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 10,951,680
Issue Date: March 16, 2021
Title: APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE CONTENT STREAMING

Inter Partes Review No. IPR2024-00516

PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT 10,951,680
CHALLENGING CLAIMS 1-12 and 14-29
UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. § 42.1 *et seq.*

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United States Patent and Trademark Office
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Submitted Electronically via PTAB E2E

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1001	U.S. Patent No. 10,951,680 ("the '680 Patent")
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1003	Declaration of Dr. Henry Houh including Curriculum Vitae ("Houh declaration")
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1008	WO1997044942 to Kliger ("Kliger")
1009	337-TA-1265 ITC Investigation Initial Determination
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TABLE A: LISTING OF CLAIMS

Claim Designation	Claim Language
Claim 1	
1[Pre]	A system for adaptive-rate content streaming of video playable on one or more end user stations over the Internet, the system comprising:
1[A]	at least one processor executing non-transitory executable instructions for generating at least one virtual timeline corresponding to the video;
1[B]	wherein the video encoded at a plurality of different bitrates creating a plurality of streams including a low quality stream, a medium quality stream, and a high quality stream,
1[C]	the low quality stream, the medium quality stream, and the high quality stream each comprising a group of streamlets encoded at a respective one of the plurality of different bitrates, each group of streamlets comprising at least first and second streamlets, each of the streamlets corresponding to a portion of the video;
1[D]	wherein at least one of the low quality stream, the medium quality stream, and the high quality stream is encoded at a bitrate of no less than 600 kbps; and
1[E]	wherein the first streamlet of each of the groups of streamlets has the same first duration and encodes the same first portion of the video in each of the low quality stream, the medium quality stream, and the high quality stream, and wherein the first streamlet of the low quality stream encodes the same first portion of the video at a different bitrate than the first streamlet of the high quality stream and the first streamlet of the medium quality stream.
Claim 2	
[2]	The system of claim 1 , wherein the processor is further for generating a plurality of virtual timelines wherein each virtual timeline corresponds to each of the low quality stream, the medium quality stream, and the high quality stream.
Claim 3	
[3]	The system of claim 1, wherein the video is a live event video.
Claim 4	
[4]	The system of claim 1 , wherein the video includes archived content.

Claim 5	
[5]	The system of claim 1 , wherein the second streamlet of each of the groups of streamlets each has the same second duration and corresponds to the same second portion of the video in the low quality stream, the medium quality stream, and the high quality stream, the second streamlet of the low quality stream having the same bitrate as the first streamlet of the low quality stream.
Claim 6	
[6]	The system of claim 5 , wherein the first and second durations are different.
Claim 7	
7[A]	The system of claim 1 , further comprising: a plurality of web servers located at different locations across the internet, each web server configured to
7[B]	receive at least one streamlet request over one or more internet connections from the one or more end user stations to retrieve the first streamlet storing a portion of the video, wherein the at least one streamlet request from the one or more end user stations includes a request for a currently selected first streamlet from one of the low quality stream, the medium quality stream, and the high quality stream based upon a determination by the end user station to select a higher or lower bitrate version of the streams;
7[C]	retrieve from the storage device the requested first streamlet from the currently selected one of the low quality stream, the medium quality stream, and the high quality stream; and
7[D]	send the retrieved first streamlet from the currently selected one of the different copies to the requesting one of the end user stations over the one or more network connections.
Claim 8	
[8]	The system of claim 1 , further comprising: a first web server configured to receive at least one virtual timeline request over the one or more internet connections from the one or more end user stations to retrieve a virtual timeline; and send the virtual timeline to the requesting one of the end user stations over the one or more network connections.
Claim 9	

9[A]	The system of claim 8 , wherein the first web server is further configured to:
9[B]	receive at least one streamlet request over one or more internet connections from the one or more end user stations to retrieve the first streamlet storing the first portion of the video, wherein the at least one streamlet request from the one or more end user stations includes a request for a currently selected first streamlet from one of the low quality stream, the medium quality stream, and the high quality stream based upon a determination by the end user station to select a higher or lower bitrate version of the video;
9[C]	retrieve from the storage device the requested first streamlet from the currently selected one of the low quality stream, the medium quality stream, and the high quality stream; and
9[D]	send the retrieved first streamlet from the currently selected one of the low quality stream, the medium quality stream, and the high quality stream to the requesting one of the end user stations over the one or more network connections.
Claim 10	
[10]	The system of claim 1 , wherein the at least one virtual timeline corresponds to the currently selected one of the low quality stream, the medium quality stream, and the high quality stream.
Claim 11	
[11]	The system of claim 1 , wherein the virtual timeline defines a playlist for a user to view.
Claim 12	
[12]	The system of claim 1, wherein the virtual timeline comprises a file that is configured to define a playlist for a user to view.
Claim 14	
14[Pre]	An end user station to stream a video over a network from a server for playback of the video, the content player device comprising:
14[A]	a processor;
14[B]	a digital processing apparatus memory device comprising non-transitory machine-readable instructions that, when executed, cause the processor to
14[C][1]	establish one or more network connections between the end user station and the server,
14[C][2]	wherein the server is configured to access at least one of a plurality of groups of streamlets;

14[C][3]	wherein the video is encoded at a plurality of different bitrates to create a plurality of streams including at least a low quality stream, a medium quality stream, and a high quality stream,
14[C][4]	each of the low quality stream, the medium quality stream, and the high quality stream comprising a group of streamlets encoded at the same respective one of the different bitrates, each group comprising at least first and second streamlets, each of the streamlets corresponding to a portion of the video;
14[C][5]	wherein at least one of the low quality stream, the medium quality stream, and the high quality stream is encoded at a bit rate of no less than 600 kbps; and
14[C][6]	wherein the first streamlets of each of the low quality stream, the medium quality stream and the high quality stream each has an equal playback duration and each of the first streamlets encodes the same portion of the video at a different one of the different bitrates;
14[D]	select a specific one of the low quality stream, the medium quality stream, and the high quality stream based upon a determination by the end user station to select a higher or lower bitrate version of the streams;
14[E]	place at least one virtual timeline request for at least one virtual times based on the selected one of the he low quality stream, the medium quality stream, and the high quality stream; and
14[F]	receive the at least one virtual timeline.
Claim 15	
15[A]	The end user station of claim 14 , wherein the non-transitory machine-readable instructions that, when executed, further cause the processor to:
15[B]	place one or more streamlet requests to the server over the one or more network connections for the first streamlet of the selected stream;
15[C]	receive the requested first streamlet from the server via the one or more network connections wherein the one or more streamlet requests are based on the at least one virtual timeline; and
15[D]	provide the received first streamlet for playback of the video.
Claim 16	
[16]	The end user station of claim 14 , wherein the second streamlet of each of the groups of streamlets each has the same second duration and corresponds to the same second portion of the video in the low

	quality stream, the medium quality stream, and the high quality stream, the second streamlet of the low quality stream having the same bitrate as the first streamlet of the low quality stream.
Claim 17	
[17]	The end user station of claim 16 , wherein the first and second durations are different.
Claim 18	
[18]	The end user station of claim 17 , wherein the virtual timeline corresponds to the currently selected one of the low quality stream, the medium quality stream, and the high quality stream.
Claim 19	
[19]	The end user station of claim 18, wherein the virtual timeline defines a playlist for a user to view.
Claim 20	
[20]	The end user station of claim 14, wherein the video is a live event video.
Claim 21	
[21]	The end user station of claim 14 , wherein the video includes archived content.
Claim 22	
22[Pre]	A process executable by one or more servers to stream a video for playback by one or more end user stations, the process comprising:
22[A]	storing, by the one or more servers, one or more virtual timelines corresponding to a plurality of streams including a low quality stream, a medium quality stream, and a high quality stream,
22[B]	wherein the low quality stream, the medium quality stream, and the high quality stream each comprise a group of streamlets encoded at a respective one of a plurality of different bitrates, each group comprising at least first and second streamlets, each of the streamlets corresponding to a portion of the video;
22[C]	wherein at least one of the low quality stream, the medium quality stream, and the high quality stream is encoded at a bitrate of no less than 600 kbps; and
22[D]	wherein the first streamlet of each of the groups of streamlets has the same first duration and encodes the same first portion of the video in the low quality stream, the medium quality stream, and the high quality stream, the first streamlet of the low quality stream having a different one of the different bitrates than the first streamlet of the

	high quality stream and the first streamlet of the medium quality stream;
22[E]	receiving at least one virtual timeline request over one or more internet connections from the one or more end user stations to retrieve a virtual timeline correspond to the first streamlet storing the first portion of the video,
22[F]	wherein the at least one streamlet request from the one or more end user stations includes a request for a currently selected first streamlet from one of the low quality stream, the medium quality stream, and the high quality stream based upon a determination by the end user station to select a higher or lower bitrate version of the video;
22[G]	retrieving from the storage device the requested virtual timeline for the currently selected one of the low quality stream, the medium quality stream, and the high quality stream; and
22[H]	sending the retrieved virtual timeline to the requesting one of the end user stations over the one or more network connections.
Claim 23	
23[A]	The process of claim 22 , further comprising:
23[B]	storing, by the one or more servers, a plurality of streams including a low quality stream, a medium quality stream, and a high quality stream; and
23[C]	receiving at least one streamlet request over one or more internet connections from the one or more end user stations to retrieve the first streamlet storing the first portion of the video,
23[D]	wherein the at least one streamlet request from the one or more end user stations includes a request for a currently selected first streamlet from one of the low quality stream, the medium quality stream, and the high quality stream based upon a determination by the end user station to select a higher or lower bitrate version of the video
23[E]	retrieving from the storage device the requested first streamlet from the currently selected one of the low quality stream, the medium quality stream, and the high quality stream; and
23[E]	sending the retrieved first streamlet from the currently selected one of the low quality stream, the medium quality stream, and the high quality stream to the requesting one of the end user stations over the one or more network connections.
Claim 24	

[24]	The process of claim 22 , wherein the second streamlet of each of the groups of streamlets each has the same second duration and corresponds to the same second portion of the video in the low quality stream, the medium quality stream, and the high quality stream, the second streamlet of the low quality stream having the same bitrate as the first streamlet of the low quality stream.
Claim 25	
[25]	The process of claim 22 , wherein the first and second durations are different.
Claim 26	
[26]	The process of claim 22, wherein the video is a live event video.
Claim 27	
[27]	The process of claim 22 , wherein the video includes archived content.
Claim 28	
28[Pre]	A process executable by a content player device to stream a video over a network from a server for playback of the video by the content player device, the process comprising:
28[A]	establishing one or more network connections between the content player device and the server,
28[B]	wherein the server accesses a plurality of streams including a low quality stream, a medium quality stream, and a high quality stream,
28[C]	wherein the low quality stream, the medium quality stream, and the high quality stream each comprise a group of streamlets encoded at a respective one of a plurality of different bitrates, each group comprising at least first and second streamlets, each of the streamlets corresponding to a portion of the video;
28[D]	wherein at least one of the low quality stream, the medium quality stream, and the high quality stream is encoded at a bitrate of no less than 600 kbps; and
28[E]	wherein the first streamlet of each of the groups of streamlets has the same first duration and encodes the same first portion of the video in the low quality stream, the medium quality stream, and the high quality stream, the first streamlet of the low quality stream having a different bitrate than the first streamlet of the high quality stream and the first streamlet of the medium quality stream;
28[F]	selecting, by the content player device, a currently selected one of the low quality stream, the medium quality stream, and the high

	quality stream based upon a determination by the end user station to select a higher or lower bitrate version of the video;
28[G]	placing a virtual time request over one or more internet connections from the one or more end user stations to retrieve at least one virtual timeline corresponding to the currently selected one of the low quality stream, the medium quality stream, and the high quality stream; and
28[H]	receiving the requested virtual timeline from the server via the one or more network connections.
Claim 29	
29[A]	The process of claim 28 further comprising: placing a streamlet request over one or more internet connections from the one or more end user stations to retrieve the first streamlet storing the first portion of the video, wherein the streamlet request is based, at least in part, on the received virtual timeline;
29[B]	receiving the requested streamlet from the server via the one or more network connections; and
29[C]	rendering, by the content player device, the received streamlet for playback of the video.

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 1-12 and 14-29 ("Challenged Claims") of U.S. Pat. 10,951,680 ("the '680 Patent") (EX1001). The '680 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 '680 Patent relates to multi-bitrate streaming of streaming content, including a server storing streamlets at different bitrates, where the client determines which bitrate version to select. The Grounds advanced here were not relied upon during prosecution of the '680 Patent and teach such multi-bitrate 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 ’680 Patent is currently asserted in the below proceedings.[1]

- *Aylo Freesites Ltd f/k/a MG Freesites Ltd v. DISH Technologies LLC*, IPR2024-00046 (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 et al. v. WebGroup Czech Republic A.S. et al.*, No. 2:23-cv-00553 (D. Utah)
- *iFIT Inc. v. ITC*, No. CAFC-23-1965 (Fed. Cir.), which is an appeal from Investigation No. 337-TA-1265 (ITC) (the “ITC Investigation”);
- *DISH Technologies LLC et al v. ICON Health & Fitness, Inc.*, No. 1-21-cv-00531 (D. Del.)
- *DISH Technologies LLC et al v. A Parent Media Co. Inc. et al.*, No. 1:23-cv-01000 (D. Del.)
- *DISH Technologies LLC et al v. fuboTV Media Inc.*, No. 1:23-cv-00986 (D. Del.)
- *DISH Technologies LLC et al v. Beachbody, LLC d/b/a/ BODi*, No. 1:23-cv-00987 (D. Del.)

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[1] The ’680 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 et al v. Vidgo Inc.*, No. 2:23-cv-00624 (D. Utah).
- *DISH Technologies LLC v. BritBox, LLC*, No. 1:23-cv-08971 (S.D.N.Y.)
- *DISH Technologies LLC v. Yanka Industries, Inc. d/b/a/ MasterClass*, No. 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 Ogdon-based IPRs on Patent Owner's related U.S. Patent Nos. 8,868,772 (IPR2024-00048); 9,407,564 (IPR2024-00047); 10,469,554 (IPR2024-00045); 10,469,555 (IPR2024-00146); 11,470,138 (IPR2024-00044); 10,757,156 (IPR2024-00147); and 11,677,798 (IPR2024-00043). Additionally, Petitioner is concurrently filing IPRs based on the same recently discovered International P.C.T. Publication WO 2002049343 to Leaning et al. ("Leaning") relied on here on U.S. Patent Nos. 8,868,772 (IPR2024-00519); 9,407,564 (IPR2024-00518); 10,469,554 (IPR2024-00514); 10,469,555 (IPR2024-00515); 11,470,138 (IPR2024-00512); 10,757,156 (IPR2024-00513); 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 '680 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 1-12 and 14-29 based on the grounds below.

Ground	Reference(s)	Challenged Claims	Basis
1	Leaning and Allen	1-12 and 14-29	103
2	Leaning and Allen and SMIL 2.0	1-12 and 14-29	103

The two grounds are supported by the Declaration of Dr. Henry Houh

(EX1003) and other supporting evidence in the Exhibit List. EX1003, ¶¶ 46-47.

V. '680 PATENT

A. Summary

The '680 Patent (application no. 16/876,604) was filed on March 16, 2021, and issued on November 5, 2019. EX1001, Cover. The '680 Patent purports to relate to "multi-bitrate content streaming," such as video, over the Internet. EX1001, Abstract, 1:31-34. The '680 Patent describes "a receiving module" to "capture media content," a streamlet module to "segment the media content and generate a plurality of streamlets," and "encoding module" to "generate a set of streamlets" such that the set of streamlets has a plurality of streamlets "having identical time indices and durations" and " a unique bitrate." *Id.*, Abstract.

One embodiment of the system of the '680 Patent includes "a content server 102" and "end user 104" coupled by a data communications network (*e.g.*, the Internet 106) wherein the "end user station 104" may be a personal computer, entertainment system, or a portable electronic device configured to present content. *Id.*, FIG. 1, 6:33-47. The '680 Patent describes encoding the same content file 200 into at least three different "quality" streams:

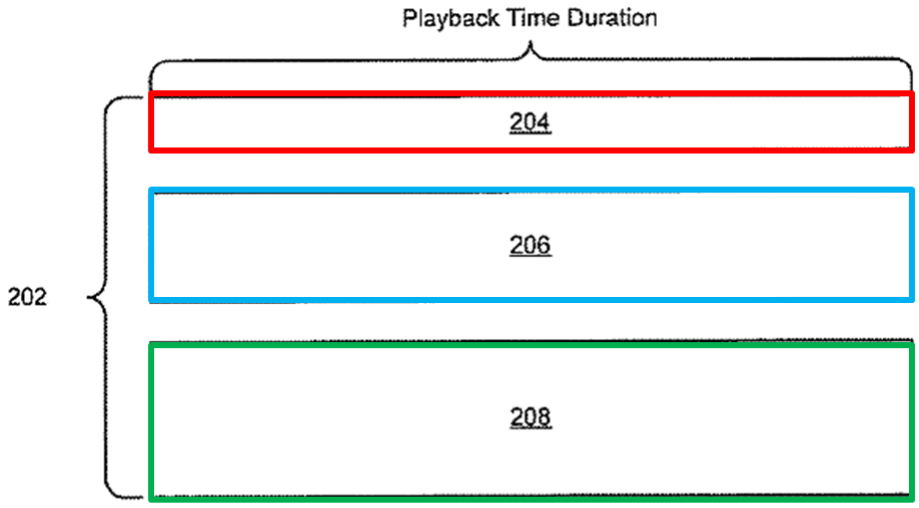


FIG. 2b

Id., FIG. 2b (annotated, low quality (red, 204), medium quality (blue, 206), and high quality (green, 208)), 7:25-31.

For example, "low quality stream 204 may be encoded and compressed to a bit rate of 100 kilobits per second (kbps), the medium quality stream 206 may be encoded and compressed to a bit rate of 200 kbps, and the high quality stream 208 may be encoded and compressed to 600 kbps." *Id.*, 7:31-36.

Each stream (204, 206, and 208) is also "divided into a plurality of source streamlets 303" where "streamlet refers to any sized portion of the content file" and may be "an independent media object" where "streamlet 0 may have a time index of 00:00 representing the beginning of content playback, and streamlet 1 may have a time index of 00:002, and so on." *Id.*, 7:37-49.

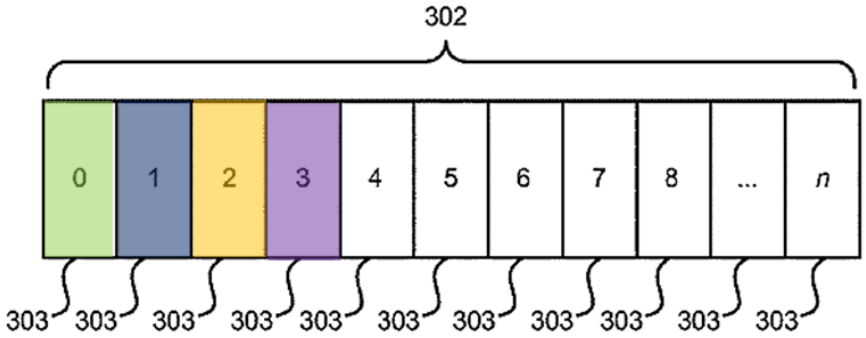


FIG. 3a

Id., FIG. 3a (annotated).

These streamlets for "sets" of streamlets 306 wherein a "set" is "a group of streamlets having identical time indices and durations but varying bitrates." *Id.*, 7:57-60.

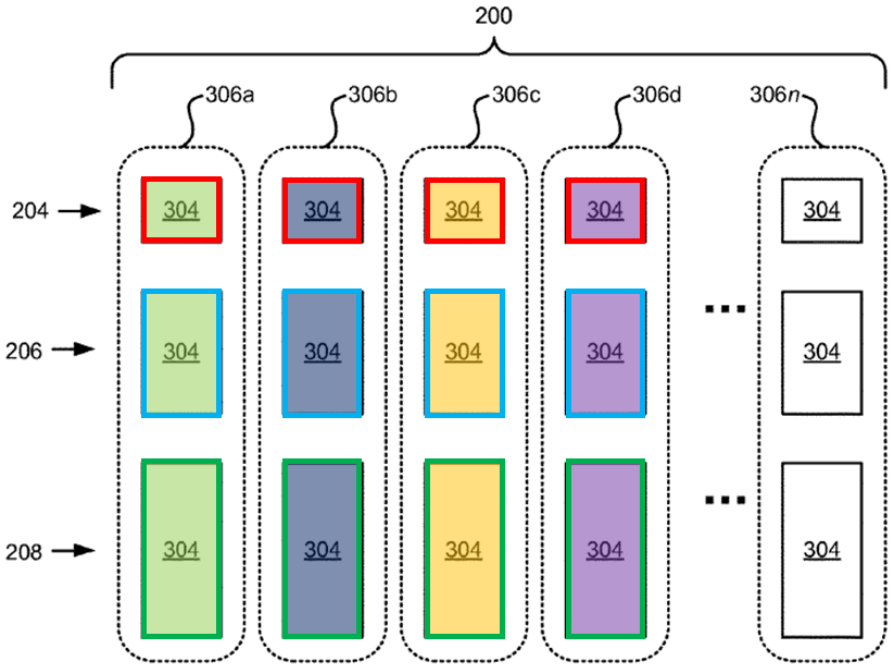


FIG. 3b

Id., FIG. 3b (annotated, showing low, medium, and high quality streamlets in

each "set" of streamlets" 306a-d).

These sets of streamlets are stored in a streamlet database 408 and then a "client module 114 may request streamlets 304" from one or more webservers using HTTP from the web server 116" or "a plurality of web servers 116." *Id.*, 9:1-4, 9:30-40. Further, the '680 Patent explains that the invention may be used to stream "live" content files on a short delay. *Id.*, 10:44-56.

To stream content, the client module 114's "agent controller module 702 is configured to select a quality level of streamlets to transmit to the viewer" and "requests lower or higher quality streams based upon continuous observation of time intervals between successive receive times of each requested streamlet." *Id.*, 13:3-26. The "agent controller module 702 receives 1004 a streamlet" and "monitors 1006 the receive time of the requested streamlet" such as time intervals between successive receive times for each streamlet response. *Id.*, 17:6-39, FIGs. 9 and 10. The agent control module determines whether to upshift or downshift the stream quality and makes a "determination of whether use of the higher quality stream is sustainable." *Id.*, 17:41-18:14.

B. Prosecution History

The '680 Patent was filed as Application No. 16/876,604 on May 18, 2020. EX1002, 75. On July 24, 2020, the Examiner issued a non-final rejection of all pending claims including non-statutory double patenting over claims in U.S. Patent

No. 10,469,554. *Id*., 82-89. On October 26, 2020, Applicant filed a Response to Office Action and argued the filed terminal disclaimer obviated the non-statutory double patent rejection. *Id*., 101-104. The Examiner issued a Notice of Allowance on November 12, 2020. *Id*., 110.

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, 2), but 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, ¶ 41. A higher level of education or specific skill might make up for less experience, and vice-versa. *Id*.

VII. CLAIM CONSTRUCTION

Petitioner submits that, for purposes of institution, most terms require no construction. However, Petitioner acknowledges that in the ITC Investigation between Patent Owner and iFIT Inc. asserting the '680 Patent and family members

of the ’680 Patent, the Chief Administrative Law Judge (“ALJ”) construed “streamlet” as “any sized portion of the content file.” EX1009, 38-43. The ALJ also construed “low quality stream,” “medium quality stream,” and “high quality stream” under their plain and ordinary meaning. *Id.*, 46-53. The ALJ also found that “end user station” and “content player device” required no construction. *Id.*, 71.

Additionally, Petitioner submits that “virtual timeline” may require construction. The ’680 Patent describes a “virtual timeline” as “a file that is configured to define a playlist for a user to view” which “may indicate that the publisher desires a user to watch a first show QMX 602a followed by QMX 602b and QMX 602c” such that “the publisher may define a broadcast schedule in a manner similar to a television station.” EX1001, 12:31-44, FIGs. 6a-6c. The ’680 Patent further explains that the Quantum Media Extension (QMX) files each “describe an entire content file.” *Id.* 12:35-36. Thus, Petitioner submits that “virtual timeline” should be construed as “a playlist of entire content files.”

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, 2, 4-12, 14-19, 21-25, and 27-29 of the ’680 Patent unpatentable even under the ITC’s constructions. By asserting that the ’680 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 addition, Petitioner notes that in the ITC Investigation, iFIT proposed a design-around that included performing an initial, adaptive stream selection based on bandwidth. EX1010, 31. According to iFIT, modifying its products in this manner would not infringe because the claims "require repeated and continuous shifting between bitrates during streaming based on ongoing network conditions." *Id*. In response, DISH argued that iFIT's Redesigned Products would still infringe because "this initial adaptive selection by itself plainly meets" limitation 16[h] of the '554 Patent and limitation 10[h] of the '555 Patent. *Id.* Limitation 16[h] of the '554 Patent is identical to limitation 14[D] of the '680 Patent. *Compare id.*, 24 (limitation 16[h]) *with* Claim Designation 14[D]. Thus, Patent Owner's position is that a single determination and quality level selection, even without subsequent "shifting," meets these limitations.

VIII. OVERVIEW OF THE PRIOR ART

A. State of the Art

The '680 Patent admits in the "Description of Related Art" section that "streaming media" was known, including streaming of "audio/video" where "quality that can be received for real time presentation is constrained by the available

bandwidth of the user's network connection." EX1001, 1:47-56. The '680 Patent further admits that Streaming was used "to deliver content on demand (previously recorded) or from live broadcasts." *Id.*, 1:56-57.

Before the Priority Date, "client-pull" streaming systems were known in the art wherein a client requested from a server sequential portions of a file at different encoded quality levels based on network bandwidth. EX1003, ¶ 49. For example, Chang (EX1007) 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. EX1007, 7:43-53, 8:59-9:5, 9:45-51, 10:15-14, 10:35-58. In another example, Kliger (EX1008) teaches that a media player device 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 ’138 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 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 a 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

[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 ’680 Patent (EX1001, Cover). 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.

determines to request a next sub-file of a higher (or lower) rate based on these assessments. EX1004, 8:1-9:8.

C. Allen

Allen (EX1005) was filed on March 15, 2002 and published on September 26, 2002. Allen is prior art under at least (pre-AIA) 35 U.S.C. § 102(b). Allen is not cited on the face of the ’680 Patent. United States publication US 2004/0117427 (which claims priority to Allen) is cited on the face of the ’680 Patent, but neither Allen nor US 2004/0117427 were used in any prior art rejections.

Allen discloses streaming media to multiple users and tailoring the delivery stream to the capabilities of the user’s system. EX1005, 1:15-21. Allen explains that multi-bitrate streaming was well-known, including encoding copies of a video at multiple quality levels with different bitrates, such as low quality (56 kbps), medium quality (300 kbps) and high quality (600 kbps). *Id.*, 12:1-5.

D. SMIL 2.0

Synchronized Multimedia Integration Language 2.0 (“SMIL 2.0”) is an XML markup language for multimedia presentations and was publicly accessible on the World Wide Web Consortium’s (“W3C”) website at least as of November 9, 2001. *See* EX1006 (SMIL 2.0); EX1011 (Wayback Affidavit showing SMIL 2.0 available on November 9, 2001); EX1003, ¶ 54.

Thus, SMIL 2.0 is prior art under at least (pre-AIA) 35 U.S.C. § 102(b). SMIL

2.0 is not cited on the face of the ’680 Patent. Petitioner notes that during prosecution of the ’680 Patent, Applicants submitted an article titled “Mobile Streaming Media CDN Enabled by Dynamic SMIL” by Yoshimura. Applicants did not submit the actual SMIL standard, and the article submitted by Applicants does not mention important elements of SMIL such as “<seq>,” “<switch>,” or “systemBitrate” teaching three quality levels (high, medium, and low) and switching to a particular quality level based upon measured system bitrate, which are pertinent to this Petition.

SMIL 2.0 discusses these elements. SMIL 2.0 discloses that, using “<seq>”, a client can request and play media elements one after the other. EX1006, 123-126. SMIL 2.0 further teaches that a client can select different encoded files based on the client’s available bandwidth. EX1006, 61-63. Specifically, the “<switch>” element can be used to list different quality files with a “systemBitrate,” and, depending on the client’s bandwidth, only one will be selected. *Id.*

E. Analogous Art

Each prior art reference is analogous art to the claimed invention in the ’680 Patent. And each is in the same field of endeavor of client-server media streaming and, more specifically, streaming by a client from a server including having the data stream segmented into a plurality of streamlets at the server side wherein the client requests the streamlets from the server and plays out the media. *Compare* EX1001,

title, Abstract, 1:25-28, 3:5-4:12, FIGs. 2c, 4, and 7, *with* EX1004, Abstract, 6:5-7:5, 8:1-9:8, FIGs. 1-5; EX1005, Abstract, 1:10-12:22; EX1006, 61-62, 123-126; EX1003, ¶ 56.

Additionally, each prior art reference is reasonably pertinent to any purported problem addressed in the '680 Patent. *Id*.; EX1001, title, Abstract, 1:30-2:67; EX1003, ¶ 57.

IX. SPECIFIC GROUNDS

A. Ground 1: Claims 1-12 and 14-29 Would Have Been Obvious in view of Leaning and Allen

1. Claim 1

a. 1[Pre]: "A system for adaptive-rate content streaming of video playable on one or more end user stations over the Internet, the system comprising:"

Whether or not the preamble is limiting, Leaning teaches 1[Pre]. Leaning discloses a system for adaptive-rate content streaming of a video that is playable on one or more end user stations (terminals) over the Internet. EX1004, Abstract ("Delivery of recorded audio or video material over a telecommunications link (2) **from a server (1) to a terminal**[3] (3) . . . Provision may be made for **switching**

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

between alternative sub-file sets representing alternative delivery modes of data rates."), 1:3-29 ("The present invention is concerned with the delivery, over a telecommunications link, of digitally coded material for presentation to a user. . . . there is provided a 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; 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. In another aspect, the invention provides a method of 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."), 2:9-10 ("the network is the **internet** or other packet network operating . . ."), 6:13-15 ("the server stores two or more versions of the recording, recorded at different compression rates (for example at compressions corresponding to (continuous) data rates of 8, 16, 24 and 32 kbit/s respectively) and **the player program is able to switch automatically between them**."), 16:6-10, claim 4, FIG.

1; EX1003, ¶ 58.

b. 1[A]: "at least one processor executing non-transitory executable instructions for generating at least one virtual timeline corresponding to the video;"

Leaning teaches 1[A]. Leaning discloses a processor (central processor 30) executing non-transitory executable instructions (programs). EX1004, 4:4-15 ("Thus Figure 2 shows such a terminal with a **central processor 30**, **memory 31**, . . . In the disk store are programs which may be retrieved into the memory 31 for **execution by the processor 30, in the usual manner**. These programs include a **communications program 37 for call-up and display of html pages** - that is, a 'web browser' program such as **Netscape Navigator or Microsoft Explorer, and a 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."), FIG. 2.

Leaning further teaches generating at least one virtual timeline (menu.htm-list of recordings) corresponding to the video. To the extent "virtual timeline" is construed to include a viewable "playlist of entire content files" (*i.e.*, recordings), Leaning teaches this limitation. EX1004, 4:1-3 ("It is also convenient that the web server stores one or more **(html) menu pages (e.g. menu.htm)** containing a **list of recordings available, with hyperlinks to the corresponding link pages**."), 4:22-34 ("1. The user uses the browser to **retrieve and display the menu page menu.htm**

from the server 1. 2. The **user selects one of the hyperlinks** within the menu page which causes the **browser to retrieve from the server, and display**, the link page for the desired recording - in this example the file mp3_bwv565_link.htm. The actual display of this page is unimportant (except that it may perhaps contain a message to reassure the user that the system is working correctly). What is important about this page is that it contains a command (or 'embed tag') to invoke in the processor 30 a secondary process in which the player program 37 is executed. The invocation of a secondary process in this manner is well-known practice (such a process is known in Netscape systems as a 'plug-in' and in Microsoft systems as 'ActiveX'). Such commands can also contains [sic] parameters to be passed to the secondary process and in the system of Figure 1 the command contains the server URL of the recording, which, for the Bach piece, would be http:\\www. server 1.com/mp3_bwv565."), 9:3-11:1 (flowchart showing request and retrieval of virtual timeline including "[Terminal] Request http:\\server1.com/menu.htm . . . [Server] Send http:\\server1.com/menu.htm . . . [Terminal] Display menu.htm") *See* Section VII (proposed construction for "virtual timeline"). To the extent "playlist" is interpreted broadly to mean a list of recordings a user may watch, the "menu" in this context would be a playlist because it provides a list of available recordings that a user could

watch in succession.[4] EX1003, ¶¶ 59-60.

c. 1[B]: "wherein the video encoded at a plurality of different bitrates creating a plurality of streams including a low quality stream, a medium quality stream, and a high quality stream,"

Leaning teaches 1[B]. Leaning discloses that the recording (audio and/or video) is encoded at a plurality of different bitrates (different compression rates) creating a plurality of streams including a low quality stream (*e.g.*, 8 or 16 kbit/s), a medium quality stream (*e.g.*, 24 kbit/s), and a high quality stream (*e.g.*, 32 kbit/s). EX1004, 6:13-26 ("the server stores two or more versions of the recording, recorded at **different compression rates** (for example at compressions corresponding to (continuous) data rates of **8, 16, 24 and 32 kbit/s respectively**) . . . loaded onto the server in separate directories corresponding to the different rate, as in the following example structure, where '008k', '024k' in the directory name indicates a rate of 8 kbit/s or 24 kbit/s and so on."), 9:3-7, 16:6-12 ("The **same principle** may be applied to the delivery of **video recordings**. . . the file is a video file (e.g. in H.261 or MPEG format) and the player program incorporates a video decoder. The manner of

[4] To the extent "virtual timeline" is construed to also require *automatic* playing of entire content files one after the other, SMIL 2.0 teaches this limitation. *See* IX.B.1, *infra*.

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**."), claim 4; EX1003, ¶ 61.

d. 1[C]: "the low quality stream, the medium quality stream, and the high quality stream each comprising a group of streamlets encoded at a respective one of the plurality of different bitrates, each group of streamlets comprising at least first and second streamlets, each of the streamlets corresponding to a portion of the video;"

Leaning teaches 1[C]. Leaning further discloses the low quality stream, the medium quality stream, and the high quality stream each comprise a group of streamlets (subfiles) encoded at a respective one of the plurality of different bitrates, wherein each streamlet (subfile) corresponds to a portion (temporal portion) of the video wherein each group of streamlets comprises at least first (*e.g.*, 000000.bin) and second (*e.g.* 000001.bin) streamlets. 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**."), 1:3-29 ("The present invention is concerned with the delivery, over a telecommunications link, of digitally coded material for presentation to a user. . . . there is provided a 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 invention provides a method of

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."), 3:-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. In this example these are given 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: it should however be emphasised that, 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 including low, medium, and high quality (8k, 16k, 18k, 24k, and 32k) and listed in an index file and saved in the directory appropriate for their bitrates), claims 1 and 11; *see also id.*, 12:8-34, 13:23-14:19, FIG. 4; EX1003, ¶ 62.

e. 1[D]: "wherein at least one of the low quality stream, the medium quality stream, and the high quality stream is encoded at a bitrate of no less than 600 kbps; and"

Leaning in view of Allen teaches 1[D]. As explained above, Leaning teaches two or more streams encoded at different bitrates including one example with four streams encoded at 8, 16, 24, and 32 kbit/s, respectively. *See* 1[Pre]-1[C]. Further, Leaning's example bitrates of 8, 16, 24, and 32 kbit/s, respectively are for audio encodings—which a POSITA would have understood generally require less data to stream than video encodings and thus typically have lower bitrates. EX1003, ¶ 63. Leaning also teaches that the same principles may be applied to video encodings and a POSITA would have understood that a user streaming video encodings at the time of the alleged priority date would generally prefer higher bitrate encoding if supported by the user's network requirements, such as 600 kbps, to enjoy high quality viewing. EX1004, 16:6-10, 18:18-27 (describing a video "mpg" with each set of subfiles encoded at 96k and at 128k); EX1003, ¶ 63.

To the extent Leaning does not explicitly teach a stream encoded at a bitrate of no less than 600 kbps, Allen teaches this limitation. Allen teaches that it was known to encode video content into at least three different quality levels (or bitrates) for streaming, for example at 56 kbps, at 300 kbps, and at 600 kbps, in order to allow streaming to various clients with different network requirements including. EX1005, 12:1-5. A POSITA would have been motivated to encode a video embodiment of

Leaning (including the corresponding sets of subfiles) into each of a low quality, medium quality, and high quality level bitrate stream (low at 56 kbps, medium at 300 kbps, and high at 600 kbps), as taught by Allen, because it would enable client terminals with a wide variety of network bandwidth requirements to stream the video and would have allowed for those with user terminals with high bandwidth connections to stream at 600 kbps and enjoy higher resolution viewing. EX1003, ¶ 64. A POSITA would have had a reasonable expectation of success with such a combination because both Leaning and Allen are drawn to similar systems of client-server based streaming of video encoded into multiple different bitrate copies and because simply encoding one of the video streams at a particular bitrate, such as the 600 kbps taught by Allen, would have been a simple and straightforward modification for a POSITA. EX1003, ¶ 64.

f. 1[E]: "wherein the first streamlet of each of the groups of streamlets has the same first duration and encodes the same first portion of the video in each of the low quality stream, the medium quality stream, and the high quality stream, and wherein the first streamlet of the low quality stream encodes the same first portion of the video at a different bitrate than the first streamlet of the high quality stream and the first streamlet of the medium quality stream."

Leaning teaches 1[E]. Leaning further discloses that the first streamlet (subfile such as 000000.bin) of each of the groups (different sets of encoded subfiles) of streamlets at each quality level (bitrate) has the same (or equal) first duration (of 4

seconds) and encodes the same first portion (temporal portion) of the video in each of the quality levels, and wherein the first streamlet of each quality level encodes the same first portion of the video at a different bitrate than the first streamlet of the other quality levels. *See* 1[B]-1[C]; EX1004, Abstract, 1:3-29, 3:5-18 ("the file is divided into smaller files before being stored on the server 1. **We prefer that each of these smaller files is of a size corresponding to a fixed playing time, perhaps four seconds**. With a compressed format such as MP3 this may mean that the files will be of different sizes in terms of the number of bits they actually contain. Thus the Bach file of 9 minutes duration would be **divided into 135 smaller files each representing four seconds' playing time**"), 5:4-6:8, 6:21-7:1 (describing the same set of 135 sub-files (000000.bin (first subfile), 000001.bin (second subfile), 000002.bin. . . 000134.bin) each encoded at a different bitrate including low, medium, and high quality (8k, 16k, 18k, 24k, and 32k) and listed in an index file and saved in the directory appropriate for their bitrates), 7:1-2 ("Note that because the length of a sub-file corresponds, as explained earlier, to a **fixed length of time**, the **number of sub-files is the same for each directory**."), 12:8-20 ("It is of interest to discuss further the process of partitioning the original file into sub-files. . . . there is no expectation that a sub-file will be followed by a sub-file other than that which immediately follows it in the original sequence . . . the sub-file size can be a fixed number of bits, or a fixed playing time length (or neither of these) . . . In the case of

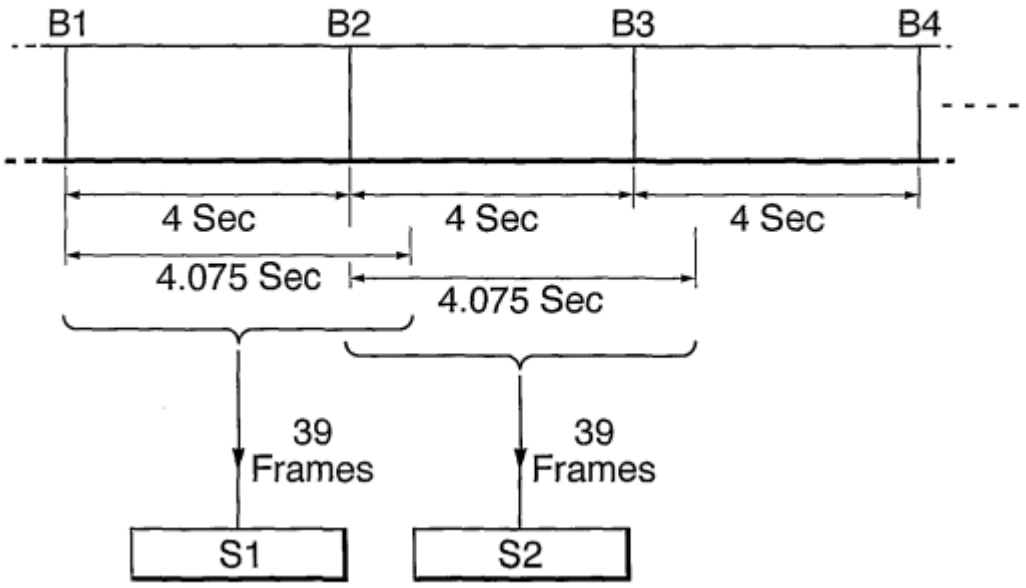
rate switching, it is, if not actually essential, **highly desirable that the sub-file boundaries are the same for each rate**, so that the **first sub-file received for a new rate continues from the same point in the recording that the last sub-file at the old rate ended**. To arrange that every sub-file should represent the same fixed time period (e.g. the **4 seconds** mentioned above) is not the only way of achieving this, but it is certainly the most convenient."); EX1003, ¶ 65.

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).

Fig.4.



EX1004, FIG. 4.

2. Claim 2: "The system of claim 1 , wherein the processor is further for generating a plurality of virtual timelines wherein each virtual timeline corresponds to each of the low quality stream, the medium quality stream, and the high quality stream."

Leaning teaches claim 10. *See* 1[A]; EX1004, 4:1-3. Further, Leaning explains that the virtual timeline "menu.htm" includes a list of available recordings (EX1004, 4:1-3) each of which has multiple quality versions (*e.g.*, low, medium, and

high) with playlists of subfiles as described above (*see* 1[C], 1[E]) which corresponds to each stream. *See* claim 9; EX1003, ¶ 66.

3. Claim 3: "The system of claim 1, wherein the video is a live event video."

Leaning teaches claim 3. Leaning discloses that the video can be a live event video. EX1004, 8:1-5 ("'Mode' indicates 'recorded' (as here) or '**live**' (to be discussed below)."), 19:6-21 ("The files to be delivered have been referred to as 'recordings'. However, it is **not necessary that the entire audio or video sequence should have been encoded - or even exist - before delivery is commenced**. Thus a computer could be provided to receive a **live feed**, to code it using the chosen coding scheme, and generate the sub-files 'on the fly' and upload them to the server, so that, once a few sub-files are present on the server, delivery may commence. . . . The same system can be used for a **live audio (or video) feed**. It is in a sense still 'recorded' - the difference being primarily that delivery and replay commence before recording has finished, although naturally there is an inherent delay in that one must wait until at least one sub-file has been recorded and loaded onto the server 1."), 20:1-41.

Additionally, Patent Owner admits in the background section of the '680 Patent that it was known to use streaming "to deliver content on demand (previously recorded) or from live broadcasts." *See* Section VIII.A; EX1003, ¶¶ 67-68.

4. Claim 4: "The system of claim 1 , wherein the video includes archived content."

Leaning teaches claim 4. Leaning discloses that the video may be archived content (recordings). EX1004, Abstract, 6:13-15, 8:1-5, 19:6-21.

Additionally, Patent Owner admits in the background section of the '138 Patent that it was known to use streaming "to deliver content on demand (previously recorded) or from live broadcasts." *See* Section VIII.A; EX1003, ¶¶ 69-70.

5. Claim 5: "The system of claim 1 , wherein the second streamlet of each of the groups of streamlets each has the same second duration and corresponds to the same second portion of the video in the low quality stream, the medium quality stream, and the high quality stream, the second streamlet of the low quality stream having the same bitrate as the first streamlet of the low quality stream."

Leaning teaches claim 5. Leaning discloses that the second streamlet (subfile, *e.g.*, 000001.bin) of each of the groups of streamlets (sets of subfiles encoded at different bitrates) has the same second duration (*e.g.*, 4 seconds) and corresponds to the same second portion of the video in the low quality stream, medium quality stream, and high quality stream. *See* 1[E]. Further, Leaning discloses that the second streamlet (subfile; *e.g.*, 000001.bin) of the low quality stream has the same bitrate as the first streamlet (subfile; *e.g.*, 000000.bin) of the low quality stream because every subfile in each quality level has the same (continuous) bitrate. EX1004, 6:13-14 ("the server stores two or more versions of the recording, recorded at **different**

compression rates (for example at compressions corresponding to (**continuous**) data rates of 8, 16, 24 and 32 kbit/s"), 6:22-26 ("encoding the same PCM file several times at different rates. He then partitions each source file into sub-files, as before. These can be loaded onto the server in separate directories corresponding to the different rate, as in the following example structure, where '008k', '024k' in the directory name indicates a rate of 8 kbit/s or 24 kbit/s and so on."); EX1003, ¶ 71.

6. Claim 6: "The system of claim 5 , wherein the first and second durations are different."

Leaning teaches claim 6. Leaning further discloses that, while it is preferred that all subfiles are the same duration (*e.g.*, 4 seconds), Leaning also teaches that making each subfile (including the first and second subfiles) the same duration "is not the only way of achieving this" (EX1004, 12:18-20) and teaches that each subfile "can be a fixed number of bits, or a fixed playing time length (or neither of these)" (*id.*, 12:12). Thus, Leaning teaches that subfiles (such as subfile 1 and subfile 2) may be different durations at least in the case of "neither of [fixed size or fixed duration]" because the subfiles would not have a fixed time length and, for example, subfile 1 (000000.bin) may be a different time duration than subfile 2 (000001.bin.). EX1004, claim 22; EX1003, ¶ 72.

7. Claim 7

a. 7[A]: "The system of claim 1 , further comprising: a plurality of web servers located at different locations across the internet, each web server configured to"

Leaning in view of Allen teaches 7[A]. Leaning discloses at least a first web server. EX1004, 2:27-32 (explaining that the server of Leaning is "merely an ordinary 'web server'"), 3:19-4:3 (describing loading subfiles "onto a web server"); EX1003, ¶ 73.

To the extent it is argued that Leaning only teaches a single web server containing the subfiles, Allen teaches providing a plurality of servers (CDNs or edge-based servers) located at different locations across the Internet in order to more effectively and efficiently deliver streams to the end user client depending on the client's location. EX1005, 11:20-22 ("Fig. 10 represents the existing architecture for encoding and distributing of streaming media across the Internet, one using a terrestrial Content Delivery Network (CDN), the other using a satellite CDN."), 12:7-13:2 ("The encoded streams (1005) are then sent via a satellite- (1006) or terrestrial-based CDN (1008) and stored on specially designed edge-based streaming media servers at various points of presence (PoPs) around the world. . . delivery using edge-based servers is currently considered to be an effective method of delivery streaming media, because once they are stored on the servers, the media files only need to traverse the 'last mile' (1022) between the ISP's point of presence

and the consumer (1024). . . . The process illustrated in Fig. 10 is the most efficient way to deliver streaming media today"), FIG. 10.

A POSITA would have been motivated to provide multiple web servers, as taught by Allen, containing the same sets of subfiles for streams in order to have redundancy in the system and allow for better geographic distribution of the subfiles based on location of the terminals making requests. EX1003, ¶¶ 74-75. A POSITA would have had a reasonable expectation of success with such a modification because it would have been a simple matter of storing the same files on multiple servers. *Id*.

b. 7[B]: "receive at least one streamlet request over one or more internet connections from the one or more end user stations to retrieve the first streamlet storing a portion of the video, wherein the at least one streamlet request from the one or more end user stations includes a request for a currently selected first streamlet from one of the low quality stream, the medium quality stream, and the high quality stream based upon a determination by the end user station to select a higher or lower bitrate version of the streams;"

Leaning teaches 7[B]. Leaning teaches that the conventional web servers are each configured to receive at least one streamlet (subfile) request over one or more Internet connections from a respective one of the one or more end user stations (terminal) to retrieve the first streamlet (subfile) storing a portion of the video. 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 ("According to one aspect of the invention there is provided a 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; 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 - i.e. www.serverl.com/mp3_bwv565/000000.bin. . . . 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**. . . 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. . . . 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 11 and 16; EX1003, ¶ 76.

Leaning further teaches that the at least one streamlet (subfile) request from the one or more end user stations (terminals) includes a request for a currently selected one of the low quality stream, the medium quality stream, and the high quality stream based upon a determination by the client to select a higher or lower bitrate version of the streams. *See* 1[B]; EX1004, Abstract, 6:9-7:3 (describing creating subfile sets at different bitrates for a requesting terminal), 8:6-11:1 ("Initially the player program will begin by requesting, from the directory specified in the link file, the index file, and stores locally a list of available data rates for future reference. . . . It then begins to request the audio sub-files as described earlier, from the first-mentioned 'rate' directory in the index file - viz. 024k_ll_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 (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 actual 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. As a result**, 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."), claims 1 ("A 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 . . ."), 4 ("server storing a plurality of sets of files, which sets correspond to respective different delivery modes, the **terminal** including: means operable to **effect 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, ¶ 77.

c. 7[C]: "retrieve from the storage device the requested first streamlet from the currently selected one of the low quality stream, the medium quality stream, and the high quality stream; and"

Leaning teaches 7[C]. Leaning discloses that the web server(s) retrieve from the storage device the requested streamlet (subfile) from the currently selected one of the low quality stream, the medium quality stream, and the high quality stream. *See* 7[B]; EX1004, 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."); EX1003, ¶ 78.

d. 7[D]: "send the retrieved first streamlet from the currently selected one of the different copies to the requesting one of the end user stations over the one or more network connections."

Leaning teaches 7[D]. Leaning discloses that the server sends the retrieved first streamlet to the respective one of the one or more end user stations (terminals) over the one or more internet connections. *See* 7[B]-7[C]; EX1004, 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**."); EX1003, ¶ 79.

8. Claim 8: "The system of claim 1 , further comprising: a first web server configured to receive at least one virtual timeline request over the one or more internet connections from the one or more end user stations to retrieve a virtual timeline; and send the virtual timeline to the requesting one of the end user stations over the one or more network connections."

Leaning teaches claim 8. Leaning discloses that the first web server is further configured to: receive at least one virtual timeline (menu of available recordings (menu.htm)) request over the one or more internet connections from the one or more end user stations (terminals) to retrieve a virtual timeline (menu.htm); and send the virtual timeline to the requesting one of the end user stations over the one or more network connections. *See* 1[A]; EX1003, ¶ 80.

9. Claim 9

a. 9[A]: "The system of claim 8 , wherein the first web server is further configured to:"

Leaning teaches 9[A]. *See* claim 7[A]; EX1003, ¶ 81.

b. 9[B]: "receive at least one streamlet request over one or more internet connections from the one or more end user stations to retrieve the first streamlet storing the first portion of the video, wherein the at least one streamlet request from the one or more end user stations includes a request for a currently selected first streamlet from one of the low quality stream, the medium quality stream, and the high quality stream based upon a determination by the end user station to select a higher or lower bitrate version of the video;"

Leaning teaches 9[B]. *See* claim 7[B]; EX1003, ¶ 82.

c. 9[C]: "retrieve from the storage device the requested first streamlet from the currently selected one of the low quality stream, the medium quality stream, and the high quality stream; and"

Leaning teaches 9[C]. *See* claim 7[C]; EX1003, ¶ 83.

d. 9[D]: "send the retrieved first streamlet from the currently selected one of the low quality stream, the medium quality stream, and the high quality stream to the requesting one of the end user stations over the one or more network connections."

Leaning teaches 9[D]. *See* claim 7[D]; EX1003, ¶ 84.

10. Claim 10: "The system of claim 1 , wherein the at least one virtual timeline corresponds to the currently selected one of the low quality stream, the medium quality stream, and the high quality stream."

Leaning teaches claim 10. *See* 1[A] and 2; EX1003, ¶ 85.

11. Claim 11: "The system of claim 1, wherein the virtual timeline defines a playlist for a user to view."

Leaning teaches claim 11. *See* 1[A] and 2. EX1003, ¶ 86.

12. Claim 12: "The system of claim 1, wherein the virtual timeline comprises a file that is configured to define a playlist for a user to view."

Leaning teaches claim 12. *See* Claims 1[A], 2, and 11; EX1003, ¶ 87.

13. Claim 14

a. 14[Pre]: "An end user station to stream a video over a network from a server for playback of the video, the content player device comprising:"

Whether or not the preamble is limiting, Leaning teaches 14[Pre]. Leaning

discloses an end user station (terminals 3) to stream a video over a network (Internet 2) from a server (server 1) for playback of the video. *See* 1[Pre]; EX1003, ¶ 88.

b. 14[A]: "a processor;"

Leaning teaches 14[B]. Leaning discloses a digital processing apparatus memory device (memory 31) comprising non-transitory machine-readable instructions (software for player program and browser) that, when executed, causes the processor to perform functions, such as receiving and displaying video. EX1004, 4:4-15 ("Thus Figure 2 shows such a terminal with a **central processor 30**, **memory 31**, . . . In the disk store are programs which may be retrieved into the memory 31 for **execution by the processor 30, in the usual manner**. These programs include a communications program 37 for call-up and display of html pages - that is, a 'web browser' program such as Netscape Navigator or Microsoft Explorer, and a 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."), FIG. 2 (showing CPU 30 on user terminals); EX1003, ¶ 89.

c. 14[B]: "a digital processing apparatus memory device comprising non-transitory machine-readable instructions that, when executed, cause the processor to:"

Leaning teaches 14[B]. Leaning discloses a digital processing apparatus memory device (memory 31) comprising non-transitory machine-readable

instructions (software for player program and browser) that, when executed, causes the processor to perform functions, such as receiving video and displaying video. EX1004, 4:4-15 ("Thus Figure 2 shows such a terminal with a **central processor 30**, **memory 31**, . . . In the disk store are programs which may be retrieved into the memory 31 for **execution by the processor 30, in the usual manner**. These programs include a communications program 37 for call-up and display of html pages - that is, a 'web browser' program such as Netscape Navigator or Microsoft Explorer, and a 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."), FIG. 2 (showing CPU 30 on user terminals); EX1003, ¶ 90.

d. 14[C][1]: "establish one or more network connections between the end user station and the server,"

Leaning teaches 14[C][1]. Leaning discloses establishing one or more network (Internet) connections between the end user station (terminals 3) and the server (server 1). EX1004, 2:15-16 ("server 1 is connected via the internet 2 to user terminals 3"), 4:4-15 ("Thus Figure 2 shows such a terminal with a central processor 30, memory 31, a disk store 32, a keyboard 33, video display 34, **communications interface 35**), FIGs. 1-2; EX1003, ¶ 91.

e. 14[C][2]: "wherein the server is configured to access at least one of a plurality of groups of streamlets;"

Leaning teaches 14[C][2]. Leaning discloses that the server is configured to access at least one of a plurality of groups (sets) of streamlets (subfiles). *See* 1[B]-1[C]; EX1004, 6:13-26 ("the server stores two or more versions of the recording, recorded at different compression rates (for example at compressions corresponding to (continuous) data rates of 8, 16, 24 and 32 kbit/s respectively) . . . In order to provide for rate switching, the person preparing the file for loading onto the server prepares several source files - by **encoding the same PCM file several times at different rates. He then partitions each source file into sub-files, as before**. These can be **loaded onto the server in separate directories** corresponding to the different rate, as in the following example structure, where '008k', '024k' in the directory name indicates a rate of 8 kbit/s or 24 kbit/s and so on."); EX1003, ¶ 92.

f. 14[C][3]: "wherein the video is encoded at a plurality of different bitrates to create a plurality of streams including at least a low quality stream, a medium quality stream, and a high quality stream,"

Leaning teaches 14[C][3]. *See* 1[B]. EX1003, ¶ 93.

g. 14[C][4]: "each of the low quality stream, the medium quality stream, and the high quality stream comprising a group of streamlets encoded at the same respective one of the different bitrates, each group comprising at least first

and second streamlets, each of the streamlets corresponding to a portion of the video;"

Leaning teaches 14[C][4]. *See* 1[C]. EX1003, ¶ 94.

h. 14[C][5]: "wherein at least one of the low quality stream, the medium quality stream, and the high quality stream is encoded at a bit rate of no less than 600 kbps; and"

Leaning in view of Allen teaches 14[C][5]. *See* 1[D]. EX1003, ¶ 95.

i. 14[C][6]: "wherein the first streamlets of each of the low quality stream, the medium quality stream and the high quality stream each has an equal playback duration and each of the first streamlets encodes the same portion of the video at a different one of the different bitrates;"

Leaning teaches 14[C][6]. *See* 1[E]. EX1003, ¶ 96.

j. 14[D]: "select a specific one of the low quality stream, the medium quality stream, and the high quality stream based upon a determination by the end user station to select a higher or lower bitrate version of the streams;"

Leaning teaches 14[D]. Leaning further discloses selecting a specific one of the quality streams based upon a determination by the end user station (terminal) to select a higher or lower bitrate version of the streams. *See* 7[B]; EX1004, Abstract, 6:9-7:3 (describing creating subfile sets at different bitrates for a requesting terminal), 8:6-11:1 ("Initially the player program will begin by requesting, from the directory specified in the link file, the index file, and stores locally a list of available data rates for future reference. . . . It then begins to request the audio sub-files as described earlier, from the first-mentioned 'rate' directory in the index file - viz.

024k_ll_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 (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 actual 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. As a result**, 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."), Claims 1, 4, 5, 6, 11, 12, 16 ("effecting 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**"), 17 ("in the event that the measured rate is below that needed for the set to which the currently requested field belongs, performing mode switching to provide that subsequent said request messages shall request files from a set corresponding to a **lower data rate**"), and 18 ("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, performing mode switching to provide that subsequent said request messages shall request files from a set corresponding to a **higher data rate**"); EX1003, ¶ 97.

k. 14[E]: "place at least one virtual timeline request for at least one virtual times based on the selected one of the low quality stream, the medium quality stream, and the high quality stream; and"

Leaning teaches 14[E]. Leaning discloses placing a at least one virtual timeline request for at least one virtual times based on the selected one of the low, medium, and high quality stream. *See* 1[A], 7[B], 14[D], claims 8 and 10-12; EX1003, ¶ 98.

l. 14[F]: "receive the at least one virtual timeline."

Leaning teaches 14[F]. *See* claims 1[A], 2, 8, and 10-12; EX1003, ¶ 99.

14. Claim 15

a. 15[A]: "The end user station of claim 14 , wherein the non-transitory machine-readable instructions that, when executed, further cause the processor to:"

Leaning teaches 15[A]. *See* 14[B]; EX1003, ¶ 100.

b. 15[B]: "place one or more streamlet requests to the server over the one or more network connections for the first streamlet of the selected stream;"

Leaning teaches 15[B]. Leaning discloses placing a streamlet request to the server over a network connection for the first streamlet of the selected stream. *See 7*[B], 14[D]; EX1004, 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 - i.e. www.serverl.com/mp3_bwv565/000000.bin. . . . 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. . . 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. . . . 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."); EX1003, ¶ 101.

c. 15[C]: "receive the requested first streamlet from the server via the one or more network connections wherein the one or more streamlet requests are based on the at least one virtual timeline; and"

Leaning teaches 15[C]. Leaning discloses receiving the requested first streamlet from the server via the internet connection. EX1004, 1:27-28 ("receiving the files; and decoding the files for replay of the material"), 4:4-21, 5:23-6:2, claim 1; EX1003, ¶ 102.

Leaning further discloses that the streamlet requests are based on the at least one virtual timeline. *See* 1[A] and 2; EX1003, ¶ 103.

d. 15[D]: "provide the received first streamlet for playback of the video."

Leaning teaches 15[D]. EX1004, 1:27-28 ("receiving the files; and decoding the files for replay of the material"), 4:4-21, 5:23-6:2, claim 1; EX1003, ¶ 104; *see also* claim 15[C].

15. **Claim 16: "The end user station of claim 14 , wherein the second streamlet of each of the groups of streamlets each has the same second duration and corresponds to the same second portion of the video in the low quality stream, the medium quality stream, and the high quality stream, the second streamlet of the low quality stream having the same bitrate as the first streamlet of the low quality stream."**

Leaning teaches claim 16. *See* claim 5; EX1003, ¶ 105.

16. **Claim 17: "The end user station of claim 16 , wherein the first and second durations are different."**

Leaning teaches claim 17. *See* claim 6; EX1003, ¶ 106.

17. **Claim 18: "The end user station of claim 17 , wherein the virtual timeline corresponds to the currently selected one of the low quality stream, the medium quality stream, and the high quality stream."**

Leaning teaches claim 18. *See* claim 10; EX1003, ¶ 107.

18. **Claim 19: "The end user station of claim 18, wherein the virtual timeline defines a playlist for a user to view."**

Leaning teaches claim 19. *See* claim 11; EX1003, ¶ 108.

19. **Claim 20: "The end user station of claim 14, wherein the video is a live event video."**

Leaning teaches claim 20. *See* claim 3; EX1003, ¶ 109.

20. **Claim 21: "The end user station of claim 14 , wherein the video includes archived content."**

Leaning teaches claim 18. *See* claim 4; EX1003, ¶ 110.

21. Claim 22

a. 22[Pre]: "A process executable by one or more servers to stream a video for playback by one or more end user stations, the process comprising:"

Leaning teaches 22[Pre]. *See* claim 1[Pre]; EX1003, ¶ 111.

b. 22[A]: "storing, by the one or more servers, one or more virtual timelines corresponding to a plurality of streams including a low quality stream, a medium quality stream, and a high quality stream"

Leaning teaches 22[A]. *See* claims 1[A]-1[B]; EX1003, ¶ 112.

c. 22[B]: "wherein the low quality stream, the medium quality stream, and the high quality stream each comprise a group of streamlets encoded at a respective one of a plurality of different bitrates, each group comprising at least first and second streamlets, each of the streamlets corresponding to a portion of the video;"

Leaning teaches 22[B]. *See* claim 1[C]; EX1003, ¶ 113.

d. 22[C]: "wherein at least one of the low quality stream, the medium quality stream, and the high quality stream is encoded at a bitrate of no less than 600 kbps; and"

Leaning in view of Allen teaches 22[C]. *See* claims 1[D]; EX1003, ¶ 114.

e. 22[D]: "wherein the first streamlet of each of the groups of streamlets has the same first duration and encodes the same first portion of the video in the low quality stream, the medium quality stream, and the high quality stream, the first streamlet of the low quality stream having a different one of the different bitrates than the first streamlet of the high quality stream and the first streamlet of the medium quality stream;"

Leaning teaches 22[D]. *See* claim 1[E]; EX1003, ¶ 115.

f. 22[E]: "receiving at least one virtual timeline request over one or more internet connections from the one or more end user stations to retrieve a virtual timeline correspond to the first streamlet storing the first portion of the video,"

Leaning teaches 22[E]. *See* claim 7[B] and 8; EX1003, ¶ 116.

g. 22[F]: "wherein the at least one streamlet request from the one or more end user stations includes a request for a currently selected first streamlet from one of the low quality stream, the medium quality stream, and the high quality stream based upon a determination by the end user station to select a higher or lower bitrate version of the video;"

Leaning teaches 22[F]. *See* claim 7[B]; EX1003, ¶ 117.

h. 22[G]: "retrieving from the storage device the requested virtual timeline for the currently selected one of the low quality stream, the medium quality stream, and the high quality stream; and"

Leaning teaches 22[G]. *See* claims 7[C], 8; EX1003, ¶ 118.

i. 22[H]: "sending the retrieved virtual timeline to the requesting one of the end user stations over the one or more network connections."

Leaning teaches 22[H]. *See* claims 7[C], 8; EX1003, ¶ 119.

22. Claim 23

a. 23[A]: "The process of claim 22 , further comprising:"

Leaning teaches 23[A]. *See* claim 22; EX1003, ¶ 120.

b. 23[B]: "storing, by the one or more servers, a plurality of streams including a low quality stream, a medium quality stream, and a high quality stream; and"

Leaning teaches claim 23[B]. *See* 1[B]; EX1004, 6:13-26 ("the **server stores**

two or more versions of the recording, recorded at different compression rates (for example at compressions corresponding to (continuous) data rates of 8, 16, 24 and 32 kbit/s respectively."); EX1003, ¶ 121.

c. 23[C]: "receiving at least one streamlet request over one or more internet connections from the one or more end user stations to retrieve the first streamlet storing the first portion of the video,"

Leaning teaches claim 23[C]. *See* claim 7[B]; EX1003, ¶ 122.

d. 23[D]: "wherein the at least one streamlet request from the one or more end user stations includes a request for a currently selected first streamlet from one of the low quality stream, the medium quality stream, and the high quality stream based upon a determination by the end user station to select a higher or lower bitrate version of the video"

Leaning teaches claim 23[D]. *See* claim 7[B]; EX1003, ¶ 123.

e. 23[E]: "retrieving from the storage device the requested first streamlet from the currently selected one of the low quality stream, the medium quality stream, and the high quality stream; and"

Leaning teaches claim 23[E]. *See* claim 7[C]; EX1003, ¶ 124.

f. 23[F]: "sending the retrieved first streamlet from the currently selected one of the low quality stream, the medium quality stream, and the high quality stream to the requesting one of the end user stations over the one or more network connections."

Leaning teaches claim 23[F]. *See* claims 7[D]; EX1003, ¶ 125.

23. Claim 24: "The process of claim 22 , wherein the second streamlet of each of the groups of streamlets each has the same second duration and corresponds to the same second portion of the video in the low quality stream, the medium quality stream, and the high quality stream, the second streamlet of the low quality stream having the same bitrate as the first streamlet of the low quality stream."

Leaning teaches claim 24. *See* claim 5; EX1003, ¶ 126.

24. Claim 25: "The process of claim 22 , wherein the first and second durations are different."

Leaning teaches claim 25. *See* claim 6; EX1003, ¶ 127.

25. Claim 26: "The process of claim 22, wherein the video is a live event video."

Leaning teaches claim 26. *See* claim 3; EX1003, ¶ 128.

26. Claim 27: "The process of claim 22 , wherein the video includes archived content."

Leaning teaches claim 27. *See* claim 21; EX1003, ¶ 129.

27. Claim 28

a. 28[Pre]: "A process executable by a content player device to stream a video over a network from a server for playback of the video by the content player device, the process comprising:"

Leaning teaches claim 28[Pre]. *See* claim 14[Pre]-14[B]; EX1003, ¶ 130.

b. 28[A]: "establishing one or more network connections between the content player device and the server,"

Leaning teaches claim 28[A]. *See* claim 14[C][1]; EX1003, ¶ 131.

c. 28[B]: "wherein the server accesses a plurality of streams including a low quality stream, a medium quality stream, and a high quality stream,"

Leaning teaches claim 28[B]. *See* claim 14[C][2]-14[C][3]; EX1003, ¶ 132.

d. 28[C]: "wherein the low quality stream, the medium quality stream, and the high quality stream each comprise a group of streamlets encoded at a respective one of a plurality of different bitrates, each group comprising at least first and second streamlets, each of the streamlets corresponding to a portion of the video;"

Leaning teaches claim 28[C]. *See* claim 14[C][4]; EX1003, ¶ 133.

e. 28[D]: "wherein at least one of the low quality stream, the medium quality stream, and the high quality stream is encoded at a bitrate of no less than 600 kbps; and"

Leaning in view of Allen teaches claim 28[D]. *See* claim 14[C][5]; EX1003, ¶ 134.

f. 28[E]: "wherein the first streamlet of each of the groups of streamlets has the same first duration and encodes the same first portion of the video in the low quality stream, the medium quality stream, and the high quality stream, the first streamlet of the low quality stream having a different bitrate than the first streamlet of the high quality stream and the first streamlet of the medium quality stream;"

Leaning teaches claim 28[E]. *See* claim 14[C][6]; EX1003, ¶ 135.

g. 28[F]: "selecting, by the content player device, a currently selected one of the low quality stream, the medium quality stream, and the high quality stream based upon a determination by the end user station to select a higher or lower bitrate version of the video;"

Leaning teaches claim 28[F]. *See* claim 14[D]; EX1003, ¶ 136.

h. 28[G]: "placing a virtual time request over one or more internet connections from the one or more end user stations to retrieve at least one virtual timeline corresponding to the currently selected one of the low quality stream, the medium quality stream, and the high quality stream; and"

Leaning teaches claim 28[G]. *See* claim 14[E]; EX1003, ¶ 137.

i. 28[H]: "receiving the requested virtual timeline from the server via the one or more network connections."

Leaning teaches claim 28[H]. *See* claim 14[F]; EX1003, ¶ 138.

28. Claim 29

a. 29[A]: "The process of claim 28 further comprising: placing a streamlet request over one or more internet connections from the one or more end user stations to retrieve the first streamlet storing the first portion of the video, wherein the streamlet request is based, at least in part, on the received virtual timeline;"

Leaning teaches claim 29[A]. *See* claim 15[B]-15[C]; EX1003, ¶ 139.

b. 29[B]: "receiving the requested streamlet from the server via the one or more network connections; and"

Leaning teaches claim 29[B]. *See* claim 15[C]; EX1003, ¶ 140.

c. 29[C]: "rendering, by the content player device, the received streamlet for playback of the video."

Leaning teaches claim 29[C]. *See* claim 15[D]; EX1003, ¶ 141.

B. Ground 2: Claims 1-12 and 14-29 Would Have Been Obvious in view of Leaning, Allen, and SMIL 2.0

The sections of Ground 1 (Section IX.A) are incorporated into this section by reference. To the extent that Patent Owner argues that Leaning in view of Allen fails

to teach certain limitations, Leaning in view of Allen and SMIL 2.0 teaches these limitations as described below. EX1003, ¶ 142.

1. Claims 1-12 and 14-29

To the extent it is argued that Leaning fails to teach a "virtual timeline" in the form of "a playlist of entire content files" wherein each content file is played automatically one after the other, SMIL 2.0 teaches such limitations. For example, SMIL 2.0 teaches generating a playlist of entire content files "vid2.mpg" followed by "vid3.mpg" using the "<seq>" element:

```
<seq>
   <img src="img1.jpg" />
   <video src="vid2.mpg" />
   <video src="vid3.mpg" />
</seq>
```

EX1006, 207, 158 ("seq container defines a sequence of elements in which **elements play one after the other**").

A POSITA would have been motivated to create a virtual timeline playlist of entire content files that play one after the other, as taught by SMIL 2.0, in order to set out a video schedule of similar recordings for clients to view in succession. EX1003, ¶¶ 143-144. A POSITA would have had a reasonable expectation of success with such a combination because both Leaning and SMIL 2.0 are drawn to similar systems of client-server based streaming and generating a playlist of entire content files would have been a straightforward modification for a POSITA.

EX1003, ¶ 144.

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 '680 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.

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 Petitioners. Second, none of the above alleged characteristics are claimed in the '680 Patent. Third, the ALJ's findings were incorrect because 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).

Further, the purported "unique" 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: claims 7[B], 9[B], 14[D], 22[F], 23[D], 28[F].

Additionally, the alleged "unique" claimed feature of "use of simple HTTP

protocol transfer of media files from standard Web servers rather than deployment of expensive media servers" cannot be a basis for finding a nexus because at least Leaning discloses using simple HTTP protocol for clients to request transfer of files from standard web servers, rather than specialized media servers. *See, e.g.*, EX1004, 2:9-32, 3:19-4:3.

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 '680 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 3, 20, and 26—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 '680 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 '680 Patent cites on its face US2004/0030547 (also to Leaning et al.) titled "Encoding Audio Signals" with claims and Abstract drawn to encoding of audio signals (EX1001, Cover), 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 more than 300 references cited on the face of the '680 Patent (EX1001, 1-4) and it was never used by the Examiner or identified by the Applicant during prosecution of the '680 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.

Finally, although Petitioner is relying on the same secondary references of Allen and SMIL 2.0 that were used as secondary references in the Ogdon-based petition, this does not weigh against institution. Leaning is relied upon to teach essentially every limitation for all challenged claims except for encoding one of the streams to a bitrate of no less than 600 kbps (*See* Ground 1). Allen is only relied upon to teach encoding to a specific bitrate (600 kbps) and more than one server for dependent claim 7. Further, SMIL 2.0 is only relied upon as an alternative to certain teachings in Leaning for Ground 2 for certain limitations relating to "virtual timeline."

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 eight other district court litigations where DISH has asserted the '680 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 '680 Patent. Neither Leaning, Allen, nor SMIL 2.0 are cited on the face of the '680 Patent. As noted above, the '680 Patent does cite on its face US2004/0030547 (also to Leaning et al.) titled "Encoding Audio Signals" with abstract and claims drawn to encoding of audio signals, but US2004/0030547 is not in the same family as the PCT Leaning reference relied upon in this Petition. Even though the cited US2004/0030547 does have overlapping disclosures with Leaning, Leaning has relevant disclosures in the Abstract, specification, and published claims directed to subject matter such as a terminal for playing streaming audio or video from a remote server that are not disclosed in US2004/0030547 and that are relied upon in this Petition such that US2004/0030547 is not cumulative of Leaning.

As Ground 1 above demonstrates, Leaning teaches each and every limitation of the independent claims (except explicitly teaching encoding a stream at no less than 600 kbps). *See* Section IX.A.

Moreover, US2004/0030547 was listed in an IDS during prosecution of the ’680 Patent along with 204 other references and is one of 301 references on the face of the ’680 Patent. EX1002, 599; EX1001, 1-7. But other than the Examiner generally stamping that every reference in the IDS was considered (EX1002, 660), 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 ’680 Patent or any related patents.

XII. CONCLUSION

Petitioner requests *inter partes* review and cancellation of claims 1-12 and 14-29.

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 13,518 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 CFR § 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 10,951,680
- Exhibits
- Petitioner's Power of Attorney

to be served via overnight delivery on the USPTO Patent Center (PAIR) Correspondence Address for U.S. Patent 10,951,680 as follows:

54583 – Dish Technologies L.L.C.
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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 litigation:

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