

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CISCO SYSTEMS, INC.,

Petitioner,

v.

NETSOCKET, INC.,

Patent Owner.

Patent No. 7,190,698

Filing Date: April 6, 2001

Issue Date: March 13, 2007

Inventors: Emil Svanberg, Joachim Johansson, Anders Torger,
Joakim Norrgard, and Anders Larsson

Title: NETWORK OPTIMISATION METHOD

PATENT OWNER'S RESPONSE

Case No. IPR2023-00607

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EXHIBIT LIST

Exhibit No.	Description of Document
2001	Amended Docket Control Order, Dkt. 47, in <i>NetSocket Inc. v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00172-JRG, dated February 2, 2023
2002	Cisco Systems, Inc.’s P.R. 3-3 Invalidity Contentions and Ineligibility Contentions in v <i>NetSocket Inc. v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00172-JRG, dated March 22, 2023
2003	Deposition of Henry H. Houh, taken in <i>Cisco Systems, Inc., v. NetSocket Inc.</i> , IPR2023-00607 on January 3, 2024 (“Houh Depo.”)
2004	Declaration of Paul Congdon (“Congdon Decl.”), dated January 10, 2024 and Exhibit A, Curriculum Vitae of Paul Congdon
2005	Defendant’s Patent Rule 4-2 Disclosure of Preliminary Claim Constructions and Extrinsic Evidence, <i>NetSocket Inc. v. Cisco Systems, Inc.</i> , Case No. 2:22-cv-00172-JRG, dated January 9, 2024

I. INTRODUCTION

The Board should issue a Final Written Decision finding all of the Challenged Claims of the U.S. Patent No. 7,190,698 (Ex. 1001, the “’698 Patent”) not unpatentable because Cisco Systems, Inc. (“Petitioner” or “Cisco”) fails to show that any combination of an article titled “Internet QoS: A Big Picture” by Xiao et al. published by the IEEE around March/April 1999 (“Xiao” or “Ex. 1005”), U.S. Patent No. 6,678,264 filed on June 30, 1999 (“Gibson” or “Ex. 1006”), an article titled “An Agent-based Architecture for Advance Reservations” by Schelén et al., published in 1997 (“Schelen-1” or “Ex. 1032”), and an article titled “Resource sharing in advance reservation agents” by Schelén et al., published in 1998 (“Schelen-2” or “Ex. 1007”) discloses or renders obvious the inventions of Claims 1-8 (the “Challenged Claims”).

Petitioner does not assert any grounds of anticipation but asserts two grounds of obviousness. Any combination of Xiao, Schelen-1, Gibson, and Schelen-2 does not teach key claim elements of the ’698 Patent’s Challenged Claims, such as “[a] [m]ethod in a packet based communication network including network domains, wherein at least one domain is a Multiprotocol Label Switching MPLS domain, to establish a virtual leased line, VLL, between a source (SRC) and a destination (DST) in different domains in order to achieve packet transfer between the source (SRC) and the destination (DST),” “wherein the bandwidth broker (BB) is associated to each network domain and the bandwidth broker (BB) is configured to control a

hierarchical routing domain,” “ii) BB_A establishes the different domains involved to reach the destination network (DST),” “iii) 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,” “iv) each involved bandwidth broker (BB) performs admission control in its domain,” “v) 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,” “characterized in that step iv) comprises the following step: performing [LSP] Label Switched Path, LSP setup and 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,” and “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.”

Patent Owner respectfully submits that Petitioner’s deficient arguments, Patent Owner’s arguments presented herein, and the additional evidence submitted herewith, such as the Declaration of Dr. Paul Congdon and the deposition testimony of Dr. Henry H. Houh, demonstrate that the Challenged Claims are patentable. Accordingly, the Board should issue a Final Written Decision finding all the

Challenged Claims of the '698 Patent not unpatentable.

II. THE '698 PATENT

The '698 Patent is entitled “Network Optimisation Method” and issued on March 13, 2007. The '698 Patent claims priority to U.S. Provisional Patent Application No. 60/197,006, filed on April. 13, 2000. At a high level, the '698 Patent is directed to a method and arrangement for networking equipment that provides virtual leased lines between different domains. Each domain includes a Bandwidth Broker that has visibility into its corresponding domain. '698 Patent at 2:48-55. Bandwidth Brokers manage policies for bandwidth resources and maintain a database of the domain's resources. Bandwidth Brokers also provide admission control decisions on Quality-of-Service (“QoS”) requests. Bandwidth Brokers further communicate with one or more Intra-Domain Brokers (IDB), which are

responsible for receiving resource requests, performing admission control, and Label Switched Path “LSP” setup. *Id.* at 7:10-18.

Figure 4 depicts an exemplary network hierarchy, which shows the Bandwidth Brokers communicating with Intra-Domain Brokers (IDB) within their own network:

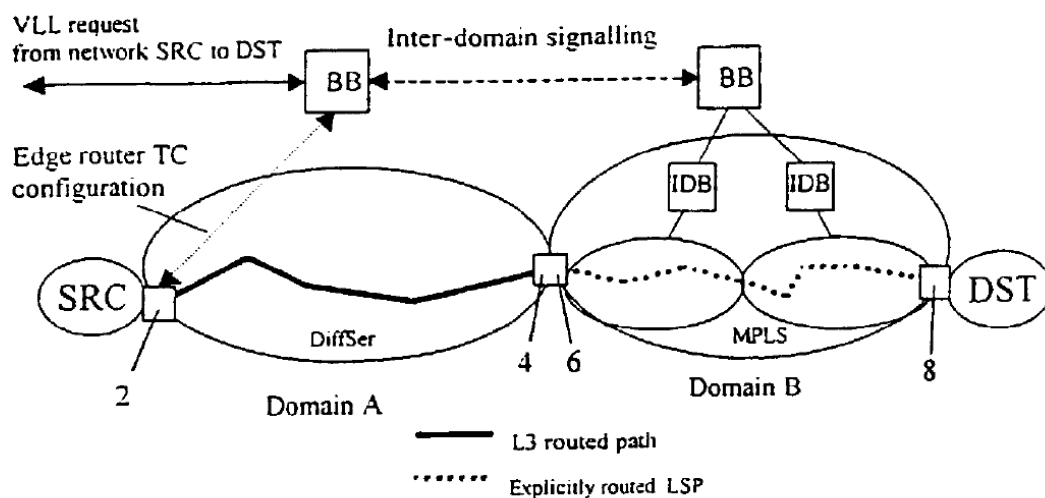


Fig. 4

Id., Fig. 4. The network configuration of the '698 Patent allows the Bandwidth Broker to gain visibility into the routing and other resources of its Domain. This allows for end-to-end virtual leased lines (VLL) and more specifically, guaranteed bandwidth VLLs. *Id.* at 4:46-53.

III. LEVEL OF ORDINARY SKILL IN THE ART

Patent Owner utilizes Petitioner’s proposed level of skill in the art—a person of ordinary skill in the art (“POSITA”) would have had “a bachelor’s degree in

computer science, computer engineering, electrical engineering, or an equivalent, and approximately two years of experience working in the field of network communications.” Pet. at 10; Ex. 2004, ¶ 27. “Additional work experience can substitute for specific educational background, and vice versa.” *Id.*

IV. CLAIM CONSTRUCTION

37 C.F.R. § 42.104 governs the required content of the petition. 37 C.F.R. § 42.104(b)(3) specifically requires the Petitioner to point out “[h]ow the challenged claim is to be construed” and also “[w]here the claim to be construed contains a means-plus-function or step-plus-function limitation as permitted under 35 U.S.C. § 112(f), the construction of the claim must identify the specific portions of the specification that describe the structure, material, or acts corresponding to each claimed function.” 37 C.F.R. § 42.104(b)(3).

In order to more fully establish the non-obviousness of the Challenged Claims, Patent Owner believes that the Board would benefit from expressly construing the preamble of Claim 1 as limiting to make clear Claim 1’s bounds in the context of Petitioner’s arguments. *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (alteration in original) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)) (“The Board is required to construe ‘only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.’”).

The preamble in Claim 1 recites: “Method in a packet based communication network including network domains, wherein at least one domain is a Multiprotocol Label Switching MPLS domain, to establish a virtual leased line, VLL, between a source (SRC) and a destination (DST) in different domains in order to achieve packet transfer between the source (SRC) and the destination (DST), wherein the bandwidth broker (BB) is associated to each network domain and the bandwidth broker (BB) is configured to control a hierarchical routing domain, the method comprises the following steps.” ’698 Patent, Claim 1. A preamble may be limiting if claims “depend[] on a particular disputed preamble phrase for antecedent basis” or the preamble “is essential to understand limitations or terms in the claim body.” *Catalina Mktg. Int’l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002) (citations omitted).

A person of ordinary skill in the art would have found that several terms in the preamble of Claim 1 are essential to understanding those limitations within Claim 1 and its dependent claims. Ex. 2004, ¶ 34. As an example, Claim 1’s preamble recites “wherein at least one domain is a Multiprotocol Label Switching MPLS domain,” while Claim 2 adds “if said domains comprise at least one Differentiated Services, DiffServ, domain” in addition to the MPLS domain of Claim 1. *Id.* Similarly, Claim 3 also recites “said domains comprise at least one Differentiated Services, DiffServ, domain and one Multiprotocol Label Switching,

MPLS, domain.” *Id.* Each of Claim 2 and Claim 3 are dependent on Claim 1 precisely because they describe multi-domain systems adding a method with a DiffServ domain to Claim 1’s method that already includes an MPLS domain. *Id.* Additionally, Claim 1 recites that a “bandwidth broker (BB) is associated to each network domain.” *Id.* A person of ordinary skill in the art would find this limitation in the preamble essential to understanding Claim 1’s subsequent limitations that “BB_A establishes the different domains involved to reach the destination network (DST),” “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,” and “each involved bandwidth broker (BB) performs admission control in its domain” because each of these limitations refers to the preamble’s statement that there is a bandwidth broker associated with each of the network domains involved in the path from source to destination networks. *Id.*

In view of the several examples where Claim 1 itself and its dependent claims rely on phrases within the preamble that are essential for understanding those subsequent limitations in Claim 1 and its dependent claims, a person of ordinary skill in the art would understand the preamble of Claim 1 to be limiting. *Id.*, ¶ 35. Notably, Petitioner also agrees that the preamble of Claim 1 of the ’698 Patent should be

construed as limiting. *See* Ex. 2006, 1-2.¹

Patent Owner agrees with the Board that Petitioner’s construction for “bandwidth broker” is not necessary. Inst. at 12-13; Ex. 2004, ¶ 36. The claim language sufficiently renders redundant Petitioner’s construction that the “bandwidth broker” “is an entity in a network domain” that “manages policies for bandwidth resources,” “maintain[s] resource information, provid[es] admission control, configure[es] the network, or communicat[es] with neighboring bandwidth brokers to allocate resources across multiple domains.” Pet. at 11; Ex. 2004, ¶ 36. For example, Claim 1 already recites that “the bandwidth broker (BB) is associated to each network domain,” “the bandwidth broker (BB) is configured to control a hierarchical routing domain,” “each involved bandwidth broker (BB) performs admission control in its domain,” and “each involved bandwidth broker (BB) returns a result of the admission control.” ’698 Patent, Claim 1; Ex. 2004, ¶ 36.

V. REQUIREMENTS UNDER 35 U.S.C. § 103

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

¹ While marked as a second page 1 in the document provided by Defendant/Petitioner in the district court litigation, for clarity, Patent Owner notes that the cite is to PDF page 4.

differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) where in evidence, so called secondary considerations. *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17–18 (1966). Failure to identify the differences between the claimed subject matter and the prior art is fatal to an obviousness challenge. See *Apple, Inc. v. Contentguard Holdings, Inc.*, IPR2015-00355, Paper 9 at 9-10 (P.T.A.B. June 26, 2015).

To arrive at obviousness, the Board must sufficiently explain and support the conclusions that the prior art references disclose all the elements recited in the Challenged Claims and a relevant skilled artisan not only could have made but would have been motivated to combine all the prior art references in the way the patent claims. *Pers. Web Techs., LLC v. Apple, Inc.*, 848 F.3d 987, 994 (Fed. Cir. 2017).

Even if all the claim elements are found across a number of references, an obviousness determination must consider whether a POSITA would have been motivated to combine those references. *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1368 (Fed. Cir. 2016); *Los Angeles Biomedical Rsch. Inst. at Harbor-UCLA Med. Ctr. v. Eli Lilly Co.*, 849 F.3d 1049, 1067 (Fed. Cir. 2017).

The Supreme Court explained in *KSR Int’l Co. v. Teleflex Inc.* that “[o]ften, it will be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace;

and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue. To facilitate review, this analysis should be made explicit.” 550 U.S. 398, 418 (2007). This combination determination, as supported by an articulated motivation to combine, requires a plausible rationale as to why those prior art references would have worked together. *Broadcom Corp. v. Emulex Corp.*, 732 F.3d 1325, 1335 (Fed. Cir. 2013). Additionally, “knowledge of a problem and motivation to solve it are entirely different from motivation to combine particular references.” *Innogenetics, N.V. v. Abbott Lab ’ys.*, 512 F.3d 1363, 1373 (Fed. Cir. 2008).

VI. PETITIONER HAS NOT PROVED INVALIDITY OF THE CHALLENGED CLAIMS BY A PREPONDERANCE OF THE EVIDENCE

As set forth below, and in view of both the Petition (“Paper No. 2” or “Pet.”) and the Board’s Institution Decision (“Paper No. 11” or “Inst.”), Petitioner has failed to demonstrate by a preponderance of the evidence that the Challenged Claims are obvious in view of the asserted prior art.

A. Ground 1: The Combination of Xiao, Schelen-1, and Gibson Does Not Render Claims 1-5 and 7-8 Obvious

- 1. The Combination of Xiao, Schelen-1, and Gibson Does Not Render Obvious “*Method in a packet based communication network including network domains, wherein at least one domain is a Multiprotocol Label Switching MPLS domain, to establish a virtual leased line, VLL, between a source (SRC) and a destination (DST) in different domains in order to achieve packet transfer between the source (SRC) and the destination (DST),*” as Required by Claim 1**

Claim 1 recites the limitation “[a] [m]ethod in a packet based communication network including network domains, wherein at least one domain is a Multiprotocol Label Switching MPLS domain, to establish a virtual leased line, VLL, between a source (SRC) and a destination (DST) in different domains in order to achieve packet transfer between the source (SRC) and the destination (DST).” As described above, the preamble should be construed as limiting, which means that Claim 1 requires “wherein at least one domain is a Multiprotocol Label Switching MPLS domain.” *See supra* Section IV; Ex. 2004, ¶ 37.

Petitioner relies on only Xiao to disclose the limitation of “a packet based communication network including network domains, wherein at least one domain is a Multiprotocol Label Switching MPLS domain, to establish a virtual leased line, VLL, between a source (SRC) and a destination (DST) in different domains in order to achieve packet transfer between the source (SRC) and the destination (DST).” *See* Pet. at 19-28; Ex. 2004, ¶ 38. However, Petitioner’s basis for Xiao disclosing this

limitation is entirely misleading because it relies on simply labeling a modified version of Fig. 4 with “MPLS domain” (*see* Pet. at 23, 27) despite the fact that Fig. 4 is obviously under Xiao’s heading of “Differentiated Services,” also known as DiffServ. *See* Ex. 1005, at 10-13; Ex. 2004, ¶ 38. Petitioner’s expert acknowledges that Fig. 4 is directed to a DiffServ system rather than an MPLS system:

Q. Could you turn to PDF page 3 of Xiao? Let me know when you’re there.

A. Page 3, yes.

Q. Do you see the heading Differentiated Services?

A. Yes.

Q. And under that heading do you see that Xiao abbreviates Differentiated Services as DS?

A. Yes.

Q. Differentiated Services is also referred to as DiffServ, correct?

A. Yes.

Q. Figures 2 to 4 are described under this heading of Differentiated Services, correct?

A. That does appear to be the case in this discussion of -- in that section in Xiao.

Q. Is it your understanding that Figures 2 to 4 describe examples of DiffServ-based architecture?

...

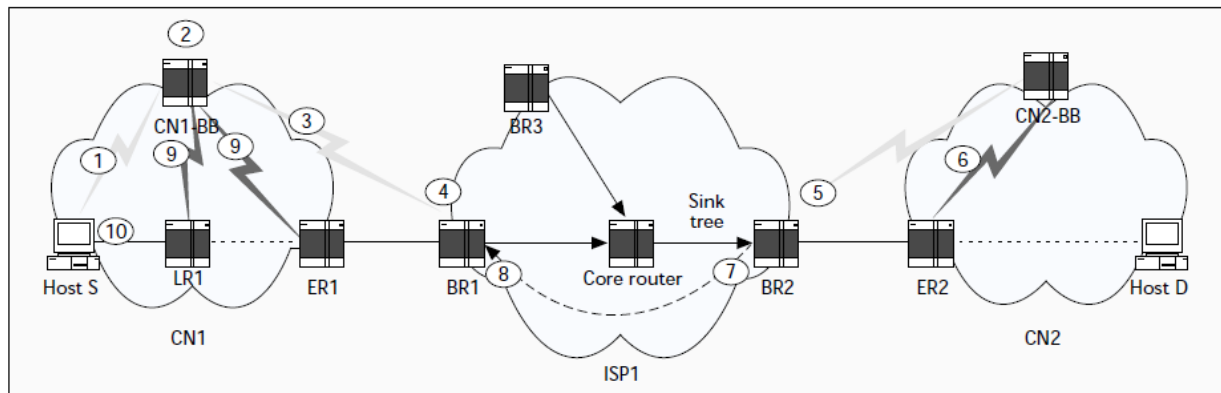
A. Well, I think those figures do appear in the section with the heading, you know, in the section Differentiated Services.

Q. Therefore, is it your understanding that Figures 2 to 4 describe examples of DiffServ-based architecture since they appear in this section with the heading Differentiated Services?

A. I mean, while they're discussing some processes, generally, and I think they are in the context of the section with the main -- with a higher level heading Differentiated Services, and they're giving examples of certain things that happen.

Id. (citing Ex. 2003, 38:6-40:2).

A person of ordinary skill in the art would therefore not look to Fig. 4 to disclose an MPLS system, particularly when there is a separate section in Xiao titled MPLS, which has a sole graphical representation marked Fig. 5 that is captioned “The signaling process of dynamic premium service *in an MPLS architecture.*” Ex. *Id.*, ¶ 39 (citing Ex. 1005, at 13-14).



■ Figure 5. The signaling process of dynamic premium service in an MPLS-based architecture.

Id., ¶ 40 (citing Ex. 1005, Fig. 5).

Petitioner's expert also acknowledges that Fig. 5 is explicitly an MPLS-based architecture:

Q. And Figure 5 of Xiao shows a MPLS-based architecture, correct?

A. Well, the discussion doesn't include the discussion of label switch paths, the discussion of Figure 5.

Q. Do you see the label underneath Figure 5 that says, "The signalling process of dynamic premium service in a MPLS-based architecture"?

A. Yes.

Q. So Figure 5 shows a MPLS-based architecture, right?

A. This is an example of one, one such MPLS-based architecture that's being discussed in the paper.

Id. (citing Ex. 2003, 37:15-38:5). As noted below, Fig. 5 does not show bandwidth brokers in each network domain of Fig. 5 in contravention of Claim 1. *See infra* Section VI.A.2; Ex. 2004, ¶ 40.

Because a person of ordinary skill in the art would not look to Xiao's Fig. 4 or be motivated to manufacture Petitioner's arbitrary edits to Xiao's Fig. 4, the combination of Xiao, Schelen-1, and Gibson cannot render Claim 1 obvious. *Id.*, ¶ 41.

2. The Combination of Xiao, Schelen-1, and Gibson Does Not Render Obvious "*wherein the bandwidth broker (BB) is associated to each network domain and the bandwidth broker (BB) is configured to control a hierarchical routing domain,*" as Required by Claim 1

Claim 1 recites the limitation "wherein the bandwidth broker (BB) is associated to each network domain and the bandwidth broker (BB) is configured to control a hierarchical routing domain." As described above in Section IV, the

preamble should be construed as limiting, which means that Claim 1 requires “wherein the² bandwidth broker (BB) is associated to each network domain.” *Id.*, ¶ 42. Coupled with the rest of Claim 1’s preamble, “wherein at least one domain is a Multiprotocol Label Switching MPLS domain,” a person of ordinary skill in the art would understand that Claim 1 requires that a bandwidth broker is associated to each network domain and at least one of those network domains is an MPLS domain that also has a bandwidth broker associated to it. *Id.*

As noted above, Fig. 5 is the only graphic representation of MPLS in Xiao. *See supra* Section VI.A.1; Ex. 2004, ¶ 43. Moreover, a person of ordinary skill in the art would understand that Xiao does not disclose a bandwidth broker associated with each domain in an MPLS architecture, as confirmed by Petitioner’s expert:

Q. So the example shown in Figure 5 does not show a bandwidth broker in Internet Service Provider 1, correct?

A. That’s what *the discussion of Figure 5 is -- is saying. This is the case where there is not a bandwidth broker in the ISP* but there are clearly examples earlier where there are bandwidth brokers in the ISP in Xiao.

Id. (citing Ex. 2003, 37:6-14) (emphasis added). Petitioner’s expert notes that only the “examples earlier” related to DiffServ architectures disclose bandwidth brokers

² Petitioner correctly notes that this language should be addressed as “a bandwidth broker.” Pet. at 28, n. 3.

in each network domain. *Id.* In fact, a person of ordinary skill in the art would understand that Xiao teaches away from this claim limitation. *Id.* Xiao describes that the major difference between MPLS-based architectures and DiffServ-based architectures is that “the MPLS effect is confined within the ISPs that use MPLS.” *Id.* (citing Ex. 1005, at 14). Xiao further describes this difference in ISPs has consequences as to whether bandwidth brokers are required in Xiao’s ISPs that use MPLS:

[S]ince LSPs are configured within the ISPs, resource requests can easily be hidden from the core routers by tunneling them from the ingress routers to the egress routers. Therefore, BBs may not be needed in MPLS-based ISP networks. Admission control is done in a distributed fashion by the ingress and egress routers.

Without BBs in the ISP networks, the signaling process for dynamic SLAs is slightly different from the one described earlier. It is depicted in Fig. 5 and described below.

Id. (citing Ex. 1005, at 14). Petitioner’s only rebuttal to the explicit statement that “BBs may not be needed in MPLS-based ISP networks,” is to cite to inapposite statements made in the DiffServ section of Xiao, which confirms that Fig. 4 was referring to a DiffServ architecture, where bandwidth brokers in each network domain are encouraged. Pet. at 28-29; Ex. 2004, ¶ 43. Xiao’s mention of an ISP1-BB does not negate the fact that Xiao chose exemplary Fig. 5 of an MPLS-based architecture to have no bandwidth broker in the ISP and therefore expressed a

preference for such an embodiment with no bandwidth broker. *Id.* Provided with such a preference, a person of skill in the art at the time of the invention of the '698 Patent would not have opted to add a bandwidth broker as an unnecessary component in an ISP network domain. *Id.*

Petitioner's cites to Schelen-1 and Gibson are inapposite. *Id.*, ¶ 44. A person of ordinary skill in the art would have understood that Schelen-1 does not even mention an MPLS-based architecture while Gibson does not disclose any relationship between its "admission managers" and their associations with network domains. *See generally* Ex. 1032 and Ex. 1006; Ex. 2004, ¶ 44. As a result, there would be no motivation to combine Xiao with either Schelen-1 or Gibson to obviate this claim limitation. *Id.*

For the reasons noted above, the combination of Xiao, Schelen-1, and Gibson cannot render Claim 1 obvious. *Id.*, ¶ 45.

3. The Combination of Xiao, Schelen-1, and Gibson Does Not Render Obvious "ii) BB_A establishes the different domains involved to reach the destination network (DST)," as Required by Claim 1

Claim 1 recites the limitation "ii) BB_A establishes the different domains involved to reach the destination network (DST)."

Since 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 “BB_A establishes the different domains involved to reach the destination network (DST).” *See supra* Sections VI.A.1 and VI.A.2; Ex. 2004, ¶ 46.

Schelen-1 does not remedy the deficiencies of Xiao. *Id.*, ¶ 47. As a preliminary matter, a person of ordinary skill in the art would understand that Schelen-1 does not describe that one bandwidth broker, BB_A “establishes the different domains involved to reach the destination network (DST)” but that every reservation agent in Schelen-1 must work *together*:

“Such reservation agents advertize [sic] themselves periodically on a well known multicast address, giving their identity and which routing domain (AS) they are responsible for. By listening to this well known multicast address, each top level agent will know the existence of all other top level agents.”

Id. (citing Ex. 1032, at 452).

Additionally, a person of ordinary skill in the art, including Petitioner’s expert, would understand 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)”:

Q. Is it your understanding that the process of discovery of other top level agents is different than the process of determining the domains involved for a request to reach a destination network?

...

A. Well, I think by definition your description of the processes are different. And, you know, in your question you describe different -- two different things. And *Schelen is describing, you know, one, the ability for the reservation agents or bandwidth brokers to know and find out about all the other domains and the bandwidth brokers. That's -- that is different than actually passing a request to bandwidth brokers of the involved domains regarding, you know, any sort of setup request*, because you would need the information, you know, of all the other domains in order to pass the request to the appropriate domains.

Id., ¶ 48 (citing Ex. 2003, 51:18-52:15).

For these reasons, Claim 1 is not rendered obvious by the combination of Xiao, Schelen-1, and Gibson. *Id.*, ¶ 49.

4. The Combination of Xiao, Schelen-1, and Gibson Does Not Render Obvious “iii) 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,” as Required by Claim 1

Claim 1 recites the limitation “iii) 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.”

Since 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 “BB_A directly or indirectly passes requests to *all Bandwidth Brokers* (BB) of the

involved domains.” *See supra* Section VI.A.2; Ex. 2004, ¶ 50.

For this reason, Claim 1 is not rendered obvious by the combination of Xiao, Schelen-1, and Gibson. *Id.*, ¶ 51.

5. The Combination of Xiao, Schelen-1, and Gibson Does Not Render Obvious “iv) each involved bandwidth broker (BB) performs admission control in its domain,” as Required by Claim 1

Claim 1 recites the limitation “iv) each involved bandwidth broker (BB) performs admission control in its domain.”

Since 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 “iv) each involved bandwidth broker (BB) performs admission control in its domain.” *See supra* Section VI.A.2; Ex. 2004, ¶ 52.

Particularly, Xiao teaches that, for its MPLS-based architecture, its bandwidth brokers are differentiated from its ingress and egress routers,³ because it

³ While a person of ordinary skill in the art would have understood that a bandwidth broker can be structured as a router or software implemented within a router (including within an ingress or egress router), a person of ordinary skill in the art would also have understood that the MPLS-architecture system of Xiao precludes

simultaneously discloses that “[a]dmission control is done in a distributed fashion by the ingress and egress routers” and that “BBs may not be needed.” Ex. 2004, ¶ 53 (citing Ex. 1005, at 14). Therefore, a person of ordinary skill in the art would have understood that Xiao does not disclose “each involved bandwidth broker (BB)” performing admission control. *Id.*

For these reasons, Claim 1 is not rendered obvious by the combination of Xiao, Schelen-1, and Gibson. *Id.*, ¶ 54.

6. The Combination of Xiao, Schelen-1, and Gibson Does Not Render Obvious “v) 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,” as Required by Claim 1

Claim 1 recites the limitation “v) 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.” Notably, Petitioner only relies on Xiao to obviate this claim limitation. Pet. at 51-53; Ex. 2004, ¶ 55.

such options in view of its clear distinction between routers and bandwidth brokers in its disclosed system and Fig. 5. Ex. 1005, at 14.

Since 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 “*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.” *See supra* Sections VI.A.2 and Section VI.A.5; Ex. 2004, ¶ 56.

For this reason, Claim 1 is not rendered obvious by the combination of Xiao, Schelen-1, and Gibson. *Id.*, ¶ 57.

7. The Combination of Xiao, Schelen-1, and Gibson Does Not Render Obvious “*characterized in that step iv) comprises the following step: performing [LSP] Label Switched Path, LSP setup,*” as Required by Claim 1

Claim 1 recites the limitation “characterized in that step iv) comprises the following step: performing [LSP] Label Switched Path, LSP setup and passing resource requests from the Bandwidth Broker (BB) to at least one intra-domain (IDB).”

Since 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 “characterized in that *step iv)* comprises the following step: performing [LSP] Label Switched Path, LSP setup” *See supra* Sections VI.A.5; Ex. 2004, ¶ 58.

In addition to its reliance on Xiao, Petitioner also incorrectly asserts that Gibson’s “admission manager corresponds to a ‘bandwidth broker.’” Pet. at 54; Ex. 2004, ¶ 59. However, 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, such as “configuring the network to meet [] granted policies.” *Id.* (citing ’698 Patent, 2:48-54).

Further, a person of ordinary skill in the art would have understood that Gibson’s admission manager does not perform LSP setup or requests LSPs across the MPLS network. *Id.*, ¶ 60. Gibson is clear that its Administrative Server has an interface that is used to request new high capacity LSPs:

The Administrative Server 35 has a COPS interface to all the admission managers at the edge of the network. ***This interface is used*** by those admission managers ***to request new high capacity label Switch paths across the MPLS network***, or to request a change in the capacity of an existing LSP.

Id. (citing Ex. 1006, 8:49-54) (emphasis added).

FIG. 2 shows the process of requesting a new LSP. Either an Endpoint 10 or an Admission Manager 35 issues a

request for a new route between two Abstract Nodes 12, 13 in the MPLS network. This is responded to by the Administrative Server, with the acceptance situation being illustrated in FIG. 2. ***The Administrative Server now signals to one of the specified abstract nodes AN1, 12 that it should set-up a path*** to the other abstract node AN2, 13. In the case that the abstract nodes represent a group of label switch routers, the administrative server specifies a particular label switch router within each abstract node.

Id. (citing Ex. 1006, 8:55-65) (emphasis added). Petitioner's expert confirms that either an endpoint or Gibson's admission server issues a request for a new route between abstract nodes but Gibson's administrative server responds to set up paths:

Q. So this section in Figure 2 show an admission manager requests LSPs from an administrative server, correct?

A. Well, it says ***either an endpoint or admission manager issues a request***, and that – that in this example this is ***responded to by the administrative server***, but it does so by further signalling other devices.

Id. (citing Ex. 2003, 62:5-13) (emphasis added). As a result, assuming that Petitioner was correct that Gibson's admission managers corresponded to the claimed bandwidth brokers (they do not), Gibson then contradicts the claim limitation since its "bandwidth brokers" do not perform LSP setup or setup any paths. *Id.*

A person of ordinary skill in the art would also not be motivated to combine Gibson with any other reference to reach this claim limitation of Claim 1 of the '698 Patent because Gibson's description of pre-determined high capacity paths contradicts the LSP path set up of the '698 Patent:

The communications network has an overlay network of high capacity paths established on it. By arranging for communication sessions to preferably be established using these *pre-determined high capacity paths* the complexity of the topology information required is reduced.

Ex. 2004, ¶ 61 (citing Ex. 1006, Abstract) (emphasis added).

A person of ordinary skill in the art would have understood that Gibson’s “pre-determined high capacity paths” are inconsistent with claim language in claim 1 requiring “Label Switch Path, LSP, *Setup*.” Ex. 2004, ¶ 62. In contrast to Gibson, the ’698 Patent’s objective is to achieve dynamic allocation of the best path within the MPLS domain at runtime using communication:

Simultaneously BB performs path sensitive admission control according to layer 3 routing from the SRC ingress router to the domain B egress router. This is achieved by *looking up the path through domain A and evaluating the resource availability on each link in the path*.

Id. (citing ’698 Patent, 7:45-50) (emphasis added). A person of ordinary skill in the art would have understood Claim 1’s LSP setup is performed by a bandwidth broker evaluating resource availability on each link in the path, instead of Gibson’s communication through “pre-determined high capacity paths.” *Id.* A person of ordinary skill in the art would have further understood that a pre-defined path does not require path setup by a bandwidth broker. *Id.*

For these reasons, Claim 1 is not rendered obvious by the combination of Xiao, Schelen-1, and Gibson. *Id.*, ¶ 63.

8. The Combination of Xiao, Schelen-1, and Gibson Does Not Render 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,*” as Required by Claim 1

Claim 1 recites the limitation “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.” Petitioner relies only on Gibson to obviate this claim limitation. Pet. at 56-70; Ex. 2004, ¶ 64.

Since 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,*” or “performing [LSP] Label Switched Path, LSP setup,” it therefore cannot disclose, teach, or suggest “characterized in that *step iv)* comprises the following step:. . .” or “*wherein each intra-domain broker (IDB) is responsible for admission control and the Label Switched Path, LSP, setup.*” See *supra* Sections VI.A.5 and VI.A.7; Ex. 2004, ¶ 65.

Petitioner incorrectly alleges that “[t]he administrative server together with one or more connection manager, corresponds to “*at least one intra-domain (IDB).*” Pet. at 57; Ex. 2004, ¶ 66. However, 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.” Ex. 1006, 8:49-50; Ex. 2004, ¶ 66. A person of ordinary skill in the art would understand Gibson’s administrative server to correspond to multiple domains. *Id.* However, a person of ordinary skill in the art, including Petitioner’s expert, would also understand that the claimed “intra-domain” to “be understood in the plain and ordinary meaning of that term, where “intra” refers to within.”; *Id.* (citing Ex. 2003, 65:2-8). Therefore, Gibson’s administrative server cannot be an intra-domain broker since it corresponds to multiple domains. *Id.*

For these reasons, Claim 1 is not rendered obvious by the combination of Xiao, Schelen-1, and Gibson. *Id.*, ¶ 67.

9. The Combination of Xiao, Schelen-1, and Gibson Does Not Render Obvious Claims 2-5 and 7-8

Claims 2-5 and 7-8 depend upon Claim 1, and for at least the same reasons as Claim 1, any combination of Xiao, Schelen-1, and Gibson fails to obviate Claims 2-5 and 7-8. *Id.*, ¶ 68.

B. Ground 2: The Combination of Xiao, Schelen-1, Gibson, and Schelen-2 Does Not Render Claims 4-8 Obvious

1. The Combination of Xiao, Schelen-1, Gibson, and Schelen-2 Does Not Render Obvious Claims 4-8

Petitioner’s Ground 2 relies exclusively on the combination of Schelen-2 with “Xiao’s bandwidth broker” that Petitioner had described already in Ground 1. *See* Pet. at 76-82; Ex. 2004, ¶ 69. Therefore for at least the same reasons as described in

Ground 1 with respect to Xiao, any combination of Xiao and Schelen-2 fails to obviate Claims 4-8. *Id.*

2. The Combination of Xiao, Schelen-1, Gibson, and Schelen-2 Does Not Render Obvious “*Method according to claim 4, characterized in 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,*” as Required by Claim 6

Claim 6 recites the limitation: “Method according to claim 4, characterized in 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.” Petitioner only relies on Schelen-2 to obviate this limitation. Pet. at 78-79; Ex. 2004, ¶ 70.

Specifically, Petitioner incorrectly asserts that Schelen-2’s description of “maintain[ing] information about reserved resources on each link in its domain” obviates the claimed limitation. Pet. at 78-79; Ex. 2004, ¶ 71. However, 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”:

Q. Based on your understanding of Schelen-2, does a reserved resource necessarily imply that a resource is used?

A. I think what [Schelen-2 is] generally saying is that, you know -- like, if I make a reservation at a restaurant, I might not show up, or I might make a reservation for 12 but 11 people show up, and so I'm not using the full reservation. I don't think -- I don't think Schelen is implying that -- that every request generates the full reservation, the full requested data for the entire time of any request. I don't -- I don't think -- I haven't seen in Schelen-2 where it's saying that.

Ex. 2004, ¶ 71 (citing Ex. 2003, 74:9-75:25). A person of ordinary skill in the art would understand that prior usage information can be used as an indicator of future usage and enable the ability to reserve or “plan” resources accordingly “ahead of time.” *Id.* Maintaining only information about reserved resources removes that ability. *Id.*

Moreover, Petitioner cites to nothing in Schelen-2 that would indicate a data structure that maintains information about *used* resources over time but only reserved resources at a given time. Ex. 2004, ¶ 72 (citing Ex. 1007, 215 (“[W]e focus on agent-based admission control where the objective is to administer resources exactly, i.e., admission control in an agent maintains information about reserved resources on each link in its domain)). A person of ordinary skill in the art would have understood that the only data structures disclosed in Schelen-2 are “data structures that manage reservations efficiently and allow quick admission control,” “[a] data structure keeps exact starting times and finishing times for each admission request,” and “[a] data structure has fixed size and depends only on the maximum

bookahead time allowed and the slot length.” Ex. 2004, ¶ 72 (citing Ex. 1007, 221).

None of these disclosed data structures in Schelen-2 store resource usage information over a period of time for each link in the topology, as Claim 6 requires.

Id.

Therefore, Claim 6 is not rendered obvious by the combination of Xiao, Schelen-1, Gibson, and Schelen-2. Ex. 2004, ¶ 73.

VII. CONCLUSION

Petitioner’s combinations fail to render obvious any Challenged Claim. The Board should issue a Final Written Decision finding the Challenged Claims not unpatentable.

Respectfully submitted,

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CERTIFICATE OF WORD COUNT

The undersigned hereby certifies that the portions of the above-captioned PATENT OWNER'S RESPONSE specified in 37 C.F.R. § 42.24 has 6,471 words in compliance with the 14,000 word limit set forth in 37 C.F.R. § 42.24. This word count was prepared using Microsoft Word for Office 365.

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