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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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GUEST TEK INTERACTIVE ENTERTAINMENT LTD.,
Petitioner,

v.

NOMADIX, INC.,
Patent Owner.

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Case IPR2019-00253
Patent 8,626,922 B2

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Before SALLY C. MEDLEY, DANIEL J. GALLIGAN, and JASON W. MELVIN, *Administrative Patent Judges*.

MEDLEY, *Administrative Patent Judge*.

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

# I. INTRODUCTION

Guest Tek Interactive Entertainment Ltd. ("Petitioner") filed a Petition for *inter partes* review of claims 1 and 9 of U.S. Patent No. 8,626,922 B2 (Ex. 1001, "the '922 patent"). Paper 1 ("Pet."). Nomadix, Inc. ("Patent Owner") filed a Preliminary Response. Paper 5 ("Prelim. Resp."). Institution of an *inter partes* review is authorized by statute when "the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." 35 U.S.C. § 314(a). Upon consideration of the Petition and Preliminary Response, we conclude the information presented shows that there is a reasonable likelihood that Petitioner would prevail in establishing the unpatentability of claims 1 and 9 of the '922 patent.

## *A. Related Matters*

Petitioner indicates that Patent Owner is asserting the '922 patent against Petitioner in claims for a breach of a license agreement in *Nomadix, Inc. v. Guest Tek Interactive Entertainment Ltd.*, Case No. 2:16-cv-08033-AB-FFM, pending in the United States District Court for the Central District of California. Pet. 2–3; *see also* Paper 3, 1.

## *B. The '922 Patent*

The specification of the '922 patent describes a "method and device for dynamic bandwidth management on a per subscriber basis." Ex. 1001, 3:32–33. A user/subscriber may set and adjust uplink and downlink bandwidths of their network access service. *Id*. at 3:33–35. "[T]he user/subscriber can increase or decrease the bandwidth of the uplink connection so that the user/subscriber only purchases the amount of

bandwidth appropriate for their network activity." *Id*. at 3:47–50. Figures 2 and 3 of the '922 patent are reproduced below.

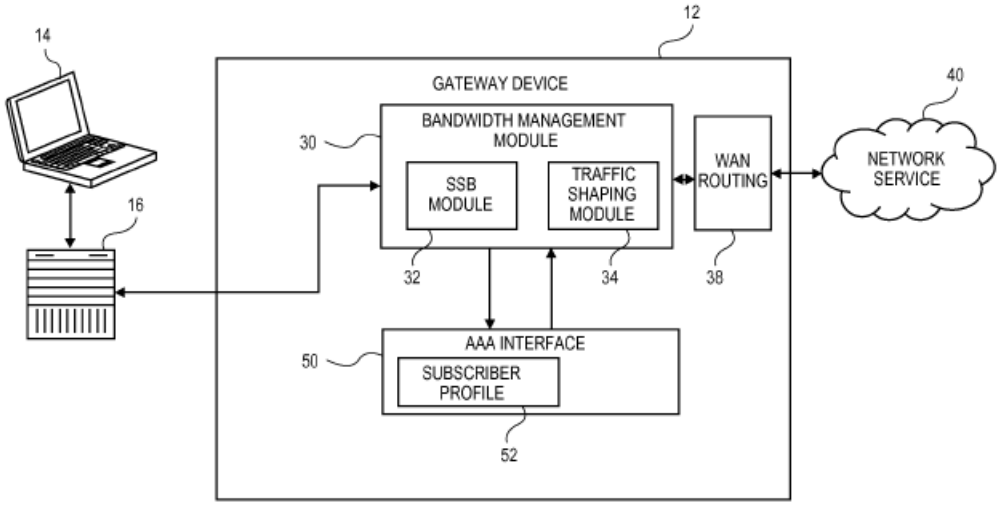


**FIG. 2**

Figure 2 of the '922 patent is a block diagram of a communications network implementing subscriber bandwidth management within a gateway device. Ex. 1001, 4:22–24.

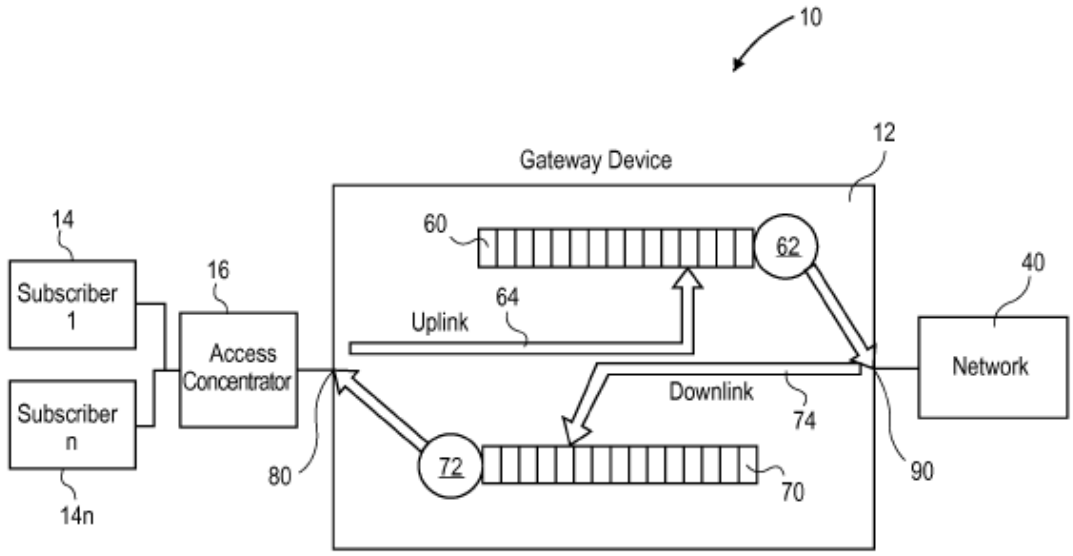


FIG. 3

Figure 3 of the ’922 patent is a block diagram of a communications network implementing uplink and downlink virtual queues in a gateway device. Ex. 1001, 4:26–28.

As seen from the above figures, a plurality of hosts 14, 14n communicate data packets through communication network 10. *Id*. at 8:60–62. Data packets are routed through an access concentrator 16 that multiplexes data packets received from the plurality of hosts. *Id*. at 8:62–64. Gateway 12 receives data packets at port 80 and communicates to uplink queue 60 via uplink path 64. *Id*. at 8:64–67. Gateway 12 includes bandwidth manager 30, which comprises subscriber selectable bandwidth module (SSB module) 32 and traffic shaping module 34. *Id*. at 8:24–25. SSB module 32 “limits the upstream and downstream bandwidths on each virtual channel through the gateway device 10 to that which the respective user/subscriber selected.” *Id*. at 8:27–30. SSB module 32 communicates

with subscriber management interface 50 to retrieve subscriber profiles 52, which include user/subscriber selected bandwidth for uplink and downlink data transfer. *Id*. at 8:33–38. SSB module 32 determines whether to reschedule delivery of a packet at a later point in time to prevent the user/subscriber from achieving a bandwidth greater than that which the user/subscriber selected. *Id*. at 8:38–42. SSB module 32 calculates "the appropriate delay, if any, using the size (in bytes) of the current data packet, and the size and time of the previous packet delivered from the subscriber." *Id*. at 8:43–46. If it is determined that a packet should be delayed, SSB module 32 places the packet in memory in a virtual queue for later delivery. *Id*. at 8:53–55.

### *C. Illustrative Claim*

Petitioner challenges independent claims 1 and 9 of the '922 patent. Claim 1 is illustrative and reproduced below.

> 1. A system for allowing a user to dynamically control an amount of bandwidth available to the user in a network, the system comprising:
>
> a first network interface for communicating over a communication link with a user device during a network session;
>
> a second network interface for communicating with one or more computer networks;
>
> a data storage system including a user profile record associated with a user, the user profile record comprising an indication of a network communication bandwidth associated with the user device; and
>
> a processor configured to calculate a delay period associated with a received packet based on the network communication bandwidth associated with the user, and the processor further configured to delay transmission of the packet based on the delay period to prevent the user device from

> achieving a bandwidth greater than the network communication bandwidth associated with the user device.

*Id.* at 14:30–49.

### *D. Asserted Grounds of Unpatentability*

Petitioner asserts that claims 1 and 9 are unpatentable based on the following grounds (Pet. 3):

| **References**[1] | **Basis**[2] | **Challenged Claims** |
|---|---|---|
| Bonomi[3] and Borella[4] | § 103 | 1 and 9 |
| Chandran[5] and Rupp[6] | § 103 | 1 and 9 |
| Teraslinna[7] and Bonomi | § 103 | 1 and 9 |

## II. DISCUSSION

### *A. Claim Construction*

In an *inter partes* review for a petition filed before November 13, 2018, we construe claim terms in an unexpired patent according to their

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[1] Petitioner refers to the references by patent number, while Patent Owner refers to the references by the last name of the first named inventor. We adopt Patent Owner's naming convention.
[2] The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) ("AIA"), amended 35 U.S.C. §§ 102 and 103. Because the '922 patent has an effective filing date before the effective date of the applicable AIA amendments, we refer to the pre-AIA versions of 35 U.S.C. §§ 102 and 103.
[3] U.S. Patent No. 5,864,540, issued Jan. 26, 1999 (Ex. 1004, "Bonomi").
[4] U.S. Patent No. 6,587,433 B1, issued July 1, 2003 (Ex. 1006, "Borella").
[5] U.S. Patent No. 7,392,279 B1, issued June 24, 2008 (Ex. 1005, "Chandran").
[6] Björn Rupp et al., INDEX: *A Platform for Determining How People Value the Quality of Their Internet Access*, In: Proceedings of the Sixth IEEE/IFIP International Workshop on Quality of Service 85 (IEEE 1998) (Ex. 1007, "Rupp").
[7] U.S. Patent No. 5,623,492, issued Apr. 22, 1997 (Ex. 1008, "Teraslinna").

broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b) (2018); *see* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51,340 (Oct. 11, 2018) (amending 37 C.F.R. § 42.100(b) effective November 13, 2018). Consistent with the broadest reasonable construction, claim terms are presumed to have their ordinary and customary meaning as understood by a person of ordinary skill in the art in the context of the entire patent disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

Petitioner proposes constructions for the following claim terms found in the challenged claims: "processor" (claim 1); "data storage system" (claim 1); and "user profile record" (claim 1). Pet. 9–10. Patent Owner does not oppose Petitioner's proposed constructions. Prelim. Resp. 7.

For purposes of this decision, we need not expressly construe any claim term. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (holding that "only those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy"); *see also Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs.* in the context of an *inter partes* review).

### *B. Principles of Law*

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 406

(2007). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art;[8] and (4) when in evidence, objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

### *C. Asserted Obviousness of Claims 1 and 9 over Bonomi and Borella and over Teraslinna and Bonomi*

Petitioner contends claims 1 and 9 are unpatentable under 35 U.S.C. § 103(a) as obvious over (1) Bonomi in view of Borella (Pet. 4, 24–41), and (2) Teraslinna in view of Bonomi (Pet. 4, 54–66). In support of its showing, Petitioner relies upon the declaration of Dr. Dordal. *Id.* (citing Ex. 1002).

#### *1. Bonomi*

Bonomi describes a method and system for controlling traffic in a communications network. Ex. 1004, 1:6–7. Bonomi further describes that for communication networks, a communication path must be established within the network between the sender(s) and receiver(s) of information. *Id.* at 1:18–21. Bonomi describes Asynchronous Transfer Mode (ATM) as "a connection oriented network technology" that transmits "packets of digital

[8] Relying on the testimony of Dr. Peter Dordal, Petitioner offers an assessment as to the level of skill in the art as of the earliest effective filing date on the face of the '922 patent. Pet. 10 (citing Ex. 1002 ¶ 27). Patent Owner does not propose an alternative assessment. *See, e.g.*, Ex. 2001 ¶ 22. To the extent necessary, and for purposes of this Decision, we accept the assessment offered by Petitioner as it is consistent with the '922 patent and the asserted prior art.

information called cells." *Id.* at 1:36–42. In such a network, a connection is formed between transmitters and receivers where each intermediate switch in the virtual circuit or channel (VC) is aware of service requirements and traffic parameters of the connection such that the quality of service (QOS) of the channel can be guaranteed by the network if the connection stays within its stated traffic parameters. *Id*. at 1:43–55. The QOS of a connection in an ATM network may be "guaranteed" by "contract" when a connection is established through a process of connection admission control (CAC). *Id*. at 2:11–14. In particular, "each connection 'contracts' to transmit cells to the network at a rate ρ (bandwidth descriptor) with burstiness σ (burst descriptor) when the connection is established." *Id*. at 2:14–17. If there are insufficient network resources (e.g., buffer and/or bandwidth) to provide the required QOS at the contracted traffic parameters, a connection will not be allowed. *Id*. at 2:17–20. Bonomi describes that it was known to employ "leaky bucket traffic shaping" to control traffic for ATM switched networks. *Id*. at 2:38–43. Credit tokens are provided by the traffic shaper at a rate ρ that represents sustainable bandwidth for the connection. *Id*. at 2:44–46. These credit tokens accumulate in a "leaky bucket" that holds up to σ credit tokens. *Id*. at 2:50–52. "Each cell arriving at the traffic shaper must claim a token to pass through the shaper; if no tokens are available, the cell is considered 'nonconforming' and is delayed until a token is available when the connection conforms to the traffic contract." *Id*. at 2:52–56.

Bonomi's invention is directed to integration of leaky-bucket traffic shaping and rate-based link scheduling. *Id*. at 4:16–18. Bonomi describes a traffic shaper, "optimally suited for, but not limited to, high speed switches in an Asynchronous Transfer Mode network." *Id*. at 6:36–38. When a cell

arrives at the traffic shaper, the cell's conformance time c is computed. *Id*. at 8:1–2. "Conformance time is the time at which an arriving cell conforms to the contracted traffic parameters of the connection the cell is coming from." *Id*. at 8:3–5. "[C]onformance time is determined from the cell's estimated arrival time, X, the contracted traffic parameters for the cell's connection, ρ and σ, and the arrival time of the last cell from the same connection." *Id*. at 8:18–21. Bonomi describes, with respect to Figure 2:

> If X is less than or equal to t+σ/ρ then the connection is complying with the traffic contract and the cell is conforming as shown in step 34. In the case of a conforming cell, conformance time c equals the current time t. As shown in step 35, if X is greater than t+σ/ρ the cell is non-conforming and the conformance time is set to comply with the contracted traffic parameters, c=X-σ/ρ.

*Id*. at 8:32–38. If the arriving packet's conformance time is equal to or before the current time, the packet is placed on the transmission queue for sending through the network. *Id*. at 7:1–10, 8:36–50, 8:63–9:2. If the packet is nonconforming, it is placed on a sorting bin queue for a delay period based on the calculated conformance time. *Id*. A sorting bin may correspond to a single delay period between conformance time and current time. *Id*. at 14:18–20.

*2. Borella*

Borella is directed to a method and system for providing different levels or classes of packet delivery service in a packet-based network. Ex. 1006, 1:13–15. Users may select a desired class of service according to the users' specific requirements, such as "bandwidth requirements." *Id*. at 2:49–54. The system controls and charges "applications and users fees according to the network resources they consume," which "provides the

ability to efficiently allocate and utilize network resources." *Id*. at 2:55–58. "Users may select the quality of service, i.e., amount of bandwidth depending on the particular type of application they are running and the cost they are willing to pay." *Id*. at 12:32–35. Service selection may be preselected or provided dynamically during a session. *Id*. at 12:35–37. Selected service class for a user is stored in a user profile record. *Id*. at 7:1–4. The user profile may include user name 410 with an associated user identifier 412 and device type 414 such as a personal computer. *Id*. at 10:3–7, Fig. 4.

*3. Teraslinna*

Teraslinna is directed to a method and system for managing bandwidth resources in a fast packet switching communication network. Ex. 1008, [57], 1:9–13. Teraslinna describes a fast packet switch that routes packets received from devices, including user devices. *Id*. at 6:3–44.

The address of the user's device, along with the device's preselected bandwidth constraint, are stored in a look-up table. *Id*. at 6:47–63, 8:26–31, 17:37–50. The system receives a packet and uses the address in the packet header for the user's device to look up the bandwidth constraint to enforce that constraint. *Id*. at [57], 6:47–63, 8:26–31, 17:37–50, Figs. 3, 12. When the fast packet switch receives a packet, a processor (packet profile processor 37 of Figure 3), analyzes the source address in the packet to determine the subscriber who sent the packet. *Id*. at 6:24–33, 6:45–49. The processor also determines if the received packet causes a violation of the pre-selected bandwidth constraint from the look-up table. *Id*. at 5:16–23, 6:28–33, 6:50–59. A violation occurs when the user's bandwidth usage exceeds the threshold bandwidth preselected in the user's traffic contract

that is stored in the look-up table. *Id*. at 6:59–63, 15:64–66. If a violation occurs, the received packet is discarded, marked with a low priority for loss, or placed in a queue for delayed transmission. *Id*. at 5:20–25, 6:59–63, 15:60–16:21.

*4. Discussion*

a. Bonomi in view of Borella

Petitioner contends that Bonomi discloses all elements of claims 1 and 9, except that Bonomi describes controlling or managing network bandwidth made available to connections in general as opposed to user devices. Pet. 24. Petitioner relies on Borella for its disclosure of user devices and a user profile record as recited in claims 1 and 9. *Id*. at 24, 32–35. Petitioner also provides reasons why a person having ordinary skill in the art at the time of the invention would have been motivated and had reason to combine the teachings of Bonomi and Borella. *Id*. at 35–41.

The preamble of claim 1 recites "[a] system for allowing a user to dynamically control an amount of bandwidth available to the user in a network." Petitioner argues that Bonomi describes allowing a connection to dynamically control an amount of bandwidth in a network. Pet. 25. Petitioner contends that Bonomi describes a traffic shaper that controls and manages the amount of bandwidth made available to each connection when transmitting packets through a network. *Id*. (citing Ex. 1004, 1:59–63, 2:14–20); *see, e.g.*, Ex. 1004, [57], 4:15–21, 6:35–42. Petitioner asserts that Bonomi describes delaying transmission of packets that are nonconforming, i.e., packets that would require a bandwidth greater than the negotiated bandwidth. Pet. 25 (citing Ex. 1004, 8:45–50). Petitioner further contends that Bonomi describes controlling and managing network resources

dynamically. *Id*. (citing Ex. 1004, 1:33–35, 9:37–40). Petitioner contends that although Bonomi describes that a network connection in general negotiates, and thus controls, the amount of bandwidth made available to it, Bonomi does not expressly describe that a "user" controls the available bandwidth as recited in claim 1. *Id*. at 26.

Petitioner relies on Borella for describing managing and controlling network resources for user devices, including allowing users to select bandwidth constraints dynamically and associating bandwidth constraints with user devices. *Id*. at 32. For example, Petitioner contends that Borella describes a system for allowing a user to select the quality of service such as the amount of bandwidth and that such selection may occur before a network session begins or that it may occur dynamically during a session. *Id*. at 32–33 (citing Ex. 1006, 12:32–37, 12:39–14:37, Table D); *see, e.g.*, Ex. 1006, 12:32–37 ("Users may select the quality of service, i.e., amount of bandwidth depending on the particular type of application they are running and the cost they are willing to pay. The service selection could be pre-selected or it could be provided dynamically during a session.").

Claim 1 further recites "a first network interface for communicating over a communication link with a user device during a network session." Petitioner contends that Bonomi describes a traffic shaper that includes a first network interface, input 1, and that packets sent from transmitting devices to a receiving device enter the traffic shaper through input 1. Pet. 26 (citing Ex. 1004, 1:17–21, 6:55–61, Fig. 1). Petitioner further contends that Borella describes communicating over a link with a user device. *Id*. at 33 (citing Ex. 1006, 3:22–27, 4:10–13, 12:39–14:37, Table D). For example, Borella describes user customer premises equipment 40 and telephony

device 44 connected via communication line 46 over Public Switched Telephone Network (PSTN) 24 via second communication line 23 to Remote Access Server (RAS) 22. Ex. 1006, 3:22–27.

Claim 1 recites "a second network interface for communicating with one or more computer networks." Petitioner contends that Bonomi describes a second network interface, output 3, which is connected to a computer network. Pet. 27 (citing Ex. 1004, 6:8–11, 6:58–61, Fig. 1).

Claim 1 recites "a data storage system including a user profile record associated with a user, the user profile record comprising an indication of a network communication bandwidth associated with the user device." Petitioner contends that Bonomi describes a data storage system, depicted in Bonomi Figure 6, showing a connection table 400 that maintains stored shaping rate (bandwidth) associated with each connection. *Id*. at 27–28 (citing Ex. 1004, 8:9–11, 9:20–24, 11:44–48, 11:53–57, 12:46–47, Fig. 6). Petitioner relies on Borella for describing a user profile record associated with a user. *Id*. at 28. Petitioner contends Borella describes that the selected class of service for a user, including desired bandwidth, is stored in a user profile record. *Id*. at 33–34 (citing Ex. 1006, 7:1–4, 10:3–13, 12:32–35, Fig. 4). Petitioner further contends that the desired bandwidth amount selected by the user is associated with the user device. *Id*. at 34 (citing Ex. 1006, 2:33–36, 2:49–54, 11:24–30).

Claim 1 recites "a processor configured to calculate a delay period associated with a received packet based on the network communication bandwidth associated with the user." Petitioner contends that Bonomi's arithmetic logic unit (ALU) is a processor. *Id*. at 29 (citing Ex. 1004, 12:38–40; Ex. 1002 ¶ 23, App. I; Ex. 1020). Petitioner further contends that

Bonomi's ALU (processor) is configured to calculate a delay period associated with a received packet based on the network communication bandwidth connection. *Id.* at 29–30 (citing Ex. 1004, 8:30–38, 12:38–40). Bonomi describes that the ALU performs the comparison and pointer manipulation operations of the described invention. Ex. 1004, 12:38–40. Petitioner contends that the comparison operation involves calculating the delay period for an arriving packet. Pet. 29. In particular, Petitioner asserts that the processor compares the arrival time of each packet (X) to see if it complies with traffic contract parameters such as the selected bandwidth, $\rho$, and if it does not, calculates a delay period (based on conformance time $c=X-\sigma/\rho$). *Id*. at 29–30 (citing Ex. 1004, 8:30–38; Ex. 1002, App. I). In his overview of Bonomi, Dr. Dordal testifies that:

> If the traffic shaper determines that an arriving cell/packet's conformance time is equal to or before the current time, the packet is placed on the transmission queue for transmission through the network, and will be transmitted without additional delay. [Ex. 1004, ] 7:1-10; 8:36-50, 8:63-9:2. If the cell/packet is "nonconforming" (i.e., the cell's conformance time is after the current time), the cell is placed on a "sorting bin" queue for a delay period based on the calculated conformance time. [*Id.* at ] 7:1-10; 8:36-50, 8:63-9:2; claim 13 ("each said sorting bin corresponds to a single delay period between said conformance time and said current time"). These sorting bins correspond approximately to the "timeslots" of the "ring buffer" of the '922 patent; see paragraph 51 below.

Ex. 1002 ¶ 50; *see also id*. ¶ 51.

Petitioner asserts that Borella describes that the bandwidth is associated with the user. Pet. 34–35. Petitioner explains that Borella describes that the quality of service containing the network communication bandwidth is selected by the user, stored with user name and device, and

used to manage resources for packets sent from the user. *Id*. (citing Ex. 1006, 10:5–13).

Claim 1 further recites that the processor is "further configured to delay transmission of the packet based on the delay period to prevent the user device from achieving a bandwidth greater than the network communication bandwidth associated with the user device." Petitioner relies on the combined teachings of Bonomi and Borella to meet this claim phrase. In particular, Petitioner contends that Bonomi's ALU performs pointer manipulation operations such that packets are moved between first in first out (FIFO) queues based on whether they are conforming. *Id*. at 30 (citing Ex. 1004, 8:45–54, 12:38–45). Bonomi describes that if a packet is nonconforming, the cell is placed in a sorting bin selected based on its calculated conformance time, c. Ex. 1004, 8:49–50. Petitioner contends that the packet remains in the sorting bin until its conformance time is reached, thereby creating a delay period and delaying transmission of the packet based on the delay period. Pet. 31 (citing Ex. 1004, 7:1–10, 8:36–50, 8:63–9:2, 9:5–8, claim 13 (14:18–20)). Petitioner contends that conformance times are based on the contracted bandwidth parameters. *Id*. (citing Ex. 1004, 8:3–5). Petitioner further explains that the delay in transmitting packets ensures that the connection bandwidth is less than or equal to the contracted bandwidth. *Id*. at 32 (citing Ex. 1004, 2:17–20, 2:36–40). Petitioner relies on Borella for describing a user device as recited in the above claim 1 phrase. *Id*. at 34–35. Petitioner asserts that Borella describes a system that implements traffic management for user devices based on bandwidths selected by users and associated with user devices. *Id*. at 34 (citing Ex. 1006, 2:33–36, 2:49–54, 11:24–30, Table D).

Petitioner asserts reasons for combining Bonomi and Borella. Pet. 35–41. For example, Petitioner contends, with supporting evidence, that both Bonomi and Borella involve the same type of networks, including ATM networks, and are directed to enforcing bandwidth constraints. *Id*. at 36; Ex. 1004, Abstract, 1:6–10; Ex. 1006, 5:17–19, 11:10–15. Petitioner further contends that a person having ordinary skill in the art would have been motivated to employ user devices as connection endpoints in Bonomi because ATM networks were originally developed to accommodate high-speed bandwidth requirements of user devices such as computers and mobile phones. Pet. 37 (citing Ex. 1002 ¶ 80). Petitioner alleges that a person having ordinary skill in the art would have been motivated to implement Borella's technique of storing service classes with desired bandwidths for user devices in user profiles so that they may be retrieved later for traffic management. *Id*. at 37–38 (citing Ex. 1002 ¶ 81). Petitioner further alleges that modifying Bonomi with Borella would have amounted to a simple substitution of one element—functionality that stores a negotiated bandwidth constraint with a network connection in general—for another known element—functionality that stores a bandwidth class for a network endpoint that is a user device in a user profile record. *Id*. at 38 (citing Ex. 1002 ¶ 82). Petitioner also asserts the combination would have been predictable, along with additional reasons why a person having ordinary skill in the art would have been motivated to combine Bonomi and Borella with a reasonable expectation of success. *Id*. at 38–40 (citing Ex. 1002 ¶¶ 83–86).

Independent claim 9 is similar to claim 1. Petitioner's showing for claim 9 is nearly the same as that for claim 1, while sufficiently accounting for differences between claim 9 and claim 1. *See* Pet. 25–41.

b. Teraslinna in view of Bonomi

Petitioner also contends Teraslinna in combination with Bonomi would have rendered claims 1 and 9 obvious. Pet. 54–66. Petitioner relies on Teraslinna to meet all elements of claims 1 and 9, except for the limitations reciting calculating a delay period and delaying transmission of the received packet based on the delay period. *Id*. at 54. For those limitations, Petitioner relies on Bonomi.

For example, Petitioner contends that Teraslinna describes a first network interface for communicating over a link with a user device. *Id*. at 55–56 (citing Ex. 1008, Fig 5 (switch 70, link 82a, equipment SE 1)). Petitioner further contends that Teraslinna describes a second network interface for communicating with one or more computer networks. *Id*. at 56–57 (citing Ex. 1008, Fig. 5 (switch 72), Fig. 11). Petitioner asserts that Teraslinna describes a look-up table that includes a user profile record associated with a user that includes an indication of a network communication bandwidth associated with the user device. *Id*. at 57–59 (citing multiple passages from Ex. 1008). Petitioner further asserts that Teraslinna describes a processor, e.g., packet protocol processor 37 of Figure 3, that performs packet protocol processing and enforces bandwidth constraints (e.g., inhibits the flow of packets) based upon the identities of the sources of the received packets and the selected bandwidths for those sources. *Id*. at 59–61 (citing multiple passages from Ex. 1008).

As it did for the Bonomi and Borella challenge, Petitioner relies on Bonomi for describing a processor configured to calculate a delay period and delay transmission of a packet based on the delay period as claimed. *Id*. at 62–63. Petitioner asserts reasons for combining Teraslinna and Bonomi. *Id*.

at 63–66. Petitioner alleges, with supporting evidence, that Teraslinna and Bonomi are analogous art (*id*. at 63), that there was a known design need for enforcing bandwidth constraints to avoid network congestion and that there were only a finite number of solutions (*id*. at 64), and that a person having ordinary skill in the art would have been motivated to delay transmission of packets, as opposed to dropping packets (*id*. at 64–65).

Petitioner also asserts that modifying Teraslinna with Bonomi would have amounted to a simple substitution of one element—a traffic flow processor configured to queue packets for a potentially unlimited amount of time until the subscriber no longer exceeds the allotted bandwidth amount—for another known element—a processor configured to calculate a specific delay period and then delay packet transmission based on the delay period. *Id*. at 65 (citing Ex. 1002 ¶ 105). Petitioner also contends the combination would have been predictable, along with additional reasons why a person having ordinary skill in the art would have been motivated to combine Teraslinna and Bonomi with a reasonable expectation of success. *Id*. at 65 (citing Ex. 1002 ¶¶ 105–106).

Independent claim 9 is similar to claim 1. Petitioner's showing for claim 9 is nearly the same as that for claim 1, while sufficiently accounting for differences between claim 9 and claim 1. *See* Pet. 54–66.

c. Patent Owner's Arguments and Analysis

Patent Owner argues that Dr. Dordal's declaration is unsworn, not made under penalty of perjury, and, therefore, is entitled to no weight. Prelim. Resp. 9–10. At this juncture of the proceeding, we decline to give little or no weight to Dr. Dordal's declaration. We authorize Petitioner to

file, within ten days of this Decision, a corrected Exhibit 1002 that complies with our rules. 37 C.F.R. §§ 1.68, 42.2, 42.53(a).

Patent Owner argues that for both challenges, Petitioner has failed to show that "Bonomi discloses calculating a delay period for a packet." Prelim. Resp. 13. Patent Owner argues that Petitioner's contention "that the act of determining whether X is less than, equal to, or greater than a threshold value constitutes calculation of a period of time by which a packet will be delayed . . . makes no sense." *Id*. at 12–13. Patent Owner's argument is misplaced because Petitioner does not rely solely on the comparison for calculating a delay. Rather, Petitioner explains that the processor compares the arrival time of each packet to see if it complies with the traffic contract parameters, and if it does not, calculates a delay period. Pet. 29–30, 62. Thus, it is not the comparison itself that Petitioner relies on for meeting the limitation "to calculate a delay period" of claim 1 or "calculating a delay period" of claim 9.

Patent Owner further argues that Petitioner contends that the delay period is based on the conformance time (c) but that "Petitioner does not explain what the supposed calculated delay period actually is, much less identify any calculations based on *c*." Prelim. Resp. 13. We disagree. Petitioner relies on Bonomi's description that, after conformance time is calculated, a determination of whether a cell is conforming is made, and if it is nonconforming, the cell is "enqueued on a sorting bin." *See, e.g.*, Pet. 62–63 (citing Ex. 1004, 8:49–50, 8:64–65). As further pointed out by Petitioner, Bonomi describes that a "sorting bin corresponds to *a single delay period* between" the conformance time and the current time. *Id*. at 62 (citing Ex. 1004, claim 13 (14:19–20)) (emphasis added); *see also* Ex. 1002

¶¶ 50–51. Thus, we disagree with Patent Owner that Petitioner does not explain what the calculated delay period is.

Patent Owner argues for the Bonomi and Borella challenge that Petitioner has failed to demonstrate that a person of ordinary skill in the art would have been motivated to combine Bonomi and Borella with a reasonable expectation of success because (1) Bonomi's traffic-shaping technology is completely reliant on underlying techniques unique to ATM networking; (2) Borella's technology is completely reliant on the specific packet format that the IP protocol dictates; and (3) the IP-rooted technology of Borella cannot be incorporated into Bonomi, which relies on unique aspects of ATM networks. Prelim. Resp. 14–25. We have considered Patent Owner's arguments spanning pages 14–25 of its Preliminary Response. At this stage of the proceeding, we do not agree with Patent Owner's arguments.

Petitioner relies on Bonomi for the majority of claim elements. Pet. 24. According to Petitioner, the only elements that Bonomi does not expressly disclose are the elements reciting a user or user device and an associated user profile record. *Id*. Petitioner explains that although ATM networks like those of Bonomi typically involve user devices at endpoints, Bonomi does not expressly state that the endpoint devices are user devices. *Id*. at 36. Rather, as Petitioner explains, Bonomi describes connections between two endpoint devices in general. *Id*. Petitioner relies on Borella for the limited purpose of teaching a user device and a user profile record. *See, e.g.*, *Id*. at 24.

Patent Owner's arguments are directed to modifications not proposed by Petitioner or are based on bodily incorporating certain technical aspects

of Borella into Bonomi. For example, Patent Owner argues that Borella's differentiated services architecture is incompatible with Bonomi's ATM-based technology and would make Bonomi inoperable for its intended purpose. Prelim. Resp. 23–24. Bonomi, however, is not limited to ATM-based technology. Ex. 1004, 6:36–38. Moreover, Petitioner does not propose incorporating Borella's entire architecture into Bonomi. Rather, Petitioner is relying on Borella for the limited purpose of teaching a user device and a user profile. The test for obviousness is what the combined teachings of the references would have suggested to a person of ordinary skill in the art, not whether one reference may be bodily incorporated into the structure of another reference. *In re Keller*, 642 F.2d 413, 425 (CCPA 1981). At this juncture of the proceeding, we determine Petitioner has presented sufficient evidence and argument to show that a person having ordinary skill in the art would have been motivated to combine Bonomi and Borella with a reasonable expectation of success.

For the Teraslinna and Bonomi challenge, Patent Owner argues, "Teraslinna and Bonomi teach away from one another" because Bonomi "relies on shaping traffic on a connection-by-connection basis," a technique Patent Owner contends Teraslinna recognizes as "cost-prohibitive with sufficiently large VPNs." Prelim. Resp. 25–27. Patent Owner argues that Teraslinna's objective is to devise a system in which bandwidth is not associated with each virtual connection but instead is associated with each source endpoint independent of the number of virtual connections emanating from an endpoint. *Id*. Patent Owner contends that modifying Teraslinna with Bonomi's technique of calculating a delay period and delaying packet transmission based on the delay period "would require enforcing bandwidth

constraints on per-connection basis, subverting Teraslinna's objectives and making it inoperable for its intended purpose of alleviating the prohibitive costs arising precisely from per-connection bandwidth management." *Id*.

A reference does not teach away if it merely expresses a general preference for an alternative invention but does not "criticize, discredit, or otherwise discourage" investigation into the *invention claimed*. *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004) (emphasis added). Our reviewing court has held that "[e]vidence concerning whether the prior art teaches away from a given invention *must relate to and be commensurate in scope with the ultimate claims at issue*." *Idemitsu Kosan Co. v. SFC Co.*, 870 F.3d 1376, 1381 (Fed. Cir. 2017) (emphasis added) (citing *MeadWestVaco Corp. v. Rexam Beauty & Closures, Inc.*, 731 F.3d 1258, 1264–65 (Fed. Cir. 2013); *In re Kahn*, 441 F.3d 977, 990 (Fed. Cir. 2006); *In re Zhang*, 654 F. App'x 488, 490 (Fed. Cir. 2016) ("While a prior art reference may indicate that a particular combination is undesirable *for its own purposes, the reference can nevertheless teach that combination if it remains suitable for the claimed invention*.") (emphasis added)).

Here, claim 1 and claim 9 do not recite or foreclose shaping traffic on a connection-by-connection basis or on a source endpoint independent of the number of virtual connections emanating from an endpoint. The specific types of connections are not claimed. Accordingly, even if Patent Owner is correct that Teraslinna discourages enforcing bandwidth constraints on a per-connection basis *for its own purposes*, we preliminary determine that the combined teachings of Teraslinna and Bonomi are relevant because the combination remains suitable for the *claimed invention*. Moreover, Patent Owner's arguments are premised on incorporating all technical aspects of

Bonomi into Teraslinna. Prelim. Resp. 25–27. Petitioner does not rely on Bonomi's connections or its per-connection approach, but rather relies on Bonomi for teaching delaying packet(s) based on a delay period. Teraslinna does not discourage investigation into a delay period for traffic shaping. Indeed, Teraslinna describes that a violation occurs when the user's bandwidth usage exceeds the threshold bandwidth preselected in the user's traffic contract that is stored in the look-up table. Ex. 1008, 6:59–63, 15:64–66. If a violation occurs, the received packet is discarded, marked with a low priority for loss, or placed in a queue for delayed transmission. *Id*. at 5:20–25, 15:60–16:21. On this record, we are persuaded a person having ordinary skill in the art would have looked to Bonomi for details of how to accomplish delayed transmission. *See, e.g.*, Ex. 1002 ¶ 103.

Based on the current record before us, we are persuaded by Petitioner's showing that the asserted prior art references teach or suggest each limitation of claims 1 and 9 and that a person of ordinary skill in the art would have had reason with rational underpinning, to combine the references in the manner Petitioner proposes. Pet. 24–41, 54–66. Accordingly, we determine the information presented shows a reasonable likelihood that Petitioner would prevail in establishing that claims 1 and 9 are unpatentable under § 103 as obvious over Bonomi and Borella and over Teraslinna and Bonomi.

*D. Asserted Obviousness of Claims 1 and 9 over Chandran and Rupp*

Petitioner contends claims 1 and 9 are unpatentable under 35 U.S.C. § 103(a) as obvious over Chandran in view of Rupp. Pet. 41–53. In support of its showing, Petitioner relies upon the declaration of Dr. Dordal. *Id.* (citing Ex. 1002).

1. *Rupp as Prior Art and What Rupp Describes*

a. Rupp as Prior Art

Patent Owner challenges Petitioner's showing that Rupp is prior art. Prelim. Resp. 29–35. We consider that issue first.

Rupp (Ex. 1007) is a technical paper that was cited during prosecution of the application that matured into the '922 patent. Pet. 7 (citing Ex. 1003, April 26, 2011 Information Disclosure Statement (IDS)). Petitioner asserts that Rupp is prior art under 35 U.S.C. §§ 102(b) or 102(a) because it was publicly available as of May 20, 1998, but no later than December 31, 1998.[9] Pet. 11 (citing Ex. 1012 (Declaration of Gerard P. Grenier of IEEE); Ex. 1007, 1 (bearing a date of May 1998 and a copyright of 1998); Ex. 1013; Ex. 1002 ¶ 89).

We turn to the evidence in support of Petitioner's assertion that Rupp is prior art. The center of the first page of Rupp includes "May 1998," and beneath that is "© 1998 IEEE." Ex. 1007, 1. The top of the second page includes "*In: Proceedings of the Sixth IEEE/IFIP International Workshop on Quality of Service, Napa, CA, May 1998, pp. 85-90*. c *1998 IEEE*.1." *Id*. at 2.

In addition to Rupp itself, Petitioner relies on the testimony of Mr. Grenier, who testifies that he is the "Senior Director of Publishing Technologies of The Institute of Electrical and Electronics Engineers, Incorporated ('IEEE')" and that his declaration is "based on [his] personal knowledge and information contained in the business records of IEEE." Ex.

[9] Petitioner asserts that the earliest effective filing date of the application that matured into the '992 patent is October 22, 1999. Pet. 11. Patent Owner does not challenge that assertion.

1012 ¶¶ 1, 5. Attached to his declaration is "Exhibit A," which he contends is a copy of Rupp he obtained through IEEE Xplore. *Id*. ¶¶ 6–9. Mr. Grenier testifies that "article abstracts from IEEE Xplore show[] the date of publication" and that "Xplore populates this information using metadata associated with the publication." *Id*. ¶ 10. Exhibit A is consistent with Mr. Grenier's testimony that article abstracts from Xplore show the date of publication. *Id*. at Exhibit A, 2 (showing Rupp's metadata including a "Published in:" date of 1998 and a "Date of Conference:" date of "18-20 May 1998"). Lastly, Mr. Grenier testifies that Rupp "was published as part of the 1998 Sixth International Workshop on Quality of Service. The 1998 Sixth International Workshop on Quality of Service was held from May 18-20, 1998. Copies of the conference proceedings were made available no later than the last day of the conference." *Id*. ¶ 11.

Petitioner also submits Exhibit 1013, which Petitioner describes as a "Printout from IEEE website regarding INDEX Project Report #98-10P [Rupp]." Pet. iv. Exhibit 1013 includes the same title and authors as Rupp and bears the indicia "Publication Year: 1998." Lastly, Petitioner submits the testimony of Dr. Dordal, who opines that a person having ordinary skill in the art "would have known to attend IEEE workshops like the Sixth International Workshop on Quality of Service or at least look to materials like Report #98-010P [Rupp] published as part of those workshops as a source for relevant technical information." Ex. 1002 ¶ 89.

Whether a document qualifies as a printed publication under 35 U.S.C. § 102 is a question of law based on underlying findings of fact. *In re Enhanced Sec. Research, LLC*, 739 F.3d 1347, 1354 (Fed. Cir. 2014) (citing *In re Hall*, 781 F.2d 897, 899 (Fed. Cir. 1986)). The Federal Circuit

"has interpreted § 102 broadly, explaining that even relatively obscure documents qualify as prior art so long as the public has a means of accessing them." *Id*. (citing *Hall*, 781 F.2d at 899).

> Our leading case on public accessibility is *In re Hall*, 781 F.2d 897 (Fed. Cir. 1986). In *Hall* we concluded that "a single cataloged thesis in one university library" constitutes "sufficient accessibility to those interested in the art exercising reasonable diligence." *Id.* at 900. Thereafter, in *Constant v. Advanced Micro–Devices, Inc.*, we explained that "[a]ccessibility goes to the issue of whether interested members of the relevant public could obtain the information if they wanted to." 848 F.2d 1560, 1569 (Fed. Cir. 1988). Therefore, "[i]f accessibility is proved, there is no requirement to show that particular members of the public actually received the information." *Id.*

*Enhanced Sec. Research, LLC*, 739 F.3d at 1354 (alterations in original). The determination of whether a document is a "printed publication" under 35 U.S.C. § 102 involves a case-by-case inquiry into the facts and circumstances surrounding its disclosure to members of the public. *In re Klopfenstein*, 380 F.3d 1345, 1350 (Fed. Cir. 2004).

In this case, Rupp itself bears a copyright date of 1998 by IEEE. Ex. 1007, 1–2. According to Mr. Grenier, he retrieved a copy of Rupp using IEEE Xplore. Ex. 1012 ¶¶ 6–9. That copy also shows a "Published in:" date of 1998, below the abstract, which Mr. Grenier testifies is customary as "article abstracts from IEEE Xplore show[] the date of publication." *Id*. at Ex. A, ¶¶ 8–10; *see also* Ex. 1013 (showing the same title and authors of Rupp and bearing the indicia "Publication Year: 1998"). Mr. Grenier also testifies that Rupp "was published as part of the 1998 Sixth International Workshop on Quality of Service." Ex. 1012 ¶ 11. He explains that he is the Senior Director of Publishing Technologies of the IEEE and that his

declaration is "based on [his] personal knowledge and information contained in the business records of IEEE." *Id.* ¶¶ 1, 5. His testimony, at this juncture of the proceeding, stands unrebutted and weighs in support of Petitioner's assertions. Despite Patent Owner's arguments, which we address below, we are persuaded, at this juncture of the proceeding, by Petitioner's showing that Rupp was publicly available by December 31, 1998, such that a person having ordinary skill in the art at the time of the invention would have been able to retrieve Rupp. Ex. 1002 ¶ 89.

Furthermore, on the record before us, we are persuaded by Petitioner's showing that Rupp was publicly available before the end of 1998, namely by May 20, 1998. Pet. 11. In support of that assertion, Petitioner relies at least on Mr. Grenier's testimony that "[t]he 1998 Sixth International Workshop on Quality of Service was held from May 18-20, 1998. Copies of the conference proceedings were made available no later than the last day of the conference." Ex. 1012 ¶ 11. As noted above, Mr. Grenier testifies that he is the Senior Director of Publishing Technologies of the IEEE and that his declaration is "based on [his] personal knowledge and information contained in the business records of IEEE." Ex. 1012 ¶¶ 1, 5. His testimony, at this juncture of the proceeding, stands unrebutted that copies of conference proceedings, of which Rupp was part, were made available no later than the last day of the conference. Despite Patent Owner's arguments, which we address below, we determine that Petitioner has shown sufficiently, for now, that Rupp was made available by May 20, 1998, to persons having ordinary skill in the art who would have attended the IEEE Workshop on Quality of Service. Ex. 1002 ¶ 89.

Patent Owner argues that Petitioner fails to show that Rupp is prior art. Prelim. Resp. 29–35. We first address Patent Owner's arguments that evidence in support of Petitioner's showing that Rupp is prior art should be excluded as containing hearsay without an exception. *Id*. In particular, Patent Owner argues that Exhibit 1012 contains hearsay because "any date appearing on IEEE Xplore" articles, such as the attached "Exhibit A" "would be inadmissible hearsay." Prelim. Resp. 32. Patent Owner also argues that "[a]nything else that Petitioner offers in support of a publication date is uncorroborated hearsay." *Id*. at 35.

Patent Owner, however, must follow the proper procedure for objecting to evidence and moving to exclude evidence. *See* 37 C.F.R. § 42.64(b)(1)–(b)(2); *see also LKQ Corp. v. Clearlamp, LLC*, Case IPR2013-00020 (PTAB March 5, 2013) (Paper 17). Patent Owner's request to exclude evidence is premature and would prevent Petitioner from serving supplemental evidence as permitted by Board rules. 37 C.F.R. § 42.64(b)(2). We will not now decide whether the evidence Petitioner relies on in support of its showing that Rupp is prior art should be excluded from the record.

Patent Owner argues that Mr. Grenier never testifies that his Exhibit A is the same as Petitioner's Exhibit 1007. Prelim. Resp. 31. He need not have, as a comparison of Exhibit 1007 with Exhibit A reveals they are nearly the same. We are not persuaded by Patent Owner's argument that they are different documents because the cover pages are not the same. The body of the documents appear to be the same and Patent Owner has not shown any substantive differences.

Patent Owner argues that Mr. Grenier does not offer testimony about when Exhibit A became available for download. *Id*. Again, he need not have. Rather, his testimony goes to corroborating the assertion that Rupp was published at least by December 31, 1998, by showing a retrieved copy of Rupp also bearing a "Published in:" date of 1998, below the abstract, which Mr. Grenier testifies is customary as "article abstracts from IEEE Xplore shows the date of publication." Ex. 1012, Ex. A, ¶ 11. We disagree with Patent Owner that "no such publication date appears in Exhibit A" (Prelim. Resp. 32), as clearly it does. Ex. 1012, Ex. A, 2 (showing a copy of Rupp with a "Published in:" date of 1998). Accordingly, for all of these reasons and those discussed above, we are persuaded, at this stage of the proceeding, that Rupp was publicly available as prior art by at least December 31, 1998, and, therefore, qualifies as prior art under 35 U.S.C. § 102(a).

Patent Owner argues that Mr. Grenier's testimony that "conference proceedings" were "made available" by the last day of the 1998 Sixth International Workshop on Quality of Service conference is not reliable, because he does not provide a foundation for personal knowledge, e.g., that "he attended the conference." Prelim. Resp. 33–35. Patent Owner also argues that Mr. Grenier's vague testimony that "conference proceedings" were "made available" is insufficient to establish public dissemination. *Id*. Patent Owner's argument that personal knowledge is necessary is misplaced. *Hall*, 781 F.2d at 899 (accepting evidence regarding the general library procedure for cataloging as probative value of routine business practice to show the performance of the specific act of cataloging a document). In any event, Patent Owner will have the opportunity to depose Mr. Grenier to

ascertain his knowledge on the subject. Accordingly, for all of these reasons and those discussed above, we are persuaded, at this juncture of the proceeding, that Rupp was publicly available as prior art by May 20, 1998, and, therefore, also qualifies as prior art under 35 U.S.C. § 102(b).

b. What Rupp Describes

Rupp describes an Internet Demand Experiment (INDEX) with the objectives of measuring user demand for Internet access as a function of quality of service (QoS), pricing structure, and application, and demonstrating an end-to-end system that provides access to a diverse group of users at attractive price-quality combinations. Ex. 1007, 1. Rupp describes that the paper "gives an overview of both the technology employed at INDEX and the goals of the experimental design." *Id*. Users of the system select network services from a menu of QoS-price offerings and pay for their usage. *Id*. at 2.

Users use a Cisco 762 ISDN router and phone line to connect to the INDEX network. *Id*. at 3, Fig. 1. "At the INDEX NOC, all connections are through either a Cisco 7507 or 7515 Internet router." *Id*. These routers distribute user traffic over a set of Billing Gateways designed to meter usage and adjust service quality of individual connections. *Id*. Users may select a service quality from a currently active menu of choices at any time. *Id*. at 3, Figs. 1, 2. User traffic is monitored and recorded. The database includes a record for each TCP connection, user ID, time stamp, selected QoS/price information, and other data describing the type of user activity. *Id*. at 3.

*2. Chandran*

Chandran describes a time-based buffering system that buffers data based on how long data should be held to comply with a traffic shaping

policy. Ex. 1005, (57). Chandran describes that traffic-shaping policies were employed to "limit a network entity to the amount of bandwidth that it has paid for." *Id*. at 1:13–18. Figure 1 of Chandran is reproduced below.

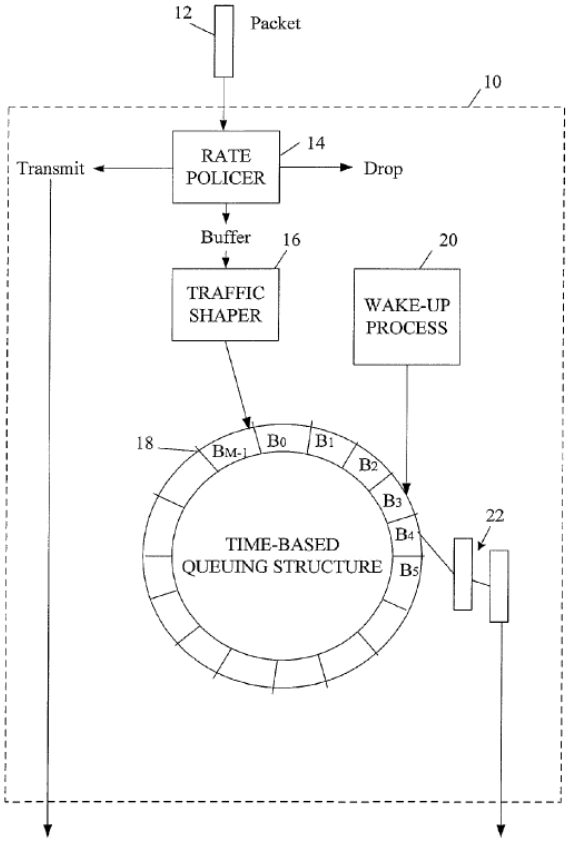


Figure 1

Figure 1 of Chandran shows a block diagram with logical elements of a time-based queuing system implemented on a network device. Ex. 1005, 3:48–51.

As seen from above, Chandran shows a network interface 10 that receives packet 12 and that connects a local network to an outside network. *Id*. at 4:40–44. Interface 10 controls traffic to or from particular network nodes for which it is responsible. *Id*. at 4:47–48. The nodes may have

limitations in the rate that they can send and receive traffic over the network, and the interface may have to shape traffic associated with a particular node. *Id*. at 4:48–54. Policing block or policer 14 is implemented as hardware, firmware, or software executed on one or more processors and determines whether a packet should be transmitted, dropped, or buffered in a time-based queue. *Id*. at 4:55–60. The policer may employ policing algorithms such as token bucket or leaky bucket algorithms. *Id*. at 4:63–64. Assuming policer 14 determines that packet 12 should be buffered, it passes the packet to traffic-shaping block 16, which determines where to buffer packet 12. *Id*. at 5:8–11. Policer determines whether a policy for the destination would be breached by transmitting the packet. *Id*. at 5:41–43. If transmission would violate a policy, policer 14 calculates a traffic-shaping delay, and if the delay is less than a maximum shaping delay, policer 14 forwards the packet to traffic shaper 16. *Id*. at 5:49–63. Traffic shaper 16 finds a bucket that is scheduled to dequeue its contents at or near the time when the calculated traffic shaper delay is up. *Id*. at 5:63–6:3.

3. *Discussion*

Petitioner relies on Chandran to meet all elements of claims 1 and 9 except for the limitation of "a user profile record associated with a user" (claim 1) and the similar limitation "user profile associated with the user" (claim 9). Pet. 41. For these "user profile" limitations, Petitioner relies on Rupp. The present record supports Petitioner's contentions.

For example, Petitioner contends that Chandran describes a first network interface for communicating over a link with a user device. *Id*. at 42–43 (citing Ex. 1005, 1:16–18, 4:41–42, 4:55–56, 5:23–25, 14:49–52, 15:30–32, Figs. 1, 5a, 9). Petitioner further contends that Chandran

describes a second network interface for communicating with one or more computer networks. *Id*. at 44 (citing Ex. 1005, 4:22–24, 4:44–46, 14:65–15:7, Figs. 1, 9). Petitioner asserts that Chandran describes a processor that is configured to calculate a delay period associated with a received packet based on the network communication bandwidth associated with the user and that delays transmission of the packet based on the delay period as recited in claim 1. *Id*. at 44–47 (citing multiple passages from Ex. 1005). Petitioner further asserts that Rupp describes a user profile as claimed. *Id*. at 47–49 (citing Ex. 1007 §§ 2.2, 2.3).

Petitioner also provides asserted reasons why a person of ordinary skill would have been motivated to modify Chandran with Rupp's user profile. *Id*. at 49–53 (citing Ex. 1002 ¶¶ 91–97). For example, Petitioner contends that Chandran and Rupp are analogous art because both are directed to the same problem of enforcing bandwidth constraints so that other network devices or connections have sufficient bandwidth for packet transmission. *Id*. at 49. Petitioner contends that a person having ordinary skill in the art faced with the problem to be solved in Chandran of enforcing bandwidth constraints would have looked to other references involving solutions to the same problem, such as Rupp. *Id*. at 49–50 (citing Ex. 1002 ¶ 92).

Petitioner further asserts that a person having ordinary skill in the art would have been motivated to implement Rupp's technique of dynamically selected service classes with desired bandwidths for user devices in user profiles so they can be retrieved later for traffic management. *Id*. at 50 (citing Ex. 1002 ¶ 92). Petitioner contends, with supporting evidence, that storing bandwidth classes in a user profile would be the most efficient and

least costly way to store and retrieve user-selected bandwidths. *Id*. We have reviewed the remaining reasons Petitioner provides for combining Chandran and Rupp and preliminarily determine that such showing is persuasive, despite Patent Owner's arguments, addressed below.

Independent claim 9 is similar to claim 1. Petitioner's showing for claim 9 is nearly the same as that for claim 1, while sufficiently accounting for differences between claim 9 and claim 1. *See* Pet. 41–53.

Patent Owner's arguments and Analysis

Patent Owner argues that Rupp is not analogous art because it is neither in the same field of endeavor as the '922 patent nor reasonably pertinent to the particular problem addressed by the '922 patent's inventors. Prelim. Resp. 35–38.

The test for determining whether a prior art reference constitutes analogous art to the claimed invention is (1) whether the prior art is from the same field of endeavor, regardless of the problem addressed, and (2) if the reference is not within the field of the inventor's endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved. *See In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004).

Patent Owner disagrees with Petitioner's assertion that Rupp is in the same field of endeavor as the '922 patent because Rupp is directed to "enforcing bandwidth constraints so that other network devices or connections have sufficient bandwidth for packet transmission." Prelim. Resp. 35–36 (quoting Pet. 49). Patent Owner argues that "Petitioner is wrong about Rupp." *Id*. at 36. Patent Owner's arguments are focused on Rupp being a "non-technical paper," summarizing a microeconomics

experiment determining user demand and user behavior that merely discusses network bandwidth. *Id*. at 36–37. Patent Owner overlooks, however, the technical aspects of Rupp. Rupp describes that it has two main objectives, including "[d]emonstration of an end-to-end system that provides access to a diverse group of users at attractive price-quality combinations." Ex. 1007, Abstract. Rupp further describes "a single system that offers variable service quality-price combinations that meet the needs of a diverse user population, an automated billing system that also gives the user control over service selection, and a remotely operated network monitoring and management system." *Id*. § 1. As a further example, Rupp provides an overview of the technology employed at INDEX, described as including Billing Gateways designed to meter usage and selectively adjust service quality of individual connections. *Id*. § 2.1, Fig. 1. Accordingly, at this stage of the proceeding, we disagree that Rupp is a nontechnical paper or merely discusses network bandwidth. On this record, we are persuaded by Petitioner's contention that Rupp is directed to "enforcing bandwidth constraints so that other network devices or connections have sufficient bandwidth for packet transmission" and, therefore, is in the same field of endeavor as the '922 patent. Pet. 49 (citing Ex. 1002 ¶ 91; Ex. 1007, Abstract); *see*, *e.g.*, Ex. 1001, 1:20–24 ("The present invention relates generally to bandwidth management in a communications network and, more particularly, to a method and apparatus for providing dynamic bandwidth management on a per subscriber basis in a communications network.").

Patent Owner argues that a person having ordinary skill in the art would not have been motivated to combine Chandran and Rupp nor would

such person have had a reasonable expectation of succeeding in combining Chandran and Rupp to arrive at the claimed invention. Prelim. Resp. 38–43. In particular, Patent Owner argues that Rupp is based on a complex and inefficient network topology and would be incompatible with Chandran's objective of scalability and efficient use of resources. *Id*. at 39–43. Patent Owner argues that modifying Chandran with Rupp as Petitioner proposes would render Chandran unsatisfactory for its intended objective of efficient, scalable traffic shaping. *Id*. (citing Ex. 2001 ¶ 69). We disagree.

Petitioner relies on Rupp to teach a user profile. *See, e.g.*, Pet. 47. Petitioner explains that Chandran's router 10 already has memory connected to the policing block that calculates the delay period. Pet. 53. Petitioner proposes modifying Chandran's router 10 with minor software adjustments, such that the memory "would merely need to be populated with the user profiles, just like the database" in Rupp and the "router's policing block [to] be programmed to use that bandwidth to determine whether and how long to delay packet transmission." *Id*.

On the other hand, Patent Owner's arguments and its witness Dr. Sirovica's testimony on the matter (Ex. 2001 ¶ 69) are based on bodily incorporating Rupp into Chandran without considering what the combined teachings of Rupp and Chandran would have suggested to a person having ordinary skill in the art. *See Keller*, 642 F.2d at 425. For example, Patent Owner argues that Petitioner's modification "would require incorporating the complex and inefficient network topology and communication flowpaths of Rupp's figure 1, which would render Chandran unsatisfactory for its intended objective of efficient, scalable traffic shaping." Prelim. Resp. 41 (citing Ex. 2001 ¶ 69). Petitioner, however, does not propose incorporating

all of the technicalities of Rupp's Figure 1 into Chandran, and, therefore, we disagree with Patent Owner's arguments.

Based on the current record before us, we are persuaded by Petitioner's showing that Chandran and Rupp teach or suggest each limitation of claims 1 and 9 and that a person of ordinary skill in the art would have had reason, with rational underpinning, to combine the references in the manner Petitioner proposes. Accordingly, we determine the information presented shows a reasonable likelihood that Petitioner would prevail in establishing that claims 1 and 9 are unpatentable under § 103 as obvious over Chandran in view of Rupp.

## III. CONCLUSION

For the foregoing reasons, we determine that the information presented establishes a reasonable likelihood that Petitioner would prevail in showing that claims 1 and 9 of the '922 patent are unpatentable.

## IV. ORDER

Accordingly, it is:

ORDERED that pursuant to 35 U.S.C. § 314(a), an *inter partes* review is hereby instituted as to claims 1 and 9 of the '922 patent on the grounds set forth in the Petition;

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial; the trial will commence on the entry date of this decision; and

FURTHER ORDERED that Petitioner is authorized to file, within ten days of this decision, a corrected Exhibit 1002 that complies with our rules (37 C.F.R. §§ 1.68, 42.2, 42.53(a)).

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