

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

UNIFIED PATENTS, LLC,

Petitioner

- vs. -

NOBLEWOOD IP LLC,

Patent Owner

DECLARATION OF DR. HENRY H. HOUE, UNDER 37 C.F.R. § 1.68 IN
SUPPORT OF PETITION FOR *INTER PARTES* REVIEW
OF U.S. PATENT NO. 7,941,553

IPR2021-01111

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

I. INTRODUCTION

1. I have been retained as an independent expert witness on behalf of Unified Patents, LLC (“Unified”) for the above-captioned Petition for *Inter Partes* Review (“IPR”) of U.S. Patent No. 7,941,553 (“the ’553 Patent”). I am being compensated at my usual and customary rate for the time I spent in connection with this IPR. My compensation is not affected by the outcome of this IPR.

2. I have been asked to provide my opinions regarding whether claims 1, 4, 6, 8, 11, and 13 (each a “Challenged Claim” and collectively the “Challenged Claims”) of the ’553 Patent are unpatentable as they would have been obvious to a person having ordinary skill in the art (“POSITA”) as of the earliest claimed priority date. It is my opinion that all of the Challenged Claims would have been obvious to a POSITA after reviewing the prior art discussed below.

3. In preparing this Declaration, I have reviewed:

- a) Ex-1001, the ’553 Patent;
- b) Ex-1002, the file history of the ’553 Patent;
- c) the prior art references discussed below:
 - Ex-1003, U.S. Patent 7,013,322 to Nils Lahr (“Lahr”),
 - Ex-1004, WO 00/29990 to Lewis et al. (“Lewis”),
 - Ex-1005, U.S. Patent 5,966,015 to Day et al. (“Day”),

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- Ex-1006, U.S. Patent 6,493,748 to Nakayama et al.

 (“Nakayama”), and
- any other document cited below.

4. The '553 Patent issued on May 10, 2011, from U.S. Patent Appl. No. 10/624,353 (“the '353 application”), filed on July 22, 2003. I understand the '353 application claims priority to a European application filed October 18, 2002.

5. In forming the opinions expressed in this Declaration, I relied upon my education and experience in the relevant field of art, and have considered the viewpoint of a POSITA, as of October 18, 2002. I have also considered:

- a) the documents listed above,
- b) any additional documents and references cited in the analysis
below,
- c) the relevant legal standards, including the standard for
obviousness, and
- d) my knowledge and experience based upon my work in this area
as described below.

6. I understand that claims in an IPR are given their ordinary and customary meaning as understood by one of ordinary skill in the art. I further understand that this is the same claim construction standard as one would use in a District Court proceeding.

II. BACKGROUND AND QUALIFICATIONS

7. My qualifications are set forth in my curriculum vitae, a copy of which is attached as Appendix A. As set forth in my curriculum vitae:

8. I received a Ph.D. in Electrical Engineering and Computer Science from the Massachusetts Institute of Technology (“MIT”) in 1998. I also received a Master of Science degree in Electrical Engineering and Computer Science in 1991, a Bachelor of Science degree in Electrical Engineering and Computer Science in 1989, and a Bachelor of Science Degree in Physics in 1990, all from MIT.

9. I am currently self-employed as an independent technical consultant. I am also president of Einstein’s Workshop, a company that provides supplemental science, technology, engineering, and mathematics (“STEM”) education to children of all ages. I am also on the board of directors of BlocksCAD, Inc., a company that makes educational computer-aided design software, which we created at Einstein’s Workshop and spun-out into an independent company.

10. I first worked in the area of telecommunications in 1987 when I worked as a summer intern at AT&T Bell Laboratories as part of a five-year dual degree program at MIT. I continued to work at AT&T Bell Laboratories as part of this MIT program. While I was at MIT, I was a teaching assistant (“TA”) in the Electrical Engineering and Computer Science Department’s core Computer Architectures course. I first was a TA as a senior, performing a role typically reserved for graduate

students. I later became head TA. As a TA, I helped write homework assignments, lab assignments, and exams. I also taught in the recitation sections.

11. Later, as part of my doctoral research at MIT from 1991-1998, I was a research assistant in the Telemedia Network Systems (“TNS”) group at the Laboratory for Computer Science. The TNS group built a high-speed gigabit network and created applications that ran over the network. Example applications included ones for remote video capture, processing, and display of video on computer terminals. In addition to working on the design of core network components, designing and building the high-speed links, and designing and writing the device drivers for the interface cards, I also set up the group’s web server. With the TNS group I researched and installed web servers and web caches. I also helped to build the web pages that initiated these video sessions via a web interface. Vice-President Al Gore visited our group in 1996 and received a demonstration of—and remotely drove—a radio controlled toy car with a wireless video camera mounted on it; the video was encoded by TNS-designed hardware, streamed over the TNS-designed network and displayed using TNS-designed software.

12. I defended and submitted my Ph.D. thesis, titled “Designing Networks for Tomorrow’s Traffic,” in January 1998. As part of my thesis research, I analyzed local-area and wide-area flows to show a more efficient method for routing packets in a network, based on traffic patterns at the time.

13. From 1997 to 1999, I was a Senior Scientist and Engineer at NBX Corporation, a start-up that made business telephone systems for streaming packetized audio over data networks instead of using traditional telephone lines. NBX was later acquired by 3Com Corporation, and the phone system created by NBX is still used today by numerous businesses. As part of my work at NBX, I designed the core audio reconstruction algorithms for the telephones, as well as the packet transmission algorithms. I also designed and validated the core packet transport protocol used by the phone system. The protocol was used for all signaling in the phone system, including for the setup of conference calls. The NBX system also featured a computer interface for initiating phone calls, which could also initiate conference calls. The NBX system also supported TAPI, the Telephony Application Programming Interface, thus allowing other computer programs to integrate with our system telephony features. We obtained U.S. Patent No. 6,697,963, entitled “Telecommunication method for ensuring on-time delivery of packets containing time-sensitive data,” as a result of part of this work.

14. From 1999-2004, I was employed by Empirix or its predecessor company, Teradyne. Empirix was a leader in test tools for telecommunications protocols and systems, providing functional testing tools as well as load testing tools. From 2000-2001, I conceived and built a test platform for testing Voice-over-IP (VoIP). The first application on this new test platform was a cloud emulator for

simulating the effects of transmitting VoIP over a busy network. Starting in 2001, I was architect for the next generation of web testing product by Empirix known as e-Test Suite. e-Test Suite is now owned by Oracle Corporation. e-Test provided functional and load testing for web sites. e-Test emulated a user's interaction with a web site and provided web developers with a method of creating various scripts and providing both functional testing (e.g., did the web site provide the correct response) and load testing (e.g., could the web site handle 5000 users on its web site simultaneously). Among Empirix's customers was H&R Block, who used e-Test Suite to test the tax filing functionality of their web site as well as to test whether the web site could handle a large expected load prior to the filing deadline.

15. In the early 2000's, I was invited to present several guest lectures in a software engineering course at MIT that focused on building network-based applications. I also mentored a team of students working on their final project for the course through the conceptualization, design, and coding of their network-based application. Separate from these guest lectures, I was also invited to participate in a pilot program at MIT that brought in industry experts to help teach core Electrical Engineering and Computer Science courses.

16. I later became Chief Technology Officer at Eons, a venture backed company founded by Jeff Taylor, who also founded the hiring web site Monster.com. Eons built a network of sites on which advertisements could be

placed, fulfilled client advertisement purchases, and tracked delivery of clients' advertisements.

17. I have also continued to develop web sites for various business projects, as well as setting up web sites on a volunteer basis for various groups that I am associated with.

18. In 2006, as part of my role at BBN Technologies, I helped found PodZinger Inc., now known as RAMP Inc. PodZinger utilized BBN's speech recognition algorithms to search through the spoken words in audio and video segments. We used the spoken content of the media to target advertising to viewers of the media, for which we filed a patent application. While I was Vice President of Operations and Technology, PodZinger followed its initial prototype with a full streaming audio and video search solution.

19. I have been awarded several United States patents, and I have several patent applications pending, including the following examples:

- U.S. Patent No. 7,975,296, "Automated security threat testing of web pages",
- U.S. Patent No. 7,877,736, "Computer language interpretation and optimization for server testing",
- U.S. Patent No. 7,801,910, "Method and apparatus for timed tagging of media content",

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- U.S. Patent Publication No. 20070106693, “Methods and apparatus for providing virtual media channels based on media search”,
- U.S. Patent Publication No. 20070106760, “Methods and apparatus for dynamic presentation of advertising, factual, and informational content using enhanced metadata in search-driven media applications”,
- U.S. Patent Publication No. 20090222442, “User-directed navigation of multimedia search results”.

20. Additional details about my employment history, fields of expertise, and publications are further included in my curriculum vitae.

III. UNDERSTANDING OF PATENT LAW

21. I am not an attorney. For the purposes of this declaration, I have been informed about certain aspects of the law that are relevant to my opinions. My understanding of the law was provided to me by Petitioner’s attorneys.

22. I understand that prior art to the ’553 Patent includes patents and printed publications in the relevant art that predate the priority date of the ’553 Patent. For purposes of this Declaration, I have applied the date of October 18, 2002, the filing

date of the earliest application that the '553 Patent claims priority to, as the priority date.¹

23. I understand that a claim is invalid if it would have been “anticipated” by or “obvious” in view of the prior art. My understanding of the two legal standards is set forth below.

24. I understand that other challenges to the validity of a patent, including patent ineligibility, enablement, written description, and definiteness, cannot be raised in *inter partes* review proceedings before the Board to challenge the validity of the '553 Patent. Accordingly, I did not consider those other challenges.

25. I understand that Petitioner has the burden of proving unpatentability by a preponderance of evidence, which means that the claims are more likely than not unpatentable.

A. Anticipation

26. I understand that the following standards govern the determination of whether a patent claim is “anticipated” by the prior art.

27. I understand that, for a patent claim to be “anticipated” by the prior art, each and every requirement of the claim must be found, expressly or inherently, in

¹ I have not considered and express no opinion as to whether the claims of the '553 Patent are actually entitled to a priority date of October 18, 2002.

a single prior art reference as recited in the claim. I understand that claim limitations that are not expressly described in a prior art reference may still be there if they are “inherent” to the thing or process being described in the prior art. For example, an indication in a prior art reference that a particular process complies with a published standard would indicate that the process must inherently perform certain steps or use certain data structures that are necessary to comply with the published standard.

28. I understand that it is acceptable to consider evidence other than the information in a particular prior art document to determine if a feature is necessarily present in or inherently described by that reference.

B. Obviousness

29. I understand that the following standards govern the determination of whether a patent claim is “obvious” in view of the prior art.

30. I understand that obviousness of a claim requires that the claim would have been obvious from the perspective of a POSITA at the time the alleged invention was made. I understand that a claim could have been obvious from a single prior art reference or from a combination of two or more prior art references.

31. I understand that an obviousness analysis requires an understanding of the scope and content of the prior art, any differences between the alleged invention and the prior art, and the level of ordinary skill in evaluating the pertinent art.

32. Also, I understand that obviousness does not require physical combination/bodily incorporation, but rather consideration of what the combined teachings would have suggested to persons of ordinary skill in the art at the time of the alleged invention. I understand that the combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.

33. I further understand that a claim would have been obvious if it unites old elements with no change to their respective functions, or alters prior art by mere substitution of one element for another known in the field and that combination yields predictable results. While it may be helpful to identify a reason for this combination, I understand that there is no rigid requirement of finding an express teaching, suggestion, or motivation to combine within the references. When a product is available, design incentives and other market forces can prompt variations of it, either in the same field or different one. If a POSITA can implement a predictable variation, obviousness likely bars its patentability. For the same reason, if a technique has been used to improve one device and a POSITA would recognize that it would improve similar devices in the same way, using the technique would have been obvious. I understand that a claim would have been obvious if common sense directs one to combine multiple prior art references or add missing features to reproduce the alleged invention recited in the claims.

34. I further understand that certain factors may support or rebut the obviousness of a claim. I understand that such secondary considerations include, among other things, commercial success of the patented invention, skepticism of those having ordinary skill in the art at the time of the alleged invention, unexpected results of the alleged invention, any long-felt but unsolved need in the art that was satisfied by the alleged invention, the failure of others to make the alleged invention, praise of the alleged invention by those having ordinary skill in the art, and copying of the alleged invention by others in the field. I understand that there must be a nexus—a connection—between any such secondary considerations and the alleged invention. I also understand that contemporaneous and independent invention by others is a secondary consideration tending to show obviousness.

35. I understand that in considering obviousness, it is important not to determine obviousness using the benefit of hindsight derived from the patent being considered.

36. The analysis in this declaration is in accordance with the above-stated legal principles.

IV. THE '553 PATENT

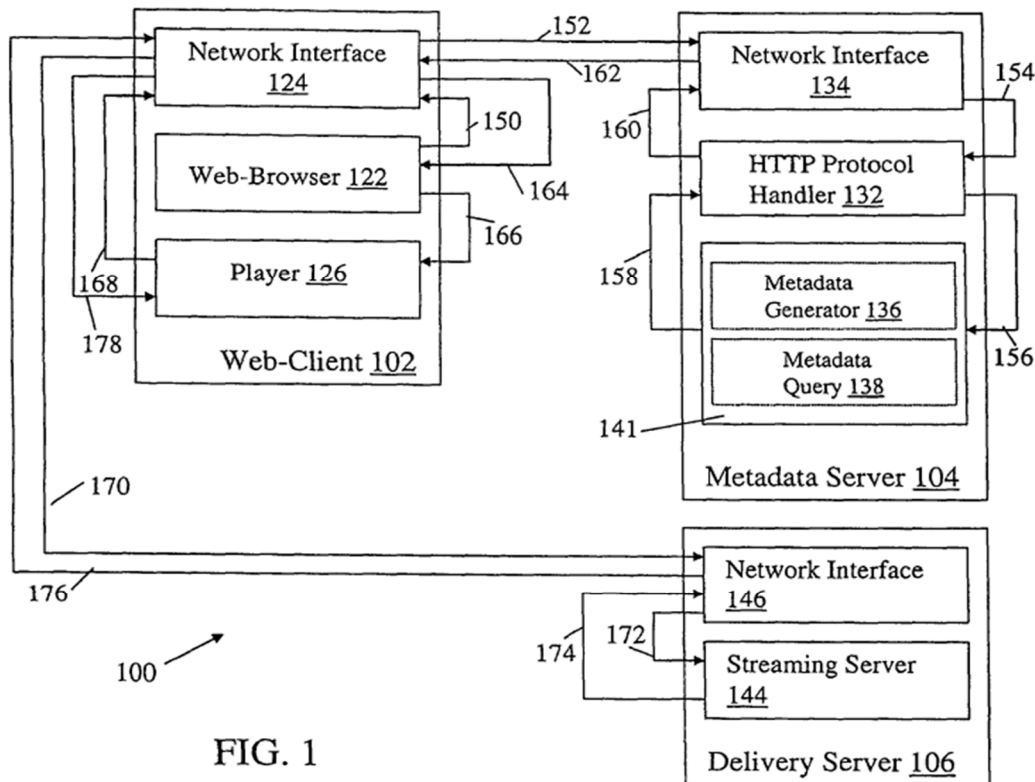
37. The '553 Patent is titled “Method and Device for Streaming a Media File Over a Distributed Information System.” The '553 Patent relates to a method and computer-readable program for receiving a request for a particular media file

from a client computer and providing a metafile containing information about the identification, location, and format of the media file to the client computer for the purposes of streaming a media file over a distributed information system. *See* '553 Patent (Ex-1001), claim 1. With respect to the term “distributed information system,” the '553 Patent explains that such a system may be the Internet. *Id.* at 1:10.

38. According to the '553 Patent, providing a metafile in response to a request for a media file is an advantage, allegedly because the “need of creating, maintaining and understanding metadata is removed.” *Id.* at 8:59–61. That is, according to the '553 Patent, web pages need not link directly to metadata or metafiles, but rather, web pages may link to media files themselves, and requests for such media files may be reinterpreted into requests for metafiles instead.

39. As relevant to the challenged claims, the '553 Patent describes a server receiving a request for a particular media file from the client computer, then providing a metafile. '553 Patent (Ex-1001), 3:32–36.

40. Figure 1, reproduced below, illustrates the request flow when a client requests to stream media content. *Id.* at Fig. 1.



'553 Patent (Ex-1001), Fig. 1

41. As shown in Figure 1, web browser 122 composes an HTTP request for a particular media content file and sends it to the web clients' network interface 124 (arrow 150). *Id.* at 5:45–47. To initiate this action, in one example, a user may click an HTML document link or enter a URL into a browser input field. *Id.* at 5:47–50. Although the request URL points to the media file itself and not the streaming metafile, the HTTP protocol handler 132 reinterprets the HTTP request so that it returns streaming metadata instead. *Id.* at 5:50–66.

42. Specifically, as depicted, the server intercepts a download request for the actual media file and reinterprets the download request into a request for receiving a corresponding metafile. *Id.* at 3:39–41. Thus, instead of returning the requested media file, a metafile is returned that allows the client to immediately stream the media file without having to wait for the download of the media file to be finished. *Id.* at 3:41–45.

43. For the HTTP protocol handler 132 to stream metadata, the handler requests metadata for the requested media resource either from the metadata generator 136 or from the metadata query component 138 (arrow 156). *Id.* at 6:2–3. In response, either the metadata generator 136 will generate the media file based on known streaming server types and the type of the requested media resource, or metadata query component 138 will query existing metadata from an internal data store that associates media locations with pre-made streaming metadata. *Id.* at 6:12–23. In one implementation, metadata required for streaming a particular media file is dynamically created depending, for example, on the file extension of the requested rich media file, the URL or any other portion thereof. *Id.* at 3:46–50. Providing a metafile may require retrieving information about the configuration of at least one of the following: the version or type of a streaming product or the location of media files, the load of the servers, the load of the network, the location of the client, and the agreed quality of service. *Id.* at 3:55–59.

44. In both the retrieving and generating scenarios, the resulting streaming metadata is returned to the HTTP protocol handler 132 (arrow 158). *Id.* at 6:18–20. The HTTP protocol handler 132 builds a HTTP response that contains the streaming metadata and a MIME-type² suitable for streaming, then returns the HTTP response to the network interface 134 (arrow 160). *Id.* at 6:30–33. The network interface 134 transfers the HTTP response to the network interface 124 on the web client 102 that initiated the request (arrow 162). *Id.* at 6:34–36. The network interface then returns the HTTP response to the requesting web browser 122 (arrow 164). *Id.* at 6:37–38. Web browser 122 analyzes the MIME-type in the HTTP response and selects a suitable multimedia player 126 based on this information. *Id.* at 6:39–41. In response, the multimedia player 126 analyzes the streaming data and extracts all relevant information, including which streaming server to contact, which streaming protocol to use, and which file to stream. *Id.* at 6:44–47.

² The acronym “MIME” is defined as “Multipurpose Internet Mail Extensions” and, as described by the ’553 Patent, “allows the browser to determinate the type of data it is currently receiving from the server.” ’553 Patent (Ex-1001), 2:6–10.

45. The multimedia player 126 then composes a streaming protocol request, which arrives at network interface 146.³ *Id.* at 6:52–54. The network interface 146 forwards the streaming protocol request to the streaming server 144 (arrow 172), which then analyses the streaming protocol request, and checks the availability and accessibility of the media files requested. *Id.* at 6:55–59. Depending on whether or not the checks are passed, streaming server 144 will either return a streaming protocol response indicating the media file cannot be streamed or a positive reply. *Id.* at 6:59–62. In the positive reply scenario, the streaming server 144 will send data packets to the network interface 146 (arrow 174), which transfers the packets to the network interface 124 of the web client 102 (arrow 176), which then forwards the packets to multimedia player 126 (arrow 178). *Id.* at 6:63–7:4. Finally, the multimedia layer 126 receives the real-time packets and renders their content as they arrive. *Id.* at 7:5–6.

46. As I detailed above, I have reviewed the file history of the '553 Patent (Ex-1002) and understand that the file history is to be considered in understanding the claims of the challenged patent. With respect to the file history, the applicant's

³ This arrives via network interface 124 (arrow 168), which sends the streaming protocol request to the network interface 146 (arrow 170). '553 Patent (Ex-1001), 6:50–54.

arguments and explanations regarding the “request for a particular media file from a client computer” are relevant to my analysis below. Specifically, I understand that, in a brief submitted during an appeal of the examiner’s rejection of the claims, the applicant argued that the request for a particular media file recited in the claims must be a download request for the actual media file. In the applicant’s words, the claim phrase required “a request *to acquire, or download*, the actual media file” and thus required more than just a request “to describe the available content.” ’553 PH (Ex-1002), p. 234. I understand that the Board of Patent Appeals and Interferences agreed with this argument of the applicant, stating that, in the claims it was “clear that the ‘download request for the actual media file’” was a request to download the actual media file rather than a request to download information with regard to or with respect to the actual media file. *Id.* at p. 251. It is with this understanding that I have performed my analysis of the ’553 Patent’s challenged claims.

47. Challenged claim 1 is representative and corresponds to aspects of the disclosure summarized above:

1. A method for streaming a media file over a distributed information system to a client computer running a browser application, the method comprising the steps of:
receiving a request for a particular media file from a client computer,

providing a metafile, wherein said metafile contains
information about the identification, location and format of the
media file,

returning said metafile back to said client computer,
characterized in that

the step of receiving a request for a particular media file from a
client computer comprises the steps of:

intercepting a download request for the actual media file and

reinterpreting said download request into a request for receiving
a corresponding metafile.

48. As I discuss below in more detail, however, the concept of providing a metafile corresponding to a requested media file, instead of providing the requested media file itself, was well-known prior to the '553 Patent. As of the '553 Patent's 2002 priority date, the delivery of video and other media over networks such as the Internet was a widely-researched topic.

49. For example, as indicated in my CV, as part of my work as a research assistant at MIT from 1991-1998, I designed and developed a network for a distributed multimedia system. There was also constant development in industry related to delivering media over various networks; for example, in the late 1990s, technologies like Apple QuickTime, Microsoft Windows Media Player, and RealNetworks were being actively developed to stream media to consumers over the Internet.

50. Commonly, requests from a user for multimedia content would reference a particular item of multimedia content. In other words, a user would request a movie to be streamed, and would not request a particular metafile for the movie, but in response to the request, the metafile would be provided to allow the user's computer to stream the media content from a streaming server. By the time of the '553 Patent's 2002 priority date, this was well-known in the relevant art as explained, for example, by the Rosser paper. *See* Ex-1008. The Rosser paper was published in March 2001 in a medical journal (Surgical Endoscopy) but it relates to and accurately describes Internet streaming, which it explains "is an exciting new technology that allows multimedia content to be stored and sent over the Internet." Rosser (Ex-1008), p. 1. Figure 1 of Rosser depicts "Standard communication for streaming video" and the figure explains that, in a first step, a user sends a request for streaming content via the web, for example, by clicking a link on a webpage, and in a second step, the server responds by sending the user a metafile that contains the location of the streamed content.

51. Thus, by the time of the '553 Patent's 2002 priority date, many companies were actively developing new technologies in this space, and the concepts described in the '553 Patent were widely-known.

V. LEVEL OF ORDINARY SKILL IN THE PERTINENT ART

52. I understand that the level of ordinary skill may be reflected by the prior art of record, and that a POSITA to which the claimed subject matter pertains would have the capability of understanding the scientific and engineering principles applicable to the pertinent art. I understand that one of ordinary skill in the art has ordinary creativity and is not a robot.

53. I understand there are multiple factors relevant to determining the level of ordinary skill in the pertinent art, including (1) the levels of education and experience of persons working in the field at the time of the invention; (2) the sophistication of the technology; (3) the types of problems encountered in the field; and (4) the prior art solutions to those problems. There are likely a wide range of educational backgrounds in the technology fields pertinent to the '553 Patent. Although technologies concerning media delivery over the Internet were still being developed at the time of the application to which the '553 Patent claims priority, the concepts disclosed in the '553 Patent are relatively simple and would have been covered by an undergraduate-level course on distributed systems, as well as in research and books on network application design.

54. I am familiar with the knowledge and capabilities that a person of ordinary skill in the art of network architecture and streaming media (e.g., content delivery) would have possessed in October 2002, especially as to design of network

applications (which is closely related to network architecture design and content delivery) and protocols. Specifically, my experience in the industry, with colleagues from academia, and with engineers practicing in the industry during the relevant timeframe allowed me to become personally familiar with the knowledge and capabilities of a person of ordinary skill in the area of these areas.

55. Thus, a person of ordinary skill in the art in the field of the '553 Patent would have been someone with a good working knowledge of networking protocols, as well as computer systems (including servers) that support these protocols and techniques. The person also would be familiar with Internet standards related to communications, programming languages, database systems, and a variety of client-server systems and technologies. The person would have gained this knowledge either through education and training, several years of practical working experience, or through a combination of these.

56. Accordingly, in my opinion, the level of skill that a person of ordinary skill in the art needed to have the capability of understanding of network architecture, streaming media, content delivery, and network application design applicable to the '553 Patent is (i) a Bachelor's degree in Computer Science, Electrical and/or Computer Engineering, or equivalent training, and (ii) one to two years of work experience in content delivery techniques over distributed networks (e.g., streaming media over the Internet). Lack of work experience can be remedied

by additional education, and vice versa. Such academic and industry experience would be necessary to appreciate what was obvious and/or anticipated in the industry and what a person of ordinary skill in the art would have thought and understood at the time. I believe I possess the requisite knowledge and experience and in fact more than the requisite knowledge and experience, and am qualified to opine on the '553 Patent.

57. For purposes of this Declaration, in general, and unless otherwise noted, my testimony below refers to the knowledge of one of ordinary skill in the art during the time period around the earliest claimed priority date of the '553 Patent. I would have been a person with at least ordinary skill in the art at that time.

VI. CLAIM CONSTRUCTION

58. It is my understanding that in order to properly evaluate the '553 Patent, the terms of the claims must first be interpreted. It is my understanding that the claims are to be given their plain and ordinary meaning consistent with the specification.

59. For purposes of this Declaration, I have given all terms in the Challenged Claims their plain and ordinary meaning.

VII. DETAILED INVALIDITY ANALYSIS

60. I have been asked to provide my opinion as to whether the Challenged Claims of the '553 Patent would have been obvious in view of the prior art. The

discussion below provides a detailed analysis of how the prior art references I reviewed teach the limitations of the Challenged Claims of the '553 Patent.

61. As part of my analysis, I have considered the scope and content of the prior art and any potential differences between the claimed subject matter and the prior art. I conducted my analysis as of the claimed priority date of the '553 Patent: October 18, 2002.⁴ I have also considered the level of ordinary skill in the pertinent art as of that date.

62. I describe in detail below the scope and content of the prior art, as well as any differences between the claimed subject matter and the prior art, on an element-by-element basis for each Challenged Claim of the '553 Patent. This analysis supports my finding that the differences between the claims of the '553 Patent and the prior art discussed herein are such that the subject matter as a whole would have been obvious at the time of the filing of the '553 Patent to a person having ordinary skill in the art to which the subject matter pertains.

63. As described in detail below, the claimed subject matter of the Challenged Claims would have been obvious in view of the teachings of the identified prior art references as well as the knowledge of a POSITA.

⁴ See n.1 *supra*.

64. I will now describe, in the grounds below, on an element-by-element basis how the prior art teaches all elements of claims 1, 4, 6, 8, 11, and 13. Unless otherwise noted, all *italics*, ***bold italics*** and ***bold italics underline*** emphasis in any quoted material has been added. Below is a summary of each of the grounds and the claims to which the grounds apply.

Ground 1: Claims 1, 4, 6, 8, 11, and 13 are obvious over Lahr and Lewis.

Ground 2: Claims 1, 4, 8, and 11 are obvious over Day and Nakayama.

A. Ground 1: Claims 1, 4, 6, 8, 11, and 13 are obvious over Lahr and Lewis

65. It is my opinion that the combined teachings of the Lahr and Lewis references teach, to a POSITA, the subject matter of each and every limitation of claims 1, 4, 6, 8, 11, and 13 of the '553 Patent.

1. The Prior Art References

a) Background on Lahr

66. U.S. Patent 7,013,322 (“Lahr”, Ex-1003) was filed January 29, 2001 and issued March 14, 2006.

67. Lahr discloses a “distributed network which is capable of dynamically changing media resource request metafiles, as well as the responses to those media resource requests by media servers in the network, to provide more efficient content delivery in the network.” Lahr (Ex-1003), Abstract. The method of Lahr includes

“intercepting a media resource request metafile client request, or a response to the media resource request by a media server in the network, and intelligently rewriting the response before sending it back to the requesting client.” *Id.*

68. Lahr’s Figure 11 and the associated description teach most of the limitations of the challenged claims. Lahr describes Figure 11 as illustrating “the conventional utilization of metafiles in a network and the preferred embodiment of the present invention wherein the metafile is rewritten.” Lahr (Ex-1003), 16:52–54.

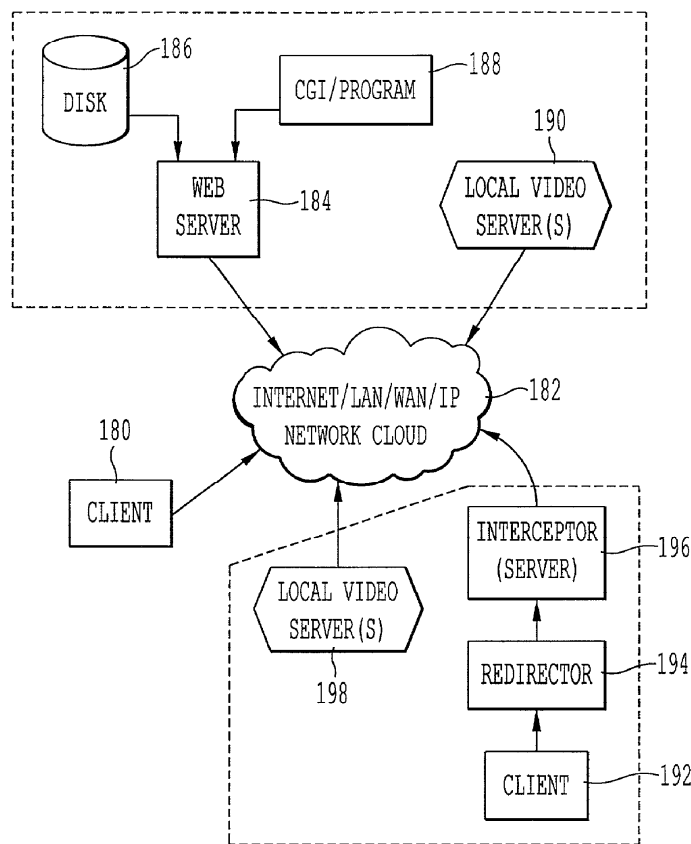


FIG. 11

69. In describing Figure 11, Lahr states that the “client 192 **requests a generic metafile/media.**” *Id.* at 16:65–67. Thus, here Lahr explicitly contemplates that a client (client 192, depicted above in Figure 11), requests a particular media file (e.g., a movie or other content).

70. Lahr continues and states the client’s “request is received by a redirector 194” also shown above. *Id.* at 16:67. The “redirector 194...redirects the request to an interceptor (server) 196.” *Id.* at 16:67–17:2. This is done “under the control of the director” which Lahr describes as “an intelligent agent that...redirects users to the optimal server.” *Id.* at 15:15–17.

71. After the redirector redirects the request to the interceptor, the “interceptor requests the metafile or media resource from the centralized web or other media server 198 via the network cloud 182” and subsequently, the “media server 198...transmits the metafile or protocol response back to the client 192.” *Id.* at 17:2–10. Lahr contemplates that the “redirector 194 and interceptor 196 can be the same component.” *Id.* at 17:17–19.

72. Lahr also specifies that “before the metafile or protocol response is delivered to the client 192, the redirector 194...analyzes the information contained in the metafile and changes it” for example, by changing links pointing to one server to point to a different server. *Id.* at 17:10–16.

73. Thus, just like the '553 Patent, Lahr's client requests a media file, its system receives a request for a media file, and in response the system returns a metafile.

74. Lahr is in the same field as the '553 Patent. The '553 Patent "generally relates to transfer of digital information" and more specifically, "relates to a method...for streaming a media file over a distributed information system, such as the Internet, to a client computer running a browser application." '553 Patent (Ex-1001), 1:7-12. Thus, the field of endeavor of the '553 Patent is media delivery over the Internet. Lahr seeks "to [] improve content delivery in the network" and thus is within the field of endeavor of the '553 Patent. Lahr (Ex-1003), 1:51-63.

75. Lahr is also reasonably pertinent to at least one problem addressed by the '553 Patent of providing metafiles in response to requests for media content, as Lahr explicitly discloses a process by which requests for media are responded to with metafiles. *See* Lahr (Ex-1003), 16:65-17:15.

76. Additional details of Lahr's disclosure are set forth below in the limitation-by-limitation analysis of the claims.

b) Background on Lewis

77. WO 00/29990 to Lewis et al. ("Lewis") (Ex-1004) was published May 25, 2000.

78. Lewis is titled “Efficient Content Server Using Request Redirection.” Lewis (Ex-1004), Title. In the Abstract, Lewis describes a “redirection function” which “intercepts media redirection file requests sent to or from the media server and rewrites such requests so that they point to the local media file cache.” Lewis (Ex-1004), Abstract. Thus, Lewis discloses techniques that are similar to the ’553 Patent; however, as used in the analysis below, Lewis is cited as teaching well-known contents of a metafile (e.g., the location, identification, and format of a media file). Accordingly, as pertinent to the analysis below, Lewis describes a process in which a “media redirection file (MRF)” is provided “to the user’s browser program” and it details the contents of such an MRF file. *Id.* at 4:26–33.

79. Lewis is analogous art. As detailed above, the ’553 Patent’s field of endeavor is media delivery over the Internet. Lewis discloses a technique for delivering “multimedia files in a computer network” (Lewis (Ex-1004), Abstract) and is thus within the same field of endeavor as the ’553 Patent.

80. Lewis is also reasonably pertinent to at least one problem addressed by the ’553 Patent of providing metafiles to web browsers, as Lewis discloses that it was known in the art to provide metafiles to requesting web browsers. *See* Lewis (Ex-1004), 11:3–16.

2. Unpatentability Analysis of Claims 1, 4, 6, 8, 11, and 13

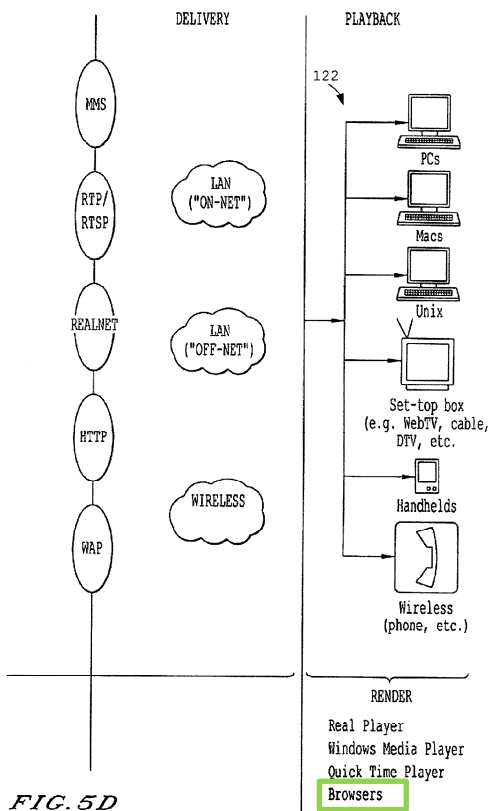
a) Claim 1

[1.0] A method for streaming a media file over a distributed information system to a client computer running a browser application, the method comprising the steps of:

81. Lahr discloses a method as set forth in the preamble.

82. First, Lahr discloses *streaming a media file over a distributed information system*. Lahr discloses that its “invention relates to a **distributed network** which is capable of dynamically changing media resource request metafiles, as well as the responses to those media resource requests by media servers in the network, to provide more efficient **content delivery** in the network.” Lahr (Ex-1003), 1:51–55. Lahr further discloses that “the Internet” (a *distributed information system*) “can be used to transmit multimedia data, such as **streaming audio and video data**, from content providers to end users....” *Id.* at 1:67–2:3. As detailed above, the ’553 Patent provides the Internet as an example of a *distributed information system*. See ’553 Patent (Ex-1001), 1:7–12 (“a distributed information system, such as the Internet....”). Thus, Lahr discloses *streaming a media file* (i.e., media resources, including audio and video data) *over a distributed information system* (the Internet).

83. Second, Lahr discloses streaming *to a client computer running a browser application*. As detailed in the preceding quote, Lahr discusses streaming audio and video data to end users “such as businesses, small or home offices, and individuals.” Lahr (Ex-1003), 1:67–2:3. In Figure 5D, Lahr depicts various playback devices, including computers, and notes that playback devices may use “browsers” to render the media:



Id., Fig. 5D (annotated), *see also id.* at 3:57–62 (“client’s...browser type...”).

84. At the time of the '553 Patent, it would have been well-known to a POSITA that client computers executed browser applications, and that a *client computer running a browser application* was well-known. For example, the Lewis

reference describes that “clients 40 run software...such as Web browsers.” Lewis (Ex-1004) 8:30–9:2.

85. Thus, Lahr discloses, or at least renders obvious to a POSITA, *streaming a media file over a distributed information system to a client computer running a browser application*. Lahr therefore discloses, or at least renders obvious, the preamble of claim 1.

[1.1] receiving a request for a particular media file from a client computer;

86. Lahr discloses, or at least renders obvious to a POSITA, this limitation. Specifically, Lahr discloses a “redirector” receiving a request for a media resource (i.e., *a request for a particular media file*) from a user’s client computer, such as a PC or workstation (i.e., *from a client computer*).

87. Lahr is titled “A system and method for rewriting **a media resource request** and/or response between origin server and client.” Lahr (Ex-1003), Title. Lahr explains that its system has “the ability to intercept a metafile or **media resource client request**, or a metafile or specific server protocol response, and intelligently re-write the response.” Lahr (Ex-1003), 22:38–43. This is explained further with respect to Figure 11, detailed above, where Lahr illustrates “both the conventional utilization of metafiles in a network and the preferred embodiment of the present invention wherein the metafile is rewritten.” Lahr (Ex-1003), 16:52–61.

In the “conventional utilization,” Lahr explains that a “**client 180** (e.g., a user 20) **requests a generic metafile/media resource.**” *Id.* Similarly, in Lahr’s invention, “a **client 192 requests** a generic metafile/media [resource]” and “**the request is received** by a redirector 194 which, under control of the director as described above, redirects the request to an interceptor (server) 196.” *Id.* at 16:65–17:2.⁵

88. That is, Lahr explains that a user can request one of two things: (1) a generic metafile; or (2) a media resource. The second option discloses *a request for a particular media file*. It is evident throughout Lahr that a media resource (i.e., *a particular media file*) is one type of request that is explicitly disclosed.⁶ For example, in the Abstract, Lahr discloses “media resource requests.” Lahr (Ex-1003),

⁵ Lahr’s uses of the word “user” interchangeably with “client” and “user devices 20” and its reference to user devices as including “PCs, workstations” and other computing devices; thus, a POSITA would have recognized that the request received at the redirector is from the user’s *client computer* or at least would have recognized such receipt from the *client computer* as obvious. See Lahr (Ex-1003), 9:11–21.

⁶ I note that the ’553 Patent equates a “media resource” with a “media file” and thus, Lahr’s request for a media resource is a request for a *media file*. See ’553 Patent (Ex-1001), 6:12–15 (“the requested media resource; i.e., media file.”)

Abstract. This is confirmed by contemporaneous research; for example, the Pieper article published in the IEEE Computer journal explicitly states: “A streaming-media link **can point directly to streaming media** or to a metafile....” Pieper (Ex-1014), p. 68. Sahai also confirms this was known: “[t]he process...starts with the user ‘clicking-on’ 22 the Universal Resource Locator (URL) associated with **the streamable multimedia asset** desired.” Sahai (Ex-1013), 5:1–4. Thus, based on Lahr’s disclosure, it was known to a POSITA that the request from the client would be, and therefore teach, *a request for a particular media file*.

89. In column 3, describing the related art, Lahr explains that “**media resource requests** are performed in many ways by a client (e.g., an end user), such as inside of a real time streaming protocol (RTSP) connection or **by a simple hyper text transfer protocol (HTTP) request**. Metafiles are the typical response for a media request.” *Id.* at 3:1–5. Here too, Lahr is contemplating a request for a media resource, not a request for a metafile. This is consistent with the arguments during prosecution referenced above, where the request is to download a particular media file rather than a request to download information with regard to or with respect to the actual media file: here, Lahr is disclosing a request to download a particular media file, where that request is sent in an HTTP request.

90. Thus, Lahr describes a client requesting a media resource, or *particular media file*, and that such a *request* is *receiv[ed]*. See also '553 Patent (Ex-1001), 5:57–6:15 (equating *media file* with a media resource).

91. Thus, by describing a client request for a media resource being received by a redirector, Lahr discloses, or at least renders obvious, *receiving a request for a particular media file from a client computer*.

[1.2] providing a metafile, wherein said metafile contains information about the identification, location and format of the media file,

92. Lahr in view of the teachings of Lewis teach limitation [1.2] of claim 1. Specifically, Lahr discloses the interceptor/redirector requesting and obtaining a metafile (i.e., *providing a metafile*), and Lewis discloses the contents of a *metafile*, including *information about the identification, location and format of the media file*.

93. After the request is received at the redirector, as detailed in limitation [1.1], Lahr discloses:

The **interceptor requests the metafile** or media resource from the centralized web or other media server 198 via the network cloud 182. The centralized web server 184 or other media server 198, receives either the statically generated metafile from the file storage disk 186 or the dynamically generated metafile from the CGI/program 188....However, before **the metafile** or protocol response **is delivered**

to the client 192, the redirector, under control of the director, analyzes the information contained in the metafile and changes it accordingly. For example, the metafile may be rewritten to change the links pointing to local server 190 to point to a different local server 198.

Lahr (Ex-1003), 17:2–16. This is similar to the '553 Patent's explanation of its process, which describes that “the HTTP protocol handler 132 according to the present invention reinterprets the HTTP request so that it returns streaming media instead. In order to do so, **the HTTP protocol handler 132 requests metadata for the requested media resource** either from the metadata generator 136 or from the metadata query component 138 (arrow 156)....” '553 Patent (Ex-1001), 5:65–6:6.

94. Lahr contemplates that the “redirector 194 and interceptor 196 can be the same component.” Lahr (Ex-1003), 17:17–19. Thus, for the purposes of this analysis, a POSITA would have recognized that references to the “redirector” and “interceptor” refer to the same component (e.g., two software programs executing on the same server device, or the functionality of the redirector and interceptor integrated into one software program executing on a server device).

95. By describing that the interceptor requests the metafile, and that the metafile is rewritten by the redirector, Lahr discloses, or at least renders obvious, *providing a metafile*. This is because, for the redirector to rewrite the metafile, the redirector must obtain the metafile—that is, the metafile must be *provid[ed]* to the

redirector. This is no more than the typical request-response paradigm common in computing systems: after a requesting component requests data, such data is provided in response.

96. Lahr further discloses, or at least suggests, that the *metafile contains information about the ... location ... of the media file* as it discloses rewriting the metafile to “change the links pointing to local server 190 to point to a different local server 198.” Lahr (Ex-1003), 17:13–15.

97. A POSITA would have appreciated that the links pointing to “different local server” is a *location* of the media file, for example, an Internet Protocol address or URL corresponding to the media file. For example, in one embodiment, Lahr describes using the “IP address and port of the...media server from which the stream can be pulled”, i.e., the *location* of the stream. Lahr (Ex-1003), 11:36–39.

98. Lahr further discloses that “the director will provide a metatag file to the requesting user 20 which will enable the user 20 **to link to the appropriate server** at the master data center 18 from which the user 20 can receive the requested video clip.” Lahr (Ex-1003), 14:51–56.

99. This provides further evidence that Lahr’s metafile includes *information about the ... location ... of the metafile*, as a POSITA would have recognized from Lahr’s description that the location provides the address (again,

URL or IP address) for the “appropriate server” from which the video clip could be obtained.

100. However, to the extent Lahr does not explicitly disclose that the *metafile contains information about the ... location ... of the media file*, this limitation would have been well-known in the art at the time of the ’553 Patent.

101. For example, a POSITA would have recognized that, in a streaming media system such as that of Lahr, a client device must receive at least the *location* of a requested media file so that the client device may obtain the media file for rendering. For example, the Rosser article referenced above specifically states and confirms this knowledge of a POSITA: “The server responds by sending the user a ‘metafile’ that contains **the location of the streamed content.**” Rosser (Ex-1008), p. 2.

102. Additionally, Lahr in view of Lewis teaches that the metafile would have provided the *location* of the media file, the *identification* of the media file (so that the client device could ensure it was receiving the correct media file, e.g., by presenting that identification to the user in a media player), and the *format* of the media file (so that the client device could execute the correct rendering application, such as RealPlayer, Windows Media Player, etc.). *See, e.g.,* Sahai (Ex-1013), 5:66–6:8 (describing the receipt of data and examining an identifier so that “the appropriate application [is] used to play 30 the data” such as RealAudio).

103. Lewis discloses that, in response to a request for media from a web browser, a web server provides the web browser with a media redirection file that contains instructions about the media file, including the location, format, and identification of the requested media file:

As is known in the art, when one of the users of the client computers 42, 52 requests a media stream such as a video clip of a presidential news conference from a site such as www.cnn.com, the browser 54 makes a request for the media stream in the form of a file request using the hypertext transfer protocol (HTTP) for a media redirection file (MRF) from the Web server 12. **The Web server 12 sends the MRF file down to the browser 54. The MRF file itself contains additional instructions for the type of media player 56 that is required to view the video clip, as well as instructions for where to locate the media stream itself.** The requested media file may be a recorded clip or a live stream.

Lewis (Ex-1004), 11:3–16.

104. Lewis further discloses:

For example, turning attention to Fig. 2, there is shown one type of MRF file known as an Active Streaming Format (ASF) file formatted for a Microsoft Media Technologies type environment. As can be seen, the MRF file is similar to a HTML type file in that it is a text file that contains tag portions. One of the tags contains an <href> type reference to a media file which can be obtained by using the "mms" protocol at

the URL //wmt . streamvision. com/msns/clinton.28. asf . The <href> reference indicates that **the desired streaming video file of President Clinton's news conference is in the ASF format and can be obtained at the indicated uniform resource locator (URL)**. In the prior art, the MRF file is returned directly to the browser 54 which in turn causes the browser 54 to open the media player 56 program such as the associated Microsoft Media Player program at the user node 42, 52. The media player 56 then obtains the streaming media file indicated by the MRF file from the media server 14 by submitting another file request over the Internet 20. The streaming media file is then sent from the media server 14 to the media player 56.

Id. at 11:17–29.

105. Lewis depicts this MRF file in Figure 2:

Here is a sample asx file; notice the redirection

```
<ASX VERSION="3">
<Title>Video 17Kbps/Audio 5Kbps</TITLE>
<AUTHOR>Microsoft Windows Media Technologies</AUTHOR>
<ABSTRACT>30fps Streaming Video!</ABSTRACT>

<ENTRY>

  <ref href="mms://wmt.streamvision.com/msns/Clinton28.asf" />
  <TITLE>Press Conference</TITLE>
  <AUTHOR>Video Courtesy of CNN</AUTHOR>
  <COPYRIGHT>? 1998 Cable News Network, Inc.</COPYRIGHT>
  <MOREINFO href="http://www.cnn.com" />
  <ABSTRACT>President Clinton Press Conference</ABSTRACT>

<ENTRY>

</ASX>
```

FIG. 2

106. In the example MRF file of Lewis' Figure 2, the *location* of the media file corresponds to the uniform resource **locator**, or URL, contained in the "ref" tag, i.e., mms://wmt.streamvision.com/msns/Clinton28.asf. The *identification* of the media file corresponds to the information contained in the "TITLE" and/or "ABSTRACT" tags, i.e., "Press Conference" and/or "President Clinton Press Conference." Finally, the *format* of the media file corresponds to the ".asf" portion of the URL. Lewis (Ex-1004), 11:25–29 ("the desired streaming video file of President Clinton's news conference **is in the ASF format.**"); see Microsoft Computer Dictionary (Ex-1012), pp. 36 ("ASF"), 21 ("Advanced Streaming

Format...An open file **format** specification for streaming multimedia files containing text, graphics, sound, video, and animation”)).

107. Based on the above disclosure in Lewis, a POSITA would have recognized that Lewis’s “MRF file” is a *metafile*. This is based on well-known definitions in the art. For example, a computer dictionary defines a “metafile” as a “file that contains or defines other files” and defines “metadata” as “[d]ata about data.” Microsoft Comp. Dictionary (Ex-1012), p. 336.

108. Consistent with these definitions, Lewis’ MRF file is data (e.g., location, title, type of media player, author, etc.) about the video data. Lewis further discloses that the “MRF file itself contains additional **instructions** for the type of media player 56 that is required to view the video clip” (e.g., data about or defining the *format* of the media file) “as well as instructions for where to locate the media stream itself” (data about or defining the *location* of the media file) Lewis (Ex-1004), 11:11–15. Lewis therefore teaches a *metafile* that *contains information about the identification, location and format of the media file*.

109. A POSITA would have been motivated to combine the teachings of Lahr and Lewis. The combined teachings would have been no more than the combination of prior art elements according to known methods to yield predictable results.

110. For example, the combination is no more than Lahr’s teaching of a system that provides metafiles with Lewis’ more specific teaching of the contents of a metafile, which would have resulted in Lahr’s system providing metafiles with the contents specified by Lewis. A POSITA would have been motivated to do so to provide Lahr’s client device with the ability to launch “the type of media player [] that is required to view the video clip” and to “locate the media stream itself” from the “indicated uniform resource locator” as taught by Lewis. Lewis (Ex-1004), 11:3–16.

111. This would have been consistent with contemporaneous literature, such as Rosser, which explains that a “metafile” contains the location of the streamed content and that, “[o]nce the metafile is received, the user’s streaming player software will be launched automatically, and the player sends a request for content to the server designated in the metafile.” Rosser (Ex-1008), p. 2. Similarly, the Sahai reference explains and teaches a POSITA why data that indicates “which application/plugin/helper should play the data” should be included in a metafile, i.e., such data should be included so that “the appropriate application” can be started. Sahai (Ex-1013), 5:66–6:5.

112. This would have been a predictable result, as it would have provided a client device with a metafile with data that was known to be contained in metafiles, consistent with the knowledge of a POSITA. Additionally, a POSITA would have

had a reasonable expectation of success in combining these teachings, at least because a POSITA would have recognized that combining the teachings as proposed would have required no more than specifying additional data to be included in Lahr's metafiles, as taught by Lewis. Thus, for at least this reason, a POSITA would have been motivated to combine the teachings of Lahr and Lewis.

113. The combined teachings of Lahr and Lewis therefore render obvious *providing a metafile, wherein said metafile contains information about the identification, location and format of the media file* as recited.

[1.3] returning said metafile back to said client computer,

114. Lahr discloses, or at least renders obvious, this limitation because it describes delivering the metafile to the client computer.

115. Specifically, as detailed above, Lahr discloses that “the metafile...is delivered to the client 192.” Lahr (Ex-1003), 17:2–16. Further, Lahr discloses in the background section that “media resource requests are performed in many ways by a client” and that “[m]eta files are the typical response for a media request.” *Id.* at 3:1–5.

116. Thus, Lahr discloses *returning said metafile back to said client computer* as recited.

[1.4.1] characterized in that the step of receiving a request for a particular media file from a client computer comprises the steps of: intercepting a download request for the actual media file and

117. Lahr discloses, or at least renders obvious, this limitation, because in response to receiving the request for the media file, Lahr's interceptor receives the request and returns a metafile.

118. As detailed above, Lahr is titled "A system and method for rewriting a **media resource request** and/or response between origin server and client." Lahr (Ex-1003), Title. Lahr explains that its system has "the ability to intercept a metafile or **media resource client request**, or a metafile or specific server protocol response, and intelligently re-write the response." Lahr (Ex-1003), 22:38–43. Lahr additionally explains that "according to an embodiment of the present invention, when a **client 192 requests a generic metafile/media**, the request is received by a redirector 194 which, under control of the director as described above, **redirects the request to an interceptor (server) 196.**" Lahr (Ex-1003), 16:65–17:2); *see also* at Abstract ("media resource requests"); 3:1–5 ("media resource requests are performed in many ways by a client (e.g., an end user), such as ... a simple hyper text transfer protocol (HTTP) request."); 3:7–10 ("sending links to a resource").

119. Thus, Lahr discloses *a request for a particular media file* as recited, and as detailed above with respect to limitation [1.1], and it explains that the request is

redirected to an interceptor, which corresponds to *intercepting a download request for the actual media file*. Lahr explains that these acts of redirecting and intercepting contrast with what occurs in the conventional method, where such a request is transmitted “to a centralized web server” without any redirecting/intercepting. *Id.* at 16:52–61.

120. Thus, Lahr discloses *intercepting a download request for the actual media file* because the client’s request for media (i.e., the client’s request to *download* the media) is received by the redirector and then redirected to the interceptor, instead of the download request being transmitted to the centralized web server.

[1.4.2] reinterpreting said download request into a request for receiving a corresponding metafile.

121. Lahr discloses, or at least renders obvious, this limitation.

122. As disclosed in Lahr, **“before the metafile or protocol response is delivered to the client 192, the redirector 194, under control of the director, analyzes the information contained in the metafile and changes it accordingly.** For example, the metafile may be rewritten to change the links pointing to local server 190 to point to a different local server 198.” Lahr (Ex-1003), 17:10–16; *see also* cl. 11 (“intercepting and modifying a data resource request issued by a user

requesting data from said network prior to said data resource request being advanced....”); 3:4–5 (“Metafiles are the typical response for a media request.”).

123. This operation corresponds to, and thus discloses, *reinterpreting said download request into a request for receiving a corresponding metafile* because, instead of Lahr of providing a media file in response to the user’s request for the media resource, Lahr provides a metafile with rewritten links.

124. This is consistent with the ’553 Patent, which explains that, in its invention, “the server intercepts a download request for the actual media file and reinterprets the download request into a request for receiving a corresponding metafile. Thus, **instead of returning the requested media file, a metafile is returned that allows immediate streaming of the requested media file without the need of waiting for the download to be finished.**” ’553 Patent (Ex-1001), 3:29–45; Abstract. In Lahr, the “metafile...is delivered to the client 192” instead of returning the “media resource” that was requested as discussed in limitation [1.1], and thus, Lahr discloses, or at least renders obvious, this limitation. *See also* Rosser (Ex-1008), p. 2.

125. Accordingly, the combined teachings of Lahr and Lewis render obvious every limitation of claim 1.

b) Claim 4

[4.1] The method according to claim 1, wherein the step of providing a metafile comprises one of the steps of: dynamically generating a metafile, and statically querying a metafile from a data store.

126. Lahr discloses limitation [4.1] of claim 4.

127. Lahr discloses that the “interceptor requests the metafile...from the centralized web or other media server 198....The centralized web server 184 or other media server 198, receives either the **statically generated metafile** from the file storage disk 186 **or the dynamically generated metafile** from the CGI/program 188, and transmits the metafile or protocol response back to the client 192 via the network cloud 182.” Lahr (Ex-1003), 17:2–9.

128. Thus, as part of the interceptor *providing a metafile* as described with reference to limitation [1.2], *supra*, the metafile is either dynamically generated or statically generated (i.e., *statically quer[ied] from a data store* (file storage disk 186)).

129. Thus, Lahr discloses both *dynamically generating a metafile* as well as *statically querying a metafile from a data store* (the “file storage disk 186.”).

c) Claim 6

[6.1] The method according to claim 1, wherein the step of providing a metafile further includes the step of retrieving information about the configuration of at

least one item chosen from the group comprising: version of the streaming product, type of the streaming product, location of the media file, load of the servers, load of the network, location of the client, quality of service.

130. Lahr discloses limitation [6.1] of claim 6.

131. I understand that claim 6, as drafted, requires the prior art to show at least one of the elements in the list following the colon.

132. Lahr describes that “the operations of the director, redirector 194 and interceptor 196 enable the request and the response to be rewritten according to **localized data such as network topology local server availability.**” Lahr (Ex-1003), 17:34–38. Lahr further describes that “server choice is based on network performance and where the content is located, along with CPU load, application status, and other factors.” *Id.* at 15:20–22.

133. Because Lahr explains that the metafile may be rewritten to “point to a different local server 198” (Lahr (Ex-1003), 17:2–16), and that such a determination may be based on “CPU load,” a POSITA would have recognized that the CPU load information must be *retriev[ed]* so that the metafile may be rewritten according to the information.

134. The above excerpt of Lahr describing pointing to a different local server also discloses *retrieving information about the ... location of the media file* as a POSITA would have recognized “a different local server 198” to be correspond to a

location of the media file and that such information would be *retriev[ed]* so that the metafile may include the location information, for example, the URL or IP address for that different local server.

135. Thus, Lahr teaches that *providing a metafile further includes the step of retrieving information about the configuration of at least one item chosen from the group comprising: ...location of the media file and load of the servers* as recited.

d) Claim 8

[8.0] A computer-readable program stored on a non-transitory computer-readable medium, said computer readable program being configured to perform the steps of:

136. Lahr discloses or at least renders obvious the preamble of claim 8.

137. Lahr discloses for example, that the “redirector 194 and interceptor 196 can be the same component,” the “interceptor 196 can be implemented in software”, and that the interceptor may include “software components.” Lahr (Ex-1003), 17:27–34; *see also supra* Claim 1.

138. A POSITA would have recognized software (i.e., a *computer-readable program*) as disclosed by Lahr to render obvious that the software is *stored on a non-transitory computer-readable medium* for example, like a hard disk drive, so that the software may be executed by appropriate hardware (e.g., a processing

device). For example, this is supported by the Microsoft Computer Dictionary, which defines “execute” as including “loading the machine code of the program into memory and then performing the instructions”, “computer-readable” as “pertaining to...information that can be interpreted and acted on by a computer” including “machine code, the form in which instructions and data reach the computer’s microprocessor”, and “CPU” as “the device that interprets and executes instructions.” Microsoft Computer Dictionary (Ex-1012), pp. 121, 132, 200.

139. Thus, Lahr discloses, or at least renders obvious, a *computer-readable program stored on a non-transitory computer-readable medium* as recited.

[8.1] receiving a request for a particular media file from a client computer;

140. Lahr discloses, or at least renders obvious, this limitation for the same reasons presented above with respect to limitation [1.1].

141. Further, as detailed above in the analysis of limitation [1.1], the request is received by a “redirector 194.” Lahr (Ex-1003), 16:65–17:2. Lahr also contemplates that “the redirector 194 and interceptor 196 can be the same component.” *Id.* at 17:16–18.

142. Thus, Lahr discloses this limitation.

[8.2] providing a metafile, wherein said metafile contains information about the identification, location and format of the media file,

143. The combined teachings of Lahr and Lewis render obvious this limitation for the same reasons presented above with respect to limitation [1.2].

[8.3] returning said metafile back to said client computer,

144. Lahr discloses, or at least renders obvious, this limitation for the same reasons presented above with respect to limitation [1.3].

[8.4.1] characterized in that the step of receiving a request for a particular media file from a client computer comprises the steps of: intercepting a download request for the actual media file and

145. Lahr discloses, or at least renders obvious, this limitation for the same reasons presented above with respect to limitation [1.4.1].

[8.4.2] reinterpreting said download request into a request for receiving a corresponding metafile.

146. Lahr discloses, or at least renders obvious, this limitation for the same reasons presented above with respect to limitation [1.4.2].

e) Claim 11

[11.1] The computer-readable program of claim 8, wherein the step of providing a metafile comprises one of the steps of: dynamically generating a metafile, and statically querying a metafile from a data store.

147. Lahr discloses, or at least renders obvious, this limitation for the same reasons presented above with respect to limitation [4.1].

f) Claim 13

[13.1] The computer readable program of claim 8, wherein the step of providing a metafile further includes the step of retrieving information about the configuration of at least one item chosen from the group comprising: version of the streaming product, type of the streaming product, location of the media file, load of the servers, load of the network, location of the client, quality of service.

148. Lahr discloses, or at least renders obvious, this limitation for the same reasons presented above with respect to limitation [6.1].

B. Ground 2: Claims 1, 4, 8, and 11 are obvious over the combination of Day and Nakayama

149. It is my opinion that the combined teachings of the Day and Nakayama references teach, to a POSITA, the subject matter of each and every limitation of claims 1, 4, 8, and 11 of the '553 Patent.

1. The Prior Art Reference

a) Background on Day

150. U.S. Patent 5,996,015 ("Day") (Ex-1005) was issued on November 30, 1999.

151. Day is titled “Method of Delivering Seamless and Continuous Presentation of Multimedia Data Files to a Target Device by Assembling and Concatenating Multimedia Segments in Memory.”

152. More specifically, Day discloses a method and multimedia server for “delivering and effecting the presentation of multimedia files to [a] client.” Day (Ex-1005), Abstract. In one pertinent aspect, Day describes that a client may select a multimedia asset (a particular media file) from an “HTML page” and that the client receives, in response an “HTML metafile ... containing the pertinent information regarding the selected asset.” Day (Ex-1005), 5:30–52.

153. Day is analogous art. The ’553 Patent “generally relates to transfer of digital information” and more specifically, “relates to a method...for streaming a media file over a distributed information system, such as the Internet, to a client computer running a browser application.” ’553 Patent (Ex-1001), 1:7-12. Thus, the field of endeavor of the ’553 Patent is media delivery over the Internet. Day is related to delivering “multimedia files” to “network clients” and discloses that networks include the Internet. Day (Ex-1005), 2:28–52, 1:33–42. Thus, Day is within the field of endeavor of the ’553 Patent.

154. Day is also reasonably pertinent to at least one problem addressed by the ’553 Patent of providing metafiles in response to requests for media content, as

Day explicitly discloses a process by which requests for media are responded to with metafiles. *See* Day (Ex-1005), 5:30–52.

b) Background on Nakayama

155. U.S. Patent 6,493,748 (“Nakayama”) (Ex-1006) was filed on July 27, 2000 and issued December 10, 2002.

156. Nakayama generally relates to a “server program for handling information delivered through a network.” Nakayama (Ex-1006), 1:14–23. Nakayama describes, in one configuration, a server computer that delivers streaming content to a local computer. *See generally* Nakayama (Ex-1006), 3:19–4:40. As relevant to the analysis below, Nakayama discloses that “streaming content is requested from [a] WWW browser” and in response, a metafile is delivered to the WWW browser. *Id.* at 6:1–14.

157. Nakayama is analogous art. As detailed above, the ’553 Patent field of endeavor is media delivery over the Internet. Nakayama is within this field, as it relates to “streaming content...transferred continually in time” and it discloses that its invention “provides even more remarkable advantages when applied to a wide area network such as the Internet.” Nakayama (Ex-1006), 4:6–19. Thus, Nakayama is within the field of endeavor of the ’553 Patent.

158. Nakayama is also reasonably pertinent to at least one problem addressed by the ’553 Patent of providing metafiles to web browsers, as Nakayama

discloses that it was known in the art to provide metafiles to requesting web browsers. *See* Nakayama (Ex-1006), 6:1–14.

2. Unpatentability Analysis of Claims 1, 4, 8, and 11

a) Claim 1

[1.0] A method for streaming a media file over a distributed information system to a client computer running a browser application, the method comprising the steps of:

159. Day discloses a method as set forth in the preamble.

160. First, Day discloses *streaming a media file* as it describes that a “data pump 213 **streams the** data to the client and the client receives the data into its network subsystem 225 where **data is passed to the multimedia player** for presentation.” Day (Ex-1005), 5:49–52.

161. Second, Day discloses *streaming over a distributed information system to a client computer* as it describes that the “data pump...is arranged to play a file to a client across a **network 105** as shown.” Day (Ex-1005), 3:45–47. As detailed in the Background of Day, a network may include “the Internet,” which the ’553 Patent provides as an example of a *distributed information system*. *Id.* at 1:35–39; ’553 Patent (Ex-1001), 1:7–12.

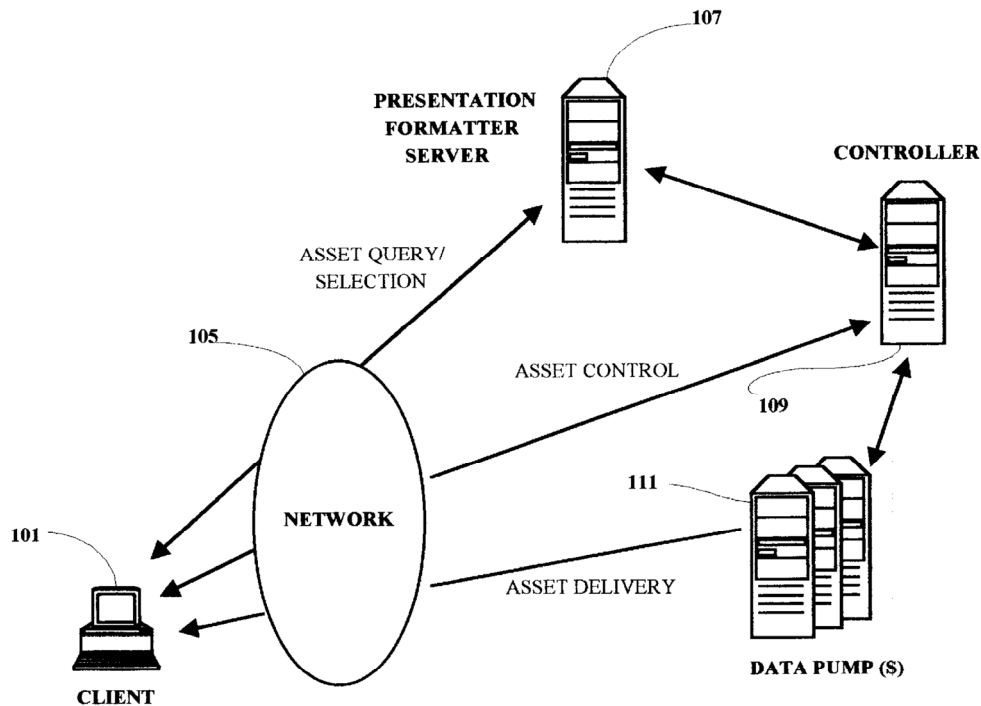


FIG. 1

162. Third, Day discloses that the *client computer* is *running a browser application*: “a client system 203 [] may include a web browser 221....” Day (Ex-1005), 3:34–37. The *browser application* in Day “receives the HTML metafile, and...launches the video client code...on the client system to play back the asset.” Day (Ex-1005), 5:37–41; *see also* ’553 Patent (Ex-1001), 6:39–43 (“web browser 122...selects a suitable multimedia player 126....It starts the multimedia player 126 and forwards the received streaming metadata information to it....”).

163. Thus, Day discloses, or at least renders obvious, the preamble of claim 1.

[1.1] receiving a request for a particular media file from a client computer;

164. Day discloses, or at least renders obvious, this limitation, because it describes a client web browser that requests a multimedia asset.

165. Day discloses that the “**client web browser 221** would request from the presentation formatter server 207 an HTML page containing links to a presentation formatter program. The presentation formatter server 207 then returns the requested page and the client web browser 221 then selects a search function from the page to initiate a search from the available assets. **The client then selects an asset from the HTML page.**” Day (Ex-1005), 5:7–30. Day also describes that the client may “**select a multimedia asset** from a listing on a HTML page presented to the client.” *Id.* at 5:1–6.

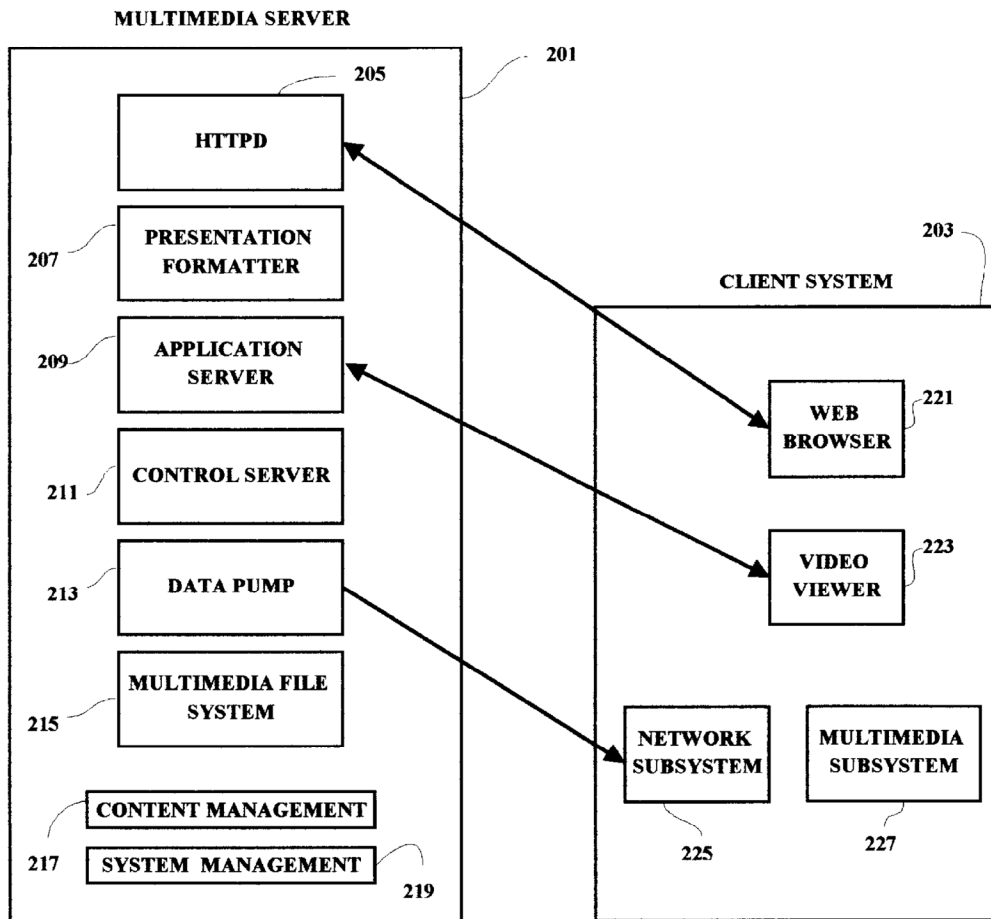


FIG. 2

166. The client's selection of an "asset" discloses, or at least renders obvious, *a request for a particular media file* because through the user's selection, the client sends a request to the server for a specific asset, for example, a video or movie. *See, e.g.,* Day (Ex-1005), 3:65–67 ("client requesting an asset"); 3:67–4:2 ("application server receives requests from a client"); 1:43–52 ("data resources and assets in multimedia networks....a user or 'client' on a network or on the Internet

may select a series of ‘active’ video display segments or ‘movies’ to be presented on the user’s display device.”).

167. In an example of how Day’s teachings would be understood by a POSITA, a client web browser may cause a search for specific content and the content management database may be queried. Day (Ex-1005), 5:7–29. In response, “an HTML page...containing the search results” is dynamically built and returned to the client. That HTML page would include links to a number of assets (each corresponding to a media file) that correspond to the client’s search (e.g., a list of “all videos directed by a certain known director and released after 1977.”). *Id.* at 5:7–29, 4:41–55. For example, the dynamically generated HTML page may include pictures corresponding to the search results, where each picture is associated with an anchor tag including a link to the search result, which would in turn permit a user to “select[] an asset from the HTML page” by clicking one of the pictures, causing a request for the video to be sent. *Id.* at 5:30. Thus, the request from the client is a *request for a particular media file* (the media file represented by the picture on the HTML page).

168. This is consistent with the applicant’s interpretation, and the Board’s interpretation, of the phrase *request for a particular media file* because Day explicitly states that the client selects a multimedia asset (i.e., an actual media file) and not simply “information with regard to or with respect to the actual media file.”

See '553 PH (Ex-1002), p. 251. Day also contemplates that an “HTML page” may include “link[s] to specific assets” and an “explicit link to **each video** stored” which confirms that the link is to *a particular media file*. Day (Ex-1005), 4:30–41. Further, because Day describes “data resources...in multimedia networks” and because the '553 Patent equates a “media resource” with a “media file”, Day’s client request for an asset or resource from the HTML page is a request for a *media file*. *See* '553 Patent (Ex-1001), 6:12–15 (“the requested media resource; i.e., media file.”)

169. Day further discloses that the request is *receiv[ed]*, because immediately following the client selecting “a multimedia asset from a listing on a HTML page,” Day describes that “[t]he presentation formatter server 207 receives the request and runs the VSP (video selection presentation) formatter program.” *Id.* at 5:30–33.

170. Thus, by describing that the presentation formatter server receives the client’s request for a multimedia asset, Day discloses *receiving a request for a particular media file from a client computer*.

[1.2] providing a metafile, wherein said metafile contains information about the identification, location and format of the media file,

171. Day in view of the teachings of Nakayama renders obvious this limitation. Specifically, Day discloses the creation of a *metafile* with pertinent

information regarding the requested asset, and that the *metafile* is provided to the presentation formatter server. Nakayama discloses the contents of such a *metafile* including the recited *identification, location, and format of the media file*.

172. After the request for the media file is received by the presentation formatter server, which runs the VSP formatter program, as detailed in limitation [1.1], Day discloses that the “VSP formatter passes the selection request to the controller 211 where **an HTML metafile is created containing the pertinent information regarding the selected asset.**” Day (Ex-1005), 5:30–35. Day further explains that the “metafile is returned via the presentation formatter server to the client” and thus, the *metafile* is *provid[ed]* to the presentation formatter server. *Id.* at 5:36–37. That is, the VSP formatter passes the request to the controller, the controller creates the metafile, and then the metafile is provided to the presentation formatter server from the controller, so that the metafile may be sent from the presentation formatter server to the client (as also cited below in the analysis of limitation [1.3]). Thus, Day discloses *providing a metafile, wherein said metafile contains information about ... the media file*.

173. The understanding that the pertinent information mentioned by Day includes information about the *identification, location, and format* of the asset would have been rendered obvious by the combined teachings of Day and Nakayama. Day does not specify what information is included in the “pertinent information regarding

the selected asset.” Day (Ex-1005), 5:30–35. However, a POSITA would have recognized the “pertinent information regarding the selected asset” in the metafile would commonly include the recited *information about the identification, location and format of the media file*.

174. For example, a POSITA would have recognized that, in a streaming media system such as that of Day, a client device must receive at least the *location* of a requested media file so that the client device may obtain the media file for rendering. *See, e.g.*, Rosser (Ex-1008), p. 2 (“The server responds by sending the user a ‘metafile’ that contains the location of the streamed content.”)).

175. It was also known to provide the *identification* of the media file so that the client device could ensure it was receiving the correct media file, as well as the *format* of the media file so that the client device could execute the correct rendering application (e.g., RealPlayer, Windows Media Player, etc.). *See, e.g.*, Sahai (Ex-1013), 5:66–6:8 (describing the receipt of data and examining an identifier so that “the appropriate application [is] used to play 30 the data” such as RealAudio). This is confirmed by Nakayama.

176. For example, in an analogous system, Nakayama discloses metafile data sent to a WWW browser in response to a request for media content. Nakayama discloses that the metafile data includes the *identification, location, and format* of a *media file*. For example, in response to a request for “streaming content” from a

“WWW browser,” Nakayama describes “response data prepared in response to the request for streaming content” and depicts such a response in Figure 6. Nakayama (Ex-1006), 6:1–18.

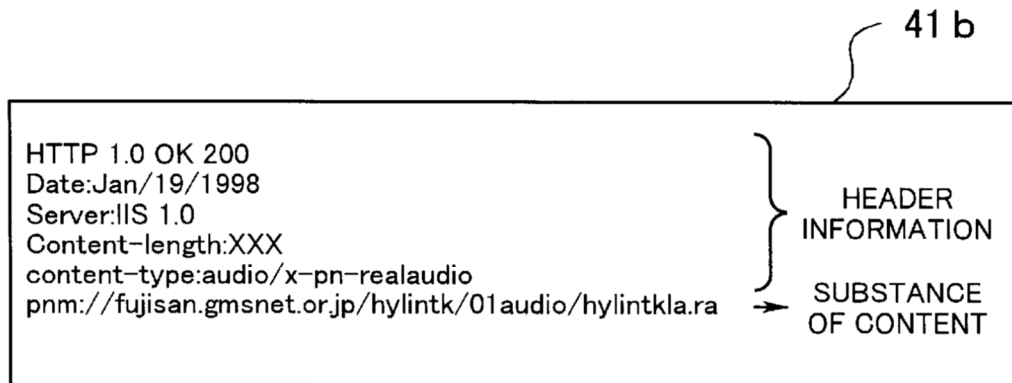


FIG. 6

177. As shown in Nakayama’s Figure 6, the *metafile* contains information about the identification, location and format of the media file. For example, the response data includes a MIME type, which corresponds to the *format* of the media file, as Nakayama explains that the “WWW browser 11 receives ‘audio/x-pn-realaudio’ as the MIME type, and therefore, it looks up the MIME table 11a and searches for a corresponding application....” Nakayama (Ex-1006), 6:20–23; ’553 Patent (Ex-1001), 2:6–11 (“MIME-Type...allows the browser to determinate the type of data it is currently receiving from the server.”).

178. The *metafile* also includes the *identification* and *location* of the media file in the URL, where the *identification* corresponds to at least the “hylink/01/audio/hylinkt1a.ra” portion of the URL and the *location* corresponds to the “pnm://fujisan.gmsnet.or.jp/” portion of the URL. *See also* RFC 1738 (Ex-1009) (detailing the standardized format for Uniform Resource Locators). For example, the “pnm://fujisan.gmsnet.or.jp/” portion of the URL includes the scheme (RFC 1738 (Ex-1009), p. 5) and the host (*id.* at 6) information (i.e., the *location* on a network from where the media is to be retrieved), while the “hylink/01/audio/hylinkt1a.ra” portion of the URL includes the url-path which “supplies the details of how the specified resource can be accessed” (i.e., the *identification* of the particular media file). *Id.*

179. A POSITA would have been motivated to combine the teachings of Day and Nakayama. Specifically, the combined teachings would have been no more than the combination of prior art elements according to known methods to yield predictable results. For example, the combination is no more than Day’s teaching of a system that provides metafiles with Nakayama’s teachings of the contents of a metafile, which would have predictably resulted in Day’s system providing metafiles with the contents specified by Nakayama. A POSITA would have been motivated to do so to provide Day’s client device with the ability to “search[] for a corresponding application” and “start [] the application” and subsequently pass the

multimedia content's location "to this player as a parameter" (Nakayama (Ex-1006), 6:20–34) so that Day's system can "start the playback" of the asset (Day (Ex-1005), 5:41–43).

180. It was well-known by the time of the '553 Patent that a "metafile" would contain the location of the streamed content and that, "[o]nce the metafile is received, the user's streaming player software will be launched automatically, and the player sends a request for content to the server designated in the metafile." Rosser (Ex-1008). Thus, a POSITA would have reasonably expected success in the combination, as it would have resulted in a streaming media system operating in accordance with the knowledge in the art. Thus, for at least this reason, a POSITA would have been motivated to combine the teachings of Day and Nakayama.

181. I note that, although in Nakayama, a client (WWW browser) requests a metafile, and not a media file, the combination analyzed above relies on the teachings of the contents of a metafile in Nakayama and not the details of the request in Nakayama. Thus, to the extent it is argued that Nakayama's request is for a metafile (which the '553 Patent contrasts with the recited *request for a particular media file*), such an argument would not be consistent with the teachings applied in the combination.

182. The combined teachings of Day and Nakayama therefore render obvious *providing a metafile, wherein said metafile contains information about the identification, location and format of the media file* as recited.

[1.3] returning said metafile back to said client computer,

183. Day discloses, or at least renders obvious, this limitation because it describes returning the metafile to the client.

184. Specifically, Day states that, after the “VSP formatter passes the selection request to the controller 211 where an HTML metafile is created” then “[t]he **metafile is returned via the presentation formatter server to the client.**” Day (Ex-1005), 5:30–37.

185. Thus, Day discloses *returning said metafile back to said client computer* as recited.

[1.4.1] characterized in that the step of receiving a request for a particular media file from a client computer comprises the steps of: intercepting a download request for the actual media file and [1.4.2] reinterpreting said download request into a request for receiving a corresponding metafile

186. Day discloses, or at least renders obvious, this limitation.

187. The ’553 Patent explains that, in its invention, “the server intercepts a download request for the actual media file and reinterprets the download request into a request for receiving a corresponding metafile. Thus, instead of returning the

requested media file, a metafile is returned that allows immediate streaming of the requested media file without the need of waiting for the download to be finished.” ’553 Patent (Ex-1001), 3:29–45; Abstract.

188. More specifically, although the ’553 Patent does not elaborate further on the meaning of “intercepting,” a POSITA would have recognized that the ’553 Patent refers to these steps of claim 1 as corresponding to at least the following aspects of the disclosure: (1) “HTTP protocol handler 132 according to the present invention reinterprets the HTTP request so that it returns streaming metadata instead” and (2) “the HTTP protocol handler 132 requests metadata for the requested resource”. ’553 Patent (Ex-1001), 5:61–6:33.

189. In Day, just as in the ’553 Patent, “instead of returning the requested media file, a metafile is returned,” (’553 Patent (Ex-1001), 3:29–45) because instead of delivering the multimedia asset in response to a client’s request for the asset, the Day system reinterprets the request as being for an HTML metafile and returns the HTML metafile instead of the requested multimedia asset itself, and the metafile is in turn used to stream the media.

190. As detailed above, Day performs *receiving a request for a particular media file from a client computer*: “the client proceeds immediately to select a multimedia asset from a listing on a HTML page presented to the client.” Day (Ex-1005), 5:1–6; *see also* 3:65–4:2 (describing client requests) and limitation [1.1].

191. Day also explains that such *receiving* includes *intercepting a download request for the actual media file and reinterpreting said download request into a request for receiving a corresponding metafile* because in response, instead of providing the multimedia asset itself, the Day system returns streaming media instead (aspect (1) above) and, in doing so, “an HTML metafile is created” upon a request from the “VSP formatter...to the controller 211” (aspect (2) above) and the “metafile is returned via the presentation formatter server to the client.” *Id.* at 5:30–37.

192. More specifically, in response to the client’s request on the HTML page, a metafile is first provided, and not the multimedia file itself. In Day, multimedia files are provided by a data pump (*see, e.g.* Day (Ex-1005), 3:43–45). For example, Day states that the data pump “stores multimedia files, which are also referred to as multimedia assets, and delivers assets to the client.” *Id.* However, in Day, before the “asset can be started” and the data pump “streams the data to the client” (*id.* at 5:47–52), the metafile is provided to the client: “client’s web browser 221 receives the HTML metafile” (described earlier in column 5, at 5:37–41).

193. Thus, when Day describes that the “presentation formatter server 207 receives the request and runs the VSP (video selection presentation) formatter program”, a POSITA would have recognized this operation as corresponding to *intercepting a download request for the actual media file* because, instead of

fulfilling the client's selection and request of an asset (*a download request for the actual media file*) with a multimedia file, Day's system causes the VSP formatter program to "pass[] the selection request to the controller 211." *Id.* at 5:30–35. After the selection request is passed to the controller, Day describes that it returns streaming metadata instead, because "an HTML metafile is created" upon request from "VSP formatter...to the controller 211" which in turn corresponds to *reinterpreting said download request into a request for receiving a corresponding metafile*. *Id.* at 5:30–37. Subsequently, the "metafile is returned via the presentation formatter server to the client," the client "receives the HTML metafile" and then "receives the data" from the data pump after the interception and redirection. *Id.* at 5:45–52

194. Additionally, returning the metafile via the presentation formatter server would be understood to include building "a HTTP response that contains the streaming metadata" because the "multimedia server 201", which includes the presentation formatter, also includes "an HTTPD unit for web communications." *Id.* at 3:26–32; Fig. 2. A POSITA would have recognized an HTTPD unit as the web server software to build HTTP responses and return such responses over a network (as Day discloses, the web). *See, e.g.,* Edwards (Ex-1015).

195. Thus, Day discloses, or at least renders obvious, *intercepting a download request for the actual media file and reinterpreting said download request*

into a request for receiving a corresponding metafile consistent with the '553 Patent's disclosure, and therefore renders these limitations obvious.

196. Accordingly, the combined teachings of Day and Nakayama render obvious every limitation of claim 1.

b) Claim 4

[4.1] The method according to claim 1, wherein the step of providing a metafile comprises one of the steps of: dynamically generating a metafile, and statically querying a metafile from a data store.

197. Day discloses limitation [4.1] of claim 4.

198. Day discloses that the “VSP formatter passes the selection request to the controller 211 where **an HTML metafile is created containing the pertinent information regarding the selected asset.**” Day (Ex-1005), 5:30–35.

199. A POSITA would have interpreted Day's creation of an HTML metafile in response to receiving the selection request to correspond to *dynamically generating a metafile* as recited because the '553 Patent uses the term creation to refer to *generating* as recited (*see, e.g., '553 Patent (Ex-1001), 3:46–50: “metadata required for streaming a particular media file is dynamically created...”*).

200. Thus, Day discloses this limitation.

c) Claim 8

[8.0] A computer-readable program stored on a non-transitory computer-readable medium, said computer readable program being configured to perform the steps of:

201. Day discloses or at least renders obvious the preamble of claim 8.

202. Day describes, for example, “multimedia server 201” which includes “an HTTPD unit for web communications” and “a presentation manager 207” which a POSITA would have interpreted as being implemented by software instructions, or a *computer-readable program stored on a non-transitory computer-readable medium* as recited. For example, a POSITA would have recognized that HTTPD was server software. *See* IEEE Internet Computing, July-August 1997 (Ex-1011) (“Prior to Apache, the most popular server software on the Web was the public domain HTTP ‘daemon’ (httpd)...”).

203. A POSITA would have recognized Day’s server software (i.e., a *computer-readable program*) to be *stored on a non-transitory computer-readable medium* for example, a hard disk drive, so that the software may be executed by appropriate hardware (e.g., a processing device of the server). For example, this is supported by the Microsoft Computer Dictionary, which defines “execute” as including “loading the machine code of the program into memory and then performing the instructions”, “computer-readable” as “pertaining to...information that can be interpreted and acted on by a computer” including “machine code, the

form in which instructions and data reach the computer's microprocessor", and "CPU" as "the device that interprets and executes instructions." Microsoft Computer Dictionary (Ex-1012), pp. 121, 132, 200. Thus, Day's server software would be loaded into memory (*a non-transitory computer-readable medium*) so that the CPU could execute and perform the instructions for the server software.

204. Thus, Day discloses, or at least renders obvious, a *computer-readable program stored on a non-transitory computer-readable medium* as recited.

[8.1] receiving a request for a particular media file from a client computer;

205. Day discloses, or at least renders obvious, this limitation for the same reasons presented above with respect to limitation [1.1]. Further, as detailed above in the analysis of limitation [1.1], the request is received by "presentation manager" or "presentation formatter 207." Day (Ex-1005), 5:30–33; Fig. 2.

206. Thus, Day discloses this limitation.

[8.2] providing a metafile, wherein said metafile contains information about the identification, location and format of the media file,

207. Day and Nakayama render obvious this limitation for the same reasons presented above with respect to limitation [1.2]. As detailed in the analysis of limitation [1.2], the combined teachings of Day and Nakayama render obvious that the presentation server is *provid[ed] a metafile*, for example, from the controller 211. *See* Day (Ex-1005), 5:30–36 ("VSP formatter passes the selection request to the

controller 211 where an HTML metafile is created containing the pertinent information regarding the selected asset. The metafile is returned via the presentation formatter server to the client.”).

208. Thus, Day and Nakayama render obvious this limitation.

[8.3] returning said metafile back to said client computer,

209. Day discloses, or at least renders obvious, this limitation for the same reasons presented above with respect to limitation [1.3]. Further, as detailed in the analysis of limitation [1.3], Day discloses that the presentation formatter server delivers the metafile to the client. *See* Day (Ex-1003), 5:30–36.

[8.4.1] characterized in that the step of receiving a request for a particular media file from a client computer comprises the steps of: intercepting a download request for the actual media file and [8.4.2] reinterpreting said download request into a request for receiving a corresponding metafile.

210. Day discloses or at least renders obvious this limitation for the same reasons discussed above regarding limitations [1.4.1]–[1.4.2].

d) Claim 11

[11.1] The computer-readable program of claim 8, wherein the step of providing a metafile comprises one of the steps of: dynamically generating a metafile, and statically querying a metafile from a data store.

211. Day discloses or at least renders obvious this limitation for the same reasons discussed above regarding limitation [4.1].

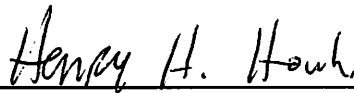
Declaration of Dr. Henry H. Houh Under 37 C.F.R. § 1.68 in Support of
Petition for *Inter Partes* Review of U.S. Patent No. 7,941,553

VIII. CONCLUSION

212. I hereby declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct, and that all statements made of my own knowledge are true and that all statements made on information and belief are believed to be true. I understand that willful false statements are punishable by fine or imprisonment or both. *See* 18 U.S.C. § 1001.

Date: June 13, 2022

Respectfully submitted,

A handwritten signature in cursive script that reads "Henry H. Houh". The signature is written in black ink and is positioned above a horizontal line.

Dr. Henry H. Houh

Appendix A

Henry H. Houh

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Education

Massachusetts Institute of Technology, Cambridge, MA

- PhD in Electrical Engineering and Computer Science, February 1998. “Designing Networks for Tomorrow's Traffic,” thesis supervised by Professor David Tennenhouse and Professor John Guttag. GPA 4.7/5.0
- Master of Science in Electrical Engineering and Computer Science, February 1991. “Demonstration of a laser repetition rate multiplier,” thesis. GPA 4.5/5.0
- Bachelor of Science in Electrical Engineering and Computer Science, June 1989. “Boundary element analysis of arbitrarily shaped dielectric structures,” thesis. GPA 4.7/5.0
- Bachelor of Science in Physics, February 1990. GPA 4.7/5.0

MITx, Cambridge, MA

- September 2020 – present: Enrolled in Statistics and Data Science MicroMasters program, a sequence of five MIT-offered graduate-level courses in statistics and machine learning, culminating in a MicroMasters certificate, expected 2022. Have completed four of five required courses.

Experience

BlocksCAD Inc. (H3XL spin-out)

- 2014 - present: Founder and member of Board of Directors. BlocksCAD is a visual Computer-Aided Design (CAD) program, designed to teach children mathematics and geometric visualization. BlocksCAD is being used in U.S. schools and worldwide in maker spaces, with 350,000+ users. BlocksCAD was selected to be part of the LearnLaunch 2017 Boost Accelerator, the MIT Play Labs 2018 Summer Accelerator, and the MassChallenge 2018 Boston Cohort. Recipient of DARPA DSO grant in 2014, and SBIR grant from the USDA in 2019.

H3XL Inc. d/b/a Einstein's Workshop (formerly Lexington Robotics)

- 2009 - present: Founder and President. Started local league providing science and engineering education programs based on LEGO Mindstorms, LEGO WeDo, and FIRST LEGO League. In 2012, grew program into a full science, technology, engineering and math enrichment program and creative/maker space, in 7,000 square feet of space. Serve 2,000+ kids and families annually. As of end of 2021, have delivered an estimated 220,000 student-instruction-hours of

STEM courses. Principle Investigator for 2-year DARPA grant to improve 3D Computer Aided Design tool developed in-house for the purposes of teaching 8 year olds and up 3D CAD.

Houh Consulting Inc. / Independent Consultant

- 2009 - present: Technical consultant specializing in Social Networking, Web 2.0, Web Site Development, Data Networking, Optical Networking, Telecommunications, Media Streaming and Voice Over IP. Clients include: Akin Gump Strauss Hauer & Feld LLP, Arnold & Porter Kaye Scholer LLP, BBN, Baker Botts LLP, Barnes & Thornburg LLP, BBN Technologies, Beus Gilbert McGroder PLLC, Bracewell LLP, Christensen O'Connor Johnson Kindness PLLC, Cooley LLP, Covington & Burling LLP, Cozen O'Connor P.C., DLA Piper, Davis Polk & Wardwell LLP, Desmarais LLP, Duane Morris LLP, Erise IP, P.A., Faegre Baker Daniels LLP, Finnegan, Henderson, Farabow, Garrett & Dunner, LLP, Fish & Richardson P.C., Goldman Ismail Tomaselli Brennan & Baum LLP, Haynes and Boone, LLP, Kaye Scholer, Kellogg Huber Hanson Todd Evans & Figel PLLC, Kirkland & Ellis LLP, Klarquist Sparkman, LLP, McCarthy Tetrault LLP, McGuireWoods LLP, Morgan, Lewis & Bockius LLP, Munger Tolles & Olson LLP, Orrick, Herrington & Sutcliffe LLP, O'Melveny & Myers LLP, Orrick, Herrington & Sutcliffe LLP, Paul Hastings LLP, Paul, Weiss, Rifkind, Wharton & Garrison LLP, Perkins Coie LLP, Quinn Emanuel Urquhart & Sullivan, LLP, Sidley Austin LLP, Smith Baluch LLP, Sterne, Kessler, Goldstein & Fox PLLC, Troutman Sanders LLP, Venable LLP, Weil, Gotshal & Manges LLP, Wiley Rein LLP, Wilmer Cutler Pickering Hale and Dorr LLP, and Winston & Strawn LLP.

Eons

- 2008 - 2009: Chief Technology Officer. Created product that Eons acquired from BBN Technologies. Integrated BBN product with Eons social networking platform and significantly increased the Eons group creation rate. Helped evaluate advertisement platform offerings and rolled out the "Boom Network" advertising network. Eons raised \$32 million from General Catalyst Partners, Charles River Ventures, Sequoia Capital, and Intel Capital.

BBN Technologies

- 2007 - 2008: Delta Division, Vice President of Technology. Grew "Boomerang" counter-sniper project engineering team and significantly de-risked \$10 million worth of product deliveries. Boomerang was a significant asset leading to the acquisition of BBN by Raytheon in 2009. Created new business plan and grew team; launched new fully-featured social networking web site in 5 months. Served as lead expert witness in patent infringement lawsuit, resulting in \$58 million jury award to client; verdict for patents I testified on were upheld on appeal which resulted in a \$120 million settlement.
- 2004 - 2007: Delta Division, Director of Technology, responsible for commercializing IP and creating new businesses. Hired and grew division's initial engineering team. Wrote three business plans, two of which are funded and active. For call center business plan, acted as general manager, hiring and managing engineering team, inside sales team, and identifying and recruiting a new general manager. Identified and recruited other key employees to Delta Division, including senior members of team leading to successful internal sales growth and spin-outs of projects. Contracted by BBN to BBN spin-out PodZinger as VP of Operations and

Technology. Identified sales team for counter-sniper system, leading to \$10 million dollars of new sales within 6 months and \$100+ million in additional orders in the following two years.

PodZinger Inc. (BBN spin-out, also known as EveryZing and now RAMP)

- 2006: Vice President of Operations and Technology. Significantly upgraded capability of consumer-facing search site and redeployed web site from company to co-location facility. Identified key portions of infrastructure for upgrading and cost reduction. Helped write business plan, evaluating advertisement models of revenue. Hired in operations replacement and phased back to BBN.

Commonwealth Capital

- 2004: Entrepreneur-in-residence (informally), performed technical due diligence on business plans, brainstormed ideas for new businesses with venture partner. With venture partner, left for portfolio company BBN to form core of commercialization team.

Empirix, Inc./Teradyne, Inc.

- 2001 - 2004: Chief Technologist, Engineering Manager, Web Application Test Group. Researched potential new product areas; developed product plan and prototype. Responsible for three new and existing products. Managed off-shore development team. Chief architect for all web testing products. Re-architected core testing product, helped write javascript interpreter. Provided technical vision for core product.
- 2000 - 2001: Chief Technologist, Communication Infrastructure Test Group. Responsible for incorporating new technology internally, tracking new technologies, technical evaluation of partnerships and potential acquisitions. Helped develop division strategy. Developed plans which formed core capabilities for successful new products introduced in 2004-5.
- 2000 - 2001: Engineering Manager, Communications Infrastructure Test Group. Execution of new product plan developed in prior role. Grew team from four existing engineers to team of over 30 on immediate team and over 40 on project. Delivered new platform in one year. Platform and derivatives accounted for large portion of booked products for the division within 2 years and is currently (2008) a key portion of new product offerings.
- 2000: Empirix was formed as a spin-out of Teradyne in January 2000. Reported to CEO in carve-out of Empirix from Teradyne.
- 1999: (Teradyne) Director of Business Development, Software Test Units. Reported directly to Chairman of the Board/Founder and then to general manager of software test unit (6 divisions of Teradyne). Evaluated and researched acquisition and partnership candidates. Internally assessed technology position in market and gaps in product lines. Worked with senior division staff to develop new product strategies. Attended internal Teradyne divisional board meetings. Chairman served as my mentor.

3Com Corporation/NBX Corporation

- 1999: Software Engineer 5. Continued work after 3Com acquisition of NBX. Built cross-division relationships for new products and research directions. NBX was acquired by 3Com in March 1999.

- 1997 - 1999: (NBX) Senior Scientist and Engineer. Work in IP Telephony. Architected next-generation product. Protocol design and validation for core protocol now used tens of millions of times daily. Led team in integration of IP protocols into current product. Designed audio reconstruction algorithms. Developed applications for bug analysis and diagnosis of system problems. Implementation of network simulator. Work on collaborative projects with external partners. Worked to identify gaps in product. Representative at numerous trade shows. Innovated novel methods of using product.

MIT Department of Electrical Engineering and Computer Science, Cambridge, MA

- 1991 - 1998: Research assistant, Telemedia Network Systems Group. Design, development, and implementation of Gigabit ATM network for distributed multimedia system. Studied host interface design issues. ATM network simulation.
- Spring 1989, Fall 1990, Spring 1995: Teaching assistant, Computation Structures digital systems course. (Spring 1995 Head TA)
- 1988 - 1989: Head laboratory teaching assistant for Computation Structures. Responsibilities included writing and revising lab assignments, and maintaining the lab.
- 1987: Laboratory teaching assistant for Computation Structures.
- 1987: Design, construction, and programming of 16-bit computer.

Agora Technology Group, Incorporated

- 1994 - 1996: Founder and CEO. Conceived and oversaw development of targeted advertising-supported Web sites. Responsible for company's vision and direction. Attended the first two WWW Conferences, presenting a workshop and paper at the first, and appearing on the "Commercialization and Economics of the Web" panel and chairing the "Where Commercial Services and the Web Are Headed" panel at the second. Sold company intact; is currently an operating stand-alone company.

AT&T Bell Laboratories, Holmdel, NJ

- 1989 - 1990: Implementation of cascadable all-optical fiber logic gate. Modelocking of all-fiber erbium laser. Construction of modelocked laser repetition rate booster. Strong optics laboratory and fiber optic experience.
- Summer 1988, 1987: Research in integrated optics. Analysis of rectangular waveguides using microwave modeling. Fabrication of integrated optical components.

Honors

- MIT Alumni Association Great Dome Award, 2010, Baker 60th Anniversary Reunion Co-Chair (highest group award given by MIT Alumni Association)
- MIT Alumni Association Presidential Citation Award (now known as Great Dome), 2008, Member of MIT Chairman's Salon committee
- MIT Alumni Association Bronze Beaver Award, 2007 (highest individual award given by MIT Alumni Association)
- MIT Alumni Association Volunteer Honor Roll, February 2004
- MIT Alumni Association Lobdell Award, 1999

- Boston Museum of Science Gold Pin for 1000 hours of Volunteer Service, April 1999
- MIT Alumni Association Presidential Citation Award (now known as Great Dome), 1997, Member of Alumni Online Communications Committee

Patents and Patent Publications

- U.S. Patent #9,697,231, H. Houh, J. Stern, R. Spina, M. Meteer, “Methods and apparatus for providing virtual media channels based on media search,” July 4, 2017.
- U.S. Patent #9,697,230, H. Houh, J. Stern, “Methods and apparatus for dynamic presentation of advertising, factual, and informational content using enhanced metadata in search-driven media applications,” July 4, 2017. See also WO2007056485.
- U.S. Patent #7,975,296, L. Apfelbaum, H. Houh, T. Mayberry and G. Friedman, “Automated security threat testing of web pages,” July 5, 2011. See also US20030159063, WO2003067405.
- U.S. Patent #7,877,736, H. Houh and J. N. Stern, “Computer language interpretation and optimization for server testing,” January 25, 2011. See also US20050138104, WO2005043300.
- U.S. Patent #7,801,910, H. Houh and J. N. Stern, “Method and apparatus for timed tagging of media content,” September 21, 2010. See also US20070112837, US20090222442, WO2007056535.
- U.S. Patent #7,590,542, D. C. Williams, W. C. Hand, H. Houh, A. R. Seeley, “Method of Generating Test Scripts Using a Voice-Capable Markup Language,” September 15, 2009. See also EP1530869, US20030212561, WO2003096663.
- U.S. Patent #6,967,963, H. H. Houh, P. Anderson, C. Gadda, “Telecommunication method for ensuring on-time delivery of packets containing time-sensitive data,” November 22, 2005. See also EP1060400, WO2000033092, CA2318774.
- U.S. Patent #5,144,375, M. C. Gabriel, H. H. Houh, N. A. Whitaker, “Sagnac Optical Logic Gate,” September 1, 1992. Also issued as European Patent # EP0456422, July 23, 1997, German Patent #DE69126913, August 28, 1997
- U.S. Patent Application Publication No. 20020015387, “Voice Traffic Packet Capture and Analysis Tool for a Data Network” (Abandoned in 2007)
- U.S. Patent Application Publication No. 20020016708, “Method and Apparatus for Utilizing a Network Processor as Part of a Test System” (Abandoned in 2007)
- U.S. Patent Application Publication No. 20020016937, “Method and Apparatus for Utilizing a Network Processor as Part of a Test System.” (Abandoned in 2007) See also WO2002011413.
- U.S. Patent Application Publication No. 20070106646, “User-directed navigation of multimedia search results” (Abandoned in 2009)
- U.S. Patent Application Publication No. 20070106660, “Method and apparatus for using confidence scores of enhanced metadata in search-driven media applications” (Abandoned in 2009)
- U.S. Patent Application Publication No. 20070106685, “Method and apparatus for updating speech recognition databases and reindexing audio and video content using the same” (Abandoned in 2015)
- U.S. Patent Application Publication No. 20070118873, “Methods and apparatus for merging media content” (Abandoned in 2015)
- U.S. Patent Application Publication No. 20090222442, “User-directed navigation of multimedia search results” (Abandoned in 2016)

- U.S. Patent Application 11/395,732, “Search snippet creation for audio and video data” (Abandoned in 2009)
- U.S. Patent Application 11/774,931, “Methods and apparatus for managing a social networking web site”
- U.S. Patent Application 11/774,947, “Methods and apparatus for organizing media files”
- U.S. Patent Application 11/774,956, “Methods and apparatus for managing an online event”
- U.S. Provisional Patent Application 61/086,909, “Measuring and ranking relationship activity”
- U.S. Provisional Patent Application 61/086,914, “Detecting media object commonality”
- U.S. Provisional Patent Application 61/086,904, “Message categorization based on message characteristics”
- U.S. Provisional Patent Application 61/086,905, “Photo tagging to request action”

Trials, Testimony and Depositions

- Case No. 1:06CV682 (CMH/BRP), Verizon vs. Vonage, U.S. District Court for the Eastern District of Virginia, filed expert report, was deposed and testified at trial.
- Case No. 1:08CV157 (CMH/TRJ), Verizon vs. Cox, U.S. District Court for the Eastern District of Virginia, was deposed and testified at trial.
- Case No. 5:09-cv-476, Two-Way Media vs. AT&T, U.S. District Court for the Western District of Texas, filed expert report, testified at trial.
- Case No. 2:10-cv-248 (RAJ/FBS), ActiveVideo Networks vs. Verizon, U.S. District Court for the Eastern District of Virginia, filed expert report and was deposed as an expert witness.
- Case No. 1:11-cv-00880-TSE-JFA, Bear Creek Technologies, Inc. vs. Verizon Services Corp., et al, U.S. District Court for the Eastern District of Virginia, was deposed as an expert witness.
- Case No. 3:10-CV-298-BBC, AlmondNet, Inc. vs. Microsoft Corp., U.S. District Court for the Western District of Wisconsin, filed expert report.
- Case No. 6:10-cv-00597, Guardian Media Technologies, Ltd. Vs. AT&T Operations, Inc. et al., U.S. District Court for the Eastern District of Texas, Tyler Division, filed expert report.
- Case No. ESCV2010-02282C, The Octopus Solution LLC v. Gary Brown et al., Essex, MA Superior Court, testified at trial.
- Investigation No. 337-TA-882, In the matter of Certain digital media devices, including televisions, Blu-ray disc players, home theater systems, tablets and mobile phones, components thereof and associated software, U.S. International Trade Commission, filed expert reports, was deposed and testified at hearing.
- Investigation No. 337-TA-995, In the matter of Certain communications or computing devices, and components thereof, U.S. International Trade Commission, filed expert reports, and was deposed.
- Case No. 8:12-cv-122-LES-TDT, Prism Technologies LLC v. AT&T Mobility LLC, U.S. District Court for the District of Nebraska, filed expert report, was deposed and testified at trial.
- Case No. 11-2684 (JWL), Sprint Communications Co., L.P., v. Comcast Cable Communications, LLC, et al., U.S. District Court for the District of Kansas, filed expert report and was deposed.
- Case No. 11-2686 (JWL), Sprint Communications Co., L.P., v. Time Warner Cable, Inc., et. al., LLC, et al., U.S. District Court for the District of Kansas, filed expert report, was deposed, and testified at trial.
- Case No. 12-487 (SLR), Cox Communications, Inc., et al., v. Sprint Communications Company L.P., et al., U.S. District Court for the District of Delaware, filed expert report and was deposed.

- Case IPR 2014-00039, Microsoft Corporation v. B.E. Technology LLC, U.S. Patent No. 6,628,314. Submitted declaration and cross-examined in deposition.
- Case IPR 2014-00086, Apple, Inc. v. Evolutionary Intelligence, LLC, U.S. Patent No. 7,010,536. Submitted declaration and cross-examined in deposition.
- Case No. 6:11-CV-421, Stragent, LLC v. Intel Corporation, U.S. District Court for the Eastern District of Texas, Tyler Division, deposited and testified at trial as a fact witness.
- IPR2014-01366, IPR2014-01367, IPR2014-01368, Samsung et al. v. Straight Path, submitted IPR declarations and was deposited.
- IPR2015-1006, IPR2015-1007, Cisco v. Straight Path, submitted IPR declarations.
- IPR2014-01457, IPR2014-01459, Microsoft v. Biscotti, submitted IPR declaration and was deposited.
- IPR2016-00302, Apple v. Nonend, submitted IPR declaration.
- IPR2014-00812, Yelp and Twitter v. Evolutionary Intelligence, submitted IPR declaration.
- IPR2015-00307, Cisco v. AIP, submitted IPR declaration.
- Microsoft v. Acacia, submitted IPR declaration.
- IPR2015-00342, AT&T Mobility LLC and Cellco Partnership d/b/a Verizon Wireless v. Solocron, submitted IPR declaration.
- Mediatube v. Bell Canada, Canadian Federal Court, submitted expert report and testified at trial.
- CBM2016-00036, Google v. At Home Bondholder's Liquidating Trust, submitted CBM declaration.
- IPR2016-01198, IPR2016-01201, Apple, Inc. v. VoIP-Pal.com, Inc., submitted IPR declaration and was deposited.
- Case No. 3:14-cv-2824-VC, Trend Micro Incorporated v. Rpost Holdings, Inc., et al, submitted expert report and was deposited
- Akamai v. Limelight Networks, IPR2016-01631, IPR2016-01711, IPR2017-00249, IPR2017-00349, submitted IPR declarations and was deposited
- Hyperlync Technologies v. Verizon Sourcing, No. 650151/2015 New York Supreme Court, submitted declaration and was deposited
- Cascades Streaming Technologies v. Big Ten Networks, submitted expert reports and was deposited
- Klaustech, Inc. v. Google LLC., Case No. 4:10-CV-05899-JSW (N.D. Cal.), submitted expert report and was deposited
- Cisco v. Uniloc, IPR2017-00198, IPR2017-00058, submitted IPR declarations and was deposited.
- Cisco v. Uniloc, IPR2017-00597, submitted IPR declaration and was deposited
- Twitter v. Youtoo Technologies, LLC, IPR2017-01133, IPR2017-01131, submitted IPR declarations and was deposited
- Taser International Inc. (now Axon Enterprise, Inc.) v. Digital Ally Inc., IPR2017-00375, submitted IPR declaration and was deposited
- Taser International Inc. (now Axon Enterprise, Inc.) v. Digital Ally Inc., IPR2017-00376, IPR2017-00515, IPR2017-00775, submitted IPR declarations
- HTC Corporation v. IPA Technologies, IPR2018-00306, IPR2018-00307, submitted IPR declaration
- Hulu v. Soundview, IPR2018-00864, IPR2018-01023, submitted IPR declarations and was deposited
- XpertUniverse v. Cisco, 3:17-cv-3848, U.S. District Court for Northern District of California, submitted declaration in support of claim construction and was deposited
- Improved Search v. Microsoft, C.A. No. 16-cv-650-JFB-SRF (Del.), submitted declaration in support of claim construction

- Apple v. Uniloc, IPR2018-00361, IPR2018-00394, IPR2018-00395, IPR2019-00700, IPR2019-00701, IPR2019-01667, submitted IPR declarations
- LG Electronics v. Uniloc, submitted IPR declaration
- SRC Labs and Saint Regis Mohawk Tribe v. Microsoft, 2:18-cv-00321-JLR, U.S. District Court for Western District of Washington at Seattle, submitted declaration in support of claim construction and was deposed
- Verizon Wireless v. Barkan Wireless IP Holdings LP, submitted IPR declarations
- Verizon Wireless and Samsung Electronics America Inc. v. Barkan Wireless IP Holdings LP, IPR2019-199, IPR2019-200, IPR2019-234, IPR2019-631, IPR2019-632, submitted IPR declarations
- Samsung Electronics America Inc. v. Barkan Wireless IP Holdings LP, IPR2019-100, submitted IPR declaration
- Cisco Systems Inc. v. Meetrix IP LLC, IPR2019-539, IPR2019-540, IPR2019-541, IPR2019-542, IPR2019-543, IPR2019-544, submitted IPR declarations
- GMG Products LLC v. Traeger Pellet Grills LLC, PGR2019-24, PGR2019-34, PGR2019-35, PGR2019-36, submitted PGR declaration and was deposed
- Uniloc 2017 LLC v. Google LLC, 2:18-cv-00502-JRG-RSP, U.S. District Court for the Eastern District of Texas, Marshall Division, submitted declaration in support of claim construction
- Microsoft Corporation v. Uniloc 2017 LLC, IPR2020-00102, IPR2020-00103, submitted IPR declarations
- Microsoft Corporation and HP Inc. v. Synkloud Technologies, LLC, IPR2020-00316, IPR2020-01031, IPR2020-01032, IPR2020-01269, IPR2020-01270, IPR2020-01271, submitted IPR declarations
- Seven Networks, LLC v. Apple Inc, 2:19-cv-115-JRG, U.S. District Court for the Eastern District of Texas, Marshall Division, submitted declaration in support of claim construction
- Unified Patents Inc. v. Ortiz & Associates Consulting, LLC, IPR2019-00743, submitted IPR declaration
- Uniloc 2017 LLC v. Apple Inc., 3:19-cv-01905-JD, U.S. District Court for the Northern District of California, San Francisco Division, submitted declaration in support of claim construction and was deposed
- ClearPlay Inc. v. Dish Network LLC et al.; 2:14-cv-00191, U.S. District Court for the District of Utah, Central Division, submitted expert report and re-examination declarations
- AMC Networks, Inc. et al v. Sound View Innovations, LLC, IPR2020-00482, submitted IPR declaration
- Case No. 1:17-cv-01734-RGA, Sprint Communications Co., L.P., v. Charter Communications, Inc., et al., U.S. District Court for the District of Delaware, filed expert report and was deposed.
- CommScope Technologies LLC et al. v. Barkan Wireless IP Holdings LP et al., IPR2020-00827, IPR2020-00829, IPR2020-00831, IPR2020-00833, IPR2020-00835, IPR2020-00838, submitted IPR declarations
- Cisco Systems Inc. v. Monarch Networking Solutions LLC, IPR2020-01226, submitted IPR declaration
- CoolTV Network.com v. Blackboard, Inc., Facebook, Inc., International Business Machines Corporation, Kaltura, Inc., Limelight Networks, Inc., Microsoft Corporation, Ooyala, Inc., Snap, Inc., and Trapelo Corp., submitted declaration in support of claim construction and was deposed
- Facebook, Inc. v. Onstream Media Corporation, IPR2020-01507, IPR2020-01508, IPR2020-01525, IPR2020-01527, IPR2020-01528, submitted IPR declarations
- Hisense Co LTD. v. Maxell, LTD, IPR2020-01598, IPR2020-01600, submitted IPR declarations
- Microsoft Corp. v. O'Brien, IPR2021-00015, submitted IPR declaration and was deposed

- Sable Networks Inc. v. Cisco Systems, Inc., WA:20-CV-00288-ADA, U.S. District Court for the Western District of Texas, Waco Division, submitted declaration in support of claim construction
- Peloton Interactive, Inc. v. Icon Health and Fitness Inc et al., IPR2021-00342, submitted IPR declaration
- Hulu, LLC v. SITO Mobile R&D IP, LLC et al., CBM2020-00028, IPR2020-00158, IPR2020-00206 , IPR2020-00219 , IPR2020-00265 , IPR2020-00298 , IPR2020-00304 , IPR2020-00308 , submitted CMB and IPR declarations and was deposited
- Twitter, Inc. and Google LLC v. B.E. Technology, LLC, IPR2021-00482, IPR2021-00483, IPR2021-00484, IPR2021-00485, submitted IPR declarations
- MG Freesites LTP v. ScorpCast, LLC, IPR2021-00511, submitted IPR declaration
- Avionte, LLC v. Sandeep Acharya, Samar Basnet, and Aqore LLC, Arbitration, Hon. Jeffrey Keyes (Ret.)
- Microsoft Corporation v. WSOU Investments, LLC d/b/a Brazos Licensing and Development, IPR2021-00751, submitted IPR declaration
- SAP America, Inc. v. Express Mobile, Inc., IPR2021-01144, IPR2021-01145, IPR2021-01146, submitted IPR declarations
- StratosAudio Inc. v. Hyundai Motor America, 6:20-cv-01125-ADA, U.S. District Court for the Western District of Texas, Waco Division, submitted claim construction declaration and was deposited Peloton Interactive, Inc. v. Ifit Health and Fitness Inc, IPR2022-00029, IPR2022-00030, submitted IPR declarations and was deposited
- Investigation No. 337-TA-1263, In the matter of Certain televisions, remote controls, and components thereof, U.S. International Trade Commission, filed expert reports, was deposited, and testified at hearing
- Alexander Stross v. Netease, Inc., et al., U.S. District Court (Central District of California), Case 2:20-cv-00861-AB(JC), filed expert reports, and was deposited
- Ralph Ledergerber v. Netease, Inc., et al., U.S. District Court (Central District of California), Case 2:20-cv-00862-AB(JC), filed expert reports and was deposited
- John Walmsley v. Netease, Inc., et al., U.S. District Court (Central District of California), Case 2:20-cv-00863-AB(JC), filed expert reports and was deposited
- Bernhard Kuhmstedt v. Netease, Inc., et al., U.S. District Court (Central District of California), Case 2:20-cv-02044-AB(JC), filed expert reports and was deposited
- F45 Training Pty Ltd. v. Body Fit Training USA Inc., C.A. No. 20-1194 (LPS) (D. Del.), filed expert report

Publications

- “IP switching: server driven flow classification,” H. H. Houh, *Proceedings of the Washington University Workshop on Integration of IP and ATM*, November 1996.
- “Aurora at MIT,” D. D. Clark, H. H. Houh, and D. L. Tennenhouse, Editors, *MIT Laboratory for Computer Science Technical Report 673*, December 1995.
- “ViewStation Applications: Implications for Network Traffic,” C. J. Lindblad, D. Wetherall, W. Stasior, J. F. Adam, H. H. Houh, M. Ismert, D. Bacher, B. Phillips, and D. L. Tennenhouse, *IEEE Journal of Selected Areas in Communications*, 1995.
- “The VuNet Desk Area Network: Architecture, Implementation, and Experience,” H. H. Houh, J. F. Adam, M. Ismert, C. J. Lindblad, and D. L. Tennenhouse, *IEEE Journal of Selected Areas in Communications*, 13 (4), May, 1995.

- “Reducing the Complexity of ATM Host Interfaces,” H. H. Houh and D. L. Tennenhouse, Hot Interconnects II Symposium Proceedings, Stanford, August 11-12, 1994.
- “Media-intensive data communications in a ‘desk-area’ network,” J. F. Adam, H. H. Houh, M. Ismert, and D. L. Tennenhouse, IEEE Communications, August 1994.
- “ViewStation Applications: Intelligent Video Processing Over A Broadband Local Area Network,” C. J. Lindblad, D. J. Wetherall, W. Stasior, B. Phillips, D. Bacher, J. Adam, H. Houh, M. Ismert, and D. L. Tennenhouse, Proceedings of the 1994 USENIX Symposium on High-Speed Networking, Oakland, CA, August 1994.
- “The Media Gateway: Live Video on the World Wide Web,” H. H. Houh, C. J. Lindblad, J. Soo, D. L. Tennenhouse, and D. J. Wetherall, Workshop at the 1994 World Wide Web Conference, Geneva, Switzerland, May 1994.
- “Active Pages: Intelligent Nodes on the World Wide Web ,” H. H. Houh, C. J. Lindblad, and D. J. Wetherall, Proceedings of the 1994 World Wide Web Conference, Geneva, Switzerland, May 1994.
- “Wavelength Division vs. Code Division Access Methods for Optical Networks,” H. H. Houh, Area Exam Paper, May 1993.
- “Experience with the VuNet: A Network Architecture for a Distributed Multimedia System,” J. F. Adam, H. H. Houh, D. L. Tennenhouse, Proceedings of the 18th Conference on Local Computer Networks, pp. 70-76, September 1993
- “The VudBoard: A Simple DMA Interface,” H. H. Houh, Proceedings of the 4th Gigabit Minijam, January 1994.
- “A Software-Oriented Approach to the Design of Media Processing Environments,” D. L. Tennenhouse, J. Adam, D. Carver, H. Houh, M. Ismert, C. Lindblad, W. Stasior, D. Weatherall, D. Bacher, and T. Chang., submitted to the International Conference on Multimedia Computing and Systems, May 1994.
- “A Network Architecture for Distributed Multimedia Systems,” J. F. Adam, H. H. Houh, M. Ismert, and D. L. Tennenhouse, submitted to the International Conference on Multimedia Computing and Systems, May 1994.
- “The Viewstation Collected Papers,” D. L. Tennenhouse, J. Adam, C. Compton, A. Duda, D. Gifford, H. Houh, M. Ismert, C. Lindblad, W. Stasior, R. Weiss, D. Wetherall, D. Bacher, D. Carver, and T. Chang, MIT Laboratory for Computer Science Technical Report, MIT/LCS/TR-590, November 1993.
- “A System’s Perspective of the Sagnac Fiber Logic Gates and Their Possible Applications,” A. Huang, N. Whitaker, C. Gabriel, H. Avramopoulos, P. M. W. French, H. H. Houh, and I. Chuang, Applied Optics, September 10, 1994
- “Complete Switching in a Three-Terminal Sagnac Switch,” H. Avramopoulos, P. M. W. French, M. C. Gabriel, H. H. Houh, N. A. Whitaker, T. Morse, IEEE Phot. Tech. Lett. **3** (3), 235
- “Complete Switching in a Three-Terminal Sagnac Switch,” H. Avramopoulos, P. M. W. French, M. C. Gabriel, H. H. Houh, N. A. Whitaker, IEEE/LEOS Annual Meeting, Paper PDP-13, November 1990
- “All-optical phase-locked oscillator,” N. A. Whitaker, Jr., H. H. Houh, H. Avramopoulos, T. F. Morse, IEEE/LEOS Annual Meeting, Paper ELT2.4/MOO3, November 1990
- “Passive modelocking of an all-fiber erbium laser,” H. Avramopoulos, H. H. Houh, N. A. Whitaker, M. C. Gabriel, T. F. Morse, IEEE/LEOS Conference on Optical Amplifiers and their Applications, Paper PDP-8, August 1990
- “Transverse modes, waveguide dispersion, and 30ps recovery in submicron GaAs/AlAs microresonators,” J. L. Jewell, S. L. McCall, A. Scherer, H. H. Houh, N. A. Whitaker, A. C. Gossard, and J. H. English, Appl. Phys. Lett. **55** (1), July 3, 1989

Leadership, Activities and Interests

- Leadership
 - Discovery Museums (Acton, MA)
 - Science and Technology Advisory Council, 2012 - present
 - MIT Alumni Association Board of Directors
 - National Selection Committee, 3 year term, 2020 – 2023
 - K-12 STEM Initiatives Co-chair, 2013 – 2017
 - Awards Committee Chair, 2012 – 2014
 - Awards Committee, 3 year term, 2011 – 2014
 - Vice President, 2 year term, 2004 – 2006
 - Alumni Ad-Hoc Committee, Chair, 2005-2006
 - Board Member, 2 year term, 1997 – 1999
 - MIT Club of Boston
 - Board of Directors, 2006 - 2011
 - K-12 Initiatives Chair, 2009 - 2012
 - VP of Communications, MIT Club of Boston, 2003 - 2006
 - Past-President, MIT Club of Boston, 2002 - 2003
 - President, MIT Club of Boston, 2001 - 2002
 - President-Elect, MIT Club of Boston, 2000 - 2001
 - VP of Programs, MIT Club of Boston, 1999 - 2000
 - Activities Super-Chair, MIT Club of Boston, 1998 - 1999
 - MIT Enterprise Forum of Cambridge, Inc.
 - Past Chair, 2009 – 2011
 - In-NOW-vation Co-chair, 2010
 - Chair, 2007 - 2009
 - Vice Chair, 2005 - 2007
 - Executive Board Member, 2002 - 2011
 - Winter Workshop Co-Chair, February 2007 - conceived idea for conference, which sold-out and produced largest attendance numbers in recent memory
 - Spring Workshop Co-Chair, Spring 2004
 - Membership Committee Chair, Fall 2003 - 2006
 - 25th Anniversary Dinner Chair, Fall 2003
 - As Membership Chair and Board Member, started Special Interest Groups in 2004; a SIG won the MIT Presidential Citation award, the MIT Alumni Association's highest award for organizations, in 2006
 - Estabrook Elementary School PTA
 - Advisory committee to the superintendent on PCB issue, 2010-2011
 - 4th Grade after-school science program co-organizer, 2010-2012
 - 4th and 5th Grade before-school Math Olympiad co-organizer, 2009-2013
 - 5th Grade BBQ and Yearbook Committee, 2011, 2013
 - Family Math Night volunteer, 2008-2012
 - Tau Beta Pi National Engineering Honor Society
 - Advisor, MA B Chapter at MIT, 2003 - present
 - District Director (National Officer), Tau Beta Pi, New England Area, 1991 - 2003
 - President, MA B Chapter at MIT, Fall 1988 - Spring 1989
 - Laureate award, 1989

- MIT Class of 1989
 - Secretary, five consecutive 5 year terms, 1989 - 2014
 - 30-year Reunion Committee, 2019
 - 25-year Reunion Committee, 2014
 - 20-year Reunion Committee and Gift Committee, 2009
 - 15-year Reunion Committee and Gift Committee, 2004
 - 10-year Reunion Committee and Gift Committee, 1999
 - 5-year Reunion Committee, 1994
 - Interim Treasurer, 1993 - 1994
 - Instituted annual senior class career fair, now raising over \$100,000 annually for senior class activities, Fall 1988
- Strong, consistent record of leadership dating to high school
- Acting
 - '21' (Sony Pictures), credited as "Chinatown Dealer," 2007, Kevin Spacey's movie about the MIT Blackjack Team inspired by "Bringing Down the House" by Ben Mezrich, opened nationwide on March 28, 2008. 21 was the number one movie in US for two weeks and number one globally for one week. 21 also topped the DVD sales, Blu-ray sales and DVD rental charts.
 - Spring Lake Theater Company, first New York-area off-broadway production of "A Chorus Line," played role of Mark, Summer 1990
- Former member of the MIT Blackjack team
- Producer for 10,000 Maniacs' 2013 album "Music from the Motion Picture"
- Executive Producer for 10,000 Maniacs' 2015 album "Twice Told Tales"
- Violist, violist, harpist, guitarist, singer, actor: played in many amateur/semi-professional groups including Reading Symphony Orchestra, MIT Summer Philharmonic Orchestra, Freisinger Chamber Orchestra, Merrimack Valley Philharmonic, Longwood Symphony, MIT Symphony, and Somerville Community Chorus
- Violist, "Coming Home" album by Karen Phillips, 2014
- Google Scholar citations: 1914, h-index: 21, i10-index: 26 (since 2016: 649/13/13)
- Erdos-Bacon number of 7
- Erdos-Bacon-Sabbath number of 11