

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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**BEFORE THE PATENT TRIAL AND APPEAL BOARD**

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NETFLIX, INC.,

Petitioner,

v.

BROADCOM CORPORATION AND AVAGO TECHNOLOGIES  
INTERNATIONAL SALES PTE. LIMITED,

Patent Owner.

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Case No. IPR2021-00303

U.S. Patent 8,270,992

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**Reply Declaration of Harley R. Myler, Ph.D.**

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### APPENDIX 5: SUPPLEMENTAL MATERIALS CONSIDERED

I, Harley R. Myler, declare as follows:

1. Petitioner has asked me to submit this reply declaration to address specific issues raised by the Patent Owner's Response and Dr. Ghassan AlRegib. Appendix 5 lists materials I have considered since I submitted my earlier declaration.

2. Although I disagree with a number of Avago and Dr. AlRegib's statements, I have been instructed to constrain this declaration to the issues addressed below that I understand are relevant to Petitioner's Reply, which is constrained by word limitations. Therefore, the fact that this declaration does not address a specific statement by the Avago or its expert is not an indication that I agree with it. I make this declaration based upon my own personal knowledge and, if called upon to testify, would testify competently to the matters contained herein.

### **I. Interpretation of "Quality Level of the Media Content"**

3. Dr. AlRegib opines that "the quality level of the media content, as those terms are used in the Challenged Claims, is independent of delivery considerations, such as network quality." Ex. 2002 ¶82. I disagree.

4. It is my understanding that "digital media content" in the challenged claims is not limited to digital media content that is stored in a file format, but is broad enough to include digital media content that is streamed. It was well-known in the art that the quality of streaming digital media content may be affected by a

number of factors including what Dr. AlRegib refers to as “network quality” or “network delivery considerations.” Network quality and network delivery considerations include the speed and characteristics of the network connecting the streaming media client and the streaming server. In addition to my own personal knowledge in the field, I note that Shaw is consistent with this understanding. Shaw recognizes in its background section that “Streaming media quality varies widely according to the type of media being delivered, *the speed of the user’s Internet connection, network conditions*, the bit rate at which the content is encoded, and the format used.” Ex. 1005, 1:37-40 (emphasis added). Shaw goes on to point out that bandwidth constraints in the context of streaming video can result in “lower resolution” and “fewer frames per second,” both of which indicate lower-quality digital media content. *Id.*, 1:40-44. Finally, Shaw explains the well-known balance struck in streaming: compressing digital media content “to maximize the richness of the content” (quality) while ensuring that it can “be delivered in real-time given limited bandwidth.” *Id.*, 1:47-54. Thus, the quality of at least streaming digital media content is not independent of delivery considerations, such as network quality.

5. I disagree with Dr. AlRegib that “the example provided in the specification from Fig. 5 states that [a] user may initially be listening on headset 520 to music that is stored locally on PDA 515” indicates that the quality level of

the media content is independent of delivery considerations such as network quality. Ex. 2002 ¶82. The problem with Dr. AlRegib's analysis is that he has picked an example where the digital media content is not being delivered over a network connection nor is it being streamed. Given that there is no use of a network in the example, it is not surprising that a non-existent network does not impact quality. But, as I explained above, once digital media content is being streamed, network considerations may impact the quality of the digital media content. As one example, streaming media content may be thinned by a server when the network conditions are poor. In that instance, the server removes information from the stream (e.g., frames) from the digital media content before it leaves the server, and thus reduces its quality.

## **II. Thinning a Stream**

6. Dr. AlRegib states: "Of all the reasons Shaw discloses that a stream might be unacceptable (and therefore justify switching sources for that stream), the only one that conceivably relates to the media content of the stream itself is the concept of thinning. Yet, Dr. Myler has indicated that, within the framework of the '992 Patent, the concept of thinning is entirely a phenomenon of access to the information, not the quality of information." Ex. 2002 ¶91. Dr. AlRegib is wrong to say that "thinning is entirely a phenomenon of access to the information, not the quality of information."

7. As I previously explained (at least in paragraph 72), thinning is a technique for handling a degraded communications channel from the server side and it involves dropping information, such as frames, at the stream's source before the stream is transmitted. Ex. 1003 ¶72. Dropping information from the stream before it is transmitted over a network reduces the quality of the digital media content being delivered, provided or obtained because, even if the user successfully receives every single bit of the stream transmitted over the network, the digital media content has less information as compared to its original quality.

8. In the context where a client can obtain the same digital media content from two servers, where the first server can provide a thinned stream of the digital media content and the second server can provide the stream without thinning, even if the streaming client receives every bit of information sent by the first server, the thinned stream being sent by the first server is at a lower quality level than what the client could receive from the second server that is not thinning the stream.

9. Here is an example that illustrates how thinning reduces the quality of the digital media content. If a server thins a stream of digital media content obtained from a file at the server and the streaming client receives the stream and saves it to a file, the file saved at the client would be smaller than the file stored at the server because the client received less information. Dr. AlRegib agrees that this is the typical outcome of thinning:

Q. Okay. Now we transmitted it. It's being thinned and it's being stored as a file on the client. Do you understand that so far?

A. Yes.

Q. If I compare the file that is stored at the client with the file that is stored on the server, are they of the same level of quality?

A. When you look at the frames that were delivered, they have the same quality. Those that were dropped basically there's no reference to they were not even sent in that file to the client because that thinning happened. Yes, so basically you have no, they're not there.

Q. Yes. And the file size of the thinned, the thinned version that's stored on the client, that's going to be smaller than the non-thinned version stored at the server, correct?

A. Yes. *I mean that's typical of the thinning outcome.*

AlRegib Dep. 160:16-161:15 (emphasis added).

10. I further disagree with Dr. AlRegib's opinion that thinning a stream does not lower the quality of the digital media content. In his deposition, he testified that when frames are dropped from a stream, the quality of the digital media content is not affected because the frames that are received are of the same quality as what was sent. AlRegib Dep. 157:21-160:9. Dr. AlRegib's opinion does not make sense and is inconsistent with how a POSITA would have assessed the relative quality of the thinned stream and the original stream. Dr. AlRegib acknowledges that the frame rate of video relates to the quality of the digital media content. AlRegib Dep. 21:19-23:2, 118:3-22. Because the thinned stream has less

frames, the frame rate of the video is reduced. A client player typically handles a missing frame in one of two ways. First, the player may advance to the next available frame in place of the skipped frame. In that instance, the playback of the video has sped up in that instant before resuming to normal speed – it’s like having pressed fast-forward for an instant. This would be an undesirable playback artifact. Second, the player may preserve the time order and just not change what is displayed when a frame is missing. This would be perceived as the video having been frozen for an instant, which is also undesirable.

**III. Shaw’s content delivery network (CDN) is not limited to storing digital media content at a single quality level.**

11. Dr. AlRegib opines that “Shaw provides no disclosure that might indicate that the ‘source stream’ might be transcoded, re-encoded, or modified in any way that might change the quality of the source stream, either before or after it has been ‘replicated.’” Ex. 2002 ¶57. He also opines that “[b]ecause the same content, at the same quality level, has been replicated to the various servers throughout the network, Shaw does not disclose, and in fact reasonably cannot be read by a POSITA to teach or suggest, switching networks to obtain higher quality content.” Ex. 2002 ¶58. I disagree with Dr. AlRegib on both points.

12. Shaw does teaches transcoding, re-encoding, or modifying a source stream in its background of the invention section where it describes how “[c]ontent owners typically chose to encode media at multiple rates....” Ex. 1005, 1:37-58.

Transcoding involves converting one encoded form to another encoded form. When a content provider takes an existing encoded media stream and encodes it into another version at a different encoding bit rate, that is an example of “transcoding” or “re-encoding” the media content. A POSITA reading Shaw would have understood Shaw to teach transcoding source media before distribution because Shaw explains how it provides a better user experience and, even without Shaw’s teaching, it was a known and common technique for distributing digital media content.

13. A POSITA reading Shaw would have also understood that Shaw’s content delivery network is not limited to replicating a single source stream. Dr. AlRegib misinterprets Shaw’s teaching at 2:27-37. In that portion, Shaw is explaining how a single object in the content delivery network is replicated efficiently using a tree-based distribution methodology. It was well-known that the process is repeated for each object to be distributed through the content delivery network.

14. Dr. AlRegib also misinterprets Shaw’s teachings in column 6 relating to its Figure 2. While Shaw describes how a single stream is distributed, a POSITA would not have read Shaw to be teaching that literally only one stream is distributed in that manner. Rather, Shaw is giving an example of how one stream is replicated across the content delivery network’s servers. Dr. AlRegib’s

interpretation is also inconsistent with Shaw's teaching that "[a]n entry point, for example, comprises two servers (for redundancy), and each server can handle many streams from multiple content providers." Ex. 1005, 6:1-3. A POSITA would have understood that teaching to mean that there is a many-to-many relationship between streams and content providers. In other words, each entry point server is handling many streams from many content providers. Finally, I note that a POSITA would have found it strange that Shaw's content delivery network is limited to storing a single version of a stream given that it was a common and regular practice to distribute content in multiple encodings to support different bandwidths and to support different media players (e.g., to provide a RealPlayer version and a QuickTime version of the same media). It would make little sense for a POSITA to interpret Shaw's CDN teachings in a way that would prevent its use for a common requirement from CDN customers to support multiple formats of content.

15. I declare that all statements made herein of my knowledge are true, and that all statements made on information and belief are believed to be true, and that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Executed on December 27, 2021.

By:

A handwritten signature in blue ink, appearing to read 'Harley R. Myler', written over a horizontal line.

Harley R. Myler, Ph.D.

## APPENDIX 5: SUPPLEMENTAL MATERIALS CONSIDERED

The following is a list of the additional materials I have considered since submitting my prior declaration in this matter.

<b>Exhibit or Paper No.</b>	<b>Description</b>
Paper 6	Patent Owner's Preliminary Response
Paper 7	Institution Decision
Paper 12	Patent Owner's Response
Ex. 2002	Declaration of Ghassan AlRegib
Ex. 1010	Deposition of Ghassan AlRegib