream’ embodiment, the Examiner either misapprehended or overlooked that Gai discloses sending

dummy traffic upstream *and* that claim 1 covers sending dummy traffic upstream, [such that] the scope of claim 1 should cover both sending downstream and upstream data frames, since upstream transmission is the only alternative to downstream transmission. . . *Second*, the Examiner either misapprehended or overlooked that Gai discloses and/or renders obvious sending dummy traffic downstream”

Pet. 100–101.

Patent Owner responds that the Examiner did not err because “*Gai* fails to disclose sending dummy traffic to one or more access switches.”

Prelim. Resp. 32. Additionally, Patent Owner argues that “*Gai* fails to disclose sending dummy traffic downstream.” *Id.*

First, we find that factor (c) does not favor denying the petition in our discretion under Section 325(d). The Examiner did not cite to Gai in any rejection and did not specifically address Gai in any correspondence, other than initialing it in an IDS. Ex. 1002. So, for factor (c), the record does not provide any evidence of the extent to which Gai was evaluated, beyond it being disclosed and acknowledged, and it was not the basis for a rejection.

For factors (e) and (f), we find that Petitioner has explained sufficiently how the Examiner allegedly erred in evaluating Gai, pointing to a specific alleged error regarding the scope of claim 1 and Gai’s disclosure of an “upstream” embodiment. Pet. 100–103. We agree with Petitioner that the facts and discussion of Gai presented in the Petition warrant reconsideration of Gai. *Id.* For the reasons discussed below in the Analysis section, at this stage we are persuaded that Gai teaches or suggests sending dummy traffic both upstream and downstream, which can include embodiments that couple edge and access switches. Therefore, we find that Petitioner has satisfied step 2 of the *Advanced Bionics* framework by demonstrating that the Examiner erred by not appreciating that Gai does

teach or suggest these features of the claimed invention, including that dummy traffic can be transmitted downstream or from an edge to an access switch, and that this error was material to patentability.

Accordingly, we decline to exercise our discretion to deny institution under 35 U.S.C. § 325(d).

III. ANALYSIS

A. *Legal Standards*

A claim is unpatentable for obviousness if, to one of ordinary skill in the pertinent art, “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.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007) (quoting 35 U.S.C. § 103(a) (2006)). The question of obviousness is resolved on the basis of underlying factual determinations, including “the scope and content of the prior art”; “differences between the prior art and the claims at issue”; and “the level of ordinary skill in the pertinent art.” *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).⁷

A patent claim “is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR*, 550 U.S. at 418. An obviousness determination requires finding “both ‘that a

⁷ Additionally, “[s]uch secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries may have relevancy.” *Graham*, 383 U.S. at 17–18. Here, however, Patent Owner has not asserted in its Preliminary Response that any such considerations are relevant in its Preliminary Response, and we have no other evidence of such indicia currently before us.

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). Also, “[t]hough less common, in appropriate circumstances, a patent can be obvious in light of a single prior art reference if it would have been obvious to modify that reference to arrive at the patented invention.” *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1361 (Fed. Cir. 2016).

“Although 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). Further, an assertion of obviousness “cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR*, 550 U.S. at 418 (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)); accord *In re NuVasive, Inc.*, 842 F.3d 1376, 1383 (Fed. Cir. 2016) (stating that “conclusory statements” amount to an “insufficient articulation[] of motivation to combine”; “instead, the finding must be supported by a ‘reasoned explanation’”); *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016) (“To satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory statements. The petitioner must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.”).

B. Level of Ordinary Skill in the Art

Petitioner argues that at the time of the filing date of the '986 patent (January 7, 2002), a person of ordinary skill in the art would have had:

a bachelor's degree in computer science, computer engineering, electrical engineering, or in an equivalent field, or approximately two years of experience working in the field of information technology and networking Lack of professional experience can be substituted by additional education, and vice versa.

Pet. 11 (citing Ex. 1003 ¶ 72). Patent Owner does not dispute this assertion or present its own contention regarding the level of ordinary skill in the art. Based on the record presented, including our review of the '986 patent and the types of problems and solutions described in the '986 patent and cited prior art, we agree with Petitioner's proposed definition of the level of ordinary skill for purposes of this Decision.

C. Claim Construction

We interpret each challenged claim:

using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.

37 C.F.R. § 42.100(b). Petitioner asserts that no claim requires express construction for the grounds presented in the Petition. Pet. 11–12. Patent Owner applies the ordinary and customary meaning to the '986 patent's claim terms. Prelim. Resp. 4. In view of these positions, we find that no express interpretation of any claim term is necessary to determine whether to institute an *inter partes* review in this proceeding. *See Nidec Motor Corp. v.*

Zhongshan Broad Ocean Motor Co., 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“Because we need only construe terms ‘that are in controversy, and *only to the extent necessary* to resolve the controversy,’ we need not construe [a particular claim limitation] where the construction is not ‘material to the . . . dispute.’” (citation omitted and emphasis added)).

*D. Ground 1*⁸

Petitioner contends that claims 1, 2, 4–7, 9–14, 16–19, and 21–24 are unpatentable as obvious over Gai, citing the testimony of Henry H. Houh, Ph.D., as support. Pet. 12–96; Ex. 1003. Patent Owner filed a Preliminary Response opposing institution. Prelim. Resp. 6–21. We are persuaded that Petitioner has established a reasonable likelihood of prevailing on its asserted ground based on Gai as to all the challenged claims, except for dependent claims 5 and 17, as discussed below.

1. Gai

Gai is a U.S. patent titled “Method and Apparatus for Rapidly Reconfiguring Computer Networks.” Ex. 1005, code (54). Similar to the ’986 patent, Gai also describes a method for rapidly recovering from a switch port or link failure in a network that implements a spanning tree protocol/algorithm. *Id.* at code (57) (“A method that rapidly reconfigures a computer network having a plurality of devices executing the spanning tree algorithm.”).

⁸ Petitioner separates Ground 1 into two subgrounds, Ground 1A and Ground 1B, stemming from Gai’s additional example of adding another access switch 117 connected to switch 114 in Figure 1. Pet. 25, 68. Instead of addressing that disclosure separately, we address it, along with the other arguments raised, in our analysis of element 1e and each element for the other claims where it is relevant.

Gai describes that “one or more devices are configured and arranged so that one port, providing connectivity to the root, is in the forwarding state and the remaining ports, providing connectivity to the root, are in the blocked state.” Ex. 1005, code (57). “Upon detection of a failure at the active forwarding port, one of the back-up ports immediately transitions from blocked to forwarding, thereby becoming the new active port for the device.” *Id.* “[D]ummy multicast messages are transmitted, each containing the source address of an entity directly coupled to the affected device or downstream thereof. By examining the dummy multicast messages, other devices in the network learn to use the new forwarding port of the affected device.” *Id.*

Figure 1 of Gai is reproduced below.

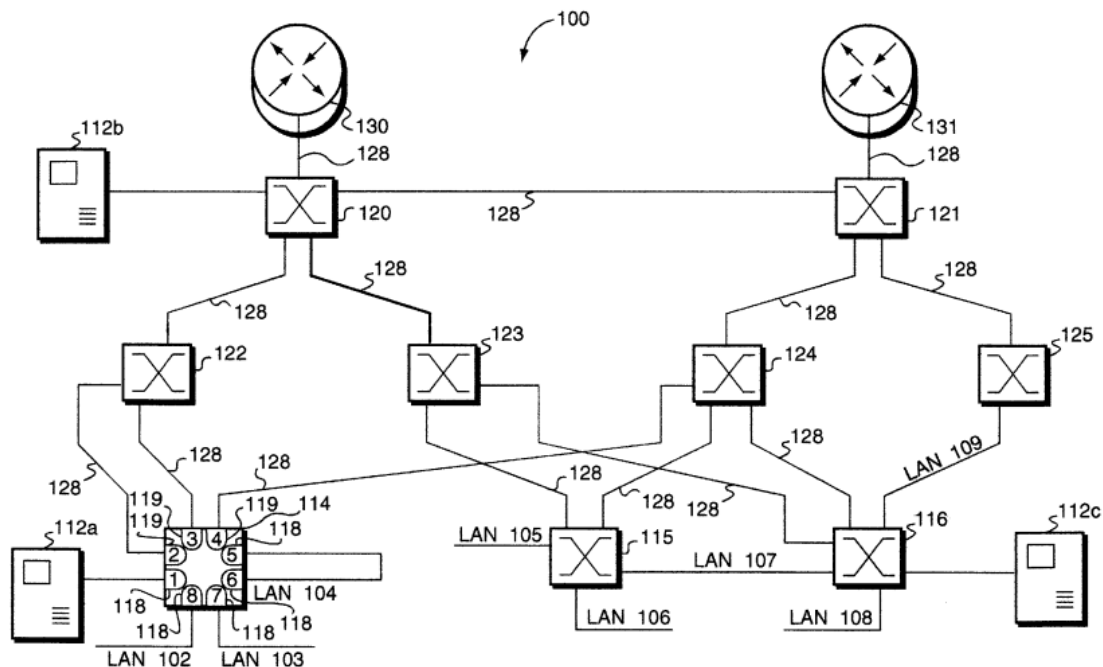


FIG. 1

Figure 1 depicts an embodiment of the invention implemented in a computer network 100 with access switches 114–116 and backbone switches 120–

125.⁹ Ex. 1005, 7:3–14. “[F]or each access switch 114–116, only one port . . . that represents a path from the access switch to the root . . . will be forwarding. All other ports . . . that represent paths from the access switch to the root will be blocked.” *Id.* at 11:8–13. “Should a . . . failure disabling the link coupled to a root port of an access switch [occur], the affected access switch will be able to rapidly reconfigure the network 100 without the significant interruption . . . experienced through conventional operation of the spanning tree algorithm.” *Id.* at 11:35–41.

“[A]ssume that port number three [on switch 114], which is coupled to backbone switch 122, is . . . in the forwarding state.” Ex. 1005, 11:42–44. Because port 3 is active, the other ports on switch 114 that connect to the root switch (directly or indirectly) are blocked as explained by the specification:

[P]ort numbers two and four, which also connect switch 114 to the backbone switches [122 and 124], are in the blocked state. If the link 128 coupled to the port number three at switch 114 fails, either one of these other two ports (i.e., port numbers two or four) will immediately transition to the forwarding state and begin receiving and sending messages.

⁹ Because the ’986 patent claims categorize switches as being access, core, and edge types, it is helpful to apply the definitions for each type from that patent (discussed above) to the switches shown in Figure 1 of Gai. The backbone switches 120–125 in Gai are core switches because they directly connect to routers 130 and 131 (connecting to WANs), or connect switches 120 and 121 that are, in turn, directly connected to the routers. *See* Ex. 1005, Fig. 1, 7:3–52. Backbone switches 122–125 are also edge switches because they are core switches that are directly connected to access switches 114–116. *See id.* Switches 114–116 are access switches because they are directly connected to LANs 102–108 and/or servers 12a and 12c. *See id.* Note that switch 120, in addition to being a core and backbone switch, is also an access switch because it is directly connected to server 112b. *See id.*

Id. at 11:45-52.

The Gai specification then gives an example where back up port number 4 on switch 114 is chosen to replace port 3, which has the failed link to switch 122, by transitioning port 4 from a blocked state to a forwarding state. Ex. 1005, 12:13–23, 12:32–35. Gai continues explaining that “Switch 114 . . . preferably informs the other devices of its new forwarding port by transmitting dummy multicast packets through the new port.” *Id.* at 12:62–66. When the dummy multicast messages are received at a new source port on backbone switch 124 that has a different route to network elements, such as to server 112a, switch 124 will update its filtering database to reflect the new information about the network. *See id.* at 13:34–38. Gai continues the example explaining:

Thereafter, if backbone switch 124 receives a message intended for server 112a, it will use this new destination port and the message will be received at port number four of switch 114, which is now capable of receiving and forwarding messages. Accordingly, the dummy multicast message[] effectively apprises backbone switch 124 of the change in forwarding ports that occurred at access switch 114. Backbone switch 124 distributes the multicast messages[] through all of its forwarding ports so that other devices, as necessary, may learn of the new forwarding ports (i.e., port number four) at access switch 114.

Id. at 13:38–49.

2. *Analysis of Claim 1*

Petitioner asserts that Gai teaches or suggests all of the limitations of claim 1. Pet. 25–46, 70–86.

With respect to the preamble, Petitioner asserts Gai teaches the preamble by disclosing its method for rapidly reconfiguring a computer

network. Pet. 25–26. Patent Owner does not dispute this element. Prelim. Resp. 6–21. The preamble here, “[a] method for network communication, comprising,” is not limiting because it is simply stating an intended use. *See Arctic Cat Inc. v. GEP Power Prod., Inc.*, 919 F.3d 1320, 1328 (Fed. Cir. 2019) (“We have long ruled that a preamble is not limiting where a patentee defines a structurally complete invention in the claim body and uses the preamble only to state a purpose or intended use for the invention.”) (citations omitted) (internal quotation marks omitted). In any event, as discussed further below, Gai teaches a method for network communication. *See* Ex. 1005, code (57).

a) Limitation 1a - coupling an edge switch in a network to one or more access switches via at least first and second redundant links, respectively connected to first and second ports of the edge switch;

Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai teaches this limitation. *See* Pet. 27–31, 70–75. Petitioner contends that Gai teaches an “edge switch” (i.e., switch 124), “one or more access switches” (i.e., switches 115 and 116), a “first redundant link” (i.e., link 128), and a “second redundant link” (i.e., link 128). *Id.*

Gai discloses multiple edge switches connected to access switches. For example, switches 122 and 124 are both edge switches because, as discussed above, they are core switches that connect to access switches 114 and 115, respectively. Ex. 1005, Fig. 1, 7:7–13. Switches 122 and 124 are core switches because they connect core switch 120 to core switch 121, which are, in turn, also core switches because they are connected to (WAN) routers 130 and 131. *Id.* at Fig. 1, 7:13–13, 7:27–29. Switches 114 and 115 are access switches because they connect to LANs 102–107. Ex. 1005, 7:4–7 (“The network 100 preferably comprises a plurality of local area networks

(LANs) 102–109 each of which is coupled to one or more access switches 114–116.”).

Figure 1 of Gai shows edge switch 122 is coupled to access switch 114 through multiple redundant links, all labeled 128, which are connected through ports 2–4 on switch 114. Ex. 1005, Fig. 1, 7:9–13, 7:47–50. Ports 2 and 3 on switch 114 are both directly coupled to switch 122, while port 4 is indirectly coupled to switch 122, first by a link to switch 124 from port 4, then switch 124 is in turn linked to switch 121, which is linked to switch 120, which is linked to switch 122. *Id.* at Fig. 1, 11:36–52. While the first and second ports on edge switch 122 are not labeled in Figure 1, they are clearly there as the figure shows edge switch 122 connected to the three redundant links 128 (two direct and one indirect) going to switch 114. *Id.*

Patent Owner does not dispute Gai teaches this limitation.

b) Limitation 1b - placing the first port in an active state, while placing the second port in a blocking state;

Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai teaches this limitation. *See* Pet. 31–33, 75–77. Petitioner contends that Gai teaches “placing the first port in an active state” (i.e., port 3 on switch 114), and “placing the second port in a blocking state” (i.e., ports 2 and 4 on switch 114). *Id.*

Gai discloses a preferred embodiment which describes that port 3 on access switch 114 is initially in the active (forwarding) state, connecting directly to edge switch 122. *Id.* at Fig. 1, 11:36–52 (“With reference to switch 114, for example, assume that port number three, which is coupled to backbone switch 122, is . . . in the forwarding state.”). Since port 3 is in the active state, ports 2 and 4 of switch 114, which are redundant links (directly and indirectly, respectively) to edge switch 122, are initially in an inactive

(blocked) state. *Id.* (“[P]ort numbers two and four, which also connect switch 114 to backbone switches (i.e., backbone switches 122 and 124), are in the blocked state.”). Therefore, of the two ports on edge switch 122 that are directly connected to access switch 114, one will initially be in the active state (the port directly connected to port 3 of switch 114), and the other will initially be in the inactive state (the one directly connected to port 2 of switch 114).

Patent Owner does not dispute that Gai teaches this limitation. Additionally, the ’986 patent describes Gai as having a method where “[o]ne of the trunk ports of each switch is placed in the forwarding state, while the others are designated as back-up ports.” Ex. 1001, 3:24–26. A “trunk port” is a port that has a link connecting it to another switch. Ex. 1005, 1:43–44 (“Ports used to couple switches to each other are generally referred to as trunk ports . . .”).

c) Limitation 1c - conveying communication traffic over the first link while the first port is in the active state, thereby causing each of the switches to build a respective database for use in forwarding the traffic;

Based on the current record, Petitioner has shown sufficiently that Gai teaches this limitation by describing that in the preferred embodiment traffic initially flows from port 3 in switch 114 over link 128 to switch 122. *See* Pet. 33–36, 77; Ex. 1005, 11:41–44. Gai makes clear that when ports are in the forwarding state, data frames, or communication traffic, is sent over the port. *Id.* at 2:56–63. Communication traffic received at a switch for the first time with an unknown source or destination address on the network will cause a database to be built on that switch. *Id.* at 11:16–33. “Switches typically learn which destination port to use in order to reach a particular entity by noting on which source port the last message originating from that

entity was received. This information is then stored by each switch in a block of memory referred to as a filtering database.” *Id.* at 1:50–54.

Petitioner’s annotated Figure 2 of Gai depicting a block diagram of a switch with a database on it, is reproduced below:

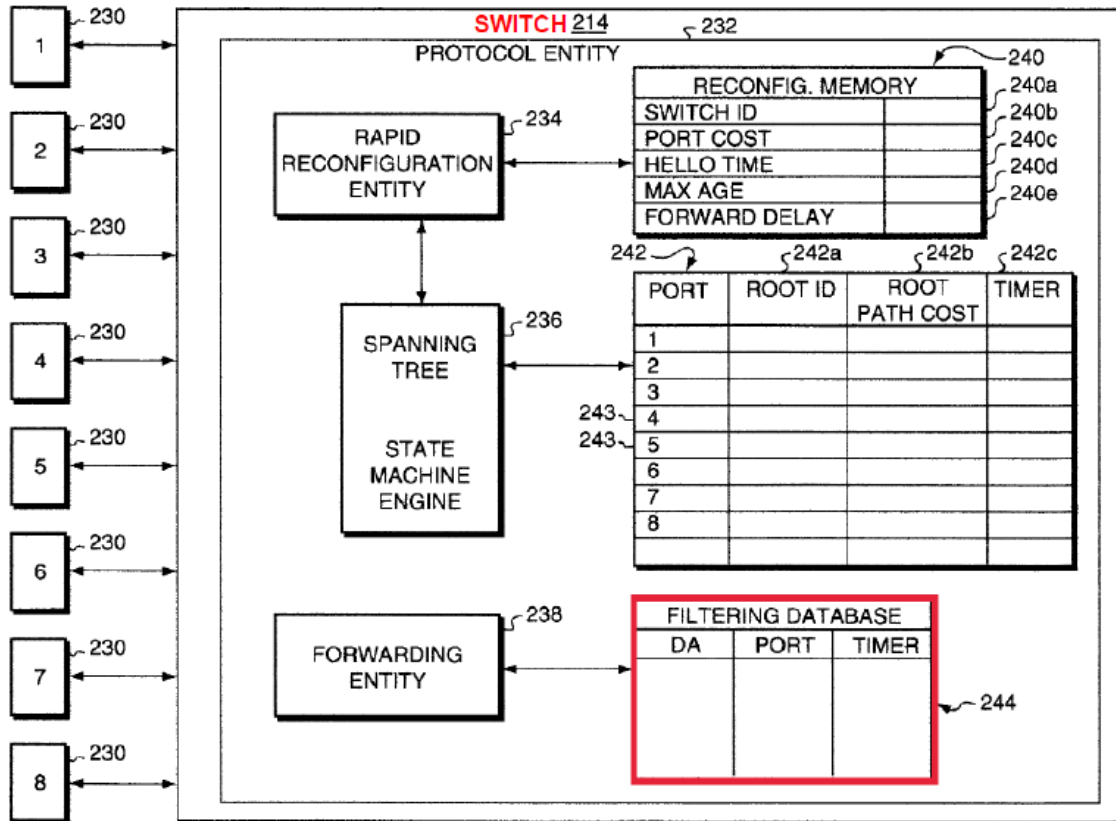


FIG. 2

Pet. 35. The annotated version of Figure 2 above shows that each switch will have, among other things, a filtering database 244. *Id.* at 7:62–64. The “filtering database 244 [is] configured to store address information corresponding to the entities of network 100. Specifically, filtering database 244 has a plurality of columns or cells, including a destination address cell [DA], a destination port [PORT], and a corresponding timer cell. Each row or entry in the filtering database 244 preferably corresponds to a particular entity.” *Id.* at 8:32–39.

Referring back to the preferred embodiment in Figure 1, the first time a data frame is transmitted from port 3 of switch 114 to switch 122, switch 122 will check its filtering database and look to see if it has switch 114 in the DA (destination address) field, so the first time a data frame is received from switch 114 there will be no entry causing a new entry to be added with the corresponding active port added to the PORT field and network address for switch 114 to the DA field. *Id.* at 11:16–33. Once this entry is added, when switch 122 receives a data frame with the destination address for switch 114, it will see it has that switch in the DA field in its filtering database, and therefore transmit the data frame out from the port specified by the PORT (which is the port that it last received a data frame from switch 114 on). *Id.* Patent Owner does not dispute that Gai teaches this limitation.

d) Limitation 1d - responsive to a failure associated with the first link, placing the second port in the active state and the first port in the blocking state; and

Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai teaches this limitation. *See* Pet. 36–38, 78–80. Petitioner contends Gai teaches that in response to “a failure associated with the first link” (i.e., link 128 from port 3 of switch 114), “placing the second port in the active state” (i.e., port 4 of switch 114) and “the first port in the blocking state” (i.e., port 3 of switch 114). *Id.*

Gai teaches that, in the preferred embodiment shown in Figure 1, once the link 128 coming from port 3 of switch 114 fails, port 3 will be placed in a blocked state, and one of the other root ports, either port 2 or port 4, will be placed in the active (forwarding state):

[F]or example, assume that port number three [on switch 114], which is coupled to backbone switch 122, is the root port for switch 114 and thus in the forwarding state. . . . port numbers

two and four, which also connect switch 114 to the backbone switches (i.e., backbone switches 122 and 124), are in the blocked state. If the link 128 coupled to the port number three at switch 114 fails, either one of these two other ports (i.e., port numbers two or four) will immediately transition to the forwarding state and begin receiving and sending messages.

Id. at 11:42–52.

The example continues, describing how port 4 could be selected as the new active root port for switch 114. *Id.* at 12:32–35. In that case, after recovering from a failure of the link coupled to port 3, switch 114 will now have root port 4 in the active state and ports 2 and 3 in the inactive state. *Id.* at 11:8–15. Since port 4 is directly connected to switch 124 (rather than switch 122 which is directly connected to port 3), the path that any upstream traffic from switch 114 will take will change. *Id.* at 12:56–59.

Additionally, the '986 patent itself acknowledges that Gai teaches this limitation, describing that, “[u]pon detection of a failure at the active forwarding port, the switch immediately places one of the back-up trunk ports in the forwarding state, so that it becomes the new active port.” Ex. 1001, 3:26–29.

Patent Owner does not dispute that Gai teaches this limitation.

e) Limitation 1e - sending dummy traffic from the edge switch over the second link to the one or more access switches, so as to cause each of the one or more access switches to modify its respective database responsive to the second port being in the active state.

Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai suggests this limitation. *See* Pet. 39–46. Petitioner contends Gai teaches “sending dummy traffic from the edge switch” (i.e., from edge switch 124), to “one or more access switches” (i.e., access switches 115 and 116), “so as to cause each of the one or more *access*

switches[] to modify its respective database” (i.e., access switches 115 and 116 updating their filtering databases). *Id.* Petitioner also contends that Gai teaches this limitation with an alternative embodiment where switch 114 is turned into an edge switch by the addition of another access switch 117 to the network disclosed in Figure 1. *Id.* at 81–86.

More specifically, Petitioner argues that the teachings in Gai could be applied to any type of switch, including edge switches, and gives a couple of examples illustrating this using the network in Figure 1, demonstrating how those examples would send dummy traffic from the edge switch over the second link to an access switch. Pet. 39–46, 81–86. In one example, Petitioner describes how the method can be applied to edge switch 124 connected to access switches 114 and 115, where the method takes place on the edge switch with dummy traffic flowing downstream to the access switches. Pet. 39–46.

Patent Owner responds that Gai fails to teach or suggest this limitation because the dummy traffic in Gai is transmitted from the access switch 114 to the edge switch 124 (upstream), instead of in the other direction as required by this limitation. Prelim. Resp. 8–12. Patent Owner takes issue with Petitioner’s example, stating:

[T]he cited example in *Gai* does not disclose sending dummy traffic from the edge switch to the one or more access switches because *Gai*’s switch 114 may not be considered an edge switch within the meaning of the ’986 patent. Rather, switch 114 of *Gai* Figure 1 is an access switch . . . because [it] has ports that connect multiple LANs.

Prelim. Resp. 14.

Based on the current record, we do not find Patent Owner’s argument to be persuasive for two reasons, 1) Gai teaches that the invention can also

be applied to edge switches, not just access switches, and 2) Gai's specification describes another embodiment where an additional access switch is added which would cause switch 114, which has the method operating on it in the preferred embodiment, to also be an edge switch. Each of these is discussed below.

Gai's Method Can Also be Implemented on Edge Switches

First, Gai discusses how to implement fast network recovery generally and says it can be accomplished using commands on both the access switches and edge switches¹⁰:

[T]he invention relates to a method and apparatus for rapidly reconfiguring a computer network. The network preferably includes a plurality of devices executing the spanning tree algorithm so as to elect a root and place the ports of the devices in either a forwarding or blocked state. In accordance with the method, one or more devices are configured and arranged so that one trunk port is in the forwarding state and other trunk ports are in the blocked state. Additionally, one or more of the blocked ports are designated as back-up ports. Upon detection of a failure at the active forwarding port, the state of one of the back-up ports immediately transitions from blocked to forwarding, thereby becoming the new active port for the device. . . . Upon transition to the new forwarding port, the device begins transmitting "dummy" multicast messages through the new port. . . . Upon receipt, the other devices examine the contents of these messages and note the port on which they were received, which may differ from the port on which messages from these entities were previously received (i.e., before the failure and subsequent replacement of the

¹⁰ Gai uses the broader term "backbone switch" instead of "edge switch," describing that "[a]ccess switches are preferably coupled to entities (e.g., LANs, end stations, etc.) whereas backbone switches provide the interconnections between access switches." Ex. 1005, 6:10–12. So the edge switches in Figure 1, such as switches 122–125, would also be backbone switches because they interconnect access switches 114–116.

device's active port) [T]he method and apparatus manifests, in part, as a series of novel commands that may be entered at the devices. *The devices, moreover, may be classified as either access switches or backbone switches. Access switches are preferably coupled to entities (e.g., LANS, end stations, etc.) whereas backbone switches provide the interconnections between access switches.*

Ex. 1005, 5:35–6:12 (emphasis added).

In view of this general teaching, Petitioner sets forth an annotated version of Gai's Figure 1, reproduced below, that illustrates implementing the fast recovery method on edge switch 124:

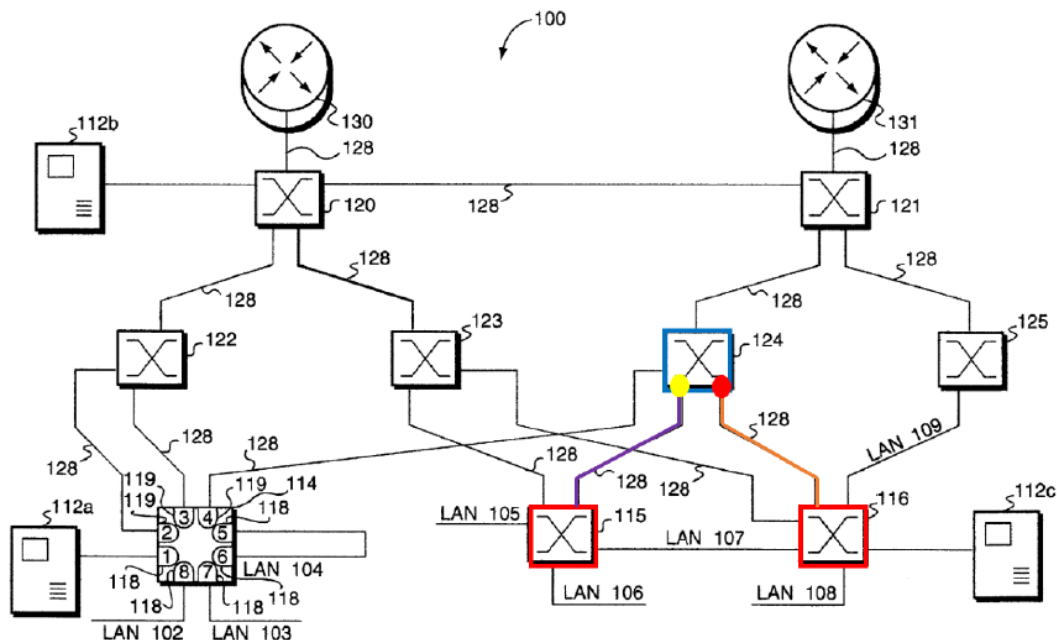


FIG. 1

Pet. 42. This annotated Figure 1 shows network 100 with edge switch 124 emphasized in blue to show its connections to access switches 115, shown in purple, and 116, shown in orange. Pet. 41–42. The highlighted colors were all added to Figure 1 by Petitioner, showing edge switch 124 is initially in a

state where the yellow port is active and the red backup port is inactive. *Id.*
According to Petitioner:

[I]f a failure happened at the port of switch 124 that is connected to first redundant link 128, then a back-up port (indicated with a red dot) would transition from “blocked” to “forwarding” state, therefore coupling switch 124 to access switch 116 through second redundant link 128
Accordingly, upon transition to the new forwarding port, *edge switch* 124 would start transmitting dummy messages, e.g., a dummy message to *access switches 116 and 115* (in that order) through the new forwarding port (indicated by the red dot) over *link 128*.

Id. Therefore, after a failure and switchover, edge switch 124 transmits dummy traffic to access switch 116 over the second link. *Id.* Based on the current record, we agree that this example is at least suggested by Gai’s teaching that “the method and apparatus manifests, in part, as a series of novel commands that may be entered at the devices. The devices, moreover, may be classified as either access switches or backbone switches.”

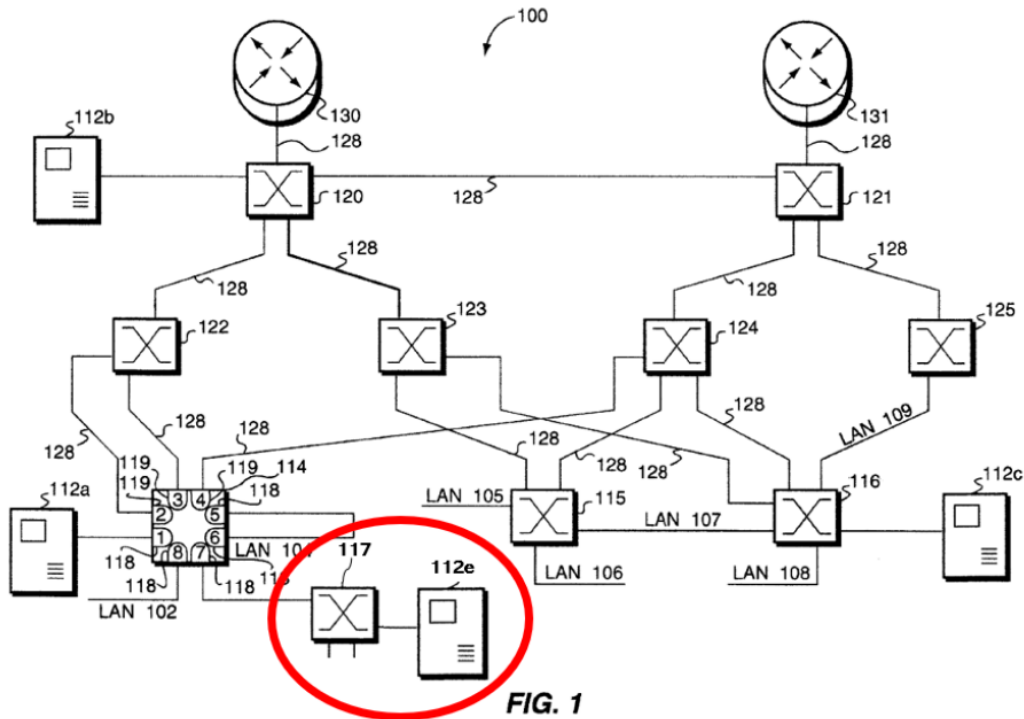
Ex. 1005, 6:6–9. Switch 124 is a backbone switch because it interconnects at least access switches 114–116, and, according to Gai, the invention can be implemented on that switch by entering the corresponding commands on it. *Id.* The rest of the example, whereby ports are switched based on a failure and dummy traffic that is transmitted to the access switches updates their filtering databases, also follows Gai’s teaching. Pet. 39–46; Ex. 1005, 5:35–6:12.

Patent Owner responds to this argument by asserting that “*Gai* itself never describes backbone switch 124 in such a way,” disputing it could transmit dummy traffic to access switch 116 over the second link. Prelim. Resp. 10–11. Rather, according to Patent Owner, “*Gai* clearly explains that such an action is in response to a port failure in access switch 114, not in

switch 124.” *Id.* at 11. Patent Owner appears to be trying to limit Gai’s teaching to the preferred embodiment that describes the failure occurring at switch 114, which we do not find warranted in view of the general teaching from Gai discussed above saying the invention can also be implemented on backbone switches. *See Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1076 (Fed. Cir. 2015) (“A reference must be considered for everything it teaches.”).

Additional Embodiment

Second, Gai describes an additional embodiment with another access switch added downstream from switch 114 on its port 7, which would then transform it into an edge switch when applied to the preferred embodiment. Ex. 1005, 13:60–63 (“[I]f port number seven at switch 114 were coupled to another access switch, entity 234 [rapid reconfiguration program running on the switch] would transmit multicast messages 400 carrying the source address of entities directly coupled to this additional access switch as well.”). To illustrate how this would look visually, Petitioner modified Figure 1 to add this additional access switch mentioned in the text of the specification, which Petitioner labelled as switch 117. Pet. 69–70. That modified figure is reproduced below:



This modified Figure 1 shows network 100 with a link from port 7 of switch 114 to a newly added access switch 117 and server 112e, shown in a red circle. *Id.* According to Petitioner, in this example switch 114 is now an edge switch because it “is a core switch (a switch that interconnects access switches 115–117, 120, and 125 into a WAN, e.g., by direct connection between core switch 114 and access switch 117) that is directly connected to access switch (*switch 117*).” *Id.* at 70. Based on the current record, we are persuaded that applying this modification to the preferred embodiment constitutes “sending dummy traffic from the edge switch over the second link to the one or more access switches,” because edge switch 114 sends dummy traffic over the second link, which is to edge switch 124, and then the dummy traffic is further transmitted to multiple switches, including

switch 121, and then to access switch 120, causing that switch to update its filtering database.¹¹ *Id.* at 81.

Petitioner argues:

Gai discloses “so as to cause each of the one or more *access switches* to modify its respective database responsive to the second port being in the active state” For example, when access switch 120 receives a dummy message from switch 121 with a source address corresponding to server 112a, it would update its corresponding database, such that the next time switch 120 transmits a frame addressed to server 112a, it would use the appropriate port, e.g., the port to send the frame towards switch 121.

Pet. 85.

Patent Owner responds to this argument by asserting that switch 120 is not an access switch. Prelim. Resp. 21–23. We do not agree on this record. Switch 120 is an access switch, since it has a port that is connected to server 112b, and thus has “ports that connect to LANs and/or other network endpoints, such as user computer systems.” Ex. 1001, 1:31–33; Ex. 1005, 7:19–22 (“Network 100 further includes a plurality of servers 112a–112c, such as file servers, print servers, etc. . . .”).

Patent Owner does not dispute Petitioner’s contention that Gai discloses the remaining portion of this limitation, i.e., “so as to cause each of

¹¹ Although not explicitly stated, Petitioner’s argument implies that dummy traffic can be sent indirectly to one or more access switches, since switch 120, the access switch identified, is not directly connected to switch 114 which is sending the dummy traffic. Pet. 81–86. Patent Owner does not address this issue in the Preliminary Response. At this stage we find that this limitation includes dummy traffic sent from an edge switch indirectly to an access switch because of the claim words “one or more access switches,” since it would only be possible to send the dummy traffic directly to a single access switch over the second link. Ex. 1001, claim 1.

the one or more access switches[] to modify its respective database responsive to the second port being in the active state.” *See* Pet. 44–46. Based on the current record, we are persuaded that the portions of Gai cited by the Petition teach this. *See id.* (citing, e.g., Ex. 1005, 5:60–6:1 (“Upon receipt [of the dummy messages,] the other devices examine the contents of these messages and note the port on which they were received, ... It is through this process that other devices within the network learn to utilize the new forwarding port, rather than the failed port, when directing messages to these entities.”), 13:34–49 (“Since the [dummy message] having the source address of server 112a was received by backbone switch 124 at a new source port, this new location information is entered by backbone switch 124 into its filtering database, replacing the previous information that was stored therein Backbone switch 124 distributes the [dummy traffic] through all of its forwarding ports so that other devices, as necessary, may learn of the new forwarding port.”)).

For the reasons discussed above, at this stage we find that Petitioner has demonstrated a reasonable likelihood that claim 1 of the ’986 patent would have been obvious over Gai.

3. *Analysis of Independent Claim 12*

Independent claim 12 is similar to independent claim 1, with several of the corresponding limitations below have the same wording, and limitation 12e, like limitation 1e, is the only limitation that Patent Owner contends Gai fails to teach or suggest.

Claim 12’s preamble, “[a] method for network communication, comprising:” is the same as claim 1’s preamble, and is similarly non-limiting because it is simply stating an intended use. *See Arctic Cat Inc.*, 919 F.3d at 1328.

a) Limitation 12a – coupling a first bridge in a network to a second bridge located downstream of the first bridge, by connecting at least first and second redundant links to respective first and second ports of the first bridge so as to communicate with the second bridge;

Based on the current record, we are persuaded that Petitioner has sufficiently shown that Gai teaches this limitation. *See* Pet. 27–31, 70–75. Petitioner contends that Gai teaches a “first bridge” (i.e., switch 124), “second bridge” (i.e., switches 115 or 116), a “first redundant link” (i.e., link 128), and a “second redundant link” (i.e., link 128). *Id.*

The only substantive difference from claim 1 is that instead of requiring an “edge switch” connected by redundant links to an “access switch,” claim 12 uses the broader terms “first bridge” connected by redundant links to a “second bridge.” Ex. 1005, claim 12. A switch is a type of bridge as discussed above in footnote 1. Therefore, our discussion above describing why we are persuaded on this record that Gai teaches or suggests limitation 1a applies here to explain why we also are persuaded on this record that Gai teaches this limitation.

Patent Owner also does not dispute that Gai teaches limitation 12a.

b) Limitation 12b - placing the first port in an active state, while placing the second port in a blocking state;

Based on the current record, we are persuaded that Petitioner has sufficiently shown that Gai teaches this limitation. *See* Pet. 31–33, 75–77. This limitation uses the same words as limitation 1b and therefore our finding above for why Gai teaches that limitation also applies here. Patent Owner does not dispute that Gai teaches this limitation.

c) Limitation 12c – conveying communication traffic over the first link while the first port is in the active state, thereby causing the bridges to build respective databases for use in the forwarding the traffic;

Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai teaches this limitation by describing that in the preferred embodiment traffic initially flows from port 3 in switch 114 over link 128 to switch 122. *See* Pet. 33–36, 77; Ex. 1005, 11:41–44. The only difference from limitation 1c is that the term “bridge” is used instead of “switch,” and since a switch is a type of bridge, our findings above for why Gai teaches limitation 1c also apply here. Patent Owner does not dispute that Gai teaches this limitation.

d) Limitation 12d – responsive to a failure associated with the first link, placing the second port in the active state and the first port in the blocking state; and

Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai teaches this limitation. *See* Pet. 36–38, 78–80. Petitioner contends Gai teaches in response to “a failure associated with the first link” (i.e., link 128 from port 3 of switch 114), “placing the second port in the active state” (i.e., port 4 of switch 114), and “the first port in the blocking state” (i.e., port 3 of switch 114). *Id.* This limitation uses the same words as limitation 1d, and therefore our findings above for why Gai teaches limitation 1d also apply here. Patent Owner does not dispute that Gai teaches this limitation.

e) Limitation 12e – sending dummy traffic from the first bridge over the second link downstream to the second bridge, so as to cause the second bridge to modify its database responsive to the second port being in the active state.

Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai suggests this limitation. *See* Pet. 39–46, 81–86. Petitioner contends Gai teaches “sending dummy traffic from the first bridge” (i.e., from edge switch 124), “to the second bridge” (i.e., access switches 115 or 116), “so as to cause the second bridge to modify its respective database” (i.e., access switches 115 and 116 updating their filtering databases). *Id.* at 39–46. Petitioner also contends that Gai teaches this limitation with an alternative embodiment where switch 114 is turned into an edge switch by the addition of another access switch 117 to the network disclosed in Fig 1. *Id.* at 81–86.

This limitation is similar to limitation 1e, except that it uses the terms “first bridge” and “second bridge” instead of “edge switch” and “access switch” and it adds the requirement that the dummy traffic is sent “downstream” over the second link. Since a switch is a type of bridge (*see supra* fn. 1), our finding above with respect to limitation 1f accounts for that difference. Therefore, we will focus our analysis on whether Gai suggests sending dummy traffic downstream over the second link after placing the second port in an active state.

For any network that implements an STP (such as the networks in the ’986 patent and Gai) a switch must be designated as root switch for the STP algorithm to work correctly. Ex. 1005, 2:42–44 (“[E]xecution of the spanning tree algorithm causes the switches to elect a single switch, among all of the switches within each network, to be the ‘root’ switch.”). Network

traffic that is going towards, or getting closer to, the root switch is going upstream, and network traffic that is going away from the root is going downstream. *Id.* at 5:54–60. In the preferred embodiment in Gai shown with respect to Figure 1, either switch 120 or switch 121 is selected as the root (in different discussions in the specification) and therefore sending dummy traffic from switch 114 port 4 to switch 124 over the second link as shown in the preferred embodiment after a failure, is sending the dummy traffic upstream. *Id.* at Fig. 1, 7:3–61, 8:57–62, 11:35–52. In view of this, both parties agree that the preferred embodiment in Gai is sending dummy traffic upstream over the second link. Pet. 38–40; Prelim. Resp. 8.

Petitioner asserts that Gai also teaches sending dummy traffic downstream over the second link, again citing to the general teaching of Gai that does not limit the method to being implemented on access switches. Pet. 39–46; Ex. 1005, 5:16–6:1. We now turn back to the example where Petitioner applies this general teaching to implement Gai’s method for fast recovery on switch 124, shown in Petitioner’s annotated version of Figure 1, which is again reproduced below for convenience:

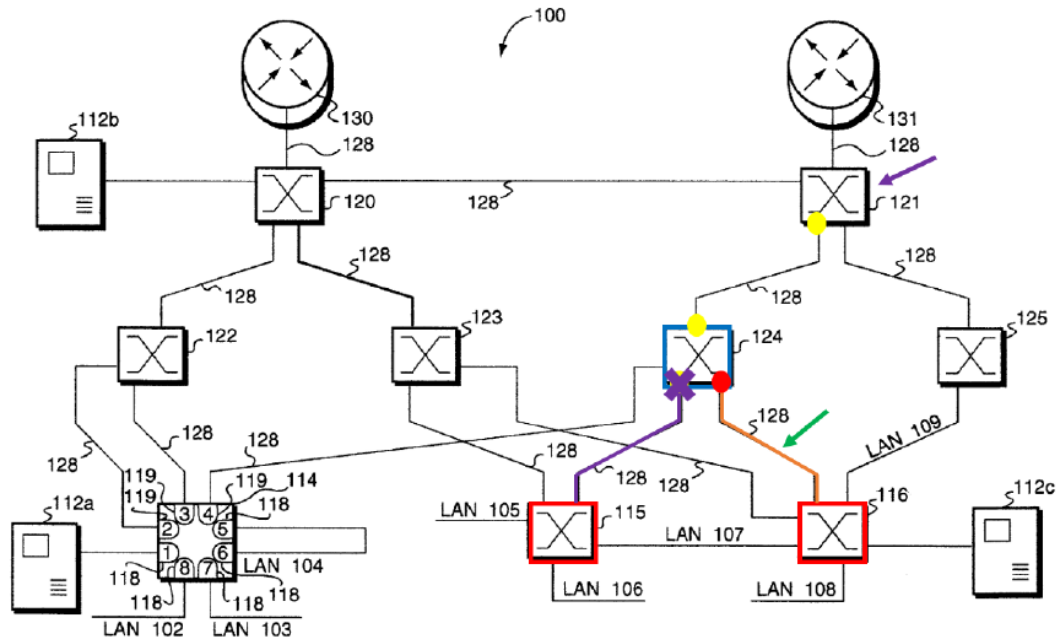


FIG. 1

Pet. 42. This figure shows network 100 with edge switch 124 emphasized in blue to show its connections to access switches 115 in purple and 116 in orange. *Id.* According to Petitioner:

[I]f a failure happened at the port of switch 124 that is connected to first redundant link 128, then a back-up port (indicated with a red dot) would transition from “blocked” to “forwarding” state, therefore coupling switch 124 to access switch 116 through second redundant link 128 . . . upon transition to the new forwarding port, *edge switch 124* would start transmitting dummy messages, e.g., a dummy message to *access switches 116 and 115* (in that order) through the new forwarding port (indicated by the red dot) over *link 128*.

Pet. 41–42. In this example, the second link is from the red port on edge switch 124 to access switch 116, so the transmission of the dummy message after activating the red port is downstream over the second link because it is getting further away from the root switches (either switch 120 or switch 121). *Id.*

Patent Owner's response to this is the same as discussed above with respect to this example for limitation 1e, that Gai's preferred embodiment does not show edge switch 124 implementing the method, but rather shows it being implemented on access switch 114. Prelim. Resp. 9–12. As discussed above, we do not find this argument persuasive in view of Gai's teaching that the method of the invention can also be implemented on backbone switches (which include edge switches). Ex. 1005, 6:6-9; *see Belden*, 805 F.3d at 1076.

Alternative Argument for Limitation 12e

Petitioner also makes an alternative argument for why Gai teaches dummy traffic can being sent downstream over the second link after a failure by citing to the portion of Gai that says that any switch on the network can be designated as a root switch. Pet. 85; Ex. 1005, 2:42–47, 10:29–33, 3:17–39. More specifically, Petitioner argues that if switch 117, which is connected to switch 114 in one example, is designated as the root (instead of switches 120 or 121), then in the preferred embodiment shown in Figure 1, dummy traffic would be travelling downstream over the second link when it is transmitted to switch 124 because it would be going away from switch 117. Pet. 85. Figure 1, modified by Petitioner to show switch 117, is reproduced below again for convenience.



The modified Figure 1 shows network 100 with the addition of a link from port 7 of switch 114 to a newly added access switch 117, shown in the red circle. *Id.* We agree that if switch 117 were designated as the root switch, then the dummy traffic transmitted over the second link from port 4 of switch 114 to switch 124 after a port switchover would be going downstream, because it would be going away from root switch 117. Patent Owner does not appear to disagree with that assertion, but instead contends that a person of ordinary skill in the art would not designate switch 117 as the root switch in view of the teachings of Gai. Prelim. Resp. 17–20.

Patent Owner cites to several passages in Gai to assert that it teaches away from designating switch 117 as the root, specifically:

Gai's teachings suggest that Petitioner's modifications would actually create an inefficient and poorly-optimized network. *Gai* teaches that the location of the root switch is important because it affects the overall performance of the network when transmitting messages. Ex. 1005, 3:17–19 (“Depending on the

configuration of a given network, the location of the root can significantly affect the distance that messages must travel.”). *Gai* further discloses that “[t]o reduce the average distance and avoid partitioning of the backbone switches, it is desirable to locate the root at a backbone switch.” *Id.*, 3:29–31. Although it is technically possible to use an access switch as the root, *Gai* clearly cautions against this. *Id.*, 3:23–29 (“If the root is located at an access switch and the principal server utilized by the end stations (i.e. clients) is coupled to a backbone switch, the average distance between end stations and the primary server may be quite high, resulting in inefficient network operation. In addition, the backbone switches may become partitioned as ports between them are blocked.”). . . . A POSITA would [have] understood, simply by reading *Gai*, that Petitioner’s modification would actually worsen the performance of network 100. *See* EX1005, 3:23–29. Therefore, a POSITA would not find that *Gai* renders obvious claim limitations 12[e] and 24[c]. Rather, a POSITA would understand that *Gai* actually teaches away from using the exact modifications that Petitioner proposes.

Prelim. Resp. 19–20.

Based on the current record, we are not persuaded by Patent Owner’s argument. *Gai* teaches that it is possible that any switch can be designated as the root switch, but cautions that designating an access switch as root may be inefficient “[d]epending on the configuration” and gives reasons why that may be the case. Ex. 1005, 3:17–19, 10:29–34 (“The conventional spanning tree algorithm, however, simply selects the switch having the lowest ID to become the root, regardless of where in the network 100 this switch is located. As a result, an access switch is often elected to be the root.”). Therefore, *Gai* recognizes that access switches in some networks may be designated as a root, even if doing so could be inefficient depending on the configuration. Despite the cautions, *Gai* describes that switch 120 could be designated as root in the preferred embodiment shown in Figure 1. *Id.* at

10:40–41 (“switch 120 is elected the root switch”). While switch 120 is a backbone switch, it is also an access switch because it has server 112a connected to one of its ports as discussed above, so we are persuaded on this record that a person of ordinary skill in the art (“POSITA”) would understand that Gai is not teaching that an access switch should never be used as a root switch, only that it might not be efficient to do so “[d]epending on the configuration.” *Id.* at 3:17–19.

Furthermore, Petitioner’s declarant opines that a POSITA would understand that an access switch can be designated as the root switch. Ex. 1003 ¶ 38. That opinion is supported by the express disclosures in Gai’s specification. *See* Ex. 1005, 3:17-19, 10:29-34, 15:28. Accordingly, at this stage, we find Petitioner has made a sufficient showing that Gai suggests this limitation, and do not find Patent Owner’s arguments on this point to be persuasive.

For the reasons discussed above, at this stage we find that Petitioner has demonstrated a reasonable likelihood that claim 12 of the ’986 patent would have been obvious over Gai.

4. *Analysis of Independent Claim 13*

Independent claim 13 is similar to independent claim 1, and limitation 13e, like limitation 1e, is the only limitation that Patent Owner contends Gai fails to teach or suggest.

Claim 13’s preamble, “[a] network switching device, comprising:” is taught by Gai’s disclosure of switches that can implement the invention, e.g., switch 124 as shown in Figure 1. Pet. 47; Ex. 1005, Fig. 1, 5:35–6:12. Patent Owner does not dispute that Gai teaches this preamble.

a) Limitation 13a – a network port, adapted to be coupled over a network trunk link to a core switch in a network so as to exchange communication traffic with the core switch;

Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai teaches this limitation. *See* Pet. 48, 88–89. Petitioner contends Gai teaches this limitation in the network shown in Figure 1, citing link 128 between switch 124 and switch 121. Pet. 48. Switch 121 is a core switch because it is connected to a (WAN) router 131 and the link 128 is a trunk line because it is between two switches. Ex. 1001, 1:30–38. Patent Owner does not dispute that Gai teaches this limitation.

b) Limitation 13b – first and second access ports, adapted to be coupled via first and second redundant network access links to one or more access switches serving network users; and

Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai teaches this limitation. *See* Pet. 49, 89. This is similar to limitation 1a, which requires first and second redundant ports coupled to an access switch, and our analysis for that limitation applies here. Patent Owner does not dispute Gai teaches this limitation.

c) Limitation 13c – a protocol processor, adapted to place the first access port in an active state, while placing the second access port in a blocking state;

Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai teaches this limitation. *See* Pet. 49–51, 89. This is similar to limitation 1b with the addition of a “protocol processor” placing the ports into active and blocking states. Petitioner points out that Gai teaches a protocol processor called a rapid reconfiguration entity, which is

software on each switch which will change active ports when it detects a failure. Pet. 49–50. Figure 2 of Gai, which is reproduced again below for convenience, identifies the components on the switch that interact with the filtering database and other data storage used on the switch:

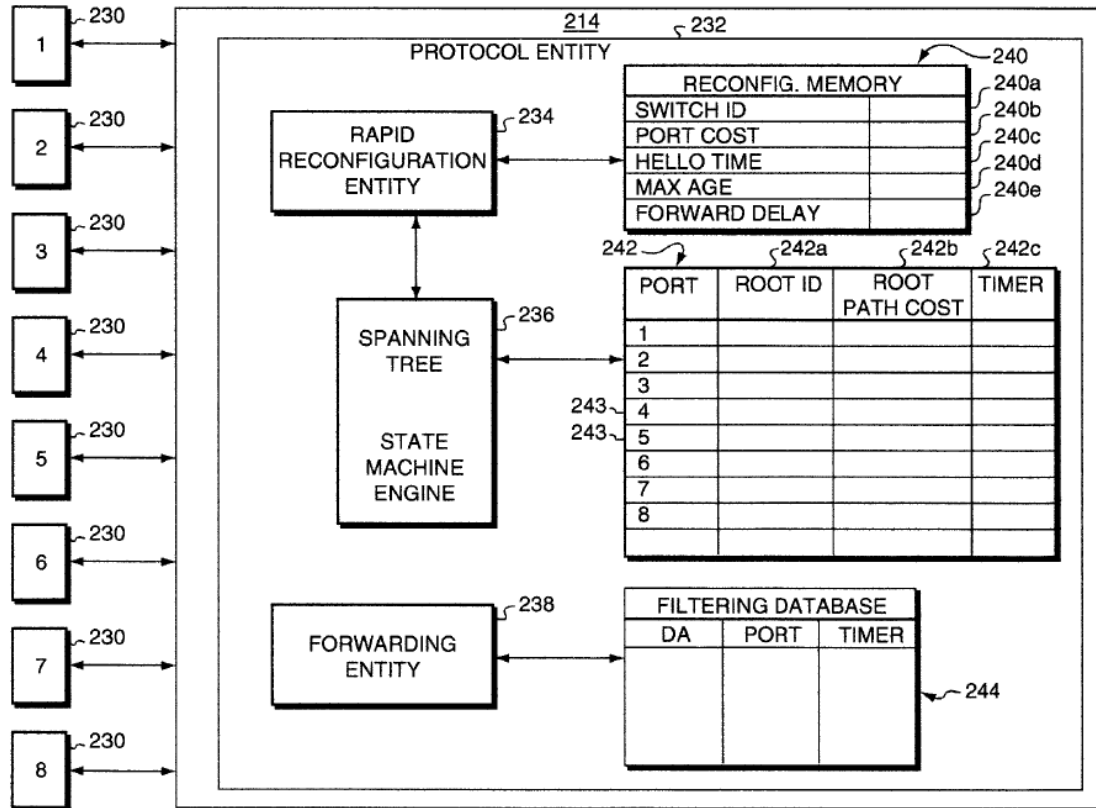


FIG. 2

Ex. 1005, Fig. 2. This Figure shows that each switch will have a protocol entity 214 that includes a rapid reconfiguration entity 234 and a spanning tree state machine engine 236. *Id.* at 8:12–14. This software is installed on each switch to implement the method for rapid recovery, and Gai describes that “rapid reconfiguration entity 234[] rapidly transition[s] a blocked port to the forwarding state.” *Id.* at 9:64–66. Patent Owner does not dispute that Gai teaches this limitation.

d) Limitation 13d – so that the communication traffic is conveyed over the first link while the first port is in the active state, thereby causing each of the access switches to build a respective access switch database for use in forwarding the traffic;

Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai teaches this limitation. *See* Pet. 51, 89. This limitation is similar to limitation 1c, and our analysis for that limitation also applies here. Patent Owner does not dispute that Gai teaches this limitation.

e) Limitation 13e – the protocol processor being further adapted, responsive to a failure associated with the first link, to place the second access port in the active state and the first port in the blocking state and

Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai teaches this limitation. *See* Pet. 51, 89. This limitation is similar to limitation 1d, and our analysis for that limitation also applies here. Patent Owner does not dispute that Gai teaches this limitation.

f) Limitation 13f – to send dummy traffic through the second access port over the second link to the one or more access switch switches, so as to cause each of the one or more access switches to modify its respective access switch database responsive to the second access port being in the active state.

Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai suggests this limitation. *See* Pet. 52, 90. Substantively, this limitation is the same as limitation 1e, but instead of specifically requiring the dummy traffic to be sent from an edge switch to an access switch, it just focuses on the access switch receiving the information. *Id.* Petitioner relies on the same arguments as for limitation 1e. *Id.* Patent Owner disputes Gai teaches or suggests this limitation for the same reasons presented for limitation 1e, which we find unpersuasive based on the current

record for the same reasons we discuss above in analyzing that limitation. Prelim. Resp. 12–16, 21–23.

For the reasons discussed above, at this stage we find that Petitioner has demonstrated a reasonable likelihood that claim 13 of the '986 patent would have been obvious over Gai.

5. *Analysis of Independent Claim 24*

Independent claim 24 is similar to independent claim 13, but is an apparatus claim instead of a method claim, and explicitly mentions the root switch (which was implicitly referenced in claim 13 by requiring that dummy traffic be sent downstream over the second link, which is measured with respect to the root switch). Limitation 24e, like limitation 13f, is the only limitation that Patent Owner contends Gai fails to teach or suggest. Prelim. Resp. 8–12, 16–21.

Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai teaches claim 24's preamble, "[a] bridge device for use in a communication network having a spanning tree root, the device comprising:" because Gai discloses a communication network having a spanning root, including in Figure 1, where either switch 120 or 121 is designated as the root for STP purposes. *See* Pet. 52, 90; Ex. 1005, 9:29–33. Patent Owner does not dispute that Gai teaches the preamble to claim 24.

a) *Limitation 24a – a designated port, adapted to be coupled over an upstream link in the network so as to communicate with the root;*

Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai teaches this limitation. *See* Pet. 52–53, 90. The designated port here is similar to the network port in limitation 13a, so our

analysis is the same as for that limitation. Patent Owner does not dispute that Gai teaches this limitation.

b) Limitation 24b – first and second downstream ports, adapted to be coupled via first and second redundant links to a further bridge device located downstream in the network relative to the spanning tree root; and

Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai teaches this limitation. *See* Pet. 53, 90. The first and second downstream ports are similar to the first and second access ports in limitation 13b, so our analysis is the same as for that limitation. Patent Owner does not dispute that Gai teaches this limitation.

c) Limitation 24c – a protocol processor, which is adapted to place the first downstream port in an active state, while placing the second downstream port in a blocking state,

Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai teaches this limitation. *See* Pet. 54, 90. This limitation is nearly identical to limitation 13c, so our analysis is the same as for that limitation. Patent Owner does not dispute that Gai teaches this limitation.

d) Limitation 24d – so that communication traffic is conveyed over the first downstream link while the first port is in the active state, thereby causing the bridge devices to build respective databases for use in forwarding the traffic,

Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai teaches this limitation. *See* Pet. 54, 91. This limitation is nearly identical to limitation 13d, so our analysis is the same as

for that limitation. Patent Owner does not dispute that Gai teaches this limitation.

e) Limitation 24e – the protocol processor being further adapted, responsive to a failure associated with the first link, to place the second downstream port in the active state and to send dummy traffic over the second link downstream to the further bridge device, so as to cause the further bridge device to modify its database responsive to the second downstream port being in the active state.

Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai suggests this limitation. *See* Pet. 54, 91. Substantively this limitation is similar to limitation 13f, and Patent Owner’s arguments for why Gai fails to teach or suggest this limitation are the same as for that limitation. Prelim. Resp. 8–12, 16–20. Accordingly, we find Patent Owner’s arguments unpersuasive for this limitation based on the current record for the same reasons we found them unpersuasive for limitation 13f.

For the reasons discussed above, at this stage we find that Petitioner has demonstrated a reasonable likelihood that claim 24 of the ’986 patent would have been obvious over Gai.

6. Analysis of Dependent Claim 2

Dependent claim 2 depends on independent claim 1, and adds “wherein placing the second port in the blocking state comprises configuring the first and second ports so that no loop is created in the network between the edge switch and the one or more access switches.” Ex. 1001, claim 2. Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai teaches this additional limitation. *See* Pet. 54–55, 91.

Petitioner contends that “Gai implements the STP, which ensures there is no loop in the network.” Pet. 55.

The network disclosed and discussed in Gai is one that implements the STP to eliminate redundant loops, so that would eliminate all loops between the edge switch and one or more access switches as required by this claim. Pet. 12–15; Ex. 1005, 7:59–61 (“To avoid the creation of loops, these switches execute the spanning tree algorithm.”). Patent Owner does not dispute that Gai teaches the additional limitation in claim 2.

7. Analysis of Dependent Claim 4

Dependent claim 4 depends on independent claim 1, and adds “and comprising, responsive to placing the second port in the active state, updating the database of the edge switch so that entries in the database point to the second port instead of the first port.” Ex. 1001, claim 4. Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai at least suggests the additional limitation recited in dependent claim 4. *See* Pet. 55–57, 91–94. Petitioner contends that Gai’s discussion about how the switches update their filtering databases renders this claim obvious. Pet. 55–57, 91–94.

Gai describes that a switch will update its filtering database under the following circumstances:

As messages [] are subsequently received . . . they are passed to forwarding entity 238 . . . The forwarding entity 238 first examines the destination address of the message and performs a look up function at the filtering database 244. Assuming an entry is found and a corresponding destination port (e.g. port number four) is identified, the message is switched out onto this port, assuming this port is in the forwarding state. . . . The forwarding entity 238 next examines the source address of the message and performs another look-up at filtering database 244. If no entry is found for the source

address, a new entry is formed and the source port (e.g., port number eight) on which the message was received is entered as the destination port in the corresponding port column. In addition, a timer associated with this entry is set to the aging time with which forwarding entity 238 is configured (e.g., five minutes).

Ex. 1005, 11:16–33. Following the logic of how the filtering database gets updated, the switch will eventually update the PORT field in its filtering database to reflect the new active port for any traffic whose destination is reachable by that port, as data frames are received back from those devices after the old entry in the database has timed out. *Id.* at 11:33–35 (“a timer associated with this entry is set to the aging time with which forwarding entity 238 is configured (e.g., five minutes)”), 11:29–33 (“[i]f no entry is found for the source address a new entry is formed and the source port . . . on which the message was received is entered as the destination port in the corresponding port column”). Since there is no timing requirement in this claim, at this stage we find this suggests that the filtering database will be updated after (responsive to) the switchover, or at least renders that obvious to a POSITA.

Additionally, Petitioner’s declarant opines that a POSITA would find this claim obvious in view of the teachings in Gai because “Gai discloses that the switches in the network, e.g., including the edge switch, discard old information in their database after a port transitions to an active state.”

Ex. 1003 ¶ 133 (citing Ex. 1005, 4:30–34). Patent Owner does not dispute that Gai suggests the additional limitation in claim 4.

8. *Analysis of Dependent Claims 5 and 17*

Dependent claim 5 depends on claim 4, but adds “wherein updating the database comprises changing the entries in the database to point to the

second port before receiving the communication traffic from the one or more access switches on the second port.” Ex. 1001, claim 5. We find that Petitioner has not provided sufficient information for us to find a reasonable likelihood that Gai teaches or suggests dependent claims 5 and 17 at this time. Dependent claim 17 is similar to claim 5, but depends on claim 16 (which in turn depends on independent claim 13), adding “wherein the protocol processor is adapted to update the entries in the database to point to the second access port before receiving the communication traffic from the one or more access switches on the second port.” *Id.* at claim 17.

These claims both require the switch implementing the method for rapid recovery, such as switch 124 in Petitioner’s example discussed above, to update its filtering database before receiving communication traffic from access switches, such as access switches 115 and 116 in Petitioner’s example. Pet. 58. That effectively means that switch 124 must update its database immediately upon transitioning to the new port either before or at the same time it transmits dummy messages to the access switches. So this differs from the analysis for claim 4 because allowing the corresponding entry in the filtering database to time out will not be sufficient to ensure that the entries will be updated before receiving communication traffic from one of the access switches.

There is no express disclosure from the portions of Gai cited by Petitioner of immediately updating the database on the switch implementing the method. Pet. 57–58, 94; Ex. 1005, 2:30–41, 5:36–39, 5:54–56, 12:62–65. Based on the current record, we are also not persuaded by Petitioner’s declarant’s explanation of why Gai allegedly teaches or suggests this limitation. In the section addressing dependent claim 5, Dr. Houh asserts that:

[A] POSITA would have understood that the dummy messages are transmitted before any communication traffic is received by the switch. As I discuss in Section VIII.A.5.ii, the filtering database is updated before transmitting the dummy messages. Accordingly, a POSITA would have understood that the database entries would have been updated before receiving any communication traffic from the access switches.

Ex. 1003 ¶ 139. However, Section VIII.A.5.ii of Dr. Houh’s declaration relates to dependent claim 4 which does not have any timing requirement, and the citations to Gai there do not describe that the switch first updates its filtering database before sending the dummy message.¹² *Id.* ¶¶ 133–136. Therefore, the conclusory and unsupported assertions that Gai teaches or suggests this limitation, or renders it obvious to a POSITA, do not persuade us that Petitioner has shown a reasonable likelihood of prevailing on these claims, at least at this stage of the proceeding.

9. *Analysis of Dependent Claim 6*

Dependent claim 6 depends on independent claim 1 and adds “wherein sending the dummy traffic comprises data frames originating at the edge switch while having sources addresses corresponding to network address of other entities in the network that are accessible to the access switches via the edge switch.” Ex. 1001, claim 6. Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai teaches dependent claim 6. *See* Pet. 59–60, 94. Petitioner contends that

¹² The Petition cites for this contention are also unpersuasive. The Petition asserts “[a]s discussed in Section VII.C.4.ii, the database is updated before transmitting the dummy messages.” Pet. 58. But Section VII.C.4.ii is addressing dependent claims 2 and 14, which relate to ensuring that no loops are created in the network between the edge and access switches when the method is applied, and does not appear to relate to whether the database is updated before transmitting the dummy messages. *Id.* at 55.

Gai's disclosure about switches updating their filtering databases after receiving the dummy messages renders claim 6 obvious. Pet. 59–60.

Gai discloses “[u]pon transition to the new forwarding port, the device begins transmitting ‘dummy’ multicast messages through the new port. These dummy multicast messages carry the source address of each entity that is directly coupled to the device with the new active port or downstream thereof (relative to the root) and are received by other devices in the computer network.” Ex. 1005, 5:54–60. So dummy messages “carry the source address” of other entities in the network. Patent Owner does not dispute that Gai teaches the additional limitation that is in dependent claim 6.

10. Analysis of Dependent Claim 7

Dependent claim 7 depends on claim 6 and adds “wherein sending the data frames comprises copying the source addresses for the data frames from the database of the edge switch.” Ex. 1001, claim 7. Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai suggests dependent claim 7. See Pet. 60–61, 94. Petitioner contends Gai's discussion of how the filtering databases get updated on the switch renders claim 7 obvious. Pet. 60–61.

Gai's “filtering database 244 [is] configured to store address information corresponding to the entities of network 100.” Ex. 1005, 8:31–39. Gai also describes loading the address of the corresponding entities into the source address field of the dummy messages. Ex. 1005, 13:14–18 (“[R]apid reconfiguration entity 234 (FIG. 2) loads SA field 412 with the address of an entity directly coupled to switch 114.”), 13:50–55 (“Rapid reconfiguration entity 234 similarly generates one or more separate multicast message 400 for each remaining entity directly coupled to access switch

114 In each message 400, entity 234 loads SA field 414 with the address of the corresponding entity.”). *See also* Pet. 60–61. On this record we are persuaded that, in view of these teachings by Gai, a POSITA would have found it obvious for the source address for the data frame for the devices to be copied from the filtering database; indeed, there does not seem to be any other readily apparent place where it would be obtained from to create the dummy messages. *See* Ex. 1003 ¶¶ 144–146. Patent Owner does not dispute that Gai suggests the additional limitation in claim 7.

11. Analysis of Dependent Claim 9

Dependent claim 9 depends on claim 6 and adds “wherein sending the data frames comprises incorporating a Virtual Local Area Network (VLAN) tag in a header of the data frames.” Ex. 1005, claim 9. Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai teaches dependent claim 9. *See* Pet. 62–63, 95. Petitioner contends that Gai’s disclosure of how VLAN tags are incorporated into dummy frames renders this claim obvious. Pet. 62–63.

Gai discloses that “in formulating dummy multicast messages following the detection of a change, access switches 114–116 may append a VLAN tag 416 to message 400.” Ex. 1005, 17:32–39. “[A]n objective of [the] VLAN arrangement is to allow all ports and entities of the network having the same VLAN designation to interchange messages by associating a VLAN designation with each message. Thus, those entities having the same VLAN designation function as if they are all part of the same LAN.” *Id.* at 16:17–22; *see also id.* at Fig. 4, 15:52–67, 17:8–56; Ex. 1003 ¶¶ 148–150. Given this disclosure, we find at this stage that Gai teaches that the dummy messages originating at the edge switch would also incorporate a

VLAN tag into the message. Patent Owner does not dispute Gai teaches this additional limitation in claim 9.

12. Analysis of Dependent Claim 10

Dependent claim 10 depends on claim 6 and adds “wherein sending the data frames comprises multicasting the data frames to all of the one or more access switches.” Ex. 1005, claim 10. Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai teaches dependent claim 10. *See* Pet. 64, 95. Petitioner contends Gai’s discussion of how the dummy multicast messages are transmitted discloses this limitation. Pet. 64.

Gai teaches that sending the dummy message include multicasting the packets so the message will reach all the switches, including any access switches, causing them to update their filtering databases to reflect the change. Ex. 1005, 13:9–13 (“Rapid reconfiguration entity 234 preferably loads DA field 410 with a multicast address that causes message 400 to be received by all devices (e.g., access switches 114–116 and backbone switches 120–125) within the network 100.”). Patent Owner does not dispute that Gai teaches the additional limitation in dependent claim 10.

13. Analysis of Dependent Claim 11

Dependent claim 11 depends on claim 1 and adds “wherein sending the dummy traffic comprises sending data frames downstream from the edge switch towards the access switches.” Ex. 1005, claim 11. Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai suggests dependent claim 11. *See* Pet. 65, 95. Independent claim 12 also requires that the dummy traffic be sent downstream, so our findings here are for the same reasons we find Gai suggests limitation 12e above.

14. Analysis of Dependent Claims 16 and 19

Dependent claim 16 depends on claim 13 and adds “comprising a memory, wherein the protocol processor is adapted to build an edge switch database in the memory responsive to the communication traffic prior to the failure associated with the first link and, responsive to placing the second access port in the active state, to update the edge switch database so that entries in the edge switch database point to the second access port instead of the first access port.” Ex. 1005, claim 16. Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai suggests dependent claim 16. *See* Pet. 65–68, 96. Petitioner contends that Gai discloses or renders claim 16 obvious by its discussion of how the switches learn which destination ports to use for forwarding messages and how that information is then stored in their filtering databases. Pet. 65–68.

Substantively, this claim is similar to dependent claim 4, so our analysis above for that claim applies here for why Gai suggests that the edge switch updates the filtering database responsive to a failure. We also find on this record that Gai teaches the rest of this claim, which requires that the filtering database is built in memory before the failure based on communication traffic. Gai describes how memory is used for the filtering database. Ex. 1005, 1:50–54 (“Switches typically learn which designation port to use in order to reach a particular entity by noting on which source port the last message originating from the entity was received. This information is then stored by each switch in a block of memory referred to as a filtering database.”). Gai also describes that software on the switch, called the forwarding entity, builds the database, so it performs the role of the claimed protocol processor. *Id.* at 11:16–41 (“As messages . . . are . . . received at the ports[], they are passed to forwarding entity 238 The

forwarding entity 238 next examines the source addresses of the message and performs another look-up at filtering database 244. If no entry is found for the source address, a new entry is formed.”). Patent Owner does not dispute that Gai suggests the additional limitation in claim 16.

Claim 19 is similar to claim 16, except claim 19 depends on dependent claim 18. Claim 19 adds the following limitation to claim 18: “comprising a memory, wherein the protocol processor is adapted to build an edge switch database in the memory responsive to the communication traffic prior to the failure associated with the first link, and, to copy the source address for the data frames from the edge switch database.”

Ex. 1005, claim 19. So, based on the current record, we find Petitioner has shown sufficiently that Gai suggests claim 19 for the same reasons discussed for claim 16. Patent Owner does not dispute that Gai suggests the additional limitation in claim 19.

15. Analysis of Dependent Claims 14, 18, 21, 22, and 23

Based on the current record, we are persuaded that Petitioner has shown sufficiently that Gai teaches dependent claims 14, 18, 21, 22, and 23. *See* Pet. 55–57, 59–60, 62–65. These dependent claims are nearly identical to dependent claims 2, 6, 9, 10, and 11 respectively, but depend on independent claim 13 (or intermediate dependent claims that depend on claim 13) instead of claim 1.

Dependent claim 14 depends on independent claim 13 and adds “wherein the protocol processor is adapted to configure the first and second access ports so that no loop is created in the network between the edge switch and the one or more access switches.” Ex. 1005, claim 14. So, for the same reasons we found that Gai teaches claim 2, based on its discussion

of how the STP protocol is run on the switches, we find on this record it also teaches claim 14. Ex. 1005, 7:59–61.

Dependent claim 18 depends on independent claim 13 and adds “wherein the dummy traffic comprises sending data frames originating at the edge switch while having source addresses corresponding to network addresses of other entities in the network that are accessible to the access switches via the edge switch.” Ex. 1001, claim 18. This limitation is substantively the same as the limitation in claim 6 so our analysis for why Gai teaches it is the same.

Dependent claim 21 depends on claim 18 and adds “wherein the protocol processor is adapted to incorporate a Virtual Local Area Network (VLAN) tag in a header of the data frames.” Ex. 1001, claim 21. This limitation is substantively the same as the limitation in claim 9, so our analysis for why Gai teaches it is the same.

Dependent claim 22 depends on claim 18 and adds “wherein the protocol processor is adapted to multicast the data frames to all of the one or more access switches.” Ex. 1001, claim 22. This limitation is substantively the same as the limitation in claim 10, so our analysis for why Gai teaches it is the same.

Dependent claim 23 depends on claim 18 and adds “wherein the dummy traffic comprises data frames sent downstream from the edge switch toward the access switches.” Ex. 1001, claim 23. This limitation is substantively the same as the limitation in claim 11, so our analysis for why Gai teaches it is the same.

IV. CONCLUSION

Based on the arguments presented in the Petition, we conclude that Petitioner has demonstrated a reasonable likelihood of prevailing with respect to at least one claim of the '986 patent challenged in the Petition. Accordingly, we institute a trial on all claims and all grounds asserted in the Petition. The Board has not made a final determination under 35 U.S.C. § 318(a) with respect to the patentability of the challenged claims.

V. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1, 2, 4–7, 9–14, 16–19, and 21–24 of the '986 patent is instituted with respect to all grounds set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), *inter partes* review of the '986 patent shall commence on the entry date of this Decision, and notice is hereby given of the institution of a trial.

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