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 8,868,772
Issue Date: October 21, 2014
Title: APPARATUS, SYSTEM, AND METHOD FOR ADAPTIVE-RATE SHIFTING OF STREAMING CONTENT

Inter Partes Review No. IPR2024-00519

PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT 8,868,772 CHALLENGING CLAIMS 1-21 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. 8,868,772 ("the '772 Patent")
1002	File History of U.S. Pat. 8,868,772
1003	Declaration of Dr. Henry Houh including Curriculum Vitae ("Houh declaration")
1004	International P.C.T. Publication WO 2002049343 to Leaning et al. ("Leaning")
1005	<RESERVED>
1006	<RESERVED>
1007	U.S. Patent No. 6,848,004 to Chang ("Chang")
1008	WO1997044942 to Kliger ("Kliger")
1009	337-TA-1265 ITC Investigation Initial Determination
1010	337-TA-1265 ITC September 11, 2023 Enforcement Complaint
1011	<RESERVED>
1012	<RESERVED>
1013	U.S. Patent No. 6,637,031 to Chou ("Chou")
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1015	<RESERVED>
1016	<RESERVED>
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1018	<RESERVED>
1019	<RESERVED>
1020	U.S. Patent Publication No. US 2004/0093420 to Gamble ("Gamble")

TABLE A: LISTING OF CLAIMS

Claim Designation	Claim Language
Claim 1	
1[Pre]	A method for presenting rate-adaptive streams, the method comprising:
1[A][1]	streaming by a media player operating on an end user station a video from a set of one or more servers,
1[A][2]	wherein each of a plurality of different copies of the video encoded at different bit rates is stored as multiple files on the set of servers,
1[A][3]	wherein each of the multiple files yields a different portion of the video on playback,
1[A][4]	wherein the multiple files across the different copies yield the same portions of the video on playback,
1[A][5]	each of said files having a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video, and wherein the streaming comprises:
1[B]	requesting by the media player a plurality of sequential ones of the files of one of the copies from the set of servers over a plurality of Transmission Control Protocol (TCP) connections based on the time indexes;
1[C]	automatically requesting by the media player from the set of servers over the plurality of TCP connections subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies, said automatically requesting including,
1[D]	repeatedly generating a set of one or more factors indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies, wherein the set of one or more factors relate to the performance of the network; and
1[E]	making the successive determinations to shift the playback quality based on at least one of the set of factors to achieve continuous playback of the video using the files of the highest quality one of the copies determined sustainable at that time; and

1[F]	presenting the video by playing back with the media player on the end user station the requested files in order of ascending playback time.
Claim 2	
[2]	The method of claim 1, wherein said requesting the plurality of sequential ones of the files includes requesting sub-parts of the files over different ones of the plurality of TCP connections, and wherein said presenting includes reassembling the files from the received sub-parts.
Claim 3	
[3]	The method of claim 1, wherein said making the successive determinations to shift comprises: upshifting to a higher quality one of the different copies when the at least one factor is greater than a first threshold; and determining if the higher quality playback can be sustained.
Claim 4	
[4]	The method of claim 3, wherein said making the successive determinations to shift comprises downshifting to a lower quality one of the different copies when the at least one factor is less than a second threshold.
Claim 5	
5[A]	The method of claim 1, further comprising: receiving user input to enable one of fast-forward, skip randomly, and rewind functionality; and
5[B]	requesting files of the video at a specified time index that is not the next sequential time in the current playback.
Claim 6	
[6]	The method of claim 1, wherein said requesting the plurality of sequential one of the files includes requesting the files from a low quality one of the different copies to enable instant playback of the video, and wherein said automatically requesting includes-upshifting to a higher quality one of the different copies.
Claim 7	
[7]	The method of claim 1, wherein said requesting the plurality of sequential ones of the files includes requesting the plurality of sequential ones of the files over different ones of the plurality of TCP connections.

Claim 8	
[8]	The method of claim 1, wherein said presenting comprises sequentially arranging the requested files from the different copies in the order of ascending playback time for playback with the media player on the end user station.
Claim 9	
[9]	The method of claim 1, wherein said automatically requesting includes requesting sub-parts of the files over different ones of the plurality of TCP connections, and wherein said presenting includes reassembling the files from the received sub-parts.
Claim 10	
[10]	The method of claim 1, wherein the at least one of the set of factors is indicative of the available bandwidth of the plurality of TCP connections.
Claim 11	
[11]	The method of claim 1, wherein the at least one of the set of factors is indicative of latency of the requested files, wherein the latency is a time measure between when one of the requests is issued and a time that response data of the request begins to arrive at the end user station.
Claim 12	
[12]	The method of claim 1, wherein the at least one of the set of factors is indicative of time intervals between successive receive times for each response to the requested files.
Claim 13	
[13]	The method of claim 1, wherein the at least one of the set of factors is indicative of delays or losses in one or more of the plurality of TCP connections.
Claim 14	
[14]	The method of claim 1, wherein at least one of the set of servers is a web server.
Claim 15	
[15]	The method of claim 14, wherein the files are requested from the web server using Hyper Text Transfer Protocol (HTTP), and wherein the web server is without specialized server-side intelligence to respond to said requesting.
Claim 16	
[16]	The method of claim 1, wherein at least one of the set of servers is a cache server of a network infrastructure operator.

Claim 17	
17[A]	The method of claim 1, wherein: said generating the set of factors comprises: monitoring time intervals between successive receive times for each of the requested files;
17[B]	calculating a current performance ratio across a current window of the time intervals; and
17[C]	calculating a current average of the performance ratio to obtain a current performance factor of the set of factors;
17[D]	said making further comprises: comparing the current performance factor with a set of one or more trigger thresholds; and
17[E]	determining whether to upshift or downshift to a higher or lower quality one of the different copies based on said comparing.
Claim 18	
18[A]	The method of claim 1, wherein said making comprises: comparing a current performance factor of the set of factors with a set of one or more trigger thresholds, wherein the set of one or more trigger thresholds is determined by a combination of two of the set of factors relating to a current read ahead margin and a minimum safety margin, wherein the current read ahead margin is an amount of contiguously available, sequentially arranged requested files of video received by the media player for playback at a current playback time index; and
18[B]	determining whether to upshift or downshift to a higher or lower quality one of the different copies based on said comparing.
Claim 19	
[19]	The method of claim 1, wherein: said requesting comprises issuing for each of the plurality of sequential ones of the files a request with the filename of that file, and said automatically requesting comprises issuing for each of the files a request with the filename of that file.
Claim 20	
[20]	The method of claim 1, wherein the set of servers includes a content server storing the multiple files of the different copies, and wherein the set of servers includes one or more cache servers caching at least some of the files.

Claim 21	
[21]	The method of claim 1, wherein the multiple files are independently cacheable by a cache server without specialized server-side intelligence.

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 1-21 ("Challenged Claims") of U.S. Pat. No. 8,868,772 ("the '772 Patent") (EX1001). The '772 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 '772 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 '772 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 '772 Patent is currently asserted in the below proceedings.[1]

- *Aylo Freesites Ltd f/k/a MG Freesites Ltd v. DISH Technologies LLC*, IPR2024-00048 (hereinafter "Ogdon-based IPR" because it relies on U.S. Patent No. 6,161,137 "Ogdon" as a primary reference)

- *DISH Technologies LLC et al. v. MG Premium Limited et al.*, No. 2:23-cv-00552 (D. Utah) (the "'552 Utah Litigation")

- *DISH Technologies LLC et al. v. Aylo Freesites Ltd et al.* 2:24-cv-00066 (D. Utah) ((the "'066 Utah Litigation") and, collectively with the '552 Utah Litigation, the "District Court Litigations")

- *DISH Technologies LLC v. A Parent Media Co. Inc. et al.* 1:23-*cv*-01000 (D. Del.)

- *DISH Technologies LLC v. fuboTV Media Inc.* 1:23-cv-00986 (D. Del.)

- *DISH Technologies LLC v. Beachbody, LLC d/b/a/ BODi* 1:23-cv-00987 (D. Del.)

- *DISH Technologies LLC et al. v. WebGroup Czech Republic A.S. et al.* 2:23-cv-00553 (D. Utah)

- *DISH Technologies LLC et al. v. Vidgo Inc.* 2:23-cv-00624 (D. Utah)

- *DISH Technologies LLC v. BritBox, LLC* 1:23-cv-08971 (S.D.N.Y)

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[1] The '772 Patent was also at issue in *MG Freesites Ltd et al. v. DISH Technologies LLC et al.* 3:23-cv-03674 (N.D. Cal.) (the "California Litigation"), but that case was dismissed for lack of personal jurisdiction on January 24, 2024.

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

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

Petitioner has also filed IPRs on related U.S. Patent Nos. 9,407,564 (IPR2024-00047); 11,470,138 (IPR2024-00044); 10,469,554 (IPR2024-00045); 10,951,680 (IPR2024-00046); 11,677,798 (IPR2024-00043); 10,469,555 (IPR2024-00146); and 10,757,156 (IPR2024-00147). Additionally, Petitioner is concurrently filing IPRs based on the same recently discovered International P.C.T. Publication WO 2002049343 to Leaning et al. ("Leaning") relied on here on U.S. Patent Nos. 9,407,564 (IPR2024-00518); 10,469,554 (IPR2024-00514); 10,469,555 (IPR2024-00515); 10,757,156 (IPR2024-); 10,951,680 (IPR2024-00516); 11,470,138 (IPR2024-00512); and 11,677,798 (IPR2024-00517).

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

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

III. CERTIFICATION OF GROUNDS FOR STANDING

Petitioner certifies that the '772 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 1-21 based on the grounds below.

Ground	Reference(s)	Challenged Claims	Basis
1	Leaning	1-21	103
2	Leaning and Gamble	2 and 9	103

These Grounds are supported by the Declaration of Dr. Henry Houh (EX1003) and other supporting evidence in the Exhibit List. EX1003, ¶¶ 55-56.

V. '772 PATENT

A. Summary

The '772 Patent (Application No. 11/116,783) was filed on April 28, 2005, which claims priority to U.S. Provisional No. 60/566,831 filed on Apr. 30, 2004. The '772 Patent issued on October 21, 2014. EX1001, Cover.

The ’772 Patent relates to “adaptive-rate shifting of streaming content,” such as video, over the Internet. EX1001, Abstract, 1:18-21.

The ’772 Patent teaches “a content server 102” and “end user 104” coupled by a data communications network (*e.g.*, the Internet 106) wherein the “end user station 104” may be a personal computer, entertainment system, or a portable electronic device configured to present content. *Id.*, FIG. 1, 6:3-17. As shown in Figure 2b below, the ’772 Patent describes encoding the same content file into three different “quality” streams: low, medium, and high.

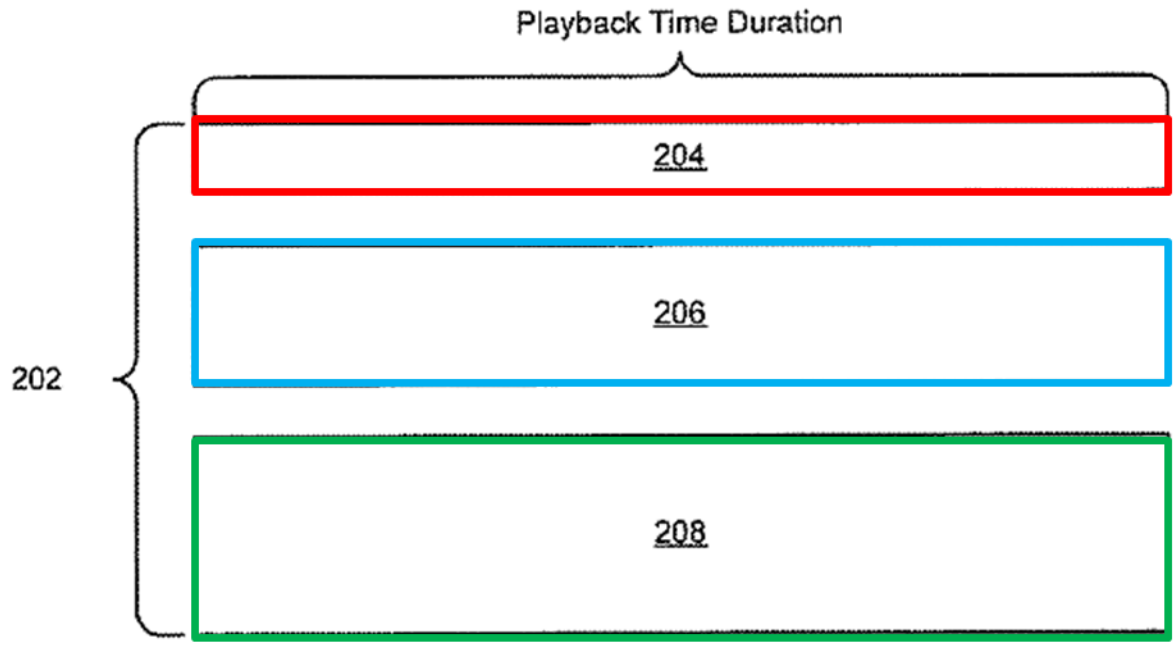


FIG. 2b

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

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

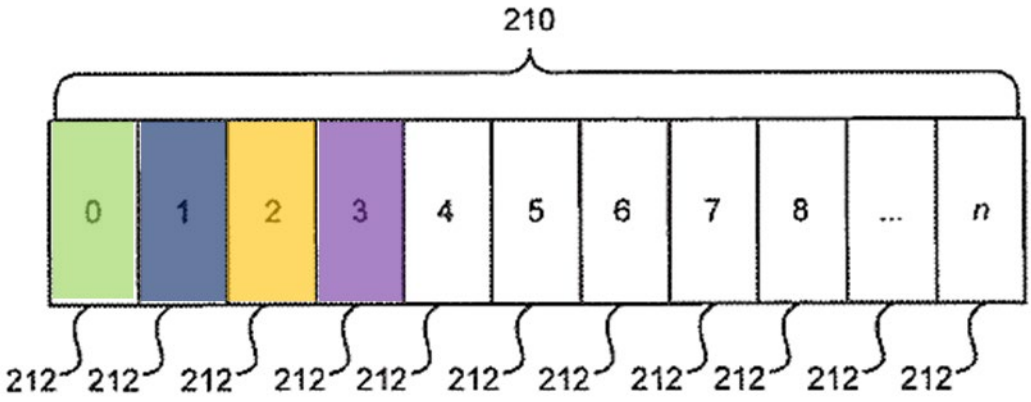


FIG. 2c

Id., FIG. 2c (annotated).

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

B. Prosecution History

The '772 Patent was filed as Application No. 11/116,783 on April 28, 2005. On May 14, 2008, the Examiner issued a non-final office action finding, *inter alia*,

the pending claims anticipated by or obvious over U.S. Publication No. 2002/0144276 ("Radford"). EX1002, 62-80.

On September 11, 2008, Applicant conducted an interview and revised the claims, arguing Radford no longer anticipates or renders obvious the claims as amended because Radford does not disclose automatically and progressively requesting video portions, achieving continuous playback, or multiple TCP connections. *Id.*, 110-122.

On February 20, 2009, the Examiner issued a final office action rejecting all pending claims. *Id.*, 394-409. The Examiner found most claims indefinite for reciting "performance factors," "requesting sub-parts," and "requesting . . . from the server over a plurality of [TCP] connections." *Id.*, 396-397. The Examiner found that pending claim 39 failed the written description requirement for reciting new matter. The Examiner found all pending claims obvious in view of U.S. Publication No. 2002/0188745 ("Hughes"), U.S. Publication No. 2003/0135631 ("Li"), U.S. Publication No. 2004/0093420 ("Gamble"), and (for some claims) Official Notice. *Id.*, 397-409.

On March 11, 2009, Applicant conducted another interview, and on March 14, 2009, Applicant submitted an amendment after final. *Id.*, 441-463. Applicant argued that claim 39, amended to recite that the "current read ahead margin" is an amount of contiguously available, sequentially arranged portions, is supported by

the specification. *Id.*, 445-446. Applicant also amended the claims to recite "one or more factors [that] relate to the performance of the network," which it asserted encompassed "any factor which relates to the performance of the network in general," and argued that "requesting sub-parts" "requires that the 'sub-parts' encompass **any part of the requested portions of the video**, not just any part of the copies of the video files." *Id.*, 446-449 (emphasis in original). Applicant further amended claim 20 to recite "requesting by the media player [. . .] from the server." *Id.*, 449-450. Applicant argued that the combination of asserted references no longer rendered the claims obvious. *Id.*, 450-463. For example, Applicant argued that Gamble's disclosure of selecting a file to be sent, segmenting the file into segments in the TCP layer, and sending the segments over parallel TCP connections does not teach "**requesting** by the media player a plurality of **sequential portions of one of the copies** . . . from the server **over a plurality of [TCP] connections**" and "automatically and progressively **requesting** by the media player from the server **over the plurality of TCP connections subsequent portions of the video from different ones of the copies**" (emphasis in original). *Id.*, 450-460.

On April 2, 2009, the Examiner declined to enter this amendment. *Id.*, 469-471. On April 10, 2009, Applicant submitted another amendment after final, making identical claim changes and remarks, except to account for cancellation of claims 22

and 39. *Id.*, 498. On May 12, 2009, the Examiner declined to enter this amendment. *Id.*, 504-506.

On June 22, 2009, Applicant further revised its claims in a Request for Continued Examination. *Id.*, 510-536. Applicant again argued that the claims are not indefinite and that the combination of asserted prior art no longer rendered obvious the claims as amended. *Id*., 527-532.

On August 20, 2009, the Examiner issued a non-final office action rejecting all claims. *Id.*, 547-560. The Examiner found that the claims recited new matter and were obvious in view of "Intelligent Streaming" ("Birney") and U.S. Publication No. 2003/0152036 ("Quigg-Brown"). *Id.*, 549-560.

On October 22, 2009, Applicant further amended the then-pending claims. *Id.*, 566-583. Applicant argued that "requesting . . . over a plurality of [TCP] connections based on the time indexes" was supported by the specification's description of, *inter alia*, streamlets encapsulated as an independent media object or file having a unique time index, and multiple TCP connections. *Id.*, 573-574. Applicant also argued that a claim amendment reciting "**repeatedly** generating a set of one or more factors" means that "the set of factors are generated more than once, not just 'at any time set." *Id.*, 574-575 (underline in original). Applicant further argued that the asserted combination of Birney and Quigg-Brown no longer rendered obvious the claims as amended, including "requesting by the media player" (first and/or second

occurrences), "stored as multiple files," "time indexes," and the media player "making the successive determinations." *Id*., 575-582.

On February 22, 2010, the Examiner issued a final office action finding the claims obvious in view of Birney, U.S. Patent No. 6,490,627 ("Kalra"), and Quigg-Brown. *Id.*, 615-630. Among other things, the Examiner asserted that Birney teaches (i) multiple files through its disclosure of discrete streams with different quality bit rates, and (ii) time indexes through its disclosure of seamlessly switching stream qualities. *Id.*, 627-628.

On February 25, 2010, Applicant filed a response arguing the claims are not obvious over the asserted prior art, including that Birney teaches streams stored as a single file (not multiple files) and that seamlessly switching stream qualities does not in and of itself teach time indexes. *Id.*, 635-640. On March 23, 2010, the Examiner issued an Advisory Action maintaining the rejection. *Id.*, 641-643. On April 22, 2010, Applicant filed another response. *Id.* 654-660. On May 17, 2010, the Examiner issued another Advisory Action maintaining the rejection. *Id.*, 661-663.

On May 24, 2010, Applicant filed a Notice of Appeal, followed by its Appeal Brief on October 25, 2010, in which it asserted arguments that the prior art does not disclose numerous pending claim limitations. *Id.*, 665-667, 672-721. In addition to arguments based on multiple files, Applicant argued, *e.g.*, that the cited art's disclosure of bandwidth fluctuations does not teach factors indicative of (i) latency,

(ii) time intervals between successive receive times for each response, or (iii) delays or losses in one or more TCP connections. *Id.*, 700-703; *see also id.*, 706. Applicant also argued that Birney's disclosure that "the [Windows Media] server selects and delivers the stream with the most appropriate bit rate" or "pushes data to a client" does not teach a web server and/or a cache server without specialized server-side intelligence. *Id.*, 703-705.

On February 16, 2011, the Examiner filed an Examiner's Answer to the Appeal Brief, maintaining the rejection of all pending claims. *Id.*, 753-778. On April 28, 2005, Applicant submitted its Reply Brief. *Id.*, 787-807.

On July 23, 2014, the PTAB issued a decision reversing the Examiner's rejection, finding that neither Birney nor Kalra discloses "that the different copies of the video are *stored as multiple files*." *Id.*, 820-825 (emphasis in original). On August 12, 2014, the Examiner issued a Notice of Allowance. *Id.*, 1516-1525. On August 20, 2014, Applicant filed another RCE with an Information Disclosure Statement. *Id.*, 2153-2154. On September 12, 2014, the Examiner issued another Notice of Allowance. *Id.*, 2158-2166.

C. Priority Date

Petitioner assumes for the purpose of this Petition a priority date of April 30, 2004 (the "Priority Date") based on the claimed priority to the Provisional

application No. 60/566,831 (EX1001, Cover), but Petitioner reserves the right to contest this priority date (and priority chain) in other proceedings.

VI. LEVEL OF ORDINARY SKILL IN THE ART

Petitioner submits that a person having ordinary skill in the art ("POSITA") as of the Priority Date would have had at least a B.S. degree in computer science or electrical engineering (or comparable degree) and two years of experience in networking or streaming media, or a M.S. in computer science or electrical engineering (or comparable degree). EX1003, ¶ 51. A higher level of education or specific skill might make up for less experience, and vice-versa. *Id*.

VII. CLAIM CONSTRUCTION

Family members of the '772 Patent were asserted in the International Trade Commission ("ITC") in Investigation No. 337-TA-1265 (ITC) ("the ITC Investigation"). Petitioner was not involved in the ITC Investigation.

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. asserting family members of the '772 Patent, the Chief Administrative Law Judge ("ALJ") construed "a factor indicative of the current ability to sustain the streaming [of the video … wherein the set of one or more factors relate to the performance of the network]" according to its plain and ordinary meaning, "*e.g.*, one or more factors relating to the performance of the network that

is indicative of an ability to sustain the streaming of the video." EX1009, 53-61. The ALJ also construed "repeatedly generating a factor" as "generating a factor more than once" and construed "successive determinations" according to its plain and ordinary meaning. *Id.*, 61-64.

The PTAB is not bound by the ITC's constructions. *Mediatek Inc. v. Advanced Micro Devices, Inc.*, IPR2018-00102, Paper 48 (Final Written Decision), at 10-11 (PTAB Apr. 29, 2019) (citing *Nobel Biocare Servs. AG v. Instradent USA, Inc.*, 903 F.3d 1365, 1375 (Fed. Cir. 2018)). Nevertheless, as shown herein, the asserted grounds render claims 1-21 of the '772 Patent unpatentable even under the ITC's constructions. By asserting that the '772 Patent claims are unpatentable under the ITC's constructions, Petitioner is not conceding that those constructions are correct and reserves its rights to challenge those constructions in any future proceeding.

In the ITC Investigation, iFIT proposed a design-around with respect to certain limitations of other patents in the family of the '772 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 ’772 Patent admits in the “Description of Related Art” section that “streaming media” was known, including streaming of “audio/video,” including on demand and live broadcasts. EX1001, 1:31-41. The ’772 Patent further admits that TCP connections were known and that “[m]ost streaming solutions use a TCP connection.” *Id.*, 2:6-49. Further, Patent Owner admits that the “standard HTTP/TCP protocol” is “the web standard upon which the Internet is built.” *See DISH Technologies LLC et al v. Aylo Premium Limited et al* Case No. 2:23-cv-00552-HCN, D.I. 1 at ¶ 30. Other admissions in the ’772 Patent are that “[u]se of cache servers is well known to those skilled in the art.” EX1001, 8:6-10.

Before the Priority Date, “client-pull” streaming systems were known in the art wherein a client requested from a server sequential portions of a file at different encoded quality levels based on network bandwidth. EX1003, ¶¶ 57-58. For example, Chang describes “real time measurement and prediction of bandwidth for adaptive content delivery of rich media according to available user bandwidth.” EX1007, Abstract. Chang discloses a client (via java applets) that performs real time bandwidth measurement according to user’s available bandwidth and fetches the corresponding bandwidth sensitive track content from the server via HTTP requests. *Id.*, 7:43-53, 8:59-9:5, 9:45-51, 10:15-14, 10:35-58. In another example, Kliger

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

B. Leaning

Leaning (EX1004) was filed on December 14, 2001 and published on June 20, 2002. Leaning is prior art under at least (pre-AIA) 35 U.S.C. § 102(b). Leaning is not cited on the face of the '772 Patent[2] nor was it considered by the ALJ in the ITC action.

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

[2] As will be explained in Section XI, *infra*, a different United States Pre-Grant Publication (US 2004/0030547) to Leaning titled "Encoding Audio Signals" with claims drawn to encoding of audio signals was cited on the face of the '772 Patent (EX1001, 3). This publication is not related, *i.e.*, outside the patent family, to the Leaning reference presented here and was not considered during examination other than being included in a lengthy IDS.

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

C. Gamble

Gamble (EX1020) was filed on November 13, 2002 and published on May 13, 2004. Gamble is prior art under at least (pre-AIA) 35 U.S.C. § 102(e). Gamble is cited on the face of the '772 Patent and was used as a secondary reference to reject the claims during prosecution, but was not considered in the ITC investigation. The grounds involving Gamble are new and combine Gamble with a primary reference that was not considered by the Examiner.

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

D. Analogous Art

Each prior art reference is analogous art to the claimed invention in the '772 Patent. Each is in the same field of endeavor of streaming based on network conditions, with Leaning teaching adaptive-rate streaming based on network conditions. *Compare* EX1001, title, Abstract, 1:18-21, 2:44-48, 2:60-3:67, FIGs. 2c, 4, and 7, *with* EX1004, Abstract, 6:5-7:5, 8:1-9:8, FIGs. 1-5; EX1020, ¶¶ 4-5, 50-52; *see also* EX1003, ¶ 63.

Additionally, the prior art references are reasonably pertinent to any purported problem addressed in the '772 Patent, such as "alleviat[ing] the problems of reliability, efficiency, and latency" and "offer[ing] instantaneous viewing" using "multiple connections between a source and a destination" and/or "requesting varying bitrate streams depending upon network conditions" *Id*.; EX1001, 2:39-2:48; EX1003, ¶ 64.

IX. SPECIFIC GROUNDS

A. Ground 1: Claims 1-21 Would Have Been Obvious in view of Leaning

1. Claim 1

a. 1[Pre]

Whether or not the preamble is limiting, Leaning teaches 1[Pre]. Leaning discloses a method for presenting a rate-adaptive digital stream from a video server (server 1) over a network (Internet 2). EX1004, Abstract ("Delivery of recorded

audio or video material over a telecommunications link (2) from a server (1) to a terminal (3) . . . Provision may be made for **switching**[3] between alternative sub-file sets representing alternative delivery modes of data rates."), 1:3-29 ("delivery, over a telecommunications link, of digitally coded material for presentation to a user"; "terminal for playing audio or video material which is stored on a remote server as a set of files representing successive temporal portions of the said material"; "transmitting digitally coded audio or **video** material comprising: partitioning the material into a plurality of discrete files each representing successive temporal portions of the said material; storing the files at a first station; and at a second station - a) transmitting to the first station requests for successive respective ones of the files; b) receiving the files; and c) decoding the files for replay of the material."), 6:13-15 ("the server stores two or more versions of the recording, recorded at different compression rates (for example . . . 8, 16, 24 and 32 kbit/s respectively) and **the player program is able to switch automatically between them**."), 16:6-10, claim 1, FIG. 1; EX1003, ¶¶ 65.

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

b. 1[A][1]

Leaning teaches 1[A][1]. Leaning discloses streaming by a media player (player program) operating on the end user station (terminal 3) from a set of one or more servers (server 1). EX1004, 4:4-15 ("terminal with . . . video display 34, communications interface 35, and audio interface ('sound card') 36. For video delivery, a video card would be fitted in place of, or in addition to, the card 36."; "'web browser' program"; "further program 38 which will be referred to here as **'the player program'** which provides the functionality necessary for the playing of audio files in accordance with this embodiment of the invention."), 5:1-14, 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, the terminal comprising: a telecommunications interface for communication with the **server** . . . ."), 6:13-15 ("the **server** stores two or more versions of the recording, recorded at different compression rates . . . and the player program is able to switch automatically between them.") EX1003, ¶ 66.

c. 1[A][2]

Leaning teaches 1[A][2]. Leaning discloses that each of a plurality of different copies (two or more versions of the recording) of the video encoded at different bit rates (compression rates) is stored on the video server (sever 1). EX1004, 6:13-26

("the server stores **two or more versions** of the recording, recorded at **different compression rates** (for example . . . **8, 16, 24 and 32 kbit/s respectively**) . . . ."), 9:3-7, 16:6-12 ("The **same principle** may be applied to the delivery of **video recordings**."; "the player program incorporates a video decoder. The manner of partitioning the file into sub-files is unchanged. As in the audio case, there may be **two or more recordings corresponding to different data rates, selected by the control mechanism already described**."); EX1003, ¶ 67.

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

sub-files (000000.bin, 000001.bin, 000002.bin. . . 000134.bin) each encoded at a different bitrate (8k, 16k,18k, 24k, and 32k) and listed in an index file and saved in the directory appropriate for their bitrates); *see also id.*, 12:8-34, 13:23-14:19; EX1003, ¶ 68.

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

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

d. 1[A][3]

Leaning discloses 1[A][3]. *See* 1[A][2]. Leaning discloses that each of the multiple files (subfiles) yields a different portion (temporal portion) of the video on playback. EX1004, 1:3-29 ("delivery, over a telecommunications link, of digitally coded material for presentation to a user"; "terminal for playing audio or video material which is stored on a remote server as a **set of files representing successive temporal portions** of the said material"; "**partitioning the material into a plurality of discrete files each representing successive temporal portions of the said material**; storing the files at a first station; and at a second station - a) transmitting to the first station requests for successive respective ones of the files; b) receiving the files; and c) decoding the files for replay of the material."), FIG. 4; EX1003, ¶ 69.

e. 1[A][4]

Leaning teaches 1[A][4]. *See* 1[A][3]. Leaning discloses that the multiple files (subfiles) across the different copies contains the same portions of the video on playback (*e.g.*, 000000.bin is the same portion of the video in each bitrate directory; 000001.bin is the same portion of the video in each bitrate directory; etc.) because each version has the same number of segments in the same order and having the same duration as each other. EX1004, Abstract, 1:3-29, 3:5-18 ("the file is divided into smaller files before being stored on the server 1. **We prefer that each of these**

smaller files is of a size corresponding to a fixed playing time, perhaps four seconds."; "Thus the Bach file of 9 minutes duration would be **divided into 135 smaller files each representing four seconds' playing time**"), 5:4-6:8, 6:21-7:1 (describing the same set of 135 sub-files (000000.bin, 000001.bin, 000002.bin. . . 000134.bin) each encoded at a different bitrate (8k, 16k, 18k, 24k, and 32k) and listed in an index file and saved in the directory appropriate for their bitrates), 7:1-2 ("because the length of a sub-file corresponds, as explained earlier, to a **fixed length of time**, the **number of sub-files is the same for each directory**."), 12:8-20 ("there is **no expectation that a sub-file will be followed by a sub-file other than that which immediately follows it in the original sequence**"' "the sub-file size can be a fixed number of bits, or a fixed playing time length (or neither of these)"; "In the case of rate switching, it is, if not actually essential, **highly desirable that the sub-file boundaries are the same for each rate**, so that the **first sub-file received for a new rate continues from the same point in the recording that the last sub-file at the old rate ended**. To arrange that every sub-file should represent the same fixed time period (e.g. the 4 seconds mentioned above) is not the only way of achieving this, but it is certainly the most convenient."); EX1003, ¶ 70.

f. 1[A][5]

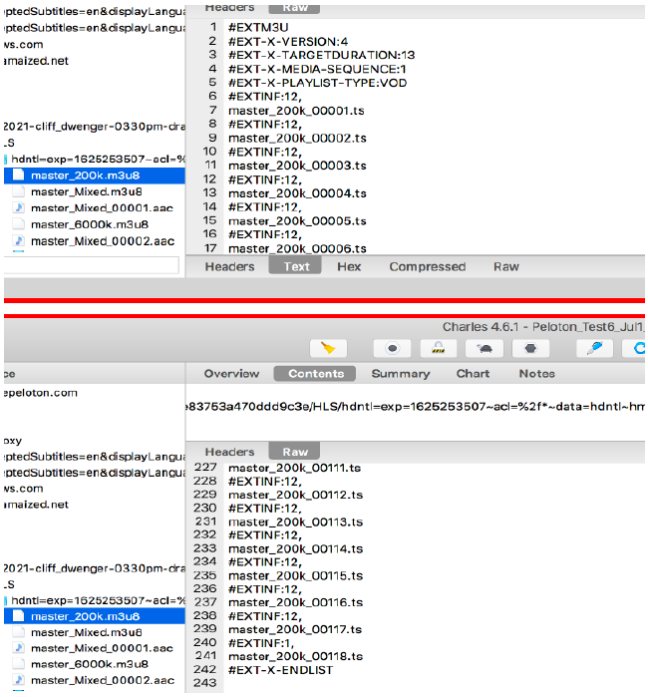
Leaning teaches 1[A][5]. Leaning discloses that each of the files (subfiles) in the different copies have a time index because the subfiles are aligned in time such

that each begin at the same playback time in relation to the beginning of the video because each directory containing different bitrate copies of the video has the same number of subfiles in the same order with the same time durations encoding the same portion of the video. *See* 1[A][4]. EX1004, 12:6-20 ("In the case of rate switching, it is, if not actually essential, **highly desirable that the sub-file boundaries are the same for each rate**, so that the first sub-file received for a new rate **continues from the same point in the recording** that the last sub-file at the old rate ended."); EX1003, ¶ 71.

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

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

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



EX1010, 90-92.

Here, as explained above, Leaning teaches that each subfile for each quality level is sequentially ordered in the same order starting from the beginning of the video, which corresponds to the playback times and are requested in order. EX1004, 7 (sequentially numbered files 000000 to 000134 in each of the different copies), 12:6-20. Thus, to the extent "time index" is interpreted as the ALJ interpreted this limitation, Leaning meets this limitation. EX1003, ¶¶ 72-73.

To the extent "time index" requires files to be indexed or named with some indication of playback time, this limitation would have been obvious to a POSITA in view of Leaning. EX1003, ¶ 74. Though Leaning's exemplary naming convention provided is to name each subfile with a number in ascending order (EX1004, 3:10-11 ("In this example these are given file names which include a serial number indicative of their sequence in the original file.")); Leaning also teaches that "any naming convention can be used" for the subfiles (*id.*, 6:5-8).

Thus, a POSITA would have understood that each subfile could be named according to a time index instead of as an integer (*e.g.*, 000000.bin would be named "00:00.bin" to indicate playback time of 0 seconds; 000001.bin would be named "00:04.bin" to indicate playback time of 4 seconds; 000002.bin would be named "00:08.bin" to indicate playback time of 8 seconds; and so on). EX1003, ¶ 75; *see also* EX1004, 15:19-28 (describing including "Odbits" in the index file to provide the player program with indications of playback time relative to the beginning of the

recording in the form of "hours:minutes:seconds"). And a POSITA would have been motivated to name segments (subfiles) according to their playback times in this way because it still would allow for ordering the subfiles in proper playback order such that when a POSITA viewed the directory of files saved on the servers the subfiles would be listed in order of how they will be played and it would provide the benefit of ascertaining an estimate of the overall length of the recording by simply viewing the name of the final segment in the directory. EX1003, ¶ 75. A POSITA would have had a reasonable expectation of success with such a modification because it would simply involve changing the naming convention for the file names of subfiles stored on the server—which was contemplated by Leaning. *Id.*

As discussed above, the files (subfiles), starting with the first segment, play back the same portion of video for the different copies. *See* 1[A][4]. And the media player (player program) streams the video. *See* 1[A][1]; EX1003, ¶ 76.

g. 1[B]

Leaning teaches 1[B].

Requesting a plurality of sequential files

Leaning teaches requesting a plurality of sequential files (subfiles) of one of the copies from the set of servers (server 1). As already described above, Leaning discloses that the subfiles of each of the copies are in the same sequential order. *See* 1[A][2], 1[A][4]-[A][5]. Leaning further discloses that end user device (terminal 3)

independently requests, via the player program, each of the sequential files (subfiles) of one of the copies from the video server in order. *See* 1[A][5]; EX1004, Abstract ("Delivery of recorded audio or video material over a telecommunications link (2) from a server (1) to a terminal (3) is accomplished by dividing the material into a **sequence of sub-files each of which is independently requested by the terminal**, which thereby has control of the rate of delivery. Provision may be made for switching between alternative sub-file sets representing alternative delivery modes of data rates."), 1:12-19 ("terminal for playing audio or **video** material which is stored on a remote server as a set of files representing successive temporal portions of the said material"; "telecommunications interface for communication with the server; a buffer for receiving the files from the telecommunications interface; means for playing the contents of the buffer; and **control means responsive to the state of the buffer to generate request messages for further files for replenishment of the buffer**."), 2:15-18 ("The function of the server 1 is to store data files, to **receive from a user terminal a request for delivery of a desired data file and, in response to such a request, to transmit the file to the user terminal via the network**."), 5:4-6:2 ("The **player program**, having received the URL, adds to this the filename of the first sub-file, to produce a complete address for the sub-file"; "The **program constructs a request message for the file having this URL** and transmits it to the server 1 via the communications interface 35 and the internet 2"; "**player program**

would send the requests directly to the communications interface, rather than via the browser. The server responds by transmitting the required sub-file. . . . The **player program increments the filename to 000001.bin and requests**, receives, decodes and stores this second sub-file as described in (4) and (5) above. . . . This process is repeated until a 'file not found error' is returned."), 6:27-7:2, 8:6-16, claims 1, 11 and 16; EX1003, ¶ 79. Leaning additionally discloses that end user device (terminal 3) requests, via the player program, a plurality of the sequential files (subfiles). EX1004, 5:6-32 ("The player program has a parameter called the playout time T_p. In this example it is set at 10 seconds . . . . It determines **the degree of buffering that the terminal performs**. The player program increments the filename to 000001.bin and requests, receives, decodes and stores this second sub-file as described in (4) and (5) above. **It repeats this process until the contents of the buffer reach or exceed the playout time T_p**."); EX1003, ¶ 79.

Plurality of TCP connections

Leaning also teaches that the media player (player program) is configured to stream the video from the video server (server 1) over a plurality of TCP connections. *See* EX1004, 2:5-32 ("The system shown in Figure 1 has as its object the delivery, to a user, of digitally coded audio signals . . . the system may be used to convey video signals instead of, or in addition to, audio signals. In this example, the **network is the internet** or other packet network operating in accordance with

the **Hypertext Transfer Protocol (see RFCs 1945/2068 for details)**"; "In Figure 1, a **server 1 is connected via the internet 2 to user terminals 3**"; "The function of the server 1 is to store data files, to **receive from a user terminal a request** for delivery of a desired data **file** and, in response to such a request, to transmit the file to the user terminal via the network. Usually such a **request takes the form of a first part indicating the network delivery mechanism (e.g. http://** or file:// for the **hypertext transfer protocol** or file transfer protocol respectively) followed by the network address of the server (e.g. www.server l.com) **suffixed with the name of the file that is being requested**."; "In these examples, the **use of the hypertext transfer protocol is assumed**"; server 1 "is merely **an ordinary 'web server'**."), 4:4-21; EX1003, ¶ 81.

A POSITA would have understood Leaning's teachings of a terminal connecting to an ordinary web server via the Internet to request subfiles from the server using HTTP (*i.e.*, HTTP 1.0 (RCF 1945) or HTTP 1.1 (RCF 2068)) to include teaching a plurality of TCP connections for such requests because a POSITA would have known that ordinary web servers supported both HTTP and TCP and that HTTP

operates over TCP connections. EX1003, ¶¶ 82;[4] *see also* EX1004, 5:8-14 ("The program constructs a **request message for the file having this URL and transmits it to the server 1 via the communications interface 35 and the internet 2**. (Processes for translating the URL into an **IP** address . . . [is] **conventional** and will not therefore be described). We envisage that the **player program would send the requests** directly to the communications interface, rather than via the browser. **The server responds by transmitting the required sub-file**."). For example, a POSITA would have known that a terminal requesting sequential subfiles from an ordinary web server using the HTTP 1.0 protocol (RCF1945) (EX1004, 2:10) as disclosed by Leaning would require using multiple TCP connections because each HTTP request in HTTP 1.0 must establish a new TCP connection to request and receive each sequential subfile. EX1003, ¶ 82. Thus, a POSITA would have understood Leaning to teach that HTTP operates over a plurality of TCP connections. *Id.*

[4] Indeed, the '772 Patent admits that TCP connections were known and used by most streaming solutions and Patent Owner also admits that the "standard HTTP/TCP protocol" is "the web standard upon which the Internet is built. *See* Section VIII.A

Requesting based on the time indexes

Leaning also teaches that the client requests the files "based on the time indexes" because, as explained above with respect to limitation 1[A][5], each subfile is sequentially ordered starting from the beginning of the video, which corresponds to the playback times, and the elements are requested in such order. In the ITC Investigation, the ALJ did not explicitly construe "requesting a plurality of sequential files of one of the copies from the video server based on the time indexes." However, DISH argued, and the ALJ found, that requesting sequential media segments "based on their filenames" that included a unique sequential number corresponding to their position in playback sequence satisfied this limitation of requesting streamlets "based on the time indexes." EX1009, 93.

Here, as explained above, Leaning discloses precisely what DISH argued, and the ALJ determined, met requesting "based on the time indexes" (*i.e.*, player independently requesting each of the subfiles 000000.bin to 000134.bin in order at the appropriate quality level). *See* 1[Pre]-1[B]. Therefore, according to DISH and the ITC's interpretation, Leaning discloses requesting files (subfiles) according to their playback times. EX1003, ¶¶ 84-85.

Petitioner does not concede that DISH and the ITC are correct in their interpretation that simply requesting files in order is requesting "based on the time indexes" because each subfile may be a different time duration and the player may

not know which specific playback time it is requesting. For example, if 000000.bin is 5 seconds, 000001.bin is 3.5 seconds, and 000002.bin is 4 seconds then the player would request 000000.bin then 000001.bin then 000002.bin—but the player would not be requesting these subfiles ***based on time indexes*** but rather requesting them ***according to their order***. EX1003, ¶ 86.

However, under DISH and the ALJ's interpretation, Leaning explicitly discloses that each sequential subfile is preferably the **same time duration** (*e.g.*, 4 seconds) such that a request for 000000.bin is a request for playback time 0-4 seconds; a request for 000001.bin is a request for playback time 4-8 seconds; and a request for 000003.bin is a request for playback time 8-12 seconds; and so on. EX1004, 3:5-18 ("We prefer that each of these smaller files is of a size corresponding to a fixed playing time, perhaps **four seconds**. . . . would be **divided into 135 smaller files each representing four seconds' playing time**"), 5:4-6:8, 6:21-7:1; *see also id.*, FIG. 4. Therefore, under DISH and the ALJ's interpretation, Leaning discloses requesting based on the time indexes because all the segments are 4 seconds in duration so the time index of each segment is readily and accurately ascertainable. EX1003, ¶ 87. Further, if the claims are read to require the request having an indication of the time index as described above, a POSITA would have been motivated to name subfiles according to their time indexes (*see* 1[A][5]) and,

as such, when subfiles are requested based on subfile name, each subfile would thus be requested "based on the time indexes." *Id.*

h. 1[C]

Leaning teaches 1[C]. Leaning discloses automatically requesting from the set of servers subsequent portions of the video over the TCP connections by requesting for each such portion one of the files from one of the copies. *See* 1[A][2]-[A][5]. Leaning also teaches that teaches that selection of a higher or lower quality for each subfile may be dependent upon successive determinations. More particularly, the player program makes multiple determinations one after the other before shifting up in quality and before shifting down in quality. EX1003, ¶ 88.

For example, when determining to shift down, the Player determines (1) if the buffer is empty, (2) if the measured rate is less than the current rate, and (3) if the measured Buffer Low Percentage more than a Step Down Threshold before shifting down; when determining to shift up, the Player determines (1) if the measured rate exceeds the current rate, and (2) if the measured rate exceeds the next higher rate for a given period of time before shifting up. EX1004, 8:17-26. Once the successive determinations conclude that the player should shift up or shift down, "rate change is effected simply by the player program changing the relevant part of the sub-file address for example, changing '008k' to '024k' to increase the data rate from 8 to 24 kbit/s and changing the current rate parameter to match" and "the next request to

the server becomes a request for the higher (or lower) rate, and the sub-file from the new directory is received, decoded and entered into the buffer." EX1004, 9:3-7, 9-11 (flowchart showing successive determinations to shift up or shift down), claims 4 ("server storing a plurality of sets of files"; "mode **switching by providing that subsequent request messages shall request files from a set different from the set to which the immediately preceding request related**"), 5 ("said sets of files correspond to respective different data rates, in which: the terminal includes means for **monitoring the received data rate**; the mode switching means is operable, in the event that the **measured rate is below** that needed for the set to which the currently requested file belongs, to provide that subsequent said request messages shall request files from a set corresponding to a **lower data rate**"), 6 ("in the event that the **measured rate is sufficient** to support delivery of files of a **higher data rate** than that of the set to which the currently requested file belongs, to provide that subsequent said request messages shall request files from a set corresponding to a **higher data rate**"), 11 and 12; EX1003, ¶ 89.

i. 1[D]

Leaning teaches 1[D]. Patent Owner contended during prosecution of the '772 Patent 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." EX1002, 447-448 (footnotes omitted); EX1003, ¶ 90.

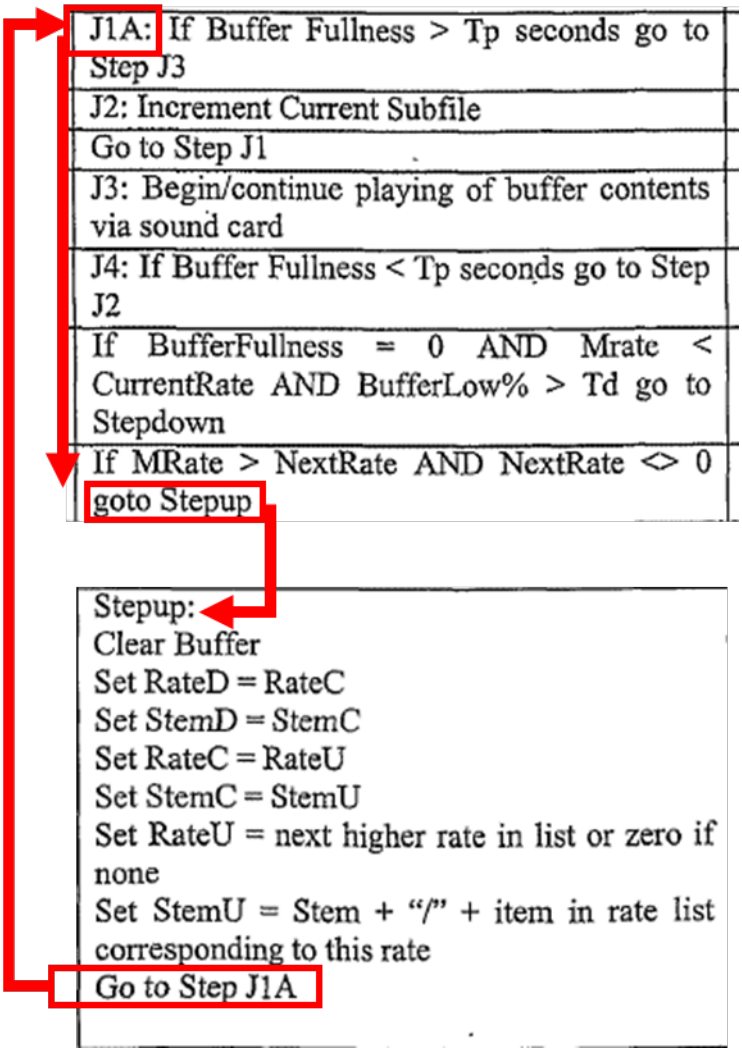
Leaning discloses "repeatedly generating a set of one or more factors indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies, wherein the set of one or more factors relate to the performance of the network" because it teaches repeatedly generating a "measured rate" (*i.e.*, the measured actual data rate being received from the server, averaged over a period of time) and comparing it to a "current rate" (*i.e.*, the bitrate of the current stream) to determine if the current stream is sustainable. EX1004, 8:7-26, claims 5 and 6. Additionally, Leaning repeatedly generates another factor ("Buffer Low Percentage") which is "the percentage of time that the buffer contents represent less than 25% of the playout time (i.e. the buffer is getting close to being empty)." EX1004, 8:27-28. Leaning also explains "that interruption" of the video stream "can be avoided and therefore it is preferable to employ a criterion which anticipates underflow and avoids it in the majority of cases" by omitting the first determination (*i.e.*, whether the buffer is completely empty) and generating measured rate and Buffer Low Percentage factors as indicators of whether the current streaming rate is sustainable. EX1004, 15:3-8, 8:11-16 (repeatedly generates the factor because "process **from then on** is that the player program **measures the actual data rate being received from the server, averaged over a period of time (for example 30 seconds)**. It does this by timing every URL request; the transfer rate achieved (number of bits per second) between the client and server is determined. The

accuracy of this figure improves as the number of requests goes up. The player maintains two stored parameters which indicate, respectively, the current rate, and the **measured rate**."), 8:17-11:1; 1[C]; EX1003, ¶ 91.

j. 1[E]

Leaning teaches 1[E]. As explained above, Leaning discloses making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files (subfiles) of the highest quality copy of the video that is determined to be sustainable at that time. *See* 1[C]-1[D]. Leaning teaches choosing the highest quality copy that is sustainable (*i.e.*, if measured rate > current rate AND measured rate > next highest rate for period of time, then shift up until no longer true—meaning shift up to highest sustainable version). EX1004, 8:24-26 ("if the measured rate exceeds not only the current rate **but also the next higher rate** for a given period of time . . . **increase the current rate**."), 9:3-7, 9-11 (flowchart showing successive determinations to shift up to highest rate deemed sustainable). For example, the excerpted and annotated portion of Leaning's process flow chart below shows that the player on the terminal beginning with step J1A moves through the process and if "MRate [measured rate] is greater than NextRate [next highest rate] AND NextRate <> 0 [there exists a next higher rate] then goto Stepup; and the Stepup process shifts up by changing the RateC [current rate] to the RateU [next highest rate] and changes RateU to the next higher rate, or to "0" if the

current rate is the highest rate then loops back to step J1A and continues the process. Thus, Leaning discloses looping "Stepup" until the highest sustainable rate is achieved up to the highest available rate (by setting RateU to zero). EX1004, 9-11; EX1003, ¶ 92.



EX1004, 10 (flowchart excerpted and annotated); EX1003, ¶ 92.

k. 1[F]

Leaning discloses 1[F]. Leaning teaches presenting the video by decoding and playing back the subfiles of the video with the player program on the terminal in order of ascending start time. EX1004, 1:13-28, 4:4-21, 5:23-6:2, 12:16-18, 14:6-11, claim 1 ("means for playing the contents of the buffer"); EX1003, ¶ 93.

2. Claim 2

Leaning teaches claim 9. *See* 1[B] (establishing plurality of TCP connections). A POSITA would have been motivated to configure Leaning's apparatus to request sub-parts of the files (subfiles) over different TCP connections and reassemble the files from the received subparts. A POSITA would have understood that this improves reliability in situations where one connection fails by retrieving other subparts over other connections and retrieving more of file 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, ¶ 94. 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. *Id*.

3. Claim 3

Leaning teaches claim 3. Leaning discloses that that the media player (player program) upshifts to a higher quality one of the different copies when the factor (the "measured rate" factor) is greater than a first threshold (the "next higher rate" for a given period of time) and determines that the higher quality playback can be sustained. *See* 1[C]-1[E]; 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"), 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 ¶ 95.

4. Claim 4

Leaning teaches claim 4. Leaning discloses that that the media player (player program) downshifts to a lower quality one of the different copies when the at least one factor (the "measured rate" 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[E]; EX1004, 8:17-26, claims 4, 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"); EX1003 ¶ 96.

5. Claim 5

a. 5[A]

Leaning teaches 5[A]. Leaning discloses functionality for fast forward and fast reverse modes, as well as skipping randomly, including receiving user input. *See* EX1004, 16:11-18:17 (describing fast forward and fast reverse functionality, including **"a fast forward command"** and "fast rewind being similar [to fast forward] but in reverse"), 11:12-12:17 (jumping to an arbitrary point of the video, "implemented by the **user indicating which part of the recording he wishes to jump to** - for example by **moving a cursor to a desired point on a displayed bar** representing the total duration of the recording" or alternatively whereby "the user may be presented with a **list of text labels or indices which may be selected (e.g. by means of a mouse)** to initiate a jump"); EX1003, ¶ 97. To the extent Leaning does not expressly disclose receiving user input for rewind functionality, a POSITA would have understood it to be taught by Leaning's disclosure of a fast forward command and rewind being similar but in reverse. EX1003, ¶ 97.

b. Claim 5[B]

Leaning teaches 5[B]. As explained with respect to limitation 5[A], Leaning discloses requesting a specified time index that is not the next sequential time in the current playback, such as via jump functionality, where the user can move a cursor on a bar representing the total duration of the recording or selecting text labels or indices. *See* EX1004, 11:12-12:17 (describing the index as containing lines in the form of "hours:minutes:seconds" timecodes); EX1003, ¶ 98.

Additionally, Leaning discloses pre-requesting files (sub-files) before playback. *See* EX1004, 5:6-6:2 (repeating the process of requesting, receiving, decoding, and storing sub-files until the contents of the buffer reach or exceed a threshold T_p and requesting a further sub-file from the server ("pre-request files") when the buffer is below the Tp threshold). The '772 Patent explains, without elaboration, that "the agent controller module 402 may be configured to anticipate streamlet 212 requests and pre-request streamlets 212. By pre-requesting streamlets 212, the user may fast-forward, skip randomly, or rewind through the content and experience no buffering delay." EX1001, 8:46-50. A POSITA would have understood from Leaning's commensurate disclosure of pre-loading subfiles that fast-forward, skip randomly, and rewind functionality was enabled. Moreover, a POSITA would have understood that when fast forwarding or randomly skipping to a part of the video past the length of one subfile, or rewinding to a previous part of

the video, whether or not those subfiles already have been retrieved and are stored or remain in the cache, then those subfiles are at a specified time index that is not the next sequential time in the current playback. EX1003, ¶ 99.

To the extent Patent Owner argues that Leaning does not teach anticipating file requests and pre-requesting files to enable fast-forward, skip randomly, and rewind functionality, a POSITA would have been motivated to configure Leaning's apparatus to anticipate file requests and pre-request files in order to utilize available bandwidth and ensure a sufficient buffer of data for such standard playback and control functionality. These functions were well known in the art and expected by consumers of multimedia content. *See* EX1013, 2:64-3:4 (discussing seeking to a particular point of time in on-demand multimedia content and its inherent delay); EX1003, ¶ 100. A POSITA would have had a reasonable expectation of success with such a modification because Leaning teaches preloading sub-files as well as functionality for fast-forwarding, skipping randomly, and rewinding, and these functions were well known and commonly implemented in media players in the art. *Id.*

6. Claim 6

Leaning teaches claim 6. Leaning teaches that the media player (player program) initially requests low quality files (*e.g.*, requesting first subfile at 024k) to enable instant playback of the content file, and subsequent upshifts according to the

performance factor (*e.g.*, upshifting to 032k when "measured rate" exceeds 32 kbit/s for a set period of time). *See* 1[C]-1[E]; EX1004, ("It then **begins to request** the audio sub-files as described earlier, **from the first-mentioned 'rate'** directory in the index file - **viz. 024k_11_s**"; "The process from then on is that the player program **measures the actual data rate** being received from the server, averaged over a period of time"; "The player maintains two stored parameters which indicate, respectively, the current rate, and the **measured rate**."); EX1003, ¶ 101.

Fig.3.

```
<html>
<head>

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

EX1004, FIG. 3 (annotated, showing initially requested 24 kbit/s which is lower than higher potential quality level 32 kbit/s); EX1003, ¶ 101.

7. Claim 7

Leaning teaches claim 7. *See* 1[B] (establishing multiple TCP connections), claim 2 (obvious to establish multiple TCP connections for sub-parts); EX1003, ¶

102. A POSITA would have been motivated to configure Leaning's apparatus to request sequential files (subfiles) over different TCP connections. As a POSITA would have understood, this improves reliability in situations where one connection fails by retrieving sequential files over other connections and retrieving file data more quickly. It also takes advantage of available bandwidth by parallelizing retrieval of files to increase throughput where an individual TCP connection's maximum throughput is the bottleneck. EX1003, ¶ 102. A POSITA would have had a reasonable expectation of success with such a modification because the TCP protocol enables multiple connections through the use of different port number combinations, and utilizing multiple connections to request and retrieve different files was well known. *Id.* Whether to utilize multiple TCP connections to retrieve multiple sequential files was a known design choice to improve performance of media playback when the bandwidth of a single TCP connection is the bottleneck. *Id.*

8. Claim 8

Leaning teaches claim 8. *See* 1[F] (requesting, receiving, and displaying ordered series of presentation segments, including collections of segments at different quality levels), 1[A][2] (different copies encoded at different bit rates), 1[C][2] (retrieving collections of segments at different quality levels); EX1003, ¶ 103.

9. Claim 9

Leaning teaches claim 9. *See* claim 2. A POSITA would have understood requesting subparts over different TCP connections and reassembling them into files in connection with both (initial) requests (as in claim 2) and automatic requests of subsequent portions (as in claim 9), as requesting and reassembling subparts of a subfile is agnostic as to the subfile's time index in relation to the beginning of the video. EX1003, ¶ 104.

10. Claim 10

Leaning teaches claim 10. *See* 1[B] (establishing plurality of TCP connections), 1[D] (factor indicative of available bandwidth); EX1003, ¶ 105. One of the set of factors Leaning teaches is the "measured rate." This factor is measured "by timing every URL request" and determining "the transfer rate achieved (number of bits per second) between the client and server," "averaged over a period of time (for example 30 seconds)." EX1004, 8:11-14. Because the measured rate accounts for the timing of both the request and the response, a POSITA would have understood that this factor is a measure of latency (timing of the request) and network bandwidth (rate of the response), and as such is "indicative of the available bandwidth of the plurality of TCP connections." EX1003, ¶ 105.

To the extent that Patent Owner argues that Leaning does not teach that the factor is indicative of the available bandwidth of the plurality of TCP connections, a

POSITA would have been motivated to configure the performance factor to be indicative of such bandwidth. For example, a POSITA would have understood that the available bandwidth over the TCP connections impacts streaming performance because it measures how much data can be retrieved within a given time, thereby being an important factor in considering when the requested sub-file will be fully available for playback. As such, a POSITA would have been motivated to repeatedly monitor and factor such available bandwidth over the plurality of TCP connections in the determination whether to shift quality. EX1003, ¶ 106. A POSITA would have had a reasonable expectation of success with such a modification because Leaning teaches measuring the transfer rate in response to each request, and monitoring streaming performance and network conditions such as available bandwidth was well known. EX1004, 8:13-14, 10; EX1003, ¶ 106.

11. Claim 11

Leaning teaches claim 11 As explained in connection with element 1[D], one of the set of factors Leaning teaches is the "measured rate." This factor is measured "by timing every URL request" and determining "the transfer rate achieved (number of bits per second) between the client and server," "averaged over a period of time (for example 30 seconds)." EX1004, 8:11-14. Because the measured rate accounts for the timing of both the request and the response, a POSITA would have understood that this factor is a measure of latency (timing of the request) and

network bandwidth (rate of the response), and as such is "indicative of latency of the requested files [subfiles], wherein the latency is a time measure between when one of the requests is issued and a time that response data of the request begins to arrive at the end user station [terminal]." EX1003, ¶ 107.

To the extent that Patent Owner argues that Leaning does not teach that the factor is indicative of latency measured as a time measure between when one of the requests is issued and a time that response data of the request begins to arrive at the end user station, a POSITA would have been motivated to configure the performance factor to be indicative of such a latency measure. For example, a POSITA would have understood that the time difference between a request and the beginning of arrival of response data impacts streaming performance and could reflect network conditions such as congestion, whereby a larger time difference increases the risk of interrupted playback because there is less time to retrieve a requested file before it is needed to be played back. Furthermore, it would have been obvious to a POSITA that the initial latency represents when the start of the reply to the sub-file request would be received, and this latency is an important factor in considering when the requested sub-file will be initially available for playback. As such, a POSITA would have been motivated to repeatedly monitor and factor such latency in the determination whether to shift quality. EX1003, ¶ 108. A POSITA would have had a reasonable expectation of success with such a modification because Leaning

teaches timing the URL requests, and monitoring streaming performance and network conditions such as latency was well known. EX1004, 8:13, 10; EX1003, ¶ 108.

12. Claim 12

Leaning teaches claim 12. As explained in connection with claim 11, one of the set of factors Leaning teaches is the "measured rate," which is measured "by timing every URL request" and determining "the transfer rate achieved (number of bits per second) between the client and server," "averaged over a period of time (for example 30 seconds)." EX1004, 8:11-14. Because the measured rate reflects multiple measurements of request and response, a POSITA would have understood that this factor is indicative of time intervals between successive receive times for each response to the requested files (subfiles). EX1003, ¶ 109.

To the extent that Patent Owner argues that Leaning does not teach that the factor is indicative of time intervals between successive receive times for each response to the requested files, a POSITA would have been motivated to configure the performance factor to be indicative of such time intervals. For example, a POSITA would have understood that the interval between successive receive times data impacts streaming performance and could reflect network conditions such as congestion, whereby a larger interval increases the risk of interrupted playback because there is less time to retrieve a given file and the next file before they are

played back. As such, a POSITA would have been motivated to repeatedly monitor and factor such intervals between receive times in the determination whether to shift quality. EX1003, ¶ 110. A POSITA would have had a reasonable expectation of success with such a modification because Leaning teaches timing the URL requests and measuring response rates, which for known bit rates are indicative of response times, and monitoring streaming performance and network conditions was known. EX1004, 8:11-14, 10; EX1003, ¶ 110.

As an additional example, a POSITA was aware of network jitter—"variability in the rate at which data is transmitted through a network" (EX1013, 2:46-47)—as a factor indicative of time intervals between successive receive times. EX1003, ¶ 111. A POSITA knew to utilize it as a performance factor because large jitter could result in a buffer underflow and necessitate a lower quality level, *i.e.*, an inability to sustain the current level. EX1003, ¶ 111. A POSITA would have had a reasonable expectation of success because adapting to network conditions such as jitter was well known and consistent with Leaning's teaching of utilizing adaptive bitrate streaming to remedy problems caused by network conditions such as congestion. *See* EX1004, 8:9-12; EX1003, ¶ 111.

13. Claim 13

Leaning teaches claim 13. As explained in connection with element 1[D], one of the set of factors Leaning teaches is "Buffer Low Percentage," which reflects how

often the buffer contents are close to empty. Leaning teaches that buffer underflow can be caused by network congestion, which its disclosure of adaptive bitrate streaming is designed to remedy. *See* EX1004, 6:10-12. Accordingly, a POSITA would have understood that this factor is indicative of congestion and thus delays or losses in the one or more TCP connections. EX1003, ¶ 112.

14. Claim 14

Leaning teaches claim 14. *See* 1[Pre]; EX1004, 2:31-32 ("Thus it is merely an ordinary 'web server'."); EX1003, ¶¶ 113.

15. Claim 15

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

16. Claim 16

Leaning teaches claim 16. Patent Owner admits that "[u]se of cache servers is well known to those skilled in the art, and will not be discussed further herein." EX1001, 8:6-10; *see* Section VIII.A; EX1003, ¶ 115. A POSITA would have been motivated to configure Leaning's apparatus to connect to a cache server in order to improve and increase reliability of response time and performance as compared to connecting to a webserver. EX1003, ¶ 115. A POSITA would have had a reasonable expectation of success with such a modification because the cache servers were well known, as admitted by Patent Owner, and implemented by ISPs and other network infrastructure operators in common networking protocols as alternatives to webservers, and Leaning teaches that "other . . . networks can be used" besides the Internet. EX1004, 2:9-11; EX1003, ¶ 115.

17. Claim 17

a. 17[A]

Leaning teaches 17[A]. *See* claim 12; EX1003, ¶ 116.

b. 17[B]

Leaning teaches 17[B]. Leaning discloses that the player program "measures the data rate being received from the server . . . by timing every URL request; the transfer rate (number of bits per second) between the client and server is determined." EX1004, 8:11-14. A POSITA would have understood that the data rate

is a ratio (number of bits per second) indicative of performance (where a larger ratio indicates better performance) across a current window of the time intervals (the window covering each request). EX1003, ¶ 117.

c. 17[C]

Leaning teaches 17[C]. Leaning discloses that the performance ratio (number of bits per second) is "averaged over a period of time (for example 30 seconds)"; Leaning refers to this average as "the measured rate." EX1004, 8:11-16. A POSITA would have understood that the measured rate is indicative of current performance (where a larger ratio indicates better performance). EX1003, ¶ 118.

d. 17[D]

Leaning teaches 17[D]. *See* 1[E], claim 3 (comparing performance factor to threshold); EX1003, ¶ 119.

e. 17[E]

Leaning teaches 17[E]. *See* 1[E], claims 3, 4 (upshifting or downshifting); EX1003, ¶ 120.

18. Claim 18

a. 18[A]

Leaning teaches 18[A]. Leaning discloses that the media player (player program) compares a current performance factor with a set of one or more trigger thresholds. The set of one or more trigger thresholds is determined by a combination

of factors relating to a current read ahead margin—an amount of contiguously available, sequentially arranged requested files received by the media player for playback at a current playback time index—and a minimum safety margin. EX1003, ¶ 121.

Leaning teaches that buffer fullness is a current performance factor that is compared to a trigger threshold T_p, playout time. EX1004, 5:6-32, 8:17-9:2, 10. A POSITA would have understood that buffer fullness is indicative of current performance insofar as having more subfiles in the buffer means there is more time for the video to play out while the next subfiles are retrieved, reducing the risk of interruption. EX1003, ¶ 122. A POSITA also would have understood that because Leaning's subfiles are all the same length (*i.e.*, four seconds), it would be an obvious design choice whether the Buffer Fullness was measured based on playback time or the number of contiguously available, sequentially arranged files that were requested and received by the media player for playback at a current playback time index—a current read ahead margin. Using counters to measure the number of files in a buffer or queue was well known in the art. EX1003, ¶ 122. A POSITA further would have understood that the trigger threshold is determined in part by a factor relating to a minimum safety margin, as the playout time T_p reflects how far the video can be read ahead and played back with the amount of subfiles that already have been retrieved. EX1003, ¶ 122.

To the extent that Patent Owner argues that Leaning does not teach that the set of one or more trigger thresholds is determined by a combination of factors relating to a current read ahead margin and a minimum safety margin, wherein the current read ahead margin is an amount of contiguously available, sequentially arranged requested files received by the media player for playback at a current playback time index, a POSITA would have been motivated to configure Leaning's media player (player program) to use such a threshold. For example, a POSITA would have understood that based on the amount of sequential stream segments present in the media player's buffer—including whether that amount is lower than a minimum safety margin, the available network bandwidth may be (i) sufficient to retrieve the segments at the given quality level (bit rate) and play them back without interruption, (ii) high enough to retrieve higher quality segments, or (iii) too low to sustain uninterrupted playback such that lower quality segments should be requested. Accordingly, a POSITA would have been motivated to factor in the presence of such stored files and their quantity compared to a minimum amount in the factor's comparison that determines whether to sustain or shift the quality level. EX1003, ¶ 123. Indeed, Leaning recognizes that automatically switching between bitrates offers a "remedy for the possibility of buffer underflow (due for example to network congestion)." EX1004, 6:9-15. A POSITA would have had a reasonable expectation of success with such a modification because Leaning teaches that

assessment and management of the buffer contents are part of the determination whether to shift or sustain quality level. EX1004, 8:17-9:2, 10; EX1003, ¶ 123.

b. 18[B]

Leaning teaches 18[B]. Leaning discloses that the media player upshifts or downshifts to a higher quality copy or lower quality copy based on comparison of a performance factor to a threshold. *See* 18[A], 1[C] (successive determinations to shift quality higher), 1[D] (performance factor), 1[E], claims 3, 4 (upshifting or downshifting); EX1003, ¶ 124. Leaning discloses that the media player allows for shifting up and/or continuing playing by comparing the buffer fullness factor to the playout time trigger threshold, upshifting only if "Buffer Fullness > Tp seconds." *See* EX1004, 8:17-9:2, 10; EX1003, ¶ 124.

19. Claim 19

Leaning teaches claim 19. Leaning discloses requesting subfiles by filename, both for the initial request and subsequent automatic requests. *See* EX1004, 7 (chart showing "Filename[s]" "000000.bin", "000001.bin", *et seq.* for subfiles stored in subdirectories that correspond to different quality levels); 10 (flowchart that "Set[s] **Current Subfile = 000000.bin**"; then at step J1 "Set[s] **URL** = StemC + **Current Subfile**" and "**Request[s] this URL**"; and at step J2 iteratively "**Increment[s] Current Subfile**" and "Go[es] to Step J1"); EX1003, ¶ 125.

20. Claim 20

Leaning teaches claim 20. *See* 1[A][1] (server 1 that stores the content); claim 16 (obvious to utilize cache server caching at least some of the files); EX1003, ¶ 126.

21. Claim 21

Leaning teaches claim 21. *See* claim 16 (obvious to utilize cache server caching at least some of the files), claim 15 (no specialized server-side intelligence). A POSITA would have understood that the Leaning's disclosure of a web server without specialized server-side intelligence is equally applicable to a cache server. EX1003, ¶ 127.

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

Claims 2 and 9 depend from or recite (in part) similar subject matter to claims discussed in Ground 1. The sections of Ground 1 (Section IX.A) are incorporated into this section by reference.

1. Claim 2

Leaning and Gamble teach claim 2. Leaning teaches a plurality of TCP connections. *See* 1[B]. Gamble teaches sub-parts of a plurality of files that are requested over a plurality of TCP connections and reassembled. Gamble discloses a network application 112 operating on a client 106 that creates a receive buffer 706 to store a plurality of N segments (here, N=4) from stream files 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, ¶ 129.

A POSITA would have been motivated to configure Leaning's apparatus to request sub-parts of the files (subfiles) over different TCP connections and reassemble the files from the received subparts, such as taught by Gamble. A POSITA would have understood that this improves reliability in situations where one connection fails by retrieving other subparts over other connections and retrieving more of file 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, ¶ 130. A POSITA would have had a reasonable expectation of success with such a modification because the TCP protocol allows for multiple

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

2. Claim 9

Leaning and Gamble teach claim 9. *See* 1[A][2] (establishing TCP connection), 1[C][2] (factor indicative of available bandwidth), 1[B], Ground 2 claim 2 (establishing multiple TCP connections, requesting sub-parts over different connections, and reassembling files from sub-parts); Ground 1 claim 9 (requesting and automatically requesting sub-parts); EX1003, ¶ 131.

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. The ’772 Patent was not asserted in the ITC Investigation, but Petitioner acknowledges that the ALJ in the ITC Investigation accepted Patent Owner’s argument that there was a presumption of a nexus between the claims that were asserted in the ITC Investigation and the Move Media Player (which was acquired by DISH) and ultimately found certain secondary considerations. EX1009, 212-213. DISH argued that respondents conceded that the Move Media Player embodied the claimed invention because respondents argued

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

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

Second, Petitioner disagrees that the Move Media Player has a nexus to the '772 Patent because any of Move's success is not tied to unique characteristics of the claimed invention. As the prior art discussed in the Grounds above shows, the purportedly unique and successful aspects of the Move system that the ALJ relied on to find a nexus were already in existence in the prior art and thus cannot form the basis of any nexus to the claimed invention. *See Yita LLC v. MacNeil IP LLC*, 69 F.4th 1356, 1364 (Fed. Cir. 2023) ("[O]ur case law makes clear that objective evidence of nonobviousness lacks a nexus if it exclusively relates to a feature that

was *known* in the prior art—not necessarily well-known") (emphasis in original) (internal citations and quotations omitted).

More specifically, the purported "unique" claimed feature of "a smooth end user experience" that "up-shifts and down-shifts in response to network and client CPU availability," was already present in the prior art. For example, Leaning discloses upshifting and downshifting quality of the stream in response to, for example, network congestion to ensure a smooth and uninterrupted stream. *See, e.g.*, Section IX.A.1 Ground 1 claims 1[B][2]-1[D].

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

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.*, Section IX.A.1 Ground 1 claims 1[C]; EX1004, 2:9-32, 3:19-4:3.

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

XI. NO BASIS FOR DISCRETIONARY DENIAL

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

1. *Fintiv* Factors

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

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

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

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

Fourth Factor. This factor favors institution. Petitioner stipulates that if this ’772 Patent IPR is instituted, Petitioner will not pursue invalidity grounds in the District Court Litigations of the Challenged Claims on any ground raised, or that could have been reasonably raised in this IPR for the Challenged Claims. *Sotera*

Wireless, Inc. v. Masimo Corp., IPR2020-01019, Paper 12, at 18-19 (PTAB Dec. 1, 2020).

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

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

2. *General Plastic Factors*

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

First Factor. This factor favors institution or is at least neutral. Although many of the same claims were challenged in a prior petition by Petitioner (in the Ogdon-based IPR), in the instant petition, Petitioner additionally challenges claims 2 and 9—which were not challenged in the Ogdon-based IPR. *See Tesla, Inc. v. Charge Fusion Tech., LLC*, IPR2023-00062, Paper 13 at 9 (PTAB May 11, 2023) (finding Factor 1 weighed in favor of institution of follow-on petition where "fewer claims were challenged in" the prior petition).

Second Factor. This factor favors institution. Petitioner has been diligent in searching for prior art and first became aware of the primary reference Leaning on

Friday January 5, 2024. Once Leaning was discovered and sufficiently analyzed, Petitioner immediately and diligently proceeded to draft and file this Leaning-based Petition and Leaning-based petitions for seven other related patents (*See* Section II.B). Despite Leaning's strength as an invalidating reference, it was not discovered or relied upon by any USPTO examiners, the respondents at the ITC, or prior targets of DISH's district court assertions of related patents to the '772 Patent. This supports finding that there was no reason that Petitioner should have known of Leaning at the time of filing the Ogdon-based IPR.

Although the '772 Patent cites on its face US2004/0030547 (also to Leaning et al.) published just two months before the alleged Priority Date and titled "Encoding Audio Signals" with claims and Abstract drawn to encoding of audio signals, it is not in the same family as the Leaning reference relied upon in this Petition. Running a family search on the cited US2004/0030547 does not turn up this Leaning reference. Further, the US2004/0030547 reference is just one of 340 references cited on the face of the '772 Patent (EX1001, 1-4) and it was never used by the Examiner or identified by the Applicant during prosecution of the '772 Patent or any related patents other than being cited in an IDS. Therefore, Petitioner discovered Leaning within a reasonable period of time and was diligent in filing this petition.

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

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

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

Sixth Factor. This factor favors institution or is at least neutral. Although the instant Leaning-based Petition was filed shortly after the POPR in the Ogdon-based

IPR, these two petitions collectively consist of only two primary references. Given the at least seven other district court litigations where DISH has asserted the '772 Patent against parties not related to Petitioner, and given the strength of Leaning as an invalidating reference, it is highly likely that if the Board exercises its discretion to deny this Petition the Board will see a similar or copycat Leaning-based petition in the future from one or more of these other parties.

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

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

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

The first factor of whether the "same or substantially the same prior art or arguments previously were presented to the Office" (*id*.) is not met because the specific grounds here were not considered during prosecution of the '772 Patent. Leaning is not cited on the face of the '772 Patent. As noted above, the '772 Patent does cite on its face US2004/0030547 (also to Leaning et al.) titled "Encoding Audio Signals" with abstract and claims drawn to encoding of audio signals, US 2004/0030547 is not in the same family as the PCT Leaning reference relied upon in this Petition. Even though the cited US2004/0030547 does have overlapping

disclosures with Leaning, Leaning has relevant disclosures in the Abstract, specification, and published claims directed to subject matter such as a terminal for playing streaming audio or video from a remote server that are not disclosed in US2004/0030547 and that are relied upon in this Petition such that US2004/0030547 is not cumulative of Leaning.

As Ground 1 above demonstrates, Leaning teaches each and every limitation of every claim in the '772 Patent. *See* Section IX.A. Additionally, as Ground 2 demonstrates, Leaning in view of Gamble teaches each and every limitation of claims 2 and 9 of the '772 Patent. *See* Section IX.B.

Moreover, US2004/0030547 was listed in an IDS during prosecution of the '772 Patent along with 235 other references and is one of 340 references on the face of the '772 Patent. EX1002, 1286-1308; EX1001, 1-4. But other than the Examiner generally stamping that every reference in the IDS was considered (EX1002, 2258), there is no evidence that the Examiner actually considered the disclosures of US2004/0030547; it was never used in a rejection and never addressed in the prosecution history of the '772 Patent or any related patents.

XII. CONCLUSION

Petitioner requests *inter partes* review and cancellation of claims 1-21.

DATED: January 30, 2024

Respectfully submitted,

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CERTIFICATION OF COMPLIANCE UNDER 37 CFR § 42.24(d)

Pursuant to 37 C.F.R. §42.24(d), Petitioner certifies that this Petition for *Inter Partes* Review has total 13,959 words as counted by Microsoft Word, exclusive of the table of contents, table of authorities, mandatory notices under § 42.8, certificate of service, word count, and appendix of exhibits or claim listing (37 C.F.R. § 42.24(a)). This is within the 14,000 word limit allowed under § 42.24(a)(1)(i).

DATED: January 30, 2024

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CERTIFICATE OF SERVICE

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

- Petition for *Inter Partes* Review of U.S. Patent 8,868,772
- Exhibits
- Petitioner's Power of Attorney

to be served via overnight delivery on the USPTO Patent Center (PAIR) Correspondence Address for U.S. Patent 8,868,772 as follows:

54583 – Dish Technologies L.L.C.
9601 S. Meridian Blvd
Englewood, CO 80112

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:

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