

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CISCO SYSTEMS, INC.,
Petitioner

v.

NETSOCKET, INC.,
Patent Owner

IPR2023-00607
U.S. Patent No. 7,190,698 B2

**PETITIONER'S REPLY
TO PATENT OWNER'S RESPONSE**

TABLE OF CONTENTS

Petitioner’s Exhibit List	4
I. Introduction.....	7
II. Claim construction.....	7
A. <i>Preamble</i>	7
B. <i>“bandwidth broker”</i>	7
III. Claim 1 is Obvious in View of Xiao, Schelen-1, and Gibson.....	8
A. Xiao renders obvious “... <i>a packet based communication network including network domains, wherein at least one domain is a Multiprotocol Label Switching MPLS domain...</i> ” (limitations [1.0.1]-[1.0.2])	8
B. The prior art renders obvious “... <i>wherein the bandwidth broker (BB) is associated to each network domain...</i> ” (limitations [1.0.3]-[1.0.4])	10
C. The prior art renders obvious “ <i>BB_A establishes the different domains involved to reach the destination network (DST)</i> ” (limitation [1.2])	15
D. The prior art renders obvious “... <i>BB_A directly or indirectly passes requests to all Bandwidth Brokers (BB) of the involved domains regarding a VLL of the predefined QoS from ingress to egress of each domain...</i> ” (limitation [1.3]).....	18
E. The prior art renders obvious “... <i>each involved bandwidth broker (BB) performs admission control in its domain...</i> ” (limitation [1.4])	18
F. The prior art renders obvious “... <i>each involved bandwidth broker (BB) returns a result of the admission control to BBA that passes it back to the requesting entity and if the request was admitted along all domains between the source (SRC) and the destination</i> ”	

	<i>(DST) a VLL of the predefined QoS is granted...</i> (limitations [1.5.1]-[1.5.2])	19
G.	The prior art renders obvious “...characterized in that step iv) comprises the following step: performing [LSP] Label Switched Path, LSP setup...” (limitation [1.6.1])	19
H.	The prior art renders obvious “...passing resource requests from the Bandwidth Broker (BB) to at least one intradomain (IDB), wherein each intra-domain broker (IDB) is responsible for admission control and the Label Switched Path, LSP, setup...” (limitations [1.6.2]-[1.7.2])	23
IV.	Claims 2-5 and 7-8 are Obvious in View of Xiao, Schelen-1, and Gibson ..	26
V.	Claims 4-8 are Obvious in View of Xiao, Schelen-1, Gibson, and Schelen-2	26
VI.	Conclusion	30
	Certificate of Word Count	31
	Certificate of Service	32

PETITIONER'S EXHIBIT LIST

Ex.1001	U.S. 7,190,698
Ex.1002	Prosecution History of U.S. 7,190,698
Ex.1003	Declaration of Henry H. Houh, Ph.D. under 37 C.F.R. § 1.68
Ex.1004	<i>Curriculum Vitae</i> of Henry H. Houh, Ph.D.
Ex.1005	"Internet QoS: A Big Picture," Xiao <i>et al.</i> , ("Xiao")
Ex.1006	U.S. 6,678,264 to Gibson ("Gibson")
Ex.1007	"Resource sharing in advance reservation agents," Schelén <i>et al.</i> , ("Schelen-2")
Ex.1008	Multiprotocol Label Switching Architecture, Rosen <i>et al.</i>
Ex.1009	RFC 1518
Ex.1010	U.S. 6,701,437
Ex.1011	"Performance of QoS Agents for Provisioning Network Resources," Schelen <i>et al.</i>
Ex.1012	Schelen, O. "Quality of Service Agents in the Internet," Doctoral Thesis, Department of Computer Science and Electrical Engineering, Division of Computer Communication, Lulea University of Technology, Lulea 1998 ("Schelen Thesis")
Ex.1013	U.S. 6,079,020
Ex.1014	U.S. 6,487,170
Ex.1015	"An Architecture for Differentiated Services," Blake <i>et al.</i>
Ex.1016	"RATES: A Server for MPLS Traffic Engineering," Aukia <i>et al.</i>
Ex.1017	"White Paper - QoS protocols & architectures," QoSforum.com
Ex.1018	U.S. 5,884,297

Ex.1019	"Advance Reservations for Predictive Service in the Internet," Degermark <i>et al.</i> , ("Degermark")
Ex.1020	"A Discussion of Bandwidth Broker Requirements for Internet2 Qbone Deployment," Hares <i>et al.</i> , Internet2 Qbone BB Advisory Council, August 1999
Ex.1021	"A two-tier resource management model for the Internet," by Terzis et al., <i>Seamless Interconnection for Universal Services. Global Telecommunications Conference. GLOBECOM'99. (Cat. No.99CH37042)</i> , 1999, pp. 1779-1791 vol.3, doi: 10.1109/GLOCOM.1999.832469
Ex.1022	"Definition of the Differentiated Services Field (DS Field) in the IPv4 and IPv6 Headers," Nichols <i>et al.</i>
Ex.1023	"Network Element Service Specification Template," Shenker <i>et al.</i> ,
Ex.1024	"Specification of Guaranteed Quality of Service," Shenker <i>et al.</i>
Ex.1025	"A Two-Tier Resource Management Model for Differentiated Services Networks," Reichmeyer <i>et al.</i>
Ex.1026	Andrew T. Campbell "A Quality of Service Architecture," Doctoral Thesis, Computing Department Lancaster University, Lulea 1996
Ex.1027	U.S. 6,744,767
Ex.1028	"Current status on quality of service in IP," Chiu
Ex.1029	"A Framework for IP Based Virtual Private Networks," Gleeson <i>et al.</i>
Ex.1030	"An Architecture for Advance Reservations in the Internet," Berson <i>et al.</i>
Ex.1031	"Sharing resources through advance reservation agents," Schelen <i>et al.</i> published in Proceedings of IFIP Fifth International Workshop on Quality of Service (IWQoS'97), New York
Ex.1032	"An Agent-based Architecture for Advance Reservations," Schelen

	<i>et al.</i> , (“Schelen-1”)
Ex.1033	“A Two-bit Differentiated Services Architecture for the Internet,” Nichols <i>et al.</i>
Ex.1034	“Aggregating Resource Reservations over Multiple Routing Domains,” Schelen <i>et al.</i>
Ex.1035	“A Better Model for Generating Test Networks,” Doar <i>et al.</i>
Ex.1036	Complaint filed on May 24, 2022
Ex.1037	Amended complaint filed on August 19, 2022
Ex.1038	“Modeling Internet Topology,” Doar <i>et al.</i>
Ex.1039	Declaration of Ingrid Hsieh-Yee, Ph.D. under 37 C.F.R. § 1.68
Ex.1040	’698 Patent Provisional Application (from WIPO)
Ex.1041	Proposed Docket Control Order, <i>NetSocket, Inc., v. Cisco Systems, Inc.</i> , Civil Action No. 2:22-cv-172-JRG (E.D. Tex, Dec. 21, 2022)
Ex.1042	Federal Court Statistics
Ex.1043	Joint Motion to Amend the Docket Control Order
Ex.1044	Attachment A, Joint-Proposed Case Management Schedule
Ex.1045 (NEW)	Deposition Transcript of Dr. Paul Congdon
Ex.1046 (NEW)	Second Declaration of Dr. Henry Houh under 37 C.F.R. § 1.68

I. Introduction

Patent Owner's Response ("Resp.," Paper 17) presents meritless arguments contending that most claim limitations are not taught. The Board's Institution Decision correctly "determine[d] that Petitioner's challenge to claim 1 meets the 'compelling merits' standard as set forth in the *Fintiv* Memo," ("Inst. Dec.," Paper 11) and for the detailed reasons discussed below, the Board should find all challenged claims unpatentable.

II. Claim construction

A. *Preamble*

Patent Owner contends that the preamble is limiting because "several terms in the preamble of Claim 1 are essential to understanding those limitations within Claim 1 and its dependent claims." Resp. 5-8. Regardless of whether the preamble is limiting, the prior art renders obvious the preamble as analyzed in the Petition and further discussed below. Ex.1046, ¶5.

B. "*bandwidth broker*"

The Petition explained that a POSITA would have understood "*bandwidth broker*" to include entities that manage policies for bandwidth resources by, for example, maintaining resource information, providing admission control, configuring the network, or communicating with neighboring bandwidth brokers to allocate resources across multiple domains. Patent Owner does not dispute

Petitioner's interpretation, but rather contends that "Petitioner's construction...is not necessary." Resp. 8. Since Patent Owner does not dispute Petitioner's interpretation, the Board need not expressly construe this term. *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999). Ex.1046, ¶6.

III. Claim 1 is Obvious in View of Xiao, Schelen-1, and Gibson

A. Xiao renders obvious "...a packet based communication network including network domains, wherein at least one domain is a Multiprotocol Label Switching MPLS domain..." (limitations [1.0.1]-[1.0.2])

The Petition explained that Xiao's Figure 4 includes a majority of the recited limitations and that "[i]t would have been obvious to a POSITA to implement multiple ISPs in the communications network of Figure 4, including ISPs that support different QoS protocols such as DiffServ and MPLS, since Xiao itself suggests this modification." Pet. 19-20; Ex.1005, 14 ("MPLS can be used together with differentiated services to provide QoS.... DS-field based and MPLS-based architectures can easily interoperate."). Ex.1046, ¶¶7-8.

Rather than address the Petition and Xiao's express teachings of using MPLS and DiffServ together, Patent Owner contends that Xiao's teaching is insufficient because "Fig. 4 is obviously under Xiao's heading of 'Differentiated Services' and "there is a separate section in Xiao titled MPLS, which has a sole graphical representation marked Fig. 5." Resp. 12-13. Patent Owner's individual

attack on Xiao's disclosure is improper, when the Petition presented a rejection based on Xiao's MPLS and DiffServ combined teachings. *In re Merck & Co., Inc.*, 800 F.2d 1091, 1097–98 (Fed. Cir. 1986) (“Non-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references.” (citations omitted)); *Game & Tech Co. v. Wargaming Grp. Ltd.*, 942 F.3d 1343, 1352 (Fed. Cir. 2019). The Board should read Xiao for what it teaches as a whole.

Additionally, Patent Owner's conclusory assertion that a POSITA would not be “motivated” to make the proposed modification to Xiao's Figure 4 ignores the numerous reasons articulated in the Petition. Pet. 20-24. The Petition explained the motivation to modify by reference to two example scenarios, a parallel example and a series example. In the parallel example, the proposed modification would be “beneficial since, if one ISP is unavailable, the customer would still be able to obtain service through the parallel ISP.” Pet. 22. The modification would also “reduce the chance of exceeding peak rates and thereby avoid dropping excess traffic” and “may also provide cost savings.” Pet. 22. In the series example, the proposed modification is beneficial since it “allow[s] for reaching destinations that are not directly connected to the same ISP domain as the source.” Pet. 23-24. Patent Owner does not dispute and therefore concedes these reasons to make the proposed modification to Figure 4. *See* 37 C.F.R. § 42.23(a) (facts not denied are

admitted); *In re NuVasive, Inc.*, 842 F.3d 1376, 1380-81 (Fed. Cir. 2016); *Google LLC v. Uniloc 2017 LLC*, IPR2020-00447, Paper 24 at 9-10 n. 6 (May 11, 2021).

Patent Owner's no-motivation argument is also contradicted by the testimony of its expert, Dr. Congdon. In deposition, Dr. Congdon explained that **"MPLS was very important technology... it was important to make those networks interoperate** or to -- or it was important to connect, interconnect them." Ex.1045, 51:6-19; *see also* Ex.1045, 49:2-9. This testimony is consistent with, and directly supports, the Petition's argument that it would have been obvious to "support different QoS protocols such as DiffServ and MPLS" in a network like that shown in Xiao's Fig. 4. Pet. 19-20; Ex.1046, ¶9.

B. The prior art renders obvious "...wherein the bandwidth broker (BB) is associated to each network domain..." (limitations [1.0.3]-[1.0.4])

First, the Petition explained that "it would have been obvious to a POSITA to associate a bandwidth broker with MPLS domain ISP2 in modified Figure 4" in view of Xiao's teachings that "it is technically better to have a BB [bandwidth broker] to allocate resources" and that "[a]t the ISP side, admission control decisions can be made...by a BB." Pet. 28-29; Ex.1005, 11, 12; Ex.1046, ¶10.

Patent Owner—ignoring the cited portion of Xiao—argues that Xiao's "Fig. 5 is the only graphic representation of MPLS" where a bandwidth broker is not "required in Xiao's ISPs." Resp. 15-16. Patent Owner also contends that "Xiao

teaches away from this claim limitation” because “Xiao chose exemplary Fig. 5 of an MPLS-based architecture to have no bandwidth broker in the ISP.” Resp. 16-17. These arguments are unavailing.

Patent Owner's argument regarding Xiao's “Fig. 5...graphic representation” is misplaced, since the Petition relied on Xiao's express teaching to use a bandwidth broker in the MPLS ISP in Figure 4. Pet. 28-29. Dr. Houh provides confirmatory testimony that “a POSITA would have been motivated to associate a bandwidth broker in the MPLS domain ISP2 of modified Figure 4 since **‘it is technically better to have a BB [bandwidth broker] to allocate resources’** and to perform **‘admission control decisions.’**” Ex.1046, ¶10; Ex.1003, ¶165; Ex.1005, 11, 12. Additionally, as discussed in the Petition and Dr. Houh's first declaration, a bandwidth broker **“provides scaling benefits.”** Ex.1003, ¶166; Ex.1011, 17; Ex.1025, 1; Ex.1046, ¶10.

Patent Owner's expert, Dr. Congdon agreed that bandwidth brokers were recognized as technically desirable to allocate resources and to provide scaling, among other benefits:

21 Basically, **it was recognized that it was**
22 **technically desirable to have [] a bandwidth**
23 **broker to allocate resources**, to provide quality of
24 service, **scaling**, and interoperable solutions. Is
25 that correct?

2 A. **Yeah, that's -- that's an important aspect**

3 of it.

Ex.1045, 42:21-43:3; *see also* Ex.1045, 43:3-44:23; Ex.1046, ¶11.

Patent Owner also confuses Xiao's example of Figure 5 (which does not "require" a bandwidth broker), as somehow categorically excluding or generally teaching away from using bandwidth brokers in MPLS networks. To the contrary, as Dr. Houh explains "Xiao's statement that 'BBs may not be needed in MPLS-based ISP networks' leaves open circumstances where using a bandwidth broker are in fact needed or at the very least beneficial." Ex.1046, ¶12. "A POSITA would have understood that Xiao does not teach away from using a bandwidth broker in the MPLS domain ISP2 since Xiao recognizes that it is technically better to use a bandwidth broker." Ex.1046, ¶12.

Second, the Petition also cited Schelen-1's teaching that "[f]or each routing domain in the network, there will be a reservation agent [bandwidth broker] responsible for admission control" and Gibson's teachings that the MPLS network has a "management layer" that includes "[a]dmission manager[s] responsible for maintaining network topology information" and "provides admission control to the communication network." Pet. 29; Ex.1032, 451-452; Ex.1006, 6:11-16, 7:1-48; Ex.1046, ¶13.

Patent Owner contends that there "would be no motivation to combine Xiao with [] Schelen-1...to obviate this claim limitation" because "Schelen-1 does not

even mention an MPLS-based architecture.” Resp. 17. This argument ignores that Schelen-1 provides a high-level discussion of techniques and concepts applicable to routing domains (also called autonomous systems) whatever protocols they use. *See* Ex.1032, 452 (“an AS is an administrative domain containing a number of routers running a routing protocol internally.... routing domain (AS)...”). Schelen-1 provides a general teaching that “[f]or each routing domain in the network, there will be a reservation agent [bandwidth broker] responsible for admission control.” Ex.1032, 451-452. As Dr. Houh explains, “a POSITA would have recognized that Schelen-1’s teaching is not limited to any particular network but rather generally applicable to networks at large.” Ex.1046, ¶14. Dr. Houh further explains that “a POSITA would have recognized that as a practical matter, networks at large, in real-world scenarios, used both DiffServ and MPLS domains to provide QoS.” Ex.1046, ¶14; *see also* Ex.1003, ¶49; Ex.1017, 16 (“In real-world use, it is unlikely that [DiffServ and MPLS] QoS protocols will be used independently, and in fact they are designed for use with other QoS technologies to provide top-to-bottom and end-to-end QoS between senders and receivers.”).

Also, Patent Owner is wrong that there “would be no motivation to combine Xiao with...Gibson to obviate this claim limitation” because “Gibson does not disclose any relationship between its ‘admission managers’ and their associations with network domains.” Resp. 17. The Petition explained “that Gibson’s admission

manager, which is part of the management layer, maintains network topology, and provides admission control, corresponds to a '*bandwidth broker*.'" Pet. 29; Ex.1006, 6:11-16, 7:1-48. Patent Owner provides no reasoning or evidence as to why Gibson's admission manager, which is part of the management layer, maintains network topology, and provides admission control, is not a "*bandwidth broker*" of the MPLS domain. Ex.1046, ¶15.

This is not surprising, since Patent Owner's expert, Dr. Congdon, agreed that a bandwidth broker is an entity that provides admission control (just like Gibson's admission manager of the MPLS domain):

1 A. Yeah. So in April 2000 time frame, a
2 **bandwidth broker was some -- again, some kind of**
3 **entity**, say -- let's say a software entity or a
4 software running on a hardware entity that was
5 responsible for managing resource allocations,
6 **doing admission control** and managing resource
7 allocations in a domain or in a local area network.

Ex.1045, 40:1-7; Ex.1046, ¶15.

Patent Owner also ignores (and therefore concedes) the Petition's articulated reasoning to combine the teachings of Xiao, Schelen-1, and Gibson, including providing scaling benefits, and minimizing reservation state and admission control overhead. Pet. 16-18, 30-32. As already noted above, Patent Owner's Dr. Congdon testified during deposition that bandwidth brokers were recognized in the art as

technically desirable to allocate resources and to provide scaling, among other benefits. Ex.1045, 42:21-43:3.

C. The prior art renders obvious “*BB_A establishes the different domains involved to reach the destination network (DST)*” (limitation [1.2])

First, the Petition explained, in significant detail, how Xiao's disclosure renders obvious this limitation. Pet. 40-44. Patent Owner does not address any of the evidence and reasoning of how Xiao renders obvious this limitation. Rather, Patent Owner only argues that “[s]ince Petitioner fails to show how the combination of Xiao, Schelen-1, and Gibson discloses, teaches, or suggests ‘wherein the bandwidth broker (BB) is associated to each network domain,’ it therefore cannot disclose, teach, or suggest” this limitation. Therefore, if the Board determines that limitation [1.0.3] is rendered obvious, there is no dispute that Xiao renders obvious this limitation.

Second, the Petition explained that Schelen-1 teaches listening to a multicast address, where all bandwidth brokers “giv[e] their identity and which routing domain (AS) they are responsible for,” so that a bandwidth broker establishes the existence of all other bandwidth brokers and their domains. Pet. 43-44; Ex.1032, 452. The Petition further explained that “it would have been obvious to a POSITA for each of the bandwidth brokers associated with Xiao's domains (see [1.0.3]) to

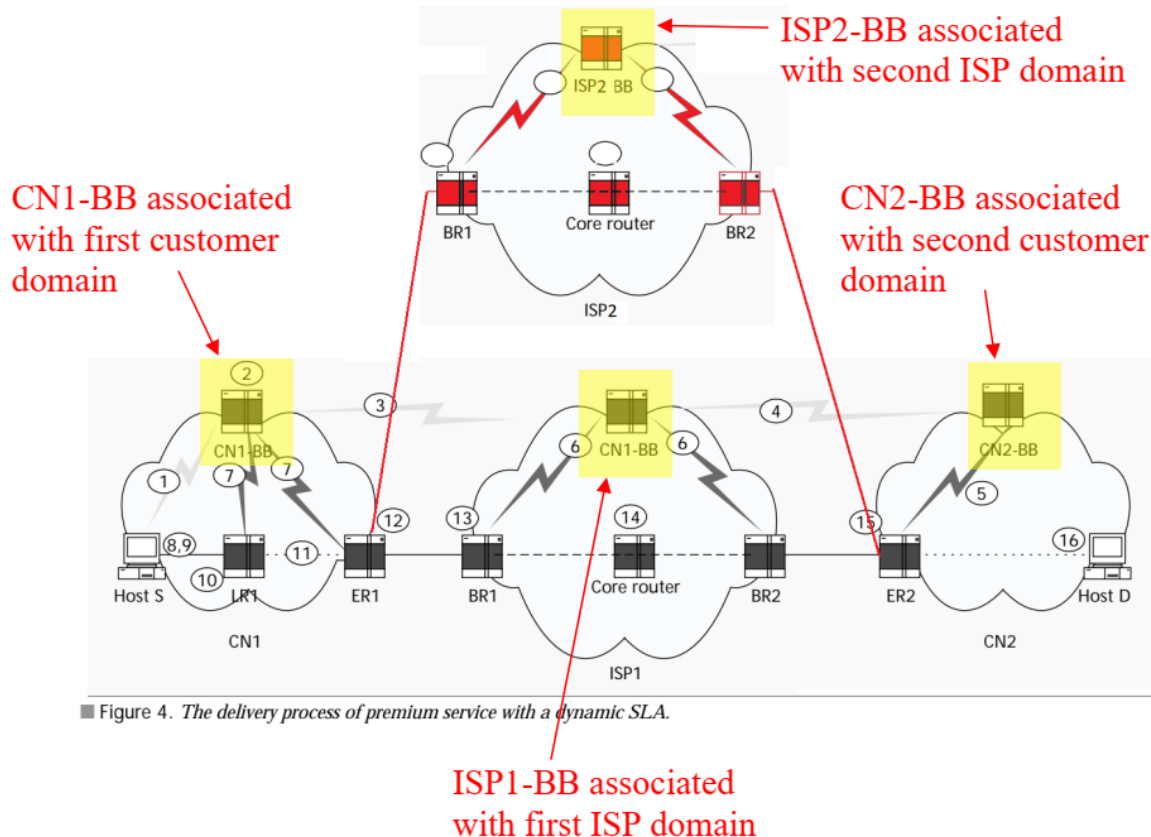
communicate via a multicast address...to establish the existence of all other bandwidth brokers and their respective domains.” Pet. 43-44; Ex.1046, ¶16.

Patent Owner contends that Schelen-1’s teaching is insufficient because “every reservation agent in Schelen-1 must work *together*.” Resp. 18 (emphasis in original). This argument is meritless. Patent Owner does not identify a claim limitation that precludes a bandwidth broker from communicating with other bandwidth brokers on a multicast address to establish the different domains involved. Ex.1046, ¶16.

Moreover, Patent Owner’s argument “that Schelen-1’s disclosure of the knowledge of other bandwidth brokers’ existence does not mean any bandwidth broker ‘establishes the different domains involved to reach the destination network (DST)’” is of no moment. Resp. 18. The Petition, and Dr. Houh, relied on Schelen-1’s teaching that all bandwidth brokers “**giv[e] their identity and which routing domain (AS) they are responsible for.**” Pet. 43-44; Ex.1032, 452. As such, all of the bandwidth brokers establish the existence of all other bandwidth brokers and their corresponding domains that they are responsible for. Ex.1046, ¶17.

To illustrate with the parallel example of Figure 4, in the combined teachings of Xiao and Schelen-1, because all bandwidth brokers (e.g., CN1-BB, ISP1-BB, ISP2-BB, and CN2-BB) give their identity and which routing domain (AS) they are responsible for on a multicast channel, CN1-BB establishes the

existence of all other bandwidth brokers and their domains involved to reach the destination customer network CN2. Pet. 43-44; Ex.1046, ¶18.



Ex.1005, Fig. 4 (annotated and modified showing parallel ISPs); Ex.1003, ¶164.

Patent Owner does not dispute (and therefore concedes) the Petition's articulated reasoning to combine these references. Pet. 16-17, 43-44. *See* 37 C.F.R. § 42.23(a) (facts not denied are admitted); *In re NuVasive*, 842 F.3d 1380-81; *Uniloc*, IPR2020-00447, Paper 24 at 9-10 n. 6.

D. The prior art renders obvious “...*BB_A directly or indirectly passes requests to all Bandwidth Brokers (BB) of the involved domains regarding a VLL of the predefined QoS from ingress to egress of each domain...*” (limitation [1.3])

Patent Owner only argues that “[s]ince Petitioner fails to show how the combination of Xiao, Schelen-1, and Gibson discloses, teaches, or suggests ‘wherein the bandwidth broker (BB) is associated to each network domain,’ it therefore cannot disclose, teach, or suggest” this limitation. Therefore, if the Board determines that limitation [1.0.3] is rendered obvious, there is no dispute that the prior art renders obvious this limitation.

E. The prior art renders obvious “...*each involved bandwidth broker (BB) performs admission control in its domain...*” (limitation [1.4])

The Petition explained how the prior art renders obvious this limitation. Pet. 49-51. Patent Owner does not address any of the evidence and reasoning in the Petition. Rather, Patent Owner argues that “[s]ince Petitioner fails to show how the combination of Xiao, Schelen-1, and Gibson discloses, teaches, or suggests ‘wherein the bandwidth broker (BB) is associated to each network domain,’ it therefore cannot disclose, teach, or suggest” this limitation. Resp. 20. Therefore, if the Board determines that limitation [1.0.3] is rendered obvious, there is no dispute that the prior art renders obvious this limitation. Moreover, as discussed above, Patent Owner's arguments regarding Xiao's Figure 5 are meritless, since the Petition relied on Xiao's teachings that “it is technically better to have a BB

[bandwidth broker] to allocate resources” and that “[a]t the ISP side, admission control decisions can be made...by a BB.” Resp. 20-21; Pet. 49-50; Ex.1005, 11, 12.

F. The prior art renders obvious “...each involved bandwidth broker (BB) returns a result of the admission control to BB_A that passes it back to the requesting entity and if the request was admitted along all domains between the source (SRC) and the destination (DST) a VLL of the predefined QoS is granted...” (limitations [1.5.1]-[1.5.2])

Patent Owner only argues that “[s]ince Petitioner fails to show how the combination of Xiao, Schelen-1, and Gibson discloses, teaches, or suggests ‘wherein the bandwidth broker (BB) is associated to each network domain,’ or ‘iv[’]) each involved bandwidth broker (BB) performs admission control in its domain,’ it therefore cannot disclose, teach, or suggest” this limitation. Resp. 21-22. Therefore, if the Board determines that limitations [1.0.3] and [1.4] are rendered obvious, there is no dispute that the prior art renders obvious this limitation.

G. The prior art renders obvious “...characterized in that step iv) comprises the following step: performing [LSP] Label Switched Path, LSP setup...” (limitation [1.6.1])

First, the Petition explained, in significant detail, the obviousness of this limitation based on Xiao's disclosure that “[w]ith MPLS, LSPs are set up” and that “LSP setup can be...data-driven (i.e., triggered by the request of a flow or traffic trunk).” Pet. 54. Patent Owner does not address any of the evidence and reasoning

of how Xiao renders obvious this limitation. Rather, Patent Owner only argues that “[s]ince Petitioner fails to show how the combination of Xiao, Schelen-1, and Gibson discloses, teaches, or suggests either ‘iv) each involved bandwidth broker (BB) performs admission control in its domain,’ it therefore cannot disclose, teach, or suggest” this limitation. Resp. 22-23. Therefore, if the Board determines that limitation [1.4] is rendered obvious, there is no dispute that Xiao renders obvious this limitation. Ex.1046, ¶19.

Second, the Petition additionally explained that Gibson, in the context of Figure 2, discloses “Dynamic LSP addition” to set up “a new LSP,” where the admission manager sends a CR-LDP message to Administrative Server for new high capacity label switch paths across the MPLS network. Pet. 54-55; Ex.1006, 8:11-9:10, Fig. 2.

Patent Owner argues that “a person of ordinary skill in the art would not have understood admission managers to correspond to bandwidth brokers because they do not perform any of the exemplary activities of a bandwidth broker described in the ’698 Patent.” Resp. 23. This is wrong.

The ’698 patent explains that a “bandwidth broker is an entity...that manages policies,” including performing activities such as “maintaining a database of the domain’s resources” and “provid[ing] admission control,” among other management activities. Ex.1001, 2:27-55. As Dr. Houh explains, “Gibson’s

admission manager, which is part of the 'management layer,' is 'responsible for maintaining network topology information,' and 'provides admission control to the communication network,' clearly performs exemplary activities delineated in the '698 patent and therefore corresponds to a '*bandwidth broker*.'" Ex.1046, ¶20; *see also* Pet. 29; Ex.1003, ¶49; Ex.1006, 6:11-16, 7:1-48. Patent Owner's expert, Dr. Congdon, agrees. Ex.1045, 40:1-7 ("...a bandwidth broker was some -- again, some kind of entity...responsible for managing resource allocations, doing admission control...").

Patent Owner further incorrectly argues that because "Gibson's admission [manager] issues a request for a new route...[to the] administrative server [which] responds to set up paths...Gibson [] contradicts the claim limitation since its 'bandwidth brokers' do not perform LSP setup or setup any paths." Resp. 24. This argument mischaracterizes the requirements of the claim, which expressly requires coordination among multiple network devices. For example, limitation [1.6.1] recites "*passing resource requests from the Bandwidth Broker (BB) to at least one intra-domain (IDB), wherein each intra-domain broker (IDB) is responsible for admission control and the Label Switched Path, LSP, setup.*" "A POSITA would have understood that Gibson's coordination among the admission manager and the administrative server is consistent with the claimed approach to LSP setup."

Ex.1046, ¶20.

Patent Owner's expert, Dr. Congdon, agrees with Petitioner's position on this issue. After reviewing the noted claim language, Patent Owner's expert, Dr. Congdon, testified that the bandwidth broker need only send a request for a new LSP to the intra-domain broker, which ultimately performs the LSP setup:

14 **Q. Do you have an understanding in the**
15 **context of the claim which entity is performing the**
16 **LSP setup?**
17 A. As the claim is stated, it's the -- that
18 **there's a request from a bandwidth broker** to at
19 least one intradomain, 1DB, or IDB, intradomain
20 broker, where each intradomain broker is
21 responsible for admission control and
22 label-switched path setup.
23 **So the intradomain broker is ultimately**
24 **performing the setup...**

Ex.1045, 68:14-24; Ex.1046, ¶21.

Dr. Congdon further conceded that a CR-LDP request (which Gibson teaches) is within the scope of setting up an LSP in the '698 patent. Ex.1045, 67:8-13 (“Q. So it's fair to say that **utilizing...CR-LDP is within the scope of setting up an LSP in the '698 patent...**A. Yeah. In the -- as we mentioned, in the **detailed embodiment of the patent...**”). Therefore, Gibson's admission manager's CR-LDP request for setting up a new LSP is within the scope of “*performing [LSP] Label Switched Path, LSP setup,*” as claimed.

Lastly, Patent Owner appears to take confusingly contradictory positions. On one hand, Patent Owner argues that Gibson describes “pre-determined high

capacity paths,” but then Patent Owner admits that “Gibson’s administrative server responds to set up paths.” Resp. 24-25. Patent Owner also ignores that Gibson discloses “Dynamic LSP addition” of “a new LSP,” which Dr. Houh explains “would be understood to mean that a new LSP is dynamically set up.” Ex.1046, ¶22; Pet. 54-55; Ex.1006, 8:11-9:10, Fig. 2. Patent Owner’s expert, Dr. Congdon, agreed that Gibson’s disclosure of dynamic LSP addition sufficiently teaches this limitation. Ex.1045, 71:24-72:9 (“**Would a prior art teaching of dynamic addition of a new LSP path be sufficient to teach performing LSP setup as recited in Claim 1? ...A. Well, provided it contains the additional limitations... then, yeah, that would be the case.**”). Ex.1046, ¶23.

H. The prior art renders obvious “...*passing resource requests from the Bandwidth Broker (BB) to at least one intra-domain (IDB), wherein each intra-domain broker (IDB) is responsible for admission control and the Label Switched Path, LSP, setup...*” (limitations [1.6.2]-[1.7.2])

The Petition explained, in significant detail, how the combination of Xiao, Schelen-1, and Gibson renders obvious these limitations. Pet. 56-70.

Patent Owner argues that the prior art lacks disclosure of “*at least one intra-domain (IDB).*” Resp. 26-27. According to Patent Owner, “Gibson’s administrative server cannot be an intra-domain broker since ‘[t]he Administrative Server 35 has a COPS interface to all the admission managers at the edge of the network.’” Resp.

26-27. This argument is baseless and contrary to the '698 patent's disclosure.

Ex.1046, ¶24.

Patent Owner provides no explanation or evidence that communicating via a COPS interface renders Gibson's administrative server incapable of being an "*intra-domain broker*." The evidence is entirely against Patent Owner's position since the '698 patent describes an intra-domain bandwidth broker using RATES, which performs LSP set up using COPS. Ex.1001, 6:60-64 ("For MPLS networks the **LSP set-up mechanism used in [RATES] is used**"); Ex.1016, 9 ("RATES has components with functions similar to those needed in a bandwidth broker and is extensible for use as an **intra-domain bandwidth broker**."); 4 ("Given that **RATES needs COPS extensions to be implemented at the ingress routers for LSP set-up**, provision of classifiers has been bundled into COPS extensions.").

Ex.1046, ¶25.

As Dr. Houh explains, "a POSITA would have understood that Gibson's teaching of using COPS is within the scope of the '698 patent's disclosure, which relies on the RATES inter-domain bandwidth broker that also uses COPS for communication." Ex.1046, ¶. Patent Owner's Dr. Congdon agrees that RATES represents the '698 patent's preferred embodiment:

17 So under the detailed description of the
18 **preferred embodiments of the invention of the '698**
19 **patent, it describes utilizing the RATES teachings**

20 to set up LSPs for MPLS. Correct?
21 A. **Yeah.** What it's describing in column 60
22 is -- specifically, it says, "For MPLS networks the
23 LSP setup mechanism used in RATES is used." So,
24 yes.

Ex.1045, 61:17-24; Ex.1046, ¶25.

Interpreting claim 1 to exclude the '698 patent's preferred embodiment would be error. *See Vitronics Corporation v. Conceptronic, Inc.*, 90 F.3d 1576, 1583 (Fed. Cir. 1996) (an interpretation that excludes a preferred embodiment "is rarely, if ever, correct and would require highly persuasive evidentiary support."); *Verizon Servs. Corp. v. Vonage Holdings Corp.*, 503 F.3d 1295, 1305 (Fed. Cir. 2007). Thus, Patent Owner's argument that the claimed *intra-domain broker (IDB)* cannot use COPS is without merit.

Moreover, Patent Owner's argument that "[a] person of ordinary skill in the art would understand Gibson's administrative server to correspond to multiple domains" is wrong. Ex.2004, ¶66. As Dr. Houh explains, "Gibson only has a single MPLS domain that the administrative server manages." Ex.1046, ¶26. To the extent that Patent Owner implies that Gibson's local areas are different domains, such would be unsupported and contrary to the understood meaning of a local area. Notably, Dr. Congdon conceded during deposition that a domain may include more than one local area. Ex.1045, 39:5-7 ("A network domain can certainly include more than one local area network, yes."). Ex.1046, ¶26.

IV. Claims 2-5 and 7-8 are Obvious in View of Xiao, Schelen-1, and Gibson

Patent Owner argues that claims 2-5 and 7-8 are patentable “for at least the same reasons as Claim 1.” Resp. 27. Therefore, if the Board determines that claim 1 is rendered obvious, there is no dispute that these claims are also obvious.

V. Claims 4-8 are Obvious in View of Xiao, Schelen-1, Gibson, and Schelen-2

Patent Owner argues that claims 4-5 and 7-8 are patentable “for at least the same reasons as described in Ground 1 [for claim 1].” Resp. 27. Therefore, if the Board determines that claim 1 in Ground 1 is rendered obvious, there is no dispute that these claims are also obvious.

Regarding claim 6, the Petition explained how the combination of Xiao, Schelen-1, Gibson, and Schelen-2 renders obvious “*that the bandwidth broker (BB) comprises a data structure which keeps resource usage information over time for each link in the topology which enables ability to plan ahead of time.*” Pet. 16-17, 78-79.

Patent Owner argues that claim 6 is patentable because, allegedly, “a person of ordinary skill in the art, and Petitioner’s expert, would understand that Schelen-2’s ‘maintain[ed] information about *reserved* resources’ does not imply or correlate to ‘resource *usage* information’ or ‘*used* resource information.’” Resp. 28-29 (emphasis in original). This argument is meritless. Although the claimed

“*resource usage information*” may include information about resources “used” (past tense), it is not so limited. As Dr. Houh explains, “the claimed ‘*resource usage information*’ would be understood to include information about resources (e.g., bandwidth) currently reserved and used and information about resources (e.g., bandwidth) reserved for future use.” Ex.1046, ¶27.

Dr. Houh further testifies that “Patent Owner’s assertion mischaracterizes my testimony since I did not testify, and I do not agree, that Schelen-2’s maintained resource information does not correlate to ‘resource usage information’ or to ‘used resource information.’” Ex.1046, ¶28. For example, in the context of allocating bandwidth for immediate use, Schelen-2 discloses an equation to “[d]etermine if the **bandwidth usage**, after adding the new load r^α , will exceed the available link bandwidth μ during the lookahead time.”

$$\mu > \max_{t \in look} (r^\alpha + R + A(t)).$$

R	Aggregate bandwidth reserved by current immediate reservations,
$A(t)$	Aggregate bandwidth reserved in advance at time t ,
$look$	The lookahead time used at immediate admission,
μ	The link bandwidth.

Ex.1007, 221; Ex.1046, ¶29.

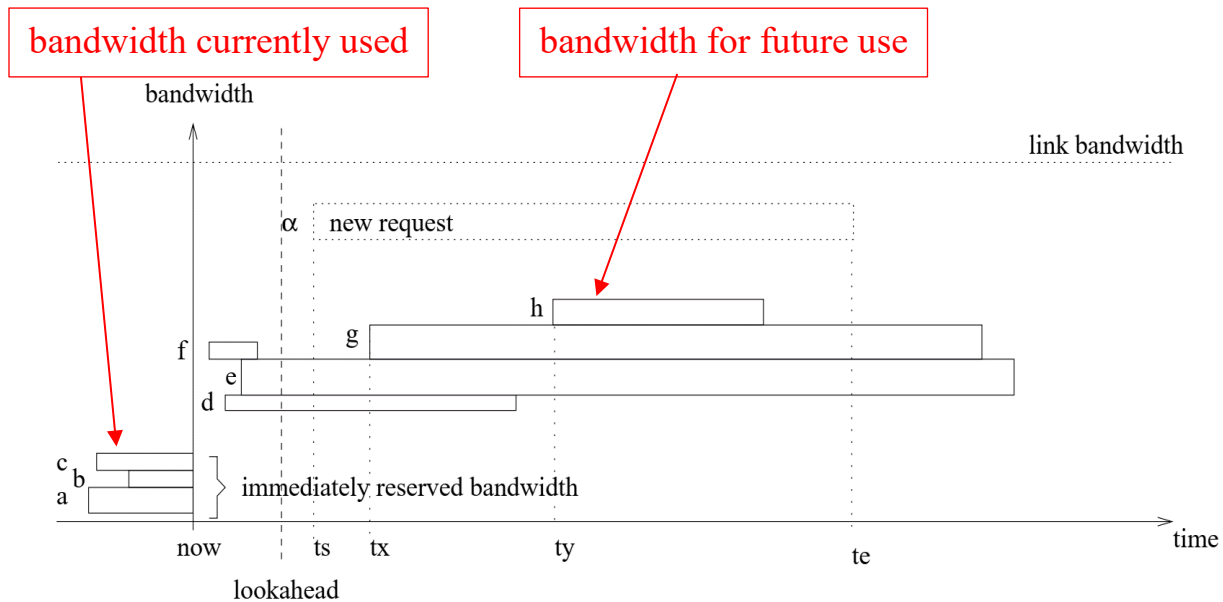


Figure 5: Snap-shot of reservations
 Ex.1007, Fig. 5 (annotated).

Dr. Houh explains that “[i]n Schelen-2’s determination of bandwidth usage, the aggregate bandwidth reserved by current immediate reservations (i.e., bandwidth currently used) and aggregate bandwidth reserved in advance (i.e., bandwidth for future use) are summed with the new potential load r^α . As such, Schelen-2’s resource information satisfies the claimed ‘*resource usage information*’ and also correlates to ‘used’ resource information, should the claim have such a requirement.” Ex.1046, ¶30.

Patent Owner’s expert, Dr. Congdon, provided consistent testimony on this point:

6 **Can usage information be used to determine**
 7 **ahead of time if the bandwidth will exceed**

8 **available link bandwidth after adding a new**
9 **potential load?**

...

11 **A. Yeah...**

Ex.1045, 75:6-11. Therefore, even if the claimed “*resource usage information*” corresponds to “used” (past tense) resources (which Petitioner does not agree is a claim requirement), the prior art renders such obvious. Ex.1046, ¶¶31-32.

Lastly, Patent Owner's argues that “[n]one [of the] disclosed data structures in Schelen-2 store resource usage information over a period of time for each link in the topology.” Resp. 29-30. This largely ignores the Petition's analysis and reliance on Schelen-2's cited teachings. Pet. 78-79. As explained in the Petition, Schelen-2 discloses “data structures that manage reservations,” including “information about the current reserved aggregate bandwidth” as well as “the aggregated bandwidth reserved in advance over time.” Ex.1007, 221. Schelen-2's bandwidth broker also “maintains information about reserved resources on each link in its domain” per a “topology map of the domain.” Ex.1007, 215. Patent Owner provides no explanation for its conclusory assertion that Schelen-2 maintains “data structures” storing resource reservation information “over time” without employing a “*data structure which keeps resource usage information over time*” as claimed. Ex.1046, ¶¶33-34.

VI. Conclusion

For the foregoing reasons, Patent Owner's arguments in its Response should be rejected, and Challenged Claims 1-8 should be found unpatentable.

Respectfully submitted,

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CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. § 42.24(d), Petitioner hereby certifies, in accordance with and reliance on the word count provided by the word-processing system used to prepare this Reply, that the number of words in this paper is 4,695.

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CERTIFICATE OF SERVICE

The undersigned certifies that, in accordance with 37 C.F.R. § 42.6(e),
service was made on Patent Owner as detailed below.

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