

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AYLO FREESITES LTD,
Petitioner

v.

DISH TECHNOLOGIES L.L.C.,
Patent Owner

U.S. Patent 11,991,234

Issue Date: May 21, 2024

Title: APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE
CONTENT STREAMING

Inter Partes Review No. IPR2024-00940

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

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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. 11,991,234 (“’234 Patent”) (EX1001) and to provide my opinions regarding the patentability of claims 1-20 of the ’234 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 ’234 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 this IPR proceeding including in EX2141 (“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 (EX2129). 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.” EX2141, ¶¶55-57. 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 cited Deposition Transcripts of Dr. Jeffay and Patent Owner’s declarants including lead inventor Mr. Major, and the Patent Owner’s Response and the

Exhibits cited therein. I also considered the '234 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. EX2141, ¶¶58-59. But Dr. Jeffay's opinions that Leaning does not teach the "to achieve continuous presentation" limitation appears to rest upon interpreting "to achieve continuous presentation" to mean there can be no disruption during playback. *E.g.*, EX2141, ¶¶61-83. Dr. Jeffay is incorrect. A POSITA would understand the language "to achieve continuous presentation" to be at most an aspirational goal given the nature of network connections and streaming, which inherently involves imperfect connections and conditions and therefore imperfect playback. Actually achieving uninterrupted, continuous playback is not required.

IV. DR. JEFFAY MISCHARACTERIZES MY OPINIONS AND THE TEACHINGS OF LEANING

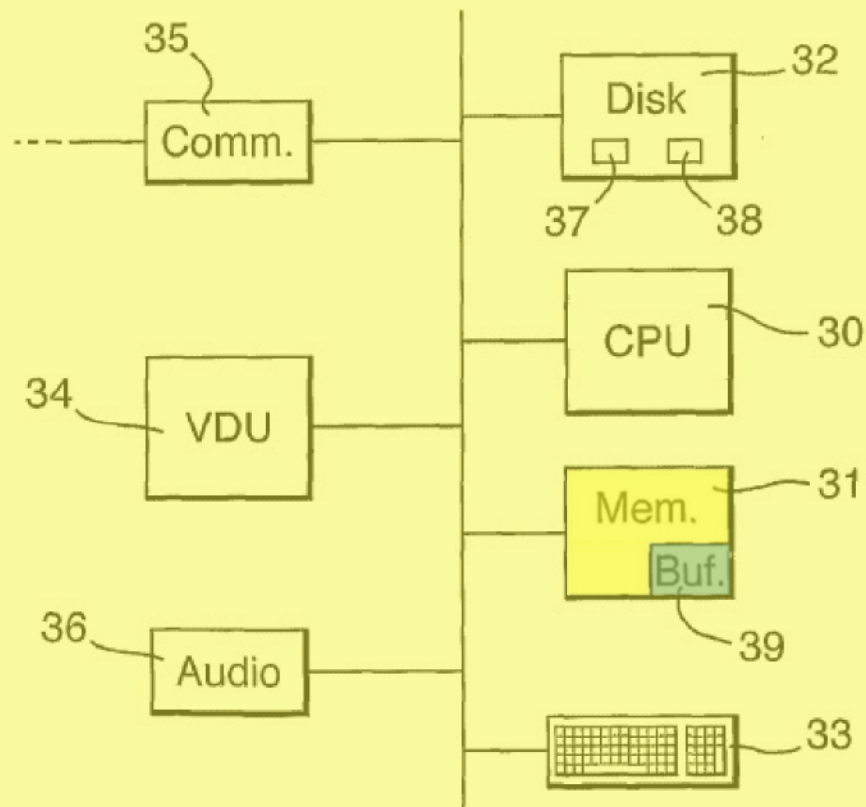
A. Leaning's "Clear Buffer" Step in the Flowchart of Leaning Is Optional and Relates to Audio Streaming Using Old Sound Cards

13. Dr. Jeffay focuses almost exclusively on the "clear buffer" in Leaning's exemplary flowchart and ignores all of Leaning's other teachings. *E.g.*, EX2141, ¶¶47-51. But the flowchart example in Leaning relates to a specific audio streaming situation when needing to reset old sound cards from the 1990s. Leaning explains that "[m]any *conventional sound cards*, although capable of operation at a range of different settings, require re-setting in order to change sampling rate, and necessarily this causes an interruption in its audio output." EX1004, 14:25-29 (emphasis added). A POSITA reading the flowchart in Leaning in context would have understood that clearing the buffer is only applicable to an audio example where you are using a conventional sound card that requires re-setting. I testified that "a person of ordinary skill in this would recognize part of the reason for clearing the buffer is that the card is being reset." EX2129, 97:6-9. There are several reasons that these old conventional sound cards needed to be reset and the buffer "cleared" when changing the sampling rate. For example, these conventional sound cards often had fixed internal clocks and digital-to-analog converters ("DAC")/analog-to-digital converters ("ADC") that were designed to operate a specific fixed clock speed.

When you changed the sampling rate, you were telling the sound card to process the audio at a different speed and this often required reconfiguring the internal clock and DAC/ADC circuitry.

14. As an initial matter, I note that a POSITA would not necessarily have considered the phrase “clear buffer” in Leaning to mean only “delete everything in the buffer and throw it away without playing it.” A POSITA would have considered this to be an extreme and wasteful measure. In context, a POSITA considering Leaning would have appreciated that “clear buffer” could include simply to play out what is already in the buffer (i.e., let the buffer “clear” by playing out all the sub-files therein), then reset the sound card if necessary, and when the buffer is empty place the next sub-file in the buffer and continue playback uninterrupted. Under these circumstances Leaning’s player program would request, receive, and decode the sub-files in some working memory (e.g., somewhere in Leaning’s Memory 31) while letting the buffer “clear” by playing back buffered sub-files before resetting the sound card and copying these decoded sub-files from the working memory into the buffer to continue playback uninterrupted without throwing away and wasting data.

Fig.2.



EX1004 (annotated, showing memory 31 (yellow) as more than simply the buffer memory 39 (blue)).

15. But regardless, by the early 2000s, sound cards and audio interfaces became far more capable of handling changes in sampling rates, often employing hardware sample rate converters that allow for seamless switching without the need for a full reset thanks to advancements in digital-to-analog and analog-to-digital

converters that made them more flexible and tolerant of clock changes, reducing the need for hard resets.

16. Even aside from the above, Leaning explicitly teaches solutions that do not require “clearing” the buffer even when using these old sound cards.

[T]he sound card could be *run continuously at the highest sampling rate envisaged*. When the player program is supplying, *to the buffer*, data at a lower sampling rate, this data is then *up-sampled to this highest rate before or after the buffer*. Similarly, if the card is always operated in stereo mode, decoded mono signals can be fed in parallel so feed both the left and right channels of the sound card input.

EX1004, 14:29-33.

17. By running the sound card at the highest sampling rate possible and up-sampling sub-files to that rate before or after buffering, there is no need to reset the sound card and no need to clear the buffer.

18. As I explained during my deposition regarding my First Declaration, “a POSITA would understand that in the instance where the sound card does not need to be reset there would be no need to clear the buffer.” EX2129, 95:19-97:23. There are examples in Leaning where clearing the buffer is explicitly not required. For example, Dr. Jeffay cites the “clear buffer” step for “jump” in Leaning’s flowchart alleging that the requirement to clear the buffer for jumps “remains unchanged throughout [Leaning’s] disclosure” such that “the buffer is cleared (*i.e.*, emptied, flushed, erased, *etc.*) **every time** a rate shift or ‘jump’ is performed.” EX2141, ¶49

(citing EX1004, 10-4) (emphasis in original). But Dr. Jeffay is mistaken. Leaning teaches that “[w]e *prefer*, in the case of the jump, to suspend decoding and clear the buffer so that the new request is sent immediately, *but this is not actually essential*.” EX1004, 11:19-20 (emphasis added); *see also id.*, 18:22 (“[O]ne would probably *choose* to clear the buffer”) (emphasis added). Dr. Jeffay agreed during cross-examination that when Leaning states that something is “not essential, Leaning is teaching that it is not required.” EX1023, 59:8-13. Dr. Jeffay also admitted that, even though Leaning’s flowchart shows “clear buffer” after the Jump command, Leaning elsewhere says “clearing the buffer after a jump command is not actually essential.” EX1023, 74:3-76:15. Thus, a POSITA considering these disclosures of Leaning would understand that clearing the buffer is not even required in the flowchart example cited by Dr. Jeffay.

B. Leaning Teaches Video Streaming Without Clearing the Buffer

19. In addition to the above, which is in the context of audio streaming, Leaning also teaches a video streaming solution **where clearing the buffer is not required upon rate switching**. Specifically, Leaning explains that “[t]he same [audio] principle may be applied to the delivery of video recordings . . . [where] the system differs from the audio version only in that the file is a video file (e.g. in H.261 or *MPEG* format) and the *player program incorporates a video decoder*” but “[t]he

manner of partitioning the file into sub-files is unchanged.” EX1004, 16:6-10; *see also id.*, 16:17-23 (explaining that each video sub-file should begin with an I-frame to avoid decoding errors when rate-switching between copies). A POSITA would understand that video such as MPEG would have been decoded using software incorporated into the player program. Thus, it would not make sense to clear the buffer because there would be no video card that required re-setting and no interruptions upon rate switching since every sub-file begins with an independently decodable I-frame.

20. Dr. Jeffay asserts that Leaning’s video embodiments would require video cards “for decompression and display” of video “which also would have needed to be cleared and reset in order to decode video.” EX2141, ¶¶ 89-90. This is not true, as explained above, but even if Dr. Jeffay were correct, the same teachings from Leaning about running an audio card at the highest sampling rate and up-sampling would apply equally to video cards. Section IV.A; EX1004, 16:6-7 (“The same principle may be applied to the delivery of video recordings.”)

C. Leaning Does Not Result in Temporal or Content-Based Discontinuities

21. Dr. Jeffay mischaracterizes Leaning to argue that Leaning requires clearing the buffer. First, Dr. Jeffay argues Leaning has “temporal discontinuities” because “playout time” T_P is allegedly set at 10 seconds “in Leaning’s only example”

and, after a rate shift, Leaning clears the buffer and “halts audio playback . . . until there is another 10 seconds of content” in the buffer. *E.g.* EX2141, ¶¶78-83. I disagree. Leaning teaches that “*typically*” the playout time T_P “*might* be 10 seconds.” EX1004, 4:16-18 (emphases added); *see also id.*, 5:20-21 (only “[i]n this *example* it is set at 10 seconds”) (emphasis added). Leaning discloses that sub-file size could be “between 30% and 130% of the playout time” (EX1004, 12:33-34), and T_P “could be made user-selectable, if desired” (*id.*, 5:20-21). Dr. Jeffay agreed that “the 10-second value is just an example” EX1023, 55:18-56:3), and that “ T_P is not limited to 10 seconds” (*id.*, 61:2-6).

22. Leaning thus teaches examples where the duration of a sub-file is *equal to or greater than* the playout time, e.g., $T_P \sim 3$ seconds for 4-second sub-files, or where T_P time can be user-selectable. Dr. Jeffay testified that he “[did not] see any issue with” the duration of the sub-file being equal to T_P , e.g., $T_P = 4$ seconds for 4-second sub-files. EX1023, 65:18-66:5. In these examples, there would be no temporal discontinuities because—even if the buffer were cleared—the next sub-file would begin playing immediately without waiting for the buffer to fill under sufficient network conditions.

23. Dr. Jeffay relies heavily on the sentence from Leaning stating if “the buffer becomes empty, the player program simply *ceases playing until further data*

arrives.” EX2141, ¶50 (quoting EX1004, 6:3-4) (emphasis in original). But on its face this sentence describes an embodiment of Leaning that did not provide for rate switching. Indeed, just a few sentences later, Leaning explains that “the system described above” does not “offer any remedy for the possibility of buffer underflow (due for example to network congestion). Therefore a second, more sophisticated embodiment of the invention, now to be described, offers the following further features.” EX1004, 8-28. Leaning goes on to describe the rate shifting embodiment relied upon in the Petition that explicitly seeks to provide such a remedy to avoid buffer underflow due to network congestion. *Id.* Any POSITA would have known that when a buffer runs dry the player has to stop playing—this is precisely why Leaning describes ways to implement its teachings to “anticipate[buffer] underflow and avoid[] it in the majority of cases.” EX1004, 15:3-6.

24. Dr. Jeffay also argues Leaning has “content-based discontinuities” because when the buffer is cleared, “any sub-files stored in the buffer at the time the rate shift occurs will be skipped because they are removed from the buffer and not requested,” and Leaning allegedly requests the next sub-file without accounting for the sub-files purged from the buffer. *E.g.* EX2141, ¶¶78-83. This incorrectly assumes that clearing the buffer is required, which it is not as discussed above. Indeed, Leaning expressly teaches: “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.*” EX1004, 12:16-18. DISH also incorrectly assumes that T_P must be set to 10 seconds, or to a time that is greater than the duration of a sub-file. As mentioned above, T_P could be set to equal to or less than the duration of sub-files in which case there would be no content-based discontinuities because even if the buffer is “cleared,”¹ the next subfile in sequence would be requested and played back.

V. LEANING TEACHES “ARRANGING” SUB-FILES

25. Dr. Jeffay’s only argument against claim 1, which he also asserts applies to claim 12, is that Leaning does not teach “arranging” sub-files. EX2141, ¶¶117-121. But the claims only require “arranging the [streamlets/individually-requestable portions] requested from the at least one server in order of ascending presentation time.” EX1001, claims 1, 12. That is precisely what Leaning does. Dr. Jeffay’s opinion as to what this “arranging” limitation requires that is not taught by

¹ As I explained above, a POSITA would have reasonably understood “clearing” the buffer to include simply letting the sub-files already in the buffer play out rather than deleting already downloaded and decoded sub-files.

Leaning is unclear. For example, Dr. Jeffay admits that Leaning “describes *requesting sub-files individually*, one-at-a-time in a predefined sequence” which “creates a scenario where the sub-files are simply stored and played back in the order in which they are received.” EX2141, ¶120 (emphasis added). Dr. Jeffay makes the conclusory allegation that Leaning “*teaches away* from sequentially arranging sub-files at its user terminal” because each sub-file is received in its “original sequence.” EX2141, ¶121 (emphasis in original). But this is wrong. Leaning discloses, as Dr. Jeffay admits, requesting, receiving, and writing in a buffer each sub-file in the proper order of ascending playback time. This is all the claims require.

26. That sub-files can be requested and received in order is not prohibited by the claim language and, in fact, resembles an embodiment of the '234 Patent. Mr. Major, the primary inventor, agreed that “if a client requests streamlet individually, one at time, in order of ascending playout time” that is covered by his invention. EX1025, 65:8-14. Indeed, the '234 Patent teaches that the client is “configured to arrange the streamlets 304 in order of ascending playback time,” where “the streamlets 304 are numbered 0, 1, 2, 3, 4, etc.” or “identified with a unique filename.” EX1001 at 13:34-41. This is shown in Figure 7 of the '234 Patent, where streamlets 304 are requested and saved in the streamlet cache 710 (i.e., the buffer). The streamlets are named with numbers in their filenames indicative of their

sequence in the original file, e.g., 1, 2, 3, . . . 14, 15. The streamlets are then played back by the Viewer 408 according to the order of their filenames, 1, 2, 3, 4, 5, etc. *Id.*, Fig. 7. That is what Leaning teaches. And in response a question about whether a “client [doing] some sort of check to see whether the files are 1, 2, 3, 4” satisfies the arranging limitation, Dr. Jeffay testified “if the client actually arranges them sequentially into playout order in its buffer, that is arranging.” This is what Leaning teaches as well.

27. Second, to the extent Dr. Jeffay is making an implicit argument that the claims require receiving streamlets out of order and requires the client to ensure that out of order sub-files are not arranged in the buffer, Leaning also contemplates this scenario. First, while storing sub-files in the order in which they are received and naming them using “a simple fixed length sequence of numbers starting with zero[] is preferred,” Leaning explains that “*any* naming convention can be used provided the player program either contains (or is sent) the name of the first sub-file *and an algorithm enabling it to calculate succeeding ones*, or alternatively is sent a list of the filenames.” EX1004, 6:7-8 (emphases added). Second, Leaning explains that when a user is viewing a live stream, to guard against playback running faster than the generation of the sub-files for the live stream, “it may be arranged that the player program checks each sub-file it receives to ascertain whether it is marked with a later

time than the previous one: if not the sub-file is discarded.” *Id.*, 21:30-22:3. Finally, Leaning also contemplates that upon receipt of a sub-file, Leaning’s player “make[es] a note of the *play time* of the sub-file,” (EX1004, 5:15-17 (emphasis added)), which a POSITA would have understood as disclosing that the player program ensures that the sub-files are written into the buffer in the proper play time order. Thus, Leaning also contemplates noting the play time of each sub-file and receiving a sub-file out of order (i.e., a sub-file earlier than one just played) and discarding it rather than writing it to the buffer to ensure continuity of playback.

VI. LEANING TEACHES “TO ACHIEVE CONTINUOUS PRESENTATION”

28. It remains my opinion that Leaning teaches the “to achieve continuous playback limitation.” For example, in my First Declaration I explained that “each corresponding sub-file” of Leaning “must comprise the same portion across the different copies to enable proper switching because ‘there is no expectation that a sub-file will be followed by a sub-file other than that which immediately follows it in the original sequence’ since in the case of rate switching it is essential or at least highly desirable that ‘the sub-file boundaries are the same for each rate, so that the first sub-file received for a new rate continues from the same point in the recording that the last sub-file at the old rate ended.’” EX1003, ¶¶67-68 (quoting

EX1004, 12:8-20) (emphases in original). In response to questions about the implications of corresponding streamlets having the same time boundaries when rate-switching, Mr. Major stated that “you can pick any of [the streamlets] for that particular time and play it and then the next two seconds you can pick any of them from there and the next two seconds. And to the viewer, it looks *continuous* and smooth.” EX1025, 38:14-41:17 (emphasis added). This further confirms that Leaning teaches continuous playback according to claim 12 of the ’234 Patent.

29. Additionally, a POSITA would understand the limitation to be at most a statement of purpose or aspiration. One of Leaning’s goals is certainly to prevent disruption during playback. E.g., EX1004, 12:16-18, 15:3-6. In fact, I note that Patent Owner and Dr. Jeffay allege that the MOVE player practices the “continuous presentation” limitation, but according to one of the MOVE internal documents cited by Patent Owner and Dr. Jeffay, the MOVE player tracked and reported the number of “stalls” or “blips” that occurred during play, and the minimum, maximum, and average duration “for the content to resume playing after a stall.” EX2022, 29.

- **stallCount** – a stall is basically when any kind of a blip occurs during play
- **mindur** – minimum duration of all the stalls users experienced (in ms)
- **avgdur** – average duration of all the stalls users experienced
- **maxdur** – maximum duration of all the stalls users experienced
- **enddurstall** – 1 if the user exited the browser during a stall; 0 if not
- **seekcount** – number of times a user used the seek function
- **mindelay** – minimum duration for the content to resume playing after a stall (in ms)
- **avgdelay** – average duration for the content to resume playing after a stall
- **maxdelay** – max duration for the content to resume playing after a stall

Id.

30. A POSITA would have understood these “blips” and/or “stalls” to be freezes or interruptions in the playback. Dr. Jeffay testified that “a blip could be something that causes the video to freeze” (EX1023, 213:18-21) and that avgdelay means “average duration for the content to resume playing after the video first froze” (*id.*, 216:22-217:8). Dr. Jeffay’s contention that “continuous presentation” requires completely avoiding interruption is at odds with the contention that the MOVE player practices the limitation. Inventor Mr. Major also agreed during his deposition in the Ogdon IPRs that his invention “enable[ed] smooth non-interrupted viewing” but freezing or buffering was not impossible, “it can happen.” EX1028, 42:12-17, 70:9-16. Patent Owner’s declarant Mr. Ericson testified that a “blip” was a “freeze or stall.” EX1027, 212:18-213:21. And Patent Owner’s declarant Mark Mitchell

testified that he himself witnessed the MOVE player suffer from temporal and content discontinuities. EX1026, 71:12-75:8.

31. And to the extent achieving continuous presentation is deemed to be an actual requirement, Leaning discloses that too. The only argument Dr. Jeffay makes that Leaning does not actually achieve continuous presentation is the erroneous argument that Leaning requires clearing the buffer upon every rate switch. As discussed in detail above, it would have been apparent to any POSITA that Leaning does not require clearing the buffer and that Leaning discloses continuous uninterrupted presentation is achievable. Section IV. Further, as I noted above, a POSITA would not necessarily have considered the phrase “clear buffer” in Leaning to mean only to delete everything in the buffer and throw it away. In context, a POSITA considering Leaning would have appreciated that “clear buffer” could include simply to play out what is already in the buffer (i.e., let the buffer “clear” by playing out all the sub-files therein), then reset the sound card (if necessary), and then, when the buffer is empty, place the next decoded sub-file in the buffer and continue playback with the next sub-file uninterrupted.

32. Additionally, Dr. Jeffay erroneously alleges that I did not address the “continuous presentation” limitation at all. EX2141, ¶¶68-73. This is wrong. For limitation 12[D] in my First Declaration I cited back up to the evidence and analysis

cited for limitation 1[D], which further cites the analysis of limitations 1[C][1]-1[C][2], all of which show that Leaning teaches the “to achieve continuous presentation” limitation. For example, I argue that “Leaning also explains ‘that *interruption*’ of the video stream ‘can be *avoided* and therefore it is *preferable* to employ a criterion which *anticipates underflow and avoids it* in the majority of cases.’” EX1003, ¶76 (emphases added). This is teaching to achieve continuous presentation. In response to Dr. Jeffay’s mischaracterizations and erroneous arguments I provide further evidence confirming that Leaning indeed teaches the “to achieve continuous presentation” limitation in this declaration. Section IV.

VII. LEANING (WITH OR WITHOUT KLEMETS) AND GAMBLE TEACH REQUESTING SUB-PARTS OF SUB-FILES OVER DIFFERENT TCP CONNECTIONS

33. As I explained in my First Declaration, Leaning (with or without Klemets) in view of Gamble and the knowledge of a POSITA renders obvious the claimed plurality of TCP connections. EX1003, ¶¶83-85, 116, 121-123. A POSITA understood that the TCP protocol allows for *multiple* connections, using well-known RANGE requests, and utilizing *multiple* connections to request and retrieve different parts of a single file was well known, as exemplified by Gamble. EX1003, ¶¶121-123 (emphases added).

34. As an initial matter, Dr. Jeffay rests his arguments upon a faulty assumption that Leaning's mention of a "file not found error" that indicates a stream is complete is somehow related to a transmission error in TCP connections. EX2141, ¶¶107-110. Dr. Jeffay testifies that "[a]n HTTP or TCP socket error message also may satisfy the 'If error message received, Stop' condition in Leaning's playback process. EX2141, ¶110. This is simply not credible. The error message referred to in Leaning is a "file not found" message that occurs when the player program attempts to access a file at a specific path—but the file is not there. For example, in Leaning's Bach recording, the sub-files go up through sub-file 134 and if the player program tries to request sub-file 135 it does not exist and therefore the player program receives an error message and the stream stops. These "file not found" errors occur at the *application*-layer and relates to the existence of a file on the server. On the other hand, a TCP connection error occurs at the *transport*-layer and relates to the ability of the client and the server to communicate at all. It is simply incorrect to conflate these two different errors.

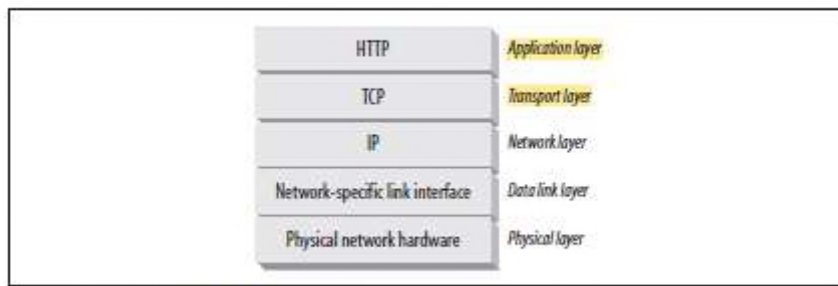


Figure 1-9. HTTP network protocol stack

EX1012, 13 FIG. 1-9 (annotated).

35. Dr. Jeffay is similarly incorrect that “Leaning does not disclose HTTP 1.0.” EX2141, ¶112. Dr. Jeffay admitted during his deposition that Leaning discloses HTTP and the RCF for HTTP 1.0. EX1023, 79:3-6. And Dr. Jeffay admits that Leaning’s clients use “HTTP” to make requests from an “ordinary ‘web server,’” that Leaning discloses HTTP 1.1, and does not dispute that Leaning teaches requesting sub-files using at least one TCP connection. EX2141, ¶¶107-109.

36. The HTTP 1.1 protocol cited in Leaning even explicitly acknowledges that it was known to use multiple simultaneous persistent TCP connections for HTTP requests including using multiple TCP connections for making HTTP RANGE requests. EX1019, 41, 119-121; EX1003, 121-123. Dr. Jeffay does not attempt to rebut these points.

37. Dr. Jeffay’s irrelevant arguments about Leaning’s use of an “error—file not found” response to indicate the end of a stream is incorrect as I explained

above. Dr. Jeffay incorrectly speculates that a TCP error message also may satisfy the ‘If error message received, Stop’ condition in Leaning’s playback process, which allegedly would cause interruptions and shows that Leaning does not use multiple TCP connections. EX2141, ¶110. This is incorrect from a technical point of view as pointed out above because these errors occur at different layers (application-layer versus transport layer). It is also irrelevant to whether the asserted Ground of Leaning (with or without Klemets) plus Gamble in view of the knowledge of a POSITA teaches requesting sub-parts of sub-files over multiple TCP connections.

38. Finally, Dr. Jeffay makes the conclusory assertion that, while Gamble discusses *transmitting* ‘segments’ of a larger file over multiple ‘connections,’ Gamble fails to disclose ‘*requesting*’ segments, files, or even sub-files over multiple TCP connections. EX2141, ¶¶174-176 (emphases in original). But my First Declaration explains how a POSITA would have implemented these teachings using well-known HTTP RANGE *requests* for portions of sub-files. EX1003, ¶¶121-123 (emphasis added). And Dr. Jeffay does not attempt to rebut this argument.

VIII. LEANING (WITH OR WITHOUT KLEMETS) TEACHES “ARRANGING” “USING THE VIRTUAL TIMELINE”

39. As with claim 1, Dr. Jeffay’s argument for claim 9 hinges upon the word “arrange.” EX2141, ¶¶137-144. The only claim language at issue here is

whether the client module is configured to “arrange the streamlets requested from the at least one server using the virtual timeline.” EX1001, claim 9.

40. Dr. Jeffay does not dispute that Leaning’s client module *requests* and *receives* a virtual timeline (e.g. “menu.htm” and/or index file e.g. “http:\\server1.com/mp3_bwv565_link.htm”). EX2141, ¶139. Nor does Dr. Jeffay dispute that Leaning’s client module requests, receives, and writes to the buffer each sequential sub-file in the proper order. *Id.* DISH states that “all Leaning’s user terminal needs to do to request a sub-file is add the sequential serial number to the URL received from the server ‘to produce a complete address for the sub-file – i.e. *www.server1.com/mp3_bwv565/000000.bin.*” EX2141, ¶140 (quoting EX1004, 5:4-6) (emphasis added). Thus, Dr. Jeffay admits that Leaning’s client module makes each request for each sub-file *using* the virtual timeline because it appends the next sub-file name to the URL of the virtual timeline (URL from the virtual timeline in green and sub-files in blue:

www.server1.com/mp3_bwv565/000000.bin

www.server1.com/mp3_bwv565/000001.bin

www.server1.com/mp3_bwv565/000002.bin

www.server1.com/mp3_bwv565/000003.bin

41. Leaning's player on the client continues to request each sub-file using the timeline and arrange each received sub-file in sequential order into the buffer based on playback time for the same reasons described above in Section V.

IX. SECONDARY CONSIDERATIONS OF NON-OBVIOUSNESS

42. I understand that Patent Owner contends that evidence of secondary considerations of non-obviousness exist solely with respect to claims 12-20 of the '234 Patent—and explicitly does not contend secondary considerations with respect to claims 1-11.

43. Dr. Jeffay only contends that a presumption of nexus exists based on an exhibit where he allegedly maps the evidence relating to the MOVE player to claim 13 of the '156 Patent. EX2141, ¶¶191-194 (citing EX2071 ('156 Patent Claim 13 Chart)). Dr. Jeffay cites no exhibit charting the MOVE player against any claim of the '234 Patent.

44. Dr. Jeffay also faults me for not addressing the ITC Decision regarding secondary considerations for related patents. EX2141, ¶¶186-190. But I have extensively considered and opined upon the purported evidence of secondary considerations, including the ITC decision, in the related Ogdon IPR proceedings where the Board came to a different conclusion than the ITC and found no nexus for secondary considerations and gave the evidence little to no weight.

45. But even if I were to assume that Dr. Jeffay had alleged secondary considerations evidence was relevant to claims 12-20 of the '234 Patent, and I have not seen any evidence that he has, it is my opinion that the MOVE player has critical unclaimed features. The MOVE player, which implemented so-called “quantum streaming,” contains at least one critical unclaimed feature—requesting in parallel at the same time multiple streamlets over multiple TCP connections. An internal MOVE document, explains that “use of multiple TCP connections between the client and the origin web server” was the “*single innovation*” of MOVE’s quantum streaming that “solves or alleviates to the extent possible, the problems of reliability, efficiency, and latency.” EX2021, 6 (emphasis added). More specifically, “[b]y requesting more than one streamlet *at a time* (*parallel* retrieval’) with each request on a different connection, *efficiency is raised to near maximum and latency is virtually eliminated.*” *Id.* (emphases added). I understand that Board in the Ogdon IPRs agreed and found “using multiple TCP connections is a critical unclaimed feature of the MOVE Media Player.” *E.g.*, EX1031, 45-46. While Claim 16 of the '234 Patent recites “a plurality of different TCP connections,” I do not understand Dr. Jeffay to be asserting nexus based on any of claim 16’s limitations nor arguing that claim 16 requires the critical *parallel* retrieval of streamlets.

46. Further, Dr. Jeffay again makes conclusory allegations that MOVE’s “success” was tied to “unique characteristics of the claimed invention” but does not state what those unique characteristics were. EX2141, ¶¶191, 244-245. To the extent Dr. Jeffay is now asserting that “continuous playback” is the “unique characteristic,” this fails at least because “continuous playback” of streaming media was already in the prior art in Leaning (as described in above and my First Declaration) and in other references. *E.g.*, EX1032, 1:51-54; EX1033, 5:47-53; EX1034, ¶45; EX1035, 270. Moreover, Dr. Jeffay admitted in an IPR on behalf of Amazon that continuous playback was nothing new. Specifically, Dr. Jeffay was retained by Amazon in IPR2022-01430 to invalidate a patent titled “Streaming media delivery system,” which claimed priority to 2000. EX1036, ¶¶31-32. The patent was directed to a system where “media data can be played out to the user *continuously* ‘despite data reception interruptions of less than a minute.’” *Id.*, ¶37. To invalidate this patent, Dr. Jeffay relied on other references that also taught “continuous playback.” For example, Dr. Jeffay relied on Carmel to argue: “A POSITA would have understood that the sequence of recorded media stream segments would be the same sequence used for *continuous playback*, otherwise the played stream would not maintain *the same temporal continuity* and would be subject to jumps that may disorient the user. *Id.*, ¶163. Dr. Jeffay also relied on

Feig, which disclosed using HTTP Get requests to stream “video ... from beginning to end in a *continuous* manner.” *Id.*, ¶74. Dr. Jeffay relied on Willebeek, which used “a standard HTTP Web server” and “TCP/IP” (*id.*, ¶76) to deliver “continuous playback” during “congestion or insufficient bandwidth availability.” EX1035, 270; *see also id.*, 269 (“continuous and smooth playback”).

47. Finally, Dr. Jeffay’s argument that British Telecom allegedly never commercialized the video teachings of Leaning is irrelevant to the ’234 Patent which claims “digital content” not video. I understand based on the declaration of Mr. Ratcliffe that BT did commercialize the audio embodiments of Leaning. EX2126, ¶11. And, even so, there are many reasons that a technology might not be commercialized right away. Mr. Ratcliffe admitted that some of these reasons could include that BT “is not a manufacturer” and its “core business” was “telecommunications” or that a patent might be obtained as a “blocking patent.” EX1037, 57:24-62:11. I note that Mr. Ratcliffe testified that Leaning has been licensed by BT as part of portfolio licenses and asserted against a third party. EX1037, 41:25-43:2, 115:16-127:3, 140:9-141:25.

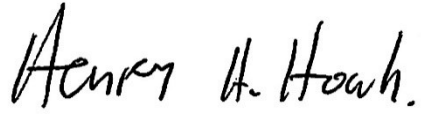
48. In addition, I note that BT may have commercialized the video teachings of Leaning. While I do not have access to BT’s confidential information, it appears based on a BT publication that a product called Fastnets “eliminates some

of the worst problems of video streaming: slow start, picture freezing on network congestion, and poor video quality.” EX1038, 1. “The key feature of Fastnets is the *patented* use of SP (switching) frames to *switch between multiple video streams encoded at different data rates.*” *Id.*, 2. “This can be done *without pause or glitch* in the displayed picture.” *Id.* “Faced with congestion that restricts throughput, the picture quality reduces but *the video continues – drastically reducing pausing and rebuffering.*” *Id.*, 1. These are features of Leaning.

X. CONCLUSION

49. In my opinion, and for the reasons provided above and in my First Declaration and deposition testimony, the Challenged Claims are unpatentable.

50. 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.

A handwritten signature in black ink, reading "Henry H. Houh." The signature is written in a cursive style with a period at the end.

Henry Houh

Executed on June 9, 2025.