UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AYLO FREESITES LTD and FUBOTV MEDIA INC.,
Petitioner
v.

DISH TECHNOLOGIES L.L.C.,
Patent Owner

U.S. Patent 11,470,138
Issue Date: October 11, 2022
Title: APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE CONTENT STREAMING

Inter Partes Review No. IPR2024-00044

SUPPLEMENTAL DECLARATION OF HENRY HOUH, Ph.D.
IN SUPPORT OF PETITIONER'S REPLY

Aylo Exhibit 1028
Aylo Freesites v. DISH Technologies
IPR2024-00044

TABLE OF CONTENTS

I. INTRODUCTION 1

II. UNDERSTANDING OF LEGAL PRINCIPLES 3

III. CLAIM CONSTRUCTION 4

IV. STATE OF THE ART 6

A. Video streaming, including adaptive rate streaming, was common and well-known before 2004. 6

B. Dividing encoded video into segments, for example along I-frames, was well-known and relatively trivial for a POSITA before 2004. 11

V. OGDON AND ALLEN AND/OR OGDON, ALLEN, AND SMIL 2.0 RENDER ALL CHALLENGED CLAIMS OBVIOUS 13

A. Ogdon teaches multiple version streams of the "*same* video presentation" at different quality levels—each having corresponding segments of the same corresponding video content across the different versions. 13

B. Ogdon teaches "video" according to any reasonable POSITA interpretation that is "streamed" in a similar manner as described in the '138 Patent. 21

C. Ogdon teaches "adaptive rate" video streaming whether or not the preamble of claim 1 is limiting. 26

D. Ogdon teaches "a streamlet request" according to the claims wherein by making such a streamlet request the client "selects" a stream in a similar way described in the '138 Patent. 27

E. Ogdon's video "segments" are "streamlets" according to any reasonable POSITA interpretation of the claims. 29

F. Ogdon's corresponding video segments across the various video versions have the same corresponding content and are the same duration. 30

G. Ogdon in view of well-known teachings from Allen's Background section render obvious the challenged claims. 35

H. Neither Ogdon nor Allen "teach away." 38

I. Ogdon teaches a plurality of web servers retrieving streamlets from the storage device as claimed. 40

J. Ogdon teaches a "virtual timeline" that is requested by a client in at least a similar manner and level of detail as described in the '138 Patent. 42

K. SMIL 2.0 also teaches making corresponding interchangeable and replaceable portions or segments precisely the same duration. 45

L. Patent Owner's evidence of secondary considerations fail to show non-obviousness. 45

1. There is no nexus between the MOVE player and the claims. 45

2. Even if there were a nexus, Patent Owner's evidence of secondary considerations does not overcome the strong showing of obviousness set forth here. 56

VI. CONCLUSION 58

I, Henry Houh, Ph.D., declare as follows:

I. INTRODUCTION

1. My name is Henry Houh, and I have been retained by counsel for Aylo Freesites, Ltd ("Petitioner") to analyze U.S. Patent No. 11,470,138 ("'138 Patent") (EX1001) and to provide my opinions regarding the patentability of claims 1, 3-12, 14-20, 22-25, and 27-29 of the '138 Patent.

2. I am being compensated at my normal consulting rate of $650 per hour for my time. My compensation is not contingent on the outcome of this proceeding, or of any proceedings relating to the '138 Patent.

3. I have been asked to prepare this Supplemental Declaration ("Supplemental Declaration") in support of Petitioner's Reply in order to provide my opinions regarding statements made by Patent Owner and the opinions expressed in the Declaration of Dr. Kevin Jeffay during these IPR proceedings including in EX2006 ("Jeffay Declaration"). I previously provided my opinions in support of Petitioner's Petition for *Inter Partes* Review (EX1003) ("First Declaration").

4. In forming my opinions expressed in this Supplemental Declaration, I relied upon my education and experience, which I describe in Section II of my First Declaration, in my *curriculum vitae* (EX1003, Exhibit A), and in my deposition (EX2009). As noted in my First Declaration, I assumed a priority date of April 30

2004—the earliest date of a provisional application. EX1003, Section V.B. I reserve the right to argue for a later priority date in other proceedings.

5. I considered the viewpoint of a person having ordinary skill in the art ("POSITA") at the time of the priority date, which I define in Section VI of my First Declaration. I understand that Dr. Jeffay has a different definition of a POSITA—specifically that a POSITA "would have been someone with at least a bachelor's degree in electrical engineering or computer science, or an equivalent degree or experience in a related field, with at least two years of practical experience or coursework in the design or development of distributed multimedia delivery systems. EX2006, ¶¶38-40. My opinions do not change under either my or Dr. Jeffay's definition of a POSITA. I was a POSITA according to either definition before the priority date, and I have taught and worked with individuals who were POSITAs under Dr. Jeffay's definition.

6. My opinions are based on, at least in part, the Exhibits cited in and attached to my First Declaration, the Exhibits cited in and attached to this Supplemental Declaration, the Jeffay Declaration and the Exhibits referenced therein, the Deposition Transcripts of Dr. Jeffay and Patent Owner's declarant Mr. Major, and the Patent Owner's Response and the Exhibits cited therein. I also considered the '138 Patent and its file history in forming my opinions.

7. My analysis of the materials relating to this matter is ongoing and I will continue to review any new material as it is provided. I reserve the right to revise, supplement, and/or amend my opinions based on new information and my continuing analysis of the materials.

II. UNDERSTANDING OF LEGAL PRINCIPLES

8. I set forth my understanding of the legal principles relevant to my opinions in my First Declaration in Section IV.

9. Additionally, I understand that Patent Owner and Dr. Jeffay have put forth evidence purporting to relate to so-called secondary considerations or objective indicia of non-obviousness. I understand that, in analyzing obviousness in light of the prior art, it is important to understand the scope of the claims, the level of skill in the relevant art, the scope and content of the prior art, the differences between the prior art and the claims, and any secondary considerations.

10. I also understand that secondary considerations may be probative evidence of non-obviousness. I understand that secondary considerations regarding non-obviousness of patent claims include commercial success, skepticism, industry praise or recognition, long-felt but unmet need, and evidence of copying.

11. I further understand that there must be a nexus between the secondary considerations of non-obviousness and the merits of the claimed invention. I

understand that the required nexus can be demonstrated either through a presumption, where the evidence is tied to a specific product and that product embodies and is coextensive with the claimed features, or by showing that the evidence of secondary considerations results from the unique characteristics of the claimed invention as a whole.

III. CLAIM CONSTRUCTION

12. I understand that Dr. Jeffay has purportedly offered no claim constructions. EX2006, ¶¶41-45. However, Dr. Jeffay has argued that virtual timeline "should [] be interpreted to require a 'playlist,' which may or may not include 'entire content file.'" *Id.*, ¶ 44. As set forth in my First Declaration, whether or not "virtual timeline" is construed to be a playlist of entire content files, my opinion is that Ogdon in view of Allen or, alternatively, Ogdon in view of Allen and SMIL 2.0 render obvious the "virtual timeline" claims.

13. Though claiming not to engage in claim construction, Dr. Jeffay makes very specific arguments about claim interpretation in the body of his declaration. For example, Dr. Jeffay asserts that "video in this context is understood to be a single integrated stream of moving images and the corresponding audio" (EX2006, ¶56) while arguing that the term "video" in Ogdon does not disclose "video" because "'video in Ogdon is not a stream of integrated audio and video" (*id.*, ¶55). As I

explain in this Supplemental Declaration, such a definition is contrary to the plain language of the claims as read in light of the Specification and the knowledge of a POSITA at the time of the alleged priority date. And, as I explain in this Supplemental Declaration, Dr. Jeffay is incorrect and Ogdon teaches "video" even under Dr. Jeffay's proposed definition.

14. Dr. Jeffay also asserts that "[a] POSITA would understand that the term 'streaming' as recited in the challenged claims refers to a particular method of transferring a video over the Internet in which the client temporarily caches or buffers limited duration portions of the streamed content but does not permanently store it." EX2006, ¶64. As I explain in this Supplemental Declaration, such a definition is contrary to the plain language of the claims as read in light of the Specification and the knowledge of a POSITA at the time of the alleged priority date. But even if such a definition was required by the claims, Ogdon still teaches video "streaming" according to Dr. Jeffay's proposed definition.

15. Dr. Jeffay also asserts that "placing '***a streamlet request***' to the server," as recited in claims 14, 23, and 28, requires "a client to place a single request to a server for a single streamlet." EX2006, ¶124 (emphasis in original). As I explain in this Supplemental Declaration, such a definition is contrary to the plain language of the claims as read in light of the Specification and the knowledge of a POSITA at

the time of the alleged priority date. But even so, as I explain in this Supplemental Declaration, Ogdon teaches this limitation even under Dr. Jeffay's proposed definition.

16. Finally, Dr. Jeffay asserts that the limitations relating to "a plurality of web servers" in claim 6 "require ***different*** **webservers** that, in response to client requests, each retrieve content from **the *same*** central storage device." EX2006, ¶¶138-140. As I explain in this Supplemental Declaration, such a definition is contrary to the plain language of the claims as read in light of the Specification and the knowledge of a POSITA at the time of the alleged priority date. But even so, as I explain in this Supplemental Declaration, Ogdon teaches this limitation even under Dr. Jeffay's proposed definition.

IV. STATE OF THE ART

A. Video streaming, including adaptive rate streaming, was common and well-known before 2004.

17. Dr. Jeffay opines that video streaming was "extremely rare" from the time frame of 1997 to the priority date. EX2006, ¶55 n.3. Patent Owner also argues, and bases much its arguments upon the premise, that "[v]ideo streaming was ***extremely rare*** during the 1997 time frame of Ogdon's earliest purported priority

date up through the [Patent's] 2004 priority date." (Paper 19, "POR"), 26 (emphasis in original). Patent Owner and Dr. Jeffay are wrong on the state of the art.

18. The '138 Patent even admits that by the time the patent was filed, the Internet was already "becoming a preferred method for distributing media files to end users" including "streaming media." EX1001, 38-57. The Ogdon Provisional also acknowledges this by discussing the "multicast backbone," *i.e.*, MBONE. EX1014, 22-23. Any POSITA will recall that in 1995 the MBONE was used to stream a Rolling Stones concert over the Internet live to thousands of fans from the Cotton Bowl in Dallas, Texas. EX1018.

19. And as I explained in my deposition testimony, I was doing video streaming in grad school since the early-to-mid-90's. *E.g.*, EX2009, 12:4-17:13, 22:6-22. As I testified, my group was doing full-HD video streaming, including pre-recorded and live video streaming, throughout our high-speed network and we also put our videos on the Internet for others to stream—but over the Internet the quality was reduced given the bandwidth constraints at the time. *Id.*

20. Dr. Jeffay also cites to a book published in 1997 titled "Video Conferencing and Interactive Multimedia" which describes the meteoric rise of video streaming in the mid-1990s due to the adoption of interoperability standards

and availability of low-cost, large-scale solid state memory. EX2007 at 2, 4-5.[1] This state of the art is confirmed by numerous other references. For example, a 1998 article by Willebeek disclosing an HTTP and TCP-based video streaming system by IBM called "Bamba" acknowledged that there were "a ***large number*** of audio and ***video streaming*** systems available."[2] EX1019, 270. Notably, Dr. Jeffay is aware of the Willebeek reference and the IBM Bamba system having relied on the Willebeek reference in an IPR on behalf of Petitioner Amazon, where Amazon retained Dr. Jeffay as an invalidity expert. EX1020, ¶¶75-76. Video streaming was certainly not "extremely rare" before 2004. In fact, it was well-known before 2004 and at the time of Ogdon as well that there were a large number of video streaming systems available including systems that adjusted the bitrate of the video based upon a measured bandwidth like the Real-Time System—as Patent Owner's declarant and named inventor Mr. Major himself admits. EX1021, 35:16-36:11.

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[1] The book refers to "video conferencing," but a POSITA would understand video conferencing is video streaming, and Dr. Jeffay does not dispute that video conferencing is video streaming. *E.g.*, EX2006, ¶56; EX1030, 101:23-102:1.

[2] All emphases in this Supplemental Declaration are added unless otherwise indicated.

21. Dr. Jeffay has also in other contexts repeatedly noted the prevalence of video streaming before the priority date. For example, in 2001, outside of this litigation, Dr. Jeffay stated that the "1990s saw the advent of multimedia computing and networking" including the ability to "acquire, store and process digitized streams of audio and video in real time" and that "Internet backbones steadily increased in capacity" allowing "communication of these streams across the Internet." EX1022, at 1. Dr. Jeffay further noted the "tremendous increases and availability in network bandwidth" and "the prevalence of streaming media applications on the Internet" during that time. *Id.*

22. And in other IPR proceedings where Dr. Jeffay has provided opinions for other petitioners, Dr. Jeffay has opined that "[b]y 2001, undergraduate networking textbooks contained comprehensive treatments of the principles and processes of adaptive multimedia data delivery including discussions of real-time streaming protocols." EX1023, ¶53. In the same declaration, submitted on behalf of Petitioner Facebook in IPR2021-00112, Dr. Jeffay claimed that "HTTP was particularly well-suited for video streaming [] by the early-2000s" (*id.*, ¶61), by the late 1990s video conferencing systems "were common in the industry" (*id.*, ¶63), and "[i]t was common for video-conferencing systems to adapt the video media delivered to the end user to … account for bandwidth availability" (*id.*, ¶64).

23. Dr. Jeffay opined on behalf of a Petitioner Amazon in IPR2022-01430 that "it was ***conventional by 1998*** to stream audio and video from 'both stored and live sources on the Web'" using "***standard*** compression technologies" and "***standard*** HTTP Web server[s]." EX1020, ¶¶75-76. Similarly, Dr. Jeffay opined on behalf of Petitioner Facebook in IPR2021-00112 that "[b]y the late 1990s, server-based video conferencing systems enabling users to receive and display real-time video feeds from multiple senders were ***common in the industry***." EX1023, ¶63. Indeed, "[i]t was ***common*** for video-conferencing systems to adapt the video media delivered to the end user to match the capabilities of the recipient device and/or to account for bandwidth availability between the server and the recipient." *Id.*, ¶64.

24. In IPR2014-00737, Dr. Jeffay discussed on behalf of Petitioner Samsung that in the mid-to-late 1990s, he "***regularly*** used the MBONE to watch and listen to live programming streamed over the Internet." EX1029, ¶15. MBONE as discussed above stands for "Multicast Backbone" system. The Ogdon Provisional discusses the MBONE, which undermines any claim by Dr. Jeffay that a POSITA would not understand Ogdon to include live video streaming. EX1014, 22.

25. In my opinion, Dr. Jeffay and Patent Owner's assertion that video streaming was "extremely rare" from 1997 to 2004 is simply false.

B. Dividing encoded video into segments, for example along I-frames, was well-known and relatively trivial for a POSITA before 2004.

26. Dr. Jeffay further opines that "[a] POSITA would also understand that at the time of Ogdon's alleged invention, the division of digitally encoded video into streamlets was not a trivial operation" arguing that the coding standards available including MPEG-1, MPEG-2, and H.263 "were not conducive to having a larger video stream be segmented." EX2006, ¶91. Dr. Jeffay is wrong. In the late 90s and early 2000s it is my opinion that a POSITA would indeed have considered segmenting a digitally encoded video into streamlets to be a trivial operation, as MPEG-encoded videos are already internally grouped in segments corresponding to the "Group of Pictures" that each starts with an independently coded frame, and contains a pre-determined sequence of predictive frames.

27. For example, WO 02/49343 A1 ("Leaning", EX1024) has a priority date from December 2000 and was published in June 2002. In addition to teaching essentially every limitation of the '138 Patent's claims (except explicitly teaching a bitrate of 600 kbps) (*See* Section V.L.1, *infra*), Leaning also describes taking "digitally coded audio or video material" and "partitioning the material into a plurality of discrete files each representing successive temporal portions of the said material." EX1024, 1:20-23. Leaning explains that when partitioning a "video file

(e.g. in H.261 or MPEG format) . . . [t]he manner of partitioning the file into sub-files is unchanged." *Id.*, 16:6-10. In contrast to Dr. Jeffay's assertion that a POSITA would not know how to partition MPEG video files, Leaning explains that it is a simple matter of splitting the video into segments such that "each sub-file should preferably begin with an intra-frame." *Id.*, 16:17-23. A POSITA would have found such segmentation of video files to be a fairly trivial matter prior to the priority date, as MPEG-encoded videos are already internally grouped in segments corresponding to the "Group of Pictures" that each starts with an intra-frame, and contains a pre-determined sequence of predictive frames.

28. As another example, Dr. Jeffay has opined in other contexts about the prior art reference Carmel (US 6,389,472, EX1025) which was filed in March 1999 and published in May 2002. EX1020. In describing Carmel, Dr. Jeffay explains that a "transmitting computer 34 generates a multimedia data sequence (data stream 40), which comprises a series of sequential data slices 42, 44, 46, 48, et., with each slice containing a segment of video and/or audio data that corresponds to a respective, successive time interval T1, T2, T3, etc. *Id.* ¶67 (citing Carmel (EX1025), 7:18-25, Fig. 3A). Dr. Jeffay went on to explain that Carmel's data stream was "divid[ed] . . . into a sequence of slices' which are in turn 'encoded in a corresponding sequence of files, each file having a respective index.'" *Id.*, ¶87

(quoting Carmel (EX1025), Abstract). Thus, even Dr. Jeffay has opined in the past that it was known to slice or divide video into segments in the late 90s and early 2000s before the priority date.

V. OGDON AND ALLEN AND/OR OGDON, ALLEN, AND SMIL 2.0 RENDER ALL CHALLENGED CLAIMS OBVIOUS

A. Ogdon teaches multiple version streams of the "*same* video presentation" at different quality levels—each having corresponding segments of the same corresponding video content across the different versions.

29. Patent Owner and Dr. Jeffay argue that Ogdon fails to teach multiple "copies" of the "same" video and that Ogdon's segments—which are "corresponding in content"—are somehow "different content." POR, 1-5, 8-10, 12-19; EX2006, ¶¶82-92. In support, they point to a different institution decision and argue that the Board "correctly found" that Ogdon does not teach "storing multiple copies of ***the same video***." POR, 5 (citing IPR2024-00146, Paper 9, 40) (emphasis in original).

30. As a threshold matter, "copies" and "same video" do not appear anywhere in the claims of the '138 Patent. Patent Owner and Dr. Jeffay instead cite to a different institution decision for a different patent to argue that claim limitations

that do not exist in the '138 Patent are not met.[3] Indeed, the '138 Patent claims recite "storing the video, wherein ***the video*** is digitally encoded at a plurality of different bitrates creating a plurality of streams … each comprising a group of streamlets, wherein ***each streamlet corresponds*** to a portion of the video." EX1001, claim 1. Thus, unlike certain other related patents not at issue in these IPR proceedings, there is no "copies of the same video" requirement. The claims at issue here only require that each streamlet "corresponds" to a portion of "the video," which Ogdon clearly teaches.

31. In any event, to the extent the claims are deemed to require "copies of the same video," it is my opinion that Ogdon teaches this. Ogdon repeatedly explains that the different versions of a video presentation are indeed copies of ***the same video presentation***, and that the alternate version segments "correspond" in content and are "interchangeable" and "replaceable" with one another. *E.g.*, EX1004, 2:30 ("Different versions of the ***same*** presentation"), 3:39-40 ("it is an aspect of the present invention to dynamically and adaptively switch between …

[3] I also note here that in my opinion, the Board misattributed limitations from claims in DISH's other patents (which were not instituted) to the claims at issue in the '555 Patent in its institution decision for the IPR2024-00146.

versions of ***the*** presentation"), 3:43-44 ("corresponding (***in content***) segments"), 21:33-34 ("video ***versions*** of ***the*** presentation"), 30:21-22 ("presenting of a ***same*** corresponding portion of the presentation"), 2:49-55 ("any of the ***corresponding*** alternative segments … from different versions can be presented as a ***replacement*** for another such ***corresponding*** segment"); 32:36-38 ("first subcollection is ***replaceable*** with said second subcollection when presenting ***the*** presentation"); 2:36-39 ("each of the one or more presentation versions includes one or more presentation segments … that provide different portions of ***the*** presentation."); 3:38-40 ("it is an ***aspect of the present invention*** to dynamically and adaptively switch between … ***versions*** of ***the*** presentation"), 3:43-44 ("corresponding (***in content***) segments of ***the*** presentation"), 21:33-34 ("***video versions*** of ***the*** presentation"), 30:21-22 ("presenting of a ***same*** corresponding portion of ***the*** presentation"); 22:63-64 ("***interchangeable*** presentation elements"). Thus, Ogdon repeatedly teaches that, regardless of which quality level a client receives, the client is receiving a copy of the same video presentation.

32. Dr. Jeffay and Patent Owner appear to be making an argument that when Ogdon describes content as "corresponding" across the segments in the different versions—it is somehow describing something different from the "same" content. I note that neither Dr. Jeffay nor Patent Owner provide any evidence for

such a definition and that interpretation is inconsistent with how a POSITA would have understood "corresponding" in 1997. Dictionaries in 1997 defined "corresponding" as "***identical*** in all essentials or respects" and defined "same" as "***corresponding***." EX1033, 3; EX1034, 3 (defining "corresponding" as "having or participating in the ***same*** relationship (as kind, degree, position, correspondence, or function)"); EX1033, 4 (defining "same" as "***identical*** with what is about to be or has just been mentioned" and "agreeing in kind, amount, etc.; ***corresponding***.").

33. Patent Owner and Dr. Jeffay also selectively quote from Ogdon to argue that Ogdon only discloses a video version and an alternate non-video version that is a "slideshow alternative" for low transmission rates. *E.g.*, POR, 8; EX2006, ¶60. Specifically, DISH focuses on Ogdon's example where an alternative version may be a "slide show format" and pretends that this one example means that Ogdon does not disclose an alternative version that is video. *Id*. But this is wrong.

34. First, while Ogdon clearly does teach at least two explicitly video versions of the same presentation (*e.g.*, EX1004, claim 9), it is worth noting that a POSITA in the late 1990s would have understood Ogdon's disclosure of "slide show format" and "slide show alternative" (EX1004, 3:51-63) to mean a very low frame rate video—such as at about 1 frame per second (fps). This type of low-quality video streaming where a single frame of video was displayed for relatively much longer

(e.g., 1 second) than a frame of a traditional 30 frame per second video (33 ms) was commonly referred to as a "slide show" type video. For example, Allen describes "slide show" as a quality level of a video stream via a "<video-quality>" tag for a video stream with values "normal, smooth motion, sharp image, ***slide show***" and notes "[t]his tag is used to control the trade-off between spatial image quality ***and the number of frames***." EX1005, 63:13-16; *see also* EX1019, 270 ("At modem speeds, the MPEG-based systems ***revert to slide-show-type video***."). Even DISH's own exhibit admits that an "emergency 'slideshow' mode" in systems implementing RealNetworks' RTP/RTSP streaming protocols was a known version of low quality video streaming. EX2059, 11. And by 1999, any POSITA would know that with the ReaPlayer's "RealVideo encoding tool, you [could] choose to ***encode*** a large ***video*** for low bandwidth ***as a 'slide show,'*** which ***streams*** approximately one frame per second." EX1031, 56. I agree with Dr. Jeffay that RealNetworks was "a recognized early pioneer" and "leader," and its RealVideo streaming player was well known to POSITAs in 1997. EX1030, 63:22-.65:15.

35. Dr. Jeffay also admitted in his deposition that when a user is watching a car race at 30 frames per second and the frame rate drops to one frame per second the user is "certainly watching the ***same*** race. They are essentially seeing like ***a slide show*** of the race." EX1030, 140:7-141:7. Thus, even the "slide show" embodiment

in Ogdon meets the claim limitations because a POSITA would have understood this version of the "same" video presentation to still be the same video of the same corresponding content—just encoded to very low frame rate video version.

36. Second, Ogdon elsewhere explicitly teaches ***at least two video*** versions of the same presentation that are different sizes (and thus appropriate for different transmission rates) but that correspond in content. *E.g.*, EX1004, claim 9; *see also id.*, claims 6 and 20. Importantly, neither Patent Owner nor Dr. Jeffay can counter the teachings of claim 9 of Ogdon, which claims the embodiment containing "a first ***video*** portion" and an alternative "second ***video*** portion that corresponds in content with said first video portion"; and the first and second video portions "have substantially different expected data transmission rates." EX1004, claim 9. Dr. Jeffay briefly addresses claim 9 in a footnote arguing that the first and second video portions are "different" and not "identical content." EX2006, ¶60 n.7. But as the claim recites, each portion "corresponds in content." There simply can be no dispute that Ogdon discloses two versions of ***video*** of the ***same corresponding portion and content*** with different data transmission rates. Ogdon also gives other examples where alternative corresponding collections of segments are both video such as a first collection of "video with motion" and a second collection of "video with one of (i) no motion and (ii) reduced motion." EX1004, claims 6 and 20. A POSITA

would similarly have understood the "reduced" or "no motion" videos to refer to low frame rate and very low frame rate videos, respectively. EX1030, 293:16-294:1 (Dr. Jeffay describing the MOVE player's emergency mode as "a very low, low resolution, low bit rate, lower motion stream"), 136:19-137:24 (Dr. Jeffay agreeing that reducing the frame rate will result in a video with "reduced motion").

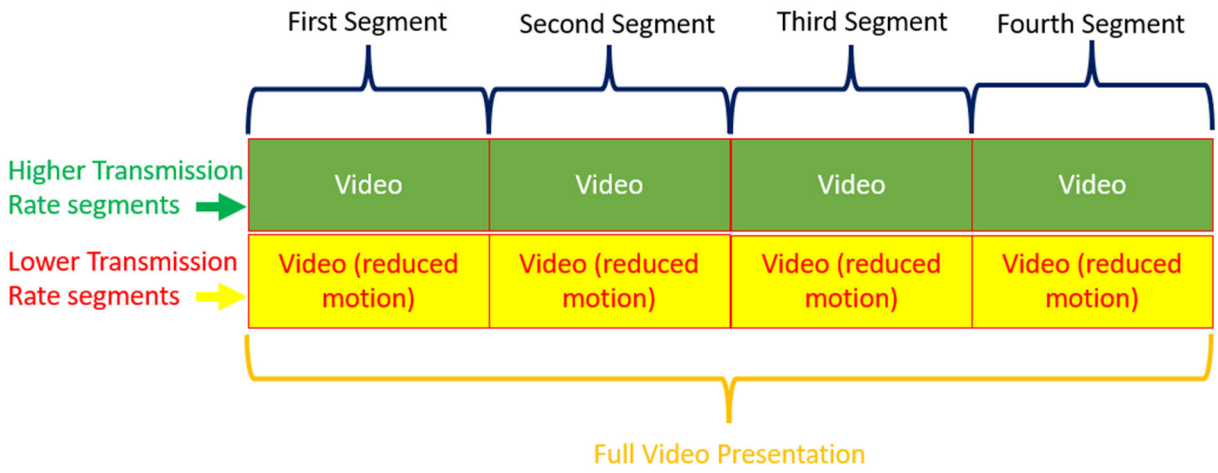
37. To the extent Patent Owner and Dr. Jeffay try to argue that Ogdon's use of the word "version" shows that the corresponding segments in Ogdon are different content rather than the same content in a different quality, this also fails. POR, 3-5, 8, 14-16; EX2006, ¶¶73-92. That is not how a POSITA would have understood Ogdon to use that word. The '138 Patent itself uses the word "version" to describe the different quality levels. *E.g.*, EX1001, claim 6 ("higher or lower bitrate version").

38. Further, to the extent Dr. Jeffay and Patent Owner try to read "identical" into the claims to argue that the claims require that the alternative segments contain "precisely identical content," this is similarly unavailing. POR, 36; *see also* POR, 9 ("identical content"), 16, 24 n.4; EX2006, 60 n.7. Nowhere does the '138 Patent specification describe the different segments of content as "identical," let alone precisely identical. Rather, for example, the specification describes using lossy compression like DivX to create different versions of video streams at different

bitrates. EX1001, 7:11-24. Further, I understand that Drew Major, a named inventor of the '138 Patent, agreed that that a video at 100 kbps and 3 fps would be the same video as a version at 4 mbps and 30 fps just with "reduced motion and reduced resolution in color, depth, and in number of bits." EX1021, 167:23-168:20. A POSITA would know that these versions correspond in content but are not "precisely identical" because there is necessarily some data loss when encoding to different quality levels. Dr. Jeffay and Patent Owner show this very concept in their fuzzy low quality screenshot compared to the high quality screenshot. POR, 2. At best, these different versions are "identical in all essentials"—the very definition of "corresponding" from 1997 I cited above. EX1033, 3. Thus Ogdon's corresponding segments containing corresponding video content are similarly "identical."

39. Finally, Patent Owner's illustrations purporting to represent the teachings of Ogdon are incorrect and not tied to the relevant disclosures of Ogdon. POR, 4-5, 14-15, 21-25; EX2006, ¶¶76, 86, 96, 101, 116, and 118. These illustrations ignore Ogdon's teachings of at least two alternative video versions of video segments. I directed counsel to create the illustration below showing an example of the embodiment that is described in Ogdon and is recited in claims 6, 9, and 20 of Ogdon. This illustration of the embodiment of Ogdon's claims 6, 9, and 20 take into account both the specification of Ogdon which provides more detailed

descriptions as well as the background knowledge of a POSITA before the alleged priority date. Ogdon teaches, for example, "a first video portion" and an alternative "second video portion that corresponds in content with said first video portion"; and the first and second video portions "have substantially different expected data transmission rates."



B. Ogdon teaches "video" according to any reasonable POSITA interpretation that is "streamed" in a similar manner as described in the '138 Patent.

40. As explained above in Section III, Dr. Jeffay makes the argument that "video" in the context of the '138 Patent means an "integrated stream" of audio and video and, therefore, Ogdon's disclosure of streaming audio and video separately does not teach video. POR, 25-27; EX2006, ¶¶53-65. Dr. Jeffay is incorrect. First, the '138 Patent explicitly teaches that video can be separate from audio. *E.g.*, EX1001, 7:17:18 ("The content file 200 may comprise uncompressed video and

audio, or alternatively, video ***or*** audio.), 12:21-30. Second, Ogdon explicitly teaches that streamed segments can be a combination of video and audio (EX1004, 3:3-8) or that "both the video and audio portions of the presentation may be provided solely by a TCP/IP network such as the Internet, assuming that there is sufficient communication bandwidth to synchronize presentation transmissions" (EX1004, 2:8-12). Thus, Ogdon teaches an integrated stream of audio and video. Finally, DISH's interpretation of "video" as requiring audio is simply not how a POSITA would understand that term.

41. Dr. Jeffay set forth a much more appropriate understanding of "video" in an IPR on behalf of Facebook where Dr. Jeffay used DISH's '444 Patent, which is related to the '138 Patent, as prior art (IPR2024-00112). There, Dr. Jeffay said that "[a] video image—essentially a still picture—is a two-dimensional structure consisting of an acquired or displayed width and height measured in picture elements ('pixels'). . . . Video is a sequence of video images wherein each image is acquired/displayed for a (typically) fixed duration and then the next image in the sequence is acquired/displayed . . . video [] has a temporal dimension, typically measured in units of the video image display duration or the number of video images displayed per unit time (a 'frame rate')." EX1023, ¶42. This same understanding is appropriate here. A POSITA would have understood "video" in the context of the

’138 Patent to mean a sequence of video images wherein each image is acquired/displayed for a (typically) fixed duration and then the next image in the sequence is acquired/displayed. A POSITA would not understand the term “video” to ***require*** an integrated stream of video ***and*** audio. But regardless, as explained above, Ogdon plainly teaches both definitions.

42. Dr. Jeffay and Patent Owner argue that the video segments of Ogdon are not “streamed” seemingly because Ogdon does not use the word “stream” right next to the word “video” and because Ogdon discloses an embodiment where video segments are downloaded and stored at the client before playback. POR, 28-29; EX2006, ¶¶59-66. But this is wrong. Ogdon does not need to use the exact phrase “video streaming” to teach video streaming. A POSITA considering Ogdon would certainly understand Ogdon to teach a video streaming system, especially in light of the corrected state of the art I provided above (*See* Section IV, *supra*). For example, Ogdon teaches that video and audio may be transmitted “solely by a TCP/IP network” when “there is sufficient communication bandwidth to synchronize presentation transmissions.” EX1004, 2:8-12. That is streaming. Ogdon also teaches that video can be transmitted to clients in the same manner as audio, (EX1004, 2:8-12, 5:16-18, 5:28-36, 7:44-48), and there is no dispute that Ogdon discloses streaming audio. POR, 17. And DISH admits that Ogdon is at least a

"content streaming system." POR, 5. As I explained in my deposition, Ogdon teaches "that the video presentation is streamed just like the audio." EX2009, 73:17-74:1.

43. Also, Dr. Jeffay's and Patent Owner's arguments that Ogdon discloses a "non-streaming" solution that downloads and plays back content rather than a "streaming" solution which requires segments to be stored temporarily in a buffer and then "deleted" is incorrect. POR, 28; EX2006, ¶¶59-66. As an initial matter, Dr. Jeffay's definition of "streaming" (*see* Section III) is too restrictive and contrary to the disclosures of the '138 Patent and the claims do not require Dr. Jeffay's restrictive definition of streaming. The '138 Patent explains that streaming "refers to technology that delivers content at a rate sufficient for presenting the media to a user in real time as the data is received." EX1001, 1:47-49. Although data "***may*** be stored in a memory temporarily until played and then subsequently deleted," it is not required. *Id.*, 1:49-51. Rather, a POSITA would understand that streaming only requires playback without having to first download the complete media file. *Id.*, 1:58-67 (distinguishing streaming from "[d]ownloading complete media files" before playback). Other prior art references set forth similar definitions including Allen and Chou. *E.g.*, EX1005, 2:14-16 ("Streaming media was developed for transmission of video and audio over networks such as the Internet, as an alternative

to having to download an entire file representing the subject performance, before the performance could be viewed"); EX1013, 2:9-13 ("In Streaming, audiovisual data is packetized, delivered over a network, and played as the packets are being received at the receiving end, as opposed to being played only after all packets have been downloaded."). I also understand that DISH's declarant and inventor of the '138 Patent, Mr. Major, also agreed that requesting and downloading segments then playing them back was streaming. EX1021, 90:19-24.

44. In any event, a POSITA would understand Ogdon to include even Dr. Jeffay's more restrictive definition of "streaming" that requires temporary storage and deletion of segments. Indeed, the Ogdon Provisional states: "The data used during the show and ***cached*** by the M.Show Client software is ***deleted*** at the end of the show." EX1014, 15.

45. Finally, Ogdon operates in a substantially similar manner as the '138 Patent. As an initial matter, both the '138 Patent and Ogdon refer to storage in a "cache"—which a POSITA at the time of the alleged priority date would have understood to mean a temporary storage. Specifically, the'138 Patent describes that an "agent controller module 702" requests a streamlet from the "streamlet cache module 704." EX1001, 9:30-40, 13:3-27, FIG. 7. If the streamlet is not already cached, the request is sent to the "network control module 705" to request it from a

webserver where the streamlet is then downloaded in its entirety and stored in the cache for future playback. *Id.*, 13:3-61. Ogdon similarly describes checking whether a segment of the video presentation is already cached at the client and, if not, the client requests the segment from webservers, downloads the segment, and plays it back without first downloading the entire video presentation. EX1004, 19:55-58, 22:10-27, 23:51-53.[4] Thus, Ogdon teaches video streaming in a very similar way as the '138 Patent.

C. Ogdon teaches "adaptive rate" video streaming whether or not the preamble of claim 1 is limiting.

46. Dr. Jeffay and Patent Owner contend that the proposed obviousness combination requires modifying Ogdon "from an adaptive content streaming system" to an "adaptive rate" system. POR, 5-6, 43; EX2006, ¶¶133-134. But this is also wrong. Though Dr. Jeffay and Patent Owner contend that the "adaptive rate" limitation in the preamble of claim 1 is limiting based on conclusory assertions, I do not offer any opinions here as to whether or not the preamble of claim 1 is limiting. It is not necessary to determine if the preamble of claim 1 is limiting because whether

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[4] That Ogdon contemplates some segments may be cached in advance via a CD is irrelevant. This is simply one option. The thrust of Ogdon's teachings is clearly streaming the segments from a standard webserver based on HTTP requests from a client.

or not the preamble of claim 1 is limiting, Ogdon teaches an adaptive ***rate*** system and thus meets the preamble.

47. Patent Owner and Dr. Jeffay parrot the argument that Ogdon's alternate segments are not different versions of the same video but are instead entirely different content, *i.e.*, a video version and a non-video version. This argument is erroneous for the reasons discussed above. *See* Section V.A. As explained in Section V.A, Ogdon teaches the same video presentation at different quality levels (*e.g.*, video with motion and video with reduced motion or, said differently, video versions with the same corresponding content but with different expected data transmission rates). *Id.*

D. Ogdon teaches "a streamlet request" according to the claims wherein by making such a streamlet request the client "selects" a stream in a similar way described in the '138 Patent.

48. As noted above in Section III, Dr. Jeffay sets forth a restrictive definition of "a streamlet request" that requires "a ***single*** streamlet request for a ***single*** streamlet." Patent Owner and Dr. Jeffay argue that Ogdon allegedly requests multiple streamlets in a single request. POR, 40-44; EX2006, ¶¶124-131. This is incorrect. First, there is no requirement that "a streamlet request" can only include ***one*** streamlet request and not ***include*** requests for multiple streamlets. Indeed, the claim language recites "the at least one streamlet request … ***includes*** a request for a

currently selected first streamlet." EX1001, claim 6. Thus the request can ***include*** requests for other streamlets as well. Second, Ogdon discloses that a request could be a request for ***just one*** segment (*i.e.*, streamlet). EX1004, 21:15 ("a next collection of ***one*** or more segments"). The word "includes" is inclusive. And claim 10 of DISH's '555 Patent recites "a streamlet request" yet multiple "requested streamlets" are received. EX1032, claim 10. Further, Ogdon expressly teaches that a requested collection of segments can include "***one*** or more" segments. EX1004, 22:30-33, 21:15. Thus, even under Dr. Jeffay's inappropriate definition, Ogdon teaches this limitation.

49. Dr. Jeffay and Patent Owner also argue that Ogdon does not make a "select[ion]" from a "plurality of streams" because Ogdon fails to disclose multiple copies of the same video—again citing to the Board's decision in a different IPR. POR, 44-45; EX2006, ¶136. But again this is wrong. As explained above, the claims in this patent do not recite "copies" of the "same video" and, regardless, Ogdon does teach that the clients selects which segments from at least two video version streams of the same video presentation to request. This is a selection of a stream in a similar manner described in the '138 Patent.

E. Ogdon's video "segments" are "streamlets" according to any reasonable POSITA interpretation of the claims.

50. Dr. Jeffay and Patent Owner alleged that the video "segments" in Ogdon are somehow not "streamlets" as claimed because Ogdon's "segments" "are not time-divided into smaller segments, nor do they collectively represent a larger stream." EX2006, ¶58; POR, 17. Dr. Jeffay and Patent Owner further claim that "Ogdon's 'segments' are distinguishable from 'streamlets' because they are not portions of any continuous larger video or live video feed and they are not synchronized with the presentation audio" and "Ogdon does not disclose streaming any larger videos with integrated audio such as 'movies,' 'sports events,' 'music,' [or] 'concert.'" *Id.* This argument fails. As already explained, there is no requirement that the "video" must have integrated audio (or even be movies, sports events, etc.)—but in any event Ogdon does teach integrated and synchronized audio. *See* Section V.B.

51. And both Dr. Jeffay and Mr. Major have described "streamlets" as simply "segments" of video—which is precisely what Ogdon teaches. For example, Mr. Major agreed that "streamlets" are "segments" (EX1021, 50:11-17; 53:7-11) and that segments, even from different videos, could be arranged to "make up a larger video presentation" (*id.*, 51:6-14, 51:15-52:5). And Dr. Jeffay admitted that Ogdon "describes ***dividing*** a presentation into different 'segments.'" EX2006, ¶35.

Dr. Jeffay also stated that when he first encountered a parent of the '138 Patent, he was impressed by the architecture which included "using a web server hosting sets of content files where each set represented ***segments*** ***('streamlets')*** of a ***larger media presentation***." EX2006, ¶46. This is precisely what Ogdon teaches.

52. The argument that Ogdon's segments are each "unique" standalone pieces of content with no relation between segments also fails. POR, 16. Ogdon repeatedly explains that the segments are "ordered" and collectively make up the larger video presentation. EX1004, 3:11-14, 3:46-50, 18:42-43. Moreover, the '138 Patent describes its own streamlets as unique standalone content files in a similar manner to Ogdon since each streamlet is encoded as "a separate content file." EX1001, 3:18-20. There can be no reasonable dispute that a POSITA considering Ogdon before the alleged priority date would consider Ogdon's video "segments" to be "streamlets" as claimed in the '138 Patent.

F. Ogdon's corresponding video segments across the various video versions have the same corresponding content and are the same duration.

53. Dr. Jeffay and Patent Owner argue that Ogdon does not teach corresponding segments with the "same duration." EX2006, ¶¶113-123; POR 12-13, 35. But Dr. Jeffay and Patent Owner do not even attempt to address the arguments regarding teachings from the Ogdon Provisional and the Ogdon File

History which confirm that Ogdon's corresponding segments are the same duration. Pet., 27-29. Dr. Jeffay and Patent Owner instead bring back out the argument that the segments are different content (*i.e.*, a video versus a single image) each with different (or no) durations. EX2006, ¶113. But this is wrong as I explained in Section V.A-B.

54. Dr. Jeffay attempts misdirection by pointing to disclosures in Ogdon that explain that other media may be used such as images (EX2006, ¶¶113-119), but this does not change the fact that Ogdon describes "video segments" (*e.g.*, EX1004, FIG. 2C) where the segments may be video (EX1004, 3:1-8). Further, the argument that "elements" in Ogdon are PowerPoint slides that do not have a duration and that the videos are on the PowerPoint slides has no basis in Ogdon's disclosures. POR, 12-13, 35. The word "PowerPoint" is not used in Ogdon and the word "slide" appears in the context of "slide show format" and "slide show alternative," which as discussed above refer to very low frame rate video that a viewer would perceive visually as more like a slide show due to the low frame rate. *See* Section V.A. Such a description of low frame rate video of about 1 fps was common in the late 90s. *Id*. Dr. Jeffay and Patent Owner also ignore Ogdon's teaching that an "element" can be any "combination of one or more of the following types of HTML multimedia data: audio, images, animation or ***video***, wherein such a multimedia element ***plays over a***

set period of time." EX1004, 2:66-3:6. Dr. Jeffay agreed during cross-examination that, in video, each video image frame is "acquired and displayed for a certain duration" (EX1030, 151:18-152:2) and testified that the video image frames are each played for a set period of time, *e.g.*, "33 milliseconds" for a 30 fps video or "one frame … displayed for one second" with a one fps video (EX1030, 139:8-19). And further, though Dr. Jeffay in his declaration contends that the "elements" of the streamed video presentation in Ogdon are somehow PowerPoint slides, it is notable that during his cross examination Dr. Jeffay testified that in a 1997 paper he authored about video conferencing involving the presentation of "elements" of multimedia streams, the word "elements really meant frames" of video. EX1030, 127:2-20. This is a much more reasonable interpretation of the "elements" of Ogdon—*i.e.*, as frames of video.

55. Dr. Jeffay and Patent Owner also make a semantic argument that since Ogdon in one part of its specification states that the corresponding segments are "***approximately*** the same" duration Ogdon was necessarily saying the segments are not precisely the same duration. EX2006, ¶¶120-123; POR, 36-37. This argument also fails. Modifiers like "approximately," "about," and "substantially" are frequently used in patents to include "exactly" and "nearly." In one of my own patents, U.S. Pat. No. 6,967,963 filed in 1998, that I mentioned in the Background

section of my First Declaration (EX1003, Section II) my co-inventors and I stated in the specification that "typically, such data must get to the destination within a certain time period (i.e., up to ***about*** 50 ms)" (EX1026, 9:65-67). Of course by saying "about 50 ms" we clearly were disclosing both ***precisely*** 50 ms as well as slightly more or slightly less than 50 ms. Indeed, the '138 Patent itself describes a streamlet's duration as "between ***about*** 0.1 and 5 seconds" but claims a precise "range of 0.1 to 5 seconds." Presumably Patent Owner and Dr. Jeffay would agree that the specification's disclosure of "about" 0.1 to 5 seconds provides written description support for a claim drawn to exactly 0.1 to 5 seconds. EX1001, 3:25-26, claim 7. Finally, I understand that Mr. Major himself used the phrase "substantially the same duration" in his declaration (EX2010) and, when asked about this phrasing, Mr. Major agreed that his use of "substantially the same duration" in his declaration means "precisely the same duration or almost the same duration." EX1021, 96:6-9. Any POSITA considering the teachings of Ogdon before the alleged priority date would understand Ogdon to be teaching that the corresponding segments can (and should) be precisely the same duration. If they were not precisely the same duration this would frustrate the purpose of Ogdon which was to synchronously provide the same video presentation to clients with different network requirements. *E.g.*, EX1004, Abstract, 3:38-44.

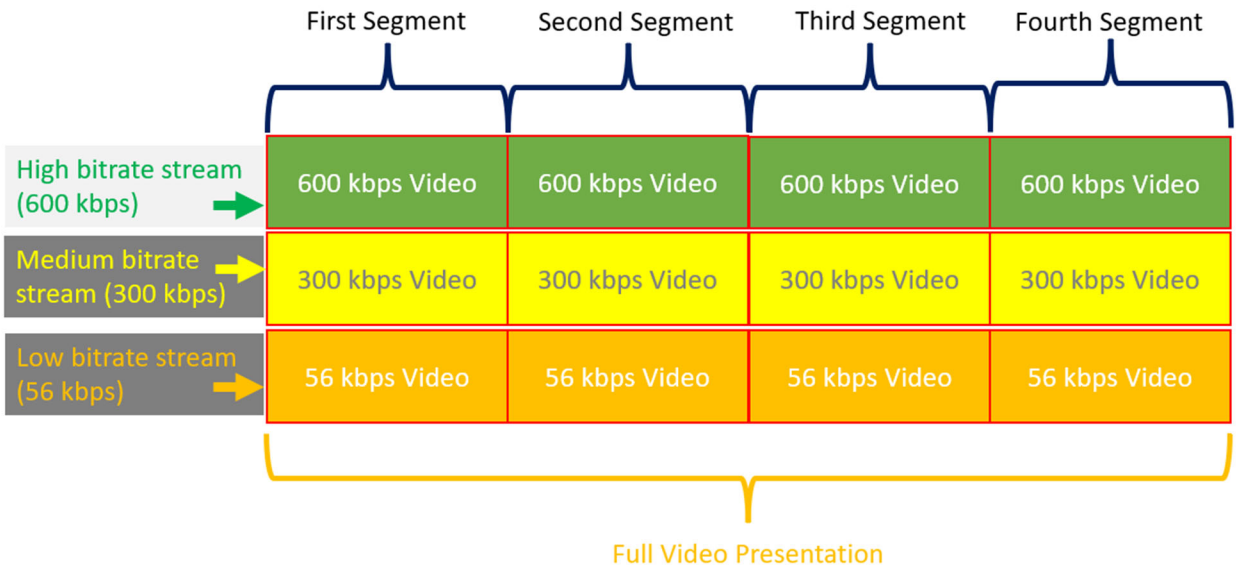
56. Dr. Jeffay and Patent Owner also argue that Ogdon actually intends for alternative corresponding segments to have different durations because that would somehow provide "advantages" in the system. EX2006, ¶¶121-123; POR, 36-37. However, Dr. Jeffay and Patent Owner cite only to EX1004, 6:40-47 for support, which says nothing about the alternative segments being different durations and certainly nothing about this being an advantage. *Id*. In fact, the only advantages mentioned are (1) client-pull and (2) avoiding firewalls with HTTP/TCP (EX1004, 6:40-47)—the very same advantages touted by the '138 Patent (EX1001, 9:32-45). Moreover, neither Dr. Jeffay nor Patent Owner explain how having different durations would provide "flexibility" or "advantages." It would not. It would only contradict Ogdon's teaching of "synchronously" providing different versions of the same video presentation to different users. EX1004, 3:38-44. Ogdon's corresponding segments were thus taught to be the same duration. And, as noted above, the Ogdon Provision and Ogdon File History evidence confirms this interpretation and neither Dr. Jeffay nor Patent Owner even attempt to refute that evidence.

57. Finally, Dr. Jeffay's and Patent Owner's argument that a presentation leader ***may*** change the script and the presentation midway through is irrelevant, has nothing to do with the actual purported benefits of Ogdon (client pull and avoiding

firewalls), and further such changes are only a possibility—not a requirement. EX2006, ¶123; POR, 35. Moreover, Ogdon's descriptions of a leader is essentially the same as the '138 Patent's example where a "publisher" may set the virtual timeline to "skip" or "loop" portions of the video or "mute" audio in some portions. EX1001, 12:44-13:2. In sum, Ogdon clearly teaches corresponding streamlets of the same duration and neither Patent Owner nor Dr. Jeffay can reasonably counter these teachings.

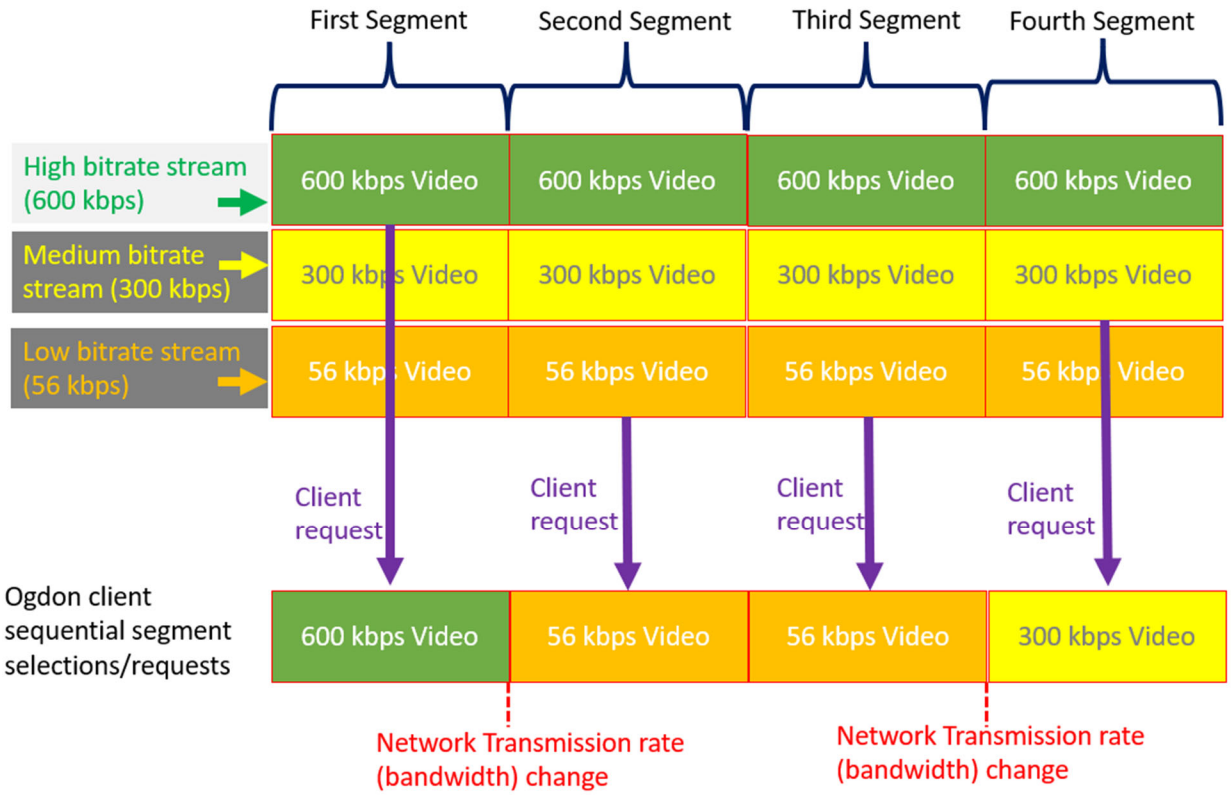
G. Ogdon in view of well-known teachings from Allen's Background section render obvious the challenged claims.

58. As explained above in Sections V.A-F, Ogdon already teaches all limitations that Dr. Jeffay and Patent Owner allege are missing. And, as set forth in the Petition and in my First Declaration, a POSITA would have been motivated to modify Ogdon based on Allen to encode the video presentation into multiple quality levels (low, medium, and high). Pet., 22-26. I directed counsel to create the illustration of this combination shown below:



59. Said differently, Ogdon already taught a video streaming system with different video versions having corresponding video segments with corresponding video content—just at different quality levels (and sizes) with different expected data transmission rates. *See* Sections V.A-F. And applying the teachings from Allen which describe what was very well-known and considered the "sophisticated" solution of encoding the same video into different bitrate versions (*i.e.*, three different quality level bitrates including 600 kbps, 300 kbps, 56 kbps) (Pet., 22-26; EX1005, 8-12), a POSITA would modify Ogdon with a reasonable expectation of success to achieve what is illustrated above—a system that operates just as Ogdon contemplates but simply with three different videos with corresponding segments encoded at different bitrates.

60. This modification would not render Ogdon unsuitable for its intended purposes, as Dr. Jeffay and Patent Owner allege (*e.g.*, EX2006, ¶¶121, 137), because Ogdon is already a client-pull adaptive rate video streaming system as explained above, and the modification taught by Allen simply encodes the segments to create three segmented versions of the same video presentation stream. Such encoding of non-overlapping segments of a video on a segment-by-segment basis, as set forth in the Petition, was well-known to a POSITA. Pet., 21-26; EX1019, 276 ("A video can be partitioned into non-overlapping segments, each segment being treated independently" and encoded independently on "a segment-by-segment basis"). The client requests for the segments would happen in the same way as Ogdon already teaches, as the illustration I directed counsel to create below shows:



H. Neither Ogdon nor Allen "teach away."

61. I understand that "teaching away" requires clear discouragement from implementing a technical feature. No such clear discouragement exists in Ogdon or Allen. Dr. Jeffay and Patent Owner argue that Ogdon "teaches away" from video streaming by arguing that Ogdon teaches "an alternative to 'video conferencing'" and rehashing its arguments about graphic slides. POR, 24-29. But, as explained above, Ogdon teaches alternative ***video*** segments that "correspond in content" and are the same portion of the same presentation that are adaptively streamed. *See* Sections V.A-C. Thus, Ogdon does not "teach away" from video streaming and it

is not a "non-streaming" solution. POR, 32. Ogdon ***is*** an adaptive-rate video streaming solution. EX1004, 3:38-44 ("[I]t is an aspect of the present invention to dynamically and adaptively switch between ... versions of the presentation according to network transmission characteristics.").

62. Dr. Jeffay and Patent Owner also argue that Allen "teaches away," but this also fails. POR, 29-33. First, the only teachings relied upon for the combination are from the Background of Allen, which describes what was very well-known and considered the "sophisticated" solution of encoding the same video into different bitrate versions (*i.e.*, three different quality level bitrates including 600 kbps, 300 kbps, 56 kbps). Pet., 22-26; EX1005, 8-12. The fact that Allen—a 143-page reference—describes elsewhere certain methods of streaming does not teach away from modifying Ogdon's system to include Allen's Background teachings of encoding video into different bitrates. Second, Dr. Jeffay and Patent Owner mischaracterize Allen to manufacture a teaching away argument. They assert that Allen teaches only "a single-bitrate approach," but this is not so. POR, 30-32. Allen's system still encodes video into multiple streams and bitrates but moves the encoding process to the "edge" servers that are closest to users, instead of at servers near the video source. EX1005, 24:19-25:23. According to Allen, edge servers know the network characteristics of users and can encode to appropriate bitrates for

users better than encoding at the video source. *Id*., 99:23-24. This does not change the fact that Allen teaches a multiple-bitrate approach. And a POSITA would have no problem combining Allen's teachings with Ogdon because Ogdon already has the "intelligence" for bandwidth selection on the end user client. *E.g.*, EX1004, 6:14-15, 22:10-29, 24:44-45, FIGs. 2C (524) and 2D (544).

I. Ogdon teaches a plurality of web servers retrieving streamlets from the storage device as claimed.

63. Dr. Jeffay and Patent Owner argue with respect to dependent claim 6 that Ogdon fails to teach "a plurality of web servers" retrieving streamlets from "the [] storage device," claiming that different web servers must retrieve the content from "the same central storage device." POR, 45-46; EX2006, ¶¶138-140. Further, Dr. Jeffay and Patent Owner try to read the unclaimed "proxy cache" feature into the claim, asserting that content must be cached at a plurality of remote proxy cache servers. POR, 46; EX2006, ¶139. This is wrong and contrary to the claim language. First, Dr. Jeffay and Patent Owner cite only to a portion of the '138 Patent specification that says content "***may*** be replicated to other web servers 116 or alternatively to proxy cache servers 118" (EX1001, 7:1-3). Second, the words "central storage" and "proxy cache" do not appear anywhere in the claims. Instead, independent claim 1 simply requires "***at least one*** storage device" and claim 6 requires that a "plurality of web servers" "retrieve from the ***at least one*** storage

device." EX1001, claims 1, 6. A POSITA considering this context would understand that claim 6 clearly contemplates a plurality of web servers retrieving streamlets from one or more storage devices, and there is no requirement that streamlets be retrieved from the "the same central storage device." POR, 45-46. Ogdon clearly teaches at least the option described in the '138 Patent of the content being "replicated to other webservers." *E.g.*, EX1004, 22:55-64. Patent Owner and Dr. Jeffay do not dispute this.

64. But regardless, Ogdon also teaches a plurality of servers each pulling from the same central storage device. EX1004, claim 31 (describing multiple servers retrieving segments from a common central storage: "storing a plurality of segments … said segments are network accessible from ***one*** or more content supplying network nodes"); *see also id.*, 5:53-65 (describing web servers retrieving segments from a network server in a virtual server collection). Thus, Ogdon teaches claim 6 even under Dr. Jeffay and Patent Owner's incorrect reading.

J. Ogdon teaches a "virtual timeline" that is requested by a client in at least a similar manner and level of detail as described in the '138 Patent.

65. Dr. Jeffay and Patent Owner argue that "virtual timeline" should just mean a "playlist,"[5] but argues that Ogdon fails to disclose a "virtual timeline" being ***requested*** by a client because the clients do not request the "scripts" in Ogdon. POR, 10. DISH argues the host in Ogdon requests the scripts from the content manager server before providing them to the client node. POR, 39. But Ogdon teaches a client request for a virtual timeline in at least the same level of detail as the '138 Patent.

66. Specifically, the '138 Patent does not disclose how a client makes a virtual timeline request. EX1001, 12:31-13:2. Nor does the '138 Patent explain whether the "virtual timeline" is stored on any server or even transmitted to the client. *Id.* The only potential description for a "request" for a virtual timeline from the client is the establishment of a connection between the client and server. EX1001, 14:7-15:28. Dr. Jeffay testified that no description was necessary because it would have been "incredibly straightforward" for a POSITA to configure "a web

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[5] To the extent the Board construes "virtual timeline" as requiring a playlist of entire content files, SMIL 2.0 teaches this limitation as set forth in the petition. Pet., 59. Dr. Jeffay and Patent Owner do not counter those teachings of SMIL 2.0.

server configured to receive a virtual timeline request over an internet connection from one or more end user stations." EX1030, 253:10-23. Ogdon teaches the same architecture and thus a client request for a virtual timeline according to the claims are also taught by Ogdon according to Dr. Jeffay's own testimony because based on the disclosures of Ogdon a POSITA would readily understand this to be a client request for a virtual timeline and find it "incredibly straightforward."

67. Ogdon describes a client "connecting" with a host (a server) and/or content manager 104 (also a server), providing presentation identification information, and, in response, receiving the virtual timeline (*i.e.*, the script or list of available segments based on the script) from the host via the content manger. Specifically, Ogdon's client software "access[es] the host 200 thorough its network 70 address and present[s] the correct presentation identification." EX1004, 16:45-48. Then, the content manager uses the presentation identification "for retrieving the presentation script(s) … [and] returning the presentation script(s) to the host." EX1004, 18:47-51. The host in turn "transmit[s] commands" to the client to "assure timely caching of this next collection of segments for timely performance." EX1004, 21:59-63. Therefore, the script "commands" are no different from a "virtual timeline" according to DISH's interpretation; and the client requests this "virtual timeline" in the same way as the '138 Patent describes by connecting to

servers and sending a "presentation performance identifier"—which is used as a catalyst for sending the appropriate script commands to the clients. Pet., 38-41. A POSITA would have understood Ogdon's clients to "request" a virtual timeline (script commands) as recited by the claims of the '138 Patent as read in light of the '138 Patent's specification.

68. And when asked on cross-examination about the '138 Patent's lack of disclosure, Dr. Jeffay testified that no description was necessary because it would have been "incredibly straightforward" for a POSITA to configure "a web server configured to receive a virtual timeline request over an internet connection from one or more end user stations." EX1030, 253:10-23. Dr. Jeffay also agreed that Ogdon's "host" was a server that "send[s] the virtual timeline" to the client. EX1030, 250:3-8. Thus, since Ogdon discloses a similar architecture with respect to establishing a connection between a client and server, it follows that Ogdon also teaches a client requesting, at least indirectly, the virtual timeline from the server in the same way the '138 Patent describes. Alternatively, following the testimony of Dr. Jeffay, modifying Ogdon to have the client request the "virtual timeline" directly instead of the host would have been "incredibly straightforward" and obvious.

K. SMIL 2.0 also teaches making corresponding interchangeable and replaceable portions or segments precisely the same duration.

69. As explained above, Ogdon teaches streamlets of the same duration. *See* Section V.F. But even if Ogdon's alternative segments are not precisely the same duration (*e.g.*, 5 seconds), SMIL teaches using the "dur" element to ensure that all interchangeable alternatives of a media are precisely the same duration. Pet., 56-58. Dr. Jeffay and Patent Owner cannot and do not counter this point. Instead, they points to other disclosures in SMIL to distract by making irrelevant arguments (POR, 47-51), but those do nothing to undermine SMIL's "dur" teaching.

L. Patent Owner's evidence of secondary considerations fail to show non-obviousness.

70. Patent Owner's evidence of secondary considerations fails to demonstrate non-obviousness at least because: (1) the MOVE player does not have a nexus to the claims and (2) even if the MOVE player did have a nexus to the claims, the secondary considerations evidence does not overcome the strong showing of obviousness here.

1. There is no nexus between the MOVE player and the claims.

71. As I noted in Section II, I understand that the required "nexus" for secondary considerations evidence can be demonstrated either through a

presumption, where the evidence is tied to a specific product and that product embodies and is coextensive with the claimed features, or by showing that the evidence of secondary considerations results from the unique characteristics of the claimed invention as a whole. Dr. Jeffay and Patent Owner contend that the MOVE system's MOVE Player "embodies the limitations present in the challenged claims" (EX2006, ¶¶164-181 (citing EX2062, EX2012, EX2010)), and that "the features claimed in the challenged claims that impact the performance of the streaming system, and that led to the inventive aspects of the challenged claims, are present in the Move Networks system (*id.*, ¶181 (citing EX2062, EX2010)).[6] Dr. Jeffay provides a claim chart (EX2062) that purports to map the MOVE player to claim 14 of the '138 Patent to show that the MOVE player is coextensive with claim 14.

72. I understand that a nexus cannot be established if the evidence of secondary considerations relates to unclaimed features or features available in the prior art. I understand that this is particularly so where the evidence of secondary

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[6] Dr. Jeffay and Patent Owner do not allege that any other player or system is coextensive with the claims. To the extent Dr. Jeffay and Patent Owner make arguments about other players such as Sling TV or ABC, it is not clear but it appears that Dr. Jeffay and Patent Owner are arguing that the MOVE player was somehow incorporated into these other systems.

considerations relates to a critical unclaimed feature that is claimed by a different patent and that materially impacts the product's functionality.

73. Here, the MOVE player includes at least one such "critical unclaimed feature"—using multiple parallel TCP connections for requesting streamlets in parallel.[7] MOVE's internal documents describe this feature as the "secret" to the MOVE player, and it is not even claimed in the '138 Patent. EX2011, 4 ("The secret lies in our use of multiple TCP connections" whereas "[o]ther streaming solutions use a single connection"); EX2059, 11. I also understand that Mr. Major agreed this feature of multiple TCP connections for parallel retrieval was "important" and "was something that improves it significantly." EX1021, 75:24-76:4. The '138 Patent dubs this feature "virtual pipelining" and hails it as "an innovation of the present invention" because "delay in or complete failure of one response does not affect transmission of other responses because each response occupies an independent TCP connection." EX1001, 15:10-28.

74. In my opinion, the fact that the claims in the '138 Patent omit this critical feature, which is the "secret" to the MOVE player as compared to other

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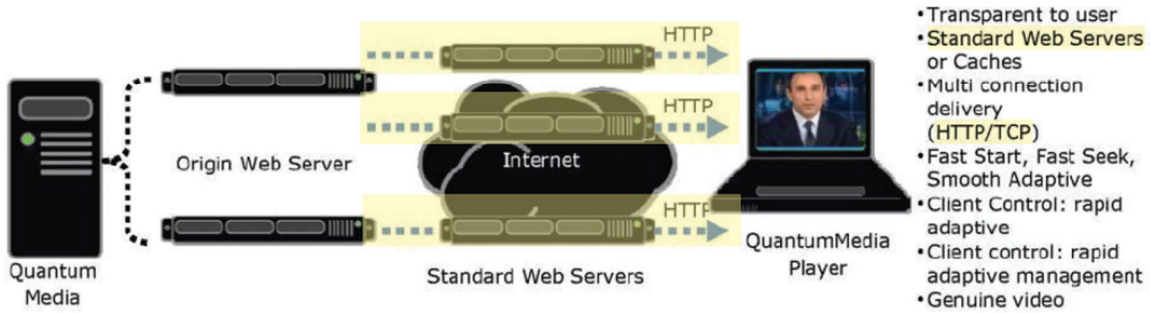
[7] Multiple parallel TCP connections is claimed in another one of DISH's patents, U.S. Patent No. 10,225,304. EX1027.

players that use a single connection (EX2011, 4) alone is enough to show that the MOVE player and system are not coextensive with the claims and that there is no nexus between the MOVE player and the claims of the ’138 Patent. Dr. Jeffay and Patent Owner have not (and cannot) show that its alleged secondary considerations evidence is not tied to this critical unclaimed feature—which Dr. Jeffay admittedly has not considered could have contributed to secondary considerations evidence and which Move itself thought was the “secret” to its success. EX1030, 268:17-23.

75. In addition to multiple parallel TCP connections, the MOVE player includes other critical unclaimed features including using HTTP and using standard web servers (*i.e.*, no specialized media servers) showing that the MOVE player is not coextensive with the claims. Dr. Jeffay’s own illustration shows the many unclaimed features of the MOVE player (including multiple parallel TCP connections):

Further, MOVE's Media Player automatically placed a streamlet request using a HTTP GET request for each streamlet over one or more network connections to the stream to retrieve a streamlet/file for the selected stream, and the HTTP GET requests identify the selected streamlet, and the requested streamlets are received from the server. *See e.g.*, EX2012; 2011.

To playback the video normally, the Move Media Player requests sequential files/streamlets from one of the copies from the video server based on the time indexes. *See e.g.*, EX2012; 2011. For example, the Move system provides for "[s]imple HTTP protocol transfer of media files from standard Web servers rather than deployment of expensive media servers." EX2012 at 22. This is further illustrated in the figure below.



EX2062, 3 (citing EX2012, 22) (annotated).

76. In my opinion, since none of these critical features of the MOVE player are claimed in the '138 Patent, there is no presumption of a nexus and, even if DISH were entitled to a rebuttable presumption of a nexus, that these critical unclaimed features exist and may account for the secondary considerations evidence the presumption has been rebutted.

77. Dr. Jeffay and Patent Owner also provide brief conclusory arguments that that "unique characteristics" of "actively adjusting . . . video quality to the bandwidth available" and "delivering 'pieces of content progressively'" are sufficient to find a nexus. POR, 53-54. But these features were already in the prior art and I understand that features that were already in the prior art cannot be used to

show a nexus because there must be a nexus to some aspect of the claims that is not already in the prior art.

78. All of Dr. Jeffay's and Patent Owner's alleged unique characteristics were already in the prior art. For example, Ogdon discloses actively adjusting video quality to the bandwidth available and delivering pieces of content progressively. EX1004, 3:38-41, 2:10-23. Additionally, another prior art reference I mentioned above in Section IV.B, Leaning, also discloses actively adjusting video quality to the bandwidth available and delivering pieces of content progressively. *E.g.*, EX1024, Abstract, 1:12-19, 5:4-6:2, 8:6-11:1. In fact, Leaning teaches not only these alleged unique characteristics, but essentially every limitation of the challenged claims including claim 14. Below I provide an exemplary claim chart of Leaning against the limitations of claim 14 to further show that all aspects of claim 14 were in the prior art and thus there cannot even be any nexus because there is nothing claimed that was not already in the prior art.

Claim 14 of the '138 Patent	**Leaning**
14[Pre]: "An end user station to stream a video over a network from a server for playback of the video, the end user station comprising:"	EX1024, Abstract ("Delivery of recorded audio or video material over a telecommunications link (2) **from a server (1) to a terminal** (3) . . . Provision may be made for **switching** between alternative sub-file sets representing alternative delivery modes of data rates."), 1:3-29, 2:9-10 ("the network is the **internet** or other packet network operating . . ."), 6:13-15 ("the server stores **two or more versions** of the recording,

	recorded at **different compression rates** … and the player program is able to **switch automatically between them**.”), 16:6-12 (“The **same principle** may be applied to the delivery of **video recordings**. . . the file is a video file (e.g. in H.261 or MPEG format) and the player program incorporates a video decoder. The manner of partitioning the file into sub-files is unchanged. As in the audio case, there may be **two or more recordings corresponding to different data rates, selected by the control mechanism already described**.”), claim 4, FIG. 1.
14[A]: “a processor;”	EX1024, 2:15-19, 4:4-15 (“Thus Figure 2 shows such a terminal with a **central processor 30**”), FIG. 2
14[B]: “a digital processing apparatus memory device comprising non-transitory machine-readable instructions that, when executed, cause the processor to:”	EX1024, 4:4-15 (“Thus Figure 2 shows such a terminal with a **central processor 30**, **memory 31**, . . . In the disk store are programs which may be retrieved into the memory 31 for **execution by the processor 30, in the usual manner**.”), FIG. 2.
14[C][1]: “establish an internet connection between the end user station and the server,”	EX1024, 2:15-16 (“server 1 is connected via the internet 2 to user terminals 3”), 4:4-15 (“Thus Figure 2 shows such a terminal with a central processor 30, memory 31, a disk store 32, a keyboard 33, video display 34, **communications interface 35**), FIGs. 1-2.
14[C][2]: “wherein the server is configured to access at least one of a plurality of groups of streamlets;”	EX1024, 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.”).
14[C][3]: “wherein the video is encoded at a plurality of different bitrates to create a plurality of streams including at least a low quality stream, a medium quality stream, and a high quality stream,”	EX1024, 6:13-26 (“the server stores two or more versions of the recording, recorded at **different compression rates** (for example at compressions corresponding to (continuous) data rates of **8, 16, 24 and 32 kbit/s respectively**) . . . loaded onto the server in separate directories corresponding to the different rate, as in the following example structure, where ‘008k’, ‘024k’ in the directory name indicates a rate of 8 kbit/s or 24 kbit/s and so on.”), 9:3-7, 16:6-12 (“The **same principle** may be applied to the delivery of **video recordings**. . . the file is a video file (e.g. in H.261 or MPEG format) and the player program incorporates a video decoder. The manner of partitioning the file into sub-files is unchanged. As in the audio case, there may be **two or more recordings corresponding to different data rates, selected by the control mechanism already described**.”), claim 4.
14[C][4]: “each of the low quality stream, the medium quality stream, and the high quality stream comprising a group of streamlets encoded at the same respective one of the different bitrates, each group comprising at least first and second streamlets, each of the streamlets corresponding to a portion of the video;”	EX1024, Abstract (“dividing the material into a **sequence of sub-files** each of which is independently requested by the terminal . . . switching between **alternative sub-file sets** representing **alternative delivery modes of data rates**.”), 1:3-29 (“there is provided a terminal for playing audio or video material which is stored on a remote server as a **set of files representing successive temporal portions** of the said material . . . the invention provides a method of transmitting digitally coded audio or video material comprising: **partitioning the material into a plurality of discrete files each representing successive temporal portions of the said material**; storing the files at a first station; and at a second station - a) transmitting to the first station requests for successive respective ones of the files; b) receiving the files; and c) decoding the files for replay of the material.”), 3:5-22 (“the file **is divided into smaller files** before being stored on the server 1. We prefer that each of these smaller files is of a size corresponding to a fixed playing time, perhaps four seconds. . . . divided into **135 smaller files** each representing four seconds’ playing time. In this example these are given file

	names which include a serial number indicative of their sequence in the original file, for example: **000000.bin 000001.bin** 000002.bin 000003.bin. . .000134.bin. . . . 'sub-files' is used here to distinguish them from the original file containing the whole recording: it should however be emphasised that, as far as the server is concerned, each sub-file' is just a file like any other file)."), 5:4-6:8, 6:21-7:7 (describing the same set of 135 sub-files (000000.bin, 000001.bin, 000002.bin. . . 000134.bin) each encoded at a different bitrate including low, medium, and high quality (8k, 16k, 18k, 24k, and 32k) and listed in an index file and saved in the directory appropriate for their bitrates), claims 1 and 11; *see also id.*, 12:8-34, 13:23-14:19, FIG. 4.
14[C][5]: "wherein at least one of the low quality stream, the medium quality stream, and the high quality stream is encoded at a bitrate of no less than 600 kbps; and"	EX1024, 16:6-10, 18:18-27 (describing a video "mpg" with each set of subfiles encoded at 96k and at 128k). While Leaning does not explicitly teach encoding to no less that 600 kbps, it would have been obvious to a POSITA to encode the high quality to no less than 600 kbps given Leanings examples of 96 kbps and 128 kbps videos. *Id.* Further, there can be no dispute that encoding to, for example, 600 kbps was in the prior art. *E.g.*, EX1005, 12:1-5.
14[C][6]: "wherein the first streamlets of each of the low quality stream, the medium quality stream and the high quality stream each has an equal playback duration and each of the first streamlets encodes the same portion of the video at a different one of the different bitrates;"	EX1024, Abstract, 1:3-29, 3:5-18 ("the file is divided into smaller files before being stored on the server 1. **We prefer that each of these smaller files is of a size corresponding to a fixed playing time, perhaps four seconds**. With a compressed format such as MP3 this may mean that the files will be of different sizes in terms of the number of bits they actually contain. Thus the Bach file of 9 minutes duration would be **divided into 135 smaller files each representing four seconds' playing time**"), 5:4-6:8, 6:21-7:1 (describing the same set of 135 sub-files (000000.bin (first subfile), 000001.bin (second subfile), 000002.bin. . . 000134.bin) each encoded at a different bitrate including low, medium, and high quality (8k, 16k, 18k, 24k, and 32k) and listed in an index file and saved in the directory appropriate for their bitrates), 7:1-2 ("Note that because the length of a sub-file corresponds, as explained earlier, to a **fixed length of time**, the **number of**

	sub-files is the same for each directory.”), 12:8-20 (“It is of interest to discuss further the process of partitioning the original file into sub-files. . . . there is no expectation that a sub-file will be followed by a sub-file other than that which immediately follows it in the original sequence . . . the sub-file size can be a fixed number of bits, or a fixed playing time length (or neither of these) . . . In the case of rate switching, it is, if not actually essential, **highly desirable that the sub-file boundaries are the same for each rate**, so that the **first sub-file received for a new rate continues from the same point in the recording that the last sub-file at the old rate ended**. To arrange that every sub-file should represent the same fixed time period (e.g. the **4 seconds** mentioned above) is not the only way of achieving this, but it is certainly the most convenient.”).
14[D]: “select a specific one of the low quality stream, the medium quality stream, and the high quality stream based upon a determination by the end user station to select a higher or lower bitrate version of the streams;”	EX1024, Abstract, 6:9-7:3 (describing creating subfile sets at different bitrates for a requesting terminal), 8:6-11:1 (“Initially the player program will begin by requesting, from the directory specified in the link file, the index file, and stores locally a list of available data rates for future reference. . . . It then begins to request the audio sub-files as described earlier, from the first-mentioned ‘rate’ directory in the index file - viz. 024k_ll_s . . . The process from then on is that the player program measures the actual data rate being received from the server, averaged over a period of time (for example 30 seconds). It does this by timing every URL request; the transfer rate achieved (number of bits per second) between the client and server is determined. . . . The actual rate change is effected simply by the player program changing the relevant part of the sub-file address for example, changing ‘008k’ to ‘024k’ to increase the data rate from 8 to 24 kbit/s, and changing the current rate parameter to match. As a result**, the next request to the server becomes a request for the higher (or lower) rate**, and the sub-file from the new directory is received, decoded and entered into the buffer.”), Claims 1, 4, 5, 6, 11, 12, 16 (“effecting mode switching by providing that **subsequent request messages shall request files from a set**

	different from the set to which the immediately preceding request related"), 17 ("in the event that the measured rate is below that needed for the set to which the currently requested field belongs, performing mode switching to provide that subsequent said request messages shall request files from a set corresponding to a **lower data rate**"), and 18 ("in the event that the measured rate is sufficient to support delivery of files of a higher data rate than that of the set to which the currently requested file belongs, performing mode switching to provide that subsequent said request messages shall request files from a set corresponding to a **higher data rate**").
14[E]: "place a streamlet request to the server over the internet connection for the first streamlet of the selected stream;"	EX1024, 5:4-6:2 ("The player program, having received the URL, adds to this the filename of the first sub-file, to produce a complete address for the sub-file - i.e. www.serverl.com/mp3_bwv565/000000.bin. . . . The program **constructs a request message for the file having this URL and transmits it to the server 1** via the communications interface 35 and the internet 2. . . We envisage that the **player program would send the requests** directly to the communications interface, rather than via the browser. The server responds by transmitting the required sub-file. . . . The player program increments the filename to 000001.bin and requests, receives, decodes and stores this second sub-file as described in (4) and (5) above. . . . This process is repeated until a 'file not found error' is returned.")
14[F]: "receive the requested first streamlet from the server via the internet connection; and provide the received first streamlet for playback of the video."	EX1024, 1:27-28 ("receiving the files; and decoding the files for replay of the material"), 4:4-21, 5:23-6:2, claim 1.

79. Moreover, every "unique characteristic" DISH relies on here to support nexus was identified by Dr. Jeffay in prior art references he relied on in other IPRs

to invalidate streaming patents on behalf of petitioners. EX1020 ¶68 (client "request or pull"), ¶¶75-76 ("standard HTTP Web server"), ¶78 ("pull system for a streaming media server"); ¶87 ("data stream … divided … into a sequence of slices" and "encoded in a corresponding sequence of files, each file having a respective index"); ¶156 ("HTTP Get request"); EX1023 ¶51 ("encoding a video stream at various bitrates and selecting an appropriate stream for delivery to the end user based on current bandwidth availability on the network to the receiving device"); ¶¶60-61 (using HTTP to "transit firewalls").

80. Thus, it is my opinion that Patent Owner is not entitled to a presumption of a nexus between the MOVE system and player because the MOVE system and player are not coextensive with the claims and Patent Owner has not otherwise shown a nexus between the MOVE system and player and the claims of the '138 Patent.

2. Even if there were a nexus, Patent Owner's evidence of secondary considerations does not overcome the strong showing of obviousness set forth here.

81. I understand that even if a nexus is established, secondary considerations cannot overcome a strong prima facie case of obviousness. Such a strong prima facie case of obviousness exists here as I set forth in my First Declaration and above. *See* EX1003; Sections V.A-K.

82. Here, Dr. Jeffay and Patent Owner have failed to tie any of the secondary considerations evidence to any of the alleged "unique characteristics." EX2006, ¶¶182-245; POR, 54-65. And as explained above, such evidence cannot be tied to any "unique characteristics" from the claims because all aspects of the claims were already in the prior art. Section V.L.1. In fact, much of what Dr. Jeffay points to for secondary considerations is not tied to the claims because what he points to does not even exist in the claims of the '138 Patent. *E.g.*, EX2006, ¶¶183 (no "special media servers"), 184 (using "standard asynchronous HTTP communication requests"), 185 ("load quickly (fast start)"; "standard HTTP web servers"; "HTTP requests"; and "full-screen HD"), 186 ("same time index"; "standard web servers"), 187 ("same time index"), 188 ("standard HTTP servers").

83. Any supposed long-felt need, surprising results, or commercial success was simply a result of the improved bandwidth available on the Internet that reduced the cost and made video streaming over the Internet more prevalent. As I explained above in Section IV with respect to the true state of the art at the time of the invention, the meteoric rise of video streaming in the mid-1990s was due to the adoption of interoperability standards and availability of low-cost, large-scale solid state memory—not the '138 Patent. Indeed, the evidence provided by Dr. Jeffay and Patent Owner shows that MOVE was not a commercial success and that Microsoft

and Apple released their own adaptive bitrate streaming solutions, which pushed MOVE toward the brink of extinction. (EX2015, EX2052). Tellingly, Move never sued Microsoft or Apple for patent infringement undermining any allegations of "copying."

84. Therefore, it is my opinion that even if Dr. Jeffay and Patent Owner had established a nexus (they did not and cannot), the evidence provided for secondary considerations cannot overcome the strong prima facie case of obviousness put forth in the Petition, the Petitioner Reply, my First Declaration, and this Supplemental Declaration.

VI. CONCLUSION

85. In my opinion, and for the reasons provided above, the Challenged Claims are obvious over at least Ogdon in view of Allen or Ogdon in view of Allen and SMIL 2.0 combinations.

86. I declare that all statements made in this declaration regarding my personal knowledge are true and accurate, and that all statements made on information and belief are believed to be true. Further, I understand that these statements were made with the knowledge that willful false statements and the like are punishable by fine, imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Henry Houh

Executed on October 7, 2024.