

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

**SECOND DECLARATION OF HENRY H. HOUEH, PH.D.,
UNDER 37 C.F.R. § 1.68 IN SUPPORT OF PETITIONER'S REPLY**

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Second Declaration of Henry H. Houh, Ph.D.
Inter Partes Review of U.S. 7,190,698

I, Henry H. Houh, Ph.D., do hereby declare as follows:

I. INTRODUCTION

1. I previously submitted a Declaration (Ex. 1003) in this proceeding (IPR2023-00607) that set forth my opinions regarding U.S. Patent No. 7,190,698 (“the ’698 patent”).

2. I submit this Second Declaration in reply to Patent Owner Response.

3. In preparing this Second Declaration, I have considered:

- (2) Patent Owner Response (Paper 17);
- (3) Declaration of Dr. Paul Congdon (Ex.2004);
- (4) Deposition Transcript of Dr. Paul Congdon (Ex.1045); and
- (5) Any other document reference herein.

4. My qualifications can be found in my first Declaration, Ex.1003 and in my CV, Ex. 1004. The discussion of the level of ordinary skill in the art and relevant legal standards are also the same as my first Declaration. In forming the opinions expressed below, I have considered the documents list above (and any additional documents discussed below) along with my own knowledge and experience.

II. CLAIM CONSTRUCTION

A. “*selecting ...*”

5. Patent Owner and Dr. Congdon contend 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; 2004, ¶¶33-35. Regardless of whether the preamble is limiting, the prior art renders obvious the preamble as analyzed in the Petition and further discussed below.

B. “*working entity*” and “*protection entity*”

6. Patent Owner and Dr. Congdon do not dispute the construction for “*bandwidth broker*” presented in my first declaration and only argue that “Petitioner’s construction...is not necessary.” Resp. 8; 2004, ¶36. Since this term’s interpretation does not appear to be disputed by Patent Owner, the Board need not expressly construe this term.

III. UNPATENTABILITY ANALYSIS

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]).

7. As discussed below, I disagree with Patent Owner and Dr. Congdon that Xiao does not disclose that “*at least one domain is a Multiprotocol Label Switching MPLS domain.*” Resp. 12-13; 2004, ¶¶37-41.

8. I disagree with Patent Owner and Dr. Congdon 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; 2004, ¶¶37-41. The proposed combination relied on a combination of Xiao's teachings and Xiao expressly teaches that "MPLS can be used together with differentiated services to provide QoS.... DS-field based and MPLS-based architectures can easily interoperate." Ex.1005, 14. Xiao's teachings of using MPLS and DiffServ together is not disputed or even addressed by Patent Owner or Dr. Congdon.

9. I also disagree with Patent Owner and Dr. Congdon that a POSITA would not be "motivated" to make the proposed modification to Xiao's Figure 4. Resp. 13; 2004, ¶41. To the contrary, I provided numerous reasons in my first declaration why it would have been beneficial and important to combine MPLS and DiffServ. Indeed, Xiao expressly teaches using MPLS and DiffServ together, which would have motivated a POSITA to make the proposed combination. That it was important for a system to implement both MPLS and DiffServ is confirmed by Dr. Congdon, who 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.

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

10. I disagree with Patent Owner and Dr. Congdon that 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; 2004, ¶¶42-45. Consistent with my first declaration, 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.1003, ¶165; Ex.1005, 11, 12. Additionally, as I explained in my first declaration, a bandwidth broker “**provides scaling benefits.**” Ex.1003, ¶166; Ex.1011, 17; Ex.1025, 1.

11. Indeed, 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, 43:3-44:24.

12. I also note that 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. 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.

13. I further explained in my first declaration that Schelen-1 teaches that "[f]or each routing domain in the network, there will be a reservation agent [bandwidth broker] responsible for admission control" and that, furthermore, Gibson teaches 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." Ex.1032, 451-452; Ex.1006, 6:11-16, 7:1-48.

14. I disagree with Patent Owner and Dr. Congdon that a POSITA would not combine Schelene-1's teachings with Xiao because "Schelen-1 does not even mention an MPLS-based architecture." Resp. 17; 2004, ¶44. Contrary to this assertion, 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. Additionally, 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.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.”).

15. I also disagree with Patent Owner and Dr. Congdon that a POSITA would not combine Gibson’s teachings with Xiao because “Gibson does not disclose any relationship between its ‘admission managers’ and their associations with network domains.” Resp. 17; 2004, ¶44. To the contrary, as explained in my first declaration (and also consistent with the undisputed claim construction), a POSITA would have understood that Gibson’s admission manager, which is part of the management layer of the MPLS domain, maintains network topology, and provides admission control, is a “*bandwidth broker*.” Indeed, 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.

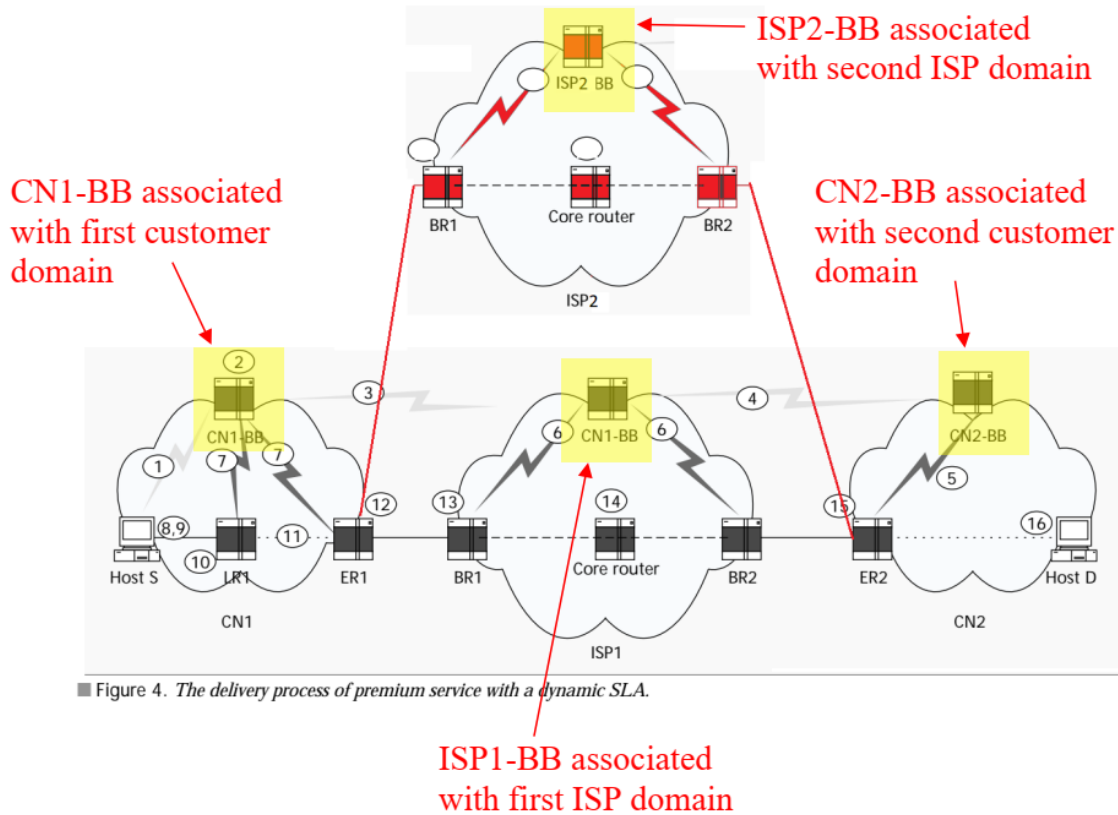
Ex.1045, 40:1-7.

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

16. I disagree with Patent Owner and Dr. Congdon argument that Schelen-1’s teaching is insufficient because “every reservation agent in Schelen-1 must work *together*.” Resp. 18 (emphasis in original); 2004, ¶47. According to Patent Owner, “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).’” Resp. 18.

17. This argument is wrong since the Petition 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, it is the combined knowledge of all bandwidth brokers and their domains that allows CN1-BB to establish the different domains involved to reach the destination customer network CN2.

18. To illustrate with the parallel example of Figure 4, when Schelen-1’s teachings are combined teachings with Xiao, 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.



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

D. 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. I disagree with Patent Owner and Dr. Congdon argument 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; 2004, ¶59. Contrary to these contentions (and consistent with the claim construction), in the context of the ’698 patent, 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. Similarly, 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*” of the MPLS domain. Ex.1006, 8:11-9:10, Fig. 2. Notably, 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...”).

20. I also disagree with Patent Owner and Dr. Congdon argument 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. To the contrary, the claim 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 intradomain (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.

21. Dr. Congdon agrees with me on this issue, testifying 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.

22. Patent Owner's argument also ignores that Gibson discloses "Dynamic LSP addition" of "a new LSP," which would be understood to mean that a new LSP is dynamically set up. Ex.1006, 8:11-9:10, Fig. 2. Again, Dr. Congdon agreed with me 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.**").

23. Accordingly, a POSITA would have understood that Xu's failure model corresponds to "*logic*." A POSITA would have also recognized that the network operator inputting failure scenarios (with a predetermined probability of occurrence) for links and nodes that are shared among different paths, "*configures*" the failure model "*to determine a probability of concurrent failure concurrent failure*" because the probability of failure for shared links and nodes corresponds to a probability of simultaneous failure for a pair that has the links or nodes in common.

E. 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]).

24. I disagree with Patent Owner and Dr. Congdon that "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; Ex. 2004, ¶¶64-66.

25. To the contrary, the '698 patent's preferred embodiment corresponds to the intra-domain broker of RATES, which performs LSP set up by communicating to devices at the edge of the network 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.**”); (“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.”). As such, 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. Patent Owner’s Dr. Congdon conceded 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.

26. I disagree with Patent Owner and Dr. Congdon’s statement that “[a] person of ordinary skill in the art would understand Gibson’s administrative server to correspond to multiple domains” since a POSITA would have understood that Gibson only has a single MPLS domain that the administrative server manages. Resp. 26; Ex. 2004, ¶66. To the extent implied that Gibson’s local areas (e.g., cloud shapes 15, 16) 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 includes more than one local area. Ex.1045, 39:5-7 (“A network domain can certainly include more than one local area network, yes.”).

F. The prior art 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*” (limitations [6.0]).

27. I disagree with Patent Owner and Dr. Congdon that 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; Ex. 2004, ¶¶71-72. As an initial matter, 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.”

28. Moreover, contrary to this argument, 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.

29. 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.”

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

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, 9.

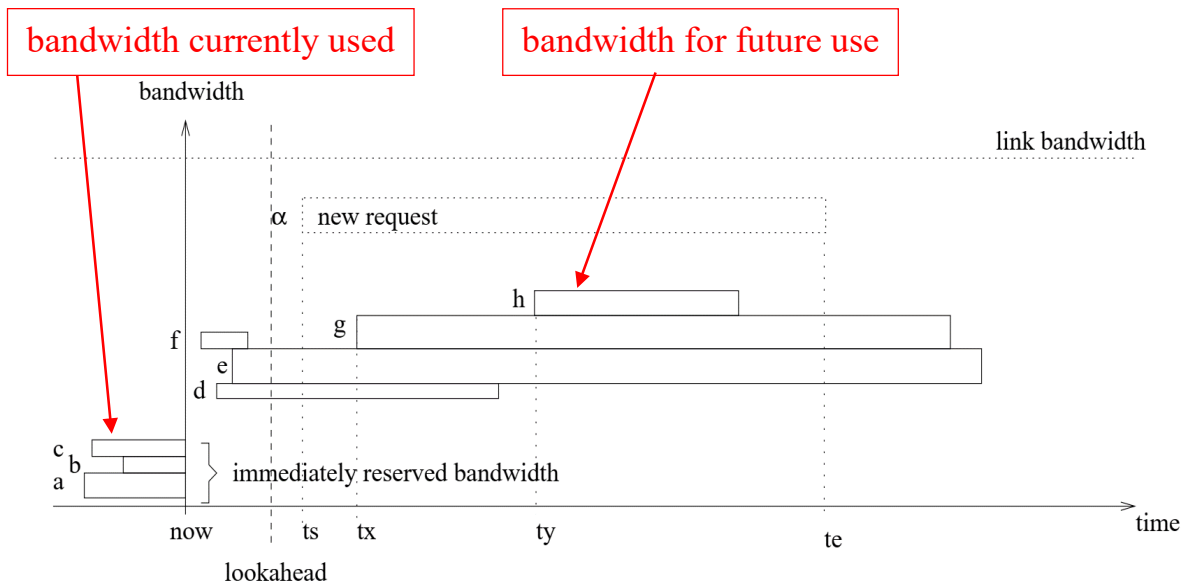


Figure 5: Snap-shot of reservations

Ex.1007, Fig. 5.

30. In 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^a . 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.

31. 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.

32. 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.

33. Lastly, I disagree with Patent Owner and Dr. Congdon 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; Ex. 2004, ¶72.

34. This largely ignores my initial analysis and reliance on Schelen-2's cited teachings, which 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.

IV. CONCLUSION

35. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and that these statements were made with knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code.

Dated: 4/23/24

Henry H. Houh.
Henry H. Houh, Ph.D.