

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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NETNUT LTD.,

Petitioner

v.

BRIGHT DATA LTD.,

Patent Owner

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Case IPR2021-00465

U.S. Patent No. 9,742,866

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**DECLARATION OF DR. V. THOMAS RHYNE**

Mail Stop PATENT BOARD  
Patent Trial and Appeal Board  
United States Patent and Trademark Office  
P.O. Box 1450  
Alexandria, VA 22313-1450

I, V. Thomas Rhyne, declare the following:

1. I have been retained as an independent expert in this matter by counsel for Bright Data Ltd. (“Bright Data”). I have been asked to provide my opinions on certain issues in connection with claims 15-20, 20-23, and 27-28 of U.S. Patent No. 9,742,866 to Shribman *et al.* (“the ’866 patent” hereafter).

2. I am being paid for my work in preparing this declaration at my normal consulting rate plus reimbursement of direct expenses. My compensation is not tied to the outcome of this matter and is not based on the substance of the opinions that I provide.

3. In preparing my opinions expressed herein, I have reviewed the ’866 patent, its prosecution history, and the documents listed in Exhibit 2003. I may rely upon these materials, my knowledge and experience, and/or additional materials to rebut arguments raised by the Petitioner. Further, I may also consider additional documents and information in forming any necessary opinions, including any relevant documents that have not yet have been made available to me.

4. I am familiar with the technology described in the ’866 patent as of its priority date of August 28, 2013. I have been asked to provide my technical review, analysis, insights, and opinions regarding that patent. I have used my experience and insight along with my study of the above-identified references as the basis for my opinions as set forth herein.

## **MY QUALIFICATIONS**

5. My background and qualifications as a technical expert for this matter are summarized below.

6. I hold degrees from Mississippi State University (Bachelors of Science in Electrical Engineering with Honors, 1962), the University of Virginia (Masters of Electrical Engineering in 1964), and the Georgia Institute of Technology (Ph.D. in Electrical Engineering, 1967). I have been a Registered Professional Engineer in the State of Texas since 1969. I have also been a Registered Patent Agent with the U.S. Patent and Trademark Office (the “USPTO”) since 1999.

7. I taught electrical engineering, computer engineering, computer architecture, and computer science at the undergraduate and graduate levels full-time at Texas A&M University from 1967 to 1983 and part-time at the graduate level at the University of Texas from 1983 to 1991. My twenty-plus years of industrial experience include work at the Electric Power Research Institute, Texas Instruments, Control Data Corporation, NASA, Texas Digital Systems, Inc. (a company I co-founded to produce microprocessor-based computer peripherals in 1976), the Microelectronics and Computer Technology Corporation (“MCC”), and Motorola, Inc.

8. I have extensive experience with computer technology, including design and teaching experience with a variety of computer systems, microcomputer

systems, and microcontrollers. I have participated in the design of several computer systems and microprocessors and have designed systems which made use of those devices as controllers. I am familiar with a variety of computer architectures and am an experienced programmer in a variety of programming languages as well as assembly-level language on a number of different computers and microprocessors. I have been an Internet user since the early 1990's.

9. Based on my academic and consulting experience, I am familiar with a variety of computer interfaces, website operations, and data-communications protocols. I have managed large and complex software-development programs, and I have been and am familiar with the Internet and its use for providing both data and services to its users. Prior to joining MCC, I was responsible for bringing access to the ARPANET to Texas A&M University, an activity which gave me insight and experience with the exchange of information over wide-area networks.

10. My experience has also included the use of a variety of networked communications systems, including use of the ARPANET and extensive use of the Internet itself as that system came into being in the early 1990s. I also coordinated MCC's initial access to the ARPANET, and later to the Internet. I am an experienced user of several search engines, including Google Chrome, Internet Explorer, Microsoft Edge, and Mozilla Firefox. In addition, in the early 1990s, MCC

researchers developed “EINet Galaxy,” one of the first web browsers with search engine capabilities; I was one of the alpha testers for that effort.<sup>1</sup>

11. I also managed distributed database development for several years at MCC, as well as MCC’s successful research and development program on Internet-based credit card fraud detection using neural networks. I have worked as a technical expert on patent cases dealing with complex software systems, the provision of secured communication using SSL/TLS during web sessions conducted with cellular telephones, and with remotely accessed home security systems. My litigation work has also included cases dealing with XML and HTTP.

12. While working at MCC in 1994 I was assigned to represent MCC and its participating companies in the planning efforts of the U.S. Technology Policy Working Group addressing the technical challenges associated with the planned National Information Infrastructure (“NII”). In that role I contributed to the portion of the planning effort dealing with “Security and Privacy Challenges” within the NII.

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<sup>1</sup> The EiNet program was spun-out of MCC in April of 1995. *See*, for example, <https://www.einet.net/static/history.htm> (“Launched in January 1994, Galaxy/EiNet was the first searchable Internet directory. Galaxy was created as part of the EiNet division at the MCC Research Consortium at the University of Texas, Austin. The original initiative was to develop tools for large-scale directory services to support electronic commerce.”) *Also see* the webpages available at <http://www.bizjournals.com/austin/stories/2000/06/12/story7>. Many of the researchers who worked in the EINet Program had previously worked for me as part of the MCC CAD Program.

13. I have chaired and otherwise participated in a number of national and international IEEE and ISO/IEC standards committees.

14. During my academic career I authored thirty technical papers. I have also presented papers at thirty-seven conferences and authored an award-winning textbook, *Fundamentals of Digital System Design*, published by Prentice-Hall in 1973 and adopted at over thirty-five U.S. and international universities during its lifetime. My textbook has been cited as a reference by the USPTO. I have also served as a technical reviewer for Prentice-Hall, the *IEEE Transactions on Computers*, and *IEEE Spectrum*.

15. I was elected to serve on the IEEE Board of Directors for two terms representing the engineering education community and the IEEE Computer Society. I was also elected to two terms as the IEEE Treasurer and served one term on the Board of Governors of the IEEE Computer Society.

16. I have extensive experience with the accreditation of engineering and computer science programs in the U.S. and abroad, an activity which has provided me an excellent opportunity to become and remain familiar with the program curricula, faculties, and graduates from a large number of U.S. and international colleges and universities. I represented the IEEE for five years on the Engineering Accreditation Commission and for six years on the Board of Directors of the Accreditation Board for Engineering and Technology ("ABET"). In 2004, I

completed a three-year *pro bono* assignment, assisting Japanese universities and industries in the establishment of the Japanese Accreditation Board for Engineering Education (“JABEE”), and have led several other international accreditation missions.

17. I was appointed by the U.S. National Research Counsel to the Panel of Assessment for the Electronics and Electrical Engineering Laboratory of the U.S. National Institute of Standards and Technology. I served on that Panel for seven years, including three terms as its chair, and I provided invited testimony before the U.S. Congress regarding the status of the Laboratory.

18. My experience and qualifications have been recognized by the Texas Society of Professional Engineers (Young Engineer of the Year in Texas, 1973), the American Society for Engineering Education (Terman Awardee as the “Outstanding Young Electrical Engineering Educator in the U.S.,” 1980), the Institute of Electrical and Electronics Engineers (IEEE Fellow, 1990, recognizing my contributions to “computer engineering and computer engineering education), the Accreditation Board for Engineering and Technology (ABET Fellow, 1992), and the IEEE Computer Society (Golden Core Awardee, 2000).

19. I retired from full-time work as of 1997 and draw retirement benefits from Texas A&M University. In addition to the full-time work described above and in my CV, I have worked part-time as a consulting engineer for the past thirty years

doing computer systems design, application-specific system design, and expert witness work in intellectual property litigation.

20. A copy of my CV is attached as Exhibit 2002.

21. I believe that I am qualified to provide reliable opinions in the field of the '866 patent, including what a person of ordinary skill in the art (a "POSA" hereafter) would have understood from the prior art in this field at that time and his or her view of anticipation and obviousness based on that prior art.

### **MY UNDERSTANDING OF CLAIM CONSTRUCTION**

22. I understand there have been two district court claim construction rulings concerning the '866 patent: (1) *Luminati Networks Ltd. v. UAB Tesonet*, No. 2:18-CV-299 (E.D. Tex.) (Ex. 1023); and (2) *Luminati Networks Ltd. v. BI Science Inc.*, No. 2:18-CV-453 (E.D. Tex.) (Ex. 1033). I have reviewed these claim construction rulings and I have considered them in forming my opinions as set forth herein.

### **PERSON OF ORDINARY SKILL IN THE ART**

23. I believe a POSA in the field of the '866 patent would be an individual who, as of August 28, 2013, the filing date of the provisional application to which the '866 patent claims priority, had a Master's Degree or higher in the field of Electrical Engineering, Computer Engineering, or Computer Science or as of that



time had a Bachelor's Degree in the same fields and two or more years of experience in Internet-related data communications.

24. Based on the foregoing, I believe that I am qualified to provide reliable opinions in the technical field of the '866 patent, including opinions on what a POSA would have understood from the patent itself and the prior art in that field at the time of the invention (August 28, 2013).

### **BACKGROUND OF THE '866 PATENT**

25. The '866 patent describes a novel network architecture using two devices and one server to allow a client device to fetch web content from a specific web server via intermediate tunneling devices. The Challenged Claims further recite content slicing as an element of the claims. As its Abstract explains, the '866 patent discloses and claims:

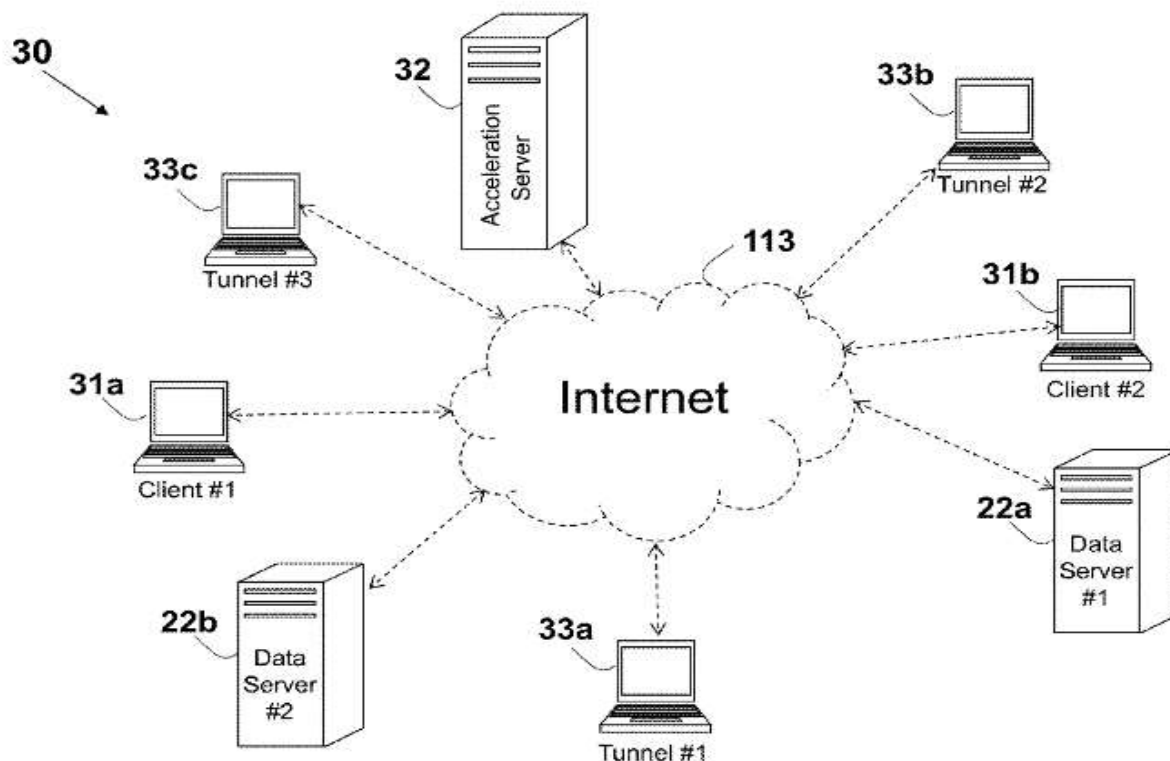
A method for fetching a content from a web server to a client device is disclosed, using tunnel devices serving as intermediate devices. The client device access[es] an acceleration server to receive a list of available tunnel devices. The requested content is partitioned into slices, and the client device sends a request for the slices to the available tunnel devices. The tunnel devices in turn fetch the slices from the data server, and send the slices to the client device, where the content is reconstructed from the received slices. A client device may also serve as a tunnel device, serving as an intermediate device to other client devices. Similarly, a tunnel device may also serve as a client device for fetching content from a data server. The selection of tunnel devices to

be used by a client device may be in the acceleration server, in the client device, or in both. The partition into slices may be overlapping or non-overlapping, and the same slice (or the whole content) may be fetched via multiple tunnel devices.

(Ex. 1001, at Abstract).

26. The specification of the '866 patent describes its technical field at 1:13-19 as follows:

27. This disclosure relates generally to an apparatus and method for improving communication over the Internet by using intermediate nodes, and in particular, to using devices that may doubly function as an end-user and as an intermediate node. Fig. 5 of the '866 patent, copied below, depicts one embodiment disclosed in its "Detailed Description of the Invention." The figure shows the architecture that is referenced in the methods required by in the Challenged Claims. Notably, that architecture includes: (i) client #1 31a; (ii) tunnel #1 33a; and (iii) acceleration server 32. Data server #1 22a, which is outside of the network and which holds content sought by client #1 31a, is also shown. In my opinion, this two device/one server architecture (client #1 31a, tunnel #1 33a, and acceleration server \ 32) is both novel and unique and differs significantly from the references cited and discussed by Petitioner.



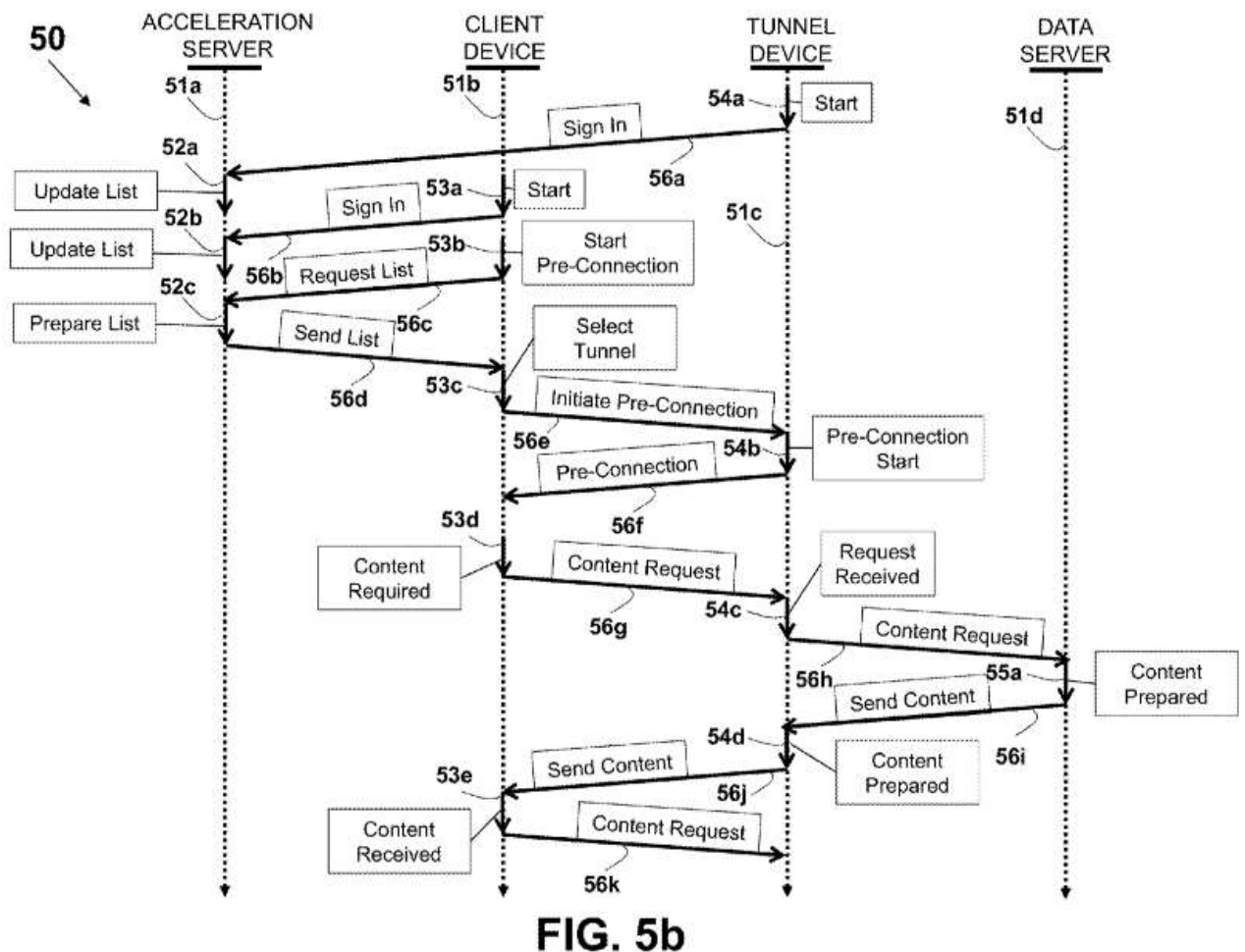
**FIG. 5**

**Fig. 5 of the '866 patent. Ex. 1001.**

28. As the Abstract of the '866 patent explains, “[a] method for fetching a content from a web server to a client device is disclosed, using tunnel devices serving as intermediate devices.” Abstract. Importantly, the Abstract explains that the method is used to “fetch” content “from” a web server using one or more “tunnel devices serving as intermediate devices.” The Abstract further explains that “[a] client device may also serve as a tunnel device, serving as an intermediate device to other client devices.” *Id.*

29. In my opinion, therefore, the Abstract clarifies that the disclosed methods use two “devices” (*i.e.*, a “client device” and a “tunnel device”) to allow the first device to obtain content from a web server via the second device. And, in my further opinion, a POSA would understand that the patent’s use of the terms “device” and “tunnel device,” as opposed to another term such as “proxy” or “proxy server,” has specific meaning within the ’866 patent, clarifying the different nature of those elements. Thus, in my opinion, the inventions of the ’866 patent contemplate a two device/one server architecture over which the claimed methods can be practiced.

30. Fig. 5b, copied below, and associated discussion in the ’866 patent at 83:25-86:11, generally describe one embodiment of the inventions of the ’866 patent:



**Fig. 5b of the '866 patent. Ex. 1001.**

31. As shown in FIG. 5b, and as discussed in the accompanying description found in the '866 specification, a CLIENT DEVICE desires content to be fetched from a DATA SERVER. The CLIENT DEVICE signs in (53a) to an ACCELERATION SERVER and then sends a request (53b) to the ACCELERATION SERVER. The CLIENT DEVICE receives the IP address of an appropriate TUNNEL DEVICE (56d). The CLIENT DEVICE then sends a fetch content request (56g) to the TUNNEL DEVICE. The TUNNEL DEVICE fetches

the requested content from the DATA SERVER (56h, 56i) and then provides the requested content to the CLIENT DEVICE (53e).

32. The '866 patent further provides the ability to obtain and to reconstruct content from content slices. As the '866 patent explains, the content requested by the client device may be portioned into multiple parts or "slices" (the '866 patent at 53:37-38) and the devices may be organized in groups (the '866 patent at 54:30-49).

33. In my opinion, therefore, based on the foregoing, and for the additional reasons discussed below, a POSA would not equate the "devices" disclosed and claimed in the '866 patent with "proxies" or "tunneling proxies" as those terms may have been known or understood at the time of the invention.

34. In my further opinion, at the time of invention of the '866 patent, the prior art included three general types of systems: (i) client-server proxy systems, which included VPN proxies and other types of proxy connections; (ii) peer-to-peer networking systems which included proxies; and (iii) content distribution/delivery systems which included proxies. I explain each of these types of systems below.

35. Client-server proxy systems generally involve using a "server" as a proxy to obtain content for a requesting "client." Luotonen (Ex. 1014) is an example of this type of system. In my opinion, traditional proxy server systems like Luotonen were disclosed to the Patent Office during prosecution of the '866 patent, including,

for example: (i) as disclosed in ‘866 specification 27:25-47 and 30:15-67; (ii) the “Internet Engineering Task Force (IETF) RFC 2547 ‘BGP/MPLS VPNs’, Mar. 1999” (Ex. 2007); and (iii) the “Internet Engineering Task Force (IETF) RFC 4026 ‘Provider Provisioned Virtual Private Network (VPN) Terminology’, Mar. 2005” (Ex. 2008).

36. The second type of content acquisition system involves obtaining information from a peer-to-peer network to access information that does not need to be current and, hence, may be obtained from cached content. In my opinion, unlike peer-to-peer networking, the inventions of the ‘866 patent solve the problem of obtaining fresh content slices from a target web server via an innovative tunnel network. In my further opinion, the tunnel network of the ‘866 patent, by acting differently from a peer-to-peer network, prevents the content source from blocking content or sending “spoofed” content based on the requester’s identifying information, thereby providing access to fresh content to the requester.

37. In my additional opinion, using a peer-to-peer network infrastructure to obtain content was already disclosed to the Patent Office during the prosecution of the ‘866 patent, including, for example, in:

- U.S. Patent No. 7,203,741 to Marco, *et al.* (Ex. 2005); and,
- U.S. Pat. App. Pub. No. 2003/0204602 to Hudson, *et al.* (Ex. 2006).

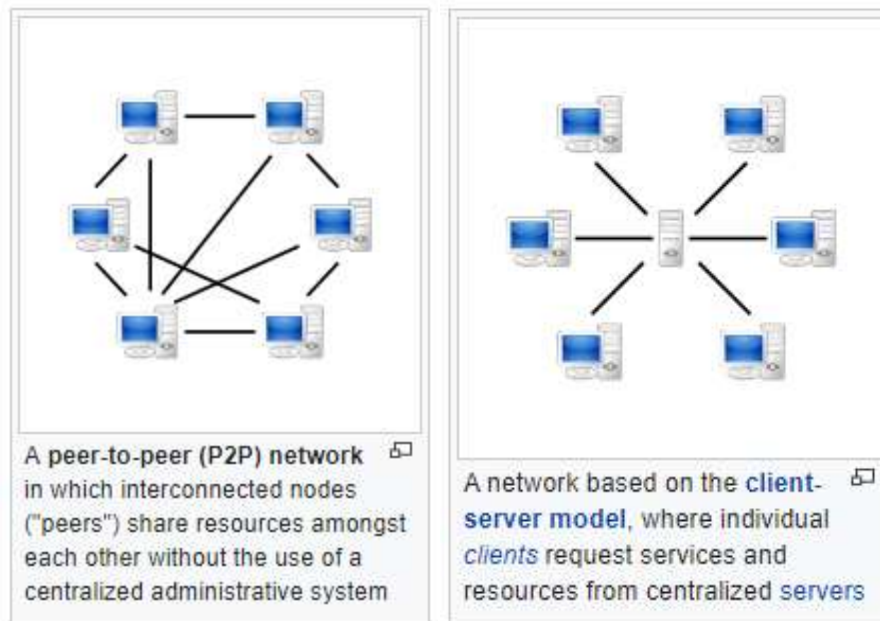
38. And, in my further opinion, peer-to-peer networks were known by POSAs as of the priority date of the '866 patent, and articles regarding peer-to-peer networks describe them as an alternative to client-server architecture. *See*, for example, “A Brief History of P2P Content Distribution.” Ex. 2010. As that article explains, “[i]n a server-based architecture, the more demand for a file, the more bandwidth cost it consumers [sic likely “to its consumers”]. In a peer to peer system, the more a file is requested, the more nodes are seeding it, lowering the delivery cost per-file distributed. The role of audience in the equation is inverted.” *Id.*

39. Also, the Wikipedia entry on “peer-to-peer” networks characterizes such networks in essentially the same way by stating that, “[a] peer-to-peer network is designed around the notion of equal peer nodes simultaneously functioning as both ‘clients’ and ‘servers’ to the other nodes on the network.”<sup>2</sup> Ex. 2011. This model of network arrangement differs from the client–server model where communication is usually to and from a central server.” *Id.* Also, as I show below, Wikipedia illustrates the difference between peer-to-peer networks and a client-server model in the following diagram:

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<sup>2</sup> *See* <https://en.wikipedia.org/wiki/Peer-to-peer> (Last visited on May 22, 2021). Ex. 2011.





**Graphic from Wikipedia entry for “peer-to-peer.” Ex. 2011.**

40. In my opinion, therefore, a POSA as of the priority date of the '866 patent would have understood that a peer-to-peer network was used to distribute a particular content widely, and that users could obtain that content from one or more sources within such a network. In my further opinion, a POSA would have understood the distinction between a peer-to-peer network and a client-server model.

41. Additionally, in my opinion, in a peer-to-peer network the user is not concerned with the first origination of a particular content, but instead seeks a content such as a song or video file from any available source or sources in that network. And, in my further opinion, the prior art asserted in the Grounds of the Petition shows that the same is true for the references cited therein, *i.e.*, the intent

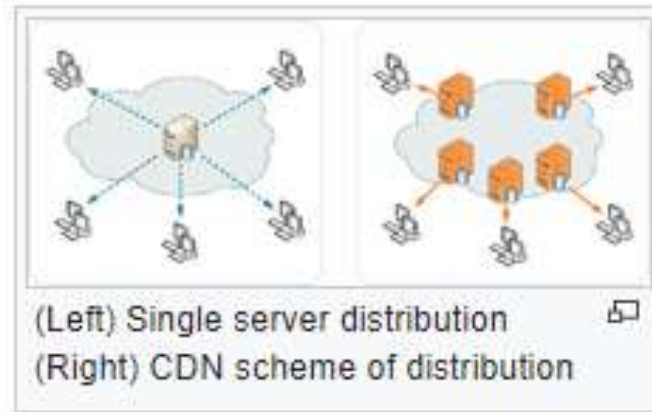
remains to obtain content from somewhere *inside* that network rather than from a targeted and specifically identified source *outside* the network.

42. In my additional opinion, Content Delivery Networks (“CDNs”) were also known as of the priority date of the ‘866 patent, given that a CDN is referenced in the ‘866 patent. Ex. 1001, at 165:62-65.

43. Further, the Wikipedia entry for “Content delivery network” states that “[t]he goal [of such networks] is to provide high availability and high performance by distributing the service spatially relative to end-users. CDNs serve a large portion of the Internet content today, including web objects (text, graphics and scripts), downloadable objects (media files, software, documents), applications (e-commerce, portals), live streaming media, on-demand streaming media, and social media sites. CDNs are a layer in the internet ecosystem. Content owners such as media companies and e-commerce vendors pay CDN operators to deliver their content to their end users. In turn, a CDN pays ISPs, carriers, and network operators for hosting its servers in their data centers.”<sup>3</sup> Ex. 2012. That Wikipedia entry also includes a graphical representation of a CDN versus a traditional client-server model as I have copied below:

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<sup>3</sup> See [https://en.wikipedia.org/wiki/Content\\_delivery\\_network](https://en.wikipedia.org/wiki/Content_delivery_network). (Last visited on May 22, 2021). Ex. 2012.



**Graphic from Wikipedia entry for “Content delivery network.” Ex. 2012.**

44. In my opinion, therefore, a POSA as of the priority date of the ‘866 patent would have understood CDNs in keeping with their high-level definition such as that provided by Wikipedia. Further, a POSA would have understood that the purpose of a CDN is to provide content quickly and efficiently without overloading a centralized content server.

45. As I explained above, in my opinion, Luotonen (Ex. 1014) adds nothing to the art that the ‘866 patent claims were already allowed over. In fact, by its own terms, Luotonen is about “Web Proxy Servers.” Ex. 1014, Title. In fact, proxy servers are discussed at length in the specification of the ‘866 patent. Ex. 1001, at 27:25-54.

46. In my further opinion the Sharp KK system (Ex. 1018) also differs significantly from the claimed inventions. For example, Sharp KK discloses a “content distribution system” (Title, Page 1) which is configured to reduce the load on the ultimate content server. Importantly, because it is a CDN, Sharp KK discloses

a closed system, *i.e.*, all available content resides on the server(s) within the system, with previously cached copies (possibly) stored on one or more of the proxies (3a/3b/3c of Embodiment 3 as shown in Fig. 20). In my opinion, therefore in every case, the content that can be requested by a client must already be within the system of Sharp KK as there is no provision to issue requests for content not already within the system. Ex. 1018, at Figs. 20 and 24 (showing that content always originates from server 2). Additionally, in my opinion the proxies 3a/3b/3c are also not “tunnel devices” or “client devices” which is evident even from the depictions of the proxies in Fig. 20. Challenged Claim 15 – the only challenged independent claim – expressly requires that “wherein each of the devices in the group is a client device.” Thus, by its own express terms, the “proxies” 3a/3b/3c of Sharp KK are not “client devices” as devices of that general nature are shown and described as Elements 4e/4f (which perform very different roles).

47. In my further opinion, none of the systems I address above includes the features required by the Challenged Claims in order to address the problems solved by the '866 patent. In my additional opinion, a key innovation of the '866 patent is that it uses a new type of network that differs substantially from a peer-to-peer network or a CDN to solve different problems and to achieve different benefits. Additionally, in my opinion the two device/one server network of the '866 patent enables un-traceability coupled with the ability to obtain fresh content slices via a

specifically-selected tunnel device. *Id.* This may permit, for example, a user to fetch content from a server as if the user were using a particular residential device in a particular geographic location, an important activity in industry for data collection.

*Id.*

48. In my additional opinion, as I explained above, the Grounds asserted in the Petition merely include systems of the type already considered by the original Examiner during prosecution of the '866 patent. Additionally, in my opinion, the alleged prior art advanced in the Petition fails to teach or suggest the specific elements of the Challenged Claims.


\* \* \* \*

49. In signing this Declaration, I recognize that it will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office, and that I may accordingly be subject to cross-examination. If such cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for that cross-examination.

50. This Declaration represents those opinions regarding the validity of the '866 patent that I have formed to date. However, I reserve the right to revise, supplement, and/or amend my opinions stated herein based on new information and on my continuing analysis of the materials produced in this proceeding.

I declare that the foregoing is true and correct under penalty of perjury of the laws of the United States of America.

Signed in Austin, TX on May 23, 2021.

  
V. Thomas Rhyne, Ph.D., P.E., R.P.A.