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 11,991,234
Issue Date: May 21, 2024
Title: APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE CONTENT STREAMING

Inter Partes Review No. IPR2024-00940

PETITION 1 of 2 FOR *INTER PARTES* REVIEW OF U.S. PATENT 11,991,234 CHALLENGING CLAIMS 1-20 UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. § 42.1 *et seq.*

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Exhibit Number	Description
1001	U.S. Pat. 11,991,234 ("the '234 Patent")
1002	File History of the '234 Patent
1003	Declaration of Dr. Henry Houh including Curriculum Vitae ("Houh declaration")
1004	International P.C.T. Publication WO 2002049343 to Leaning et al. ("Leaning")
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1006	U.S. Patent Publication No. 2003/0236906 to Klements ("Klements")
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	Internet Archive Affidavit for URLs including EX1019
1012	Gourley, David, and Brian Totty. HTTP: the definitive guide. O'Reilly Media, Inc., 2002 ("Gourley"). available at https://archive.org/details/httpdefinitivegu00gour/page/n1/mode/2up.
1013	Patent Owner Preliminary Response in IPR2024-00514
1014	DISH May 7, 2024 letter in support of its motion for leave to file first amended complaint in *DISH Technologies L.L.C. et. Al. v. fuboTV Media Inc*., 1:23-cv-00986-GBW (D. Del.)
1015	Excerpted transcript from March 27, 2024 hearing at United Kingdom High Court of Justice in *DISH Technologies, L.L.C. et al. v. Aylo Premium Ltd et al*., Claim No. HP-2023-000043
1016	File History of U.S. Pat. No. 11,470,138 ("'138 Patent")
1017	Petition for IPR in IPR2024-00512
1018	File History of U.S. Pat. No. 8,868,772
1019	HTTP 1.1 Protocol - RCF2616 (https://web.archive.org/web/20020802040147/https://www.ietf.org/rfc/rfc2616.txt)
1020	U.S. Patent Publication No. 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 comprising:
1[A][1]	a client module configured to be connected to a network having at least one server and further configured to request digital content over the network via at least one transmission control protocol (TCP) connection,
1[A][2]	wherein at least two different copies of the digital content are each encoded at different bit rates and stored on the at least one server,
1[A][3]	wherein each copy of the digital content is divided into a plurality of streamlets, each of the plurality of streamlets of a corresponding copy comprising a different portion of the digital content during presentation,
1[A][4]	wherein corresponding streamlets across the at least two different copies comprise the same corresponding portions of the digital content during presentation,
1[A][5]	and wherein the client module streams the digital content by:
1[B]	requesting a first streamlet from the at least one server;
1[C][1]	automatically requesting from the at least one server subsequent portions of the digital content by requesting for each subsequent portion of the streamlets from the different copies of the digital content dependent upon successive determinations by the client module to change a currently requested bit rate to a higher or lower bit rate, the automatically requesting including
1[C][2]	repeatedly generating a factor indicative of a current ability to receive digital content at a rate sufficient for presenting the digital content as the digital content is received;
1[D]	making the successive determinations to change the digital content bit rate based on the factor using the streamlets of one of the different copies of the digital content having the highest bit rate determined receivable for presentation so that the client module selects a higher bit rate one of the different copies when the factor is greater than a first threshold and selects a lower bit rate one of the different copies when the factor is less than a second threshold; and

1[E]	arranging the streamlets requested from the at least one server in order of ascending presentation time for output to a presentation device.
Claim 2	
[2]	The end user station of claim 1, wherein at least some streamlets are requested from the at least one server via a hypertext transfer protocol (HTTP) GET request.
Claim 3	
[3]	The end user station of claim 1 wherein the at least one server comprises at least two servers and wherein at least one streamlet is requested from a first of the at least one server and at least one other streamlet is requested from a second server of the at least one server other than the first server.
Claim 4	
[4]	The end user station of claim 1, wherein the client module repeatedly generates the factor based on a moving time window.
Claim 5	
[5]	The end user station of claim 1, wherein the client module generates the factor based on a current read ahead margin.
Claim 6	
[6]	The end user station of claim 1, wherein a first streamlet of each copy of the digital content has the same first duration and corresponds to a same first temporal portion of the digital content, wherein a second streamlet of each copy of the digital content have the same duration and correspond to a same second temporal position of the digital content.
Claim 7	
[7]	The end user station of claim 6, wherein the first and second duration of the first streamlets of each copy are different from the durations of the second streamlets of each copy.
Claim 8	
[8]	The end user station of claim 6, wherein each of the first streamlets has a first duration that is a range of 0.1 to 5 seconds
Claim 9	
[9]	The end user station of claim 1, wherein the client module is further configured to transmit at least one virtual timeline request to retrieve a virtual timeline corresponding to the digital content and to receive the virtual timeline from the at least one server; and arrange the

	streamlets requested from the at least one server using the virtual timeline.
Claim 10	
[10]	The end user station of claim 1, wherein the client module is further configured to output the streamlets requested from the at least one server to the presentation device in the order of ascending presentation time.
Claim 11	
[11]	11. The end user station of claim 1, further comprising the presentation device to display the streamlets in the order of ascending presentation time.
Claim 12	
12[Pre]	A method executable by a client device to output rate-adaptive streams received via at least one transmission control protocol (RCP) [sic] connection with at least one server over a network, the method comprising:
12[A][1]	receiving, by the client device, digital content from the at least one server via the at least one TCP connection over the network,
12[A][2]	wherein multiple different copies of the digital content encoded at different bit rates are stored as individually-requestable portions on the at least one server,
12[A][3]	wherein each of the individually-requestable portions of a corresponding copy of the digital content is a different portion of the digital content during presentation,
12[A][4]	wherein the individually requestable portions across the different copies yield the same portions of the digital content upon presentation, and wherein the receiving comprises:
12[B]	requesting by the client device a plurality of sequential individually-requestable portions of one of the copies from the at least one server;
12[C][1]	automatically requesting by the client device from the at least one server subsequent portions of the digital content by requesting for each such portion one of the individually-requestable portions from one of the copies dependent upon successive determinations by the client device to change a requested bit rate to a higher or lower bit rate one of the different copies, the automatically requesting including
12[C][2]	repeatedly generating a factor indicative of a current ability to receive the digital content at a rate sufficient for presenting the digital content

	as the digital content is received, individually-requestable wherein the factor relates to a performance of the network; and
12[D]	making the successive determinations whether to change the requested bit rate based on the factor to achieve continuous presentation of the digital content using the individually-requestable portions of the highest bit rate one of the copies determined receivable at that time at a rate sufficient for presenting the digital content as the individually-requestable portions of the digital content are received, wherein the making of the successive determinations to change the requested bit rate comprises: requesting a subsequent individually-requestable portion from a higher bit rate one of the different copies than a currently requested one of the different copies when the at least one factor is greater than a first threshold; and requesting a subsequent individually-requestable portion from a lower bit rate one of the different copies than the currently requested one of the different copies when the at least one factor is less than a second threshold; and
12[E]	arranging the individually-requestable portions requested from the at least one server in order of ascending presentation time for output to a presentation device.
Claim 13	
[13]	The method of claim 12 wherein the automatically requesting comprises requesting at least some individually requestable portions via a hypertext transfer protocol (HTTP) GET request.
Claim 14	
[14]	The method of claim 12 wherein the at least one server comprises at least two servers and wherein the client device requests at least one streamlet from a first server of the at least two servers and at least one other streamlet from a second server of the at least two servers other than the first server.
Claim 15	
[15]	The method of claim 12, wherein the digital content is stored on the at least one server in a plurality of streamlets, each of the plurality of streamlets corresponding to a different temporal portion of said digital content and wherein each of the individually-requestable portions is requestable by the client device without regard to whether the client device has previously requested other individually requestable portions of the digital content.
Claim 16	

[16]	The method of claim 12, wherein the at least one TCP connection comprises a plurality of different TCP connections, and wherein the requesting of the plurality of sequential individually-requestable portions includes requesting sub-parts of the individually-requestable portions over different ones of the plurality of different TCP connections, and wherein the arranging includes reassembling the individually-requestable portions from the requested sub-parts.
Claim 17	
[17]	The method of claim 12, wherein the making the successive determinations to change the requested bit rate comprises: determining if the higher bit rate one of the different copies can be received at a rate sufficient for presenting the digital content as the digital content is received.
Claim 18	
[18]	The method of claim 12, wherein the factor is indicative of a delay or a loss in one or more of the at least one TCP connections.
Claim 19	
[19]	The method of claim 12, wherein the at least one server comprises a cache server of a network infrastructure operator.
Claim 20	
[20]	The method of claim 12, further comprising: outputting the received content to the presentation device.

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 1-20 ("Challenged Claims") of U.S. Patent No. 11,991,234 ("the '234 Patent") (EX1001). The '234 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 '234 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 '234 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 day the '234 Patent issued DISH asserted all claims 1-20 against Petitioner in an amended complaint in *DISH Technologies LLC et al v. Aylo*

Freesites Ltd. f/k/a MG Freesites Ltd. et al. 2:24-cv-00066 (D. Utah). Along with the instant petition ("the Leaning-based petition"), petitioner is filing a #2 ranked petition challenging all Challenged Claims based on the reference Ogdon (IPR2024-00941 "Ogdon-based petition"). Petitioner ranks the instant Leaning-based petition #1 for purposes of review and the Ogdon-based petition #2. *See* Ranking Notice.

Patents related to the '234 Patent are currently asserted in the below proceedings.

- *Aylo Freesites Ltd. f/k/a MG Freesites Ltd. v. DISH Technologies LLC et al*. 1-24-cv-00086 (D. Del.);
- *DISH Technologies LLC et al v. Aylo Freesites Ltd. f/k/a MG Freesites Ltd. et al*. 2:24-cv-00066 (D. Utah);
- *DISH Technologies LLC v. Yanka Industries, Inc. d/b/a MasterClass* 1-23-cv-01305 (D. Del.);
- *DISH Technologies LLC et al v. BritBox*, LLC 1-23-cv-08971 (S.D.N.Y.);
- *DISH Technologies LLC et al v. Vidgo Inc.* 2-23-cv-00624 (D. Utah);
- *DISH Technologies LLC v. fuboTV Media Inc*. 1-23-cv-00986 (D. Del.);
- *DISH Technologies LLC et al v. MG Premium Limited et al.* 2-23-cv-00552 (D. Utah);
- *DISH Technologies L.L.C. et al v. WebGroup Czech Republic A.S. et al*. 2-23-cv-00553 (D. Utah).

Petitioner has also pending IPRs on related U.S. Patent Nos. 8,868,772 (IPR2024-00519); 11,470,138 (IPR2024-00044 and IPR2024-00512); 10,469,554 (IPR2024-00045 and IPR2024-00514); 10,951,680 (IPR2024-00046 and IPR2024-00516); 9,407,564 (IPR2024-00518); 11,677,798 (IPR2024-00043 and IPR2024-00517); 10,469,555 (IPR2024-00146 and IPR2024-00515); and 10,757,156 (IPR2024-00513). Unrelated parties to Petitioner have recently filed "copycat" petitions and moved to join certain of these IPR proceedings in IPR2024-00901, -00902, -00903, -00904, -00905, -00917, -00918, and -00919.

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 ’234 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 1-20 based on the grounds below.

Ground	Reference(s)	Challenged Claims	Basis
1	Leaning	1-15 and 17-20	103
2	Leaning and Klements	1-15 and 17-20	103
3	Leaning (with or without Klements) and Gamble	16	103

These Grounds are supported by the Declaration of Dr. Henry Houh (EX1003) and other supporting evidence in the Exhibit List. EX1003, ¶¶ 47-48.

V. ’234 PATENT

A. Summary

The ’234 Patent (Application No. 18/069,450) was filed on December 21, 2022. The ’234 Patent purports to relate to “multi-bitrate content streaming,” such as video, over the Internet. EX1001, Abstract, 1:35-38. The ’234 Patent describes “a receiving module” to “capture media content,” a streamlet module to “segment the media content and generate a plurality of streamlets,” and “encoding module” to “generate a set of streamlets” such that the set of streamlets has a plurality of

streamlets "having identical time indices and durations" and "a unique bitrate." *Id.*, Abstract.

One embodiment of the system of the '234 Patent includes "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, 6:39-50. The '234 Patent describes encoding the same content file 200 into at least three different "quality" streams:

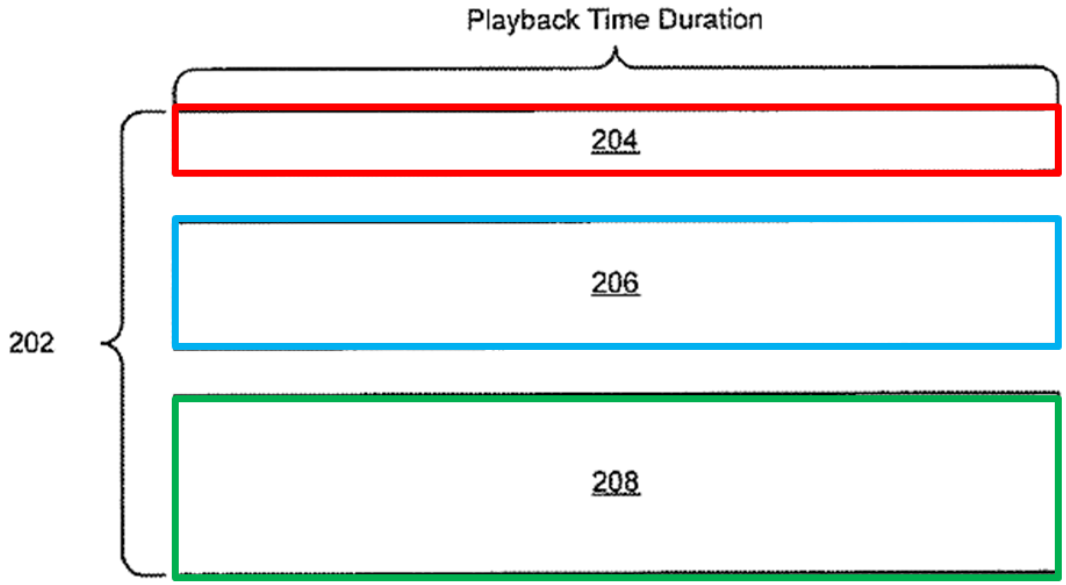

FIG. 2b

Id., FIG. 2b (annotated, low quality (red, 204), medium quality (blue, 206), and high quality (green, 208)), 7:28-34.

For example, "low quality stream 204 may be encoded and compressed to a bit rate of 100 kilobits per second (kbps), the medium quality stream 206 may be

encoded and compressed to a bit rate of 200 kbps, and the high quality stream 208 may be encoded and compressed to 600 kbps." *Id.*, 7:33-39.

Each stream (204, 206, and 208) is also "divided into a plurality of source streamlets 303" where "streamlet refers to any sized portion of the content file" and may be "an independent media object" 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.*, 7:39-52.

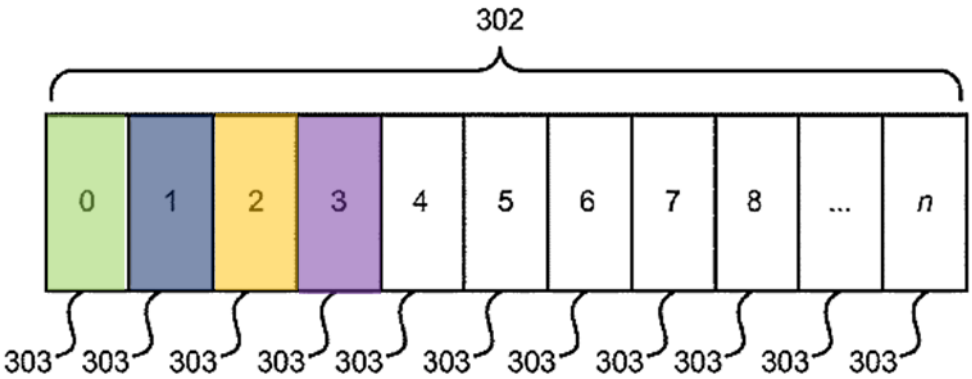

FIG. 3a

Id., FIG. 3a (annotated).

These streamlets form "sets" of streamlets 306 wherein a "set" is "a group of streamlets having identical time indices and durations but varying bitrates." *Id.*, 7:60-62.

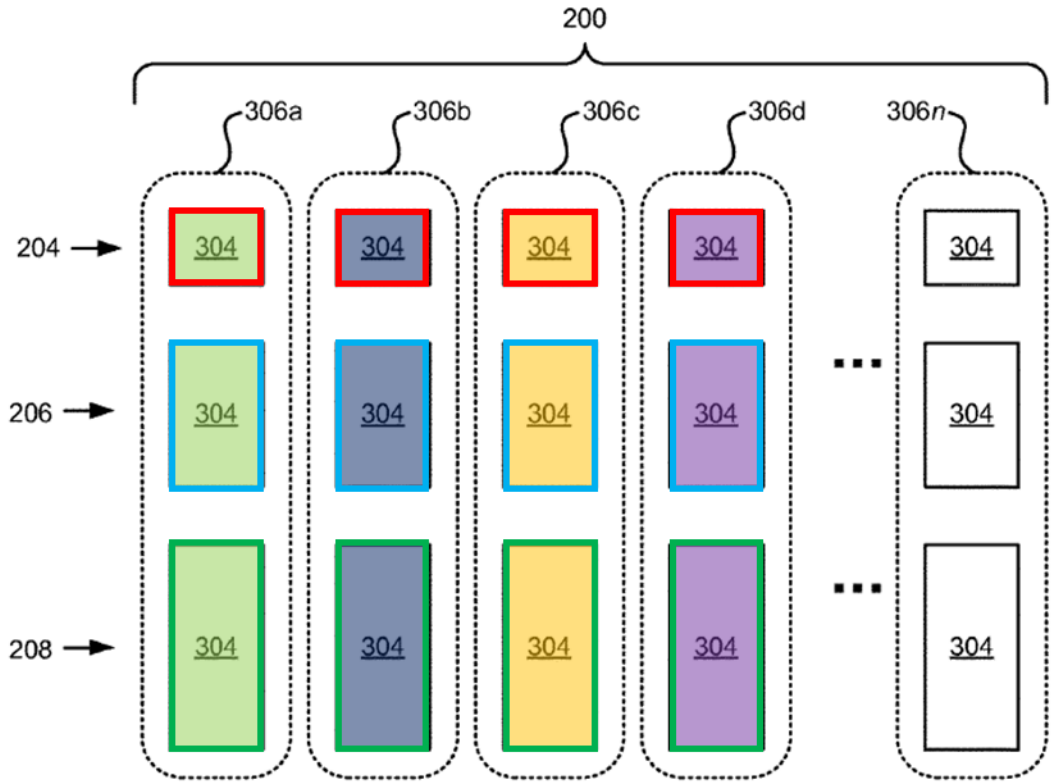

FIG. 3b

Id., FIG. 3b (annotated, showing low, medium, and high quality streamlets in each "set" of streamlets" 306a-d).

These sets of streamlets are stored in a streamlet database 408 and then a "client module 114 may request streamlets 304 using HTTP from the web server 116" or "a plurality of web servers 116." *Id.*, 9:4-7, 9:34-44.

To stream content, the client module 114's "agent controller module 702 is configured to select a quality level of streamlets to transmit to the viewer" and

"requests lower or higher quality streams based upon continuous observation of time intervals between successive receive times of each requested streamlet." *Id.*, 13:9-33. The "agent controller module 702 receives 1004 a streamlet" and "monitors 1006 the receive time of the requested streamlet" such as time intervals between successive receive times for each streamlet response and "calculates 1008 a performance ratio" and "obtain[s] a performance factor." *Id.*, 17:6-44, FIGs. 9 and 10. The agent control module 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.*, 17:44-18:17.

B. Prosecution History

The '234 Patent was filed as Application No. 18/069,450 on December 21, 2022. In the first office action on March 16, 2023, the Examiner rejected claims 1-10 over prior art combinations including Jacobs (US 2004/0172478), Carmel (US 6,389,473), Lee (US 7,996,450), Pulier (US 2002/0091840), Omoigui (US 7,096,271), and Lu (US 2008/0225959). EX1002, 186-201. The examiner rejected claims 11 and 22 under nonstatutory double patenting over claims of U.S. Patent No. 8,868,772 in view of (Carmel US 6,389,473). *Id.* In that same first office action, the Examiner indicated that claims 11-30 were allowable, stating "[a] thorough review of the prior art teaches portions of the claim language with respect to client-side

monitoring of the ability to receive the streamlet at the current bitrate, the client adjusting the higher and lower bitrates based upon the determination and the parsing and encoding of the stream into a plurality of streamlets, it fails to disclose or render obvious,

> 'automatically requesting from the at least one server subsequent portions of the digital content by requesting for each subsequent portion one of the streamlets from the different copies of the digital content dependent upon successive determinations by the client module to change a currently requested bit rate to a higher or lower bit rate, the automatically requesting including repeatedly generating a factor indicative of a current ability to receive digital content at a rate sufficient for presenting the digital content as the digital content is received; making the successive determinations to change the digital content bit rate based on the factor using the streamlets of one of the different copies of the digital content having the highest bit rate determined receivable for presentation so that the client module selects a higher bit rate one of the different copies when the factor is greater than a first threshold and selects a lower bit rate one of the different copies when the factor is less than a second threshold.'"

EX1002, 201

In response, Applicant canceled claims 1-10 and filed a terminal disclaimer. EX1002, 327-342. The Examiner then issued a notice of allowance reciting the same reasons for allowance on July 14, 2023. EX1002, 356-358. On August 21, 2023, the Examiner contacted Applicant's representative to inform him that claim 22 of the instant application had an additional nonstatutory double patenting rejection over U.S. Patent No. 9,407,564 in view of Carmel (EX1002, 389) and Applicant promptly

filed another terminal disclaimer (*id.*, 381). Applicant filed an RCE on October 19, 2023 and submitted multiple lengthy IDSs in total listing 670 references including Petitioner's prior IPR petitions and supporting declarations for related patents over base prior art reference Ogdon (U.S. 6,161,137). EX1002, 397-621. Shortly thereafter on November 30, 2023, the Examiner issued another Notice of Allowance with no reasons for allowance and simply checking the IDS box on the form and stamping "all references considered" for the lengthy IDSs. EX1002, 657. On February 1, 2024, Applicant filed another RCE and submitted an additional IDS citing for the first time the Leaning reference (the primary reference in this Petition) and the Leaning-based IPR petitions Petitioner filed against related patents. EX1002, 1001-1006. On March 25, 2024, the Examiner issued yet another Notice of Allowance again providing no reasons for allowance and simply stamping "all references considered" and checking the IDS box on the Notice of Allowance form. EX1002, 1018. Well-after the issue fee was paid ***on the day before the '234 Patent issued***, Applicant filed an IDS without a certification statement and submitted fuboTV's and Yanka Industries' IPR petitions and for the first time ***the Board's institution decisions <u>granting institution</u> of IPRs of related patents***. *Id.*, 1411-1420. Rather than file a petition to withdraw from issue, as it has done in the past, Applicant filed this late IDS knowing it would not be considered. *Id*.

C. Priority Date

The ’234 Patent claims priority (1) through a chain of continuations to application No. 11/673,483 filed on February 9, 2007; (2) through a continuation-in-part to application No. 11/116,783 filed on April 28, 2005; and (3) to Provisional application No. 60/566,831 filed on April 30, 2004.[1] EX1001, Cover. 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, 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

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[1] All of these priority dates are prior to the America Invents Act and thus the ’234 Patent is not available for Post-Grant Review. *See Sweegen, Inc. v. Purecircle Usa Inc.* 2021 WL 203202, at *4 (P.T.A.B. Jan. 19, 2021).

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 "streamlet" as "any sized portion of the content file." EX1009, 38-43. The ALJ also 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.

Additionally, Petitioner submits that "virtual timeline" may require construction. The '234 Patent describes a "virtual timeline" as "a file that is configured to define a playlist for a user to view" which "may indicate that the publisher desires a user to watch a first show QMX 602a followed by QMX 602b and QMX 602c" such that "the publisher may define a broadcast schedule in a manner similar to a television station." EX1001, 12:33-45, FIGs. 6a-6c. The '234

Patent further explains that the Quantum Media Extension (QMX) files each "describe an entire content file." *Id.* 12:37-38. Thus, Petitioner submits that "virtual timeline" should be construed as "a playlist of entire content files." EX1003, ¶¶ 43-46.

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. Instradent USA, Inc.*, 903 F.3d 1365, 1375 (Fed. Cir. 2018)). Nevertheless, as shown herein, the asserted grounds render claims 1-16 of the '234 Patent unpatentable even under the ITC's constructions. By asserting that the '234 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. Petitioner also reserves the right to challenge in any litigation the claims under 35 U.S.C. § 112(a), (b), and/or (f), including without limitation, the claimed "client module."

In the ITC Investigation, iFIT proposed a design-around with respect to certain limitations of other patents in the family of the '234 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 '234 Patent admits in the "Description of Related Art" section that "streaming media" was known, including streaming of "audio/video" where "quality that can be received for real time presentation is constrained by the available bandwidth of the user's network connection." EX1001, 1:51-61. The '234 Patent further admits that TCP connections were known and that "[m]ost streaming solutions use a TCP connection." *Id.*, 2:5-50. The Patent admits that the HTTP protocol is "standard." *Id.*, 9:36-37. 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, D.I. 1 at ¶ 30.

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, ¶¶ 49-50. 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 was not considered by the ALJ in the ITC action. Applicant cited Leaning on an IDS submitted February 1, 2024—after the Examiner had issued three prior Notices of Allowances—and the Examiner issued a fourth Notice of Allowance shortly thereafter with no reasons for allowance given and no indication that the Examiner meaningfully considered Leaning other than rubber stamping "all references considered" on the IDS form. Petitioner has submitted IPRs challenging related patents using Leaning (*see* Section II.B). DISH, however, did not address the merits of Leaning in these petitions instead opting to seek discretionary denial. *E.g.*, EX1013. Despite DISH's unsupported assertion of "many deficiencies" in the Leaning-based Petitions (*id.*, 11 n.1), DISH has stated that it "likely" will need to

amend similar claims in related European patents asserted against Petitioner in the United Kingdom to try to overcome Leaning. EX1015, 58:19-59:15 (DISH's UK Counsel, Mr. Moody-Stuart: "if we seek to amend, which would seem to be likely"), 62:4-25 ("[W]e may well amend the patent, we are contemplating it"), 64:22-65:7 ("There is a likelihood we may amend . . . it is something that it is a real possibility"), 65:12-14 ("MR. JUSTICE MEADE: For all I know, Mr. Moody-Stuart, you have reached the conclusion that you have to amend over Leaning").

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 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. Klements

Klements (EX1006) was filed on June 24, 2002 and issued on December 25, 2003. Klements is prior art under at least (pre-AIA) 35 U.S.C. § 102(e). Klements is cited on the face of the '234 Patent but was not used by the Examiner in any office action. Klements is related to client-side caching of streaming media. EX1006, ¶ [0001]. Klements discloses that such streaming media may be segmented into different "pieces" of content (*e.g.*, every five minutes of content is a piece") where "[e]ach piece of media content may include multiple streams . . . typically at a particular encoded bit rate. EX1006, ¶¶ [0036]-[0038]. These are "[m]ultiple versions of the same" content to "allow[] selection of different combinations of these streams for playback by [a client] media player." EX1006, ¶ [0039]. Klements further discloses grouping multiple pieces of content together in a "playlist" such that each "piece" (*e.g.*, 20 songs in a playlist) is streamed subsequently in succession. EX1006, ¶ [0041]. Klements' media player determines "the current available bandwidth" and requests the appropriate bit rate version based on this determination from the server. EX1006, ¶¶ [0045]-[0054].

D. 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 '234 Patent but was not used by the Examiner in any office

action. Gamble discloses transferring files over a plurality of parallel TCP connections between client and server. EX1020, Abstract, ¶ [0034], [0050]. Gamble further discloses a client application for receiving multiple subparts of stream files over a plurality of parallel TCP connections to a server. *Id*., ¶¶ [0034]-[0040], [0050]-[0052]. Gamble further discloses implementing TCP congestion protocols for the client. *Id*., ¶ [0052].

E. Analogous Art

Each prior art reference is analogous art to the claimed invention in the ’234 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, 1:35-38, 2:61-3:4, 3:5-4:36, FIGs. 2-7, *with* EX1004, Abstract, 6:5-7:5, 8:1-9:8, FIGs. 1-5; EX1006, ¶¶ [0001], [0036]-[0054]; EX1020, ¶¶ [0004]-[0005], [0050]-[0052]; *see also* EX1003, ¶ 57.

Additionally, the prior art references are reasonably pertinent to any purported problem addressed in the ’234 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, 2:61-3:4; EX1003, ¶ 58.

IX. SPECIFIC GROUNDS

A. Ground 1: Claims 1-15 and 17-20 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 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 because Leaning describes "[d]elivery of recorded audio or video material" (digital content) "over a telecommunications link" (Internet) "**from a server (1) to a terminal (3)**"[2] and that provisions are "made for **switching between alternative sub-file sets** representing alternative delivery modes of data rates" (adapting delivery to different modes (rates)). EX1004, Abstract, 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

[2] All emphases in citations to prior art references are added unless otherwise indicated.

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, ¶ 59.

b. 1[A][1]: "a client module configured to be connected to a network having at least one server and further configured to request digital content over the network via at least one transmission control protocol (TCP) connection,"

Leaning teaches 1[A][1]. Leaning describes a client module, *i.e.* "player program" on the user terminal 3, "which provides the functionality necessary for the playing of audio files." EX1004, 4:4-15, 5:1-14. Leaning' "player program" (client module) is configured to be connected to a network (internet 2) having at least one server (server 1) and further configured to "construct[] a request message for" the digital content (each sub-file) and "transmit[] it to the server" over the network, *i.e.* "via the communications interface and the internet 2," for each sub-file such that the "server responds by transmitting the required sub-file." *Id.*, 5:18-14, FIG. 1.

Leaning discloses that these requests from the player program are made via at least one transmission control protocol (TCP) connection because Leaning discloses

that the player program (client module) makes requests using HTTP messages (citing RFCs for HTTP/1.0 and HTTP/1.1) via at least one connection over the Internet to an ordinary web server. *E.g.*, EX1004, 2:9-10, 2:15-16 (server and client "connected via the internet"), 2:18-22 ("such a request takes the form of a first part indicating the network delivery mechanism (e.g. http:// . . .) followed by the network address of the server (e.g. www.server1.com) suffixed with the name of the file that is being requested."), 2:29-30 (server 1 "is merely an ordinary 'web server'"), 5:9-10 ("IP address"). Leaning discloses that "the network is the internet . . . operating in accordance with the Hypertext Transfer Protocol" and directs the reader to "see RFCs 1945/2068 for details." EX1004, 2:9-10.

A POSITA would have known that (1) HTTP/1.0 was drafted by the Internet Engineering Task Force (IETF), republished by WC3, and finalized and fully documented in 1996 as "RFC1945;" (2) HTTP/1.1 was introduced in 1995 and published in 1997 as "RFC2068;" and (3) HTTP/1.1 was revised in 1999 as "RFC2616." EX1003, ¶¶ 60-62. And although Leaning does not use the word "TCP," Leaning discloses, or at least renders obvious, that HTTP requests are made via at least one TCP connection over the Internet because a POSITA would have known that TCP was the underlying network transport layer for the application transport layer HTTP (EX1012, 23, 31-33) and that in order for Leaning's client to send an HTTP message to Leaning's ordinary HTTP web server it must first

establish at least one TCP/IP connection between the client and server using the Internet (IP) addresses of each in order to send HTTP messages to the server and receive HTTP responses from the server (*Id.*, 13). EX1003, ¶ 62. Indeed, a POSITA would have known that "just about all of the world's HTTP communication is carried over TCP/IP" and that "HTTP connections really are nothing more than TCP connections, plus a few rules about how to use them." EX1012, 94-95; EX1003, ¶ 62. Additionally, a POSITA would have known about the HTTP RFCs cited by Leaning as providing more "details" and a POSITA would have known consistent with the RFCs that HTTP communication on the Internet usually takes place over TCP/IP connections. EX1019 (HTTP/1.1 RFC 2616), 12; EX1011; EX1003, ¶ 62. The '234 Patent itself even 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.

Thus, a POSITA would have understood the above disclosures of Leaning to disclose that the HTTP requests are made via at least one transmission control protocol (TCP) connection. EX1003, ¶ 63. At a minimum, Leaning renders using a TCP connection obvious in view of the knowledge of a POSITA. Specifically, to the extent Leaning does not explicitly disclose at least one TCP connection, a POSITA would have been motivated to modify Leaning such that Leaning's HTTP

requests to an ordinary webserver were made via at least one transmission control protocol (TCP) connection because essentially all such HTTP requests were made via at least one TCP connection at the time and such a modification would have yielded the predictable result of requesting and receiving desired files with the benefit of TCP's built-in error checking capabilities to ensure every necessary file is received and put in order. EX1003, ¶ 63. A POSITA would have had a reasonable expectation of success with such a modification because essentially all HTTP runs over TPC connections. *Id.*

c. 1[A][2]: "wherein at least two different copies of the digital content are each encoded at different bit rates and stored on the at least one server,"

Leaning teaches 1[A][2]. Leaning describes at least two different copies (*i.e.*, versions) of the digital content (audio or video) are each encoded at different bit rates (*e.g.*, 8, 16, 24, and 32 kbit/s) and stored on the server because Leaning explains that "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 "[i]n order to prepare for rate switching, the person preparing the file for loading onto the server prepares several source files – by **encoding the same PCM file several times at different rates**." EX1004, 6:13-26, 9:3-7, 16:6-12; EX1003, ¶ 64.

d. 1[A][3]: "wherein each copy of the digital content is divided into a plurality of streamlets, each of the plurality of streamlets of a corresponding copy comprising a different portion of the digital content during presentation,"

Leaning teaches 1[A][3]. Leaning describes that each copy (version) is divided into a plurality of streamlets (sub-files) because Leaning describes, after encoding into several different versions, "partition[ing] each source file into sub-files." EX1004, 6:21-22. Leaning further describes "dividing the material into a **sequence of sub-files**" (EX1004, Abstract) such that the larger audio or video file "**is divided into smaller files** before being stored on the server 1" (*id.*, 3:5-6). Leaning further explains that each of the plurality of streamlets (sub-files) of a corresponding copy (version) comprises a different portion of the digital content during presentation because Leaning explains that "a set of files represent[s] **successive temporal portions** of the said material" and "partitioning the material into a plurality of discrete files **each representing successive temporal portions of the said material**." *Id.*, 1:3-29.

Leaning further describes that preferably "each of these smaller files is of a size corresponding to a fixed playing time, perhaps four seconds." And, in one example, "divided into **135 smaller files** each representing four seconds' playing time" having "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." *Id.*, 3:1-22, 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. As shown below, Leaning describes that each sub-file (*e.g.* first sub-file 000000.bin) has a corresponding version in each copy encoded at a different bitrate:

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 sub-files (000000.bin-000134.bin each comprising a different portion of the file upon playback) in the same order); EX1003, ¶¶ 65-66.

e. 1[A][4]: "wherein corresponding streamlets across the at least two different copies comprise the same corresponding portions of the digital content during presentation,"

Leaning teaches 1[A][4]. Leaning's corresponding streamlets (sub-files) across the at least two different copies (versions) comprise the same corresponding portions of the digital content during presentation because Leaning explains that each version has the same number of sub-files encoding the same successive portions in the same order and having the same duration as each other. *See* 1[A][3]. Further, Leaning describes that, preferably, "each of these smaller files is of a size corresponding to **a fixed playing time, perhaps four seconds**" and in Leaning's example "the Bach file of 9 minutes duration would be divided into **135 smaller files each representing four seconds' playing time**." EX1004, 3:5-18, 1:3-29, 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**.").

Additionally, Leaning explains that each corresponding sub-file must comprise the same portion across the different copies to enable proper switching because "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" since in the case of rate-switching it is essential or at least 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." *Id.*, 12:8-20; EX1003, ¶¶ 67-68.

f. 1[A][5]: "and wherein the client module streams the digital content by:"

Leaning teaches 1[A][5]. Leaning describes that the client module (player program on terminal 3) streams the digital content. *See* 1[Pre], 1[A][1]; EX1004, 4:13-15 ("program 38 . . . 'the player program' [] provides the functionality necessary for playing the audio files in accordance with this embodiment of the invention"); EX1003, ¶ 69.

g. 1[B]: "requesting a first streamlet from the at least one server;"

Leaning teaches 1[B]. Leaning describes that the player program requests a first streamlet (sub-file 000000.bin) from a server (server 1) because the "player program, having received the URL, adds to this filename of **the first sub-file**, to produce a complete address for the sub-file – i.e.

www.**server1**.com/mp3_bwv565/**000000.bin**" and "constructs a request message" for first sub-file 000000.bin "and transmits it to the server 1." EX1004, 5:4-9, EX1003, ¶ 70.

h. 1[C][1]: "automatically requesting from the at least one server subsequent portions of the digital content by requesting for each subsequent portion of the streamlets from the different copies of the digital content dependent upon successive determinations by the client module to change a currently requested bit rate to a higher or lower bit rate, the automatically requesting including"

Leaning teaches 1[C][1]. Leaning describes that the player program automatically requests each subsequent portion (subsequent sub-files 000001.bin, 000002.bin, etc.) from the server because 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" and "repeats this process." EX1004, 5:23-24.

Leaning further explains that in requesting each subsequent portion of the streamlets (sub-files) from the different copies (versions) of the digital content, the player program makes successive determinations to change a currently requested bit rate to a higher or lower bitrate. For example, Leaning describes 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 is more than a Step Down Threshold before shifting down and requesting the next sub-file at a lower bitrate version; 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 and requesting the next sub-file at a higher bitrate version. 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, ¶¶ 71-73.

i. 1[C][2]: "repeatedly generating a factor indicative of a current ability to receive digital content at a rate sufficient for presenting the digital content as the digital content is received;"

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, ¶ 74.

Leaning describes that the player program repeatedly generates a factor indicative of a current ability to receive digital content at a rate sufficient for presenting the digital content as it is received because Leaning repeatedly generates a "measured rate" factor (the measured actual data rate being received from the server, averaged over a period of time) and compares it to a "current rate" (the bitrate of the current sub-file being requested) 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 (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, ¶¶ 75-76.

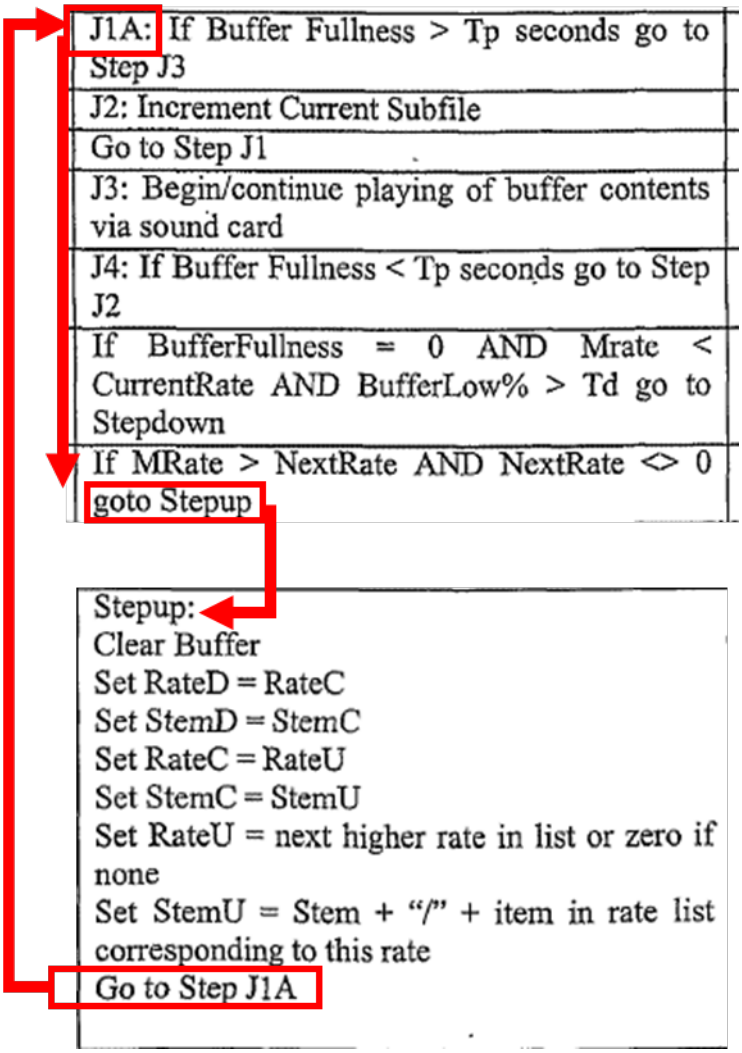
j. 1[D]: "making the successive determinations to change the digital content bit rate based on the factor using the streamlets of one of the different copies of the digital content having the highest bit rate determined receivable for presentation so that the client module selects a higher bit rate one of the different copies when the factor is greater than a first threshold and selects a lower bit rate one of the different copies when the factor is less than a second threshold; and"

Leaning teaches 1[D]. As explained above, Leaning describes making successive determinations to change the digital content bit rate of requested

sequential sub-files based on the factor (*e.g.*, "measured rate"). *See* 1[C][1]-1[C][2]. Leaning further describes requesting, or using, the streamlets (sub-files) from one of the different copies having the highest bit rate determined receivable for presentation where the client module (*i.e.* player program) selects a higher bit rate of one of the different copies when the factor (*e.g.*, measured rate) is greater than a first threshold (*e.g.*, next highest rate) for a period of time, then shifts up until no longer true—meaning shift up to highest version possible—and selects a lower bit rate one of the different copies when the factor (*e.g.*, measured rate) is less than a second threshold (*e.g.*, current rate). EX1004, 9-11 (flowchart). For example, Leaning explains that "if the measured rate exceeds not only the current rate but also **the next higher rate** for a given period of time . . . [the player program will] **increase the current rate**." EX1004, 8:24-26,9:3-7, 9-11 (flowchart).

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 [factor; measured rate] is greater than NextRate [first threshold; next highest rate] AND NextRate <> 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 receivable

rate is achieved up to the highest available rate (by setting RateU to zero). EX1004, 9-11; EX1003, ¶¶ 77-78.



EX1004, 10 (flowchart excerpted and annotated); EX1003, ¶ 78.

Leaning further explains that the player program 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 ¶ 79.

k. 1[E]: "arranging the streamlets requested from the at least one server in order of ascending presentation time for output to a presentation device."

Leaning teaches 1[E]. Leaning describes arranging the streamlets (sub-files) requested from the at least one server (server 1) in order of ascending presentation time. Leaning's annotated flowchart below shows that sub-files are requested, received, decoded, and written to the buffer one after the other.

Terminal
Set Current Subfile = 000000.bin
J1: Set URL = StemC + Current Subfile
Request this URL
If error message received, Stop
Decode received subfile
Write to buffer
J1A: If Buffer Fullness > Tp seconds go to Step J3
J2: Increment Current Subfile
Go to Step J1
J3: Begin/continue playing of buffer contents via sound card
J4: If Buffer Fullness < Tp seconds go to Step J2

EX1004, 10 (flowchart, excerpted and annotated).

Once a sub-file is written to the buffer, the current sub-file number is increased (J2) and the next sub-file is requested (J1) sequentially in the order of ascending playback time (firstly sub-file 000000.bin, then sub-file 000001.bin, etc.). Thus, the buffer will subsequently store the decoded sub-files in the corresponding order for sequential playback (in order of ascending playback time) to enable proper sequential playback of the video or audio file. 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"). Leaning also describes outputting to a presentation device (*e.g.*, video display 34 and audio interface ("sound card") 36). *Id.*, 4:7-9; EX1003, ¶¶ 80-81.

2. Claim 2: "The end user station of claim 1, wherein at least some streamlets are requested from the at least one server via a hypertext transfer protocol (HTTP) GET request."

Leaning teaches claim 2. As explained above, Leaning describes that the end user station requests streamlets from a conventional webserver via HTTP. *See* 1[A][1], 1[B], 1[C][1]. Leaning describes that the player requests sub-files from the conventional web server using "the Hypertext Transfer Protocol" and cites to RCFs for the HTTP 1.0 and HTTP 1.1 protocols. EX1004, 2:5-32. Leaning also provides a request example of "http://www.server1.com/mp3_bwv565/000003.bin where 'www.server1.com' is the URL of the server 1" which requests file "000003.bin" stored on server 1 by its URL. EX1004, 3:28-31.

A POSITA would have understood Leaning's descriptions of client end user stations making HTTP requests for sub-files from an ordinary webserver to include disclosure of HTTP GET requests for said sub-files because a POSITA would have known that HTTP/1.1 (which is cited to by Leaning) requires servers to implement the GET method and that "GET is the most common method" in HTTP and "usually is used to ask a server to send a resource". EX1012, at 73-74; EX1019, 31 ("The methods GET and HEAD MUST be supported by all general-purpose servers"), 46 (HTTP 1.1 protocol describing "GET" as the means by which to "retrieve whatever information (in the form of an entity) is identified by the Request-URI"); EX1011; EX1003, ¶¶ 82-83.

To the extent HTTP GET is not explicitly disclosed by Leaning, it would have been obvious in view of the knowledge of a POSITA. A POSITA would have been motivated to use HTTP GET requests to request and receive sub-files from Leaning's server because HTTP GET requests are one of a finite number of identified methods available in the HTTP protocol, and thus one of a finite number of identified predictable solutions (indeed, the only solution) for requesting files from a server with a reasonable expectation of success. EX1019, 45-47; EX1011; EX1003, ¶ 84. A POSITA would have also had a reasonable expectation of success because HTTP is a universally known and used protocol and GET requests are a standard method within that protocol for requesting files from a server. *Id.*

3. Claim 3: "The end user station of claim 1 wherein the at least one server comprises at least two servers and wherein at least one streamlet is requested from a first of the at least one server and at least one other streamlet is requested from a second server of the at least one server other than the first server."

Leaning teaches claim 3. As explained above, Leaning discloses at least one server storing the sub-files. *See* 1[A][2]. To the extent Leaning does not disclose at least two servers wherein one sub-file (streamlet) is requested from a first server and another sub-file (streamlet) is requested from a second server such an arrangement would have been obvious in view of the knowledge of a POSITA. For example, a POSITA would have known that it was common for a client to establish multiple

connections with multiple servers and request different files from different servers. EX1012, 88 (objects being requested "do not all need to be hosted on the same web server, so the parallel connections can be established to multiple servers"), FIG. 4-11 (showing requesting different objects from a Server1 and a Server2 via parallel TCP connections; EX1003, ¶ 85. A POSITA would have been motivated to provide multiple web servers containing the same sets of sub-files for streams in order to have redundancy in the system and allow for clients to establish connections with multiple servers and request a first sub-file from a first web server and, if the connection between the first web server becomes congested or the first web server otherwise fails or becomes unavailable, request a subsequent sub-file from the second web server. EX1003, ¶ 85. A POSITA would have had a reasonable expectation of success with such a modification because it would have been a simple matter of storing the same files on multiple servers. *Id*.

4. Claim 4: "The end user station of claim 1, wherein the client module repeatedly generates the factor based on a moving time window."

Leaning teaches claim 4. As explained above, Leaning describes that the client module repeatedly generates a factor. *See* 1[C][2]. Leaning describes that at least one factor (*e.g.*, "measured rate") is generated based upon a moving time window because Leaning describes that "the player program measures the actual data rate being received from the server, averaged over a period of time (for example 30

seconds)" and the "accuracy of this figure improves as the number of requests goes up." EX1004, 8:12-15. Thus, the factor (measured rate) is repeatedly generated based on a moving time window (*e.g.*, prior 30 second window). *Id.*, EX1003, ¶ 86.

5. Claim 5: "The end user station of claim 1, wherein the client module generates the factor based on a current read ahead margin."

Leaning teaches claim 5. As explained above, Leaning describes that the client module repeatedly generates a factor. *See* 1[C][2]. Leaning describes that at least one factor (*e.g.*, "Buffer Low Percentage") is generated based upon a current read ahead margin (how much is in the buffer) because Leaning explains that the "Buffer Low Percentage 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; EX1003, ¶ 87.

6. Claim 6: "The end user station of claim 1, wherein a first streamlet of each copy of the digital content has the same first duration and corresponds to a same first temporal portion of the digital content, wherein a second streamlet of each copy of the digital content have the same duration and correspond to a same second temporal position of the digital content."

Leaning teaches claim 6. Leaning discloses that each streamlet (sub-file) across the different copies are the same duration (*e.g.*, four seconds) and contain the same portions of the video on playback (*e.g.*, first sub-file 000000.bin is four seconds and contains the same portion of the video in each bitrate directory; second sub-file

000001.bin is four seconds and contains 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. *See* 1[A][3], 1[A][4]; 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**. With a compressed format such as MP3 this may mean that the files will be of different sizes in terms of the number of bits they actually contain. 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 ("Note that 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 ("It is of interest to discuss further the process of partitioning the original file into sub-files. . . . 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, ¶ 88.

7. Claim 7: "The end user station of claim 6, wherein the first and second duration of the first streamlets of each copy are different from the durations of the second streamlets of each copy."

Leaning teaches claim 7. Leaning explains that making each sub-file (*e.g.* the first and second sub-files) the same duration (*e.g.*, four seconds) "is not the only way of achieving" its goals (EX1004, 12:18-20) and that each sub-file "can be a fixed number of bits, or a fixed playing time length (or neither of these)" (*id.*, 12:12). Thus, Leaning discloses that sub-files (*e.g.*, sub-file 1 (000000.bin) and sub-file 2 (000001.bin)) may be different durations at least in the case of "neither of [fixed size or fixed duration]" because the sub-files would not have a fixed time length and, for example, sub-file 1 (000000.bin) may be a different time duration than sub-file 2 (000001.bin.). EX1004, claim 22; EX1003, ¶ 89.

Alternatively, it would have been "obvious to try" for a POSITA to make the first and second durations (*e.g.* of the first and second sub-files, respectively) different rather than the same because this would be a POSITA choosing between

one of a finite number of possible solutions. EX1003, ¶ 90. Namely, a POSITA would have only two possible solutions for choosing sub-file durations: (1) all sub-files (including the first and second sub-files) have the same duration, or (2) some sub-files (*e.g.*, the first and second sub-files) each have different durations. *Id*. Therefore, it would have been obvious for a POSITA to try making the durations different as one of a finite number of solutions. *Id*. A POSITA would have had a reasonable expectation of success with such modifications because the sub-files all have *some* duration and merely adjusting the duration of each sub-file so that the first sub-file duration is different from the second sub-file duration would have been a simple and straightforward modification for a POSITA. *Id.*

8. Claim 8: "The end user station of claim 6, wherein each of the first streamlets has a first duration that is a range of 0.1 to 5 seconds."

Leaning teaches claim 8. Leaning explains that each of the first streamlets has a first duration that is the range of 0.1 to 5 seconds (four seconds). *See* 1[A][3], 1[A][4]; EX1004, 12:16-20, FIG. 4; EX1003, ¶ 91.

9. Claim 9: "The end user station of claim 1, wherein the client module is further configured to transmit at least one virtual timeline request to retrieve a virtual timeline corresponding to the digital content and to receive the virtual timeline from the at least one server; and arrange the streamlets requested from the at least one server using the virtual timeline."

Leaning teaches claim 9. To the extent "virtual timeline" is construed to include a viewable "playlist of entire content files" (recordings), Leaning discloses this limitation. Leaning discloses that the client module (player program and/or browser) is configured to request, and receive, a virtual timeline (menu of available recordings (menu.htm)) corresponding to the digital content (recordings) from a server because Leaning describes that "the web server stores one or more **(html) menu pages (e.g. menu.htm)** containing a **list of recordings available, with hyperlinks to the corresponding link pages**." EX1004, 4:1-3. The client module "retrieve[s] and display[s] the menu page menu.htm from the server 1" such that selection of a hyperlink "causes the browser to retrieve from the server, and display, the link page for the desired recording - in this example the file mp3_bwv565_link.htm." EX1004, 4:22-34;*see also id.*, 9:3-11:1 (flowchart showing request and retrieval of virtual timeline including "[Terminal] Request http:\\server1.com/menu.htm . . . [Server] Send http:\\server1.com/menu.htm . . . [Terminal] Display menu.htm"). To the extent "virtual timeline" is construed to mean an index or manifest file containing a playlist of sub-files, Leaning also meets

this limitation because Leaning teaches an "index file" to "provide a list of the data rates that are available" where the player program requests "the index file, and stores locally a list of available data rates for future reference" and "begins to request" sub-files and play them out automatically and sequentially. EX1004, 6:27-8:17); Section VII (proposed construction for "virtual timeline"). To the extent "playlist" is interpreted broadly to mean a list of recordings a user may watch, the "menu" in this context would be a playlist because it provides a list of available recordings that a user could watch in succession.[3]

Leaning further describes arranging the streamlets (sub-files) requested from the at least one server using the virtual timeline because Leaning describes arranging the sub-files for playback in sequential order. *See* 1[E]; EX1003, ¶¶ 92-93.

10. Claim 10: "The end user station of claim 1, wherein the client module is further configured to output the streamlets requested from the at least one server to the presentation device in the order of ascending presentation time."

Leaning teaches claim 10. Leaning discloses that the client module is configured to output the streamlets requested from the at least one server to the

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[3] To the extent "virtual timeline" is construed to also require *automatic* playing of *entire* content files one after the other, Klements teaches this limitation. *See* IX.B.1, *infra*.

presentation device in the order of ascending presentation time. *See* 1[E]; EX1004, 4:7-9 (outputting to a presentation device (*e.g.*, video display 34 and audio interface ("sound card") 36); EX1003, ¶ 94.

11. Claim 11: "The end user station of claim 1, further comprising the presentation device to display the streamlets in the order of ascending presentation time."

Leaning teaches claim 11. Leaning describes that the presentation device is to display the streamlets in the order of ascending presentation time. *See* 1[E], claim 10; EX1004, 4:7-9 (outputting to a presentation device (*e.g.*, video display 34 and audio interface ("sound card") 36); EX1003, ¶ 95.

12. Claim 12

a. 12[Pre]: "A method executable by a client device to output rate-adaptive streams received via at least one transmission control protocol (RCP) [sic] connection with at least one server over a network, the method comprising:"

Leaning teaches 12[Pre]. *See* 1[Pre], 1[A][1]; EX1003, ¶ 96.

b. 12[A][1]: "receiving, by the client device, digital content from the at least one server via the at least one TCP connection over the network,"

Leaning teaches 12[A][1]. *See* 1[A][1]; EX1003, ¶ 97.

c. 12[A][2]: "wherein multiple different copies of the digital content encoded at different bit rates are stored as individually-requestable portions on the at least one server,"

Leaning teaches 12[A][2]. *See* 1[A][2], 1[A][3], 1[B], 1[C][1]. Leaning's sub-files are each "individually-requestable portions" because Leaning's player requests each sub-file individually. EX1004, 1:20-24, 2:15-23, 3:19-32, 5:4-25; EX1003, ¶ 98.

d. 12[A][3]: "wherein each of the individually-requestable portions of a corresponding copy of the digital content is a different portion of the digital content during presentation,"

Leaning teaches 12[A][3]. *See* 1[A][3]; EX1003, ¶ 99.

e. 12[A][4]: "wherein the individually requestable portions across the different copies yield the same portions of the digital content upon presentation, and wherein the receiving comprises:"

Leaning teaches 12[A][4]. *See* 1[A][4]; EX1003, ¶ 100.

f. 12[B]: "requesting by the client device a plurality of sequential individually-requestable portions of one of the copies from the at least one server;"

Leaning teaches 12[B]. Leaning discloses requesting a plurality of individually-requestable portions. As explained above, Leaning discloses requesting the first sub-file "000000.bin." *See* 1[B] (requesting first sub-file). Leaning further teaches requesting a plurality of sequential individually requestable sub-files (*e.g.*, 000000.bin followed by 000001.bin) because, after requesting 000000.bin,

Leaning's "player program increments the filename to 000001.bin and **requests**, receives, decodes and stores this second sub-file" in the same way as with the first sub-file 000000.bin. EX1004, 5:23-25. Further, Leaning explains in its flowchart (excerpted and annotated below) that Leaning's player continues to increment and request sequential individually requestable sub-files until "Buffer Fullness > Tp seconds." EX1004, 10.

Thus, Leaning's player requests a plurality of sub-files (shown in the red boxes in the annotated flowchart, requesting 000000.bin, 000001.bin, etc.) until the buffer exceeds Tp seconds (shown in the blue box in the annotated flowchart) and only upon exceeding this fullness threshold may the contents begin to be played back and the automatic requesting (as described in limitation 12[C][2] and 1[C][1]) based on determinations by the player regarding available bandwidth commence (as shown in the green box of the annotated flowchart). EX1004, 10; EX1003, ¶¶ 101-102.

Terminal
Set Current Subfile = 000000.bin
J1: Set URL = StemC + Current Subfile
Request this URL
If error message received, Stop
Decode received subfile
Write to buffer
J1A: If Buffer Fullness > Tp seconds go to Step J3
J2: Increment Current Subfile
Go to Step J1
J3: Begin/continue playing of buffer contents via sound card
J4: If Buffer Fullness < Tp seconds go to Step J2
If BufferFullness = 0 AND Mrate < CurrentRate AND BufferLow% > Td go to Stepdown
If MRate > NextRate AND NextRate <> 0 goto Stepup

EX1004, 10 (flowchart, excerpted and annotated).

g. 12[C][1]: "automatically requesting by the client device from the at least one server subsequent portions of the digital content by requesting for each such portion one of the individually-requestable portions from one of the copies dependent upon successive determinations by the client device to change a requested bit rate to a higher or lower bit rate one of the different copies, the automatically requesting including"

Leaning teaches 12[C][1]. *See* 1[C][1]; EX1003, ¶ 103.

h. 12[C][2]: "repeatedly generating a factor indicative of a current ability to receive the digital content at a rate sufficient for presenting the digital content as the digital content is received, individually-requestable wherein the factor relates to a performance of the network; and"

Leaning teaches 12[C][2]. *See* 1[C][2]; EX1003, ¶ 104.

i. 12[D]: "making the successive determinations whether to change the requested bit rate based on the factor to achieve continuous presentation of the digital content using the individually-requestable portions of the highest bit rate one of the copies determined receivable at that time at a rate sufficient for presenting the digital content as the individually-requestable portions of the digital content are received, wherein the making of the successive determinations to change the requested bit rate comprises: requesting a subsequent individually-requestable portion from a higher bit rate one of the different copies than a currently requested one of the different copies when the at least one factor is greater than a first threshold; and requesting a subsequent individually-requestable portion from a lower bit rate one of the different copies than the currently requested one of the different copies when the at least one factor is less than a second threshold; and"

Leaning teaches 12[D]. *See* 1[D]; EX1003, ¶ 105.

j. 12[E]: "arranging the individually-requestable portions requested from the at least one server in order of ascending presentation time for output to a presentation device."

Leaning teaches 12[E]. *See* 1[E]; EX1003, ¶ 106.

13. Claim 13: "The method of claim 12 wherein the automatically requesting comprises requesting at least some individually requestable portions via a hypertext transfer protocol (HTTP) GET request."

Leaning teaches claim 13. *See* claim 2; EX1003, ¶ 107.

14. Claim 14: "The method of claim 12 wherein the at least one server comprises at least two servers and wherein the client device requests at least one streamlet from a first server of the at least two servers and at least one other streamlet from a second server of the at least two servers other than the first server."

Leaning teaches claim 14. *See* claim 3; EX1003, ¶ 108.

15. Claim 15: "The method of claim 12, wherein the digital content is stored on the at least one server in a plurality of streamlets, each of the plurality of streamlets corresponding to a different temporal portion of said digital content and wherein each of the individually-requestable portions is requestable by the client device without regard to whether the client device has previously requested other individually requestable portions of the digital content."

Leaning teaches claim 15. *See* 12[A][2], 1[B], 1[C][1]; EX1003, ¶ 109.

16. Claim 17: "The method of claim 12, wherein the making the successive determinations to change the requested bit rate comprises: determining if the higher bit rate one of the different copies can be received at a rate sufficient for presenting the digital content as the digital content is received."

Leaning teaches claim 17. *See* 1[D]; EX1003, ¶ 110.

17. Claim 18: "The method of claim 12, wherein the factor is indicative of a delay or a loss in one or more of the at least one TCP connections."

Leaning teaches claim 18. As explained regarding 1[A][1], Leaning teaches at least one TCP connection. And as explained in connection with elements 1[C][1]-1[C][2], one of the factors Leaning describes is "measured rate," which reflects a measurement of the actual data rate being received from the server, averaged over a period of time. EX1004, 8:11-16. Accordingly, if the measured rate were to decrease, this would be indicative of a delay or a loss in one or more of the TCP connections because delays or losses would reduce the rate that data is received from the server and thus decrease the measured rate. EX1003, ¶ 111. Accordingly, a POSITA would have understood "measured rate" to be indicative of delays or losses in the one or more TCP connections. EX1003, ¶ 111.

18. Claim 19: "The method of claim 12, wherein the at least one server comprises a cache server of a network infrastructure operator."

Leaning teaches claim 19. 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, 9:52-54; EX1003, ¶ 112. Further, such cache servers, also referred to as "web caches," were well-known before the alleged Priority Date. For example, it was well-known that cache servers were used to store copies of popular files and were beneficial to client-server systems because cache servers reduce redundant data

transfers, reduce network bottlenecks, reduce the load on origin servers, and reduce distance delays. EX1003, ¶ 112; EX1012, 181-186. A POSITA would have been motivated to configure Leaning's clients to connect to a cache server in order to improve and increase reliability of response time and performance as compared to connecting to an origin webserver and reduce the load on the origin server. EX1003, ¶ 112. 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 webservers. *Id.*

19. Claim 20: "The method of claim 12, further comprising: outputting the received content to the presentation device."

Leaning teaches claim 20. *See* 1[E]; EX1003, ¶ 113.

B. Ground 2: Claims 1-15 and 17-20 Would Have Been Obvious in view of Leaning and Klements

The sections of Ground 1 (Section IX.A) are incorporated into this section by reference. To the extent certain limitations are not disclosed or rendered obvious over Leaning alone, Klements teaches these limitations. EX1003, ¶ 114.

1. Claims 1 and 12

a. 1[A][1]; 12[Pre]; 12[A][1]

As explained above in Ground 1, Leaning teaches 1[A][1], 12[Pre], and 12[A][1]. To the extent it is argued that Leaning does not explicitly disclose or

suggest making HTTP requests via at least one transmission control protocol (TCP) connection, Leaning in view of Klements teaches this limitation. For example, Klements describes requesting and receiving streaming media from servers via "HTTP . . . using TCP (Transmission Control Protocol) data delivery." EX1005, ¶ [0099]. Thus, Klements teaches using at least one TCP connection between a client media player and servers over the Internet for communications between clients and servers where the client requests video content from the servers. *Id.*; EX1003, ¶ 115. A POSITA would have been motivated to modify Leaning such that Leaning's HTTP requests to an ordinary webserver were made via at least one transmission control protocol (TCP) connection, as taught by Klements, because essentially all such HTTP requests were made via at least one TCP connection at the time and because, beneficially, TCP connections were not typically blocked by firewalls. EX1003, ¶ 115. A POSITA would have had a reasonable expectation of success with such a modification because essentially all HTTP runs over TPC connections. *Id.*

2. Claims 3 and 14

As explained above, Leaning renders obvious claims 3 and 14. Additionally, Klements explicitly teaches these limitations. For example, Klements describes that, in addition to using an origin server, "[o]ne or more proxy servers (not shown) may be part of the network 106, and requests from client device 102 and responses to the client device 102 may be sent to and received from such a proxy server(s)." EX1005,

¶ [0025]. Klements further explains that "a single client 102 may access multiple servers 146, although only a single client 102 and server 146 have been shown in FIG. 2 for ease of explanation." EX1005, ¶ [0028]. . A POSITA would have been motivated to provide multiple webservers containing the requestable same sets of sub-files for streams, as taught by Klements, in order to have redundancy in the system and allow for clients to establish connections with multiple servers and request a first sub-file from a first web server and, if the connection between the first web server becomes congested or the first web server otherwise fails or becomes unavailable, request a subsequent sub-file from the second web server. EX1003, ¶ 116. A POSITA would have had a reasonable expectation of success with such a modification because it would have been a simple matter of storing the same files on multiple servers. *Id*.

3. Claim 9

As explained above, to the extent "virtual timeline" is construed to include a viewable "playlist of entire content files" (recordings), Leaning teaches this limitation at least because Leaning discloses that the client module (player program and/or browser) is configured to request, and receive, a virtual timeline (menu of available recordings (menu.htm)) corresponding to the digital content (recordings) from a server and arranging the streamlets (sub-files) requested from the at least one

server using the virtual timeline because Leaning describes arranging the sub-files for playback in sequential order. *See* Sections IX.A (claim 9); IX.B; EX1003, ¶ 117.

To the extent it is argued that Leaning fails to teach a "virtual timeline" in the form of "a playlist of entire content files" wherein each content file is played automatically one after the other, Klements teaches such limitations. For example, Klements teaches generating a playlist of entire content files such as "twenty . . . songs to be part of a play list, and subsequently have those songs played back . . . by selecting playback of the play list." EX1005, ¶ [0041]; *see also id.*, ¶ [0068] ("streaming media player 142 indicates to streaming module 144 that the player is ready for the next piece of content in the play list. . . . by communicating a 'stream next entry' command to streaming module 144"); EX1003, ¶ 118.

A POSITA would have been motivated to create a virtual timeline playlist of entire content files that play one after the other, as taught by Klements, in order to set out a schedule of similar recordings for clients to play sequentially in succession so that the presentation is made in the order as originally intended instead of a random or different order. EX1003, ¶ 119. A POSITA would have had a reasonable expectation of success with such a combination because both Leaning and Klements are drawn to similar systems of client-server based streaming and generating a playlist of entire content files would have been a straightforward modification for a POSITA. EX1003, ¶ 119.

C. Ground 3: Claim 16 Would Have Been Obvious in view of Leaning (with or without Klements) and Gamble

The sections of Ground 1 (Section IX.A) and Ground 2 (Section IX.B) are incorporated into this section by reference. To the extent certain limitations are not disclosed or rendered obvious over Leaning alone or Leaning in view of Klements, Gamble teaches these limitations. EX1003, ¶ 120.

1. Claim 16: "The method of claim 12, wherein the at least one TCP connection comprises a plurality of different TCP connections, and wherein the requesting of the plurality of sequential individually-requestable portions includes requesting sub-parts of the individually-requestable portions over different ones of the plurality of different TCP connections, and wherein the arranging includes reassembling the individually-requestable portions from the requested sub-parts."

Leaning in view of Gamble teaches claim 16. As explained above, Leaning (or, alternatively, Leaning in view of Klements) teaches that the at least one TCP connection over which the files are requested may comprise a plurality of TCP connections. *See* Sections IX.A (claim 3), IX.B.1. Additionally, Gamble teaches sub-parts of a plurality of files that are requested over a plurality of TCP connections and reassembled. For example, 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 706_1 through 706_4 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 706_1 through 706_4. *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, ¶ 121.

Additionally, a POSITA would have known that, using HTTP, a client could request sub-parts of a file by making RANGE requests. EX1003, ¶ 122. For example, a POSITA would have known that HTTP allows clients to request a byte range from a file and that requests could be made for multiple ranges from the same file in any order such that "client could connect to multiple servers simultaneously [and] request[] multiple ranges." EX1012, 383-384; EX1019, 119-121 (explaining HTTP RANGE requests, including requests for a single range or a set of ranges); EX1003, ¶ 122.

A POSITA would have been motivated to configure Leaning's apparatus to request sub-parts of the files (sub-files) 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, ¶ 123; EX1012, 108-109 (explaining that parallel TCP connections were known and may be faster). 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*.

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 of related patents to the '234 Patent 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. Patent

Owner argued that the respondents in the ITC Investigation 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 that met 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.

However, these findings by the ALJ 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 any of the '234 Patent claims at least 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. *Id.*; *see, e.g.*, Section IX.A.1 Ground 1: 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: 1[C][1], claim 2; 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 cannot show any nexus to the claim language.

XI. NO BASIS FOR DISCRETIONARY DENIAL

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

The six *Fintiv* factors do not apply here and therefore favor institution because this petition was filed the same day that the '234 Patent was asserted in District Court and thus no significant events have occurred. If Patent Owner argues for denial under *Fintiv* Petitioner reserves the right to respond.

Regarding *General Plastics*,[4] this petition (filed concurrently with #2 ranked IPR2024-00941 "Ogdon-based petition") is ranked #1 in a concurrently filed notice to the Board and therefore the instant Leaning-based petition is the first petition filed against the '234 Patent.[5] *General Plastics* does not apply and this favors institution.

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[4] *See* concurrently filed Ranking Notice.

[5] In the prior IPRs Petitioner filed against related patents, the Ogdon-based petitions and Leaning-based petitions were filed separately because Petitioner had to quickly file on the best known art (Ogdon) in response to a preliminary injunction motion Patent Owner filed in Utah District Court. Petitioner filed the Leaning-based IPRs

If Patent Owner argues for denial under *General Plastics*, Petitioner reserves the right to respond.

B. § 325(d): *Advanced Bionics*

The *Advanced Bionics* two-part framework also favors institution. Although, Leaning, Klements, and Gamble were submitted in stamped IDSs during prosecution of the ’234 Patent (though only after the Examiner had already decided to allow the claims), none were used by the Examiner in any rejections or discussed in any way during prosecution and thus not meaningfully considered. To the extent it is found that Part I of *Advanced Bionics* is met, even though it appears none of these references were “meaningfully considered,” under Part II, the Examiner erred in a

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as soon as reasonably possible once Petitioner became aware of Leaning; but even if Petitioner had been aware of both references there is not enough room to challenge these patents’ many claims with a Leaning Ground and an Ogdon ground in the 14,000 word limit. Further, Petitioner must challenge all claims of each of Patent Owner’s asserted patents because Patent Owner has recently confirmed its intention to assert all of its nearly 200 claims in its asserted patents against its targets. EX1014, 1 (attempting to amend to assert all independent and dependent claims across all eight patents against fuboTV).

manner material to the patentability of the Challenged Claims such that *Advanced Bionics* favors institution.

As noted above in Section V.B, the Examiner's stated reasons for allowance was that the prior art failed to disclose or render obvious "automatically requesting from the at least one server subsequent portions of the digital content by requesting for each subsequent portion one of the streamlets from the different copies of the digital content dependent upon successive determinations by the client module to change a currently requested bit rate to a higher or lower bit rate, the automatically requesting including repeatedly generating a factor indicative of a current ability to receive digital content at a rate sufficient for presenting the digital content as the digital content is received; making the successive determinations to change the digital content bit rate based on the factor using the streamlets of one of the different copies of the digital content having the highest bit rate determined receivable for presentation so that the client module selects a higher bit rate one of the different copies when the factor is greater than a first threshold and selects a lower bit rate one of the different copies when the factor is less than a second threshold." EX1002, 201.

However, as explained above in Ground 1, Leaning teaches each and every one of these limitations. *See* Section IX.A.1 (1[C][1], 1[C][2], and 1[D]). Thus, the Examiner erred at least by not appreciating that Leaning disclosed or rendered

obvious these limitations.[6] This conclusion is bolstered by the fact that the prosecution history provides no evidence that the Examiner meaningfully considered Leaning. The Examiner simply stamped the IDSs that were submitted and checked the box in the Notice of Allowance forms that the IDSs were considered.[7] The Examiner never gave any reasons for allowance over Leaning. The Examiner made a material error by failing to appreciate that Leaning discloses or renders obvious each and every limitation of the independent claims—including the limitations

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[6] The Examiner similarly erred when allowing the related patent U.S. 11,470, 138 over the Carmel reference (EX1016, 1270-1272) by failing to find and apply Leaning to reject similar claims when Leaning disclosed precisely what the Examiner alleged Carmel lacked—(1) streamlets having the same duration (EX1004, 1:3-29)) and (2) separate files requested from a multi-level stream (EX1004, Abstract, 1:3-29, 3:5-18, 5:4-6:8, 6:21-7:2, 12:8-20). EX1017, 11-13, 25, n.4.

[7] Notably, Patent Owner ***did not submit Board decisions granting institution of related patents for consideration by the Examiner*** and instead dumped them in an IDS at the 11th hour the day before issue without filing a petition to withdraw from issue—thus they were not considered. *See* Section V.B.

indicated in the Examiner's reasons for allowance before Leaning was disclosed to the Office.

XII. CONCLUSION

Petitioner requests *inter partes* review and cancellation of claims 1-20.

DATED: May 21, 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 13,546 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: May 21, 2024

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CERTIFICATE OF SERVICE

I hereby certify that on May 21, 2024 I caused a true and correct copy of the:

- Petition for *Inter Partes* Review of U.S. Patent 11,991,234
- Exhibits
- Petitioner's Power of Attorney

to be served via overnight delivery on the USPTO Patent Center (PAIR) Correspondence Address for U.S. Patent 11,991,234 as follows:

70540 – KW LAW LLP (Dish Technologies L.L.C.)
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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 litigations and related IPR proceedings:

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