

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AYLO FREESITES LTD,

Petitioner

v.

DISH TECHNOLOGIES L.L.C.,

Patent Owner

U.S. Patent 9,407,564

Issue Date: August 2, 2016

Title: APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE
SHIFTING OF STREAMING CONTENT

Inter Partes Review No. IPR2024-00518

PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT 9,407,564

CHALLENGING CLAIMS 1-16

UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. § 42.1 *et seq.*

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PETITIONER’S EXHIBIT LIST

Table of Exhibits for U.S. Pat. 9,407,564 Petition for *Inter Partes* Review

Exhibit Number	Description
1001	U.S. Pat. 9,407,564 (“the ’564 Patent”)
1002	File History of U.S. Pat. 9,407,564
1003	Declaration of Dr. Henry Houh including Curriculum Vitae (“Houh declaration”)
1004	International P.C.T. Publication WO 2002049343 to Leaning et al. (“Leaning”)
1005	<RESERVED>
1006	<RESERVED>
1007	U.S. Patent No. 6,848,004 to Chang (“Chang”)
1008	WO1997044942 to Kliger (“Kliger”)
1009	337-TA-1265 ITC Investigation Initial Determination
1010	337-TA-1265 ITC September 11, 2023 Enforcement Complaint
1011	<RESERVED>
1012	<RESERVED>
1013	U.S. Patent No. 6,637,031 to Chou (“Chou”)
1014	<RESERVED>
1015	<RESERVED>
1016	<RESERVED>
1017	<RESERVED>

1018	<RESERVED>
1019	<RESERVED>
1020	U.S. Patent Publication No. US 2004/0093420 to Gamble ("Gamble")

TABLE A: LISTING OF CLAIMS

Claim Designation	Claim Language
Claim 1	
1[Pre]	An end user station for adaptive-rate content streaming of digital content from a video server over a network, the end user station comprising:
1[A][1]	a media player operating on the end user station
1[A][2]	configured to stream a video from the video server via at least one transmission control protocol (TCP) connection over the network,
1[A][3]	wherein multiple different copies of the video encoded at different bit rates are stored on the video server as multiple sets of files,
1[A][4]	wherein each of the files yields a different portion of the video on playback,
1[A][5]	wherein the files across the different copies yield the same portions of the video on playback,
1[A][6]	and wherein each of the files comprises a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video, and wherein the media player streams the video by:
1[B]	requesting a plurality of sequential files of one of the copies from the video server based on the time indexes;
1[C][1]	automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies, the automatically requesting including
1[C][2]	repeatedly generating a factor indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies, wherein the set of one or more factors relate to the performance of the network;
1[D]	making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files of the highest quality one of the copies determined sustainable at that time so that the media player upshifts to a higher quality one of the different copies when the factor is greater than a first threshold and

	downshifts to a lower quality one of the different copies when the factor is less than a second threshold; and
1[E]	presenting the video by playing back the requested media files with the media player on the end user station in order of ascending playback time.
Claim 2	
[2]	The end user station of claim 1, wherein the at least one TCP connection comprises multiple Transmission Control protocol (TCP) connections with the content server.
Claim 3	
[3]	The end user station of claim 1, wherein the media player is configured to generate the factor according to the responses to segment requests.
Claim 4	
[4]	The end user station of claim 1, wherein the media player is configured to upshift to the higher quality copy when the factor is greater than the first threshold and the media player determines the higher quality playback can be sustained according to a combination of factors.
Claim 5	
[5]	The end user station of claim 1 wherein the media player is configured to upshift to the higher quality copy when the performance factor is greater than the first threshold and the media player determines that the higher quality playback can be sustained according to an amount of contiguously available files stored by the media player.
Claim 6	
[6]	The end user station of claim 1, wherein the media player is further configured to anticipate file requests and to pre-request files to enable fast-forward, skip randomly, and rewind functionality.
Claim 7	
[7]	The end user station of claim 1, wherein the media player is configured to initially request low quality files to enable instant playback of the video, and to subsequently upshift to a better quality copy of the video according to the performance factor.
Claim 8	
8[Pre]	A method executable by an end user station to present rate-adaptive streams received via at least one transmission control protocol (TCP) connection with a server over a network, the method comprising:
8[A][1]	streaming, by a media player operating on the end user station, a video from the server via the at least one TCP connection over the network,

8[A][2]	wherein multiple different copies of the video encoded at different bit rates are stored as multiple sets of files on the server,
8[A][3]	wherein each of the files yields a different portion of the video on playback,
8[A][4]	wherein the files across the different copies yield the same portions of the video on playback,
8[A][5]	and wherein each of the files comprises a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video, and wherein the streaming comprises:
8[B]	requesting by the media player a plurality of sequential files of one of the copies from the server based on the time indexes;
8[C][1]	automatically requesting by the media player from the server subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies,
8[C][2]	the automatically requesting including repeatedly generating a factor indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies, wherein the factor relates to the performance of the network; and
8[C][3]	making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files of the highest quality one of the copies determined sustainable at that time, wherein the making the successive determinations to shift comprises upshifting to a higher quality one of the different copies when the at least one factor is greater than a first threshold and downshifting to a lower quality one of the different copies when the at least one factor is less than a second threshold; and
8[D]	presenting the video by playing back the requested media files with the media player on the end user station in order of ascending playback time.
Claim 9	
[9]	The method of claim 8, wherein the at least one TCP connection comprises a plurality of different TCP connections, and wherein the requesting the plurality of sequential files includes requesting sub-parts of the files over different ones of the plurality of different TCP

	connections, and wherein said presenting includes reassembling the files from the received sub-parts.
Claim 10	
[10]	The method of claim 8, wherein said making the successive determinations to shift comprises: determining if the higher quality playback can be sustained.
Claim 11	
[11]	11. The method of claim 8, wherein the at least one TCP connection comprises a plurality of different TCP connections, and wherein the automatically requesting includes requesting sub-parts of the files over different ones of the plurality of TCP connections, and wherein said presenting includes reassembling the files from the received sub-parts, and wherein the factor is indicative of the available bandwidth of the plurality of TCP connections.
Claim 12	
[12]	The method of claim 8, wherein the factor is indicative of latency of the requested files, wherein the latency is a time measure between when one of the requests is issued and a time that response data of the request begins to arrive at the end user station.
Claim 13	
[13]	The method of claim 8, wherein the factor is indicative of time intervals between successive receive times for each response to the requested files.
Claim 14	
[14]	The method of claim 8, wherein the factor is indicative of delays or losses in one or more of the at least one TCP connection.
Claim 15	
[15]	The method of claim 8, wherein the server is a web server, and wherein the files are requested from the web server using Hyper Text Transfer Protocol (HTTP) messages sent via the at least one TCP connection.
Claim 16	
[16]	The method of claim 8, wherein the server comprises a cache server of a network infrastructure operator.

I. INTRODUCTION

Aylo Freesites Ltd (“Petitioner”) petitions under 35 U.S.C. § 312 and 37 C.F.R. § 42 for *inter partes* review of claims 1-16 (“Challenged Claims”) of U.S. Patent No. 9,407,564 (“the ’564 Patent”) (EX1001). The ’564 Patent is assigned to DISH Technologies L.L.C. (“DISH”) and, based on information and belief, Sling TV L.L.C. is an exclusive licensee.

The ’564 Patent relates to adaptive-rate shifting of streaming content, including a server storing sets of files at different bit rates and the client repeatedly generating a factor relating to the network that is indicative of an ability to sustain streaming at the highest quality set of files determined sustainable at that time. The Grounds advanced here were not relied upon during prosecution of the ’564 Patent and teach such adaptive-rate shifting of content streaming.

II. MANDATORY NOTICES

A. Real Party-in-Interest – § 42.8(b)(1)

Petitioner certifies that Aylo Freesites Ltd (f/k/a MG Freesites Ltd), Aylo Premium Ltd (f/k/a MG Premium Ltd), and Aylo Billing Limited (f/k/a MG Billing Limited) are the only real parties-in-interest.

B. Related Proceedings – § 42.8(b)(2)

The '564 Patent is currently asserted in the below proceedings.¹

- *Aylo Freesites Ltd f/k/a MG Freesites Ltd v. DISH Technologies LLC*, IPR2024-00047 (hereinafter “Ogdon-based IPR” because it relies on U.S. Patent No. 6,161,137 “Ogdon” as a primary reference)
- *DISH Technologies LLC et al. v. MG Premium Limited et al.* 2:23-cv-00552 (D. Utah) (the “’552 Utah Litigation”)
- *DISH Technologies LLC et al. v. Aylo Freesites Ltd et al.* 2:24-cv-00066 (D. Utah) ((the “’066 Utah Litigation”) and, collectively with the ’552 Utah Litigation, the “District Court Litigations”)
- *iFIT Inc. v. ITC* CAFC-23-1965 (Fed. Cir.), which is an appeal from Investigation No. 337-TA-1265 (ITC) (the “ITC Investigation”)
- *DISH Technologies LLC v. A Parent Media Co. Inc. et al.* 1:23-cv-01000 (D. Del.)
- *DISH Technologies LLC v. fuboTV Media Inc.* 1:23-cv-00986 (D. Del.)
- *DISH Technologies LLC v. Beachbody, LLC d/b/a/ BODi* 1:23-cv-00987 (D. Del.)
- *DISH Technologies LLC et al. v. WebGroup Czech Republic A.S. et al.* 2:23-cv-00553 (D. Utah)
- *DISH Technologies LLC et al. v. Vidgo Inc.* 2:23-cv-00624 (D. Utah)

¹ The '564 Patent was also at issue in *MG Freesites Ltd et al. v. DISH Technologies LLC et al.* 3:23-cv-03674 (N.D. Cal.) (the “California Litigation”), but that case was dismissed for lack of personal jurisdiction on January 24, 2024.

- *DISH Technologies LLC v. BritBox, LLC* 1:23-cv-08971 (S.D.N.Y)
- *DISH Technologies LLC v. Yanka Industries, Inc. d/b/a/ MasterClass* 1:23-cv-01305 (D. Del.)

Petitioner and its RPIs are only named parties in the Ogdon-based IPR and the District Court Litigations defined above.

Petitioner has also filed IPRs on related U.S. Patent Nos. 8,868,772 (IPR2024-00048); 11,470,138 (IPR2024-00044); 10,469,554 (IPR2024-00045); 10,951,680 (IPR2024-00046); 11,677,798 (IPR2024-00043); 10,469,555 (IPR2024-00146); and 10,757,156 (IPR2024-00147). Additionally, Petitioner is concurrently filing IPRs based on the same recently discovered International P.C.T. Publication WO 2002049343 to Leaning et al. (“Leaning”) relied on here on U.S. Patent Nos. 8,868,772 (IPR2024-00519); 10,469,554 (IPR2024-00514); 10,469,555 (IPR2024-00515); 10,757,156 (IPR2024-00513); 10,951,680 (IPR2024-00516); 11,470,138 (IPR2024-00512); and 11,677,798 (IPR2024-00517).

C. Counsel – § 42.8(b)(3) and (b)(4); Service Information; Fees

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A Power of Attorney is filed concurrently herewith under 37 C.F.R. § 42.10(b). The Office is authorized to charge the fee set forth in 37 C.F.R. § 42.15(a) or other fees to Deposit Account No. 22-0261.

III. CERTIFICATION OF GROUNDS FOR STANDING

Petitioner certifies that the '564 Patent is available for IPR and that Petitioner is not barred or estopped from requesting IPR challenging the patent claims on the grounds identified in this Petition.

IV. UNPATENTABILITY GROUNDS

Petitioner requests cancellation of claims 1-16 based on the grounds below.

Ground	Reference(s)	Challenged Claims	Basis
1	Leaning	1-16	103
2	Leaning and Gamble	9 and 11	103

These Grounds are supported by the Declaration of Dr. Henry Houh (EX1003) and other supporting evidence in the Exhibit List. EX1003, ¶¶ 46-47.

V. '564 PATENT

A. Summary

The '564 Patent (Application No. 14/516,303) was filed on October 16, 2014, which is a continuation of Application No. 11/116,783 (U.S. 8,868,772), which claims priority to U.S. Provisional No. 60/566,831 filed on Apr. 30, 2004. The '564 Patent issued on August 2, 2016. EX1001, Cover.

The '564 Patent relates to “adaptive-rate shifting of streaming content,” such as video, over the Internet. EX1001, Abstract, 1:18-21.

The '564 Patent teaches “a content server 102” and “end user 104” coupled by a data communications network (*e.g.*, the Internet 106) wherein the “end user station 104” may be a personal computer, entertainment system, or a portable electronic device configured to present content. *Id.*, FIG. 1, 6:3-17. As shown in Figure 2b below, the '564 Patent describes encoding the same content file into three different “quality” streams: low, medium, and high.

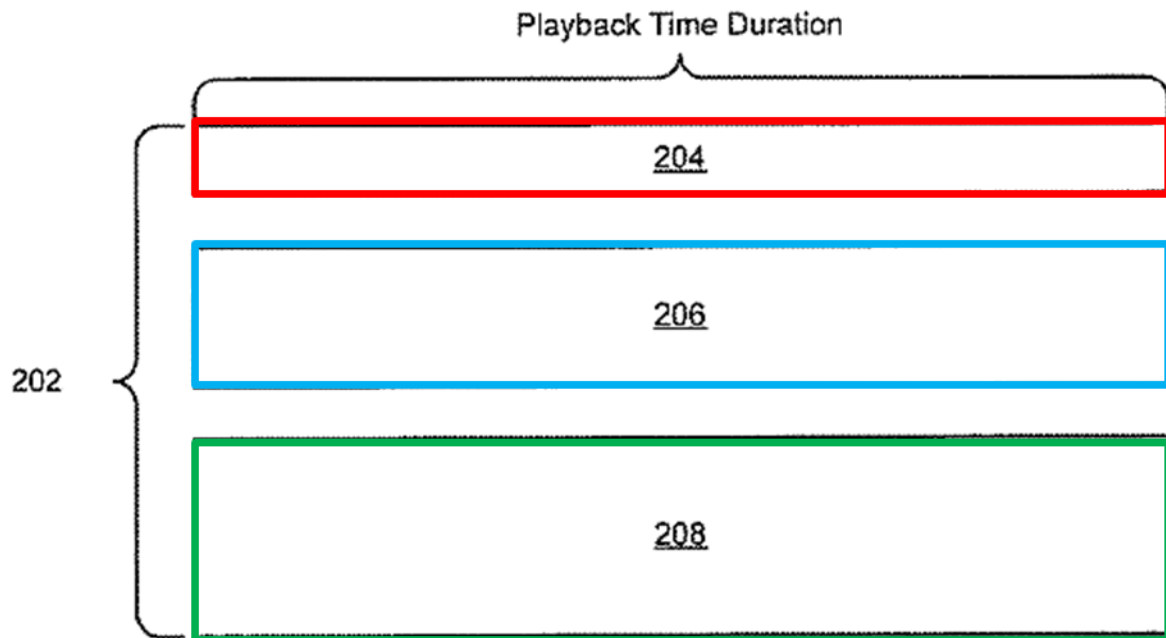


FIG. 2b

Id., FIG. 2b (annotated, low quality (red, 204), medium quality (blue, 206), and high quality (green, 208)), 6:46-57.

Each stream (204, 206, and 208) is “divided into a plurality of streamlets 212” where “streamlet 0 may have a time index of 00:00 representing the beginning of content playback, and streamlet 1 may have a time index of 00:02, and so on.” *Id.*, 6:58-7:7. This is shown in Figure 2c below.

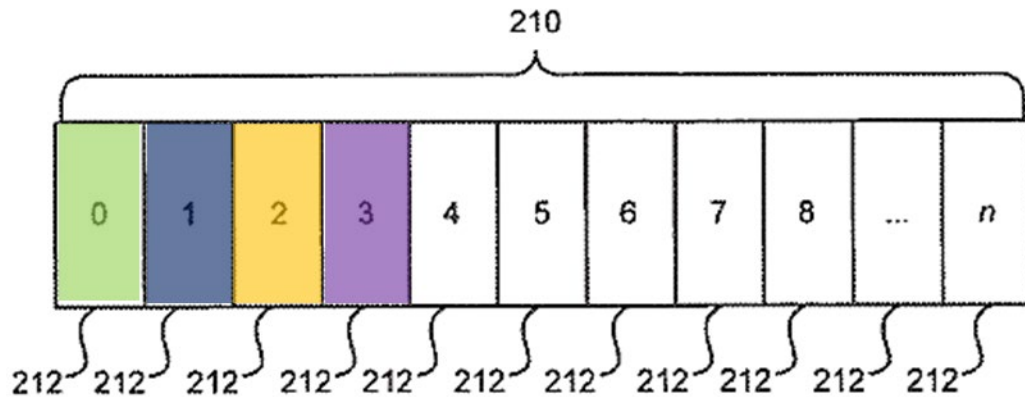


FIG. 2c

Id., FIG. 2c (annotated).

As the client receives a streamlet, it “calculates 708 a performance ratio” and “obtain[s] a performance factor.” *Id.*, 12:15-40, FIGs. 6 and 7. Thereafter, the client determines whether to upshift or downshift the stream quality based upon comparing the performance factor versus trigger thresholds and makes a “determination of whether use of the higher quality stream is sustainable.” *Id.*, 12:41-65.

B. Prosecution History

The '564 Patent was filed as Application No. 14/516,303 on October 16, 2014. On June 19, 2015, the Examiner issued a non-final rejection of all pending claims.

EX1002, 129-144. All pending claims were rejected under non-statutory double patenting, under 35 U.S.C. § 101 as directed to non-statutory subject matter, and 35 U.S.C. § 112 ¶ 2 as being indefinite; claims 1, 3-11, 13-20 were rejected under 35 U.S.C. § 103(a) as being obvious in view of U.S. Publication No. 2002/0144276 (“Radford”) and “Intelligent Streaming” (“Birney”); and claims 2 and 12 were rejected under 35 U.S.C. § 103(a) as being obvious in view of Radford, Birney, and U.S. Publication No. 2003/0152036 (“Quinn-Brown”). *Id.*

On December 21, 2015, Applicant in response significantly amended the claims including deleting or rewriting limitations that were rejected under 35 U.S.C. § 112. *Id.*, 221-231.

Based on the newly-amended language, Applicant requested that the Examiner reconsider the prior art rejections. Applicant also referred to a Board decision in the parent application of the present application, which held that Birney did not disclose a limitation that “each of a plurality of different copies of the video encoded at different bit rates is stored as multiple files,” which Applicant stated is similar to limitations in the newly-amended language.

Then, after an Examiner-initiated interview where Applicant agreed to roll pending claims 23 and 22 into claim 20 and make all other independent claims parallel (*id.*, 255), the Examiner issued a Notice of Allowance on March 31, 2016 (*id.*, 239-254).

C. Priority Date

Petitioner assumes for the purpose of this Petition a priority date of April 30, 2004 (the “Priority Date”) based on the claimed priority to the Provisional application No. 60/566,831 (EX1001, Cover), but Petitioner reserves the right to contest this priority date (and priority chain) in other proceedings.

VI. LEVEL OF ORDINARY SKILL IN THE ART

Petitioner submits that a person having ordinary skill in the art (“POSITA”) as of the Priority Date would have had at least a B.S. degree in computer science or electrical engineering (or comparable degree) and two years of experience in networking or streaming media, or a M.S. in computer science or electrical engineering (or comparable degree). EX1003, ¶ 42. A higher level of education or specific skill might make up for less experience, and vice-versa. *Id.*

VII. CLAIM CONSTRUCTION

Petitioner submits that, for purposes of institution, no constructions are necessary. However, Petitioner acknowledges that in the ITC Investigation between Patent Owner and iFIT Inc., the Chief Administrative Law Judge (“ALJ”) construed “a factor indicative of the current ability to sustain the streaming [of the video ... wherein the set of one or more factors relate to the performance of the network]” according to its plain and ordinary meaning, “*e.g.*, one or more factors relating to the performance of the network that is indicative of an ability to sustain the streaming

of the video.” EX1009, 53-61. The ALJ also construed “repeatedly generating a factor” as “generating a factor more than once” and construed “successive determinations” according to its plain and ordinary meaning. *Id.*, 61-64.

The PTAB is not bound by the ITC’s constructions. *Mediatek Inc. v. Advanced Micro Devices, Inc.*, IPR2018-00102, Paper 48 (Final Written Decision), at 10-11 (PTAB Apr. 29, 2019) (citing *Nobel Biocare Servs. AG v. Intradent USA, Inc.*, 903 F.3d 1365, 1375 (Fed. Cir. 2018)). Nevertheless, as shown herein, the asserted grounds render claims 1-16 of the ’564 Patent unpatentable even under the ITC’s constructions. By asserting that the ’564 Patent claims are unpatentable under the ITC’s constructions, Petitioner is not conceding that those constructions are correct and reserves its rights to challenge those constructions in any future proceeding.

In the ITC Investigation, iFIT proposed a design-around with respect to certain limitations of other patents in the family of the ’564 Patent. In response, DISH argued that even where limitations “require repeated up- and down-shifting, the single, initial adaptive stream selection performed by iFIT’s Redesigned Products *is equivalent*.” EX1010, 32 (emphasis added). Thus, although Petitioner does not necessarily agree with Patent Owner, Patent Owner should be held to its argument that a “single, initial adaptive stream selection” is equivalent to limitations that require repeated up- and down-shifting.

VIII. OVERVIEW OF THE PRIOR ART

A. State of the Art

The '564 Patent admits in the “Description of Related Art” section that “streaming media” was known, including streaming of “audio/video,” including on demand and live broadcasts. EX1001, 1:31-41. The '564 Patent further admits that TCP connections were known and that “[m]ost streaming solutions use a TCP connection.” *Id.*, 2:6-49. Further, Patent Owner admits that the “standard HTTP/TCP protocol” is “the web standard upon which the Internet is built.” *See DISH Technologies LLC et al v. Aylo Premium Limited et al* Case No. 2:23-cv-00552-HCN, D.I. 1 at ¶ 30. Other admissions in the '564 Patent are that “[u]se of cache servers is well known to those skilled in the art.” EX1001, 8:6-10.

Before the Priority Date, “client-pull” streaming systems were known in the art wherein a client requested from a server sequential portions of a file at different encoded quality levels based on network bandwidth. EX1003, ¶¶ 48-49. For example, Chang describes “real time measurement and prediction of bandwidth for adaptive content delivery of rich media according to available user bandwidth.” EX1007, Abstract. Chang discloses a client (via java applets) that performs real time bandwidth measurement according to user’s available bandwidth and fetches the corresponding bandwidth sensitive track content from the server via HTTP requests. *Id.*, 7:43-53, 8:59-9:5, 9:45-51, 10:15-14, 10:35-58. In another example, Kliger

teaches a media player device that requests from a server the appropriate bandwidth object depending on network bandwidth. EX1008, 3:25-32, 5:25-28, 9:32-10:4, 12:33:13:8, claim 3.

B. Leaning

Leaning (EX1004) was filed on December 14, 2001 and published on June 20, 2002. Leaning is prior art under at least (pre-AIA) 35 U.S.C. § 102(b). Leaning is not cited on the face of the '564 Patent² nor was it considered by the ALJ in the ITC action.

Leaning discloses delivery of video over the internet from a server to a client terminal by dividing the video into a sequence of “sub-files each of which is independently requested by the terminal, which thereby has control of the rate of delivery” and “switching between alternative sub-file sets representing alternative

² As will be explained in Section XI, *infra*, a different United States Pre-Grant Publication (US 2004/0030547) to Leaning titled “Encoding Audio Signals” with claims drawn to encoding of audio signals was cited on the face of the '564 Patent (EX1001, 3). This publication is not related, *i.e.*, outside the patent family, to the Leaning reference presented here and was not considered during examination other than being included in a lengthy IDS.

delivery modes of data rates.” EX1004, Abstract. Leaning further explains that a “server stores two or more versions of the recording, recorded at different compression rates” and client terminal’s “player program is able to switch automatically between them” by using an “index file” that provides a list of the data rates available and each set of sub-files for each different rate. EX1004, 6:5-7:5. The client in Leaning makes repeated assessments relating to network characteristics and determines to request a next sub-file of a higher (or lower) rate based on these assessments. EX1004, 8:1-9:8.

C. Gamble

Gamble (EX1020) was filed on November 13, 2002 and published on May 13, 2004. Gamble is prior art under at least (pre-AIA) 35 U.S.C. § 102(e). Gamble is cited on the face of the ’564 Patent and was used as a secondary reference to reject the claims during prosecution of parent U.S. Patent No. 8,868,772, but was not considered in the ITC investigation. The grounds involving Gamble are new and combine Gamble with a primary reference that was not considered by the Examiner.

Gamble discloses transferring files over a plurality of parallel TCP connections between client and server. EX1020, Abstract, ¶ 34, 50. Gamble further discloses a client application for receiving multiple subparts of stream files over a plurality of parallel TCP connections to a server. *Id.*, ¶¶ 34-40, 50-52. Gamble further discloses implementing TCP congestion protocols for the client. *Id.*, ¶ 52.

D. Analogous Art

Each prior art reference is analogous art to the claimed invention in the '564 Patent. Each is in the same field of endeavor of streaming based on network conditions, with Leaning teaching adaptive-rate streaming based on network conditions. *Compare* EX1001, title, Abstract, 1:18-21, 2:44-48, 2:60-3:67, FIGs. 2c, 4, and 7, *with* EX1004, Abstract, 6:5-7:5, 8:1-9:8, FIGs. 1-5; EX1020, ¶¶ 4-5, 50-52; *see also* EX1003, ¶ 54.

Additionally, the prior art references are reasonably pertinent to any purported problem addressed in the '564 Patent, such as “alleviat[ing] the problems of reliability, efficiency, and latency” and “offer[ing] instantaneous viewing” using “multiple connections between a source and a destination” and/or “requesting varying bitrate streams depending upon network conditions” *Id.*; EX1001, 2:39-2:48; EX1003, ¶ 55.

IX. SPECIFIC GROUNDS

A. Ground 1: Claims 1-16 Would Have Been Obvious in view of Leaning

1. Claim 1

- a. 1[Pre]: “An end user station for adaptive-rate content streaming of digital content from a video server over a network, the end user station comprising:”**

Whether or not the preamble is limiting, Leaning teaches 1[Pre]. Leaning discloses an end user station (terminals 3) for adaptive-rate content streaming of

digital content from a video server (server 1) over a network (Internet 2). EX1004, Abstract (“Delivery of recorded audio or video material over a telecommunications link (2) **from a server (1) to a terminal**³ (3) . . . Provision may be made for **switching** between alternative sub-file sets representing alternative delivery modes of data rates.”), 1:3-29 (“delivery, over a telecommunications link, of digitally coded material for presentation to a user”; “terminal for playing audio or video material which is stored on a remote server as a set of files representing successive temporal portions of the said material”; “transmitting digitally coded audio or **video** material comprising: partitioning the material into a plurality of discrete files each representing successive temporal portions of the said material; storing the files at a first station; and at a second station - a) transmitting to the first station requests for successive respective ones of the files; b) receiving the files; and c) decoding the files for replay of the material.”), 6:13-15 (“the server stores two or more versions of the recording, recorded at different compression rates (for example . . . 8, 16, 24 and 32 kbit/s respectively) and **the player program is able to switch automatically between them.**”), 16:6-10, claim 1, FIG. 1; EX1003, ¶ 56.

³ All emphases in citations to prior art references are added unless otherwise indicated.

b. 1[A][1]: “a media player operating on the end user station”

Leaning teaches 1[A][1]. Leaning discloses a media player (player program) operating on the end user station (terminal 3). EX1004, 4:4-15 (“terminal with . . . video display 34, communications interface 35, and audio interface (‘sound card’) 36. For video delivery, a video card would be fitted in place of, or in addition to, the card 36.”; “‘web browser’ program”; “further program 38 which will be referred to here as ‘**the player program**’ which provides the functionality necessary for the playing of audio files in accordance with this embodiment of the invention.”), 5:1-14; EX1003, ¶ 57.

c. 1[A][2]: “configured to stream a video from the video server via at least one transmission control protocol (TCP) connection over the network,”

Leaning teaches 1[A][2]. Leaning discloses that the media player (player program) is configured to stream the video from the video server (server 1) via at least one TCP connection over the network (Internet). EX1004, 2:5-32 (“The system shown in Figure 1 has as its object the delivery, to a user, of digitally coded audio signals . . . the system may be used to convey video signals instead of, or in addition to, audio signals. In this example, the **network is the internet** or other packet network operating in accordance with the **Hypertext Transfer Protocol (see RFCs 1945/2068 for details)**”; “In Figure 1, a **server 1 is connected via the internet 2 to user terminals 3**”; “The function of the server 1 is to store data files, to **receive**

from a user terminal a request for delivery of a desired data **file** and, in response to such a request, to transmit the file to the user terminal via the network. Usually such a **request takes the form of a first part indicating the network delivery mechanism (e.g. http:// or file:// for the hypertext transfer protocol or file transfer protocol respectively)** followed by the network address of the server (e.g. www.server l.com) **suffixes with the name of the file that is being requested.**”; “In these examples, the **use of the hypertext transfer protocol is assumed**”; server 1 “is merely **an ordinary ‘web server’.**”), 4:4-21; EX1003, ¶ 58.

A POSITA would have understood Leaning’s teachings of a terminal connecting to an ordinary web server via the Internet to request subfiles from the server using HTTP (*i.e.*, HTTP 1.0 (RCF 1945) or HTTP 1.1 (RCF 2068)) to include teaching at least one TCP connection for such requests because a POSITA would have known that ordinary web servers supported both HTTP and TCP and that HTTP operates over TCP connections. EX1003, ¶¶ 59;⁴ *see also* EX1004, 5:8-14 (“The program constructs a **request message for the file having this URL and transmits**

⁴ Indeed, the ’564 Patent admits that TCP connections were known and used by most streaming solutions and Patent Owner also admits that the “standard HTTP/TCP protocol” is “the web standard upon which the Internet is built. *See* Section VIII.A

it to the server 1 via the communications interface 35 and the internet 2. (Processes for translating the URL into an IP address . . . [is] **conventional** and will not therefore be described). We envisage that the **player program would send the requests** directly to the communications interface, rather than via the browser. **The server responds by transmitting the required sub-file.**”); EX1003, ¶ 59. For example, a POSITA would have known that a terminal requesting sequential subfiles from an ordinary web server using the HTTP 1.0 protocol (RFC1945) (EX1004, 2:10) as disclosed by Leaning would require using multiple TCP connections because each HTTP request in HTTP 1.0 must establish a new TCP connection to request and receive each sequential subfile. EX1003, ¶ 59. Thus, a POSITA would have understood Leaning to teach that HTTP operates via one or more TCP connections. *Id.*

d. 1[A][3]: “wherein multiple different copies of the video encoded at different bit rates are stored on the video server as multiple sets of files,”

Leaning teaches 1[A][3]. Leaning discloses that multiple different copies (two or more versions of the recording) of the video encoded at different bit rates (compression rates) are stored on the video server (server 1). EX1004, 6:13-26 (“the server stores **two or more versions** of the recording, recorded at **different compression rates** (for example . . . **8, 16, 24 and 32 kbit/s respectively**) . . .”), 9:3-7, 16:6-12 (“The **same principle** may be applied to the delivery of **video**

recordings.”; “the player program incorporates a video decoder. The manner of partitioning the file into sub-files is unchanged. As in the audio case, there may be **two or more recordings corresponding to different data rates, selected by the control mechanism already described.”**); EX1003, ¶ 60.

Leaning further discloses that these multiple copies are stored as multiple sets of files (sets of subfiles at each compression rate in appropriate directories). EX1004, Abstract (“dividing the material into a **sequence of sub-files** each of which is independently requested by the terminal . . . switching between **alternative sub-file sets** representing **alternative delivery modes of data rates.”**), 3:1-22 (“the file is **divided into smaller files** before being stored on the server 1. We prefer that each of these smaller files is of a size corresponding to a fixed playing time, perhaps four seconds.”; “divided into **135 smaller files** each representing four seconds’ playing time”; “file names which include a serial number indicative of their sequence in the original file, for example: 000000.bin 000001.bin 000002.bin 000003.bin. . . 000134.bin. . . ‘sub-files’ is used here to distinguish them from the original file containing the whole recording: . . . as far as the server is concerned, each sub-file’ is just a file like any other file.”), 5:4-6:8, 6:21-7:7 (describing the same set of 135 sub-files (000000.bin, 000001.bin, 000002.bin. . . 000134.bin) each encoded at a different bitrate (8k, 16k, 18k, 24k, and 32k) and listed in an index file and saved in

the directory appropriate for their bitrates); *see also id.*, 12:8-34, 13:23-14:19; EX1003, ¶ 61.

Directory	Subdirectory	Filename
mp3_bwv565	none	link.htm index.htm
mp3_bwv565	008k_11_m	000000.bin 000001.bin 000002.bin 000003.bin . . 000134.bin
mp3_bwv565	016k_11_m	000000.bin 000001.bin 000002.bin 000003.bin . . 000134.bin
mp3_bwv565	018k_11_s	000000.bin 000001.bin 000002.bin 000003.bin . . 000134.bin
mp3_bwv565	024k_11_s	000000.bin 000001.bin 000002.bin 000003.bin . . 000134.bin
mp3_bwv565	032k_11_s	000000.bin 000001.bin 000002.bin 000003.bin . . 000134.bin

EX1004, 7 (annotated, showing each of the directories containing the different versions of the same recording (encoded at 8, 16, 24, and 32 kbit/s) and each containing the same set of subfiles (000000.bin-000134.bin) in the same order).

e. 1[A][4]: “wherein each of the files yields a different portion of the video on playback,”

Leaning discloses 1[A][4]. *See* 1[A][2]-1[A][3]. Leaning discloses that each of the files (subfiles) yields a different portion (temporal portion) of the video on

playback. EX1004, 1:3-29 (“delivery, over a telecommunications link, of digitally coded material for presentation to a user”; “terminal for playing audio or video material which is stored on a remote server as a **set of files representing successive temporal portions** of the said material”; “**partitioning the material into a plurality of discrete files each representing successive temporal portions of the said material**; storing the files at a first station; and at a second station - a) transmitting to the first station requests for successive respective ones of the files; b) receiving the files; and c) decoding the files for replay of the material.”), FIG. 4; EX1003, ¶ 62.

f. 1[A][5]: “wherein the files across the different copies yield the same portions of the video on playback,”

Leaning teaches 1[A][5]. *See* 1[A][3]. Leaning discloses that the files (subfiles) across the different copies contains the same portions of the video on playback (*e.g.*, 000000.bin is the same portion of the video in each bitrate directory; 000001.bin is the same portion of the video in each bitrate directory; etc.) because each version has the same number of segments in the same order and having the same duration as each other. EX1004, Abstract, 1:3-29, 3:5-18 (“the file is divided into smaller files before being stored on the server 1. **We prefer that each of these smaller files is of a size corresponding to a fixed playing time, perhaps four seconds.**”; “Thus the Bach file of 9 minutes duration would be **divided into 135**

smaller files each representing four seconds' playing time”), 5:4-6:8, 6:21-7:1 (describing the same set of 135 sub-files (000000.bin, 000001.bin, 000002.bin. . . 000134.bin) each encoded at a different bitrate (8k, 16k, 18k, 24k, and 32k) and listed in an index file and saved in the directory appropriate for their bitrates), 7:1-2 (“because the length of a sub-file corresponds, as explained earlier, to a **fixed length of time**, the **number of sub-files is the same for each directory**.”), 12:8-20 (“there is **no expectation that a sub-file will be followed by a sub-file other than that which immediately follows it in the original sequence**” “the sub-file size can be a fixed number of bits, or a fixed playing time length (or neither of these)”); “In the case of rate switching, it is, if not actually essential, **highly desirable that the sub-file boundaries are the same for each rate**, so that the **first sub-file received for a new rate continues from the same point in the recording that the last sub-file at the old rate ended**. To arrange that every sub-file should represent the same fixed time period (e.g. the 4 seconds mentioned above) is not the only way of achieving this, but it is certainly the most convenient.”); EX1003, ¶ 63.

g. 1[A][6]: “and wherein each of the files comprises a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video, and wherein the media player streams the video by:”

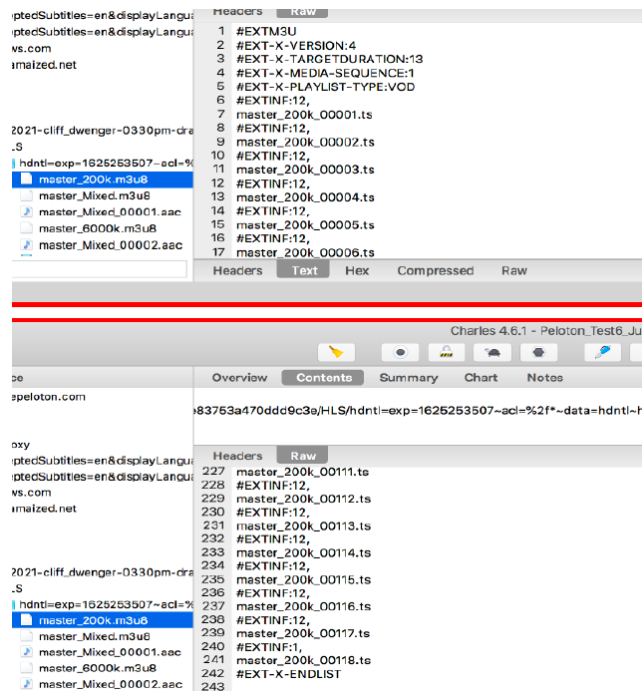
Leaning teaches 1[A][6]. Leaning discloses that each of the files (subfiles) in the different copies have a time index because the subfiles are aligned in time such

that each begin at the same playback time in relation to the beginning of the video because each directory containing different bitrate copies of the video has the same number of subfiles in the same order with the same time durations encoding the same portion of the video. *See* 1[A][5]. EX1004, 12:6-20 (“In the case of rate switching, it is, if not actually essential, **highly desirable that the sub-file boundaries are the same for each rate**, so that the first sub-file received for a new rate **continues from the same point in the recording** that the last sub-file at the old rate ended.”) ; EX1003, ¶ 64.

Directory	Subdirectory	Filename
mp3_bwv565	none	link.htm index.htm
mp3_bwv565	008k_11_m	000000.bin 000001.bin 000002.bin 000003.bin . . 000134.bin
mp3_bwv565	016k_11_m	000000.bin 000001.bin 000002.bin 000003.bin . . 000134.bin
mp3_bwv565	018k_11_s	000000.bin 000001.bin 000002.bin 000003.bin . . 000134.bin
mp3_bwv565	024k_11_s	000000.bin 000001.bin 000002.bin 000003.bin . . 000134.bin
mp3_bwv565	032k_11_s	000000.bin 000001.bin 000002.bin 000003.bin . . 000134.bin

EX1004, 7 (showing each of the directories containing the different versions (8, 16, 24, and 32 kbit/s) containing the same set of subfiles (000000.bin-000134.bin) in the same order).

In the ITC Investigation, the ALJ interpreted “time index” according to its plain and ordinary meaning and found this limitation was met by requesting sequential media segments according to an increasing “sequential Media Sequence number that starts at an initial value (00001) for the first Media Segment and increases sequentially to end at a larger number for the last Media Segment (00118 ... below)” noting that the “URI contains information that is an index for the relative position in time of the Media Segment within the larger Media Sequence.”



EX1010, 90-92.

Here, as explained above, Leaning teaches that each subfile for each quality level is sequentially ordered in the same order starting from the beginning of the video, which corresponds to the playback times and are requested in order. EX1004, 7 (sequentially numbered files 000000 to 000134 in each of the different copies), 12:6-20. Thus, to the extent “time index” is interpreted as the ALJ interpreted this limitation, Leaning meets this limitation. EX1003, ¶¶ 65-66.

To the extent “time index” requires files to be indexed or named with some indication of playback time, this limitation would have been obvious to a POSITA in view of Leaning. EX1003, ¶ 67. Though Leaning’s exemplary naming convention provided is to name each subfile with a number in ascending order (EX1004, 3:10-11 (“In this example these are given file names which include a serial number indicative of their sequence in the original file.”)); Leaning also teaches that “any naming convention can be used” for the subfiles (*id.*, 6:5-8).

Thus, a POSITA would have understood that each subfile could be named according to a time index instead of as an integer (*e.g.*, 000000.bin would be named “00:00.bin” to indicate playback time of 0 seconds; 000001.bin would be named “00:04.bin” to indicate playback time of 4 seconds; 000002.bin would be named “00:08.bin” to indicate playback time of 8 seconds; and so on). EX1003, ¶ 68; *see also* EX1004, 15:19-28 (describing including “Odbits” in the index file to provide the player program with indications of playback time relative to the beginning of the

recording in the form of “hours:minutes:seconds”). And a POSITA would have been motivated to name segments (subfiles) according to their playback times in this way because it still would allow for ordering the subfiles in proper playback order such that when a POSITA viewed the directory of files saved on the servers the subfiles would be listed in order of how they will be played and it would provide the benefit of ascertaining an estimate of the overall length of the recording by simply viewing the name of the final segment in the directory. EX1003, ¶ 68. A POSITA would have had a reasonable expectation of success with such a modification because it would simply involve changing the naming convention for the file names of subfiles stored on the server—which was contemplated by Leaning. *Id.*

As discussed above, the files (subfiles), starting with the first segment, play back the same portion of video for the different copies. *See* 1[A][5]. And the media player (player program) streams the video. *See* 1[A][1]-1[A][2]; EX1003, ¶ 69.

h. 1[B]: “requesting a plurality of sequential files of one of the copies from the video server based on the time indexes,”

Leaning teaches 1[B].

Requesting a plurality of sequential files

Leaning teaches requesting a plurality of sequential files (subfiles) of one of the copies from the video server (server 1). As already described above, Leaning discloses that the subfiles of each of the copies are in the same sequential order. *See*

1[A][3], 1[A][5]-[A][6]. Leaning further discloses that end user device (terminal 3) independently requests, via the player program, each of the sequential files (subfiles) of one of the copies from the video server in order. *See* 1[A][6]; EX1004, Abstract (“Delivery of recorded audio or video material over a telecommunications link (2) from a server (1) to a terminal (3) is accomplished by dividing the material into a **sequence of sub-files each of which is independently requested by the terminal**, which thereby has control of the rate of delivery. Provision may be made for switching between alternative sub-file sets representing alternative delivery modes of data rates.”), 1:12-19 (“terminal for playing audio or **video** material which is stored on a remote server as a set of files representing successive temporal portions of the said material”; “telecommunications interface for communication with the server; a buffer for receiving the files from the telecommunications interface; means for playing the contents of the buffer; and **control means responsive to the state of the buffer to generate request messages for further files for replenishment of the buffer.**”), 2:15-18 (“The function of the server 1 is to store data files, to **receive from a user terminal a request for delivery of a desired data file and, in response to such a request, to transmit the file to the user terminal via the network.**”), 5:4-6:2 (“The **player program**, having received the URL, adds to this the filename of the first sub-file, to produce a complete address for the sub-file”; “The **program constructs a request message for the file having this URL** and transmits it to the

server 1 via the communications interface 35 and the internet 2”; **“player program would send the requests** directly to the communications interface, rather than via the browser. The server responds by transmitting the required sub-file. . . . The **player program increments the filename to 000001.bin and requests**, receives, decodes and stores this second sub-file as described in (4) and (5) above. . . . This process is repeated until a ‘file not found error’ is returned.”), 6:27-7:2, 8:6-16, claims 1, 11 and 16; EX1003, ¶ 71. Leaning additionally discloses that end user device (terminal 3) requests, via the player program, a plurality of the sequential files (subfiles). EX1004, 5:6-32 (“The player program has a parameter called the playout time T_p . In this example it is set at 10 seconds It determines **the degree of buffering that the terminal performs**. The player program increments the filename to 000001.bin and requests, receives, decodes and stores this second sub-file as described in (4) and (5) above. **It repeats this process until the contents of the buffer reach or exceed the playout time T_p .**”); EX1003, ¶ 71.

Requesting based on the time indexes

Leaning also teaches that the client requests the files “based on the time indexes” because, as explained above with respect to limitation 1[A][6], each subfile is sequentially ordered starting from the beginning of the video, which corresponds to the playback times, and the elements are requested in such order. In the ITC Investigation, the ALJ did not explicitly construe “requesting a plurality of

sequential files of one of the copies from the video server based on the time indexes.” However, DISH argued, and the ALJ found, that requesting sequential media segments “based on their filenames” that included a unique sequential number corresponding to their position in playback sequence satisfied this limitation of requesting streamlets “based on the time indexes.” EX1009, 93.

Here, as explained above, Leaning discloses precisely what DISH argued, and the ALJ determined, met requesting “based on the time indexes” (*i.e.*, player independently requesting each of the subfiles 000000.bin to 000134.bin in order at the appropriate quality level). *See* 1[Pre]-1[B]. Therefore, according to DISH and the ITC’s interpretation, Leaning discloses requesting files (subfiles) according to their playback times. EX1003, ¶¶ 73-74.

Petitioner does not concede that DISH and the ITC are correct in their interpretation that simply requesting files in order is requesting “based on the time indexes” because each subfile may be a different time duration and the player may not know which specific playback time it is requesting. For example, if 000000.bin is 5 seconds, 000001.bin is 3.5 seconds, and 000002.bin is 4 seconds then the player would request 000000.bin then 000001.bin then 000002.bin—but the player would not be requesting these subfiles ***based on time indexes*** but rather requesting them ***according to their order***. EX1003, ¶ 75.

However, under DISH and the ALJ's interpretation, Leaning explicitly discloses that each sequential subfile is preferably the **same time duration** (*e.g.*, 4 seconds) such that a request for 000000.bin is a request for playback time 0-4 seconds; a request for 000001.bin is a request for playback time 4-8 seconds; and a request for 000003.bin is a request for playback time 8-12 seconds; and so on. EX1004, 3:5-18 (“We prefer that each of these smaller files is of a size corresponding to a fixed playing time, perhaps **four seconds**. . . . would be **divided into 135 smaller files each representing four seconds' playing time**”), 5:4-6:8, 6:21-7:1; *see also id.*, FIG. 4. Therefore, under DISH and the ALJ's interpretation, Leaning discloses requesting based on the time indexes because all the segments are 4 seconds in duration so the time index of each segment is readily and accurately ascertainable. EX1003, ¶ 76. Further, if the claims are read to require the request having an indication of the time index as described above, a POSITA would have been motivated to name subfiles according to their time indexes (*see* 1[A][6]) and, as such, when subfiles are requested based on subfile name, each subfile would thus be requested “based on the time indexes.” *Id.*

- i. **1[C][1]: “automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies, the automatically requesting including”**

Leaning teaches 1[C][1]. Leaning discloses automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies. *See* 1[A][3]-[A][6]. Leaning also teaches that teaches that selection of a higher or lower quality for each subfile may be dependent upon successive determinations. More particularly, the player program makes multiple determinations one after the other before shifting up in quality and before shifting down in quality. EX1003, ¶ 77.

For example, when determining to shift down, the Player determines (1) if the buffer is empty, (2) if the measured rate is less than the current rate, and (3) if the measured Buffer Low Percentage more than a Step Down Threshold before shifting down; when determining to shift up, the Player determines (1) if the measured rate exceeds the current rate, and (2) if the measured rate exceeds the next higher rate for a given period of time before shifting up. EX1004, 8:17-26. Once the successive determinations conclude that the player should shift up or shift down, “rate change is effected simply by the player program changing the relevant part of the sub-file address for example, changing ‘008k’ to ‘024k’ to increase the data rate from 8 to

24 kbit/s and changing the current rate parameter to match” and “the next request to the server becomes a request for the higher (or lower) rate, and the sub-file from the new directory is received, decoded and entered into the buffer.” EX1004, 9:3-7, 9-11 (flowchart showing successive determinations to shift up or shift down), claims 4 (“server storing a plurality of sets of files”; “mode **switching by providing that subsequent request messages shall request files from a set different from the set to which the immediately preceding request related**”), 5 (“said sets of files correspond to respective different data rates, in which: the terminal includes means for **monitoring the received data rate**; the mode switching means is operable, in the event that the **measured rate is below** that needed for the set to which the currently requested file belongs, to provide that subsequent said request messages shall request files from a set corresponding to a **lower data rate**”), 6 (“in the event that the **measured rate is sufficient** to support delivery of files of a **higher data rate** than that of the set to which the currently requested file belongs, to provide that subsequent said request messages shall request files from a set corresponding to a **higher data rate**”), 11 and 12; EX1003, ¶ 78.

- j. 1[C][2]: “repeatedly generating a factor indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies, wherein the set of one or more factors relate to the performance of the network;”

Leaning teaches 1[C][2]. Patent Owner contended in the file history of parent U.S. Patent No. 8,868,772 that there is allegedly sufficient disclosure for such a factor being “indicative of latency, delays or losses of the requested portions, and available bandwidth of the TCP connections.” EX1018, 447-448 (footnotes omitted). EX1003, ¶ 79.

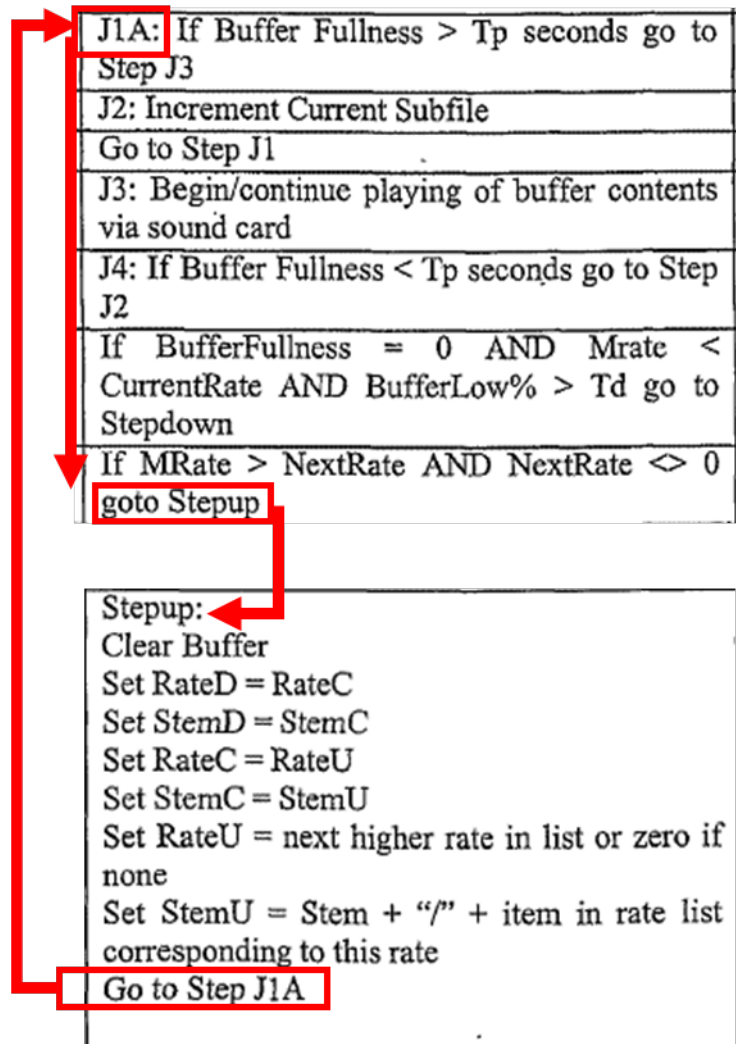
Leaning discloses “repeatedly generating a factor indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies, wherein the set of one or more factors relate to the performance of the network” because it teaches repeatedly generating a “measured rate” (*i.e.*, the measured actual data rate being received from the server, averaged over a period of time) and comparing it to a “current rate” (*i.e.*, the bitrate of the current stream) to determine if the current stream is sustainable. EX1004, 8:7-26, claims 5 and 6. Additionally, Leaning repeatedly generates another factor (“Buffer Low Percentage”) which is “the percentage of time that the buffer contents represent less than 25% of the playout time (*i.e.* the buffer is getting close to being empty).” EX1004, 8:27-28. Leaning also explains “that interruption” of the video stream “can be avoided and therefore it is preferable to employ a criterion which anticipates

underflow and avoids it in the majority of cases” by omitting the first determination (*i.e.*, whether the buffer is completely empty) and generating measured rate and Buffer Low Percentage factors as indicators of whether the current streaming rate is sustainable. EX1004, 15:3-8, 8:11-16 (repeatedly generates the factor because “process **from then on** is that the player program **measures the actual data rate being received from the server, averaged over a period of time (for example 30 seconds)**). It does this by timing every URL request; the transfer rate achieved (number of bits per second) between the client and server is determined. The **accuracy of this figure improves as the number of requests goes up**. The player maintains two stored parameters which indicate, respectively, the current rate, and the **measured rate.**”), 8:17-11:1; 1[C][1]; EX1003, ¶¶ 80.

- k. 1[D]: “**making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files of the highest quality one of the copies determined sustainable at that time so that the media player upshifts to a higher quality one of the different copies when the factor is greater than a first threshold and downshifts to a lower quality one of the different copies when the factor is less than a second threshold; and**”

Leaning teaches 1[D]. As explained above, Leaning discloses making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files (subfiles) of the highest quality copy of the video that is determined to be sustainable at that time. *See* 1[C][1]-1[C][2].

Leaning teaches choosing the highest quality copy that is sustainable (*i.e.*, if measured rate > current rate AND measured rate > next highest rate for period of time, then shift up until no longer true—meaning shift up to highest sustainable version). EX1004, 8:24-26 (“if the measured rate exceeds not only the current rate **but also the next higher rate** for a given period of time . . . **increase the current rate.**”), 9:3-7, 9-11 (flowchart showing successive determinations to shift up to highest rate deemed sustainable). For example, the excerpted and annotated portion of Leaning’s process flow chart below shows that the player on the terminal beginning with step J1A moves through the process and if “MRate [measured rate] is greater than NextRate [next highest rate] AND NextRate $\neq$ 0 [there exists a next higher rate] then goto Stepup; and the Stepup process shifts up by changing the RateC [current rate] to the RateU [next highest rate] and changes RateU to the next higher rate, or to “0” if the current rate is the highest rate then loops back to step J1A and continues the process. Thus, Leaning discloses looping “Stepup” until the highest sustainable rate is achieved up to the highest available rate (by setting RateU to zero). EX1004, 9-11; EX1003, ¶ 81.



EX1004, 10 (flowchart excerpted and annotated); EX1003, ¶ 81.

Leaning further discloses that that the media player (player program) upshifts to a higher quality one of the different copies when the factor (the “measured rate” factor) is greater than a first threshold (the “next higher rate” for a given period of time) and similarly downshifts to a lower quality one of the different copies when the factor is less than a second threshold (“current rate” (and when the Buffer Low Percentage more than a Step Down Threshold)). See 1[C][1]-1[C][2]; EX1004, 8:17-

26, claims 4 (“mode switching by providing that subsequent request messages shall request files from a set different from the set to which the immediately preceding request related”), 5 (“said sets of files correspond to respective different data rates, in which: the terminal includes means for monitoring the received data rate; the mode switching means is operable, in the event that the measured rate is below that needed for the set to which the currently requested file belongs, to provide that subsequent said request messages shall request files from a set corresponding to a lower data rate”), 6 (“in the event that the measured rate is sufficient to support delivery of files of a higher data rate than that of the set to which the currently requested file belongs, to provide that subsequent said request messages shall request files from a set corresponding to a higher data rate”); EX1003 ¶ 82.

l. 1[E]: “presenting the video by playing back the requested media files with the media player on the end user station in order of ascending playback time.”

Leaning discloses 1[E]. Leaning teaches presenting the video by decoding and playing back the subfiles of the video with the player program on the terminal in order of ascending start time. EX1004, 1:13-28, 4:4-21, 5:23-6:2, 12:16-18, 14:6-11, claim 1 (“means for playing the contents of the buffer”); EX1003, ¶ 83.

2. Claim 2: “The end user station of claim 1, wherein the at least one TCP connection comprises multiple Transmission Control protocol (TCP) connections with the content server.”

Leaning teaches claim 2. As explained above with respect to limitation 1[A][2], Leaning discloses operating over the Internet using HTTP and teaches using more than one TCP connection at least because Leaning teaches use of HTTP 1.0—which a POSITA would have known requires a new TCP connection for each subfile request and thus by requesting sequential subfiles Leaning teaches establishing multiple TCP connections with a content server, and requesting sequential files (subfiles) of varying bitrates due to rate switching. *See* 1[A][2]; 1[C][1]-1[D]; EX1003, ¶ 84.

3. Claim 3: “The end user station of claim 1, wherein the media player is configured to generate the factor according to the responses to segment requests.”

Leaning teaches claim 3. *See* 1[C][2] (e.g., generating measured rate and Buffer Low Percentage factors as indicators of whether the current streaming rate is sustainable); EX1004, 8:7-25 (“[T]he player program **measures the actual data rate being received** from the server, averaged over a period of time **It does this by timing every URL request; the transfer rate achieved . . .** between the client and server is determined.”); EX1003, ¶ 85.

4. **Claim 4: “The end user station of claim 1, wherein the media player is configured to upshift to the higher quality copy when the factor is greater than the first threshold and the media player determines the higher quality playback can be sustained according to a combination of factors.”**

Leaning teaches claim 4. *See* 1[B], 1[C][1] (successive determinations to shift quality higher), 1[D] (upshifting to the higher quality copy when the factor is greater than the first threshold), 1[C][2] (determining that the quality of playback can be sustained according to a combination of factors). For example, Leaning discloses that downshifting (Stepdown) occurs if $\text{BufferFullness} = 0 \text{ AND } \text{Mrate} < \text{CurrentRate} \text{ AND } \text{BufferLow\%} > \text{Td}$, and upshifting (Stepup) occurs if $\text{MRate} > \text{NextRate} \text{ AND } \text{NextRate} < 0$. EX1004, 8:17-9:2, 10 (flowchart step J4). Accordingly, Leaning teaches that the media player (player program) determines not to downshift, *i.e.*, determines that the higher quality playback can be sustained, according to a combination of such factors as (i) the buffer not being empty, (ii) the measured rate not being less than the current rate, and (iii) the Buffer Low Percentage not exceeding the Step Down Threshold; and that the given quality level will be maintained until (iv) the measured rate exceeds the next rate or (v) there is no next rate (*i.e.*, no higher quality level)). EX1004, 8:17-9:2, 10; EX1003, ¶ 86.

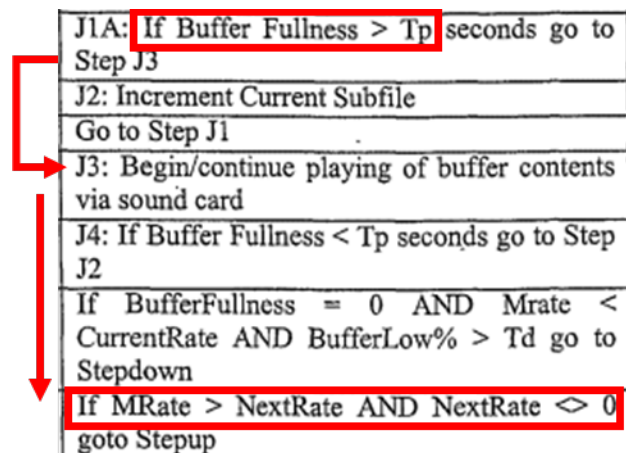
To the extent that Patent Owner argues that Leaning does not teach determining that higher quality playback can be sustained according to a combination of factors, a POSITA would have been motivated to configure

Leaning's media player (player program) to determine that higher quality playback can be sustained according to a combination of the foregoing and additional factors such as network congestion and bandwidth. For example, a POSITA would have understood that these network conditions impact streaming performance whereby a higher level of congestion and/or a lower bandwidth increase the risk of interrupted playback because there is less time to request and retrieve a given file and the next file before they are played back. As such, a POSITA would have been motivated to repeatedly monitor and factor such conditions into the determination whether to shift quality level. EX1003, ¶ 87. A POSITA would have had a reasonable expectation of success because adapting to network conditions was well known and consistent with Leaning's teaching of utilizing adaptive bitrate streaming to remedy problems caused by network conditions such as congestion. *See* EX1004, 8:9-12; EX1003, ¶ 87.

5. **Claim 5: "The end user station of claim 1 wherein the media player is configured to upshift to the higher quality copy when the performance factor is greater than the first threshold and the media player determines that the higher quality playback can be sustained according to an amount of contiguously available files stored by the media player."**

Leaning teaches claim 5. Leaning discloses that the media player upshifts to the higher quality copy when the performance factor is greater than the first threshold. *See* 1[C][1] (successive determinations to shift quality higher), 1[C][2]

(performance factor), 1[D] (upshifting to the higher quality copy when the factor is greater than the first threshold). Leaning further discloses that the media player determines that this higher quality playback can be sustained according to an amount of contiguously available files stored (*i.e.*, only allows for shifting up and/or continuing playing if “Buffer Fullness > Tp seconds”) by the media player. *See* EX1004, 8:17-9:2, 10 (determining that the quality of playback can be sustained according to factors such as the buffer fullness exceeding the playout time threshold (Buffer Fullness > Tp seconds); EX1003, ¶ 88. A POSITA would have understood that because Leaning’s subfiles are all the same length (*i.e.*, four seconds), it would be an obvious design choice whether the Buffer Fullness was measured based on playback time or the number of contiguously available files stored by the media player. Using counters to measure the number of files in a buffer or queue was well known in the art. EX1003, ¶ 88.



EX1004, 10 (flowchart, excerpted and annotated to show the media player can go to Stepup when the performance factor $MRate > NextRate$ *only if* it determines that it is sustainable according to an amount of contiguously available files stored in buffer by first requiring “Buffer Fullness $> T_p$ ”).

To the extent that Patent Owner argues that Leaning does not teach determining that the higher quality playback can be sustained according to an amount of contiguously available files stored by the media player, a POSITA would have been motivated to configure Leaning’s media player (player program) to upshift to a higher quality copy of the video when the factor (measured rate) is greater than the first threshold (next highest rate) and the media player determines the higher quality playback can be sustained according to an amount of contiguously available files (subfiles) stored by the media player. For example, a POSITA would have understood that when sequential stream segments are present in the media player’s buffer, the available network bandwidth is sufficient to retrieve the segments at the given quality level (bit rate) and play them back without interruption, such that the higher quality level can be sustained, and there is no need to reduce the quality level (bit rate). Accordingly, a POSITA would have been motivated to factor in the presence of such stored files in the determination whether to sustain the quality level. EX1003, ¶ 89. Indeed, Leaning recognizes that automatically switching between bitrates offers a “remedy for the possibility of buffer underflow (due for

example to network congestion).” EX1004, 6:9-15. A POSITA would have had a reasonable expectation of success with such a modification because Leaning teaches that assessment and management of the buffer contents are part of the determination whether to shift or sustain quality level. EX1004, 8:17-9:2, 10; EX1003, ¶ 89.

6. Claim 6: “The end user station of claim 1, wherein the media player is further configured to anticipate file requests and to pre-request files to enable fast-forward, skip randomly, and rewind functionality.”

Leaning teaches claim 6. Leaning discloses pre-requesting files (sub-files) before playback. *See* EX1004, 5:6-6:2 (repeating the process of requesting, receiving, decoding, and storing sub-files until the contents of the buffer reach or exceed a threshold T_p and requesting a further sub-file from the server (“pre-request files”) when the buffer is below the T_p threshold). Leaning further discloses functionality for fast forward and fast reverse modes, as well as skipping randomly. *See* EX1004, 16:11-18:17, 11:12-12:17 (jumping to an arbitrary point of the video); EX1003, ¶ 90. The ’564 Patent explains, without elaboration, that “the agent controller module 402 may be configured to anticipate streamlet 212 requests and pre-request streamlets 212. By pre-requesting streamlets 212, the user may fast-forward, skip randomly, or rewind through the content and experience no buffering delay.” EX1001, 8:46-50. A POSITA would have understood from Leaning’s commensurate disclosure of pre-loading subfiles that fast-forward, skip randomly,

and rewind functionality was enabled. Moreover, a POSITA would have understood that when fast forwarding or randomly skipping to a part of the video whose subfiles already have been retrieved and are stored in the cache, or rewinding to a part of the video whose subfiles remain in the cache, then those subfiles have been pre-requested. EX1003, ¶ 91.

To the extent Patent Owner argues that Leaning does not teach anticipating file requests and pre-requesting files to enable fast-forward, skip randomly, and rewind functionality, a POSITA would have been motivated to configure Leaning's apparatus to anticipate file requests and pre-request files in order to utilize available bandwidth and ensure a sufficient buffer of data for such standard playback and control functionality. These functions were well known in the art and expected by consumers of multimedia content. *See* EX1013, 2:64-3:4 (discussing seeking to a particular point of time in on-demand multimedia content and its inherent delay); EX1003, ¶ 92. A POSITA would have had a reasonable expectation of success with such a modification because Leaning teaches preloading sub-files as well as functionality for fast-forwarding, skipping randomly, and rewinding, and these functions were well known and commonly implemented in media players in the art. *Id.*

7. **Claim 7: “The end user station of claim 1, wherein the media player is configured to initially request low quality files to enable instant playback of the video, and to subsequently upshift to a better quality copy of the video according to the performance factor.”**

Leaning teaches claim 7. Leaning teaches that the media player (player program) is configured to initially request low quality files (*e.g.*, requesting first subfile at 024k) to enable instant playback of the content file, and subsequent upshifting according to the performance factor (*e.g.*, upshifting to 032k when “measured rate” exceeds 32 kbit/s for a set period of time). *See* 1[C][1]-1[D]; EX1004, (“It then **begins to request** the audio sub-files as described earlier, **from the first-mentioned ‘rate’** directory in the index file - **viz. 024k_11_s**”; “The process from then on is that the player program **measures the actual data rate** being received from the server, averaged over a period of time”; “The player maintains two stored parameters which indicate, respectively, the current rate, and the **measured rate.**”); EX1003, ¶ 93.

Fig.3.

```
<html>
<head>

<!-- Odbits: Mode = "recorded" -->
<!-- Audio = "mp3-024k_11_s mp3-032k_11_s mp3-018k_11_s mp3-016k_11_m
mp3-008k_11_m" -->
<!-- LFI = "44" -->
<!-- SL = "178" -->
<!-- Title = "Toccata and Fugue in D minor" -->
<!-- Author = "J.S. Bach" -->
<!-- Created = "6 Nov 2000" -->
<!-- Copyright = "© 1999" -->
<!-- Comments = "One of Bach's many organ works." -->
</head>
<body>
An announcement to appear on the display
</body>
</html>
```

EX1004, FIG. 3 (annotated, showing initially requested 24 kbit/s which is lower than higher potential quality level 32 kbit/s); EX1003, ¶ 93.

8. Claim 8

- a. 8[Pre]: “A method executable by an end user station to present rate-adaptive streams received via at least one transmission control protocol (TCP) connection with a server over a network, the method comprising:”

Whether or not the preamble is limiting, Leaning teaches 8[Pre]. Leaning discloses a method executable by an end user station (terminals 3) to present rate-adaptive streams received via at least one TCP connection with a server (server 1) over a network (Internet 2); *See* 1[Pre]-1[A][2]; EX1003, ¶ 94.

- b. 8[A][1]: “streaming, by a media player operating on the end user station, a video from the server via the at least one TCP connection over the network,”**

Leaning teaches 8[A][1]. *See* 1[A][1] (media player operating on the end user station), 1[A][2] (streaming a video from the server at least one TCP connection over the network); EX1003, ¶ 95.

- c. 8[A][2]: “wherein multiple different copies of the video encoded at different bit rates are stored as multiple sets of files on the server,”**

Leaning teaches 8[A][2]. *See* 1[A][3]; EX1003, ¶ 96.

- d. 8[A][3]: “wherein each of the files yields a different portion of the video on playback,”**

Leaning teaches 8[A][3]. *See* 1[A][4]; EX1003, ¶ 97.

- e. 8[A][4]: “wherein the files across the different copies yield the same portions of the video on playback,”**

Leaning teaches 8[A][4]. *See* 1[A][5]; EX1003, ¶ 98.

- f. 8[A][5]: “and wherein each of the files comprises a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video, and wherein the streaming comprises,”**

Leaning teaches 8[A][5]. *See* 1[A][6]; EX1003, ¶ 99.

- g. 8[B]: “requesting by the media player a plurality of sequential files of one of the copies from the server based on the time indexes,”**

Leaning teaches 8[B]. *See* 1[B]; EX1003, ¶ 100.

- h. 8[C][1]: “automatically requesting by the media player from the server subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies,”**

Leaning teaches 8[C][1]. *See* 1[C][1]; EX1003, ¶ 101.

- i. 8[C][2]: “the automatically requesting including repeatedly generating a factor indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies, wherein the factor relates to the performance of the network; and”**

Leaning teaches 8[C][2]. *See* 1[C][2]; EX1003, ¶ 102.

- j. 8[C][3]: “making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files of the highest quality one of the copies determined sustainable at that time, wherein the making the successive determinations to shift comprises upshifting to a higher quality one of the different copies when the at least one factor is greater than a first threshold and downshifting to a lower quality one of the different copies when the at least one factor is less than a second threshold; and”**

Leaning teaches 8[C][3]. *See* 1[D]; EX1003, ¶ 103.

- k. 8[D]: “presenting the video by playing back the requested media files with the media player on the end user station in order of ascending playback time.”**

Leaning teaches 8[D]. *See* 1[E]; EX1003, ¶ 104.

9. **Claim 9: “The method of claim 8, wherein the at least one TCP connection comprises a plurality of different TCP connections, and wherein the requesting the plurality of sequential files includes requesting sub-parts of the files over different ones of the plurality of different TCP connections, and wherein said presenting includes reassembling the files from the received sub-parts.”**

Leaning teaches claim 9. *See* claim 2 (establishing multiple TCP connections).

A POSITA would have been motivated to configure Leaning’s apparatus to request sub-parts of the files (subfiles) over different TCP connections and reassemble the files from the received subparts. A POSITA would have understood that this improves reliability in situations where one connection fails by retrieving other subparts over other connections and retrieving more file data more quickly. A POSITA also would have understood that it takes advantage of available bandwidth by parallelizing retrieval of a segment to increase throughput where an individual TCP connection’s maximum throughput is the bottleneck. EX1003, ¶ 105. A POSITA would have had a reasonable expectation of success with such a modification because the TCP protocol allows for multiple connections through the use of different port number combinations, and utilizing multiple connections to request and retrieve different parts of a single file was well known. *Id.*

10. Claim 10: “The method of claim 8, wherein said making the successive determinations to shift comprises: determining if the higher quality playback can be sustained.”

Leaning teaches claim 10. *See* claim 4, 1[C][1] (successive determinations to shift quality higher), 1[D] (upshifting to the higher quality copy when the factor is greater than the first threshold), 1[C][2] (determining that the quality of playback can be sustained according to a combination of factors such as measured data rate and buffer fullness); EX1003, ¶ 106.

11. Claim 11: “The method of claim 8, wherein the at least one TCP connection comprises a plurality of different TCP connections, and wherein the automatically requesting includes requesting sub-parts of the files over different ones of the plurality of TCP connections, and wherein said presenting includes reassembling the files from the received sub-parts, and wherein the factor is indicative of the available bandwidth of the plurality of TCP connections.”

Leaning teaches claim 11. *See* 1[A][2] (establishing TCP connection), 1[C][2] (factor indicative of available bandwidth); claims 2, 9 (establishing multiple TCP connections, requesting sub-parts over different connections, and reassembling files from sub-parts). A POSITA would have understood requesting subparts over different TCP connections and reassembling them into files in connection with both (initial) requests (as in claim 9) and automatic requests of subsequent portions (as in claim 11), as requesting and reassembling subparts of a subfile is agnostic as to the subfile’s time index in relation to the beginning of the video. EX1003, ¶ 107.

12. Claim 12: “The method of claim 8, wherein the factor is indicative of latency of the requested files, wherein the latency is a time measure between when one of the requests is issued and a time that response data of the request begins to arrive at the end user station.”

Leaning teaches claim 12. As explained in connection with element 1[C][2], one of the factors Leaning teaches is the “measured rate.” This factor is measured “by timing every URL request” and determining “the transfer rate achieved (number of bits per second) between the client and server,” “averaged over a period of time (for example 30 seconds).” EX1004, 8:11-14. Because the measured rate accounts for the timing of both the request and the response, a POSITA would have understood that this factor is a measure of latency (timing of the request) and network bandwidth (rate of the response), and as such is “indicative of “latency of the requested files [subfiles], wherein the latency is a time measure between when one of the requests is issued and a time that response data of the request begins to arrive at the end user station [terminal].” EX1003, ¶ 108.

To the extent that Patent Owner argues that Leaning does not teach that the factor is indicative of latency measured as a time measure between when one of the requests is issued and a time that response data of the request begins to arrive at the end user station, a POSITA would have been motivated to configure the performance factor to be indicative of such a latency measure. For example, a POSITA would have understood that the time difference between a request and the beginning of

arrival of response data impacts streaming performance and could reflect network conditions such as congestion, whereby a larger time difference increases the risk of interrupted playback because there is less time to retrieve a requested file before it is needed to be played back. Furthermore, it would have been obvious to a POSITA that the initial latency represents when the start of the reply to the sub-file request would be received, and this latency is an important factor in considering when the requested sub-file will be initially available for playback. As such, a POSITA would have been motivated to repeatedly monitor and factor such latency in the determination whether to shift quality. EX1003, ¶ 109. A POSITA would have had a reasonable expectation of success with such a modification because Leaning teaches timing the URL requests, and monitoring streaming performance and network conditions such as latency was well known. EX1004, 8:13, 10; EX1003, ¶ 109.

13. Claim 13: “The method of claim 8, wherein the factor is indicative of time intervals between successive receive times for each response to the requested files.”

Leaning teaches claim 13. As explained in connection with claim 12, one of the factors Leaning teaches is the “measured rate,” which is measured “by timing every URL request” and determining “the transfer rate achieved (number of bits per second) between the client and server,” “averaged over a period of time (for example 30 seconds).” EX1004, 8:11-14. Because the measured rate reflects multiple

measurements of request and response, a POSITA would have understood that this factor is indicative of time intervals between successive receive times for each response to the requested files (subfiles). EX1003, ¶ 110.

To the extent that Patent Owner argues that Leaning does not teach that the factor is indicative of time intervals between successive receive times for each response to the requested files, a POSITA would have been motivated to configure the performance factor to be indicative of such time intervals. For example, a POSITA would have understood that the interval between successive receive times data impacts streaming performance and could reflect network conditions such as congestion, whereby a larger interval increases the risk of interrupted playback because there is less time to retrieve a given file and the next file before they are played back. As such, a POSITA would have been motivated to repeatedly monitor and factor such intervals between receive times in the determination whether to shift quality. EX1003, ¶ 111. A POSITA would have had a reasonable expectation of success with such a modification because Leaning teaches timing the URL requests and measuring response rates, which for known bit rates are indicative of response times, and monitoring streaming performance and network conditions was known. EX1004, 8:11-14, 10; EX1003, ¶ 111.

As an additional example, a POSITA was aware of network jitter—
“variability in the rate at which data is transmitted through a network” (EX1013,

2:46-47)—as a factor indicative of time intervals between successive receive times. EX1003, ¶ 112. A POSITA knew to utilize it as a performance factor because large jitter could result in a buffer underflow and necessitate a lower quality level, *i.e.*, an inability to sustain the current level. EX1003, ¶ 112. A POSITA would have had a reasonable expectation of success because adapting to network conditions such as jitter was well known and consistent with Leaning’s teaching of utilizing adaptive bitrate streaming to remedy problems caused by network conditions such as congestion. *See* EX1004, 8:9-12; EX1003, ¶ 112.

14. Claim 14: “The method of claim 8, wherein the factor is indicative of delays or losses in one or more of the at least one TCP connection.”

Leaning teaches claim 14. As explained in connection with element 1[C][2], one of the factors Leaning teaches is “Buffer Low Percentage,” which reflects how often the buffer contents are close to empty. Leaning teaches that buffer underflow can be caused by network congestion, which its disclosure of adaptive bitrate streaming is designed to remedy. *See* EX1004, 6:10-12. Accordingly, a POSITA would have understood that this factor is indicative of congestion and thus delays or losses in the one or more TCP connections. EX1003, ¶ 113.

15. Claim 15: “The method of claim 8, wherein the server is a web server, and wherein the files are requested from the web server using Hyper Text Transfer Protocol (HTTP) messages sent via the at least one TCP connection.”

Leaning teaches claim 15. *See* EX1004, 2:5-32 (“the network is the internet or other packet network operating in accordance with the **Hypertext Transfer Protocol** (see RFCs 1945/2068 for details)”; “**http://** . . . for the **hypertext transfer protocol**”; “In these examples, the use of the **hypertext transfer protocol** is assumed”; “Conventionally, a server for delivery of MP3 files takes the form of a so-called streamer which includes processing arrangements for the dynamic control of the rate at which data are transmitted . . . , for the masking of errors due to packet loss and . . . the control of the flow of data between server and client; **here however the server 1 need contain no such provision.** Thus it is **merely an ordinary ‘web server’.**”); 1[A][2] (TCP connection); EX1003, ¶ 114.

16. Claim 16: “The method of claim 8, wherein the server comprises a cache server of a network infrastructure operator.”

Leaning teaches claim 16. Patent Owner admits that “[u]se of cache servers is well known to those skilled in the art, and will not be discussed further herein.” EX1001, 8:6-10; *see* Section VIII.A; EX1003, ¶ 115. A POSITA would have been motivated to configure Leaning’s apparatus to connect to a cache server in order to improve and increase reliability of response time and performance as compared to

connecting to a webserver. EX1003, ¶ 115. A POSITA would have had a reasonable expectation of success with such a modification because the cache servers were well known, as admitted by Patent Owner, and implemented by ISPs and other network infrastructure operators in common networking protocols as alternatives to webserver, and Leaning teaches that “other . . . networks can be used” besides the Internet. EX1004, 2:9-11; EX1003, ¶ 115.

B. Ground 2: Claims 9 and 11 Would Have Been Obvious in view of Leaning and Gamble

Claims 9 and 11 depend from or recite (in part) similar subject matter to claims discussed in Ground 1. The sections of Ground 1 (Section IX.A) are incorporated into this section by reference.

- 1. Claim 9: “The method of claim 8, wherein the at least one TCP connection comprises a plurality of different TCP connections, and wherein the requesting the plurality of sequential files includes requesting sub-parts of the files over different ones of the plurality of different TCP connections, and wherein said presenting includes reassembling the files from the received sub-parts.”**

Leaning and Gamble teach claim 9. Leaning teaches that the at least one TCP connection over which the files are requested comprises a plurality of TCP connections. *See* claim 2. Gamble teaches sub-parts of a plurality of files that are requested over a plurality of TCP connections and reassembled. Gamble discloses a network application 112 operating on a client 106 that creates a receive buffer 706

to store a plurality of N segments (here, N=4) from stream files 706₁ through 706₄ received over N parallel connections from server 108. EX1020, ¶¶ 50-51. The receive buffer 706 includes multiple sub-buffers B1 through B4 to store N(=4) segments of a data file 702A that are respectively streamed out of stream files 706₁ through 706₄. *Id.* ¶ 51. The segments in the receive buffer 706 are ordered into a data file 702B to match the order in data file 702A, and the process continues until all segments have been received and ordered. *Id.*, ¶ 52; *see also* ¶ 40. Gamble explains that the TCP layer 312 of the network connection operating on the client 106 acknowledges and reorders packets and can send packets on multiple or parallel connections. *Id.*, ¶ 37; EX1003, ¶ 117.

A POSITA would have been motivated to configure Leaning's apparatus to request sub-parts of the files (subfiles) over different TCP connections and reassemble the files from the received subparts, such as taught by Gamble. A POSITA would have understood that this improves reliability in situations where one connection fails by retrieving other subparts over other connections and retrieving more file data more quickly. A POSITA also would have understood that it takes advantage of available bandwidth by parallelizing retrieval of a segment to increase throughput where an individual TCP connection's maximum throughput is the bottleneck. EX1003, ¶ 118. A POSITA would have had a reasonable expectation of success with such a modification because the TCP protocol allows for multiple

connections, and utilizing multiple connections to request and retrieve different parts of a single file was well known, as exemplified by Gamble. *Id.*

2. **Claim 11: “The method of claim 8, wherein the at least one TCP connection comprises a plurality of different TCP connections, and wherein the automatically requesting includes requesting sub-parts of the files over different ones of the plurality of TCP connections, and wherein said presenting includes reassembling the files from the received sub-parts, and wherein the factor is indicative of the available bandwidth of the plurality of TCP connections.”**

Leaning and Gamble teach claim 11. *See* 1[A][2] (establishing TCP connection), 1[C][2] (factor indicative of available bandwidth), claim 2, Ground 2 claim 9 (establishing multiple TCP connections, requesting sub-parts over different connections, and reassembling files from sub-parts), Ground 1 claim 11 (requesting and automatically requesting sub-parts); EX1003, ¶ 119.

X. GRAHAM FACTORS (NO SECONDARY CONSIDERATIONS)

The first three *Graham* factors were discussed for each ground, including the scope of the prior art, the prior art as compared to the claims, and the level of ordinary skill in the pertinent art. *See* Sections V-IX.

For the last factor, secondary considerations, Patent Owner cannot show any nexus to the claim language. Petitioner acknowledges that the ALJ in the ITC Investigation accepted Patent Owner’s argument that there was a presumption of a nexus between the claims that were asserted in the ITC Investigation and the Move

Media Player (which was acquired by DISH) and ultimately found certain secondary considerations. EX1009, 212-213. DISH argued that respondents conceded that the Move Media Player embodied the claimed invention because respondents argued that a public use of Move Media Player in 2005 was an invalidating use meeting each and every element of the asserted claims. *Id.*, 212. The ALJ accepted this argument and also found that DISH's expert demonstrated that Move's success is tied to the unique characteristics of the claimed invention including "offering 'a smooth end user experience as the Move Media Player up-shifts and down-shifts in response to network and client CPU availability'" and streaming using "simple HTTP protocol transfer of media files from standard Web servers rather than deployment of expensive media servers," which reduce cost and complexity. *Id.*, 213.

Petitioner submits that these findings are incorrect. First, Petitioner has not made any claims that prior use of the Move Media Player was an invalidating public use and thus the ALJ's findings regarding the concession that Move Media Player meets the claims does not apply to Petitioner.

Second, Petitioner disagrees that the Move Media Player has a nexus to the '564 Patent because any of Move's success is not tied to unique characteristics of the claimed invention. As the prior art discussed in the Grounds above shows, the purportedly unique and successful aspects of the Move system that the ALJ relied on to find a nexus were already in existence in the prior art and thus cannot form the

basis of any nexus to the claimed invention. *See Yita LLC v. MacNeil IP LLC*, 69 F.4th 1356, 1364 (Fed. Cir. 2023) (“[O]ur case law makes clear that objective evidence of nonobviousness lacks a nexus if it exclusively relates to a feature that was *known* in the prior art—not necessarily well-known”) (emphasis in original) (internal citations and quotations omitted).

More specifically, the purported “unique” claimed feature of “a smooth end user experience” that “up-shifts and down-shifts in response to network and client CPU availability,” was already present in the prior art. For example, Leaning discloses upshifting and downshifting quality of the stream in response to, for example, network congestion to ensure a smooth and uninterrupted stream. *See, e.g.*, Section IX.A.1 Ground 1 claims 1[C][1]-1[D].

Additionally, the alleged “unique” claimed feature of “use of simple HTTP protocol transfer of media files from standard Web servers rather than deployment of expensive media servers” cannot be a basis for finding a nexus explained in the Grounds above, at least Leaning discloses using simple HTTP protocol for clients to request transfer of files from standard web servers, rather than specialized media servers. *See* Section IX.A.1 Ground 1 claims 1[C][1]; EX1004, 2:9-32, 3:19-4:3.

Additionally, the alleged “unique” claimed feature of “use of simple HTTP protocol transfer of media files from standard Web servers rather than deployment of expensive media servers” cannot be a basis for finding a nexus because at least

Leaning discloses using simple HTTP protocol for clients to request transfer of files from standard web servers, rather than specialized media servers. *See, e.g.*, EX1004, 2:9-32, 3:19-4:3.

Thus, Patent Owner has not shown any nexus to the claim language.

XI. NO BASIS FOR DISCRETIONARY DENIAL

A. § 314(a): *Fintiv* and *General Plastic* Factors Favor Institution

1. *Fintiv* Factors

The six *Fintiv* factors weigh against discretionary denial. *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11, at 6 (PTAB Mar. 20, 2020).

First Factor. This factor is neutral because Petitioner has not yet moved to stay the District Court Litigations pending IPR.

Second Factor. This factor favors institution as a Final Written Decision is likely before a trial occurs given no trial date is yet scheduled for either of the District Court Litigations.

Third Factor. This factor favors institution given the District Court Litigations are in their earliest stages. Defendants filed a motion to dismiss or transfer in the '552 Utah Litigation on January 24, 2024—no schedule has been set. DISH filed the '066 Utah Litigation on January 24, 2024. There has been no answer and no schedule has yet been set.

Fourth Factor. This factor favors institution. Petitioner stipulates that if this '564 Patent IPR is instituted, Petitioner will not pursue invalidity grounds in the District Court Litigations of the Challenged Claims on any ground raised, or that could have been reasonably raised in this IPR for the Challenged Claims. *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12, at 18-19 (PTAB Dec. 1, 2020).

Fifth Factor. This factor should be accorded little weight or is neutral given the Petitioner (and its RPIs) and Patent Owner are the same parties as in the District Court Litigations.

Sixth Factor. Petitioner's merits are strong as demonstrated by the above Grounds and supporting Houh declaration.

2. General Plastic Factors

Additionally, the *Gen. Plastic Indus. Co. v. Canon Kabushiki Kaisha* factors weigh against discretionary denial. IPR2016-01357, Paper 19, at 16-18 (PTAB Sept. 6, 2017).

First Factor. This factor favors institution or is at least neutral. Although many of the same claims were challenged in a prior petition by Petitioner (in the Ogdon-based IPR), in the instant petition, Petitioner additionally challenges claims 9 and 11—which were not challenged in the Ogdon-based IPR. *See Tesla, Inc. v. Charge Fusion Tech., LLC*, IPR2023-00062, Paper 13 at 9 (PTAB May 11, 2023)

(finding Factor 1 weighed in favor of institution of follow-on petition where “fewer claims were challenged in” the prior petition).

Second Factor. This factor favors institution. Petitioner has been diligent in searching for prior art and first became aware of the primary reference Leaning on Friday January 5, 2024. Once Leaning was discovered and sufficiently analyzed, Petitioner immediately and diligently proceeded to draft and file this Leaning-based Petition and Leaning-based petitions for seven other related patents (*See* Section II.B). Despite Leaning’s strength as an invalidating reference, it was not discovered or relied upon by any USPTO examiners, the respondents at the ITC, or prior targets of DISH’s district court assertions of related patents to the ’564 Patent. This supports finding that there was no reason that Petitioner should have known of Leaning at the time of filing the Ogdon-based IPR.

Although the ’564 Patent cites on its face US2004/0030547 (also to Leaning et al.) published just two months before the alleged Priority Date and titled “Encoding Audio Signals” with claims and Abstract drawn to encoding of audio signals, it is not in the same family as the Leaning reference relied upon in this Petition. Running a family search on the cited US2004/0030547 does not turn up this Leaning reference. Further, the US2004/0030547 reference is just one of 345 references cited on the face of the ’564 Patent (EX1001, 1-4) and it was never used by the Examiner or identified by the Applicant during prosecution of the ’564 Patent

or any related patents other than being cited in an IDS. Therefore, Petitioner discovered Leaning within a reasonable period of time and was diligent in filing this petition.

Third Factor. This factor favors institution or is neutral. As explained above, Petitioner only discovered the Leaning reference 13 days before the POPR was due for the Ogdon-based IPR. Petitioner promptly reviewed Leaning and diligently began drafting the instant Petition (and seven other Leaning-based petitions) on January 10, 2024 and filed the instant Petition and the other seven Leaning-based petitions as soon as reasonably possible and only 12 days after DISH submitted its POPR in the Ogdon-based IPR. Further, DISH’s POPR arguments were directed to the Ogdon reference—not Leaning. Thus Petitioner did not and could not use it as a “roadmap” for this Leaning-based petition. *See LG Elecs., Inc. v. Bell N. Rsch., LLC*, IPR2020-0319, Paper 15 (PTAB June 23, 2020) (rejecting Patent Owner’s arguments that Petitioner used knowledge gained from the POPR to improve the petition where the Board could “not discern specific arguments in the current petition that are in response to arguments made in a prior preliminary response”).

Fourth Factor. This factor favors institution. Petitioner filed this Petition shortly after discovering Leaning and worked diligently to draft the instant Petition (and seven other Leaning-based petitions).

Fifth Factor. This factor favors institution. Petitioner has adequately explained its diligence since discovering the Leaning reference.

Sixth Factor. This factor favors institution or is at least neutral. Although the instant Leaning-based Petition was filed shortly after the POPR in the Ogdon-based IPR, these two petitions collectively consist of only two primary references. Given the at least seven other district court litigations where DISH has asserted the '564 Patent against parties not related to Petitioner, and given the strength of Leaning as an invalidating reference, it is highly likely that if the Board exercises its discretion to deny this Petition the Board will see a similar or copycat Leaning-based petition in the future from one or more of these other parties.

Seventh Factor. This factor is neutral. Any trial in the present proceeding could be resolved within the one-year statutory timeframe.

B. § 325(d): *Advanced Bionics* Favors Institution

Denial under § 325(d) is not warranted under *Advanced Bionics*' two-factor test. *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6, at 8 (PTAB Feb. 13, 2020).

The first factor of whether the "same or substantially the same prior art or arguments previously were presented to the Office" (*id.*) is not met because the specific grounds here were not considered during prosecution of the '564 Patent. Leaning is not cited on the face of the '564 Patent. As noted above, the '564 Patent

does cite on its face US2004/0030547 (also to Leaning et al.) titled “Encoding Audio Signals” with abstract and claims drawn to encoding of audio signals, but US2004/0030547 is not in the same family as the PCT Leaning reference relied upon in this Petition. Even though the cited US2004/0030547 does have overlapping disclosures with Leaning, Leaning has relevant disclosures in the Abstract, specification, and published claims directed to subject matter such as a terminal for playing streaming audio or video from a remote server that are not disclosed in US2004/0030547 and that are relied upon in this Petition such that US2004/0030547 is not cumulative of Leaning.

As Ground 1 above demonstrates, Leaning teaches each and every limitation of every claim in the ’564 Patent. *See* Section IX.A. Additionally, as Ground 2 demonstrates, Leaning in view of Gamble teaches each and every limitation of claims 9 and 11 in the ’564 Patent. *See* Section IX.B.

Moreover, US2004/0030547 was listed in an IDS during prosecution of the ’564 Patent along with 309 other references and is one of 345 references on the face of the ’564 Patent. EX1002, 7-53; EX1001, 1-4. But other than the Examiner generally stamping that every reference in the IDS was considered (EX1002, 181), there is no evidence that the Examiner actually considered the disclosures of US2004/0030547; it was never used in a rejection and never addressed in the prosecution history of the ’564 Patent or any related patents.

XII. CONCLUSION

Petitioner requests *inter partes* review and cancellation of claims 1-16.

DATED: January 30, 2024

Respectfully submitted,

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CERTIFICATION OF COMPLIANCE UNDER 37 CFR § 42.24(d)

Pursuant to 37 C.F.R. §42.24(d), Petitioner certifies that this Petition for *Inter Partes* Review has total 13,834 words as counted by Microsoft Word, exclusive of the table of contents, table of authorities, mandatory notices under § 42.8, certificate of service, word count, and appendix of exhibits or claim listing (37 C.F.R. § 42.24(a)). This is within the 14,000 word limit allowed under § 42.24(a)(1)(i).

DATED: January 30, 2024

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CERTIFICATE OF SERVICE

I hereby certify that on January 30, 2024 I caused a true and correct copy of the foregoing materials:

- Petition for *Inter Partes* Review of U.S. Patent 9,407,564
- Exhibits
- Petitioner's Power of Attorney

to be served via overnight delivery on the USPTO Patent Center (PAIR)

Correspondence Address for U.S. Patent 9,407,564 as follows:

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I also caused a courtesy copy of the foregoing materials to be served via email on DISH's counsel of record in the district court litigation:

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