UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

WEBGROUP CZECH REPUBLIC A.S. and NKL ASSOCIATES, S.R.O.,
Petitioners
v.

DISH TECHNOLOGIES L.L.C.,
Patent Owner

U.S. Patent 11,677,798
Issue Date: June 13, 2023
Title: APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE CONTENT STREAMING

Inter Partes Review No. IPR2025-00470

PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT 11,677,798 CHALLENGING CLAIMS 1-25 UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. § 42.1 *et seq.*

Mail Stop PATENT BOARD Patent Trial and Appeal Board
United States Patent and Trademark Office
PO Box 1450
Alexandria, Virginia 22313-1450
Submitted Electronically via PTAB E2E

TABLE OF CONTENTS

Page

TABLE OF AUTHORITIES

Page(s)

Cases

Statutes

Other Authorities

PETITIONER'S EXHIBIT LIST

Table of Exhibits for U.S. Pat. 11,677,798 Petition for *Inter Partes* Review

Exhibit Number	Description
1001	U.S. Patent No. 11,677,798 (the "'798 Patent")
1002	File History of U.S. Patent No. 11,677,798
1003	Declaration of Dr. Reza Rajaie including Curriculum Vitae ("Rejaie declaration")
1004	U.S. Patent No. 7,447,791 ("Leaning")
1005	WO 2004/030310 ("Reme")
1006	Synchronized Multimedia Integration Language (SMIL 2.0) ("SMIL 2.0")
1007	U.S. Patent No. 6,848,004 to Chang ("Chang")
1008	WO1997044942 to Kliger ("Kliger")
1009	337-TA-1265 ITC Investigation Initial Determination
1010	337-TA-1265 ITC September 11, 2023 Enforcement Complaint
1011	HTTP 1.1 Protocol
1012	U.S. Patent No. 6,002,440 to Dalby ("Dalby")
1013	U.S. Patent No. 6,553,413 ("Leighton")
1014	Article entitled "Video streaming: Concepts, algorithms, and systems"
1015	Reza Rejaie Dissertation entitled "An End-to-End Architecture for Quality Adaptive Streaming Applications in the Internet"
1016	U.S. Patent No. 6,389,473 ("Carmel")
1017	Article entitled "Design Issues for Layered Quality-Adaptive Internet Video Playback"
1018	Article entitled "Quality Adaptation for Congestion Controlled Video Playback over the Internet"
1019	Article entitled "PALS: Peer-to-Peer Adaptive Layered Streaming"
1020	<RESERVED>
1021	<RESERVED>

TABLE A: LISTING OF CLAIMS

Claim Designation	Claim Language
Claim 1	
1[Pre]	A system for adaptive-rate content streaming of digital content playable on one or more end user stations over the Internet, the system comprising:
1[A]	at least one storage device storing digital content,
1[B]	the digital content encoded at a plurality of different bit rates creating a plurality of streams including a first bit rate stream, a second bit rate stream, and a third bit rate stream,
1[C]	wherein the first bit rate stream, the second bit rate stream, and the third bit rate stream each comprise a group of streamlets encoded at a respective one of the plurality of different bit rates, each group of streamlets comprising at least first and second streamlets, each of the streamlets corresponding to a portion of the digital content;
1[D]	wherein at least one of the first bit rate stream, the second bit rate stream, and the third bit rate stream is encoded at a bit rate 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 temporal portion of the digital content in each of the first bit rate stream, the second bit rate stream, and the third bit rate stream, and wherein the first streamlet of the first bit rate stream encodes the same first temporal portion of the digital content at a different bit rate than the first streamlet of the second bit rate stream and the first streamlet of the third bit rate stream.
Claim 2	
2[A]	The system of claim 1, further comprising: a plurality of servers located at different locations across the Internet, each server configured to:
2[B]	receive at least one streamlet request over one or more network connections from one or more end user stations to retrieve the first streamlet storing a portion of the digital content, 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 first bit rate stream, the second bit rate stream, and the third bit rate stream

Claim Designation	Claim Language
	based upon a determination by the end user station to select a higher or lower bit rate copy of the streams;
2[C]	retrieve from the at least one storage device the requested first streamlet from the currently selected one of the first bit rate stream, the second bit rate stream, and the third bit rate stream; and
2[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 3	
[3]	The system of claim 2, 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 digital content in the first bit rate stream, the second bit rate stream, and the third bit rate stream, the second streamlet of the first bit rate stream having the same bit rate as the first streamlet of the first bit rate stream.
Claim 4	
[4]	The system of claim 3, wherein the first and second durations are different.
Claim 5	
5[A]	The system of claim 1, further comprising: a first server configured to:
5[B]	receive at least one streamlet request over one or more network connections from the one or more end user stations to retrieve the first streamlet storing the first temporal portion of the digital content, 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 first bit rate stream, the second bit rate stream, and the third bit rate stream based upon a determination by the end user station to select a higher or lower bit rate copy of the digital content;
5[C]	retrieve from the at least one storage device the requested first streamlet from the currently selected one of the first bit rate stream, the second bit rate stream, and the third bit rate stream; and

Claim Designation	Claim Language
5[D]	send the retrieved first streamlet from the currently selected one of the first bit rate stream, the second bit rate stream, and the third bit rate stream to the requesting one of the end user stations over the one or more network connections.
Claim 6	
[6]	The system of claim 5, wherein the digital content comprises a live event video of a live event, and the first streamlets of the first bit rate stream, the second bit rate stream, and the third bit rate stream are available before the live event is complete.
Claim 7	
[7]	The system of claim 6, wherein the streamlets from the first bit rate stream, the second bit rate stream, and the third bit rate stream of the live event, when played back, are presented in a live stream to a viewer.
Claim 8	
[8]	The system of claim 7, wherein the first server is further configured to: receive at least one virtual timeline request over the one or more network 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]	The system of claim 1, further comprising: an encoding module configured to receive the digital content and encode the streamlets of the first bit rate.
Claim 10	
[10]	The system of claim 9, wherein the encoding module is configured to encode the streamlets of the multiple copies of the digital content in each of the different bit rates using a multi-pass encoding process.
Claim 11	
11[Pre]	An end user station comprising:
11[A]	a processor;
11[B]	a digital processing apparatus memory device comprising non-transitory machine-readable instructions that, when executed, cause the processor to:
11[C][1]	establish one or more network connections between the end user station and at least one server,

Claim Designation	Claim Language
11[C][2]	wherein the at least one server is configured to access at least one of a plurality of groups of streamlets of digital content;
11[C][3]	wherein the digital content is encoded at a plurality of different bit rates to create a plurality of streams including at least a first bit rate stream, a second bit rate stream, and a third bit rate stream,
11[C][4]	wherein each of the first bit rate stream, the second bit rate stream, and the third bit rate stream comprises a group of streamlets encoded at the same respective one of the different bit rates, each group comprising at least first and second streamlets, each of the streamlets corresponding to a portion of the digital content;
11[C][5]	wherein at least one of the first bit rate stream, the second bit rate stream, and the third bit rate stream is encoded at a bit rate of no less than 600 kbps; and
11[C][6]	wherein the first streamlets of each of the first bit rate stream, the second bit rate stream and the third bit rate stream each has an equal playback duration and each of the first streamlets encodes the same portion of the digital content at a different one of the different bit rates;
11[D]	determine whether to select a higher or lower bit rate copy of the stream and based on that determination, select a specific one of the first bit rate stream, the second bit rate stream, and the third bit rate stream;
11[E]	place a first streamlet request to the at least one server over the one or more network connections for the first streamlet of the selected stream;
11[F]	receive the requested first streamlet from the at least one server via the one or more network connections; and provide the received first streamlet for output of the digital content to a presentation device.
Claim 12	
12[A]	The end user station of claim 11, wherein the non-transitory machine-readable instructions further comprise instructions that cause the processor to:
12[B]	place a second streamlet request to the at least one server over the one or more network connections for the second streamlet of the selected stream;
12[C]	receive the requested second streamlet from the at least one server via the one or more network connections; and

Claim Designation	Claim Language
12[D]	arrange the first streamlet and second streamlet in order of ascending presentation time for output of the digital content to the presentation device.
Claim 13	
[13]	The end user station of claim 11, wherein at least some streamlets are requested from the at least one server via a hypertext transfer protocol (HTTP) GET request.
Claim 14	
[14]	The end user station of claim 11, wherein the at least one server comprises at least two servers and wherein at least one streamlet is requested from a first server of the at least one server and at least one other streamlet is requested from a second server of the at least one server other than the first server.
Claim 15	
[15]	The end user station of claim 11, wherein each of the streamlets is requestable by the processor without regard to whether the processor has previously requested other streamlets of the digital content.
Claim 16	
[16]	The end user station of claim 11, wherein at least a plurality of streamlets are separate files stored by the at least one server.
Claim 17	
17[A]	The end user station of claim 11, wherein the non-transitory machine-readable instructions further comprise instructions that cause the processor to:
17[B]	place a second streamlet request to the at least one server over the one or more network connections for a second streamlet of a different bit rate stream, wherein the different bit rate stream comprises a different stream than the selected stream;
17[C]	receive the requested second streamlet from the at least one server via the one or more network connections;
17[D]	arrange the first streamlet and second streamlet in order of ascending presentation time for output of the digital content to the presentation device.
Claim 18	

Claim Designation	Claim Language
18[A]	The end user station of claim 16, wherein the non-transitory machine-readable instructions further comprise instructions that cause the processor to:
18[B]	determine an anticipated inability to receive the digital content at the second bit rate of the second bit rate stream at a rate sufficient for presenting the digital content as the digital content is received, and in response to the determining the anticipated inability, requesting a third streamlet of the first bit rate stream, the third streamlet immediately
	subsequently adjacent to the second streamlet of the digital content during presentation.
Claim 19	
[19]	The end user station of claim 18, 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 digital content in the first bit rate stream, the second bit rate stream, and the third bit rate stream, the second streamlet of the first bit rate stream having the same bit rate as the first streamlet of the first bit rate stream.
Claim 20	
[20]	The end user station of claim 12, wherein the streamlets of the first bit rate stream, the second bit rate stream, and the third bit rate stream of the live event are available on a ten second delay.
Claim 21	
[21]	The end user station of claim 12, wherein the processor providing the first received streamlet for playback comprises outputting the first streamlet to a presentation device connected to the end user station.
Claim 22	
22[Pre]	A process executable by one or more servers to stream digital content for playback by one or more end user stations, the process comprising:
22[A]	storing, by the one or more servers, a plurality of streams including a first bit rate stream, a second bit rate stream, and a third bit rate stream,
22[B]	wherein the first bit rate stream, the second bit rate stream, and the third bit rate stream each comprise a group of streamlets encoded at a respective one of a plurality of different bit rates, each group comprising at least first and second streamlets, each of the streamlets corresponding to a portion of the digital content;

Claim Designation	Claim Language
22[C]	wherein at least one of the first bit rate stream, the second bit rate stream, and the third bit rate stream is encoded at a bit rate 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 temporal portion of the digital content in the first bit rate stream, the second bit rate stream, and the third bit rate stream, the first streamlet of the first bit rate stream having a different one of the different bit rates than the first streamlet of the second bit rate stream and the first streamlet of the third bit rate stream;
22[E]	receiving at least one streamlet request over one or more network connections from the one or more end user stations to retrieve the first streamlet storing the first temporal portion of the digital content,
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 first bit rate stream, the second bit rate stream, and the third bit rate stream based upon a determination by the end user station to select a higher or lower bit rate copy of the digital content;
22[G]	retrieving from the storage device the requested first streamlet from the currently selected one of the first bit rate stream, the second bit rate stream, and the third bit rate stream; and
22[H]	sending the retrieved first streamlet from the currently selected one of the first bit rate stream, the second bit rate stream, and the third bit rate stream to the requesting one of the end user stations over the one or more network connections.
Claim 23	
[23]	The method of claim 22, wherein a second streamlet of each of the groups of streamlets each has a same second duration and corresponds to a same second temporal portion of the digital content in the first bit rate stream, the second bit rate stream, and the third bit rate stream, the second streamlet of the first bit rate stream having the same bit rate as the first streamlet of the first bit rate stream.
Claim 24	
[24]	The method of claim 23, wherein the first and second durations are different.

Claim Designation	Claim Language
Claim 25	
[25]	The method of claim 22, wherein the digital content is a live event, and wherein the first streamlets of the first bit rate stream, the second bit rate stream, and the third bit rate stream are available before the live event is complete.

I. INTRODUCTION

WebGroup Czech Republic A.S. and NKL Associates, S.R.O. ("Petitioners") petition under 35 U.S.C. § 312 and 37 C.F.R. § 42 for *inter partes* review of claims 1-25 ("Challenged Claims") of U.S. Pat. 11,677,798 ("the '798 Patent") (EX1001). The '798 Patent is assigned to DISH Technologies L.L.C. ("DISH") and Sling TV L.L.C. is an exclusive licensee.

The '798 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 '798 Patent.

II. STANDING

Petitioners certify that the '798 Patent is available for IPR and that Petitioners are not barred or estopped from requesting IPR challenging the patent claims on the grounds identified in this Petition.

III. UNPATENTABILITY GROUNDS

Petitioners request cancellation of claims 1-25 based on the grounds below.

Ground	Basis	Reference(s)	Challenged Claims
1	§ 103	Leaning in view of Leighton	1-9, 11-25[1]
2	§ 103	Leaning in view of Leighton and Reme	1-9, 11-25
3	§ 103	Leaning in view of Leighton and SMIL 2.0	1-9, 11-25
4	§ 103	Leaning in view of Leighton and Dalby	1-25

These grounds are supported by the Declaration of Dr. Reza Rejaie (EX1003) and other supporting evidence in the Exhibit List. EX1003. EX1003, ¶¶1-259.

IV. POSITA

A POSITA at the time of the '798 Patent had at least a bachelor's in electrical engineering, computer engineering, computer science or equivalent, and two years of experience with networking or media streaming. EX1003, ¶¶77-80. Petitioners' expert exceeded this level of experience by the priority date. *Id*.

V. BACKGROUND

A. Technical Background

Streaming techniques have been known for over 30 years, and documented since at least 1994. EX1003, ¶¶41-67. Generally speaking, in a streaming system, one or more servers communicate multimedia content over a network connection to

[1] Leighton is relied upon for dependent claims 2[A] and 14.

a client device that displays the multimedia to the user as it is received or shortly thereafter. The quality, or bitrate, of the media affects how quickly it can be received and displayed to the user, with greater quality requiring an increased bandwidth, relative to a lower quality, to avoid noticeable delays (*e.g.*, buffering) in playback. In an ideal user experience, the streaming system streams the highest quality version of the multimedia to the client device without causing playback delays.

B. '798 Patent

The '798 Patent (Application Serial No. 17/962,231) was filed on October 7, 2022 and issued on June 13, 2023. EX1001, Cover. It purports to relate to "multi-bitrate content streaming," such as video, over the Internet. *Id.*, Abstract, 1:34-37; EX1003, ¶¶68-74. The '798 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 '798 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, 6:36-54. The '798 Patent describes encoding the same content file 200 into at least three different "quality" streams:

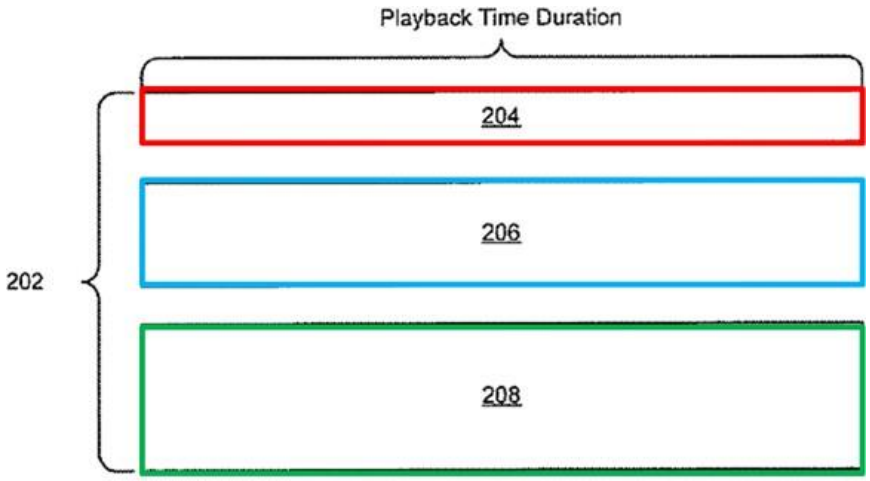


FIG. 2b

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

For example, "low quality stream 204 may be encoded and compressed to a bit rate of 100 kilobits per second (kbps), the medium quality stream 206 may be encoded and compressed to a bit rate of 200 kbps, and the high quality stream 208 may be encoded and compressed to 600 kbps." *Id.*, 7:34-39.

Each stream (204, 206, and 208) is also "divided into a plurality of source streamlets 303" where "streamlet refers to any sized portion of the content file" and may be "an independent media object" where "streamlet 0 may have a time index of 00:00 representing the beginning of content playback, and streamlet 1 may have a time index of 00:002, and so on." *Id.*, 7:40-52.

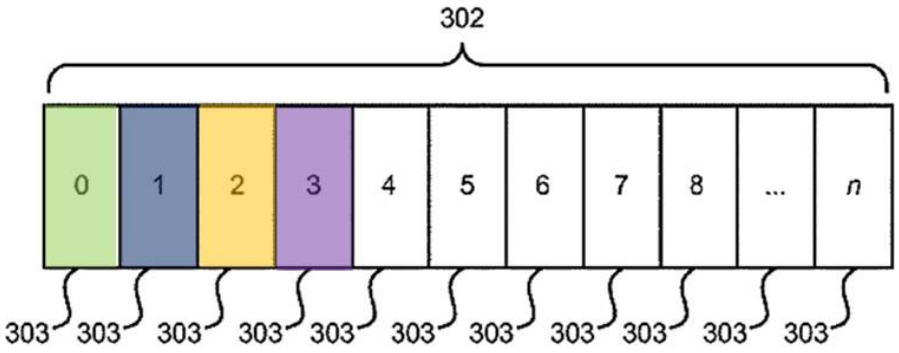


FIG. 3a

Id., FIG. 3a (annotated).

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

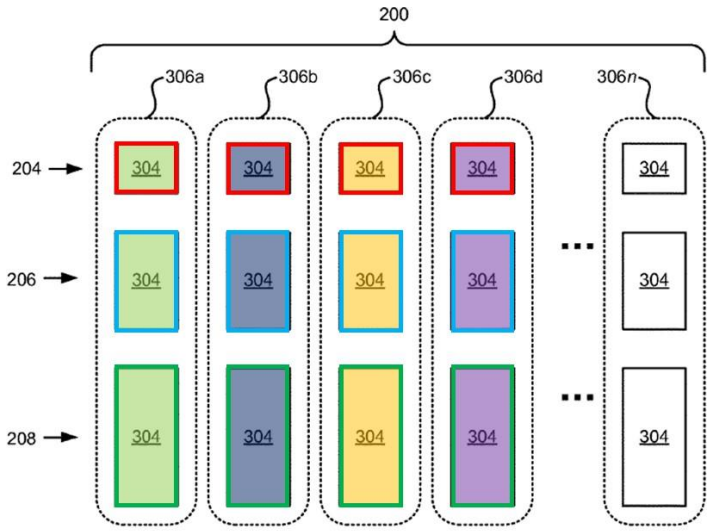


FIG. 3b

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

These sets of streamlets are stored in a streamlet database 408 and then a "client module 114 may request streamlets 304 using HTTP from the web server 116" or "a plurality of web servers 116." *Id.*, 9:4-7, 9:34-44. Further, the '798 Patent explains that the invention may be used to stream "live" content files on a short delay. *Id.*, 10:48-60.

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.*, 13:5-28.

1. Prosecution History

The '798 Patent was filed as Application No. 17/962,231 on October 7, 2022. EX1002, 175. On January 5, 2023, Applicant filed a terminal disclaimer to obviate a double patenting rejection over prior U.S. Patent No. 11,470,138. *Id.*, 183-184. On January 30, 2023, the Examiner issued a Notice of Allowance. *Id.*, 203.

Petitioners assume 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 Serial No. 60/566,831 (EX1001, 2), but reserve the right to contest this priority date (and priority chain) in other proceedings. EX1003, ¶¶75-76.

2. Claim Construction

For purposes of this Petition only Petitioners do not believe any terms require a formal construction. Every term carries its "ordinary and customary meaning," which is "the meaning that the term would have to a person of ordinary skill in the art in question" at the time of the invention. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007) (citation omitted). However, Petitioners acknowledge that in the ITC Investigation involving Patent Owner and Respondent iFIT, Inc. asserting family members of the '798 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," "content player device" required no construction. *Id*., 71.

Petitioners submit that "virtual timeline" does not require construction. The '798 Patent describes a "virtual timeline" as "at least one quantum media extension 602" ("QMX"), and that a QMX describe[s] an entire content file." *Id.* 12:35-36. Thus, a "virtual timeline" may be "a file that is configured to define a playlist for a user to view" and that "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, 12:32-45, FIGs. 6a-6c. The ’798 Patent provides no other information regarding the nature of a “virtual timeline” envisioned by the Patent Owner. *Id*. Petitioners submit that “virtual timeline” should be construed with its ordinary meaning, which, according to the specification of the ’798 Patent, is “a playlist of entire content files.” EX1003, ¶¶81-82.

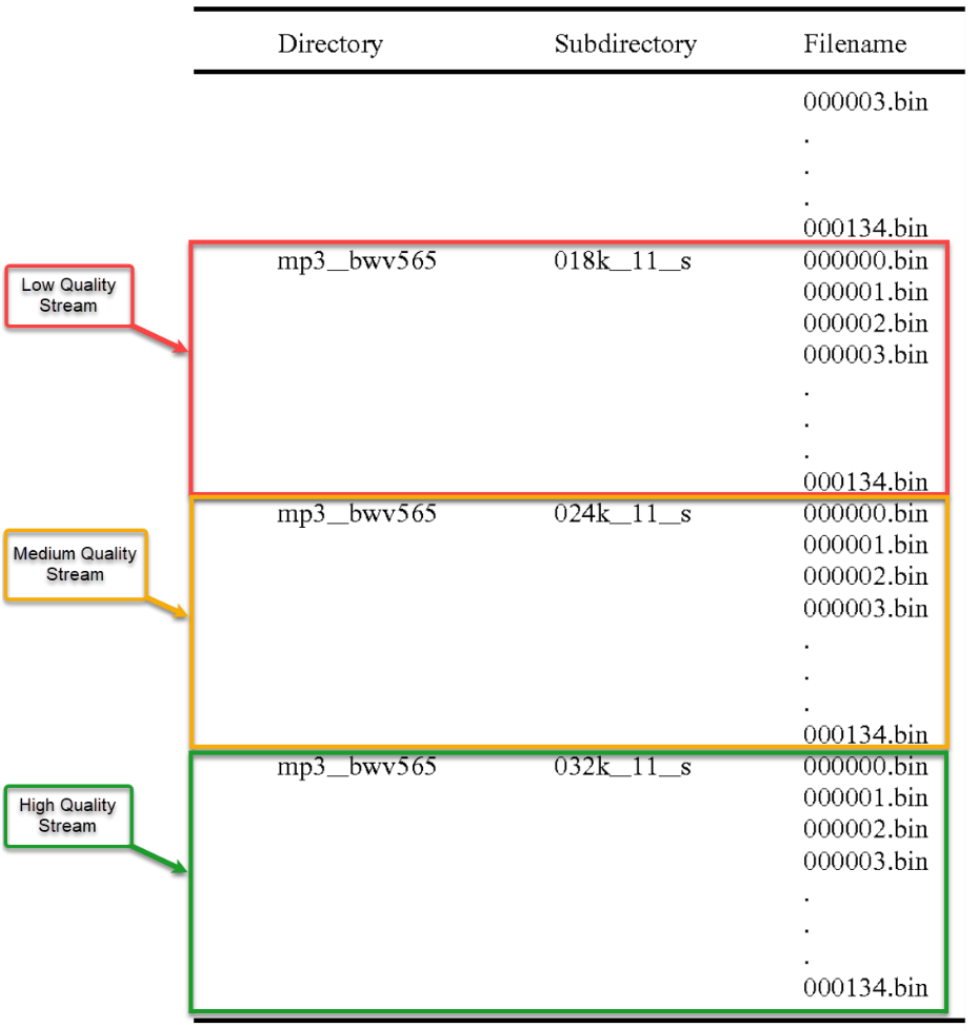
C. Prior Art

1. 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). EX1003, ¶¶84-86. Leaning is not cited on the face of the ’798 Patent nor was it considered by the ALJ in the ITC action. 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 ’798 Patent (EX1001, Cover). However, the PTAB did not substantively consider this publication during examination, other than initialing it within a lengthy IDS.

Leaning is directed to techniques for streaming media content with different sets of files, called sub-files, that are successive temporal portions of the content being streamed. Each of the sets of files corresponds to a different quality version of the same content and a client can switch between quality versions each time it requests the sub-file for the next temporal portion of the content. Leaning teaches a

client and server connected by a network wherein the client measures the actual data rate being received from the server and, based on that measurement, determines a "rate" directory (*e.g.*, a quality level) from which to request the next sequential sub-file in the media stream. EX1004, Abstract, 5:28-51. Leaning expressly teaches streams stored as three different quality versions (*e.g.*, high, medium, and low) with each version divided into sub-files that each represent the same portion of the media across the different versions. EX1004, 5:28-51, 6:1-33.



EX1004, 6:1-29 (annotated, excerpted table showing each of the subdirectories containing the sub-files for three different versions of the same media (mp3_bwv565, encoded at 18, 24, and 32 kbps) with each subdirectory containing sub-files with the same names (*e.g.*, 000000.bin-000134.bin) in the same order).

2. Reme

Reme (EX1005) was filed on September 15, 2003 and published on April 8, 2004. Reme is prior art under at least pre-AIA 35 U.S.C. § 102(e). EX1003, ¶¶87-88. Reme is not cited on the face of the '798 Patent nor did the ALJ consider it in the ITC action.

Reme is directed to a technique for streaming content to a user via the internet and configured to switch among a plurality of pre-encoded versions of the content, where each version corresponds to a different encoding rate and hence to a different quality (*e.g.*, encoding rates at 30 kbps, 300 kbps, and 5 Mbps). EX1005, Abstract, 3:15-17, 5:1-12. Reme discloses that its streaming system allows for automatically "selecting the version of the content which encoding rate best matches" the transmission rate of the network connection between the client and the server and that it may "switch from one version to another in order to take into account the modifications of the state of the transmission network." EX1005, 5:7-12.

3. Leighton

Leighton (EX1007) was filed on June 28, 2000, and issued on April 22, 2003. Leighton is prior art under at least pre-AIA 35 U.S.C. § 102(b). EX1003, ¶¶89-90. Leighton is not cited on the face of the '798 Patent nor did the ALJ consider it in the ITC action.

Leighton is directed to a network architecture for hosting and distributing content to clients across the globe. EX1007, Abstract. Leighton discloses a network with "a set of servers operating in a distributed manner," including several "hosting servers" that are used to transmit content to clients using those hosting servers that are near the client machines. EX1007, Abstract. Additionally, Leighton's architecture includes a web server 12 that is "one of a plurality of [web] servers which are accessible by clients." EX1007, 5:2-4. In processing a client's HTTP request for content, Leighton's system "determine[s] where in the network [(*e.g.*, internet)] a user is located, and then [directs] the user to a … server 40 that is close-by." EX1007, 9:46-50.

4. Dalby

Dalby (EX1012) was filed on December 1, 1997 and published on December 14, 1999. Dalby is prior art under at least (pre-AIA) 35 U.S.C. § 102(b) and not cited on the face of the '798 Patent. Dalby discloses methods of encoding a

video signal including multiple passes through the encoder. EX1012, Abstract, 4:43-5:27, FIG.3; EX1003, ¶93.

5. SMIL 2.0

Synchronized Multimedia Integration Language 2.0 ("SMIL 2.0") is an XML markup language for streaming presentation of multimedia 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); IPR2024-00044, EX1011 (Wayback Affidavit showing SMIL 2.0 available on November 9, 2001); EX1003, ¶¶91-92. 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 '798 Patent nor did the ALJ consider it in the ITC Investigation. Petitioner notes that during prosecution of the '798 Patent, Applicants submitted an article entitled "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>" and "<switch>" elements or "systemBitrate" teaching three content 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 the "<seq>" element, a client can request and play media elements (*e.g.*, successive temporal portions of a video) sequentially. 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 file versions of the same content with a "systemBitrate," and, depending on the client's bandwidth, only one will be selected. *Id*.

D. Analogous Art

Leaning, Reme, Leighton, Dalby and the '798 Patent are analogous art because all five are directed to systems and techniques to improve performance in streaming systems using multiple copies of a video. EX1001, Title, Abstract, 1:31-34, 3:11-4:34, *with* EX1004, Abstract, 4:3-5:51, 6:50-7:34, FIGs. 1-5; EX1005, Abstract, 2:7-14, 3:11-24, 4:22-5:12; EX1003, ¶¶94-96.

Like the '798 Patent, Leaning and Reme involve 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, 1:34-37, 3:7-4:37, FIGs. 4 and 7, *with* EX1004, Abstract, 6:5-7:5, 8:1-9:8, FIGs. 1-5; EX1005, EX1005, Abstract, 2:7-14, 3:11-24, 4:22-5:12; EX1003, ¶95. Likewise, Dalby is in the field of video-encoding, and has been cited by US5712946A on the subject of recording/reproducing video signals with a plurality of playback speeds. EX1012.

Leaning, Leighton, SMIL 2.0, and the '798 patent are all directed to systems and techniques to improve performance in client-server based streaming over the

internet. EX1001, 6:35-8:15; EX1004, Abstract; EX1006, 104-107 (describing "The SMIL 2.0 Media Object Models," including video files, which SMIL 2.0 enables clients to download using several HTTP links associated with different "temporal subparts" of the video); EX1013, 2:51-56 and 3:33-45 (Disclosing a "network architecture [that] is used to speed-up the delivery of richer Web pages" by servicing clients' HTTP requests with "servers located close to end users."); EX1003, ¶96.

VI. GROUNDS OF REJECTION

A. Ground 1: Claims 1-9 and 11-25 Are Obvious in view of Leaning and Leighton

1. Claim 1

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

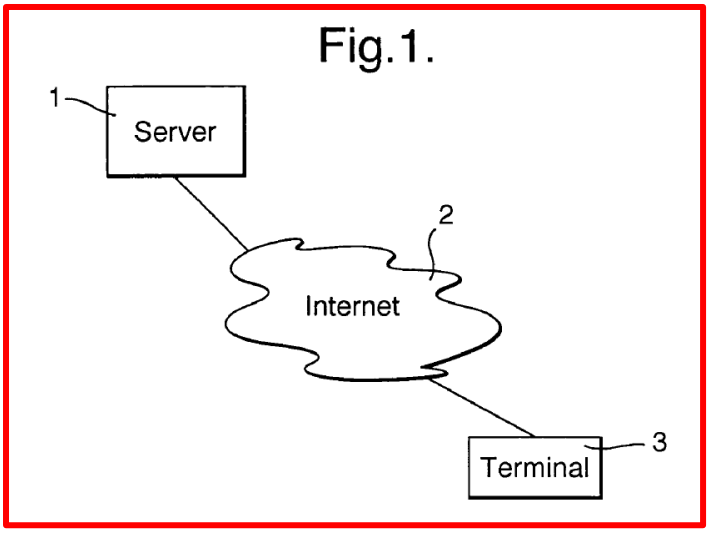
A system for adaptive-rate content streaming: Leaning discloses a "system…[which] has as its object the delivery, to a user, of digitally coded audio signals (for example, of recorded music or speech) via a telecommunications network to a user terminal where the corresponding Sounds are to be played to the user…." EX1004, 2:4-9. Leaning discloses that a "Provision may be made for ***switching between alternative*** sub-file sets representing alternative delivery modes or ***data rates***. EX1004, Abstract. Leaning discloses a "server [which] 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***." EX1004, 5:28-32.

of digital content: Leaning discloses that "the system may be used to convey video signals [or] audio signals." 2:9-10.

playable on one or more end user stations: Leaning discloses that "a user terminal where the corresponding sounds are to be played to the user**.**" EX1004, 2:7-8. "[T]he terminal [] may typically take the form of a conventional desktop computer….If desired, the terminal could take the form of a handheld computer, or even be incorporated into a mobile telephone." EX1004, 3:42-47.

over the Internet: Leaning discloses transmission "via a telecommunications network." EX1004, 2:7; *see also* 2:11-12 ("the network is the ***internet*** or other packet network operating . . ."), 3:50-60 ("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' [] provides the functionality necessary for the playing of audio files in accordance with this embodiment of the invention").



Accordingly, the system in Figure 1 above is a system for adaptive-rate content streaming of live event video playable on one or more end user stations over the Internet. EX1003, ¶¶97-101.

b. 1[A]: "at least one storage device storing digital content,"

Leaning discloses at least one server storing the video. EX1004, 17:12-13 ("video material which is stored on a remote server"); EX1003, ¶¶102-103.

c. 1[B]: "the digital content encoded at a plurality of different bit rates creating a plurality of streams including a first bit rate stream, a second bit rate stream, and a third bit rate stream,"

Leaning discloses that the recording (audio and/or video) is digitally encoded at a plurality of different bitrates (different compression rates) creating a plurality of streams including a first low quality bitrate stream (*e.g.*, 8 or 16 kbit/s), a second medium quality bitrate stream (*e.g.*, 24 kbit/s), and a third high quality bitrate stream

(*e.g.*, 32 kbit/s). Leaning's 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." EX1004, 5:27-48. Leaning applies the same methodology "to the delivery of ***video recordings***…[such that] [t]he manner of partitioning the file into sub-files is unchanged." EX1004, 12:48-60. EX1003, ¶¶104-106.

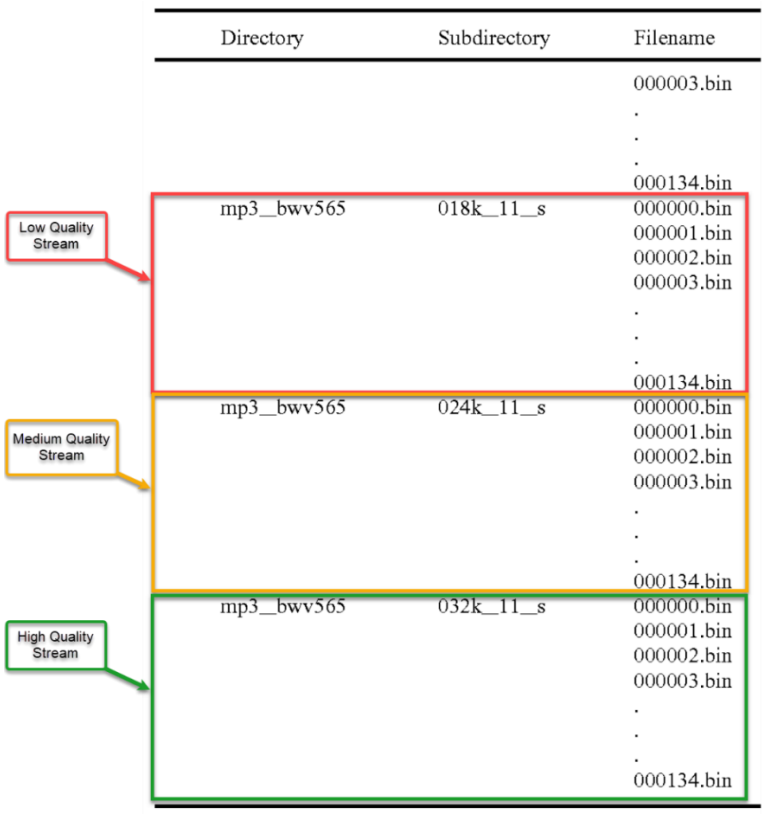
d. 1[C]: "wherein the first bit rate stream, the second bit rate stream, and the third bit rate stream each comprise a group of streamlets encoded at a respective one of the plurality of different bit rates, each group of streamlets comprising at least first and second streamlets, each of the streamlets corresponding to a portion of the digital content;"

The '138 Patent states a "streamlet refers to any sized portion of a portion of the content file" (EX1001, 7:43-44). Similarly, Leaning's "sub-files" are portions of "the original file containing the whole recording." EX1004, 3:13-19; Abstract (content is "divid[ed] [] into a sequence of sub-files").

wherein the first bit rate stream, the second bit rate stream, and the third bit rate stream each comprise a group of streamlets encoded at a respective one of the plurality of different bit rates: Leaning discloses the first bitrate stream (*e.g.*,

8 or 16 kbit/s), the second bitrate stream (*e.g.*, 24 kbit/s), and the third bitrate stream (*e.g.*, 32 kbit/s) each comprise a group of streamlets (subfiles) wherein each streamlet (subfile) in each group of streamlets is encoded at a respective one of the plurality of different bitrates (8, 16, 24, or 32 kbit/s), wherein each group of streamlets comprises at least first (*e.g.*, 000000.bin) and second (*e.g.* 000001.bin) streamlets each corresponding to a portion (temporal portion) of the video. 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***.")

As shown in the annotated excerpt below (EX1004, 6:1-29), Leaning discloses at least a low quality stream encoded at 18kbps ("018k_11_s" (indicated in red)), a medium quality stream encoded at 24kbps ("024k_11_s" (indicated in orange)), and a high quality stream encoded at 32 kbps ("032k_11_s" (indicated in green)).



each group of streamlets comprising at least first and second streamlets, each of the streamlets corresponding to a portion of the digital content: Leaning discloses that each group of streamlets consists of at least two streamlets, each of which corresponding to a portion of the digital content. Leaning discloses "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." EX1004, 1:11-51. Further, "the file ***is divided into smaller files***…of a size corresponding to a fixed playing time, perhaps four seconds….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." EX1004, 2:57-3:10; *see also id.* 5:41-6:27 (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; EX1003, ¶¶107-111.

e. 1[D]: "wherein at least one of the first bit rate stream, the second bit rate stream, and the third bit rate stream is encoded at a bit rate of no less than 600 kbps; and"

As explained above, Leaning teaches two or more streams encoded at different bitrates including one example with at least three streams encoded at 16, 24, and 32 kbit/s, respectively. *See* 1[PRE]-1[C]. Further, Leaning's example bitrates of 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, ¶¶112-116. As described previously, Leaning also teaches that alternative embodiments could include video encodings. EX1004, 2:9-11. Additionally, the '798 Patent admits that content (*e.g.*, video encodings) "may be compressed using ***standard or proprietary encoding schemes***. Examples of encoding schemes capable of use with the present invention include, but are not limited to, DivX, Windows Media Ivdeo, Quicktime Sorenson 3, On2, OGG Vorbis, MP3 or Quicktime 6.5/MPEG-4 encoded content." EX1001, 7:22-27. While Leaning discloses further encoding schemes known to a POSITA at the presumed time of invention, the H.261 and MPEG video coding formats, which Leaning teaches can be used to encode the video streams transmitted as streamlets (*e.g.*, sub-files) to an end user. EX1004, 12:48-54. Further, it was well known in the art to use at least the H.261 video format to stream video content at a bitrate equal to, or greater than, 600 kbps[2]. EX1003, ¶114.

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 1,920 kbps, to enjoy high

[2] To the extent Patent Owner argues that a stream encoded at a bitrate of no less than 600 kbps is not within the ordinary knowledge of a POSITA, ground 2 combines Reme (EX1005) with Leaning for its express teaching of this limitation.

quality viewing. EX1004, 13:42-14:64. (describing a video file ("mpg_name") that is encoded at 96 kbps and at 128 kbps and partitioned into two corresponding sets of sub-files (stored in directories "mpg_name/096k_x1/" and "mpg_name/0128k_x1/", respectively)); EX1003, ¶115.

A POSITA would have been motivated to encode a video embodiment of Leaning (including the corresponding sets of sub-files) into each of a low quality, medium quality, and high quality level bitrate stream (low at 30 kbps, medium at 300 kbps, and high at 1,920 kbps), using the H.261 video codec disclosed by Leaning, 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 1,920 kbps and enjoy higher resolution viewing and a better user experience. EX1003, ¶116. A POSITA would have had a reasonable expectation of success with such an embodiment of Leaning's disclosure because Leaning expressly teaches the use of the H.261 video codec, which was known to support bitrates of up to 1,920 kbps at the presumed time of invention and because simply encoding one of the video streams at a particular bitrate, such as the 1,920 kbps of the H.261 video format, would have been a simple and straightforward implementation of Leaning's teachings for a POSITA to make when switching from the audio to video embodiments of Leaning. EX1003, ¶ 116.

f. 1[E] "wherein the first streamlet of each of the groups

> **of streamlets has the same first duration and encodes the same first temporal portion of the digital content in each of the first bit rate stream, the second bit rate stream, and the third bit rate stream, and wherein the first streamlet of the first bit rate stream encodes the same first temporal portion of the digital content at a different bit rate than the first streamlet of the second bit rate stream and the first streamlet of the third bit rate stream."**

Leaning further discloses that the first streamlet (subfile such as 000000.bin) of each of the groups (different sets of encoded subfiles) of streamlets has the same (or equal) first duration (of four seconds) and encodes the same first temporal portion of the digital content (audio and/or video) in each of the first, second, and third bit rate streams (8, 16, 24, 32, kbit/s), and wherein the first streamlet of the first bitrate stream (*e.g.*, subfile 000000.bin in16 kbit/s) encodes the same first temporal portion of the digital content at a different bitrate than the first streamlet of the second bitrate stream (*e.g.*, subfile 000000.bin in 24 kbit/s) and the first streamlet of the third bitrate stream (*e.g.*, subfile 000000.bin in32 kbit/s). *See* 1[B]-1[C]; EX1004, Abstract; EX1003, ¶¶117-122.

Leaning "***prefer[s] that each of these smaller files is of a size corresponding to a fixed playing time, perhaps four seconds***" such that, for example, a "file of 9 minutes duration would be ***divided into 135 smaller files each representing four seconds' playing time***". EX1004, 2:58-64.

Directory	Subdirectory	Filename
mpg_name	096k_x1	000000.bin 000001.bin . . . 000134.bin
	096k_x5	000000.bin . . . 000134.bin

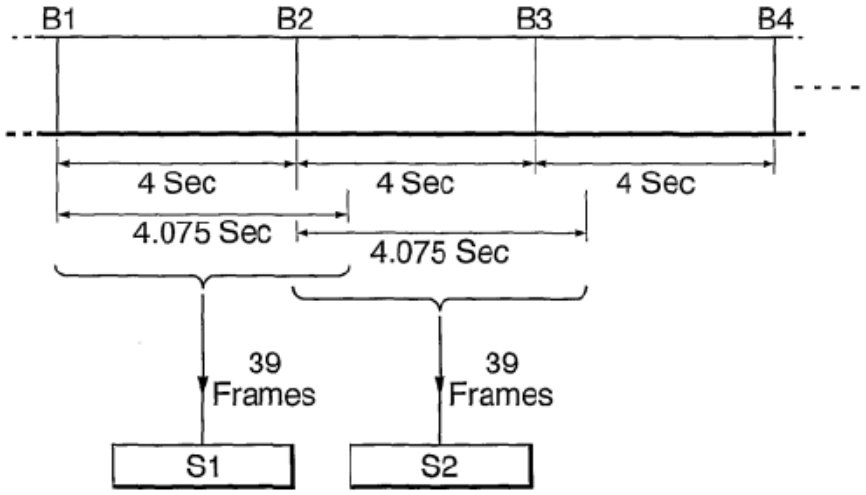
Id., 13:50-60. Indeed, each of the ".bin" files created from that file would correspond to a fixed playing time and an order in the sequence indicated by the file names of the sub-files. 2:57-3:19 (The sub-files "are given file names … indicative of their sequence in the original file, for example: ***000000***.bin ***000001***.bin ***000002***.bin" and so on.). Accordingly, for a video file encoded and partitioned into several streamlets of sub-files, each streamlet at a different bitrate, the first sub-file (***000000***.bin) in each of the sets of sub-files represents the same ***fixed playing time*** (e.g., the first four seconds) of the original video file.

Additionally, to facilitate 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***." EX1004, 9:64-10:4. Leaning again teaches that "***every sub-file*** [be configured to] represent the ***same*** fixed time period," describing it as "the most convenient" way to provide sub-file boundaries [that] are the same for each rate." EX1004, 9:64-10:4.

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, 5:55-6:29 (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.



2. Claim 2

a. 2[A]: "The system of claim 1, further comprising: a plurality of servers located at different locations across the Internet, each server configured to:"

Leaning in view of Leighton teaches the limitation of Claim 2. Leaning discloses at least a first web server. EX1004, 2:40-49 (explaining that the server of Leaning is "merely an ordinary 'web server'"), 3:19-4:3 (describing loading subfiles "onto a web server"); EX1003, ¶¶123-131.

To the extent it is argued that Leaning only teaches a single web server containing the subfiles, Leighton's network architecture includes a plurality of web servers, which "supports hosting and content distribution on a truly global scale." Ex 1013, Abstract.

It would have been obvious to combine the network architecture in Leighton, which includes a plurality of web servers, with the streaming system of Leaning. EX1003, ¶¶127-131. A POSITA would have been motivated to provide multiple web servers, as taught by Leighton, 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, ¶¶127-131. 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. 2[B]: "receive at least one streamlet request over one or more network connections from one or more end user stations to retrieve the first streamlet storing a portion of the digital content, 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 first bit rate stream, the second bit rate stream, and the third bit rate stream based upon a determination by the end user station to select a higher or lower bit rate copy of the streams;"

receive at least one streamlet request over one or more network connections from one or more end user stations to retrieve the first streamlet storing a portion of the digital content: Leaning teaches that the conventional web servers are each configured to receive at least one streamlet (sub-file) 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 (sub-file) storing a portion of the video. EX1004, Abstract ("Delivery of recorded audio or video material over a telecommunications link from a server [to a terminal] 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 or data rates."), 1:28-19 ("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."), 2:23-26 ("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."), 4:27-5:10 ("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.").

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 first bit rate stream, the second bit rate stream, and the third bit rate stream

based upon a determination by the end user station to select a higher or lower bit rate copy of the streams: Leaning further teaches that the at least one streamlet (sub-file) 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* 1b; EX1004, Abstract, 5:28-6:32 (describing creating sub-file sets at different bitrates to be requested by a terminal), 6:50-7:34 ("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."), Claim 1 (17:12-30) ("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 . . ."), Claim 9 (18:27-35) ("monitoring the received data rate at the second station; and 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."), Claim 8 (18:10-26) ("storing a plurality of sets of files, which sets correspond to respective different delivery modes, and including, at the second station, 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."), Claim 10 (18:36-45) ("monitoring the received data rate at the second station; and 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, ¶¶132-134.

c. 2[C] "retrieve from the at least one storage device the requested first streamlet from the currently selected one of the first bit rate stream, the second bit rate stream, and the third bit rate stream; and"

Leaning discloses that the web server(s) retrieve from at least one storage device the requested first streamlet (subfile) from the currently selected one of the first, second, and third bitrate stream. *See* 2[B]; EX1004, 2:23- 26 ("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, ¶¶135-136.

d. 2[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 discloses that the server sends the retrieved first streamlet (subfile) from the currently selected one of the different copies to the requesting one of the end user stations (terminals) over the one or more network (Internet) connections. *See* 2[B]-2[C]; EX1004, 2:23-26 ("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, ¶¶137-138.

3. Claim 3: "The system of claim 2, 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 digital content in the first bit rate stream, the second bit rate stream, and the third bit rate stream, the second streamlet of the first bit rate stream having the same

bit rate as the first streamlet of the first bit rate stream."

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 encodes the same second portion of the digital content in the first, second, and third bit rate stream. *See* 1[E]. Further, Leaning discloses that the second streamlet (subfile; *e.g.*, 000001.bin) of the first bitrate stream has the same bitrate as the first streamlet (subfile; *e.g.*, 000000.bin) of the first bitrate stream because every subfile in each quality level has the same (continuous) bitrate. EX1004, 5:28-29 ("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"), 5:43-48 ("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, ¶¶139-141.

4. Claim 4: "The system of claim 3, wherein the first and second durations are different."

Leaning further discloses that, while it is preferred that all subfiles are the same duration (*e.g.*, four 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, 10:1-4) and teaches that each subfile "can be a fixed number of bits, or a fixed playing time length (or neither of these)" (*id.*, 9:57-59). 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, ¶¶142-143.

5. Claim 5:

a. 5[A]

Leaning teaches the limitation of 5[A]. *See* 2[A]; EX1003, ¶144.

b. 5[B]

Leaning teaches the limitation of 5[B]. *See* 1[E] and 2[B]; EX1003, ¶145.

c. 5[C]

Leaning teaches the limitation of 5[C]. *See* claim 2[C]; EX1003, ¶146.

d. 5[D]

Leaning teaches the limitation of 5[D]. *See* claim 2[D]; EX1003, ¶147.

6. Claim 6: "The system of claim 5, wherein the digital content comprises a live event video of a live event, and the first streamlets of the first bit rate stream, the second bit rate stream, and the third bit rate stream are available before the

live event is complete."

Leaning discloses that the digital content can be a live event video of a live event, and the first streamlets (first subfiles) of the first bit rate stream, the second bit rate stream, and the third bit rate stream are available before the live event is complete (encoded on the fly) and presented as live. EX1004, 6:46-47 ("'Mode' indicates 'recorded' (as here) or '***live***' (to be discussed below)."), 14:65-15:22 ("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."); EX1003, ¶¶148-149.

7. Claim 7: "The system of claim 6, wherein the streamlets from the first bit rate stream, the second bit rate stream, and the third bit rate stream of the live event, when played back, are

presented in a live stream to a viewer."

Leaning teaches the limitation of claim 7. *See* claim 6; EX1003, ¶¶150-152. Leaning discloses a live stream, or live feed. EX 1004, 14:65-15:22 ("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.")

Leaning further discloses methods for ensuring that "the playing operation [does not] run[] slightly faster or slower than the recording operation"—in other words, that the recording and playing feed are simultaneous, synchronous, live. *See id*. 16:64-17:10.

8. Claim 8: "The system of claim 7, wherein the first server is further configured to: receive at least one virtual timeline request over the one or more network 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 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 network (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. EX1004, 3:38-41 ("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***."), 4:3-22 ("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."), 7:40-8:65 (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***"); EX1003, ¶¶153-157.

A POSITA would have understood, in light of the specification of the '798 Patent, that a "virtual timeline" may comprise a file (such as Leaning's "menu.htm") configured to present a playlist to the end user that is sent by the server to a client device (*e.g.*, an end user station). *See* EX1001, 12:34-40 ("In one embodiment, the virtual timeline 600 comprises at least one quantum media extension 602. The quantum media extension (hereinafter 'QMX') 602 describes an entire content file 200. Therefore, the virtual timeline (hereinafter 'VT') 600 may comprise a file that is configured to define a playlist for a user to view."); EX1003, ¶155.

Additionally, Leaning teaches use of a second "virtual timeline," referred to as an "index file," that "provide[s] a list of the data rates that are available" and the sequentially-named files that correspond to each data rate. EX1004, 5:49-6:29. Leaning's index file, therefore, is also a "virtual timeline" because it is a content file that is configured to define a playlist for a user to view. EX1003, ¶156.

Leaning discloses that the end user device's player program requests from the server "the index file, and stores locally a list of available data rates for future reference[,]" which allows it to "begin[] to request" sub-files encoded a particular data rate and play them out automatically and sequentially. EX1004, 6:30-58. Leaning further describes arranging the streamlets (sub-files) requested from the server using the virtual timeline (*e.g.*, the "menu.htm" and/or "index file") because Leaning describes arranging the sub-files for playback in sequential order. *See* EX1004, Abstract ("Delivery of recorded audio or video material over a telecommunications link from a server 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."), 5:14-16 ("The sub-file naming convention used here, of a simple fixed length ***sequence of numbers*** starting with zero, is preferred as it is simple to implement"); EX1003, ¶157.

9. Claim 9: "The system of claim 1, further comprising: an encoding module configured to receive the digital content and encode the streamlets of the first bit rate."

Leaning discloses an encoding module configured to receive the digital content and encode the streamlets of the first bit rate. EX1004, 5:41-44 ("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***."), 11:42-43 ("easily

solved by ***encoding each sub-file separately***, as if it were a single recording"); EX1003, ¶158-159.

10. Claim 11:

a. 11[Pre]: "An end user station comprising:"

Leaning discloses an end user station (terminal 3). *See* 1[Pre]; EX1003, ¶¶160-161.

b. 11[A]: "a processor;"

Leaning discloses a processor at terminals 3. EX1004 3:47-51 ("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, and audio interface ('sound card') 36. For video delivery, a video card would be fitted in place of, or in addition to, the card 36."), FIG. 2 (showing CPU 30 on user terminals); EX1003, ¶¶162-163.

c. 11[B]: "a digital processing apparatus memory device comprising non-transitory machine-readable instructions that, when executed, cause the processor to:"

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 presentation information. EX1004, 3:47-60 ("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, ¶¶164-165.

d. 11[C][1]: "establish one or more network connections between the end user station and at least one server,"

Leaning discloses establishing one or more network (Internet) connections between the end user station (terminal 3) and the server (server 1). EX1004, 2:21-22 ("server 1 is connected via the internet 2 to user terminals 3"), 3:47-49 ("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, ¶¶166-167.

e. 11[C][2]: "wherein the at least one server is configured to access at least one of a plurality of groups of streamlets of digital content;"

Leaning discloses that the server is configured to access at least one of a plurality of groups (sets) of streamlets (subfiles) of the digital content. *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, ¶¶168-169.

f. 11[C][3]

Leaning teaches the limitation of 11[C][3]. *See* 1[B]; EX1003, ¶170.

g. 11[C][4]

Leaning teaches the limitation of 11[C][4]. *See* 1[C]; EX1003, ¶171.

h. 11[C][5]

Leaning teaches the limitation of 11[C][5]. *See* 1[D]; EX1003, ¶172.

i. 11[C][6]

Leaning teaches the limitation of 11[C][6]. *See* 1[E]; EX1003, ¶173.

j. 11[D]: "determine whether to select a higher or lower bit rate copy of the stream and based on that determination, select a specific one of the first bit rate stream, the second bit rate stream, and the third bit rate stream;"

Leaning further discloses determining whether to select a higher or lower bit rate copy of the stream and based on that determination, selecting a specific one of the first bit rate stream, the second bit rate stream, and the third bit rate stream. *See* 2[B]; EX1004, Abstract, 5:28-5:51 (describing creating subfile sets at different bitrates for a requesting terminal), 6:50-7:34 ("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 8 (18:23-26) ("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"), 9

(18:31-35) ("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 (18:40-45) ("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, ¶¶174-175.

k. 11[E]: "place a first streamlet request to the at least one server over the one or more network connections for the first streamlet of the selected stream;"

Leaning discloses placing a first streamlet (subfile) request to the server over the one or more network (Internet) connections for the first streamlet of the selected stream. *See* 2[B], 11[D]; EX1004, 4:28-5:10 ("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, ¶¶176-177.

l. 11[F]: "receive the requested first streamlet from the at least one server via the one or more network connections; and provide the received first streamlet for output of the digital content to a presentation device."

Leaning discloses receiving the requested first streamlet from the server via the one or more network (Internet) connections and providing the received first streamlet for playback of the video to a presentation device. EX1004, 1:50-51 ("receiving the files; and decoding the files for replay of the material"), Claim 1; EX1003, ¶¶178-179.

11. Claim 12:

a. 12[A]

Leaning teaches the limitation of 12[A]. *See* 11[Pre], 11[B]; EX1003, ¶180.

b. 12[B]: "place a second streamlet request to the at least one server over the one or more network connections for the second streamlet of the selected stream;"

Leaning discloses placing a second streamlet (subfile) request to the at least one server over the one or more network connections for the second streamlet of the selected stream. *See* 11[E]; EX1004, 4:57-59 ("The player program increments the

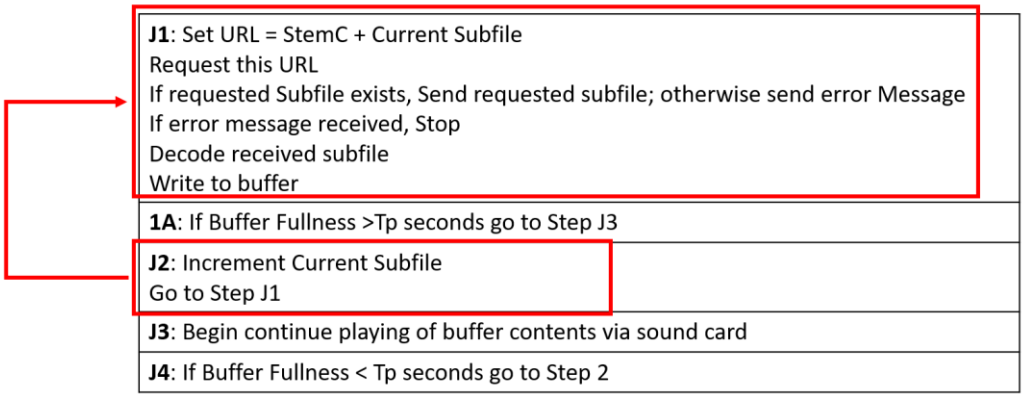
filename to 000001.bin and requests, receives, decodes and stores this second sub-file as described in (4) and (5) above."); EX1003, ¶¶181-182.

c. 12[C]: "receive the requested second streamlet from the at least one server via the one or more network connections; and"

Leaning discloses receiving the requested second streamlet from the at least one server via the one or more network connections. *See* 11[F]; EX1004, 4:57-59 ("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."); EX1003, ¶¶183-184.

d. 12[D]: "arrange the first streamlet and second streamlet in order of ascending presentation time for output of the digital content to the presentation device."

Leaning teaches the limitation of 12[D]. Leaning discloses arranging the first streamlet and second streamlet in order of ascending presentation time for output of the digital content to the presentation device. EX1004, 4:57-59 ("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.").

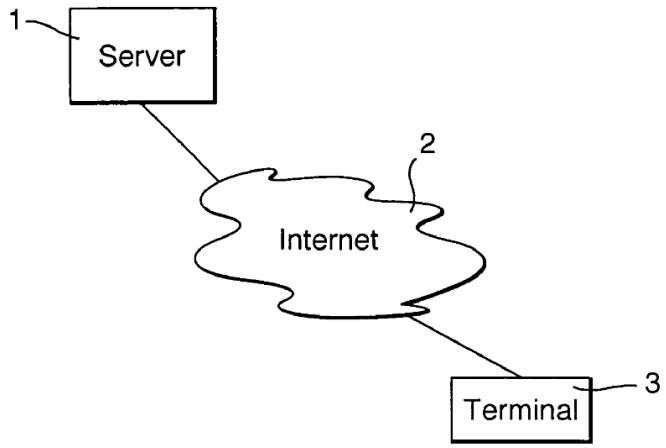


EX1004, 8:15-8:32 (excerpt of flowchart reformatted for clarity, annotated to show incrementing subfile, requesting, writing the received subfile to buffer, and repeating until end—thus arranging first, second, and further subfiles according to ascending presentation time); EX1003, ¶¶185-186.

12. Claim 13: "The end user station of claim 11, wherein at least some streamlets are requested from the at least one server via a hypertext transfer protocol (HTTP) GET request."

Leaning teaches that the client requests may be made by transmitting HTTP GET requests. EX1003, ¶¶187-192. Leaning discloses that server 1, as represented in the below Fig. 1, "receive[s] 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" and "the network is the internet or other packet network operating in accordance with the Hypertext Transfer Protocol" (HTTP). EX1004, 2:11-13, 2:23-27.

Fig.1.



Leaning further discloses that the player program requests subfiles from the conventional web server using "the Hypertext Transfer Protocol" and cites to RCFs for HTTP 1.0 and HTTP 1.1 protocols. EX1004, 2:5-35. Leaning also provides a request example of "http://www.server1.com/mp3_bwv565/000003.bin where 'www.serverl.com' is the URL of the server 1" which requests file "000003.bin" stored on server 1 by its URL. EX1004, 3:28-31; EX1003, ¶189.

It was known to a POSITA that the only way to request and receive the "000003.bin" file using HTTP in the example provided was by a request-URI (*i.e.*, "http://www.server1.com/mp3_bwv565/000003.bin" URL) to the server via an "HTTP GET" request. EX1003, ¶190. A POSITA considering the disclosures of Leaning (*i.e.*, operating via HTTP between a client and an ordinary web server to

request and receive files) would have understood that HTTP required ordinary web servers to support HTTP GET requests and thus would have understood Leaning's disclosure of a terminal using HTTP to request subfiles from a server to include teaching the use of HTTP GET requests. EX1003, ¶190; EX1011, 5.11 ("The methods GET and HEAD MUST be supported by all general-purpose servers").

It was known to a POSITA that HTTP requests made via providing a URL for items on a server are commonly made by a client transmitting "HTTP GET" requests. *See* EX1011, 9.3 (HTTP 1.1 protocol describing "GET" as the means by which to "retrieve whatever information (in the form of an entity) is identified by the Request-URI"); EX1003, ¶191. In fact, the '798 Patent itself admits that HTTP GET requests were "standard." EX1001, 14:14-15. A Request-URI stands for Request-Uniform Resource Identifier and "Uniform Resource Identifiers are simply formatted strings which identify—via name, location, or any other characteristic—a resource" (EX1011, 3.2) such that an HTTP GET request is "used to identify a resource on an origin server or gateway" (EX1011, 5.1.2). Thus, a POSITA would have understood the above teachings from Leaning to teach that the player program makes HTTP GET requests for each sequential subfile. EX1003, ¶191.

Further, to the extent it is deemed necessary, a POSITA would have been motivated to modify Leaning to make its requests for subfiles from servers via standard HTTP GET requests because GET requests are identified in the HTTP

protocol, and thus the only solution for requesting files from a server with a reasonable expectation of success. EX1011, 9.3; EX1003, ¶192. There also would have been a reasonable expectation of success because HTTP was a universally known and used protocol and GET requests are a standard method within that protocol for requesting files from a server. EX1003, ¶192.

13. Claim 14: "The end user station of claim 11, wherein the at least one server comprises at least two servers and wherein at least one streamlet is requested from a first server of the at least one server and at least one other streamlet is requested from a second server of the at least one server other than the first server."

As described above regarding 2[A], a POSITA would have been motivated to modify Leaning in view of Leighton to provide two or more servers, each of which having the same sets of requestable subfiles, 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. *See* 2[A]. Therefore, Leaning, as modified by Leighton above, teaches at least one streamlet (subfile) may be requested from a first server of the at least one server and at least one other streamlet (subfile) may be requested from a second server of the at least one server other than the first server because each server has the same set of requestable subfiles. EX1003, ¶¶193-197. Further, a POSITA would have understood that in certain instances after a client has requested a streamlet from a first server, the network connection between the first

server and the client may be congested, or the first server may fail or otherwise become unavailable, such that the next streamlet would be requested from the second server.

14. Claim 15: "The end user station of claim 11, wherein each of the streamlets is requestable by the processor without regard to whether the processor has previously requested other streamlets of the digital content."

A POSITA would have understood that each streamlet is requestable without regard to whether the processor has previously requested other streamlets, because Leaning discloses the ability to view the digital content as a live event during which an end user may begin watching after the live event starts and thus begin requesting subfiles that are not the initial subfiles of the video presentation without first requesting those initial subfiles. EX1004, 6:46-47 ("'Mode' indicates 'recorded' (as here) or '***live***' (to be discussed below)."), 14:65-15:22 ("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."); EX1003, ¶¶198-199.

15. Claim 16: "The end user station of claim 11, wherein at least a plurality of streamlets are separate files stored by the at least one server."

Leaning teaches the limitation of claim 16. Leaning discloses wherein at least a plurality of streamlets (subfiles) are separate files stored by the at least one server. *See* 1[A]; EX1004, 3:15-19 ("The expression 'sub-files' is used here to distinguish them from the original file containing the whole recording: it should however be emphasised [sic] that, as far as the server is concerned, ***each 'sub-file' is just a file like any other file***."); EX1003, ¶¶200-201.

16. Claim 17:

a. 17[A]

Leaning teaches the limitation of 17[A]. *See* 11[B] and 12[A]; EX1003, ¶202.

b. 17[B]: "place a second streamlet request to the at least one server over the one or more network connections for a second streamlet of a different bit rate stream, wherein the different bit rate stream comprises a different stream than the selected stream;"

Leaning discloses placing a second streamlet (subfile) request to the at least one server over the one or more network connections for a second streamlet (subfile) of a different bit rate, wherein the different bit rate stream comprises a different

stream than the selected stream. *See* 11[E] and 12[B]; EX1004, 14:43-57 ("Exactly the same process could be used ***for rate-switching***…. The request series would then look like: mpg_name/***096k_xl/000099.****bin*.mpg_ name/096/***128_xl/000100.bin.***mpg_ name/128k_xl/000101.bin"). EX1003, ¶¶203-204.

c. 17[C]

Leaning teaches the limitation of 17[C]. *See* 11[F] and 12[C]; EX1003, ¶205.

d. 17[D]: "arrange the first streamlet and second streamlet in order of ascending presentation time for output of the digital content to the presentation device."

Leaning teaches the limitation of 17[D]. *See* 12[D]; EX1003, ¶206.

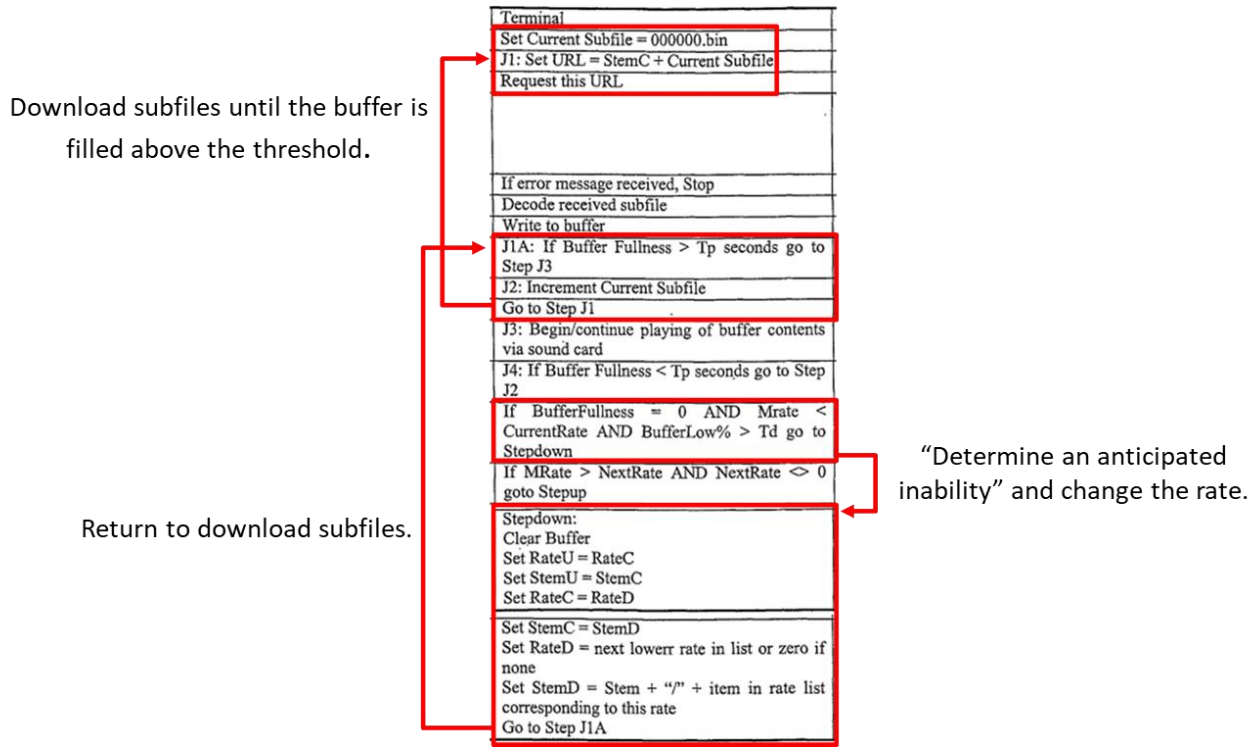
17. Claim 18:

a. 18[A]

Leaning teaches the limitation of 18[A]. *See* 11[B] and 12[A]; EX1003, ¶207.

b. 18[B]: "determine an anticipated inability to receive the digital content at the second bit rate of the second bit rate stream at a rate sufficient for presenting the digital content as the digital content is received, and in response to the determining the anticipated inability, requesting a third streamlet of the first bit rate stream, the third streamlet immediately subsequently adjacent to the second streamlet of the digital content during presentation."

Leaning discloses determining an anticipated inability to receive the digital content at the second bit rate of the second bit rate stream at a rate sufficient for presenting the digital content as the digital content is received, and in response to the determining the anticipated inability, requesting a third streamlet (subfile) of the first bit rate stream, the third streamlet immediately subsequently adjacent to the second streamlet of the digital content during presentation. For example, Leaning discloses selecting a third streamlet (subfile) of the next immediately adjacent subfile upon iteration at a lower (or first) bitrate due to a determination to "stepdown." *See* 11[D]; EX1004, 6:50-7:34 ("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. . . . ***player program measures the actual data rate*** being received from the server . . . . ***the next request*** to the server becomes a request for the higher (or ***lower***) rate, and the ***sub-file from the new directory is received***, decoded and entered into the buffer.").



EX1004, 10-11 (excerpt of flowchart reformatted for clarity, annotated to show iterating subfile and stepping down rate for next request), 9:65-10:1 ("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***."), 11:61-12:2 ("Recollecting that the criteria discussed earlier for automatic data rate switching downwards envisaged a rate reduction only in cases of buffer underflow (involving therefore interruptions in the output), we note that with this modification ***such interruption can be avoided and therefore it is preferable to employ a criterion which anticipates underflow*** and avoids it in the majority of cases. In this case ***the first of the three AND***

conditions mentioned above (namely, that the buffer is empty) would be omitted.");

EX1003, ¶¶208-215.

18. Claim 19

Leaning teaches the limitation of claim 19. *See* claim 3; EX1003, ¶216.

19. Claim 20: "The end user station of claim 12, wherein the streamlets of the first bit rate stream, the second bit rate stream, and the third bit rate stream of the live event are available on a ten second delay."

Leaning discloses that the subfiles of each bitrate stream of the live event are available on a ten second delay. *See* claim 15; EX1004, 3:60-63 ("Also shown is a region 39 of the memory 31 which is allocated as a buffer. This is a decoded audio buffer containing data waiting to be played (typically the playout time of the buffer might be 10 seconds"); 15:17-22 ("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."); EX1003, ¶¶217-222.

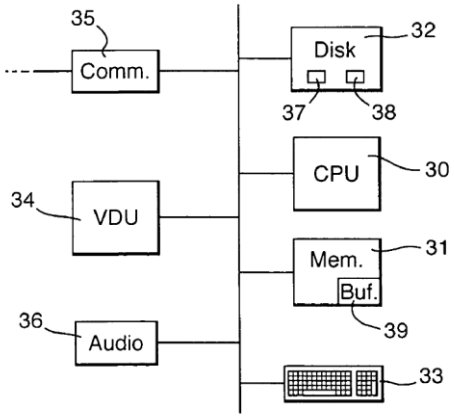
A POSITA would have understood that such an inherent delay to include a ten second delay—which is enough time to generate and load onto the server at least two subfiles. *Id.* To the extent it is argued that an inherent delay does not include a ten second delay, it would have been obvious to a POSITA to include at least a ten

second delay to provide enough time to generate and load onto the server at least two subfiles to ensure playback of live feeds. *Id*.

20. Claim 21: "The end user station of claim 12, wherein the processor providing the first received streamlet for playback comprises outputting the first streamlet to a presentation device connected to the end user station."

Leaning discloses wherein the processor providing the first received streamlet for playback comprises outputting the first streamlet to a presentation device (video display 34) as a component of the end user station (terminal). EX1004, 3:47-49, FIG. 2; EX1003, ¶¶223-224.

Fig.2.



21. Claim 22:

a. 22[Pre]

Leaning teaches the limitation of 22[Pre]. *See* 1[Pre]; EX1003, ¶225.

b. 22[A]

Leaning teaches the limitation of 22[A]. *See* 1[A]-1[B]; EX1003, ¶226.

c. 22[B]

Leaning teaches the limitation of 22[B]. *See* 1[C]; EX1003, ¶227.

d. 22[C]

Leaning teaches the limitation of 22[C]. *See* 1[D]; EX1003, ¶228.

e. 22[D]

Leaning teaches the limitation of 22[D]. *See* 1[E]; EX1003, ¶229.

f. 22[E]

Leaning teaches the limitation of 22[E]. *See* 1[E]; 2[B]; EX1003, ¶230.

g. 22[F]

Leaning teaches the limitation of 22[F]. *See* 2[B]; EX1003, ¶231.

h. 22[G]

Leaning teaches the limitation of 22[G]. *See* 2[C]; EX1003, ¶232.

i. 22[H]

Leaning teaches the limitation of 22[H]. *See* 2[D]; EX1003, ¶233.

22. Claim 23

Leaning teaches the limitation of 23. *See* 19; EX1003, ¶234.

23. Claim 24

Leaning teaches the limitation of 24. *See* 4; EX1003, ¶235.

24. Claim 25

Leaning teaches the limitation of 25. *See* 6; EX1003, ¶236.

B. <u>Ground 2</u>: Claims 1-9 and 11-25 Are Obvious in View of Leaning,

Leighton, and Reme

The sections of Ground 1 (Section IV.A) are incorporated into this section by reference.

1. Claim 1[D]

a. 1[D]: "wherein at least one of the first bit rate stream, the second bit rate stream, and the third bit rate stream is encoded at a bit rate of no less than 600 kbps; and"

As explained in Ground 1, Leaning alone renders obvious this limitation. *See* Section IV.A. But to the extent Leaning does not render obvious a stream encoded at a bitrate of no less than 600 kbps, Leaning in view of Reme renders obvious this limitation. EX1003, ¶¶237-242. Reme teaches that it was known to encode video content into at least three different quality levels (or bitrates) for streaming, for example at 30 kbps, at 300 kbps, and at 5Mbps, in order to allow streaming to various clients with different network conditions. For example, Reme proposes "a plurality of pre-encoded versions of the [video] content, each version corresponding to a different encoding rate (and hence to a different quality)." EX1005, 3:15-17. Indeed, Reme explains that "Internet streaming applications should be quality adaptive" and that "streaming applications should adjust the quality of the delivered stream such that the bandwidth required for transmitting the stream ***matches*** the available bandwidth." EX1005, 3:11-14. To achieve this, Reme proposes that streaming

clients "switch among [the] plurality of pre-encoded versions of the content" each with a different encoding rate (***bit rate***) or quality level." EX1005, 3:15-17.

	Version $V_{i,1}$ (encoding rate 30kbps)	Version $V_{i,2}$ (encoding rate 300kbps)	Version $V_{i,3}$ (encoding rate 5Mbps)

EX1004, 5:1-4 (annotated).

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 30 kbps, medium at 300 kbps, and high at 5 Mbps), as taught by Reme, 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 5 Mbps and enjoy higher resolution viewing. EX1003, ¶242. A POSITA would have had a reasonable expectation of success with such a combination because both Leaning and Reme 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 5 Mbps taught by Reme, would have been a simple and straightforward modification for a POSITA. EX1003, ¶242.

C. Ground 3: Claims 1-9 and 11-25 Are Obvious in View of Leaning, Leighton, and SMIL 2.0

The sections of Ground 1 (Section IV.A) are incorporated into this section by reference.

1. Claim 8

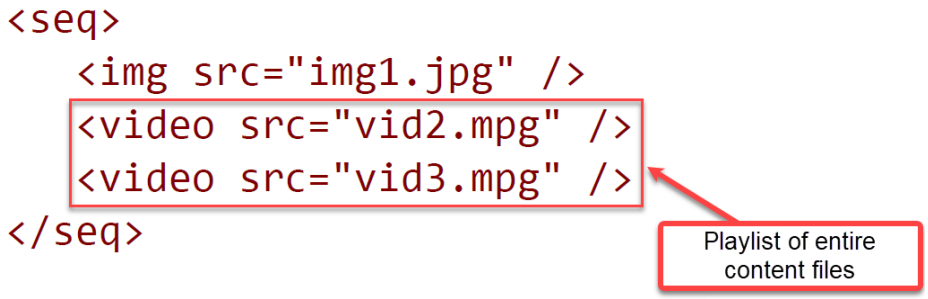
Leaning teaches the limitation of claim 8. However, to the extent it is determined that Leaning does not teach a "virtual timeline" in the form of "a playlist of entire content files" wherein each content file is played automatically one after the other, SMIL 2.0 teaches such limitations. EX1003, ¶¶243-249.

It would have been obvious for a POSITA to incorporate SMIL 2.0's teachings into the combination of Leaning and Leighton: the use of certain web elements (*e.g.*, the <seq> container) to "define[] a sequence of elements [(*e.g.*, videos)] in which elements play one after the other". SMIL 2.0's defined sequence of elements that successively play is a "virtual timeline," according to the plain and ordinary meaning of that term and how it is used in the '798 patent. *See* EX1001, ("the virtual timeline (hereinafter 'VT') 600 may comprise a file that is configured to define a playlist for a user to view").

A POSITA would have been motivated to incorporate SMIL 2.0's teaching of a virtual timeline with the combination of Leaning's streaming system. EX1003, ¶247. The system in Leaning is already in the streaming context and expressly

discloses switching between different versions of streams based on the bitrate, or desired quality, and one or more network characteristics. EX1004, Abstract. A POSITA would have been motivated to further improve Leaning by applying SMIL 2.0's teachings regarding the use of a virtual timeline to control the playback of one or more media files.

SMIL 2.0 expressly teaches generating a playlist of entire content files – for example, the "vid2.mpg" file is followed by the "vid3.mpg" file using the "<seq>" element:



EX1006, 207, 158 (the seq container, shown by the <seq> and </seq> tags, "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 in Leaning of entire content files (*e.g.*, the .bin files streamed to the client in Leaning's system) that play one after the other, as taught by SMIL 2.0 (*e.g.*, using the <seq> element, shown above), in order to set out a video schedule of similar videos for clients to view in succession. EX1003, ¶248. 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, ¶249.

D. Ground 4: Claims 1-25 Are Obvious in View of Leaning, Leighton, and Dalby

The sections of Ground 1 (Section IV.A) are incorporated into this section by reference.

1. Claim 10: "The system of claim 9, wherein the encoding module is configured to encode the streamlets of the multiple copies of the digital content in each of the different bit rates using a multi-pass encoding process."

Leaning in view of Dalby teaches the limitation of claim 10. EX1003, ¶¶250-253. In fact, on its face, Leaning directs to teachings from Dalby regarding video encoding to teach that the encoding module is configured to encode the streamlets (subfiles) of the multiple copies of the digital content in each of the different bit rates. EX1004, 13:34-14:42 (pointing to "using the principle described in our [Dalby] patent" to solve problems with rate switching when video compression uses interframe techniques). Dalby teaches interframe encoding wherein "encoding of a video signal requires several passes through the encoder." EX1021, 4:43-49.

A POSITA would have been motivated to combine the teachings of multi-pass encoding from Dalby with the video encoding of streamlets in Leaning because

Leaning explicitly directs a POSITA to Dalby to solve issues with rate-switching videos that have interframe encoding. EX1003, ¶253. A POSITA would have had a reasonable expectation of success with such a modification because Leaning directs a POSITA to Dalby as a solution using video encoding techniques. *Id.*

VII. SECONDARY CONSIDERATIONS DO NOT SUPPORT A CONCLUSION OF NON-OBVIOUSNESS

The Patent Owner cannot show any nexus to the claim language. The '798 Patent was asserted in the ITC Investigation and 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. The ALJ found that DISH's expert demonstrated that Move's success is tied to the supposedly unique features 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." EX1009, 213.

However, because Leaning discloses those same features, the secondary factors, such as commercial success, "are irrelevant." *Magseis FF LLC v. Seabed*

Geosolutions (US) Inc., 860 F. App'x 746, 752 (Fed. Cir. 2021) (citing O*rmco Corp. v. Align Technology, Inc.*, 463 F.3d 1299, 1312 (Fed. Cir. 2006)). Indeed, these characteristics cannot support a nexus to the claim language "because the evidence of secondary considerations is not tied to the claimed invention's ***unique*** characteristics." *Magseis*, 860 F. App'x at 752 (emphasis added) (quoting *Ormco*, 463 F.3d at 1312 ("[I]f the feature that creates the commercial success was known in the prior art, the success is not pertinent."). Accordingly, the purportedly unique and successful aspects of the Move system 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 non-obviousness 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).

Accordingly, the secondary considerations relied upon by DISH in previous proceedings cannot support a finding of non-obviousness in light of the features disclosed in Leaning. EX1003, ¶¶254-256.

VIII. FINITIV

The Board balances six factors in considering discretionary denial under 35 U.S.C. § 314(a) when parallel litigation exists. *Apple Inc. v. Fintiv, Inc.*, IPR2020-

00019, Paper 11 (PTAB Mar. 20, 2020) (precedential). Here, the factors ("*Fintiv* factors") favor institution.

Factor 1—potential stay of the district court litigation—is neutral because no party has requested a stay. *VMWare, Inc. v. Intellectual Ventures I LLC*, IPR2020-00470, Paper 13 (P.T.A.B. Aug. 18, 2020), at 17 (finding in the absence of a stay motion that this factor "does not weigh for or against discretionary denial").

Factor 2—district court trial date and the Board's statutory deadline—weighs heavily against discretionary denial. No trial date is yet scheduled for ***any*** of the district court litigations. Accordingly, the earliest estimated trial date for each and all of the district court litigations is far in the future and is likely to occur years after the estimated date for the Board's Final Written Decision.

Factor 3—investment in the district court proceedings—weighs heavily against discretionary denial. The associated district court case is still in the very early stages of litigation: Petitioners are yet to file their answer, a schedule has not been set, discovery has not yet begun, the Defendants have not yet served their invalidity contentions, and a claim construction hearing is not yet scheduled. Moreover, a claim construction order will not issue prior to the PTAB's projected institution decision date. Accordingly, the district court will not invest significant resources or issue substantive orders related to the challenged patent prior to the issuance of an institution decision. *See Fintiv*, IPR2020-00019, Paper 11 at 9-12.

Factor 4—overlap in the parallel proceedings—is neutral as the same claims are challenged here as are asserted in the parallel proceeding.

Factor 5—overlapping parties—is neutral as it is "far from an unusual circumstance that a petitioner in *inter partes* review and a defendant in a parallel district court proceeding are the same." *Sand Revolution II, LLC v. Continental Intermodal Group–Trucking LLC*, IPR2019-01393, Paper 24, at 12-13.

Factor 6—other considerations—weighs against discretionary denial. As explained, the merits of the Petition are strong, and the Challenged Claims are invalid. For example, none of the grounds asserted herein were previously considered by either the Office or the district courts in evaluating the validity of the '798 patent. *Cf. Comcast Cable Commn's, LLC v. Rovi Guides, Inc*., IPR2019-00231, Paper 14 at 11 (PTAB May 20, 2019) (obviousness challenges not "previously considered by the Office or any court" weigh in favor of not denying institution). The '798 Patent is currently asserted in several district court cases. Institution of this IPR provides the opportunity for narrowing and simplifying the litigations for the district court. Accordingly, this factor weighs heavily in favor of institution.

Compelling Merits – Finally, discretionary denial is not warranted because this petition presents compelling evidence of unpatentability. The '798 Patent

purports to teach "multi-bitrate content streaming," such as video, over the Internet. *Id.*, Abstract, 1:34-37. As discussed above, Leaning and Leighton clearly teach this.

Accordingly, the Board should decline to exercise its discretion under *Fintiv* and institute trial.

IX. ADVANCED BIONICS

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 '798 Patent. Neither Leaning, Leighton, SMIL 2.0, nor Dalby are cited on the face of the '798 Patent.

As noted above, the '798 Patent does cite on its face US2004/0030547 (also to Leaning), but that application was buried in an IDS containing nearly a hundred references. EX1002; EX1001, 2-4. Beyond the Examiner initialing every reference in the IDS (EX1002), there is no evidence that the Examiner actually considered the disclosures of US2004/0030547: it was never used in a rejection and never was never substantively addressed during prosecution of the '798 Patent. Further, 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.

X. MANDATORY NOTICES

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

The real parties-in-interest for Petitioners are WebGroup Czech Republic A.S. and NKL Associates, S.R.O.

B. Related Proceedings – § 42.8(b)(2)

The '798 Patent is currently asserted in the below proceedings.[3]

No.	Case Caption	Court
1	*DISH Technologies LLC et al. v. MG Premium Limited et al.*, No. 2:23- cv-00552	D. Utah
2	*DISH Technologies LLC et al. v. Aylo Freesites Ltd et al.*, No. 2:24-cv- 00066	D. Utah
3	*DISH Technologies LLC et al. v. WebGroup Czech Republic A.S. et al.*, No. 2:23-cv-00553	D. Utah

[3] The '798 Patent was also at issue in three since-dismissed cases: (1) *MG Freesites Ltd et al. v. DISH Technologies LLC et al*. 3:23-cv-03674 (N.D. Cal.), (2) *DISH Technologies LLC et al. v. iFIT Health & Fitness, Inc. f/k/a ICON Health & Fitness, Inc.*, No. 1:23-cv-00963 (D. Del.), and (3) *DISH Technologies LLC v. A Parent Media Co. Inc. et al.*, No. 1:23-cv-01000 (D. Del.).

No.	Case Caption	Court
4	*DISH Technologies LLC et al. v. Vidgo Inc.*, No. 2:23-cv-00624	D. Utah
5	*DISH Technologies LLC v. fuboTV Media Inc.*, No. 1:23-cv-00986	D. Del.
6	*DISH Technologies LLC v. Beachbody, LLC d/b/a/BODi*, No. 1:23-cv- 00987 (D. Del.)	D. Del.
7	*DISH Technologies LLC v. BritBox, LLC*, No. 1:23-cv-08971	S.D.N.Y.
8	*DISH Technologies LLC v. Yanka Industries, Inc. d/b/a/ MasterClass*, No. 1:23-cv-01305	D. Del.
9	*Aylo Freesites Ltd f/k/a MG Freesites Ltd v. DISH Technologies LLC*, IPR2024-00043	PTAB
10	*Aylo Freesites Ltd f/k/a MG Freesites Ltd v. DISH Technologies LLC*, IPR2024-00517	PTAB
11	*fuboTV Media Inc. v. DISH Technologies LLC*, IPR2024-00901	PTAB

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

Lead Counsel:	Backup Counsel:
Jim M. Glass Reg No. 46729 jimglass@quinnemanuel.com Quinn Emanuel Urquhart & Sullivan, LLP 51 Madison Avenue, 22nd Floor New York, NY 10010 Tel: +1 (212) 849-7000 Fax: +1 (212) 849-7100	Quincy Lu Reg. No. 76954 Reg No. 46729 quincylu@quinnemanuel.com Quinn Emanuel Urquhart & Sullivan, LLP 1109 First Avenue, Suite 210 Seattle, WA 98101 Tel: (206) 905-7000 Fax: (206) 905-7100

	Christopher Mathews Reg No. 35944 chrismathews@quinnemanuel.com Quinn Emanuel Urquhart & Sullivan, LLP 865 South Figueroa Street, 10th Floor Los Angeles, CA 90017-2543 Tel: (213) 443-3000 Fax: (213) 443-3100 Brian Mack Reg No. 57189 brianmack@quinnemanuel.com Quinn Emanuel Urquhart & Sullivan, LLP 50 California St 22nd Floor San Francisco, CA 94111 Tel: +1 (415) 875-6600 Fax: +1 (415) 875-6700

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.

XI. CONCLUSION

Petitioners request *inter partes* review and cancellation of claims 1-25.

DATED: January 17, 2025

Respectfully submitted,

By: */s/ James M. Glass*

James M. Glass
QUINN EMANUEL URQUHART
& SULLIVAN, LLP
51 Madison Avenue, 22nd Floor
New York, NY 10010
Tel: (212) 849-7000
Fax: (212) 849-7100

Counsel for Petitioners

CERTIFICATION OF COMPLIANCE UNDER 37 CFR § 42.24(d)

Pursuant to 37 C.F.R. § 42.24(d), Petitioners certify that this Petition for *Inter Partes* Review has total 13,984 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 17, 2025

Respectfully submitted,

By: */s/ James M. Glass*

James M. Glass
QUINN EMANUEL URQUHART
& SULLIVAN, LLP
51 Madison Avenue, 22nd Floor
New York, NY 10010
Tel: (212) 849-7000
Fax: (212) 849-7100

Counsel for Petitioners

CERTIFICATE OF SERVICE

The undersigned hereby certifies that on January 17, 2025, true and correct copies of the foregoing document and supporting materials were served in its entirety on the Patent Owner at the following address of record as listed in Patent Center via Priority Mail Express® or Express Mail:

70560 - KW LAW LLP (Dish Technologies L.L.C.)
6122 N 7th St Suite D
Phoenix, AZ 85014

Courtesy copies were also sent via electronic mail to Patent Owner's counsel of record in the related district court proceeding:

Brent O. Hatch (5715)
hatch@hatchpc.com
Adam M. Pace (14278)
pace@hatchpc.com
HATCH LAW GROUP, P.C.
22 East 100 South, Suite 400
Salt Lake City, Utah 84111
Telephone: (801) 869-1919

DATED: January 17, 2025 Respectfully submitted,

By: */s/ James M. Glass*