

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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GOOGLE LLC,  
Petitioner

v.

SANDPIPER CDN, LLC,  
Patent Owner

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Case IPR2025-00969  
U.S. Patent No. 8,478,903

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**DECLARATION OF DR. PRASHANT SHENOY**

***Mail Stop “PATENT BOARD”***  
Patent Trial and Appeal Board  
U.S. Patent and Trademark Office  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sandpiper EX2014  
Google v. Sandpiper  
IPR2025-00969

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I, Prashant Shenoy, Ph.D., do hereby declare as follows:

1. I am over the age of twenty-one and otherwise competent to make this Declaration. This Declaration is based on my personal knowledge as an expert in the relevant field. I could testify competently if asked to do so.

2. I have been retained by Sterne, Kessler, Goldstein & Fox, P.L.L.C. as a technical expert witness on behalf of Sandpiper CDN, LLC (“Patent Owner”) to provide this Declaration concerning technical subject matter relevant to the *inter partes* review of U.S. Patent No. 8,478,903 (“’903 Patent”) in IPR2025-00969.

3. I am being compensated for the time spent on this matter at my standard consulting rate of \$650.00/hour. My compensation is not dependent on, and in no way affects, the substance of my statements in this Declaration. My findings are based on my education, experience, and background in the fields discussed below. I reside in Amherst, Massachusetts, USA.

4. In formulating my opinions, I have relied upon my experience in the relevant art, and I have considered each document cited herein, in light of the general knowledge in the art as of February 10, 1998, the earliest possible priority date of the ’903 Patent. For example, I have considered the documents listed in Section II and any other documents cited in this declaration. To the best of my knowledge, these documents are true and accurate copies of what they purport to

be. An expert in the field would reasonably rely on them to formulate opinions such as those set forth in this declaration.

5. I will cite to the specification of a U.S. patent using the following format: (Patent, Col: Line Number(s)). For example, the citation to the '903 Patent, 1:1-10 points to the '903 Patent specification at column 1, lines 1-10.

6. I am familiar with the technology at issue and the state of the art at the time the application leading to the '903 Patent was filed, including content delivery networks, web protocols, network protocols, and proxy servers.

7. I have been asked to provide my technical review, analysis, insights, and opinions regarding the references. I reserve the right to supplement this Declaration in response to additional evidence that may come to light.

## **I. MY BACKGROUND AND QUALIFICATIONS**

8. I earned a Bachelor of Technology degree from the Department of Computer Science and Engineering at the Indian Institute of Technology in Bombay, India. I later received my Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees in 1994 and 1998, respectively, in Computer Science from the University of Texas at Austin.

9. Over the years, I have led research and industry collaboration projects in areas such as storage and file systems, Web and Internet systems, content

distribution, streaming media, database systems, cloud computing, virtualization, RFID and sensor networks, and energy systems.

10. I am a tenured professor in the College of Information and Computer Sciences at the University of Massachusetts Amherst (“UMass”), where I currently hold the position of Distinguished Professor of Computer Science. I am also an Associate Dean in the College of Information and Computer Sciences. I currently work in both these capacities. I have been a faculty member at UMass since 1998.

11. I received my Bachelor of Technology (B.Tech.) degree in 1993 from the Department of Computer Science and Engineering at The Indian Institute of Technology (“IIT”), Mumbai, India. IIT awarded me the Institute Medal for being the top ranking undergraduate student. In 1994, I received my Master of Science (M.S.) degree in Computer Sciences from The University of Texas at Austin. In 1998, I received my Doctor of Philosophy (Ph.D.) also from the Department of Computer Sciences at The University of Texas at Austin. My dissertation, which was in the area of file systems, was recognized by the department as the Best Doctoral Dissertation of 1998-1999.

12. I have been involved in the research and development of distributed computing systems for more than 30 years. I have been a faculty member at the UMass since 1998. I perform research and teach in the areas of distributed systems,

operating systems, computer networking, data management, and multimedia systems, among others.

13. A major focus of my research has been the design of large-scale distributed computing systems. Over the years, I have led research and industry collaboration projects in areas such as computer networking, distributed systems, storage and file systems, Web and Internet systems, content distribution, streaming media, database systems, cloud computing, virtualization, Radio Frequency Identification (“RFID”) and sensor networks, and energy systems. During that time, I have consulted with both large companies and startups in a technical advisory role related to product architecture, intellectual property (“IP”) issues, and applied research.

14. For example, starting in the early 1990s, my research focused on the development of storage and file systems. During that time, I developed multimedia file system and data management technologies that were designed for efficient storage and retrieval of large amounts of video and audio data. I collaborated with AT&T Bell Laboratories to design a new media server for video streaming. These efforts led to resulted in U.S. Patent No. 6,079,028 on fault-tolerant architectures for continuous media servers.

15. In the late 1990s, I led the design of a new operating system called QLinux that was based on the open-source Linux operating system. As part of this

research, I developed resource management and scheduling techniques that provided isolation and service guarantees to applications. This technology provided the underpinnings for fair resource management and isolation techniques used in operating system (“OS”) virtualization. It was adopted by a startup company for providing resource isolation in its web hosting products.

16. In the early 2000s, I led several projects on web systems and cloud computing. For example, I led research projects on web technologies such as web caching and scalable web applications. I also led research projects on cloud computing platforms (which were known as web hosting platforms at the time) involving virtualization, dynamic resource management, replication, fault tolerance, and storage. My group at UMass collaborated with technology companies such as IBM, AT&T, Sprint, Intel, and many others as part of this research.

17. My research on virtualization has involved designing technologies for virtual machines and container resource management and deploying them in cloud computing systems and data centers. I am co-inventor on U.S. Patent No. 8,473,557, jointly assigned to AT&T and UMass, on virtual machine migration.

18. Over the years, I have authored or co-authored more than 300 articles in peer-reviewed journals and conference proceedings that have been cited over 27,000 times. Seventeen papers authored by myself and members of my research

group on this project won awards for their technical contributions. Two papers have won Test-of-Time awards, an award given to a publication that has had the most impact over a ten year period since its publication.

19. I have served as an Editor for six leading journals and have served as the Technical Program Chair for twenty conferences and workshops in my field. I founded the ACM Special Interest Group on Energy Systems and also served on a steering committee of conferences and journals.

20. I am also a Fellow of the ACM, IEEE, AAAS, and AAIA, four professional societies in computing and science.

21. I am a named inventor on three U.S. Patents and one published application (U.S. Application No. 2014/0040206 and U.S. Patent Nos. 8,510,596, 8,473,557, and 6,079,028). These documents are generally related to distributed and operating systems, virtualization, and cloud data centers.

22. As a faculty member at UMass, I have also taught undergraduate and graduate courses in operating systems, distributed systems, networking, and related topics for more than twenty years.

23. These courses teach concepts related to operating systems, virtual machines, containers, cloud computing, file systems, and distributed systems. They also involve hands-on course projects on these topics.

24. My *Curriculum Vitae* is attached as EX2015, which contains further details on my education, experience, publications, and other qualifications to render an expert opinion.

## II. LIST OF MATERIALS CONSIDERED

| Exhibit No. | Description                                                                                                                                                                                |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1001        | U.S. Patent No. 8,478,903 to Farber et al. (“’903 Patent”)                                                                                                                                 |
| 1002        | Prosecution History of U.S. Application No. 11/065,412                                                                                                                                     |
| 1003        | Declaration of Dr. Todd C. Mowry (“Mowry Dec.”)                                                                                                                                            |
| 1004        | Curriculum Vitae of Dr. Todd. C. Mowry                                                                                                                                                     |
| 1005        | International Publication No. WO1996041285 to Kenner et al. (“Kenner”)                                                                                                                     |
| 1006        | Ronald J. Vetter et. al, Mosaic and the World-Wide Web, Computer, vol. 27, no. 10, pp. 49-57, Oct. 1994 (“Vetter”)                                                                         |
| 1007        | European Publication No. EP 0753836 to Rekimoto et al. (“Rekimoto”)                                                                                                                        |
| 1008        | U.S. Patent No. 5,511,208 to Boyles et al. (“Boyles”)                                                                                                                                      |
| 1009        | Andrew Tanenbaum, Computer Networks (3rd ed. 1996) (“Tanenbaum”)                                                                                                                           |
| 1010        | Tim Berners-Lee, The World-Wide Web, Communications of the ACM, Vol. 37, No. 8, August 1994 (“Berners-Lee”)                                                                                |
| 1011        | Radhika Malpani, Making World Wide Web Caching Servers Cooperate, WWW4: Proceedings of the Fourth International Conference on World Wide Web, Pages 107-117, December 11, 1995 (“Malpani”) |
| 1012        | Fielding et al., Hypertext Transfer Protocol – HTTP/1.1, RFC 2068, Jan. 1997, <a href="https://www.rfc-editor.org/rfc/rfc2068">https://www.rfc-editor.org/rfc/rfc2068</a> (“HTTP/1.1”)     |

| Exhibit No. | Description                                                                                                                                                                                                                                                                  |
|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1013        | Barbara Tockey Zivkov et al., Disk Caching in Large Databases and Timeshared Systems, Proceedings Fifth International Symposium on Modeling, Analysis, and Simulation of Computer and Telecommunication Systems (MASCOTS 97), Haifa, Israel, 184–95, January 1997 (“Zivkov”) |
| 1014        | Declaration of Lauren Gluckman Regarding EX-1006                                                                                                                                                                                                                             |
| 1015        | Scheduling Order, <i>Sandpiper CDN, LLC v. Google LLC</i> , 2:24-cv-03951, Dkt. 62 (C.D. Cal. Dec. 6, 2024)                                                                                                                                                                  |
| 1016        | Letter to Robert H. Reckers re <i>Sandpiper CDN LLC v. Google LLC</i> , No. 2:24-3951-AB-RAO (C.D. Cal.) (May 6, 2025)                                                                                                                                                       |
| 2001        | “Cloud CDN: content delivery network,” <i>Google Cloud</i> , accessed at <a href="https://cloud.google.com/cdn">https://cloud.google.com/cdn</a> (last accessed July 2, 2025)                                                                                                |
| 2002        | <i>Intentionally Left Blank</i>                                                                                                                                                                                                                                              |
| 2003        | <i>Sandpiper CDN, LLC v. Google LLC</i> , No. 2:24-cv-03951, ECF No. 1 (C.D. Cal. May 10, 2024)                                                                                                                                                                              |
| 2004        | <i>Sandpiper CDN, LLC v. Google LLC</i> , No. 2:24-cv-03951, Invalidity Contentions (C.D. Cal. April 22, 2025)                                                                                                                                                               |
| 2005        | <i>Sandpiper CDN, LLC v. Google LLC</i> , No. 2:24-cv-03951, ECF No. 75 (C.D. Cal. May 23, 2025)                                                                                                                                                                             |
| 2006        | <i>Sandpiper CDN, LLC v. Google LLC</i> , No. 2:24-cv-03951, ECF No. 82 (C.D. Cal. June 24, 2025)                                                                                                                                                                            |
| 2007        | <i>Sandpiper CDN, LLC v. Google LLC</i> , No. 2:24-cv-03951, ECF No. 28 (C.D. Cal. Sept. 16, 2024)                                                                                                                                                                           |
| 2008        | FAQs for Interim Processes for PTAB Workload Management, accessed at <a href="https://www.uspto.gov/patents/ptab/faqs/interim-processes-workload-management">https://www.uspto.gov/patents/ptab/faqs/interim-processes-workload-management</a>                               |
| 2009        | <i>Intentionally Left Blank</i>                                                                                                                                                                                                                                              |
| 2010        | <i>Intentionally Left Blank</i>                                                                                                                                                                                                                                              |

| <b>Exhibit No.</b> | <b>Description</b>                                                         |
|--------------------|----------------------------------------------------------------------------|
| 2011               | <i>Intentionally Left Blank</i>                                            |
| 2012               | <i>Intentionally Left Blank</i>                                            |
| 2013               | Interim Processes for PTAB Workload Management Memorandum (March 26, 2025) |
| 2015               | Curriculum Vitae of Dr. Prashant Shenoy                                    |

### **III. BACKGROUND OF THE TECHNOLOGY**

25. Content delivery networks (“CDNs”) provide critical services that enable content providers to quickly deliver online content to millions of consumers simultaneously over the Internet. In the early 1990s, the World Wide Web saw increasing adoption and became a household staple. This mass adoption led to data congestion issues from the ever-growing number of users seeking to simultaneously access Internet content.

26. A typical computer server in the 1990s could only handle a limited number of simultaneous connections before becoming overloaded. Moreover, signals take time to traverse routers and move through content-congested internet cables. Consumers living far from the physical server(s) hosting content experienced sluggish load times and high latency due to problems such as overloaded servers, congested network segments, and geographic separation.

27. The availability of CDN servers around the world allowed service providers to replicate appropriate content from customers’ origin servers to

appropriate CDN servers and transparently route end users requesting that content to the “best” CDN server to deliver that content, all while providing their customers with control over their content and the user experience. This service and its architecture was quickly adopted by many others in the industry.

28. End-users would connect to an optimal edge server—a server that was closer to the end user or that had available capacity. Distributing content across a network of servers alleviated data congestion issues and allowed consumers to connect to edge servers located near them to reduce latency. Systems and methods for propagating data from origin servers to edge servers are known as “caching.”

29. By 1996, a team at Sandpiper Networks Inc. had conceived techniques for delivering static and dynamic content, including streaming resources, such as audio and video, using Sandpiper’s CDN.

30. By at least May 1998, Sandpiper Networks was caching content and delivering cached content to end users of content providers using its CDN. Sandpiper Networks’ first paying customer was the L.A. Times, which paid Sandpiper Networks to host the report of Independent Counsel Ken Starr on his investigation of President Bill Clinton (“the Starr Report”) beginning on September 11, 1998. Sandpiper Networks’ CDN was capable of caching and was used to cache and deliver Internet resources including pictures, text files, dynamic resources, and streaming multimedia resources.

31. In the early-to-mid 2000s, demand for CDNs exploded. Content providers like Google and YouTube use CDN technology to meet their enormous data streaming needs and to provide video search results. *See* EX2001. Google built a CDN, which uses technology described and claimed by Sandpiper's patents. Additionally, YouTube, which Google purchased in 2006, relies upon CDN technology to meet its enormous data streaming needs and to provide Google's video search results (powered by YouTube).

#### **IV. OVERVIEW OF THE '903 PATENT**

32. The '903 Patent is titled "Shared Content Delivery Infrastructure" and was filed as U.S. Patent Application No. 09/021,506 on February 23, 2005. The '903 Patent claims priority benefit to U.S. Application No. 09/612,598 ("the '598 Application"), filed July 7, 2000, now abandoned. The '598 Application was a divisional of U.S. Patent Application No. 09/021,506, filed on February 10, 1998, now U.S. Patent No. 6,185,598.

33. One fundamental issue in CDN technology is the delivery of resources from more than one content provider. The inventors of the '903 Patent understood that website owners and other content providers want to have their own internet domain shown in end users' browsers even when the content providers are using a CDN to serve their content.

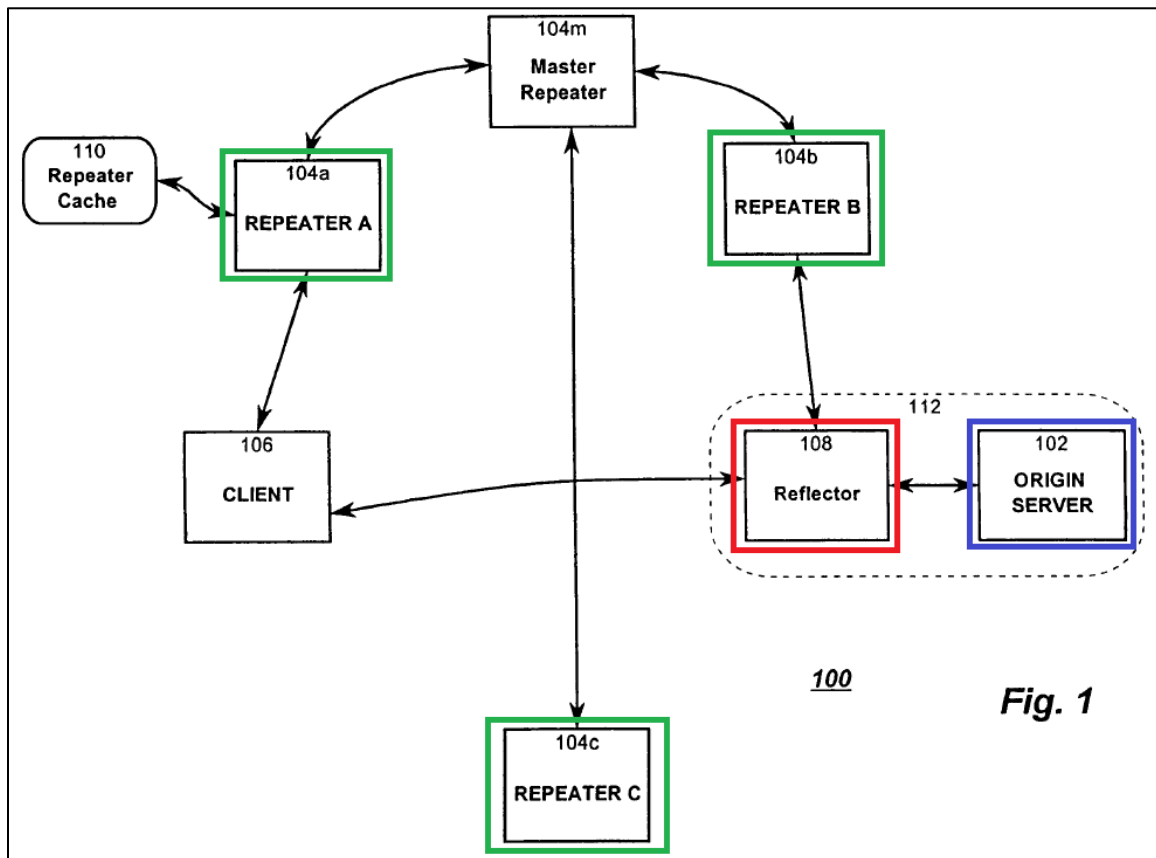
34. The '903 Patent is directed to CDN technology and to solving issues related to delivering resources from more than one content provider. In some embodiments, this involves replicating content from a source associated with a client of a CDN network onto CDN servers. End-user requests are then directed to the CDN servers instead of to the client's source servers (generally referred to as "origin" servers). Embodiments of the '903 Patent address issues such as load balancing and reducing traffic to client origin servers. When an origin server receives and must reply to multiple requests, delivery of content from a content provider can be slow. Methods of using CDN servers to deliver content as described in the '903 Patent help to solve this issue.

35. The inventors devised the concrete solutions recited in the '903 Patent to address unique problems related to providing content from multiple content providers using CDN technology. For instance, the inventors conceived of approaches to content delivery in a network for delivering resources associated with more than one content provider using a shared CDN server and alias names to provide resources in response to requests.

36. For instance, the '903 Patent describes using a first/second alias name associated with a repeater server and a first/second resource of a first/second content provider and a table that can be consulted to determine a content provider associated with a particular resource. These innovations enabled CDN customers to

use their own domain name while using a provider's CDN services to serve content to end users.

37. FIG. 1 of the '903 Patent illustrates a network environment including **reflector 108** at **origin server 102** and **repeaters 104a, 104b, and 104c**. '903 Patent, 4:22-26.



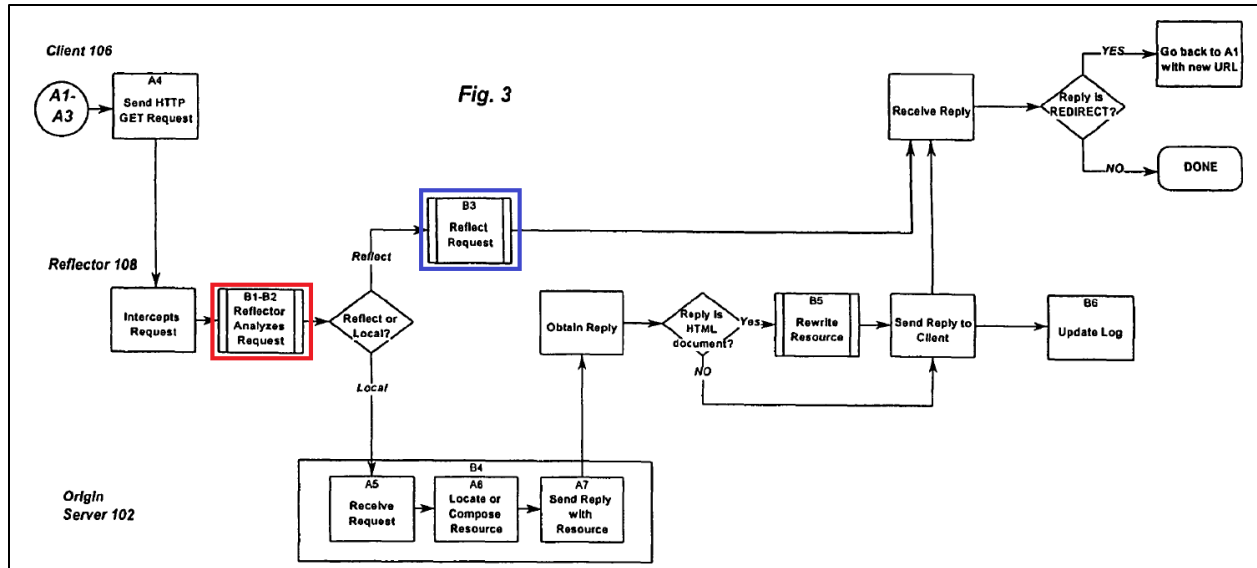
'903 Patent, FIG. 1 (annotated).

38. “Each **repeater 104a, 104b, and 104c** replicates some or all of the information on the **origin server 102** as well as information available on other origin servers in the network.” *Id.*, 4:27-29; *see also id.*, 4:37-40 (“Thus, a repeater can be considered as a dedicated proxy server that maintains a partial or sparse

mirror of the **origin server 102**, by implementing a distributed coherent cache of the origin server.”).

39. When a client requests resources from the origin server, **reflector 108** intercepts the request and either serves the request locally or reflects the request to a selected repeater. *Id.*, 5:9-22. **Reflector 108** is typically, though not necessarily, co-located with the origin server. *Id.*, 5:34-39. Essentially, **reflector 108** takes over **origin server 102’s** IP address and port number so that when a client attempts to connect to **origin server 102**, the client connects to **reflector 108**. *Id.*, 7:40-49.

40. FIG. 3 of the '903 Patent illustrates the processing performed by a reflector. In **B1-B2**, the reflector analyzes a request to determine whether the requestor is a browser (i.e., received from a client) or a repeater. *Id.*, 7:59-60. A request from a repeater is served locally by the origin server. *Id.*, 7:62-63. This allows a repeater to build a cache of the content on the origin server because a repeater’s requests to the origin server are always processed locally by the origin server.



'903 Patent, FIG. 3 (annotated).

41. If the request is from a client, the reflector looks up the requested resource in a rule base (e.g., a list of regular expressions and related attributes) to determine whether the resource requested is “repeatable” and either reflects the request (by sending to a repeater) or serves the request locally. *Id.*, 8:4-9; *see also id.*, 9:14-15 (“By using a rule base . . . , it is possible to selectively reflect resources.”).

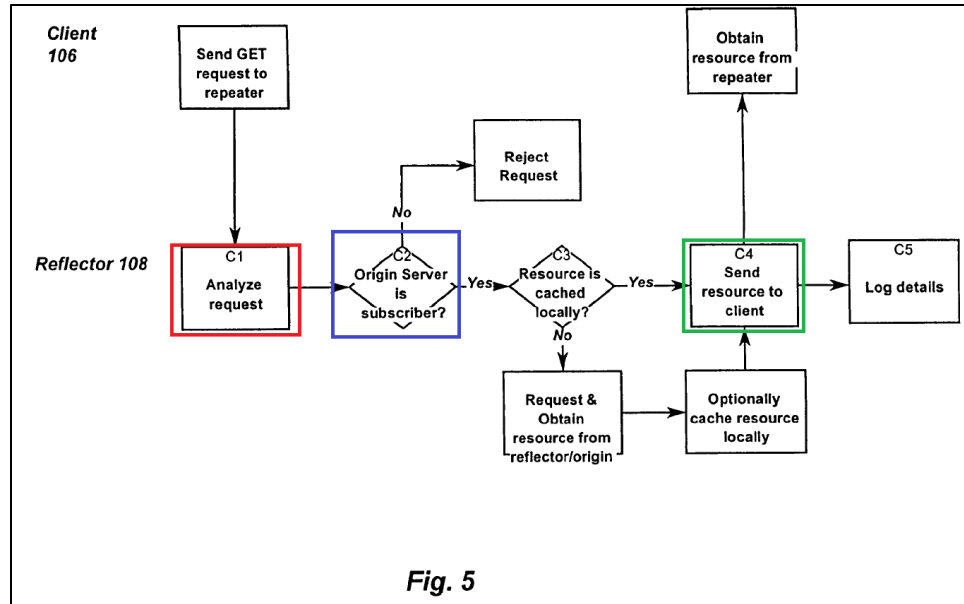
42. In **B3** (FIG. 4 illustrates the sub-steps of B3 in further detail), the reflector “determines the best repeater to reflect the request to, [and] creates a new resource identifier (URL) (using the requested URL and the best repeater) that identifies the same resource at the selected repeater.” *Id.*, 8:22-28. The reflector creates a single URL that contains both the “URL of the original resources” and “the identity of the selected repeater.” *Id.*, 8:29-33. For example, for an HTTP

request, the single URL may be: `http://<repeater>/<server>/<path>`. *Id.*, 8:34-41.

Alternatively, the '903 Patent can employ a “family” of names for an origin server, with “each identifying one of the repeaters used by that server.” *Id.*, 9:44-47. “For instance, if `www.example.com` is the origin server, names for three repeaters might be created: `wr1.example.com`[, `wr2.example.com`[, and] `wr3.example.com`.” *Id.*, 9:48-52. “The name ‘`wr1.example.com`’ would be an alias for repeater1, which might also be known by other names such as ‘`wr1.anotherExample.com`’ and ‘`wr1.example.edu`.’” *Id.*, 9:53-55.

43. The reflector sends a “REDIRECT reply containing this new URL to the requesting client.” *Id.*, 8:50-51. When the browser receives the REDIRECT, the browser reissues a request to the repeater for the resource using the new URL. *Id.*, 10:12-19.

44. In FIG. 5, the '903 Patent illustrates how a repeater intelligently processes a reflected request. '903 Patent, 10:16-64. In **C1**, the repeater “analyzes the request to determine the network address of the requested client and the path of the resource requested.” *Id.*, 10:20-22, 10:22-23 (“Included in the path is an origin server name.”).



'903 Patent, FIG. 5 (annotated).

45. To determine the path of the resource, the repeater must know the name by which the client addressed the repeater. *Id.*, 9:56-59. A repeater determines the alias name used by inspecting the HOST tag in the request's HTTP header. *Id.* 10:4-7.

46. In C2, the repeater references a table that associates repeater aliases with origin server names to determine the requested origin server. *Id.*, 9:56-59. “For instance, if repeater 1 is addressed as wr1.example.com, then the origin server is ‘www.example.com’; if it is addressed as ‘wr1.anotherExample.com’, then the origin server is ‘www.anotherExample.com’.” *Id.*, 9:59-63. The '903 Patent details this step:

C2. The repeater uses an internal table to verify that the origin server belongs to a known “subscriber”. A subscriber is an entity (e.g., a company) that publishes resources (e.g., files) via one or more origin

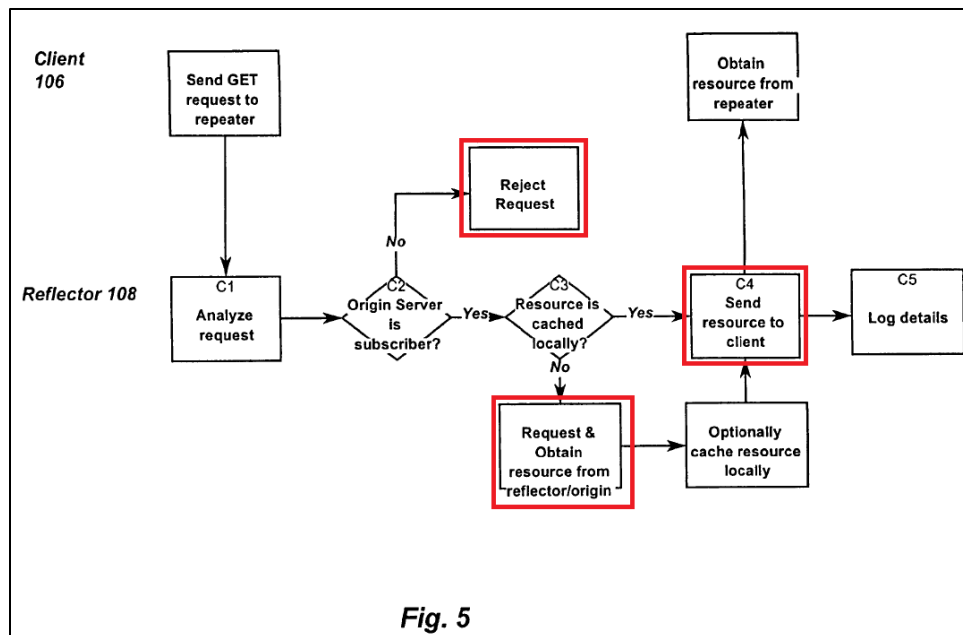
servers. When the entity subscribes, it is permitted to utilize the repeater network. The subscriber tables described below include the information that is used to link reflectors to subscribers.

*Id.*, 10:24-31. The '903 Patent provides additional detail about the subscriber table:

When a new subscriber is added to the network, information about the subscriber is entered in a Subscriber Table at the master repeater and propagated to all repeaters in the network. This information includes the Committed Aggregate Information Rate (CAIR) for servers belonging to the subscriber, and **a list of the repeaters that may be used by servers belonging to the subscriber.**

*Id.*, 17:51-57 (emphasis added).

47. Returning to FIG. 5, if the requested resource is not from a known subscriber, the repeater rejects the request. *Id.*, 10:32-33.



'903 Patent, FIG. 5 (annotated).

48. In C4, the repeater “constructs a reply including the requested resource (which was retrieved from the cache or from the origin server) and sends that reply to the requesting client.” *Id.*, 10:54-57; *see also id.*, 10:42-44 (“Because this request to the originating reflector is from a repeater, the reflector always returns the requested resources rather than reflecting the request.”). The client obtains the resource from the repeater, reducing the processing impact to the origin server. *Id.*, 2:62-65.

## **V. PROSECUTION HISTORY**

49. The '903 Patent was examined as U.S. Application No. 11/065,412 (“’412 application”), which was filed on February 23, 2005. Applicant co-filed a First Preliminary Amendment that included one claim (“originally presented claim”). EX1002, 954, 1024.

50. On June 26, 2007, Applicant filed a Second Preliminary Amendment that cancelled the originally presented claim and introduced new claims 2-26 (“new claims”). *Id.*, 876-92. On July 12, 2007, January 25, 2008, and May 12, 2008, Applicant filed three separate Information Disclosure Statements. *Id.*, 788, 781, and 717. On August 5, 2008, Applicant filed a Third Preliminary Amendment that cancelled new claims 2-26 and introduced new claims 27-51 (“prosecution claims”). *Id.*, 687-96.

51. In a Non-Final Office Action mailed on September 18, 2008, Examiner Blair rejected the originally presented claim. *Id.*, 605-09. Recognizing that the Non-Final Office Action did not address the prosecution claims in the Third Preliminary Amendment, Applicant filed a Fourth Preliminary Amendment on December 10, 2008 that again cancelled all claims and re-advanced prosecution claims 27-51. *Id.*, 583-92, 599-00.

52. In a Non-Final Office Action mailed on January 9, 2009, Examiner Blair rejected prosecution claims 27-38, 43-45, 47, and 49-51 as anticipated by U.S. Patent No. 5,867,706 (“Martin”) and claims 39-42, 46, and 48 as obvious over Martin in view of U.S. Patent Number 6,052,718 (“Gifford”). EX1002, 536-45.

53. On July 9, 2009, Applicant responded with amendments and remarks. *Id.*, 505-29. For example, Applicant amended claim 29:

29. (Currently amended) A ~~distributed hosting framework~~ content delivery system operative in a computer network for delivering resources associated with a plurality of content providers to multiple client machines, the ~~framework~~ system comprising:

at least one shared ~~content~~ repeater server constructed and adapted to replicate at least some of the resources associated with a first content provider of said plurality of content providers, and to replicate at least some of the resources associated with a second content provider of said plurality of content providers; and

~~at least one name server that provides domain name service (DNS) resolution;~~

wherein ~~resources~~ at least a first resource associated with the first content provider ~~are~~ is associated with a first alias name, said first alias name being associated with said at least one shared repeater server; and

~~wherein, that causes the at least one name server to identify the at least one shared content server to serve the resources in response to requests for the first resource~~ resources associated with the first content provider made from said client machines are directed to the at least one shared repeater server, based at least in part on said first alias name; and

wherein ~~the resources~~ at least a second resource associated with the second content provider ~~are~~ is associated with a second alias name, said second alias name being associated with said at least one shared repeater server; and wherein

~~that causes the at least one name server to identify the at least one shared content server to serve the resources in response to requests for the resources~~ second resource associated with the second content provider made from said client machines are directed to the at least one shared repeater server, based at least in part on said second alias name.

EX1002, 506-07.

Applicant argued that Martin did not disclose “‘at least one shared repeater server’ that replicates at least some of the resources associated with a first content provider

and a second content provider” and that “Martin pertains to a server that serves resources only from and on behalf of a single content source (or content provider).” *Id.*, 520. Applicant also advanced new claims 53 and 54 that recited a “subscriber table”, e.g., new claim 54 read:

54. (New) The content delivery system as in claim 45, further comprising:  
providing a subscriber table listing origin servers having content located thereon that is authorized for delivery to client machines via the at least one shared repeater server, wherein the origin servers comprise the first origin server and the second origin server; and  
wherein the at least one repeater server is further constructed and adapted to analyze, using the subscriber table, information about an alias name received with a client request for a resource to determine an origin server associated with the requested resource.

EX1002, 512-13.

54. On September 10, 2009, Examiner Blair issued a Notice of Non-Compliant Amendment that objected to additional text in the amendment between prosecution claims 51 and 52. *Id.*, 332-34. On September 11, 2009, Applicant filed a response to the notice of non-compliant amendment with a corrective amendment that removed the additional text. *Id.*, 319-28. The amendment was substantively similar to the claims filed on July 9, 2025 and again included new claims 53 and 54. *Id.*

55. On November 25, 2009, Examiner Blair issued a Restriction Requirement because prosecution claims 27 and 28 (Group I) were drawn to a

different invention than prosecution claims 29-42, 45-50, and 52-57 (Group II).

EX1002, 303-08. On January 25, 2010, Applicant filed a response to the Restriction Requirement electing Group II. *Id.*, 297.

56. In a Final Office Action mailed on May 7, 2010, Examiner Blair rejected prosecution claims 29-38, 43-45, 47, and 55-57 as anticipated by U.S. Patent No. 6,085,193 (“Malkin”) in view of Martin and claims 39-42, 46, and 48 as obvious over Malkin in view of Martin in view of Gifford. *Id.*, 241-50. Examiner Blair noted that claims 53 and 54 contained Allowable Subject Matter. *Id.*, 249.

57. On July 2, 2010, Applicant responded with amendments and remarks. *Id.*, 207-26. Applicant amended the independent claims to incorporate the subject matter deemed allowable by Examiner Blair in prosecution claims 53 and 54:

29. (Currently amended) A content delivery system operative in a computer network for delivering resources associated with a plurality of content providers to multiple client machines, the system comprising:

at least one shared repeater server constructed and adapted to replicate at least some of the resources associated with a first content provider of said plurality of content providers, and to replicate at least some of the resources associated with a second content provider of said plurality of content providers;

at least one table listing a plurality of alias names corresponding to content providers authorized to have resources delivered to client machines via the at least one shared repeater server, wherein the plurality of content providers comprises the first content provider and the second content provider,

wherein at least a first resource associated with the first content provider is associated with a first alias name of the plurality of alias names, said first alias name being associated with said at least one shared repeater server; ~~and~~

wherein, requests for the first resource from said client machines are directed to the at least one shared repeater server, based at least in part on said first alias name; ~~and~~

wherein at least a second resource associated with the second content provider is associated with a second alias name of the plurality of alias names, said second alias name being associated with said at least one shared repeater server; ~~and~~

wherein requests for the second resource made from said client machines are directed to the at least one shared repeater server, based at least in part on said second alias name; and

wherein the at least one shared repeater server is further constructed and adapted to analyze, using the table, an alias name received with a client request for a particular resource to determine a content provider associated with the particular resource.

EX1002, 210.

58. On October 9, 2012, the Examiner issued a First Notice of Allowance including an Examiner's Amendment that added "wherein the second content provider is distinct from the first content provider" to the independent claims:

|                                                                                                                                                                                                                                                                                                                                                                                                                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| at least one shared repeater server constructed and adapted to replicate at least some of the resources associated with a first content provider of said plurality of content providers, and to replicate at least some of the resources associated with a second content provider of said plurality of content providers, <u>wherein the second content provider is distinct from the first content provider;</u> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

EX1002, 82.

Examiner Blair noted that the closest prior art (Armbruster) "teaches [] a table listing aliases associated with content providers . . . [but] the cache servers in Armbruster do not perform the claimed analysis using the table." *Id.*, 94.

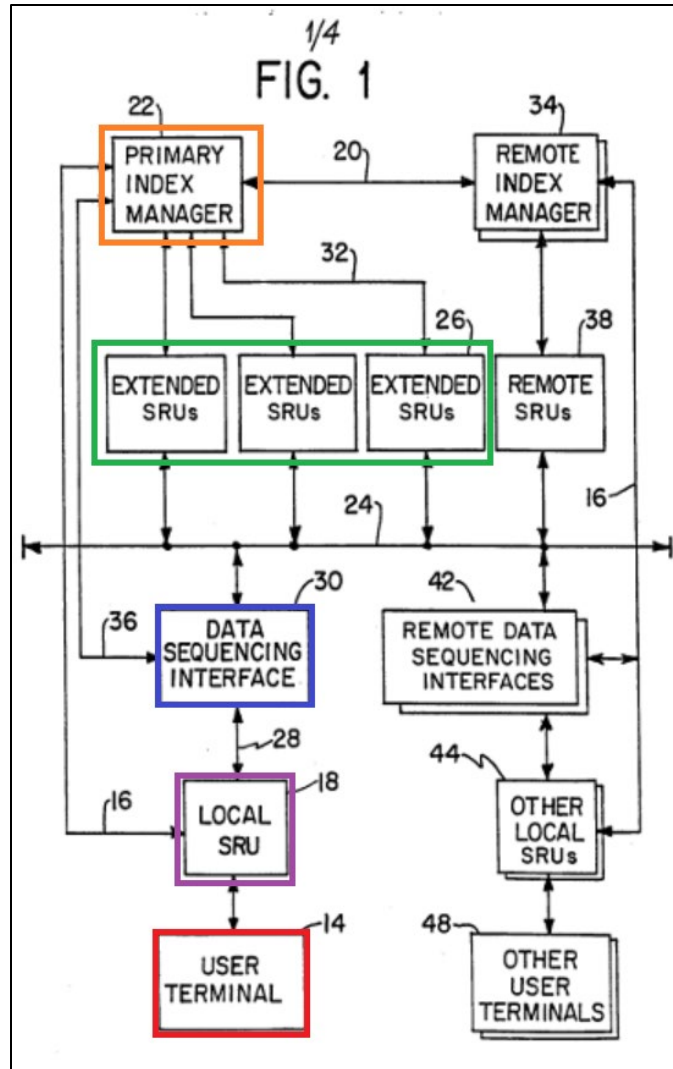
59. On October 17, 2012, Applicant paid the Issue Fee. *Id.*, 76. On October 31, 2012, Applicant filed a Petition to Withdraw an Application from Issue After Payment of the Issue Fee. *Id.*, 60-61. Applicant co-filed an Information Disclosure Statement listing a European Search Report. *Id.*, 62-64.

60. On April 29, 2013, Examiner Blair issued a Second Notice of Allowance. EX1002, 16. The Second Notice of Allowance also included the Examiner's Amendment recreated above. *Id.*, 23-34. On May 15, 2013, Applicant again filed the Issue Fee Payment form. *Id.*, 13-14. The '903 Patent issued on July 2, 2013. *Id.*, 2.

## VI. OVERVIEW OF THE CITED PRIOR ART

61. Kenner discloses a “video clip storage and retrieval system” in which “video clips . . . can be requested and retrieved by a user” at a multimedia terminal. EX1005, Abstract; *see also id.*, 1:12-16, 6:20-22. Because “video files can be very large,” Kenner recognizes a need “for a system capable of providing improved access to audio/video content on the Internet . . . .” *Id.*, 3:15-17, 4:5-7.

62. FIG. 1 of Kenner illustrates a video clip storage and retrieval system. *Id.*, 10:18-20. Kenner’s system includes **user terminal 14**, **data sequencing interface (“DSI”) 30**, **extended storage and retrieval units (“extended SRUs”) 26**, and one or more index managers (“IM”) including **primary IM (“PIM”) 22**.



EX1005, FIG. 1 (annotated).

63. **User terminal 14** allows a “user to manipulate retrieved video clips”—e.g., play, stop, pause, fast forward, etc. *Id.*, 13:17-20. **User terminal 14** also “provides the user access to a database or index which can be interrogated for desired video clips and other information.” *Id.*, 13:13-24.

64. **Local SRU 18** provides large capacity hard drives for temporarily storing video clips. *Id.*, 13:31-14:19. For example, **local SRU 18** may be a “file

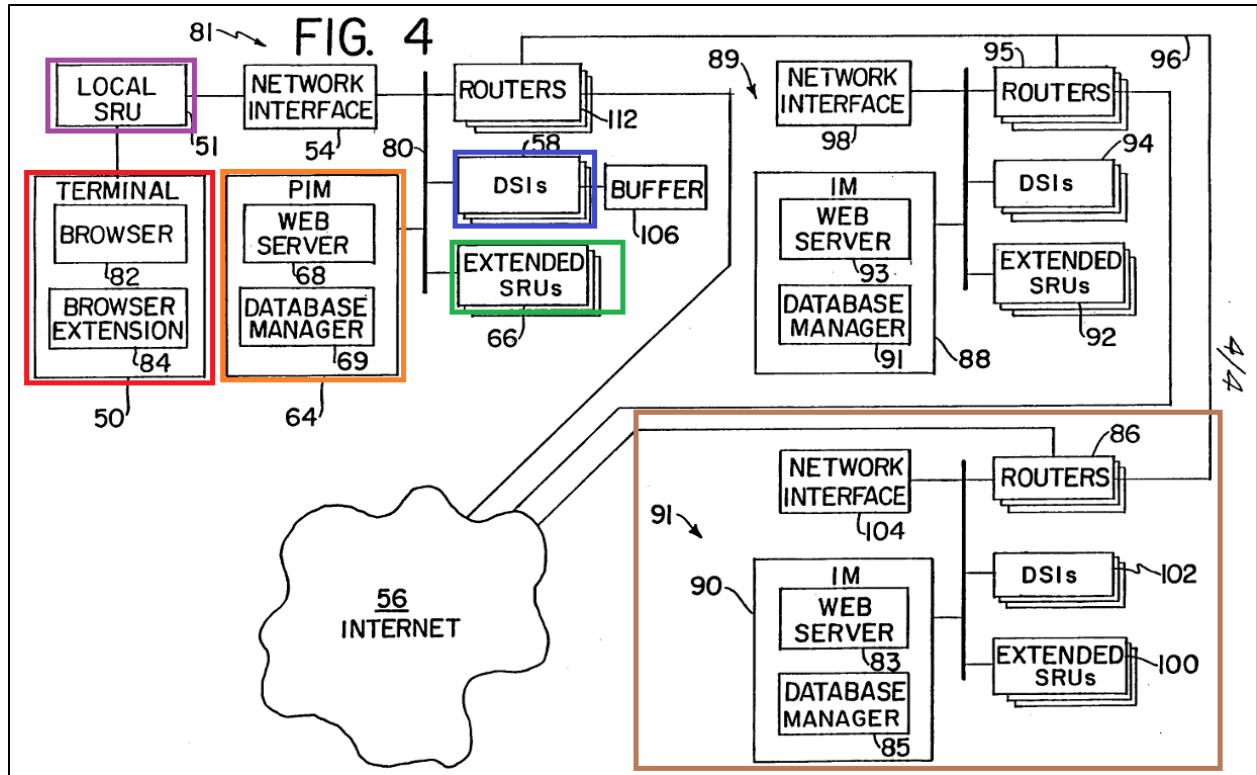
server for a local area network, with one or more integral or connected storage devices.” *Id.*, 14:3-5.

65. **PIM 22** is the “primary search engine and database management module of the invention.” *Id.*, 16:2-3, 31:19. **PIM 22** “locates the requested video clips” and directs “the efficient download of the video clips to the user terminal 14.” *Id.*, 10:27-28.

66. **Extended storage retrieval units (“SRUs”) 26** provide the “principle storage facility for the system and [are] used to store audio-visual data in a plurality of audio-visual storage media.” *Id.*, 17:30-32. **SRUs 26** transmit requested data to **user terminal 14**. *Id.*, 18:13-15.

67. **DSI 30** “manages the download of video clips and other information to **local SRU 18** from the various locations.” *Id.*, 15:4-6. “A **DSI 30** is created and/or initialized by **PIM 22** whenever a user requests audiovisual information that is not stored within the **local SRU**.” *Id.* 19:4-5; *see also id.* 31:26-28 (“[O]ne or more transient DSI processes 58 . . . may be created by the **PIM 64**, as required, for each user receiving audio-video content.”).

68. FIG. 4 of Kenner illustrates a “preferred embodiment of an Internet-related video clip storage and retrieval system.” *Id.*, 31:2-3. In this embodiment, “**terminal 50** is a personal computer running an HTML browser 82 with an audio-video decoding and playback ‘browser extension’ 84.” *Id.*, 31:10-12.



EX1005, FIG. 4 (annotated).

**Content provider's region 91** includes an “IM 90 hosting a Web server 83 and a database manager 85, at least one extended SRU 100, one or more transient DSI's 102, and router 86.” *Id.*, 32:14-16.

69. A content provider's server creates web pages for the user at **terminal 50** that inform the user of available content. *Id.*, 35:17-36:9. “A reference to a desired clip is embedded within the HTML of the Web page”—e.g., a video ID that is unique identifier for the selected clip referenced within an HTML EMBED tag. *Id.*, 36:15-18. The video ID includes:

a text name of the file as defined by the content provider; the content provider's account number as provided by the organization running the subscription service; a category coordinate, possibly a representation of a hierarchical portion of a category tree, a geographic coordinate used

to determine where the file is relevant (e.g. a region, state, or city); a time stamp, and a time period over which the file is relevant.

*Id.*, 36:32-37:5; *see also id.*, 36:28-29 (“The video ID consists of a multidimensional set of content-characterization coordinates plus a unique file name.”), 44:1-14 (discussing creation of the video ID when the content provider uploads a clip).

70. When the user selects a video clip, **PIM 64** receives a “virtual URL” that takes the form: “’http://’ plus the Internet address of the **PIM 64**, plus the user’s subscriber ID number, plus the video ID.” *Id.*, 37:7-10; *see also id.*, 36:22-24 (noting that the browser invokes local SRU 51 to receive the video data). When **PIM 64** receives the virtual URL, “the virtual URL is decomposed into the video ID and subscriber ID components, which are then used to access the PIM’s internal databases.” *Id.*, 37:15-17.

71. **PIM 64** “maintains information on the audio-visual clips stored on its extended SRUs 66 in a clip database.” *Id.*, 34:3-5. The database can contain the video ID and other information for each clip:

| Item Name         | Format        | Description                                                                                                                  |
|-------------------|---------------|------------------------------------------------------------------------------------------------------------------------------|
| Counter           | numeric       | Primary index for the records. Each record represents one video clip.                                                        |
| Video ID          | text          | The globally unique name of the video clip, as specified above.                                                              |
| Extended SRUs     | IP array      | The IP addresses of all the extended SRUs 66 which contain the file.                                                         |
| Copyright         | boolean       | A flag to indicate that the file is copyrighted and must be protected.                                                       |
| Charge Mechanism  | numeric       | A code representing the mechanism for charging for the file (pay per view, one-time fee, etc.).                              |
| Charge Parameters | numeric array | The amount charged per use under the specified charge mechanism.                                                             |
| Expiration Date   | date          | Date after which the file is to be removed from the system.                                                                  |
| Size of File      | numeric       | Size of the file, in bytes.                                                                                                  |
| Date              | date          | Date the file was made by the content provider.                                                                              |
| Time              | time          | Time the file was made by the content provider.                                                                              |
| Category          | numeric       | The subject category of the file, used for load projections as discussed below.                                              |
| Usage Count       | numeric array | The historical frequency of clip access across days and hours, used for load projections.                                    |
| Segment Info      | text/numeric  | If the file is segmented, this is the array of segment descriptors and pointers into the file.                               |
| Link Info         | text/numeric  | If the file has been annotated with links to other files, this is the array of link names, URLs, and pointers into the file. |

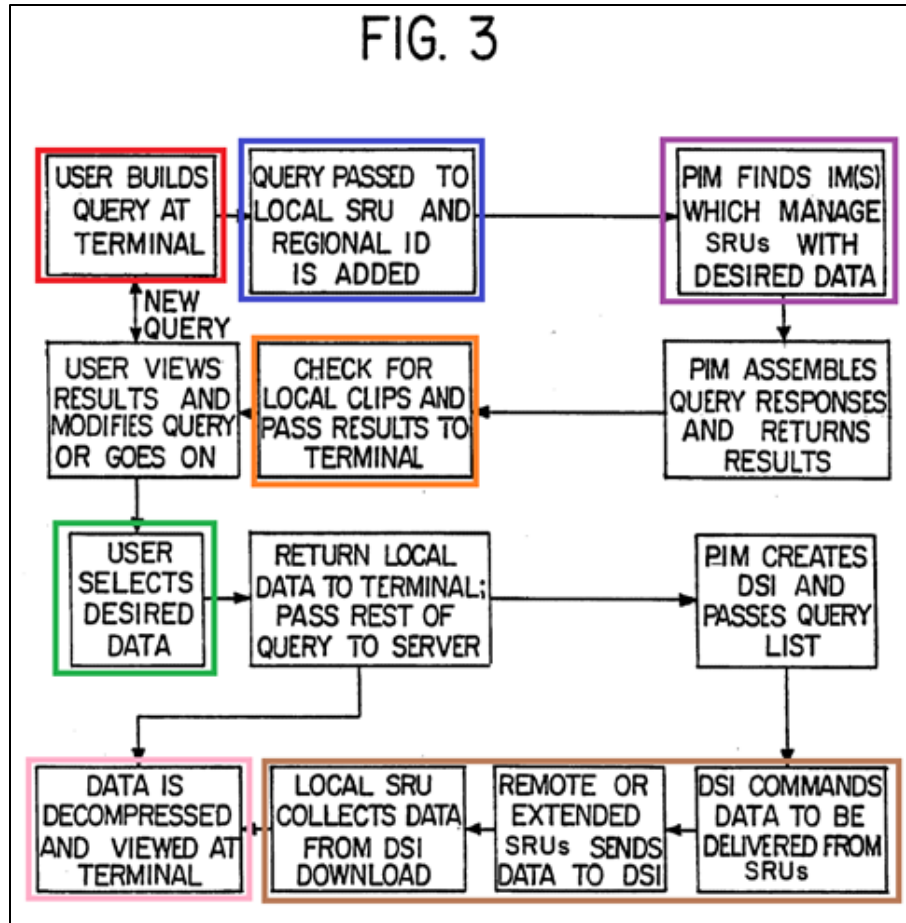
*Id.*, 34:5-35:3.

72. The PIM “checks the user’s subscription rights in its user database, and if authorized and necessary, initiates a DSI process 58 to download the desired clip to the user’s terminal 50.” *Id.*, 37:18-20; 9:5-8 (noting that a user may establish a subscription account with a content provider or ISP). The PIM “queries

its clip database to determine on which extended SRUs 66 the desired clip is stored.” *Id.*, 38:32-39:1. The DSI then selects the least loaded SRU from the list and oversees the transfer of the video file from the selected SRU to the terminal 50. *Id.*, 39:6-9.

73. However, if PIM 64 determines that none of the extended SRUs 66 has the desired clips, PIM 64 will query the closest IMs to determine if any of them have the desired clip. *Id.*, 40:29-34. If none of the neighboring IMs has the desired clip, the PIM 64 will contact the source IM 90, where the content provider first uploaded the file. *Id.*, 41:13-16.

74. FIG. 3 of Kenner illustrates how “the invention would operate to search and download data.” *Id.*, 25:7-8. A user “builds a data query at the user terminal 14 from the text database.” *Id.*, 25:8-9; *see also id.*, 6:32.



EX1005, FIG. 3 (annotated).

The local SRU then “(1) attaches a regional identifier to the query; and (2) searches its own database and flags each request that is stored at the local SRU . . . .” *Id.*, 25:11-14; *see also id.* 7:3-5 (“The local SRU provides temporary storage for the user’s most requested video clips, and before the query is sent to the user’s PIM, the local SRU is polled for requested video clips.”). The PIM identifies exact locations of the audio-visual data stored at the extended and remote storage units and “downloads a list of all available video clips to the user’s terminal 14.” *Id.*, 25:14-22; *see also id.*, 6:32-7:1 (“The request is transmitted to the user’s (“PIM”)

via a local storage and retrieval unit (local SRU).”) The user then “identifies and selects individual records or groups of records for further viewing and manipulation.” *Id.*, 25:25-27. The data is retrieved from the storage units via the DSI and downloaded to the user terminal for viewing. *Id.*, 25:27-26:7; *see also id.*, 7:18-20 (“The DSI collects the requested video clips from the appropriate extended and remote SRUs and transmits this information to the local SRUs.”); 7:21-22 (“The requested video clips . . . are then displayed at the user’s terminal.”).

## **VII. UNDERSTANDING OF RELEVANT LEGAL STANDARDS**

75. In formulating my opinions set forth in this Declaration, I applied the following legal principles.

### **A. Person of Ordinary Skill in the Art (“POSA”)**

76. I understand that patent law analyses are performed from the viewpoint of a POSA. I understand that a POSA is a hypothetical person who is presumed to be aware of all pertinent art, thinks along conventional wisdom in the art, and is a person of ordinary creativity. For purposes of this declaration, I have applied Petitioner’s articulation of a POSA. *See* Pet., 5; EX1003, ¶48 (“A POSITA at the time of the invention would have had at least a bachelor’s degree in computer science, electrical engineering, or a related field, and at least two years of work or research experience in the field of content delivery management or networks. Work experience can substitute for formal education and additional

formal education can substitute for work experience”). It is my opinion that the definition of a POSA would not materially affect the limited analysis required for deciding institution and presented in this declaration. If called to give further opinions in this proceeding, I reserve the right to reconsider the definition of a POSA and arrive at my own conclusion.

**B. Claim Construction**

77. I understand that in an IPR, patent claim terms are given their ordinary and customary meaning as understood by a POSA at the time of the invention, in view of the patent’s specification and its prosecution history—unless the patent explicitly defines the claim term. I also understand that when a patent explicitly defines a claim term in the specification, the patent’s definition controls.

78. I understand that a dependent claim contains all limitations of the claim from which it depends.

**C. Anticipation**

79. I have been informed and I understand that a patent claim is anticipated when a single piece of prior art describes every element of the claimed invention, either expressly or inherently, arranged in the same way as in the claim. I have been told to consider elements to be inherently described only if they are necessarily present in the piece of prior art.

**D. Obviousness**

80. I understand that an obviousness analysis involves comparing a claim to the prior art to determine whether the claimed subject matter would have been obvious to a POSA in view of the prior art and general knowledge in the prior art at the time of the patent's priority date (here, July 7, 2000).

81. I understand that obviousness must be assessed from the viewpoint of a POSA at the time of the invention. I further understand that to establish obviousness, a party must perform the following factual inquiries: (a) determining the scope and content of the prior art; (b) ascertaining the differences between the claimed invention and the prior art; and (c) resolving the level of skill in the art. I understand that, in determining the scope and content of the prior art and ascertaining the differences between the claimed invention, a patent challenger must specify where each element of the claim is found in the prior art.

82. I understand that one way of establishing obviousness is by establishing that a POSA would have had both (i) a reason to modify or combine the teachings of the prior art to achieve the claimed invention and (ii) a reasonable expectation of success in doing so. I understand that the reason to combine prior art references can come from a variety of sources, not just the prior art itself or the specific problem the patentee was trying to solve. And I understand that the references themselves need not provide a specific hint or suggestion of the

alteration needed to arrive at the claimed invention; the analysis may include recourse to logic, judgment, and common sense available to a POSA that does not need to be explicit in any reference.

83. I understand that a “reasonable expectation of success” is assessed in view of the prior art and general knowledge in the art from the viewpoint of a POSA at the time of the patent’s priority date, and it does not require an absolute certainty of success. Furthermore, I understand that determining whether the prior art would have suggested to a POSA to carry out the claimed invention with a reasonable expectation of success must be done after determining that the claimed elements are present in the prior art.

84. I also understand that before reaching a conclusion that the claimed invention would have been obvious one must consider any objective evidence of non-obviousness if it is available. The objective evidence of non-obviousness can include evidence of commercial success attributable to the claimed invention, evidence of industry praise for the claimed invention, evidence of a long-felt need that was solved by the claimed subject matter, evidence that others copied the claimed subject matter, or evidence that the claimed subject matter achieved an unexpected, superior result relative to the closest prior art. I understand that such evidence must have a nexus, or causal relationship, to the claimed subject matter

beyond what was available in the prior art and must be commensurate in scope with the patent claim(s) at issue.

### **VIII. DETAILED DISCUSSION OF OPINIONS**

85. Upon considering the materials listed above and discussed herein, based on my extensive experience and education in the relevant art, in view of my understanding of the governing legal principles and the arguments presented in the Petition, I have formed the following opinions.

86. As a preliminary matter, I note that the '903 Patent claims are directed to a CDN that serves multiple content providers. The claimed innovations allow a repeater server to receive a reflected request, identify authorized origin servers, and serve content from authorized content providers to clients.

87. Kenner does not disclose such a CDN. Instead, Kenner discloses delivering content to many simultaneous end users using distributed index managers. Pet., 8-12 *citing* EX1005, 4:32-5:5 (describing general advantages of parallel systems), 5:21-26 (describing capability of supporting thousands of simultaneous users), 28:3-6 (describing remote storage units), 33:4-11 (describing subscription service for users), 35:11-16 (describing user accessing videos from a subscription service), 40:24-28 (describing multiple index managers to server a large number of concurrent users), 41:13-19 (noting that a PIM can contact a

source index manager), 54:12-16 (describing a large number of geographically dispersed users).

88. In this regard, the “subscribers” in Kenner and the ’903 Patent are not the same. *See, e.g.,* Pet., 19. In the ’903 Patent, a “subscriber” is “an entity (e.g., a company) that publishes resources (e.g., files) via one or more origin servers.” ’903 Patent, 10:24-31 (“When the entity subscribes, it is permitted to utilize the repeater network.”). In Kenner, a “subscriber” is the end user. *See* EX1005, 52:7-12. The Petition erroneously conflates the two. *See* Pet., 19.

89. Similarly, the Petition falsely equates Kenner’s PIM to the claimed *at least one shared repeater server*. *See* Pet., 14-15. Kenner’s PIM is more akin to a web server with access to local and remote storage than a repeater server—e.g., Kenner does not describe a proxy, a cache, etc. *See* ’903 Patent, 4:37-40 (“[A] repeater can be considered as a dedicated proxy server that maintains a partial or sparse mirror of the origin server 102, by implementing a distributed coherent cache of the origin server.”).

90. As I discuss below, Kenner fails to teach or suggest: (1) a *first alias name* and a *second alias name* and/or (2) *the at least one shared repeater server is further constructed and adapted to analyze, using the table, an alias name received with a client request for a particular resource to determine a content provider associated with the particular resource*. For ease of reference, I refer below to the

language of claim 1, but each of the independent claims recites substantially similar features. *See* Section X.

**A. Kenner does not teach or suggest a *first alias name* and a *second alias name*.**

91. Each of the independent claims (1, 28, 37, 40, and 43) recites a *first alias name* and a *second alias name*—e.g., claim 1 recites:

1. A content delivery system operative in a computer network for delivering resources associated with a plurality of content providers to multiple client machines, the system comprising:

at least one shared repeater server constructed and adapted to replicate at least some of the resources associated with a first content provider of said plurality of content providers, and to replicate at least some of the resources associated with a second content provider of said plurality of content providers, wherein the second content provider is distinct from the first content provider;

at least one table listing a plurality of alias names corresponding to content providers authorized to have resources delivered to client machines via the at least one shared repeater server, wherein the plurality of content providers comprises the first content provider and the second content provider,

wherein at least a first resource associated with the first content provider is associated with **a first alias name** of the plurality of alias names, **said first alias name** being associated with said at least one shared repeater server;

wherein, requests for the first resource from said client machines are directed to the at least one shared repeater server, based at least in part on **said first alias name**;

wherein at least a second resource associated with the second content provider is associated with **a second alias name** of the plurality of alias names, **said second alias name** being associated with said at least one shared repeater server;

wherein requests for the second resource made from said client machines are directed to the at least one shared repeater server, based at least in part on **said second alias name**; and

wherein the at least one shared repeater server is further constructed and adapted to analyze, using the table, an alias name received with a client request for a particular resource to determine a content provider associated with the particular resource.

EX1001, 25:14-51 (emphasis added). I have included a claim comparison in Appendix A below that highlights the claimed *first alias name* and a *second alias name* across each of the independent claims.

**1. Kenner’s video ID is not an alias name.**

92. In the ’903 Patent, the *alias name* is an alternative address for a repeater server that contains the URL of a resource. ’903 Patent, 8:29-33, 9:53-55. For example, an *alias name* identifies both a repeater (“wr1”) and an origin server (“example.com”, “anotherExample.com”, or “example.edu”).

| Repeater Name | Example Alias Names                                                |
|---------------|--------------------------------------------------------------------|
| repeater1     | “wrl.example.com”<br>“wrl.anotherExample.com”<br>“wrl.example.edu” |

’903 Patent, 9:44-55.

93. The repeater server receives a reflected request that includes this alias name (e.g., the repeater can examine the host tag of the HTTP header). ’903 Patent, 10:4-7. Using the alias name, the repeater determines the origin server being addressed by referencing a table that “associates repeater alias names with origin server names.” *Id.*, 9:56-59. The table indicates whether the origin server is a valid subscriber and whether that subscriber may use that particular repeater. *See id.*, 17:51-57. In this fashion, the repeater can identify the origin server for the resource and assess whether a corresponding content provider can use that repeater. *Id.*, 9:56-59, 17:54-57.

94. Kenner does not teach or suggest an *alias name*. The Petition identifies Kenner’s video ID as allegedly teaching both the *first alias name* and the *second alias name*. *See* Pet., 20-21, 23. But Kenner’s video ID is not an alias—it is a “unique reference identifier for each video clip” that “corresponds to an identifying field within the text database.” EX1005, 22:1-2, 43:27-29 (“The software tool will also communicate with a master database of video ID numbers to ensure that each clip uploaded, no matter from where, will have a unique video ID.”). Kenner’s video ID is not used as an “alias” for anything, rather, it is the only

unique identifier of a video. For example, Kenner’s PIM, SRUs, and DSI each reference the same unique identifier of the video ID in a database. *See* EX1005, 21:1-6, 22:1-5, 22:30-23:9, 23:30-24:5.

| <b>’903 Patent <i>alias names</i></b>                                           | <b>Kenner’s Video ID</b>                                                                                                                                                                    |
|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b><i>Alternative identifiers for a single repeater server</i></b>              | <b><i>A unique identifier for a video.</i></b>                                                                                                                                              |
| Examples:<br>“wrl.example.com”<br>“wrl.anotherExample.com”<br>“wrl.example.edu” | Constructed from: “a text name of the file,” the “content provider’s account number,” “a category coordinate,” a “geographic coordinate”, a “time stamp,” and a “time period” of relevance. |

*Compare ’903 Patent, 9:44-55 with EX1005, 36:32-37:6.*

95. Thus, it is my opinion that Kenner does not teach or suggest the *first alias name* and *second alias name* required by the independent claims.

**2. Kenner’s video ID is not associated with *at least one repeater server*.**

96. In the claims, the *first alias name* and the *second alias name* are associated with a resource from a distinct *first content provider* and *second content provider*—e.g., claim 1 recites:

1. A content delivery system operative in a computer network for delivering resources associated with a plurality of content providers to multiple client machines, the system comprising:  
at least one shared repeater server constructed and adapted to replicate at least some of the resources associated with a first content provider of said plurality of content providers, and to replicate at least some of the resources associated with a second content provider of

said plurality of content providers, wherein the second content provider is distinct from the first content provider;

at least one table listing a plurality of alias names corresponding to content providers authorized to have resources delivered to client machines via the at least one shared repeater server, wherein the plurality of content providers comprises the first content provider and the second content provider,

wherein **at least a first resource associated with the first content provider is associated with a first alias name** of the plurality of alias names, **said first alias name** being associated with **said at least one shared repeater server**;

wherein, requests for the first resource from said client machines are directed to the at least one shared repeater server, based at least in part on said first alias name;

wherein **at least a second resource associated with the second content provider is associated with a second alias name** of the plurality of alias names, **said second alias name** being associated **with said at least one shared repeater server**;

wherein requests for the second resource made from said client machines are directed to the at least one shared repeater server, based at least in part on said second alias name; and

wherein the at least one shared repeater server is further constructed and adapted to analyze, using the table, an alias name received with a client request for a particular resource to determine a content provider associated with the particular resource.

EX1001, 25:14-51 (emphasis added). Claims 28, 37, and 43 refer to the *content provider* as an *origin server* but require a substantially similar association. I have included a claim comparison in Appendix A that highlights the claimed *association* between the alias name and the repeater server/content provider.

97. In claim 1, the *first alias name* and the *second alias name* are associated with both a *first/second resource* from a *first/second content provider* and *at least one shared repeater server*. Similarly, claim 28 requires *associating the at least one repeater server with a first/second alias name*. Claim 37 requires *associating a plurality of alias names with the at least one shared repeater server, each of said plurality of alias names being associated with an origin server*. Claims 40 and 43 are directed to a *server* (i.e., the repeater server) that is associated with both the *first alias name* and the *second alias name*.

98. In claims 1, 28, and 37, a request for a resource is directed to the repeater server *based at least in part on the first/second alias name*. The repeater server recited in claims 40 and 43 uses *a table listing content providers of said plurality of content providers having content that is authorized for delivery to client machines via the server*, and the repeater server uses *the table to analyze an alias name associated with the request to determine a content provider associated with the resource*. For ease of reference, I will refer below to these features using the language of claim 1.

99. The *first alias name* and the *second alias name* are associated with **distinct** content providers. But both the *first alias name* and the *second alias name* are associated with **the same** *at least one shared repeater server*. In other words, the same *at least one shared repeater server* is addressable using either/both the *first alias name* and the *second alias name*. See '903 Patent, 9:59-63; see also *id.*, claim 2 (“wherein the [at] least one shared repeater server is addressable using the first alias name and the second alias name.”). This is reflected in the above table because “repeater1” can be addressed using “wr1.example.com,” “wr1.anotherExample.com,” or “wr1.example.edu.” Each of the example alias names is also associated with a distinct content provider—i.e., “example.com,” “anotherExample.com,” and “example.edu.”

100. Kenner’s video ID is not associated with both a *resource* and *at least one shared repeater server*, as required by the claims, because Kenner’s video ID does not identify a repeater server or anything analogous to a repeater server. The Petition asserts that Kenner’s PIM is the *at least one shared repeater server*. See Pet., 15-16. But Kenner’s video ID does not identify a PIM or otherwise associate the video ID with a PIM.

101. Kenner’s video ID includes:

**a text name of the file** as defined by the content provider; the **content provider’s account number** as provided by the organization running the subscription service; a category coordinate, possibly a

representation of a hierarchical portion of a category tree, a geographic coordinate used to determine where the file is relevant (e.g. a region, state, or city); a time stamp, and a time period over which the file is relevant.

EX1005, 36:32-37:5 (emphasis added). But nothing in the video ID indicates the PIM (*at least one shared repeater server*).

102. The Petition asserts that Kenner's clip database provides the association between the *first/second alias name* and the *at least one shared repeater server*. Pet., 20-21. Kenner's clip database includes the video ID and the retrieval units that store the referenced file.

| Item Name     | Format   | Description                                                           |
|---------------|----------|-----------------------------------------------------------------------|
| Counter       | numeric  | Primary index for the records. Each record represents one video clip. |
| Video ID      | text     | The globally unique name of the video clip, as specified above.       |
| Extended SRUs | IP array | The IP addresses of all the extended SRUs 66 which contain the file.  |

EX1005, 34:7-11.

Petitioner asserts that by storing a table that includes video IDs on a PIM, Kenner teaches an association between a video ID and the PIM. But this interpretation is radically divorced from the claimed context.

103. Namely, the claims require that requests for a resource be directed to the repeater *based at least in part on said [first/second] alias name*. In Kenner, a

user terminal always accesses the same PIM (which the Petition asserts is the claimed *repeater server*). Nothing is *directed to* the PIM in any manner that is *based on* the video ID. Again, Kenner’s video ID identifies with particularity the video file. The video ID does not identify a PIM and the user terminal directs all requests to the same PIM. *See, e.g.,* EX1005, 37:7-38:16.

104. This is to be contrasted with the ’903 Patent, where the *alias name* specifies both the *resource* (or *origin server*) and the *at least one shared repeater server*. This allows a reflector to direct the request to a repeater in the content delivery network and allows the repeater to determine the content provider upon receiving the request. *See* ’903 Patent, 9:59-63.

105. The Petition also points to a “request [that] may be directed to the [PIM] from a neighboring IM.” Pet., 22 *citing* EX1005, 40:29-33. The Petition asserts that the “content coordinate data included in the video ID” can be used to “determine which IMs are likely to have the desired clip.” Pet., 22. But Kenner’s content coordinate data specifies “which categories of content are to be made available to the subscribers in its region.” EX1005, 44:27-30. In this fashion, a PIM can identify regional IMs that have subscribed to the category of the video ID. EX1005, 36:20-30 (“The content coordinates enable a match with the regional IMs that have subscribed to that type of file”). But this behavior does not teach the video ID (the purported *first/second alias name*) itself being associated with a

particular PIM (the purported *at least one repeater server*) as required by the claims. If anything it just teaches the alleged repeater server (a PIM) being associated with other repeater servers (other IMs).

106. To summarize, Kenner's video ID is not an alias name at all, let alone an alias name that is associated with a *resource/content provider* and *at least one shared repeater* and used to direct requests from a client machine to a repeater server.

**B. Kenner does not teach or suggest *the at least one shared repeater server is further constructed and adapted to analyze, using the table, an alias name received with a client request for a particular resource to determine a content provider associated with the particular resource.***

107. Each of the independent claims (1, 28, 37, 40, and 43) recites using a *table* to analyze *an alias name* received with a client request to determine an origin server (or content provider) associated with a requested resource—e.g., claim 1 recites:

1. A content delivery system operative in a computer network for delivering resources associated with a plurality of content providers to multiple client machines, the system comprising:

at least one shared repeater server constructed and adapted to replicate at least some of the resources associated with a first content provider of said plurality of content providers, and to replicate at least some of the resources associated with a second content provider of

said plurality of content providers, wherein the second content provider is distinct from the first content provider;

**at least one table listing a plurality of alias names corresponding to content providers authorized to have resources delivered to client machines via the at least one shared repeater server**, wherein the plurality of content providers comprises the first content provider and the second content provider,

wherein at least a first resource associated with the first content provider is associated with a first alias name of the plurality of alias names, said first alias name being associated with said at least one shared repeater server;

wherein, requests for the first resource from said client machines are directed to the at least one shared repeater server, based at least in part on said first alias name;

wherein at least a second resource associated with the second content provider is associated with a second alias name of the plurality of alias names, said second alias name being associated with said at least one shared repeater server;

wherein requests for the second resource made from said client machines are directed to the at least one shared repeater server, based at least in part on said second alias name; and

wherein **the at least one shared repeater server is further constructed and adapted to analyze, using the table, an alias name received with a client request for a particular resource to determine a content provider associated with the particular resource.**

EX1001, 25:14-51 (emphasis added). I have included a claim comparison in Appendix A below that highlights the *table* and the use of the *table* across the independent claims.

108. I note that the recitation of the *table* differs slightly across the independent claims. Claim 1 recites *at least one table listing a plurality of alias names*. Claim 28 recites *a table listing origin servers having content located thereon*. Claim 37 recites *at least one table associating alias names with origin servers having content located thereon*. Claim 40 recites *a table listing content providers of said plurality of content providers having content that is authorized for delivery to client machines via the server*. Claim 43 recites *a table listing a plurality of origin servers having content that is authorized for delivery to client machines via the server*.

109. Moreover, I note that the recitation of how *the table* is used differs slightly between the independent claims. Claim 1 recites *wherein the at least one shared repeater server is further constructed and adapted to analyze, using the table, an alias name received with a client request for a particular resource to determine a content provider associated with the particular resource*. Claim 28 recites *wherein the at least one repeater server is further constructed and adapted to analyze, using the table, an alias name received with a client request for a particular resource to determine an origin server associated with the particular*

*resource. Claim 37 recites wherein the at least one repeater server uses the at least one table and an alias name received with a client request for a resource to determine an origin server associated with the requested resource. Claim 40 recites wherein, in response to a request for a resource, the server is operable to use at least the table to analyze an alias name associated with the request to determine a content provider associated with the resource. Claim 43 recites wherein, in response to a request for a resource, the server uses at least the table to analyze an alias name associated with the request to determine an origin server associated with the particular resource.*

110. However, despite these syntactic differences, in each independent claim, the claimed *table* allows the repeater to determine a content source and verify that the content source relates to a valid subscriber using an *alias name* received in a request. '903 Patent, 9:56-59, 10:24-31, 17:51-57. In this regard, all of the independent claims require a substantially similar feature to claim 1's *the at least one shared repeater server is further constructed and adapted to analyze, using the table, an alias name received with a client request for a particular resource to determine a content provider associated with the particular resource.* Again, for ease of reference, I will refer to this feature below using the language of claim 1.

111. Kenner does not teach or suggest *analyze, using the table, an alias name* received with the request. The Petition points to a “clip database” maintained on Kenner’s PIM as teaching the claimed *table*. Pet., 18. Kenner’s clip database includes the video ID and other information about the videos stored in the extended SRUs. EX1005, 34:3-6.

| Item Name     | Format   | Description                                                           |
|---------------|----------|-----------------------------------------------------------------------|
| Counter       | numeric  | Primary index for the records. Each record represents one video clip. |
| Video ID      | text     | The globally unique name of the video clip, as specified above.       |
| Extended SRUs | IP array | The IP addresses of all the extended SRUs 66 which contain the file.  |

EX1005, 34:7-11.

112. As I discussed above, the video ID is not an *alias name* (it is a “globally unique name of the video clip”) and Kenner fails to teach the claimed *table listing a plurality of alias names* on that basis alone. See Section VIII.A.1.

113. The claims further require that the *table* list content from content providers that are *authorized to have resources delivered to client machines via the at least one shared repeater server*. Kenner does not teach or suggest any such authorization across different content providers. The Petition points to the fact that Kenner’s video ID includes a content provider’s account number. See Pet., 19 *citing* EX1005, 36:32-37:6. The mere inclusion of the provider’s account number

in the video ID does not indicate that a content provider *is authorized to have resources delivered to client machines via the at least one shared repeater server*.

Kenner does not disclose authorization of content providers—presumably all content providers are authorized to use the PIM in Kenner. The only permissions checked in Kenner are the access permissions of end users. *See id.*, 33:4-11.

114. Moreover, in the '903 Patent, the claims require that the authorization be particular to the repeater server—i.e., *via the at least one shared repeater server*. *See* '903 Patent, 10:29-31 (“The subscriber tables described below include the information that is used to link reflectors to subscribers.”) That is, a particular content provider has permission or lacks permission to use a particular repeater in the network. *Id.*, 17:56-57 (describing the subscriber table having a list of the repeaters that may be used by a subscriber’s servers). Kenner’s clip database does not include any information related to authorization, let alone authorization to have resources delivered via a specific PIM (the purported *repeater server*). *See* EX1005, 34:5-35:3.

115. The repeater uses *the table to analyze an alias name received with a client request*—another aspect that not disclosed, taught, or suggested by Kenner. This deficiency further highlights the Petition’s fundamental error in equating Kenner’s video ID to an *alias name*. Pet., 25 (identifying a PIM locating content at a source IM as teaching [1.g]). In Kenner, a PIM could identify the source IM with

the video ID because the video ID itself contains the provider's account number.

*See* EX1005, 36:32-37:5. Kenner's PIM need not analyze the video ID *using the table*. In Kenner, any additional analysis of the video ID to determine the provider with respect to the clip database would be redundant. In contrast, in the claimed invention, a repeater analyzes the *alias name* received in the header of a request with reference to the *table* to determine an origin server/content provider.

116. Thus, entirely absent from Kenner is any teaching of *analyzing* the purported *alias name* ("video ID") with respect to a *table* (the PIM's clip database). I note that Dr. Mowry provides no further insights to cover this gap in Kenner. *Compare* EX1003, ¶96 *with* Pet., 48-49 (nearly matching exactly).

## IX. CONCLUSION

117. In signing this declaration, I recognize that the declaration will be filed as evidence in an *inter partes* review before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross-examination in the case and that cross-examination will take place within the United States. If cross-examination is required, I will appear for cross-examination within the United States during the time allotted.

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

Executed on this 15th day of September 2025, in Amherst, MA.

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Dr. Prashant Shenoy

## X. APPENDIX A: COMPARISON OF INDEPENDENT CLAIMS

### Independent Claims Comparison

| <i>first/second alias name</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <i>alias -&gt; repeater association</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <i>direction based on alias name</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <i>table</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <i>use of table</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
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| Claim 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Claim 28                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Claim 37                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Claim 40                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Claim 43                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <p>1. A content delivery system operative in a computer network for delivering resources associated with a plurality of content providers to multiple client machines, the system comprising:</p> <p>at least one shared repeater server constructed and adapted to replicate at least some of the resources associated with a first content provider of said plurality of content providers, and to replicate at least some of the resources associated with a second content provider of said plurality of content providers, wherein the second content provider is distinct from the first content provider;</p> <p>at least one table listing a plurality of alias names corresponding to content providers authorized to have resources delivered to client machines via the at least one shared repeater server, wherein the plurality of content providers comprises the first content provider and the second content provider,</p> <p>wherein at least a first resource associated with the first content provider is associated</p> | <p>28. A method, in a content delivery system operative in a computer network for delivering content to client machines, the computer network comprising a plurality of origin servers, each of said origin servers having resources associated therewith, and the content delivery system comprising at least one shared repeater server operable to replicate resources associated with the plurality of origin servers, the method comprising:</p> <p>associating the at least one repeater server with a <i>first alias name</i>, wherein requests for a first resource located on a first origin server are directed, based at least in part on said <i>first alias name</i>, to the at least one repeater server for delivery of the first resource from said at least one repeater server;</p> <p>associating the at least one repeater server with a <i>second alias name</i>, wherein requests for a second resource located on a second origin server are directed, based at least in part on said <i>second alias name</i>, to the at least one repeater server for delivery of the second</p> | <p>37. A method, in a content delivery system operative in a computer network for delivering content to client machines and comprising at least one shared repeater server operable to replicate resources stored on a plurality of origin servers, the method comprising:</p> <p>associating a plurality of alias names with the at least one shared repeater server, each of said plurality of alias names being associated with an origin server, wherein a <i>first alias name</i> of said plurality of alias names is associated with a first origin server, and at least a <i>second alias name</i> of said plurality of alias names is associated with a second origin server distinct from said first origin server,</p> <p>providing at least one table associating alias names with origin servers having content located thereon, wherein said content is authorized for delivery to client machines via the at least one shared repeater server, wherein the origin servers comprise the first origin server and the second origin server;</p> | <p>40. A server operative in a computer network for delivering resources associated with a plurality of content providers to multiple client machines, wherein the plurality of content providers comprise at least a first content provider and a second content provider distinct from the first content provider, the server comprising:</p> <p>cache storage;</p> <p>a table listing content providers of said plurality of content providers having content that is authorized for delivery to client machines via the server,</p> <p>wherein the server is associated with a <i>first alias name</i> corresponding to said first content provider, and</p> <p>wherein the server is associated with a <i>second alias name</i> corresponding to said second content provider, said <i>second alias name</i> being distinct from the <i>first alias name</i>, and</p> <p>wherein the server is operable to replicate at least some of the resources associated with the first content provider, and at least some of the resources associated with the</p> | <p>43. A server operative in a computer network for delivering resources to multiple client machines, the server comprising:</p> <p>cache storage;</p> <p>a table listing a plurality of origin servers having content that is authorized for delivery to client machines via the server,</p> <p>wherein the server is associated with a <i>first alias name</i> corresponding to a first origin server of the plurality of origin servers, and</p> <p>wherein the server is associated with a <i>second alias name</i> corresponding to a second origin server of the plurality of origin servers, said second origin server being distinct from the first origin server and said <i>second alias name</i> being distinct from the <i>first alias name</i>, and</p> <p>wherein the server is operable to replicate at least some of the resources located on the first origin server, and at least some of the resources located on the second origin server, and</p> <p>wherein, in response to a request for a resource, the server uses at least the table to analyze an</p> |

| Claim 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Claim 28                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Claim 37                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Claim 40                                                                                                                                                                                                                                                         | Claim 43                                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| <p>with a <i>first alias name</i> of the plurality of alias names, <i>said first alias name</i> being associated with said at least one shared repeater server;</p> <p>wherein, requests for the first resource from said client machines are directed to the at least one shared repeater server, based at least in part on <i>said first alias name</i>;</p> <p>wherein at least a second resource associated with the second content provider is associated with a <i>second alias name</i> of the plurality of alias names, <i>said second alias name</i> being associated with said at least one shared repeater server;</p> <p>wherein requests for the second resource made from said client machines are directed to the at least one shared repeater server, based at least in part on <i>said second alias name</i>; and</p> <p>wherein the at least one shared repeater server is further constructed and adapted to analyze, using the table, an alias name received with a client request for a particular resource to determine a content provider associated with the particular resource.</p> | <p>resource from said at least one repeater server, wherein the second origin server is distinct from the first origin server;</p> <p>providing a table listing origin servers having content located thereon, wherein said content is authorized for delivery to client machines via the at least one shared repeater server, and wherein the origin servers comprise the first origin server and the second origin server; and</p> <p>wherein the at least one repeater server is further constructed and adapted to analyze, using the table, an alias name received with a client request for a particular resource to determine an origin server associated with the particular resource.</p> | <p>wherein requests for a first resource originating on the first origin server are directed, based at least in part on <i>said first alias name</i>, to the at least one shared repeater server for delivery of the first resource from said at least one repeater server; and</p> <p>wherein requests for a second resource originating on the second origin server are directed, based at least in part on <i>said second alias name</i>, to the at least one shared repeater server for delivery of the second resource from said at least one repeater server; and</p> <p>wherein the at least one repeater server uses the at least one table and an alias name received with a client request for a resource to determine an origin server associated with the requested resource.</p> | <p>second content provider, and</p> <p>wherein, in response to a request for a resource, the server is operable to use at least the table to analyze an alias name associated with the request to determine a content provider associated with the resource.</p> | <p>alias name associated with the request to determine an origin server associated with the particular resource.</p> |