

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Oxylabs, UAB,
Petitioner

v.

Bright Data Ltd.
Patent Owner.

**EXHIBIT 1003
DECLARATION OF KEVIN ALMEROOTH
IN SUPPORT OF
PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 11,206,317**

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1. I, Dr. Kevin C. Almeroth, declare as follows:

I. INTRODUCTION

2. I have been retained by Oxylabs, UAB (“Petitioner”), as an independent expert consultant in this inter partes review (“IPR”) proceeding before the United States Patent and Trademark Office (“PTO”).

3. I have been asked Oxylabs’ Counsel (“Counsel”) to consider whether certain references disclose, teach, and/or suggest the features recited in Claims 1, 8, 16, 17, 22, 29, and 30 of U.S. Patent No. 11,206,317 (“Shribman”) (Ex-1001). My opinions and the bases for my opinions are set forth below.

4. I am being compensated at my ordinary and customary consulting rate for my work, which is \$800 per hour. My compensation is in no way contingent on the nature of my findings, the presentation of my findings in testimony, or the outcome of this or any other proceeding. I have no other financial interest in this proceeding.

II. BACKGROUND AND QUALIFICATIONS

5. All of my opinions stated in this Declaration are based on my own personal knowledge and professional judgment. In forming my opinions, I have relied on my knowledge and experience in designing, developing, researching, and teaching the technology referenced in this Declaration.

6. I am over 18 years of age and, if I am called upon to do so, I would be competent to testify as to the matters set forth herein. I understand that a copy of my current curriculum vitae, which details my education and professional and academic experience, is being submitted as Ex-1004. The following provides a brief overview of some of my experience that is relevant to the matters set forth in this Declaration.

7. I am currently a Professor Emeritus in the Department of Computer Science at the University of California, Santa Barbara (UCSB). While active at UCSB, I held faculty appointments and was a founding member of the Computer Engineering (CE) Program, Media Arts and Technology (MAT) Program, and the Technology Management Program (TMP). I also served as the Associate Director of the Center for Information Technology and Society (CITS) from 1999 to 2012. I have been a faculty member at UCSB since July 1997.

8. I hold three degrees from the Georgia Institute of Technology: (1) a Bachelor of Science degree in Information and Computer Science (with minors in Economics, Technical Communication, and American Literature) earned in June 1992; (2) a Master of Science degree in Computer Science (with specialization in Networking and Systems) earned in June 1994; and (3) a Doctor of Philosophy (Ph.D.) degree in Computer Science (Dissertation Title: Networking and System Support for the Efficient, Scalable Delivery of Services in Interactive Multimedia

System, minor in Telecommunications Public Policy) earned in June 1997. During my education, I have taken a wide variety of courses as demonstrated by my minors. My undergraduate degree also included a number of courses more typical of a degree in electrical engineering including digital logic, signal processing, and telecommunications theory.

9. One of the major concentrations of my research over the past 30+ years has been the delivery of multimedia content and data between computing devices, including various network architectures. In my research, I have studied large-scale content delivery systems, and the use of servers located in a variety of geographic locations to provide scalable delivery to hundreds or thousands of users simultaneously. I have also studied smaller-scale content delivery systems in which content is exchanged between individual computers and portable devices. My work has emphasized the exchange of content more efficiently across computer networks, including the scalable delivery of content to many users, mobile computing, satellite networking, delivering content to mobile devices, and network support for data delivery in wireless networks.

10. In 1992, the initial focus of my research was on the provision of interactive functions (e.g., VCR-style functions like pause, rewind, and fast-forward) for near video-on-demand systems in cable systems; in particular, how to aggregate requests for movies at a cable head-end and then how to satisfy a

multitude of requests using one audio/video stream broadcast to multiple receivers simultaneously. This research has continually evolved and resulted in the development of techniques to scalably deliver on-demand content, including audio, video, web documents, and other types of data, through the Internet and over other types of networks, including over cable systems, broadband telephone lines, and satellite links.

11. An important component of my research has been investigating the challenges of communicating multimedia content, including video, between computers and across networks including the Internet. Although the early Internet was used mostly for text-based, non-real time applications, the interest in sharing multimedia content, such as video, quickly developed. Multimedia-based applications ranged from downloading content to a device to streaming multimedia content to be instantly used. One of the challenges was that multimedia content is typically larger than text-only content, but there are also opportunities to use different delivery techniques since multimedia content is more resilient to errors. I have worked on a variety of research problems and used a number of systems that were developed to deliver multimedia content to users. One content-delivery method I have researched is the one-to-many communication facility called “multicast,” first deployed as the Multicast Backbone, a virtual overlay network supporting one-to-many communication. Multicast is one technique that can be

used on the Internet to provide streaming media support for complex applications like video-on-demand, distance learning, distributed collaboration, distributed games, and large-scale wireless communication. The delivery of media through multicast often involves using Internet infrastructure, devices and protocols, including protocols for routing and TCP/IP.

12. Starting in 1997, I worked on a project to integrate the streaming media capabilities of the Internet together with the interactivity of the web. I developed a project called the Interactive Multimedia Jukebox (IMJ). Users would visit a web page and select content to view. The content would then be scheduled on one of a number of channels, including delivery to students in Georgia Tech dorms delivered via the campus cable plant. The content of each channel was delivered using multicast communication.

13. In the IMJ, the number of channels varied depending on the capabilities of the server including the available bandwidth of its connection to the Internet. If one of the channels was idle, the requesting user would be able to watch their selection immediately. If all channels were streaming previously selected content, the user's selection would be queued on the channel with the shortest wait time. In the meantime, the user would see what content was currently playing on other channels, and because of the use of multicast, would be able to

join one of the existing channels and watch the content at the point it was currently being transmitted.

14. The IMJ service combined the interactivity of the web with the streaming capabilities of the Internet to create a jukebox-like service. It supported true Video-on-Demand when capacity allowed, but scaled to any number of users based on queuing requested programs. As part of the project, we obtained permission from Turner Broadcasting to transmit cartoons and other short-subject content. We also connected the IMJ into the Georgia Tech campus cable television network so that students in their dorms could use the web to request content and then view that content on one of the campus's public access channels.

15. More recently, I have also studied issues concerning how users choose content, especially when considering the price of that content. My research has examined how dynamic content pricing can be used to control system load. By raising prices when systems start to become overloaded (i.e., when all available resources are fully utilized) and reducing prices when system capacity is readily available, users' capacity to pay as well as their willingness can be used as factors in stabilizing the response time of a system. This capability is particularly useful in systems where content is downloaded or streamed on-demand to users.

16. As a parallel research theme, starting in 1997, I began researching issues related to wireless devices and sensors. In particular, I was interested in

showing how to provide greater communication capability to “lightweight devices,” i.e., small form-factor, resource-constrained (e.g., CPU, memory, networking, and power) devices. Starting in 1998, I published several papers on my work to develop a flexible, lightweight, battery-aware network protocol stack. The lightweight protocols we envisioned were similar in nature to protocols like Bluetooth, Universal Plug and Play (UPnP) and Digital Living Network Alliance (DLNA).

17. From this initial work, I have made wireless networking—including ad hoc, mesh networks and wireless devices—one of the major themes of my research. My work in wireless network spans the protocol stack from applications through to the encoding and exchange of data at the data link and physical layers.

18. At the application layer, even before the large-scale “app stores” were available, my research looked at building, installing, and using apps for a variety of purposes, from network monitoring to support for traditional computer-based applications (e.g., content retrieval) to new applications enabled by ubiquitous, mobile devices. For example, my research has looked at developing applications for virally exchanging and tracking “coupons” through “opportunistic contact” (i.e., communication with other devices coming into communication range with a user). In many of the courses I have taught there is a project component. Through

these projects I have supervised numerous efforts to develop new “apps” for download and use across a variety of mobile platforms.

19. Toward the middle of the protocol stack, my research also looked to build wireless infrastructure support to enable communication among a set of mobile devices unaided by any other kind of network infrastructure. These kinds of networks are useful either in challenged network environments (e.g., when a natural disaster has destroyed existing infrastructure) or when suitable support for network communication never existed. The deployment of such networks (or even the use of traditional network support) are critical to support services like disaster relief, catastrophic event coordination, and emergency services deployment.

20. Yet another theme is monitoring wireless networks, in particular different variants of IEEE 802.11 compliant networks, to (1) understand the operation of the various protocols used in real-world deployments, (2) use these measurements to characterize use of the networks and identify protocol limitations and weaknesses, and (3) propose and evaluate solutions to these problems. I have successfully used monitoring techniques to study wireless data link layer protocol operation and to improve performance by enhancing the operation of such protocols. For wireless protocols, this research includes functions like network acquisition and channel bonding.

21. Protecting networks, including their operation and content, has been an underlying theme of my research almost since the beginning of my research career. Starting in 2000, I have been involved in several projects that specifically address security, network protection, and firewalls. After significant background work, a team on which I was a member successfully submitted a \$4.3M grant proposal to the Army Research Office (ARO) at the Department of Defense to propose and develop a high-speed intrusion detection system. Key aspects of the system included associating streams of packets and analyzing them for viruses and other malware. Once the grant was awarded, we spent several years developing and meeting the milestones of the project. A number of my students worked on related projects and published papers on topics ranging from intrusion detection to developing advanced techniques to be incorporated into firewalls. I have also used firewalls, including their associated malware detection features, in developing techniques for the classroom to ensure that students are not distracted by online content.

22. Recent work ties some of the various threads of my past research together. I have investigated content delivery in online social networks and proposed reputation management systems in large-scale social networks and marketplaces. On the content delivery side, I have looked at issues of caching and cache placement, especially when content being shared and the cache has

geographical relevance. We were able to show that effective caching strategies can greatly improve performance and reduce deployment costs. Our work on reputation systems showed that reputations have economic value, and as such, creates a motivation to manipulate reputations. In response, we developed a variety of solutions to protect the integrity of reputations in online social networks. The techniques we developed for content delivery and reputation management were particularly relevant in peer-to-peer communication and recommendations for downloadable “apps.”

23. As an important component of my research program, I have been involved in the development of academic research into available technology in the market place. One aspect of this work is my involvement in the Internet Engineering Task Force (IETF). The IETF is a large and open international community of network designers, operators, vendors, and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet. I have been involved in various IETF groups including many content delivery-related working groups like the Audio Video Transport (AVT) group, the MBone Deployment (MBONED) group, Source Specific Multicast (SSM) group, the Inter-Domain Multicast Routing (IDMR) group, the Reliable Multicast Transport (RMT) group, the Protocol Independent Multicast (PIM) group, etc. I have also served as a member of the Multicast Directorate (MADDOGS), which

oversaw the standardization of all things related to multicast in the IETF. Finally, I was the Chair of the Internet2 Multicast Working Group for seven years.

24. My involvement in the research community extends to leadership positions for several academic journals and conferences. I am the co-chair of the Steering Committee for the ACM Network and System Support for Digital Audio and Video (NOSSDAV) workshop and on the Steering Committees for the International Conference on Network Protocols (ICNP), ACM Sigcomm Workshop on Challenged Networks (CHANTS), and IEEE Global Internet (GI) Symposium. I have served or am serving on the Editorial Boards of IEEE/ACM Transactions on Networking, IEEE Transactions on Mobile Computing, IEEE Network, ACM Computers in Entertainment, AACE Journal of Interactive Learning Research (JILR), and ACM Computer Communications Review. I have co-chaired a number of conferences and workshops, including the IEEE International Conference on Network Protocols (ICNP), IEEE Conference on Sensor, Mesh and Ad Hoc Communications and Networks (SECON), International Conference on Communication Systems and Networks (COMSNETS), IFIP/IEEE International Conference on Management of Multimedia Networks and Services (MMNS), the International Workshop On Wireless Network Measurement (WiNMee), ACM Sigcomm Workshop on Challenged Networks (CHANTS), the Network Group Communication (NGC) workshop, and the Global Internet

Symposium, and I have served on the program committees for numerous conferences.

25. Furthermore, in the courses I have taught at UCSB, a significant portion of my curriculum covered aspects of the Internet and network communication, including the physical and data link layers of the Open System Interconnect (OSI) protocol stack, and standardized protocols for communicating across a variety of physical media such as cable systems, telephone lines, wireless, and high-speed Local Area Networks (LANs). The courses I have taught also cover most major topics in Internet communication, including data communication, multimedia encoding, and mobile application design. My research and courses have covered a range of physical infrastructures for delivering content over networks, including cable, Integrated Services Digital Network (ISDN), Ethernet, Asynchronous Transfer Mode (ATM), fiber, and Digital Subscriber Line (DSL). For a complete list of courses I have taught, see my curriculum vitae (CV) (Ex-1004).

26. In addition, I co-founded a technology company called Santa Barbara Labs that was working under a sub-contract from the U.S. Air Force to develop very accurate emulation systems for the military's next generation internetwork. Santa Barbara Labs' focus was in developing an emulation platform to test the performance characteristics of the network architecture in the variety of

environments in which it was expected to operate, and, in particular, for network services including IPv6, multicast, Quality of Service (QoS), satellite-based communication, and security. Applications for this emulation program included communication of a variety of multimedia-based services, including video conferencing and video-on-demand.

27. In addition to having co-founded a technology company myself, I have worked for, consulted with, and collaborated with companies for nearly 30 years. These companies range from well-established companies to start-ups and include IBM, Hitachi Telecom, Turner Broadcasting System (TBS), Bell South, Digital Fountain, RealNetworks, Intel Research, Cisco Systems, and Lockheed Martin.

28. Through my graduate education, leadership with CITS, involvement in TMP, role in the development of the Internet2 infrastructure, and consulting with ISPs, I have gained a strong understanding in the role of the Internet in our society and the challenges of deploying large-scale production networking infrastructure. CITS, since its inception, has looked at the role of the Internet in society, including how the evolution of technology have created communication opportunities and challenges, including, for example through disruptive technologies like P2P. TMP looks to focus on non-purely technical issues, including, for example, state-of-the-art business methods, strategies for successful

technology commercialization, new venture creation, and best practices for fostering innovation. Through my industry collaborations and Internet2 work, I have developed significant experience in the challenges of deploying, monitoring, managing, and scaling communication infrastructure to support evolving Internet services like streaming media, conferencing, content exchange, social networking, and e-commerce.

29. I am a Member of the Association of Computing Machinery (ACM) and a Fellow of the Institute of Electrical and Electronics Engineers (IEEE).

III. INFORMATION CONSIDERED

30. In preparation for this Declaration, I have considered the materials discussed in this Declaration, including, for example, the Shribman patent and the Goodell prior art reference. In addition, my opinions are further based on my education, training, experience, and knowledge in the relevant field.

IV. RELEVANT LEGAL STANDARDS

31. I am not an attorney and offer no legal opinions. For the purposes of this Declaration, I have been informed about certain aspects of the law that are relevant to my analysis, as summarized below.

A. Claim Interpretation

32. I have been informed and understand that in an IPR proceeding, claims are to be interpreted according to the *Phillips* claim construction standard. I

have been informed and understand that claim construction is a matter of law and that the final claim constructions for this proceeding will be determined by the Patent Trial and Appeal Board (“PTAB”).

33. I understand that I am to interpret the claims of Shribman according to the *Phillips* claim construction standard.

34. I understand that both the Board and the district court have considered the scope of the terms “client” and “server” in the context of related patents, and have found that “client” and “server” refer to the role the device plays, not to particular hardware characteristics.

35. The Board, in instituting IPRs on related Patents, stated: “We credit the district court’s interpretation of the claim terms. Accordingly, for the purposes of this decision we adopt the construction of a ‘client device’ as ‘communication device that is operating in the role of a client.’” IPR2021-012493, Paper 11 at 22; *see also* IPR2021-012492, Paper 12 at 19 (“we adopt the district court’s original construction, with the clarification that the second server is ‘a device that is operating in the role of a server and that is not the first client device’”), 13 (“we agree with Petitioner’s claim constructions, specifically, that ‘the devices in question may be configured to operate in different roles and are characterized by the function they perform (i.e., sending or receiving), not by any physical properties’”).

36. In district-court litigation on related patents, the court held that “client device” means “communication device that is operating in the role of a client” and rejected Patent Owner’s contention that the term required a “consumer computer.” Ex-1021, 10-12; Ex-1007, 11-13. In one of its orders, the Court, in construing the term “first server,” addressed “whether one component can simultaneously serve as more than one of: the client device, the first server[], and the web server,” concluded “[i]t cannot,” and construed “first server” as “server that is not the client device or the web server.” Ex-1007, 13-15. Subsequently, it became apparent that “server” required further construction, and Petitioner requested a clarified construction of: “a device that is operating in the role of a server and that is not the first client device or the web server.” Ex-1022, 2 (emphasis in original). The District Court declined to formally change the construction, but confirmed “Defendants’ understanding of the scope of the construction[], as represented by the requested clarification[] ..., is correct” and “already embedded in” the original construction. Ex-1023, 7-11. The Court confirmed that “a component can be configured to operate in different roles—so long as it does not ‘simultaneously serve as more than one of: the client device, the first server/second server, and the web server.’” *Id.*, 10 (emphasis in original).

B. Perspective of One of Ordinary Skill in the Art

37. I have been informed and understand that a patent is to be understood from the perspective of a hypothetical “person of ordinary skill in the art” (“POSITA”). Such an individual is considered to possess normal skills and knowledge in a particular technical field (as opposed to being a genius). I understand that in considering what the claims of a patent require, what was known prior to that patent, what a prior art reference discloses, and whether an invention is obvious or not, one must use the perspective of such a POSITA.

C. Obviousness

38. I have been informed and understand that a patent claim is obvious under 35 U.S.C. §103, and therefore invalid, if the claimed subject matter, as a whole, would have been obvious to a POSITA as of the priority date of the patent based on one or more prior art references and/or the knowledge of a POSITA.

39. Petitioner’s argument is based on what I understand to be called “single-reference obviousness,” instead of anticipation. I understand that anticipation requires a higher level of teaching than single-reference obviousness, requiring that references teach limitations of a claim explicitly or inherently. I

understand that, for single-reference obviousness, the reference need only render a limitation obvious to one of skill in the art at the time of the invention.¹

40. I understand that a POSITA is presumed to know the relevant prior art. I understand that the obviousness analysis may take into account the inferences and creative steps that a POSITA would employ.

V. LEVEL OF ORDINARY SKILL IN THE ART

41. In my opinion, in light of *Shribman*, a person of ordinary skill in the art would have had a bachelor's degree in computer science or a related field (or

¹ According to counsel, although “anticipation is the epitome of obviousness, they are separate and distinct concepts.” *SK Hynix Inc. v. Netlist, Inc.*, IPR2017-00561, Paper 36, 11. I understand that anticipation requires “a higher level of teaching requiring that references teach limitations of a claim explicitly or inherently.” *Id.* For single-reference obviousness, I understand that “the reference need only render a limitation obvious to one of skill in the art at the time of the invention.” *Id.*; see also *Cisco Sys., Inc. v. Centripetal Networks, Inc.*, IPR2018-01760, Paper 9, 24 (“[A] party may contend a reference *teaches or suggests* each limitation of claim, but does not meet the more exacting requirement of explicit or inherent disclosure.”)

equivalent experience) and at least two years' experience working with and programming networked computer systems.

VI. SUMMARY OF OPINIONS

42. I have been asked to consider whether the claims of Shribman are obvious over a dissertation entitled "Perspective Access Networks" (Ex-1005) ("Goodell"). As explained below in detail in this Declaration, it is my opinion that claims 1, 8, 16, 17, 22, 29, and 30 of Shribman are unpatentable as obvious over Goodell.

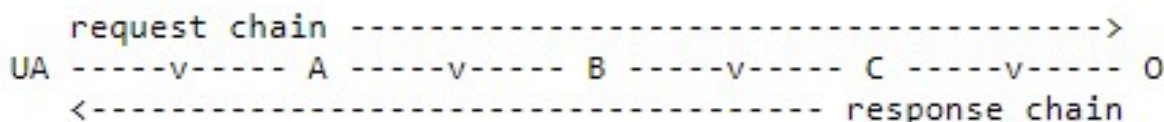
VII. TECHNOLOGY BACKGROUND

43. Shribman relates to the fields of web communications and routing, including the HyperText Transfer Protocol (HTTP).

44. By 2009, a POSITA would have been familiar with the field of technology described in the petition at Section III including the underlying principles of web, internet, network communication, data transfer, and content sharing across networks, including HTTP and the TCP/IP protocols. As noted in Shribman, one of skill in the art would have understood the conversion of URLs to IP addresses, through, for example, the Domain Name System (DNS). Ex-1001, 13:15-18.

45. By 2009, web communications and routing were well known, and would have been understood by a POSITA. A POSITA would be familiar with

Requests for Comments (RFCs) from the Internet Engineering Task Force (IETF) relating to HTTP, including RFC 2616. A POSITA would understand that RFC 2616 discloses multi-hop routing using “proxy” devices running an intermediary program which acts as both a server and a client for the purpose of making requests on behalf of other clients. In particular, Ex-1006 (RFC 2616) discloses, at 12, that while communication may be “accomplished via a single connection (v) between the user agent (UA) and the origin server (O),” “more complicated situation[s]” were also known “when one or more intermediaries are present in the request/response chain,” such as an illustrated chain with “three intermediaries (A, B, and C).” This is disclosed at the figure below, found in the RFC.



RFC 2616 further describes clients and servers: “Any given program may be capable of being both a client and a server; our use of these terms refers only to the role being performed by the program for a particular connection.” Ex-1008, 9. RFC 2616 provides further guidance on each of these “roles,” defining a “client” as “establish[ing] connections for the purpose of sending requests” and a “server” as “accept[ing] connections in order to service requests by sending back responses.” Ex-1008, 9. RFC 2616 explains that a “proxy” is an “intermediary program which acts as both a server and a client for the purpose of making requests

on behalf of other clients.” Ex-1008, 10. These RFC 2616 statements would have carried significant weight with a POSITA.

46. A POSITA would have understood, well before 2009, that audio and video files may be requested and provided using HTML. For example, in 1999, RFC 2616 disclosed the HTML header field “Accept” which “can be used to specify certain media types that are acceptable for response.” Ex-1006, 100. An example disclosed in RFC 2616 specified “audio” in the field, which would request “any audio type.” *Id.*, 101. Further, the Internet Archive shows that YouTube allowed users to watch videos over HTML as early as 2005. Ex-1028.

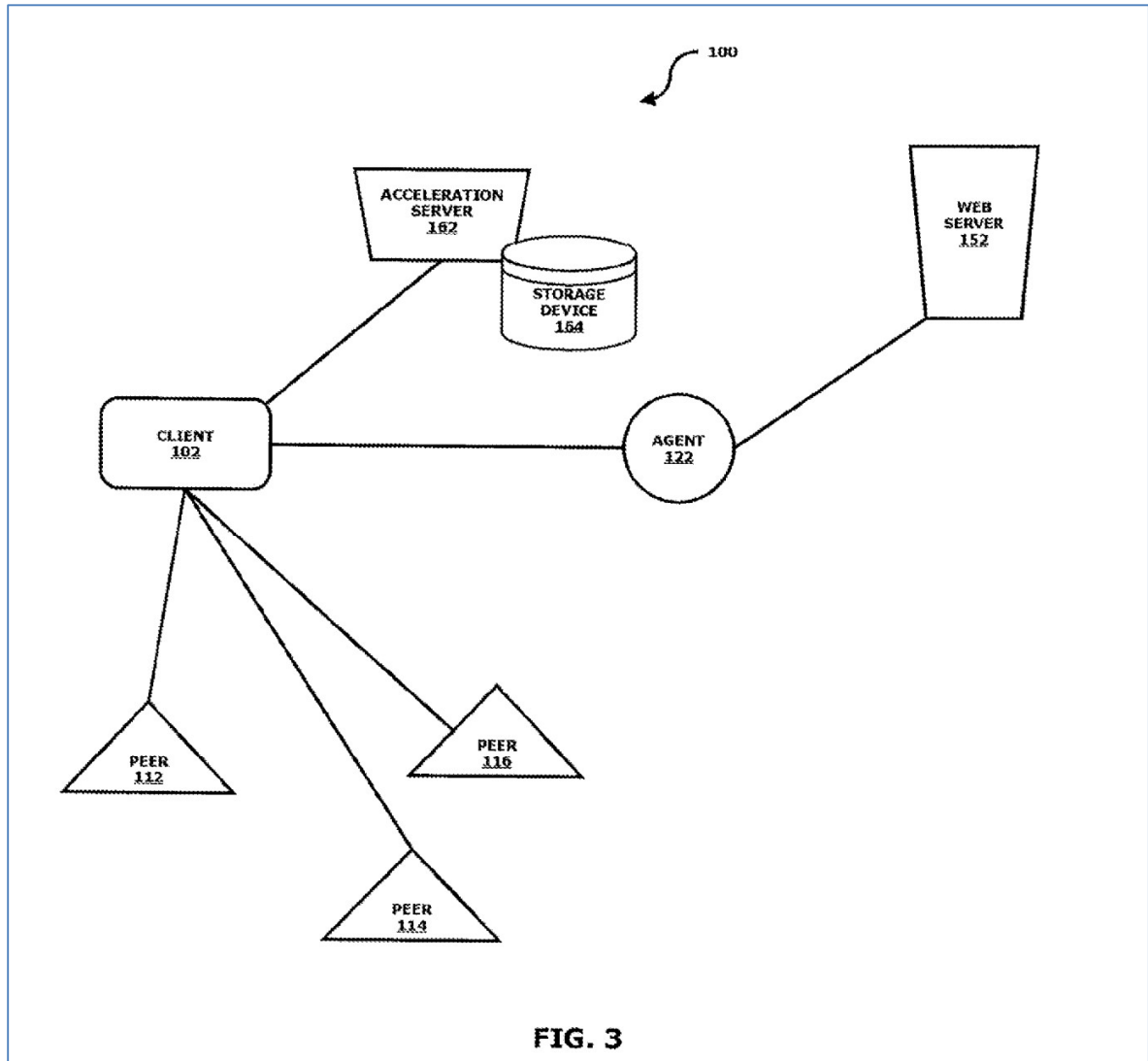
47. Content Delivery Networks (“CDNs”) were well known to a POSITA before 2009. For example, companies like Akamai began providing commercial CDN services in the late 1990s. Akamai also was among a group of early developers that patented some of the original CDN concepts (*see, e.g.,* U.S. Patent No. 6,108,703 to Akamai and U.S. Patent No. 6,185,598 to Sandpiper Networks). Additional features of CDNs were described in, for example, U.S. Patent No. 7,240,100 to Wein (filed in 2001). Ex-1034, 1:15-52. Wein discloses a network of “surrogate” origin servers, located at strategic locations, for delivering high-quality streaming-media delivery. *Id.* A POSITA would have been familiar with, not only the first generation of CDNs, but advancements in CDN functionality, capability, and efficiency developed in the decade after the first CDN systems and patents.

48. One of skill in the art would understand, for example, by 2009, the geographic location of a user could be determined in a variety of ways and then used to access content that was closer to a user. For example, U.S. Patent No. 6,477,581 to Carpenter (filed April 9, 1996) states that many techniques are available to acquire the geographic location of a client, including accepting user input specifying the location of a client, and using an automated position-sensing system, such as GPS. Ex-1024, 1:30-61, 2:13-28, 2:34-52, 4:60-62, 5:20-28, 5:66-6:2, 6:46-7:23, 8:40, Fig. 2 block 50, cls. 1-4, 6-11. One of skill in the art would also understand, well before 2009, that the geographic location of a user could be used to help select an appropriate proxy through which to access the Internet and web content. *Id.*, 5:23-43.

VIII. THE CHALLENGED PATENT

49. Shribman discloses a four-role system by which a client requests and receives information from a web server. The “Summary of the Invention” discloses a system with (i) a **client communication device** requesting data from a **data server**, (ii) an **agent communication device**, assigned to the data server, that “keeps track of which client communication devices have received responses to data requests,” (iii) a **peer communication device** for storing portions of data received in response to data requests, and (iv) an **acceleration server** for assigning agent communication devices to data servers and communicating that information

the client communication devices. Ex-1001, 3:12-34. This system is shown at Shribman's Figure 3:



50. Shribman further describes acceleration server 162 as maintaining a list of IP addresses of communication devices within the network. Ex.1001, 5:15-20, 10:25-33. When an in-network communication device requests information (such as from web server 152), that communication device is designated as a “client.” *Id.*, 5:20-25. Software (on the client) routes these requests for

information through the communication network, rather than querying the web server directly. *Id.*, 8:60-64, 9:27-36. A different in-network communication device is designated as an “agent.” *Id.*, 5:21-34. The client sends its request for information to the agent, and the agent obtains and returns (to the client) a list of in-network peer devices that may have the requested information. *Id.*, 9:44-50.

51. More particularly, Shribman discloses that, when a client requests a webpage (such as the URL www.aol.com/index.html), the client looks up the IP address of the appropriate web server and sends that IP address to the acceleration server. *Id.* 12:62-13:15. The acceleration server responds with a list of “suitable” agents. *Id.*, 13:16-30. The client next sends its original webpage request to the listed agents in order to evaluate which agent is “best suited to” assist with the request. *Id.*, 13:31-36. After selecting an agent, the client sends the agent requests for data. *Id.*, 14:10-23. The agent determines, on a data-chunk-by-data-chunk basis, whether it or other in-network peers have previously stored each chunk of the requested data. *Id.* 14:24-41. For each chunk, the agent either (i) sends the client a list of peers that have previously stored the chunk, sorted by geographic proximity to the client or (ii) loads and stores the information directly from the web server, and informs the client that the agent is the only peer for that information. *Id.*, 14:52-66. The client then requests the data chunks from the agent and peers. *Id.*, 15:12-23.

52. The independent claim at issue has little to do with the disclosed system. Instead of the using the described four-role system (client, acceleration server, agent, peer) to interact with a web server, the claim discloses two devices: a first device that requests webpages and a second device that stores a list of IP addresses that are each associated with a geographical location. Ex-1001, cl. 1. The first device sends a URL along with a geographic location to the second device. *Id.* The first device then receives a webpage from the second device in response to the received URL and geographic location. *Id.* The claim then requires the first device to send a second URL and geographic location, which results in a second webpage. *Id.*

IX. PROSECUTION HISTORY

Shribman's file history is submitted as Ex-1002. The prosecution history includes no substantive analysis of any prior art. The Examiner initially rejected all claims for double patenting over the related '511 Patent. Ex-1002, 240-245. After Patent Owner filed an e-TD, *id.*, 420, the Examiner allowed all pending claims, *id.*, 422-430.

X. PRIORITY DATE

53. The earliest possible priority for Shribman is October 8, 2009, the filing date of provisional application No. 61/249,624. Ex-1001, page 2. I take no position here on the proper priority date for each claim of Shribman. I understand

that Goodell is prior art even assuming that Shribman is entitled to its earliest possible priority date (October 8, 2009).

XI. BRIEF DESCRIPTION OF THE PRIOR ART REFERENCE

A. Goodell (Ex-1005)

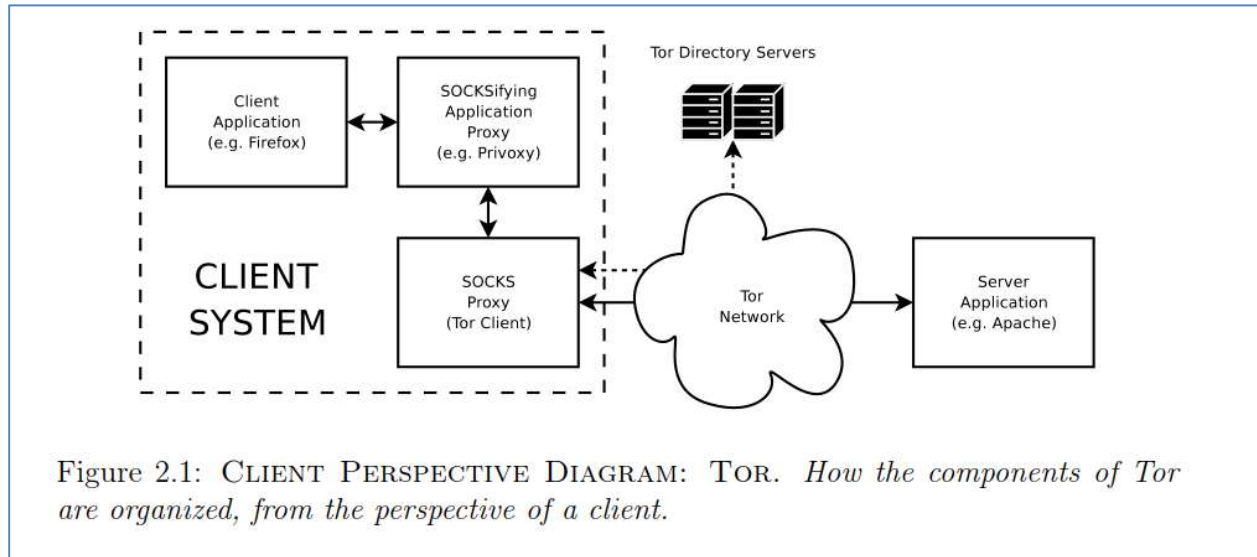
54. Goodell is a Harvard University dissertation by Geoffrey Goodell, entitled “Perspective Access Networks.” Ex-1005; Ex-1033 (Goodell Declaration)

¶ 6. The dissertation is dated July 2006. I understand that Goodell qualifies as prior art under at least 35 U.S.C. §102(b), because it was publicly available well over a year before Shribman’s earliest claim of priority.

55. As suggested by the title, Goodell focuses on “perspective access networks,” defined as “overlay network[s] that allows users to specify not only the resources that they want to view but the *perspectives* from which they want to view them.” Ex-1005, 2; *see also id.* at Abstract (“Perspective Access Networks provide an infrastructure from which users can specify the location from which they wish to view the internet.”) Goodell discusses both theoretical perspective access networks and a real-world prototype (named Blossom, *id.* at 5, 24) created by the author. Goodell and Shribman both address methods of downloading resources from the Internet and are thus both in the same field of endeavor.

56. Goodell discloses that Blossom was built on the backbone of Tor, *id.* at 64, which is characterized as an “anonymity network,” *id.* at 61. As shown at

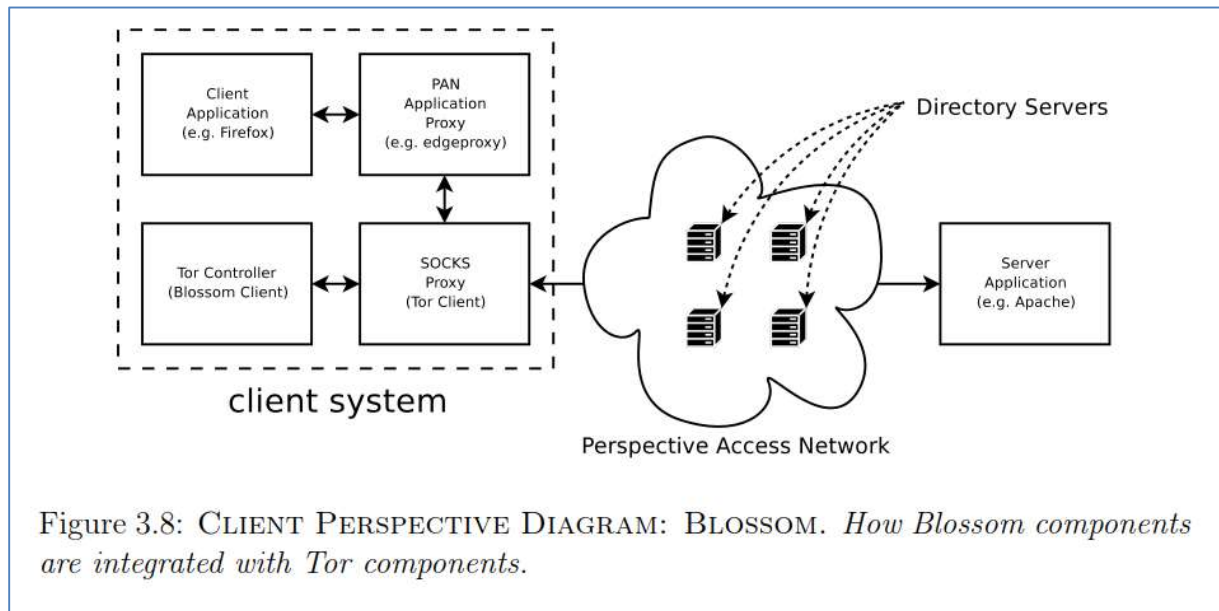
Goodell Figure 2.1 (at 62), from a user's perspective, the Tor network connects client systems to web servers through a network of forwarders (proxies, *id.*, 110) that communicate with Tor directory servers:



57. The directory servers publish, for each individual forwarder/proxy, “descriptors” that “carry all of the details a client needs to use the forward to build circuits,” (e.g., the forwarder’s identity, public key, and IP address), along with the forwarder’s “exit policy,” which specifies the set of IP addresses to which the forwarder is willing to provide access as an exit node. *Id.* at 63. When the client seeks to connect with a remote server, the Tor client software “uses descriptors obtained from the directory server to build a random path through the Tor network to the application server it wishes to contact.” *Id.* Once the circuit is built, the “exit forwarder” can transmit data requests to the application server (e.g., an HTTP GET request), and send the received data response back to the client through the

chain of forwarders. *Id.* at 63-64, Fig. 2.2. Importantly, with Tor, the choice of the “exit forwarder” is left to chance—Tor will randomly choose a forwarder whose exit policy can access the requested website. *Id.* at 112 (“If the chosen exit forwarder happens to be in Germany, then Google search results will be skewed to assigned German-language pages higher by default.”).

58. An implementation of Blossom disclosed by Goodell shows a system similar to the Tor system at Figure 2.1, *id.* at 118, but with “Blossom client” software at the client system:



See also *id.* at 112 (“Both Blossom networks and Tor networks consist of interconnected proxies”). With Blossom, the user specifies both a web server and a location (or “perspective”). *Id.* at 118 (e.g., a web server from a perspective in

Greece).² The Blossom client parses the request to separate the hostname from the perspective request, and then constructs a circuit to an exit forwarder in Greece.

Id. at 119, 146. The Blossom client uses Tor descriptors to build circuits using the underlying Tor system. *Id.* at 113. The client application may then exchange requests and responses with the web server via the circuit (where, from the web server's point of view, the exit forwarder in Greece is the client). *Id.* at 119.

Goodell confirms that, using Blossom, “the set of web pages accessible from some ISP in China differs from the set of web pages accessible from some ISP in Boston.” *Id.* at 147.

59. Goodell also discloses perspective access networks more generally through the use of four roles: resources (to which the network enables access), forwarders (that make up the peer-to-peer overlay network), clients (that establish circuits through the overlay network), and directory servers (that store information about the individual forwarders). *Id.*, 28-29. At the client, the human users “interact with ordinary Internet-aware applications [e.g., web browsers], which in

² Blossom included a web interface that allowed a user to specify a URL and a country from which to view the URL, along with a page cataloging Tor forwarders by country and exit policy. *Id.* at 119.

turn interact with a PAN client via a proxy interface. Applications treat the PAN client as a generic transport-layer proxy.” *Id.*, 28.

60. Perspective-access-network directory servers store information about forwarders in the network, including (at a minimum) IP address, port for accepting circuit-building connection, exit policy, and public key. *Id.* at 141-43. The disclosed directory servers may also store metadata information that further describes the forwarders, such as geographic region or network name. *Id.*; *see also id.* at 104 (a forwarder [perspective] can be described by political location (e.g., US.Massachusetts. – Cambridge); ISP or private network (e.g., Harvard.EECS); or latitude-longitude coordinates (e.g., 42.3, -72.1, r: 3km), among others). The metadata may also explicitly include the network-address ranges that the forwarder “allows or restricts access.” *Id.*, 105. All directory servers also serve as forwarders, although most forwarders are not directory servers. *Id.*, 100, *see also id.*, 139. Perspective-access-network directory servers also store (i) a “master record” (containing attributes describing itself), and (ii) a set of “directory records,” describing other directory servers in the system. *Id.*, 136, 141 (“A directory server **must** publish a forwarder record for itself.”).

61. A perspective-network-access client must be able to define the circuits to be constructed. *Id.*, 111. Clients “contact directory servers to obtain information necessary to route traffic[.]” *Id.*, 78, 101, 104 (“A client requests a

perspective matching a set of characteristics, and receives instructions for constructing a source route through the network that provides a perspective meeting the specification.”), 107. A client may issue a “perspective query” indicating “that the client wants to build a circuit that terminates at any last-hop forwarder whose forwarder record on some directory server matches some set of criteria.” *Id.* at 143-44, 151-151; *see also id.* at 107-108 (describing metadata queries based on political location or IP address (“explicit environmental filtering”)).

62. Goodell recognizes options to ensure “connection state,” i.e., ensuring that packets “be able to travel between the client and the resource in both the forward and reverse directions.” EX1005, 83. One way to achieve this goal is to “have the original requester specify the set of forwarders explicitly,” and have the application server “use the list of forwarders to direct the response.” *Id.*, *see also id.*, 81, 85 (“One approach is to have the client explicitly provide a means by which the exit forwarder can route replies back through the infrastructure to the client.”). A second way to achieve this goal (used by Blossom) is to “maintain connection state within the network” by “maintaining a mapping for individual connections that allow them to correctly route replies.” *Id.*, 84.

63. Goodell discloses the possibility of a “secret” overlay network of forwarders, rather than a “public” network of forwarders. EX1005, 87. “In a

secret network, the identities of participating forwarders are deliberately obscured, so that while a participant in the system must know the identities of a small number (possibly one) of other participants, it has no way of ascertaining the identities of other forwarders.” *Id.* “In a *public* network, the identities of participating forwarders are exposed to public view, such that any party may determine the identities of all of the participating forwarders, or whether any given host is a participant in the network.” *Id.*

64. Goodell discloses a case where an enterprise uses the Internet to connect its various offices, as shown at Figure 3.15:

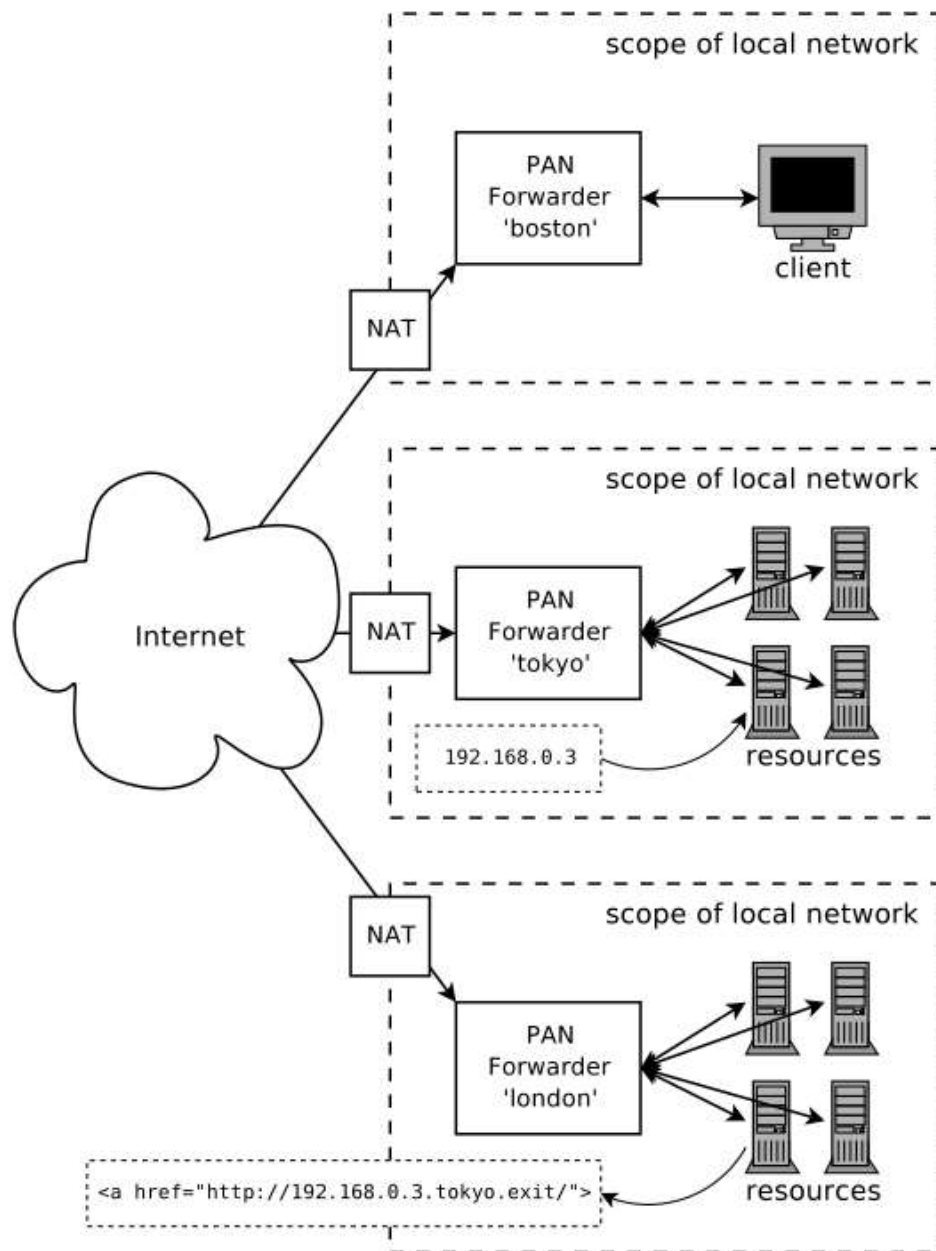


Figure 3.15: EXPLICIT REFERENCES ACROSS BOUNDARIES. *Resources located in one office of an enterprise can refer to resources only accessible from within other, specific offices.*

EX1005, 126, 132. In this case, “resources within one network can implicitly use PAN [perspective access networks] to refer to resources accessible via a PAN

forwarder in a remote office, even if such resources are not available directly.” *Id.*,
126.

XII. DETAILED EXPLANATION OF GROUNDS

65. Shribman contains 30 claims; only claim 1 is independent. As explained below, all challenged claims (1, 8, 16, 17, 22, 29, and 30) are obvious in view of the prior art.

A. Ground 1: Claims 1, 8, 16, 17, 22, 29, and 30 are rendered obvious by Goodell

66. Goodell discloses a networking system with the same components and functionalities as Shribman. As shown below, Goodell’s disclosure renders all challenged claims obvious to a POSITA.

1. Independent claim 1

- a. [1.p] A method for fetching, by a first device, a first web-page that is identified by a first Uniform Resource Locator (URL) and is stored in a first web server and a second web-page that is identified by a second URL and is stored in a second web server, for use with a second device that stores a group of Internet Protocol (IP) addresses, each of the IP addresses is associated with a respective geographical location, the method comprising:**

67. Goodell teaches the preamble of claim 1 (element [1.p]), to the extent limiting.

68. In Goodell, disclosed perspective access networks allow clients [first devices] to access web content, accessible and identified by URL, stored in web

servers. Ex-1005 at Abstract, 118-119, 146-147. Goodell discloses directory servers [second devices] that store information about forwarders/proxies in the network, including IP addresses and associated metadata, which includes geographic region, political location, or latitude-longitude coordinates. *Id.*, 104, 141-43. Goodell thus discloses a second device [directory servers] that stores a group of IP addresses where each of the IP addresses is associated with a respective geographical location.

b. [1.1] identifying, at the first device, the first URL and a first geographical location that is associated with at least one of the IP addresses in the group;

69. Goodell teaches element [1.1].

70. Disclosed perspective access networks allow a user at a client device to identify a URL and a geographical location associated with an IP address at the directory server. For example, Goodell discloses that users can specify, with Blossom, both a web server and a location (e.g., Greece) from which to access the web server, Ex-1005 at 118-119, which allows the construction of a circuit to an exit forwarder in that location, *id.* Goodell discloses that perspective access networks allow users to specify the resources and the perspectives from which to view the resources, e.g., the “location from which they wish to view the internet.” *Id.*, Abstract, 2, 143-47 (perspective query), 151-152. For both Blossom and perspective-access networks more generally, in order for a circuit to be constructed

with an exit forwarder in the requested location, the requested location must be associated with an IP address (forwarder) stored at the directory server. This would be obvious to a POSITA.

c. [1.2] sending, by the first device to the second device, the first URL and the first geographical location;

71. Goodell teaches element [1.2].

72. Goodell discloses that PAN clients [first device] contact directory servers [second device] to obtain the information necessary to construct a circuit to the requested data from the requested perspective. *See* Ex-1005, 78, 101, 104, 107. The directory servers include information about each forwarder's IP address, exit policy (defined as the set of IP addresses and TCP port ranges to which a forwarder is willing to provide as an access node, Ex-1005, 63) and associated metadata, which includes geographic region, political location, or latitude-longitude coordinates. Ex-1005, 141; *see also id.*, 135 ("PAN consists of a pairwise-connected overlay network of *forwarders*, each of which has access to some set of internet resources.").

73. To choose a forwarder that can access the requested information from the requested perspective/location, a POSITA would understand that the directory server must receive (from the client) information about both the requested webpage and the requested geographical location, so that the directory server can choose a last-hop forwarder that has (i) an exit policy that allows it to access the requested

webpage, and (ii) metadata that indicates that the forwarder is in the requested geographical location. Because Goodell discloses that exit policies are expressed in the terms of a set of IP addresses, Ex-1005, 63, a POSITA would expect the client to transmit information sufficient to identify the target web server by IP address. Further, for a POSITA, it would be obvious to send a URL (rather than an IP address) to the directory server to identify the requested information, because Shribman recognizes (and a POSITA would understand) that converting URLs to IP addresses is “known by one having ordinary skill in the art.” Ex-1001, 13:15-18.

74. Further, Goodell discloses metadata queries whereby the client queries the directory server to return an appropriate forwarder. Ex-1005, 107-08, 143-46. In those queries, a client may send a request for a forwarder that (i) is from a particular geographical location [form 1, “political location”) and (ii) may access a particular IP address [form 4, “explicit environmental filtering”]. *Id.*, 107-108. For a POSITA, it would be obvious for a client to send a URL to the directory server instead of an IP address, because a POSITA would understand that a directory server could translate the URL into an IP address before running the disclosed metadata queries, especially in light of the disclosure in Shribman. Ex-1001, 13:15-18.

75. Thus, in light of Goodell, it would be obvious for the client device (the first device) to send the first URL and the first location to the directory server (the second device) so that the directory server could identify a last-hop forwarder that could respond with the requested information from the requested perspective.

d. [1.3] receiving, by the first device from the second device, the first web-page, in response to the sending of the first URL and the first geographical location;

76. Goodell teaches element [1.3].

77. Goodell discloses a perspective-access-networks client device that can query a directory server for an appropriate forwarder that can access a particular URL from a particular location, as shown in my analysis above for claim term [1.2]. The disclosed perspective-access-network directory servers are also forwarders. Ex-1005, 100. The clients receive the requested web pages. *Id.*, Abstract, 120-21. In such a system, a POSITA would recognize three different ways that this claim term is disclosed and rendered obvious by Goodell, where the client device [first device] receives the first webpage from the directory server [second device] in response to the sending of the first URL and the first geographic location.

78. First, after the client device sends the first URL and the first geographic location, a POSITA would understand that the directory server may identify *itself* as a forwarder that can access the requested URL from the

perspective of the first geographic location. Ex-1005, 100, 136, 139, 141 (directory server maintains forwarder record for itself). In that situation, to ensure connection state, a POSITA would understand that either (i) the client device would explicitly specify a set of forwarders where the directory server is the “last hop” to transport requests to the web server and web pages back to the client, or (ii) the client device would maintain a connection state to the web server through the last-hop directory server. Ex-1005, 81, 83-85. In either situation, the client device would receive the requested web page from the directory server in response to sending the URL and the geographical location.

79. Second, Goodell discloses the use of a “secret” overlay network of forwarders, where “a participant in the system must know the identities of a small number (possibly one) of the other participants.” Ex.-1005, 87. To use a secret perspective-access network where the client device knows only one other participant, as disclosed by Goodell, a POSITA would understand that the other participant would mediate all communications between the client system and the network, and would thus act as (i) the directory server, (ii) the first forwarder for passing requests from the client to the web server, and (iii) the last-hop forwarder for responsive web pages passing from the web server to the client device.³ In

³ Goodell discloses an architecture where all of a client’s communications pass

such a system, a POSITA would understand that the directory server would still receive a request for a URL and a geographic location from the client server and choose an appropriate last-hop forwarder with an appropriate exit policy and geographic location. To maintain secrecy, however, a POSITA would understand that the directory server would *not* be able to share that information with the client device, and would have to pass the requests and receive the responsive web pages on the client's behalf, acting as a proxy. In this second situation, a POSITA would understand that the client device would receive the requested web page from the directory server in response to sending the URL and the geographical location.

80. Third, Goodell also discloses that the client device may “specify the list of forwarders explicitly” and “use the list of forwarders to direct the response.” *Id.*, 81, 83, 85. A POSITA would thus understand that the disclosed perspective-access-networks client device may define the route (i.e., list of forwarders) to and back from the web server. Further, because the directory server is also a perspective-access-network forwarder, Ex-1005, 100, a POSITA would understand that the directory server could be included in the list of forwarders. As a result, a

through a single forwarder, Figure 3.15. Ex-1005, 126, 132 (PAN forwarder “boston”). A POSITA would further rely on Figure 3.15 to conclude that it is possible for a client to interface with a single PAN forwarder.

POSITA would understand that a client device [first device] may receive the requested web page from the directory server [second device] by including the directory server in the list of forwarders connecting the client and the web server. Further, based on this disclosure, a POSITA would see a benefit for the client device to include the directory server in the list of forwarders. The client device has recently contacted the directory server; thus, the directory server has already proved itself as reliable and unlikely to break the transport chain, making the directory server a good choice (from the client's perspective) for inclusion in the list of forwarders connecting the client and the web server. In this third situation, a POSITA would understand that the client device would receive the requested web page from the directory server in response to sending the URL and the geographical location.

e. [1.4] identifying, at the first device, the second URL and a second geographical location that is associated with at least one of the IP addresses in the group;

81. Goodell teaches element [1.4].

82. As disclosed above in my analysis of claim term [1.1], Goodell discloses the first “identifying” step. A POSITA would understand that the same client [first device] could identify a second URL and a second geographical location. This is buttressed by the disclosure in Goodell confirming that the

internet looks different from different locations, Ex-1005, 147, suggesting to a POSITA that the author executed multiple queries from the same computer.

83. Further, Goodell discloses that an HTTP proxy can automatically append the same metadata query (e.g., geographical location, Ex-1005, 104, 107-108, 141-43) to successive web content requests to make sure that links that are clicked on are viewed from the same perspective. Ex-1005, 121. The successive web-content request is an identification of a second URL and a second geographical location. A POSITA would understand from this disclosure that a user could make successive requests for web pages specifying a URL and a location.

f. [1.5] sending, by the first device to the second device, the second URL and the second geographical location; and

84. Goodell teaches element [1.5].

85. As disclosed above at claim term [1.2], Goodell discloses and renders obvious the first “sending” step. A POSITA would understand that the same client [first device] could send a second query to the same directory server [second device] with a second URL and a second geographical location.

86. Further, as noted above at element [1.4], Goodell discloses that an HTTP proxy can automatically append the same metadata query (e.g., geographical location, Ex-1005, 104, 107-108, 141-43) to successive web content requests to

make sure that links that are clicked on are viewed from the same perspective. Ex-1005, 121. The successive web-content request sends a second URL and a second geographical location to the second device. A POSITA would understand from this disclosure that a user could make successive requests for web pages specifying a URL and a location.

g. [1.6] receiving, by the first device from the second device, the second web-page, in response to the sending of the second URL and the second geographical location;

87. Goodell teaches element [1.6].

88. As disclosed above at claim term [1.3], Goodell discloses and renders obvious the first “receiving” step. A POSITA would understand that the same client [first device] could receive a second web-page from the same directory server [second device] in response to a second URL and a second geographical location. This is especially true when the second geographic location is the same as the first geographic location. Ex-1001, cl. 29 (“wherein the first and second geographical locations are the same geographical locations”).

89. Further, as noted in my analyses for claim terms [1.4] and [1.5], Goodell discloses that an HTTP proxy can automatically append the same metadata query (e.g., geographical location, Ex-1005, 104, 107-108, 141-43) to successive web content requests to make sure that links that are clicked on are viewed from the same perspective. Ex-1005, 121. The successive web-content

request receives, by the first device from the second device, a second web page in response to the sending of the second URL and the second geographical location.

A POSITA would understand from this disclosure that a user could make successive requests for web pages specifying a URL and a location, and receive those webpages in response.

2. Dependent claims 8, 16, 17, 22, 29, and 30:

- a. [8] The method according to claim 1, for use with a plurality of devices, wherein each one of the devices out of the plurality of devices is addressable in the Internet using an IP address from the group.**

90. Goodell teaches claim 8.

91. Goodell discloses directory servers [second devices] that store information about forwarders/proxies in the network [a plurality of devices], including IP addresses and associated metadata, which includes geographic region, political location, or latitude-longitude coordinates. Ex-1005, 104, 141-43. Goodell thus discloses a second device [directory server] for use with a plurality of devices [forwarders], where the plurality of devices are addressable in the Internet using an IP address in the group of IP addresses stored by the second device.

- b. [16] The method according to claim 1, wherein the first device comprises a client device.**

92. Goodell teaches claim 16.

93. Goodell discloses that the first device is the client device. *See, e.g.*, Ex-1005, 28-29, 107, 118. As shown in my analysis for claim terms [1.p], [1.1], [1.2], [1.3], [1.4], [1.5], and [1.6], the “first device” claim steps are performed by Goodell’s disclosed client device. The client device is “operating in the role of a client,” in that it requests webpages and receives (and displays) webpages from the second device.

- c. [17] The method according to claim 16, further comprising executing, by the first device, an application, and wherein the identifying in part of, or in response to, the executing.**

94. Goodell teaches claim 17.

95. Goodell discloses the client device [first device] executing an application. Goodell discloses both (i) a web browser which passes requests to the Tor client via the SOCKS protocol, and (ii) a web interface that allows a user to specify a URL and a country from which she wants to view the URL. Ex-1005, 118-19. In both cases, the user executes the application [the web browser or the web interface] to identify the first or second URLs. In the second case, the user also executes the application [the web interface] to identify the first or second geographical locations.

- d. [22] The method according to claim 1, wherein each of the IP addresses in the group is associated with a respective device that is identified over the Internet using a respective IP address.**

96. Goodell teaches claim 22.

97. Goodell discloses directory servers [second devices] that store information about forwarders/proxies in the network [respective devices], including IP addresses and associated metadata, which includes geographic region, political location, or latitude-longitude coordinates. Ex-1005, 104, 141-43. Each forwarder may be contacted through its respective IP address. Ex-1005, 141. Goodell thus discloses a second device [directory server] that stores a group of IP addresses where each of the IP addresses is associated with a respective device [a forwarder] that is identified over the Internet using a respective IP address.

- e. [29.1] receiving a request from a learning management system of a user to access content residing on a content delivery network (CDN);**

98. Goodell teaches element [29.1].

99. Goodell discloses both HTTP requests and HTTP servers. Ex-1005 at 120-21. In particular, (i) Blossom includes an HTTP proxy that sits between the web browser and Tor, (ii) the proxy handles GET and POST requests from the client, and (iii) the proxy parses HTTP responses received from the web server. *Id.*, *see also id.*, 143. Further, Goodell's Figure 2.2 (Ex-1005, 63) discloses a web server responding to an HTTP GET request. Goodell thus discloses a web server

that is an HTTP server responding to HTTP requests. Further, a POSITA would understand from this disclosure that it would be obvious to use an HTTP server responding to HTTP requests as the web server.

100. As noted above in my analysis for dependent claim 16, Goodell discloses and renders obvious the limitation that the first device comprises a client device.

f. [29.2] wherein the first and second geographical locations are the same geographical location.

101. Goodell teaches element [29.2], and thus claim 29.

102. Goodell discloses a network “from which users can specify the location from which they wish to view the internet.” Ex-1005, Abstract. Two successive requests seeking information from the same geographic location meet this claim limitation. Goodell discloses, for example, that an HTTP proxy can automatically append the same metadata query (e.g., geographical location, Ex-1005, 104, 107-108, 141-43) to successive web content requests to make sure that links that are clicked on are viewed from the same perspective. Ex-1005, 121. Thus, Goodell discloses successive HTTP requests using the same geographic location. Further, a POSITA would understand, from the disclosure in Goodell, that a client could send successive requests with the same geographical location.

- g. [30] The method according to claim 1, wherein the first web-page comprises audio content, video content, or any combination thereof**

103. Goodell teaches claim 30.

104. Goodell discloses a network “from which users can specify the location from which they wish to view the internet.” Ex-1005, Abstract. Goodell discloses both HTTP requests and HTTP servers. Ex-1005 at 120-21. A POSITA would understand that web pages accessed through HTTP may pass audio content, video content, or any combination thereof.

XIII. CONCLUSION

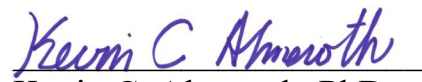
105. The challenged claims of Shribman (1, 8, 16, 17, 22, 29, and 30) are obvious over Goodell.

106. In signing this declaration, I understand that the declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I acknowledge that I may be subject to cross-examination in this case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

107. I declare that all statements made herein of my knowledge are true, that all statements made on information and belief are believed to be true, and that

these statements were made with the 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.

108. I declare under penalty of perjury that the foregoing is true and correct.


Kevin C. Almeroth, PhD