

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF TEXAS
MARSHALL DIVISION**

PERSONALIZED MEDIA
COMMUNICATIONS, LLC,

Plaintiff,

v.

AKAMAI TECHNOLOGIES, INC.,

Defendant.

Civil Action No. _____

JURY TRIAL DEMANDED

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Personalized Media Communications, LLC (“PMC”), as and for its Complaint against Defendant Akamai Technologies, Inc. (“Akamai”), alleges as follows:

THE PARTIES

1. PMC is a limited liability company organized and existing under the laws of the State of Texas, having its principal place of business at 14090 Southwest Freeway, Suite 450, Sugar Land, Texas 77478.

2. On information and belief, Akamai is a Delaware corporation with its principal office at 150 Broadway, Cambridge, MA 02142. Akamai offers its products and/or services, including those accused herein of infringement, to customers and potential customers located in Texas and in the judicial Eastern District of Texas.

JURISDICTION AND VENUE

3. PMC brings this action for patent infringement under the patent laws of the United States, 35 U.S.C. § 271 *et seq.* This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

4. This Court has personal jurisdiction over Akamai in this action because Akamai has committed acts within the Eastern District of Texas giving rise to this action and has established minimum contacts with this forum such that the exercise of jurisdiction over Akamai would not offend traditional notions of fair play and substantial justice. Akamai has committed and continues to commit acts of infringement in this District by, among other things, offering to sell and selling products and/or services that infringe the asserted patents.

5. Akamai is a multinational technology company that collects, stores, organizes, and distributes data. Akamai has a substantial presence in the District through the products and services Akamai provides residents of this District, including delivering digital content such as video.

6. Akamai's content delivery network ("CDN") is one example of its physical presence in this District. Using its CDN—a "large, geographically distributed network of specialized servers that accelerate the delivery of web content and rich media to internet-connected devices"¹—Akamai provides web-based services, such as video streaming, to users throughout the world, including in this District.

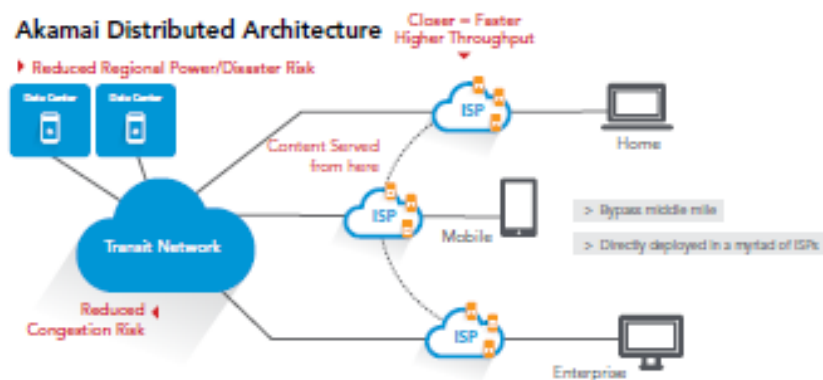
7. Akamai employs a distributed architecture to effectively deliver content to viewers through its "Adaptive Media Delivery" product, while trying to avoid "latency, congestion, and packet loss, which can significantly limit online video quality."² Proximity to users aids Akamai to "effectively bypass [those] common interruptions."³ To that end, Akamai

¹ See <https://www.akamai.com/us/en/resources/content-distribution-network.jsp>

² See <https://www.akamai.com/us/en/multimedia/documents/product-brief/adaptive-media-delivery-product-brief.pdf> at 1.

³ See <https://www.akamai.com/us/en/resources/visualizing-akamai/media-delivery-map.jsp>

“caches content close to end users,”⁴ using servers hosted by local internet service providers (“ISPs”) to deliver content to local users. Akamai claims its “distributed architecture and ISP partnerships place the servers — and [its customers’] content — closer to the viewer, for better reliability, availability, and performance.”



Source: <https://www.akamai.com/us/en/multimedia/documents/product-brief/adaptive-media-delivery-product-brief.pdf> at 2.

8. To achieve its ends, Akamai has “more than 233,000 servers in more than 130 countries and within 1600 networks around the world.”⁵

9. Through its Akamai Accelerated Network Partner (“AANP”) program, Akamai partners with ISPs, who “agree to collocate Akamai servers within their own networks,” in order to place those servers “as close to the end users as possible.”⁶

⁴ See <https://www.akamai.com/us/en/multimedia/documents/product-brief/adaptive-media-delivery-product-brief.pdf> at 2.

⁵ See *id.* at 1.

⁶ <https://www.akamai.com/us/en/multimedia/documents/akamai/akamai-accelerated-network-partner-aanp-faq.pdf>

10. On information and belief, in order to effectively serve content to residents of this District, Akamai partners with ISPs that offer Internet services to residents of this District, and installs servers with those ISPs in this District, including but not limited to CompuCom in Plano, Texas, which is in this District.⁷

11. For one non-limiting example, web traffic analysis indicates that, when streaming certain Akamai video content from the District, Akamai hosts that video content on a server named “ae2.cyrusone-dfw2.netarch.akamai.com.” The IP address associated with that server is 23.203.147.193, which is registered to Akamai. The server name, which includes the terms “cyrusone,” “dfw,” and “akamai,” indicates that it is hosted by CyrusOne, in the Dallas-Fort Worth, Texas area, and belongs to Akamai. CyrusOne is a company that provides data center facilities with locations around the world, including in this District. CyrusOne’s facilities in the Dallas-Fort Worth, Texas area are in Allen, Carrollton, and Lewisville, all within this District.⁸

12. On information and belief, when an ISP agrees to host an Akamai server, Akamai retains ownership and exclusive control of the server, which it provides to the ISPs “at no cost[.]”⁹ The servers continue to be “managed by Akamai.”¹⁰ On information and belief, through its contracts with ISPs, Akamai retains exclusive control of its ISP-hosted servers, including but not limited to by requiring ISPs to meet Akamai’s network requirements; shipping, configuring,

⁷ See <https://www.cloudtango.org/akamai/us/>

⁸ See <https://cyrusone.com/locations/>

⁹ See <https://www.akamai.com/us/en/multimedia/documents/akamai/akamai-accelerated-network-partner-aanp-faq.pdf>

¹⁰ See *id.*

monitoring, and updating the Akamai servers; and limiting the activities partner ISPs may take that have the potential to impact the hosted Akamai servers.

13. Akamai's servers located in this District deliver cached content to residents in this District. Those physical servers are Akamai's regular and established places of business.

14. Because Akamai uses its local servers to provide video content to residents of this District, Akamai's infringement of PMC's patents—which, as described below, relate to adaptive video streaming—is substantially related to its regular and established place of business in this District. Many of the claims discussed herein relate to Akamai's server architecture generally and its localized, hosted servers specifically.

THE CLAIMED TECHNOLOGY

15. The technology claimed in this case relates to adaptive video streaming, which enables content providers like Akamai to serve each user the highest possible quality video over the Internet. Adaptive streaming permits Internet video content providers to serve users with content tailored to each specific user's device and Internet connection. Without adaptive streaming, streaming Internet video content can suffer from poor quality and delivery delays.

16. PMC's discoveries are embodied in U.S. Patent Nos. 7,769,344 (the "'344 Patent"), 7,865,920 (the "'920 Patent"), 8,601,528 (the "'528 Patent"), 8,739,241 (the "'241 Patent"), and 9,674,560 (the "'560 Patent") (collectively, the "Patents-in-Suit").

17. On August 3, 2010, the United States Patent and Trademark Office duly and lawfully issued the '344 Patent, entitled "Signal Processing Apparatus and Methods," based upon an application filed by inventors John Christopher Harvey and James William Cuddihy. The '344 patent is directed to remotely and dynamically reprogramming receiver station software to facilitate receiving video programming. This invention was made in 1981 and represented a

significant advance over what was conventional then. Conventional systems of 1981—typically a television and cable box—did not have the capacity for remote reprogramming. In contrast, the ‘344 invention generates and sends a request for a set of instructions via a network connection of a processor operating under the control of another set of instructions. In response to the request, the set of instructions are transmitted to the receiver station where they are received and executed to enable the receiver station to receive video media. Advantages of the ‘344 invention over prior technologies include, but are not limited to: fully automated updates to receiver station software; extension of receiver station operating life; standardization of receiver station software within a network; and the remote addition of new features and capabilities to a receiver station. A true and correct copy of the ’344 Patent is attached hereto as Exhibit A.

18. On January 4, 2011, the United States Patent and Trademark Office duly and lawfully issued the ’920 Patent, entitled “Signal Processing Apparatus and Methods,” based upon an application filed by inventors John Christopher Harvey and James William Cuddihy. The ‘920 patent is directed to remotely controlling systems within a media distribution network. The invention was made in 1987 and represented a significant advancement over conventional media distribution available at the time. Network control is facilitated through the incorporation of selective communication devices (e.g. switches) within the transmission station hardware, with the switches in turn being controlled by network signals in combination with transmission station data stored in memory at the transmitter. Advantages of the ‘920 invention over prior technologies include, but are not limited to: network control of audio/video programming storage at an intermediate transmission station and network control of audio/video programming transmission by the intermediate transmission station. A true and correct copy of the ’920 Patent is attached hereto as Exhibit B.

19. On December 3, 2013, the United States Patent and Trademark Office duly and lawfully issued the '528 Patent, entitled "Signal Processing Apparatus and Methods," based upon an application filed by inventors John Christopher Harvey and James William Cuddihy. The '528 Patent is directed to controlling a receiver station to skip over video frames if the receiver station detects that they are incomplete. The invention uses data associated with a television signal to determine if a video image within the signal is complete. The data is either contained within, or received with the television signal, and is processed at the receiver station to make the determination. If the image is incomplete, the receiver station will prevent the image from being displayed and will automatically advance to subsequent information received with the television signal. The invention was made in 1987 and represented a significant advancement over conventional technology systems of that time, which, as a non-limiting example, had no capability to skip the display of incomplete video images. A true and correct copy of the '528 Patent is attached hereto as Exhibit C.

20. On May 27, 2014, the United States Patent and Trademark Office duly and lawfully issued the '241 Patent, entitled "Signal Processing Apparatus and Methods," based upon an application filed by inventors John Christopher Harvey and James William Cuddihy. The '241 patent is directed to remotely controlling systems within a media distribution network. Network control is facilitated through the inclusion of signals transmitted with the television programming. At least one of the signals is used to control subsequent transmission based on programming identification information previously stored at the intermediate transmitter station; and at least one of the signals is transmitted to the receiver station where it is processed to facilitate the output of the television programming. The invention was made in 1981 and represented a significant advancement over conventional technology systems of that time.

Advantages of the '241 invention over prior conventional technology systems include, but are not limited to: network control of television programming storage and transmission at an intermediate transmitter station and network control of the receiver station to output the television program. A true and correct copy of the '241 Patent is attached hereto as Exhibit D.

21. On June 6, 2017, the United States Patent and Trademark Office duly and lawfully issued the '560 Patent, entitled "Signal Processing Apparatus and Methods," based upon an application filed by inventors John Christopher Harvey and James William Cuddihy. The '560 patent is directed to remotely controlling systems within a media distribution network. Network control of storage is realized by including control signals in the transmission of media to an intermediate transmission station. The control signals will facilitate the selection of received media for storage at the intermediate transmission station based on operating records stored there, cause the intermediate transmission station to select a storage location for the media, and cause the operating records to be updated to reflect reception and storage of the received media. The invention was made in 1987 and represented significant advancement over prior conventional technology systems in media storage and tracking, for non-limiting examples. A true and correct copy of the '560 Patent is attached hereto as Exhibit E.

22. The Patents-in-Suit generally relate to methods and systems for digital signal processing, which enable adaptive streaming.

23. PMC owns all right, title, and interest in and to the Patents-in-Suit and possesses all rights of recovery.

FACTUAL ALLEGATIONS

The Company

24. PMC is a family-run company that was founded by inventor and PMC Chairman John Harvey. PMC's Chairman, along with his co-inventor James Cuddihy, made numerous inventions in the early 1980s (collectively referred to hereinafter as "the Harvey Inventions") which have been the basis for nearly 100 patents.

25. PMC operates from Sugar Land, Texas. Its intellectual property commercialization and licensing activities have directly created jobs for engineers, technical specialists, management personnel, and counsel.

26. PMC's inventors created a visionary portfolio of intellectual property that covers a whole system of related technologies. Taken together, the system they invented in the early 1980's created possibilities unknown to those familiar with what was routine and conventional at the time. For example, content providers could use the control and information signals in these inventions to provide subscribers with personalized content. Content providers could use other PMC inventions to protect their content from piracy, and they could do so in consistent and cost-effective ways which were fully automated. PMC's patents also disclose and claim apparatuses and processes that improved on contemporary technology by adding capabilities to transmitter and receiver stations using remotely supplied software updates.

27. PMC first attempted to commercialize the Harvey Inventions' technology internally. From 1989 to 1992, in the pre-Internet era, the company developed and publicly disclosed a television system prototype that demonstrated many of its patented personalization and access control concepts.

28. The company also sought partnerships with more-established companies to jointly develop, market, and manufacture commercial embodiments of PMC's technology. PMC and its predecessor, Personalized Mass Media Corporation, made multiple attempts in the 1990's to market the Harvey Inventions by contacting a number of large technology companies. PMC entered into agreements with industry leaders, including General Electric, to explore the technology's possibilities. PMC also contracted with Sarnoff Labs to develop software implementing features of the Harvey Inventions to demonstrate the technology's potential.

29. Most of these established firms eventually decided not to pursue the Harvey Inventions at that time. A few forward-focused firms, however, including Starsight and Gemstar (now subsidiaries of TiVo), did recognize the technological significance of the Harvey inventions and became some of PMC's first licensees.

30. Substantial improvements to computer networks have enabled many firms to adopt and take advantage of the foundational contributions made by the Harvey Inventions. The Harvey Inventions have now received significant industry recognition and have been licensed by some of the world's most sophisticated and respected content and network companies. PMC has licensed its patented technology to Sony, Motorola, Sharp, Panasonic, DirecTV, DISH Network, EchoStar, FOX, The Weather Channel, Gemstar-TV Guide (now a subsidiary of TiVo), Cisco, Arris, Samsung, Vizio, Funai, Tongfang, Haier, and TCL, among others. PMC's patented technology makes content more relevant, more secure, and more reliable—all enhancements that directly contribute to licensees' profits.

31. PMC has never enforced third-party patents. PMC exclusively enforces the fruits of PMC's inventors, John Harvey and James Cuddihy.

32. This Court is familiar with PMC, and at least the '217 Patent, in addition to the patents from which the other Patents-in-Suit claim priority, having previously presided over numerous related cases, including *Personalized Media Communications, LLC v. TCL Corp. et al*, Case No. 2-17-cv-00433-JRG; *Personalized Media Communications, LLC v. Hisense Co. Ltd. et al*, Case No. 2-17-cv-00437-JRG-RSP; *Personalized Media Communications, LLC v. Haier America Company, LLC et al*, Case No. 2-17-cv-00438-JRG; *Personalized Media Communications, LLC v. Tsinghua Tongfang Co., Ltd. et al*, Case No. 2-17-cv-00439-JRG; *Personalized Media Communications, LLC v. Funai Electric Co., Ltd.*, Case No. 2-16-cv-00105-JRG-RSP; *Personalized Media Communications, LLC v. Samsung Electronics America, Inc. et al*, Case No. 2-15-cv-01754-JRG-RSP; *Personalized Media Communications LLC v. Apple Inc.*, Case No. 2-15-cv-01366-JRG-RSP; *Personalized Media Communications, LLC v. TPV Int'l (USA), Inc. et al*, Case No. 2-15-cv-01206-JRG-RSP; *Personalized Media Communications, L.L.C. v. Zynga, Inc.*, Case No. 2-12-cv-00068-JRG-RSP; and *Personalized Media Communications, L.L.C. v. Motorola, Inc., et. al.*, Case No. 2-08-cv-00070-RSP.

Defendant and the Accused Products

33. As referred to in this Complaint, and consistent with 35 U.S.C. § 100(c), the “United States” means “the United States of America, its territories and possessions.”

34. Upon information and belief, including based on products identified on Akamai websites, Akamai makes, uses, offers to sell, and/or sells in the United States, and/or imports into the United States, products made in accordance with the Patents-in-Suit, including, but not limited to Akamai’s Content Delivery Network, Adaptive Media Delivery, Akamai Intelligent Platform, Intelligent Edge Platform, Managed CDN, Licensed CDN, Video On Demand, and

Adaptive Media Player product and service offerings (collectively, “Accused Akamai Products and Services”).

35. Upon information and belief, Akamai actively and knowingly directs, causes, induces, and encourages others, including, but not limited to, its designers, manufacturers, suppliers, distributors, resellers, audio and video integrators and consultants, software developers, customers, and/or end users, to make, use, sell, and/or offer to sell in the United States, and/or import into the United States, products made in accordance with the Patents-in-Suit, including, but not limited to, the Accused Akamai Products and Services, by, among other things, providing instructions, manuals, and technical assistance relating to the installation, set up, use, operation, and maintenance of said Accused Akamai Products and Services.

Notice of Infringement

36. Akamai has had notice of the Patents-in-Suit at least as of the time of the filing of the complaint.

COUNT I: INFRINGEMENT OF THE '344 PATENT

37. PMC incorporates the preceding paragraphs as if fully set forth herein.

38. Upon information and belief, Akamai has infringed at least claims 1 and 2 of the '344 Patent, pursuant to 35 U.S.C. § 271(a) by making, using, offering to sell, and/or selling in the United States, and/or importing into the Accused Akamai Products and Services. For example, claim 1 of the '344 Patent recites a “method for reprogramming a receiver station that receives television or radio programming, said receiver station having a data network connection to an external data network, a processor, an input device, and a data storage device.” Akamai reprograms devices running Akamai video player software—such as personal computers, mobile devices, and televisions, which have CPUs, touch screens, data storage, and are connected to the

Internet—by supplying programming. Claim 1 recites: “storing first operating instructions at said receiver station, executing said first operating instructions at said processor to perform a first function, said first operating instructions being different from permanent operating instructions permanently stored at said receiver station;” “generating a query at said receiver station, said query comprising a request by said receiver station for reprogramming;” “promulgating said query from said receiver station under control of said processor executing said first operating instructions through said data network connection to said external data network;” “receiving second operating instructions different from both said permanent operating instructions and said first operating instructions in response to said step of promulgating said query, said second operating instructions for controlling operation of said processor, wherein said first and said second operating instructions do not include audio data, video data, image data and any combination thereof;” “reprogramming said processor with said received second operating instructions;” “performing a second function by executing said second operating instructions at said processor, said second function including controlling reception of signals required to output a video programming transmission;” “receiving said signals required to output said video programming transmission;” “processing said signals to enable the output of said video programming transmission; and” “outputting said video programming transmission for display to a viewer.” Akamai stores operating instructions, such as such as operating instructions received from an Akamai license server in response to first license request or a content license that provides instructions on how to decrypt encrypted video programming; executes the operating instructions—which are different from permanent operating instructions permanently stored at the devices running Akamai’s video player software such as BIOS—to, for example, perform a first function such as preparing a subsequent license request or decrypting a first portion of a

television program at the receiver station; generates a query to be reprogrammed with a license for a portion of the television program, such as during playback; promulgates the query from the devices running Akamai's video player software executing the first operating instructions over the Internet to Akamai's servers; in response to promulgating the query, Akamai receives second license operating instructions that are different than the permanent operating instructions and the first operating instructions described above; the first and second operating instructions do not include audio data, video data, image data and any combination thereof; Akamai reprograms the processor, such as by updating the Content Decryption Module with the received second license operating instructions; performs a second function by executing said second operating instructions included in the license, said second function including controlling reception of signals required to output a video programming transmission, such as performing the decryption process on subsequent audio or video contents of a television program, or portions thereof; receives signals containing video programming (such as the packets, containers, and frames comprising video); decodes the video frames to enable the output of said video programming; and outputs video programming to a viewer on a computer, mobile device, or digital television. Upon information and belief, Akamai's infringement pursuant to 35 U.S.C. § 271(a) is ongoing.

39. Upon information and belief, since having notice of the '344 Patent, Akamai has induced infringement of at least claims 1 and 2 of the '344 Patent pursuant to 35 U.S.C. § 271(b), by actively and knowingly inducing, directing, causing, and encouraging others, including, but not limited to, their designers, manufacturers, suppliers, distributors, resellers, audio and video integrators and consultants, software developers, customers, and/or end users, to make, use, sell, and/or offer to sell in the United States, and/or import into the United States, Accused Akamai Products and Services made in accordance with the '344 Patent, by, among other things,

providing instructions, manuals, and technical assistance relating to the installation, set up, use, operation, and maintenance of said Accused Akamai Products and Services. For example, where acts constituting direct infringement of claim 1 of the '344 Patent are not performed by Akamai, such acts constituting direct infringement are performed by Akamai's designers, manufacturers, suppliers, distributors, resellers, audio and video integrators and consultants, software developers, customers, and/or end users, who act at the direction and/or control of Akamai, with Akamai's knowledge. Upon information and belief, Akamai's inducement of infringement pursuant to 35 U.S.C. § 271(b) is ongoing.

40. Upon information and belief, Akamai committed the foregoing infringing activities without license from PMC and with notice of the '344 Patent.

41. The acts of infringement by Akamai will continue unless enjoined by this Court.

42. PMC has been and will continue to be irreparably harmed and damaged by Akamai's infringement of the '344 Patent and has no adequate remedy at law.

COUNT II: INFRINGEMENT OF THE '920 PATENT

43. PMC incorporates the preceding paragraphs as if fully set forth herein.

44. Upon information and belief, Akamai has infringed at least claims 7-9, 12, and 17-19 of the '920 Patent, pursuant to 35 U.S.C. § 271(a) by making, using, offering to sell, and/or selling in the United States, and/or importing into the United States the Accused Akamai Products and Services. For example, claim 7 of the '920 Patent recites a "method of communicating programming to subscribers in a network, said network including one or more programming origination stations, a plurality of intermediate transmission stations, and a plurality of subscriber stations, each intermediate transmission station receiving audio or video programming from said origination stations, each intermediate transmission stations including

one or more selective communications devices and a plurality of storage locations.” Akamai communicates audio and video programming to subscribers using its CDN, including the Accused Akamai Products and Services, which includes one or more programming origination stations (such as data centers, “origin storage,” or Akamai NetStorage), a plurality of intermediate transmission stations (also referred to as edge nodes or edge node clusters, including caching devices, such as Akamai servers in its CDN, including those deployed at ISPs, which receive audio or video programming for television programs originating in an origin storage server, and include a motherboard which includes a switch to permit selective communication and a plurality of storage locations, such as locations in flash or hard-disk drive storage drives), and a plurality of subscriber stations (such as computers, mobile devices, and digital televisions running Akamai video player software). Claim 7 recites: “passing a plurality of units of audio or video programming to a transmitter at said one or more programming origination stations”; “passing to said transmitter at said one or more programming origination stations, data identifying said units of audio or video programming or subject matter included in said units of audio or video programming, said data effective to instruct”; “at least one of said plurality of intermediate transmission stations to indicate when to retransmit said plurality of units of audio or video programming to at least one of said plurality of subscriber stations, wherein data of one or more predetermined transmission station capacities is processed at said at least one of said plurality of intermediate transmission stations to identify one of said plurality of storage locations at which to store at least one said plurality of units of audio or video programming”; “wherein said identified storage locations are different for each of said plurality of units of audio or video programming, and”; “wherein said stored at least one of said plurality of units of programming is transferred from said identified one of said plurality of storage

locations to another of said plurality of storage locations based on said data identifying said units of audio or video programming or subject matter included in said units of audio or video programming and said data of one or more predetermined transmission station capacities; and”; “transmitting said plurality of units of audio or video programming and said data that identify said units of audio or video programming or a subject matter included in said units of audio or video programming to said plurality of intermediate transmission stations.” Akamai passes units of audio and video television programming to a network port or network interface card at its data center, “origin storage,” or NetStorage servers; passes container data and metadata, and data indicating start and end of frames, such as a segment index, that identifies the units of audio or video programming, or subject matter included in said units of audio or video programming, to the transmitter described above; the data described above is effective to instruct an intermediate transmitter station (such as an Akamai edge node) to indicate when to retransmit the units of audio/video programming to Akamai subscribers; the Akamai edge nodes process data relating to the type of caching/edge device in the Akamai hierarchy and its storage to identify one of said plurality of storage locations in the edge network at which to store a unit of audio or video programming; in the storage used by Akamai, the identified storage locations are different for video data and audio data; based on information identifying the audio/video programming units (such as files and/or segments) and data of the transmission station capacities, Akamai transfers a file and/or segment of audio/video programming from an identified location in nonvolatile storage to another storage location in the Akamai edge/caching network or nodes; and Akamai origination stations send units (such as the segments and/or files) of audio/video programming and said data described above to the edge nodes. Upon information and belief, Akamai’s infringement pursuant to 35 U.S.C. § 271(a) is ongoing.

45. Upon information and belief, since having notice of the '920 Patent, Akamai has induced infringement of at least claims 7-9, 12, and 17-19 of the '920 Patent pursuant to 35 U.S.C. § 271(b), by actively and knowingly inducing, directing, causing, and encouraging others, including, but not limited to, their designers, manufacturers, suppliers, distributors, resellers, audio and video integrators and consultants, software developers, customers, and/or end users, to make, use, sell, and/or offer to sell in the United States, and/or import into the United States, Accused Akamai Products and Services made in accordance with the '920 Patent, by, among other things, providing instructions, manuals, and technical assistance relating to the installation, set up, use, operation, and maintenance of said Accused Akamai Products and Services. For example, where acts constituting direct infringement of claim 7 of the '920 Patent are not performed by Akamai, such acts constituting direct infringement are performed by Akamai's designers, manufacturers, suppliers, distributors, resellers, audio and video integrators and consultants, software developers, customers, and/or end users, who act at the direction and/or control of Akamai, with Akamai's knowledge. Upon information and belief, Akamai's inducement of infringement pursuant to 35 U.S.C. § 271(b) is ongoing.

46. Upon information and belief, Akamai committed the foregoing infringing activities without license from PMC and with notice of the '920 Patent.

47. The acts of infringement by Akamai will continue unless enjoined by this Court.

48. PMC has been and will continue to be irreparably harmed and damaged by Akamai's infringement of the '920 Patent and has no adequate remedy at law.

COUNT III: INFRINGEMENT OF THE '528 PATENT

49. PMC incorporates the preceding paragraphs as if fully set forth herein.

50. Upon information and belief, Akamai has infringed at least claims 21-27, 32, and 37-39 of the '528 Patent, pursuant to 35 U.S.C. § 271(a) by making, using, offering to sell, and/or selling in the United States, and/or importing into the United States Accused Akamai Products and Services. For example, claim 21 of the '528 Patent recites a “method of controlling the display of television programming at a receiver station, wherein said receiver station includes a monitor for displaying said television programming, a receiver operatively connected to said monitor, and a processor operatively connected to at least one of said monitor and said receiver.” Akamai controls the display of television programming at receiver stations (such as computers, mobile devices, and digital televisions running video player software), wherein said receiver station includes a monitor for displaying said television programming, a receiver (such as a wired or wireless network interface) operatively connected to said monitor, and a processor (such as a CPU) operatively connected to at least one of said monitor and said receiver. Claim 21 comprises: “receiving an information transmission including a television signal;” “passing at least a portion of said information transmission to said processor;” “determining the absence of complete generated television image data by processing information at least one of included in and received with said television signal;” “determining a location of subsequent information for advancing to based on said step of determining the absence of complete generated television image data;” “advancing to the subsequent information received in said information transmission; and” “preventing said monitor from displaying an incomplete television image based on said step of determining the absence of complete generate television image data, wherein said method controls the display of said television programming at said receiver

station.” Akamai receives, at a receiver station, packets (i.e., an information transmission) that carry a television signal, such as a video title requested by the user; Akamai’s Adaptive Media Player software passes segments of video to said processor; Akamai determines (via software running on the receiver station) the absence of complete generated television image data (for example, missing frames) by processing information included in and received with said television signal; based on the step of determining the absence of complete generated television image, Akamai determines a location of subsequent information (such as the next random access point in the stream) from which it can continue the video presentation; advances to the subsequent information received in said information transmission; and prevents said monitor from displaying an incomplete television image based on the step of determining the absence of complete generated television image data. With the above method, Akamai controls the display of the television programming at the receiver station. Upon information and belief, Akamai’s infringement pursuant to 35 U.S.C. § 271(a) is ongoing.

51. Upon information and belief, since having notice of the ’528 Patent, Akamai has induced infringement of at least claims 21-27, 32, and 37-39 of the ’528 Patent pursuant to 35 U.S.C. § 271(b), by actively and knowingly inducing, directing, causing, and encouraging others, including, but not limited to, their designers, manufacturers, suppliers, distributors, resellers, audio and video integrators and consultants, software developers, customers, and/or end users, to make, use, sell, and/or offer to sell in the United States, and/or import into the United States, Accused Akamai Products and Services made in accordance with the ’528 Patent, by, among other things, providing instructions, manuals, and technical assistance relating to the installation, set up, use, operation, and maintenance of said Accused Akamai Products and Services. For example, where acts constituting direct infringement of claim 21 of the ’528 Patent are not

performed by Akamai, such acts constituting direct infringement are performed by Akamai's designers, manufacturers, suppliers, distributors, resellers, audio and video integrators and consultants, software developers, customers, and/or end users, who act at the direction and/or control of Akamai, with Akamai's knowledge. Upon information and belief, Akamai's inducement of infringement pursuant to 35 U.S.C. § 271(b) is ongoing.

52. Upon information and belief, Akamai committed the foregoing infringing activities without license from PMC and with notice of the '528 Patent.

53. The acts of infringement by Akamai will continue unless enjoined by this Court.

54. PMC has been and will continue to be irreparably harmed and damaged by Akamai's infringement of the '528 Patent and has no adequate remedy at law.

COUNT IV: INFRINGEMENT OF THE '241 PATENT

55. PMC incorporates the preceding paragraphs as if fully set forth herein.

56. Upon information and belief, Akamai has infringed at least claims 16-17, 22-23, 30, 33-34, 36-37, and 39 of the '241 Patent, pursuant to 35 U.S.C. § 271(a) by making, using, offering to sell, and/or selling in the United States, and/or importing into the United States Accused Akamai Products and Services. For example, claim 16 of the '241 Patent recites a "method of controlling an intermediate transmitter station to communicate television programming to a receiver station." Akamai controls Akamai servers in its CDN, including those deployed at ISPs (intermediate transmitter stations) to communicate television programming to a device (a receiver station) with media players configured to work with Akamai's CDN. Claim 16 recites: "receiving said television programming at an origination station;" "transmitting said television programming and a plurality of control signals from said origination station to said intermediate transmitter station, said control signals for controlling the operation and

identification of signals by controlling how and where to search for signals at the intermediate transmitter station and automatically controlling the operation of said intermediate transmitter station;” “receiving at said intermediate transmitter station said television programming and said plurality of control signals;” “transmitting said television programming and at least a first portion of said plurality of control signals from said intermediate transmitter station to said receiver station based upon at least a second portion of said plurality of control signals received at said intermediate transmitter station;” “receiving, at said receiver station, said at least a first portion of said plurality of control signals from said intermediate transmitter station;” and “receiving and displaying at a television display device at said receiver station said transmitted television programming based upon said at least a first portion of said plurality of control signals.” Akamai receives television programming at an origination station (such as a data center, “origin storage,” or Akamai NetStorage); transmits audio and video portions of the television programming, as well as a plurality of control signals (such as TCP/IP port identifiers, title identifiers, and container data and metadata), from the origination servers to the intermediate transmission stations; such control signals control the operation and identification of signals at the intermediate transmission stations, which use the control signals to automatically find audio and video chunks, segments, fragments, and/or frames within numerous packets received by the intermediate transmission stations; Akamai receives the television programming and control signals at the intermediate transmission stations; transmits the television programming and at least a first portion of the control signals (such as container data and metadata embedded into or encapsulating the audio/video portions of the television programming used to decode video frames and audio portions) from the intermediate transmission stations to receiver stations running video player software; this transmission is based upon at least a second portion of the

control signals received at the intermediate transmission stations (such as title identifiers and container data and metadata encapsulating the audio/video portions of the television programming and identifying the titles, types of audio/video encoding, resolutions, and chunk offset information present) which is used to locate individual audio/video portions of television programming and send it to the video players; the video player software receives at least the first portion of control signals from the intermediate transmission stations; and based on at least the first portion of control signals, the video player software controls the processing and display of the transmitted television programming. Upon information and belief, Akamai's infringement pursuant to 35 U.S.C. § 271(a) is ongoing.

57. Upon information and belief, since having notice of the '241 Patent, Akamai has induced infringement of at least claims 16-17, 22-23, 30, 33-34, 36-37, and 39 of the '241 Patent pursuant to 35 U.S.C. § 271(b), by actively and knowingly inducing, directing, causing, and encouraging others, including, but not limited to, their designers, manufacturers, suppliers, distributors, resellers, audio and video integrators and consultants, software developers, customers, and/or end users, to make, use, sell, and/or offer to sell in the United States, and/or import into the United States, Accused Akamai Products and Services made in accordance with the '241 Patent, by, among other things, providing instructions, manuals, and technical assistance relating to the installation, set up, use, operation, and maintenance of said Accused Akamai Products and Services. For example, where acts constituting direct infringement of claim 16 of the '241 Patent are not performed by Akamai, such acts constituting direct infringement are performed by Akamai's designers, manufacturers, suppliers, distributors, resellers, audio and video integrators and consultants, software developers, customers, and/or end users, who act at

the direction and/or control of Akamai, with Akamai's knowledge. Upon information and belief, Akamai's inducement of infringement pursuant to 35 U.S.C. § 271(b) is ongoing.

58. Upon information and belief, Akamai committed the foregoing infringing activities without license from PMC and with notice of the '241 Patent.

59. The acts of infringement by Akamai will continue unless enjoined by this Court.

60. PMC has been and will continue to be irreparably harmed and damaged by Akamai's infringement of the '241 Patent and has no adequate remedy at law.

COUNT V: INFRINGEMENT OF THE '560 PATENT

61. PMC incorporates the preceding paragraphs as if fully set forth herein.

62. Upon information and belief, Akamai has infringed at least claims 4-10 of the '560 Patent, pursuant to 35 U.S.C. § 271(a) by making, using, offering to sell, and/or selling in the United States, and/or importing into the United States Accused Akamai Products and Services. For example, claim 5 of the '560 Patent recites a "method of communicating units of programming to a subscriber in a network, said network including at least one programming origination station, an intermediate transmission station, and at least one subscriber station, said intermediate transmission station transmitting said units of programming to said at least one subscriber station." Akamai communicates units of programming to its network of subscribers via its CDN infrastructure, including its origination servers (such as a data center, "origin storage," or Akamai NetStorage) and edge node servers, such as cache nodes. The edge nodes transmit the units of programming, such as television programs, to the subscriber stations. Claim 5 recites: "receiving an information transmission containing a control signal from said origination station at said intermediate transmission station;" "detecting said control signal at said intermediate transmission station and passing said control signal to a computer;"

“controlling said intermediate transmission station based on said control signal to: select a portion of said units of programming based on operating records stored at said intermediate transmission station;” “receive said units of programming at said intermediate transmission station;” “communicate said selected a portion of said-units of programming to a storage location;” “store said selected a portion of said units of programming at said storage location;” “alter said operating records stored at said intermediate transmission station to indicate at least one of reception and storage of said selected a portion of units of programming; and” “subsequently transmitting said selected a portion of said-units of programming to said at least one subscriber station.” For example, an Akamai edge node receives a transmission with a control signal, such as container data and metadata encapsulating the audio/video portions of the television programming and identifying the titles, types of audio/video encoding, resolutions, and chunk offset information, from an Akamai data center, “origin storage,” or Akamai NetStorage. Akamai edge nodes detect said control signal and pass it to a computer, such as the motherboard and processor of the edge node. Akamai controls the edge node based on the control signal, so that the edge node selects a portion of the units of programming, such as a portion of a television program, based on the operating records stored at the edge nodes of what portions of the television program are already stored at the edge node, receives television programming not already stored at the edge node, communicates the received television programming to a storage location on an edge node, such as a location on a solid state drive or a hard-disk drive, stores the received television programming at the location on a solid state drive or hard-disk drive, and alters the operating record to indicate the received portions of the television program. Subsequently, the edge node transmits the received television programming to a subscriber

station running video player software. Upon information and belief, Akamai's infringement pursuant to 35 U.S.C. § 271(a) is ongoing.

63. Upon information and belief, since having notice of the '560 Patent, Akamai has induced infringement of at least claims 4-10 of the '560 Patent pursuant to 35 U.S.C. § 271(b), by actively and knowingly inducing, directing, causing, and encouraging others, including, but not limited to, their designers, manufacturers, suppliers, distributors, resellers, audio and video integrators and consultants, software developers, customers, and/or end users, to make, use, sell, and/or offer to sell in the United States, and/or import into the United States, Accused Akamai Products and Services made in accordance with the '560 Patent, by, among other things, providing instructions, manuals, and technical assistance relating to the installation, set up, use, operation, and maintenance of said Accused Akamai Products and Services. For example, where acts constituting direct infringement of claim 4 of the '560 Patent are not performed by Akamai, such acts constituting direct infringement are performed by Akamai's designers, manufacturers, suppliers, distributors, resellers, audio and video integrators and consultants, software developers, customers, and/or end users, who act at the direction and/or control of Akamai, with Akamai's knowledge. Upon information and belief, Akamai's inducement of infringement pursuant to 35 U.S.C. § 271(b) is ongoing.

64. Upon information and belief, Akamai committed the foregoing infringing activities without license from PMC and with notice of the '560 Patent.

65. The acts of infringement by Akamai will continue unless enjoined by this Court.

66. PMC has been and will continue to be irreparably harmed and damaged by Akamai's infringement of the '560 Patent and has no adequate remedy at law.

PRAYER FOR RELIEF

WHEREFORE, PMC prays for judgment in its favor against Akamai, and specifically, for the following relief:

- A. Entry of judgment in favor of PMC and against Akamai on all counts;
- B. Entry of judgment that Akamai has infringed the Patents-in-Suit;
- C. An order permanently enjoining Akamai, together with its officers, directors, agents, servants, employees, and attorneys, and upon those persons in active concert or participation with them, from infringing the Patents-in-Suit;
- D. An award of compensatory damages adequate to compensate PMC for Akamai's infringement of the Patents-in-Suit, in no event less than a reasonably royalty;
- E. Pre-judgment and post-judgment interest on PMC's award, in an amount according to proof; and
- F. All such other and further costs and relief as the Court deems just and proper.

DEMAND FOR JURY TRIAL

Pursuant to Rule 38 of the Federal Rules of Civil Procedure, PMC hereby demands a trial by jury in this action of all claims so triable.

Dated: March 21, 2019

Respectfully submitted,

s/ Calvin Capshaw

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