EXHIBIT 1009

PUBLIC VERSION

[redacted]

UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington, D.C.

In the Matter of **CERTAIN FITNESS DEVICES, STREAMING COMPONENTS THEREOF, AND SYSTEMS CONTAINING SAME**	**INV. NO. 337-TA-1265**

INITIAL DETERMINATION ON VIOLATION OF SECTION 337 AND RECOMMENDED DETERMINATION ON REMEDY AND BOND

Chief Administrative Law Judge Clark S. Cheney

(September 9, 2022)

Pursuant to the notice of investigation, 86 Fed. Reg. 27106 (May 19, 2021), this is the initial determination in *Certain Fitness Devices, Streaming Components Thereof, and Systems Containing Same*, United States International Trade Commission Investigation No. 337-TA-1265.

A violation of section 337 of the Tariff Act, as amended, has occurred in the importation into the United States, the sale for importation, or the sale within the United States after importation, of certain fitness devices, streaming components thereof, and systems containing same, with respect to U.S. Patent No. 9,407,564; U.S. Patent No. 10,469,554; U.S. Patent No. 10,469,555; and U.S. Patent No. 10,757,156.

[redacted]

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[redacted]

I. INTRODUCTION

A. Procedural History

By publication of a notice in the *Federal Register* on May 19, 2021, pursuant to subsection (b) of section 337 of the Tariff Act of 1930, as amended, the Commission instituted this investigation to determine:

> [W]hether there is a violation of subsection (a)(1)(B) of section 337 in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain products identified in paragraph (2) by reason of infringement of one or more of claims 1, 3-8, 10, and 13-15 of the '564 patent [U.S. Patent No. 9,407,564]; claims 16-25 and 30 of the '554 patent [U.S. Patent No. 10,469,554]; claims 10-17 and 26-27 of the '555 patent [U.S. Patent No. 10,469,555]; claims 1-12 of the '156 patent [U.S. Patent No. 10,757,156]; and claims 14-16, 18-21, and 28-29 of the '680 patent [U.S. Patent No. 10,951,680]; and whether an industry in the United States exists as required by subsection (a)(2) of section 337.

86 Fed. Reg. 27106 (May 19, 2021).

The Commission named as complainants DISH DBS Corporation ("DDBS") of Englewood, Colorado; DISH Technologies L.L.C. ("DTL") of Englewood, Colorado; and Sling TV L.L.C. ("STL") of Englewood, Colorado. *Id.* DDBS, DTL, and STL are referred to collectively herein as "DISH" or "complainants."

The Commission named as respondents ICON Health & Fitness, Inc. ("ICON") of Logan, Utah; FreeMotion Fitness, Inc. ("FreeMotion") of Logan, Utah; NordicTrack, Inc. ("NordicTrack") of Logan, Utah; lululemon athletica inc. ("lululemon") of Vancouver, Canada; Curiouser Products Inc. d/b/a MIRROR ("Curiouser") of New York, New York; and Peloton Interactive, Inc. ("Peloton") of New York, New York (collectively, "respondents"). *Id.*

The Office of Unfair Import Investigations ("Staff") was also named as a party to this investigation. *Id.*

The target date for completion of this investigation was set at November 19, 2022, which is 18 months from institution. Order No. 4 (Initial Determination) (June 9, 2021), unreviewed, *see* Notice of Commission Decision Not to Review an Initial Determination Setting an 18-Month Target Date (EDIS Doc. ID No. 745716) (June 29, 2021). An evidentiary hearing was originally scheduled for March 21-25, 2022. Order No. 6 (June 28, 2021).

On September 8, 2021, the investigation was reassigned to Administrative Law Judge David P. Shaw. *See* Notice to the Parties (Sept. 8, 2021) (EDIS Doc. ID No. 751195).

On September 22, 2021, in view of the reassignment of the investigation, the parties jointly moved to amend the procedural schedule, and to reschedule the evidentiary hearing to take place from March 9-15, 2022. The administrative law judge granted the motion. Order No. 13 (Sept. 24, 2021).

On September 24, 2021, ICON moved to amend the notice of investigation such "that the name 'ICON Health & Fitness, Inc.' be replaced with 'iFIT Inc.'" The administrative law judge granted the motion in an initial determination. Order No. 14 (Nov. 4, 2021), unreviewed, Notice of a Commission Determination Not to Review an Initial Determination Granting Respondent Icon's Motion to Amend the Notice of Investigation (EDIS Doc. ID No. 758005) (Dec. 6, 2021).

On October 14, 2021, DISH filed a motion to terminate the investigation in part and to withdraw allegations in its complaint that any respondents infringe claims 6, 11, and 12 of the '156 patent; claim 22 of the '554 patent, and claim 17 of the '555 patent. In addition, DISH withdrew allegations that iFIT Inc.; Free Motion; NordicTrack; and Peloton infringe claims 9 and 12 of the '156 patent, claim 19 of the '554 patent, claims 12 and 13 of the '555 patent, and claim 6 of the '564 patent. The administrative law judge granted the motion in an initial determination. Order No. 15 (Nov. 19, 2021), unreviewed, Commission Determination Not to Review an Initial

Determination Granting Complainants' Motion for Partial Termination of Investigation (Dec. 20, 2021) (EDIS Doc. No. 758930).

On February 18, 2022, DISH filed a motion to terminate the investigation in part and to withdraw allegations in its complaint that any respondents infringe claims 6-8, 10, and 13-15 of the '564 patent, claims 18-19, 21, 23-25, and 30 of the '554 patent, claims 12-13, 16, and 26-27 of the '555 patent, claims 3, and 7-10 of the '156 patent, and all asserted claims of the '680 patent. The administrative law judge granted the motion in an initial determination. Order No. 21 (Mar. 3, 2022), unreviewed, Commission Determination Not to Review an Initial Determination Granting Complainants' Motion for Partial Termination of the Investigation (Mar. 23, 2022) (EDIS Doc. No. 766127).

A prehearing conference was held on March 9, 2022, with the evidentiary hearing in this investigation commencing immediately thereafter. DISH, iFIT Inc., FreeMotion, NordicTrack, lululemon, Curiouser, and Peloton participated in the hearing. The hearing concluded on March 14, 2022. *See* Order No. 20 (Mar. 1, 2022); P.H. Tr. 1-26; Tr. 1-656. The parties were requested to file post-hearing briefs not to exceed 300 pages in length, and to file reply briefs not to exceed 90 pages in length. Order No. 20 at 4.

On March 29, 2022, DISH filed its post-hearing brief, which asserts, against all respondents, claims 1 and 3-5 of the '564 patent (Compls. Br. at 47), claims 16, 17, and 20 of the '554 patent (*id.* at 82), claims 10, 11, 14 and 15 of the '555 patent (*id.* at 93), and claims 1, 4 and 5 of the '156 patent (*id.* at 103). DISH also asserts claim 2 of the '156 patent against Peloton. *See id.* at 111.

Pursuant to Order No. 2 (Ground Rules), the parties also submitted a joint outline of the issues to be decided in the Final Initial Determination. *See* Joint Outline of Issues to Be Decided in the Final Initial Determination (EDIS Doc. ID No. 768188) ("Joint Outline").

On June 23, 2022, the investigation was reassigned to Chief Administrative Law Judge Clark S. Cheney. *See* Notice to the Parties (June 23, 2022) (EDIS Doc. ID No. 773712).

On July 19, 2022, July 28, 2022, and August 12, 2022, I issued three initial determinations extending the target date, and setting a due date of September 9, 2022 for this final initial determination. *See* Order No. 23 (July 19, 2022) (EDIS Doc. ID No. 775744); Order No. 24 (July 28, 2022) (EDIS Doc. ID No. 776430); Order No. 25 (Aug. 12, 2022) (EDIS Doc. ID No. 777802).

B. The Private Parties

1. Complainant DISH

Complainant DDBS is a Colorado corporation with a principal place of business at 9601 South Meridian Boulevard, Englewood, Colorado 80112. Compl., ¶ 3.1 (EDIS Doc ID 739751). DDBS is a wholly owned indirect subsidiary of DISH Network Corporation. *Id.*, ¶ 3.2. Complainants DTL and STL are Colorado limited liability companies with their principal place of business at 9601 South Meridian Boulevard, Englewood, Colorado 80112. *Id.*, ¶¶ 3.12, 3.17. DTL and STL are indirect wholly owned subsidiaries of DDBS. *Id.*, ¶¶ 3.13, 3.18.

2. Respondent Peloton

Respondent Peloton is a Delaware corporation with its principal place of business at 125 West 25th Street, 11th Floor, New York, New York 10001. Peloton Resp. to Compl. (EDIS Doc ID 745054), ¶ 3.45.

3. Respondent iFit

Respondent iFit Inc. is a Delaware corporation with its principal place of business at 1500 South 1000 West, Logan, Utah 84321. ICON Health & Fitness Resp. to Compl. (EDIS Doc ID 745068), ¶ 3.25. Respondents FreeMotion and NordicTrack are Utah corporations with their principal place of business located at the same address. *Id.*, ¶¶ 3.29, 3.33. Respondents iFit Inc., FreeMotion and NordicTrack are referred to collectively herein as "iFit."

4. Respondent MIRROR

Respondent lululemon is a Delaware corporation with its principal place of business at 1818 Cornwall Ave., Vancouver, British Columbia, Canada V6J 1C7. MIRROR Resp. to Compl. (EDIS Doc ID 745062), ¶ 3.38. Respondent Curiouser is a Delaware corporation with its principal place of business at 1261 Broadway, # 208, New York, New York 10001. *Id.*, ¶ 3.40. Respondents lululemon and Curiouser are referred to collectively herein as "MIRROR."

C. Overview of the Technology

The technology at issue generally relates to streaming video and audio content over the Internet. The parties stipulated to the following general description of the relevant technology:

> The technology at issue in this Investigation is the delivery of video over networks such as the Internet using adaptive bitrate streaming. Streaming refers to technology that delivers audio/video content from a server to a client at a bitrate that allows the user to view the content contemporaneous with its receipt. The higher the bitrate of the video, the more data (in bits) it takes to represent and stream that video. The delivery of the content may be limited by the speed of the end-user's network connection. The network speed can change during the course of content delivery resulting in buffering and stalling. Adaptive bitrate streaming systems may shift the bitrate of the audio/video content based on the network speed in an attempt to avoid stalling.

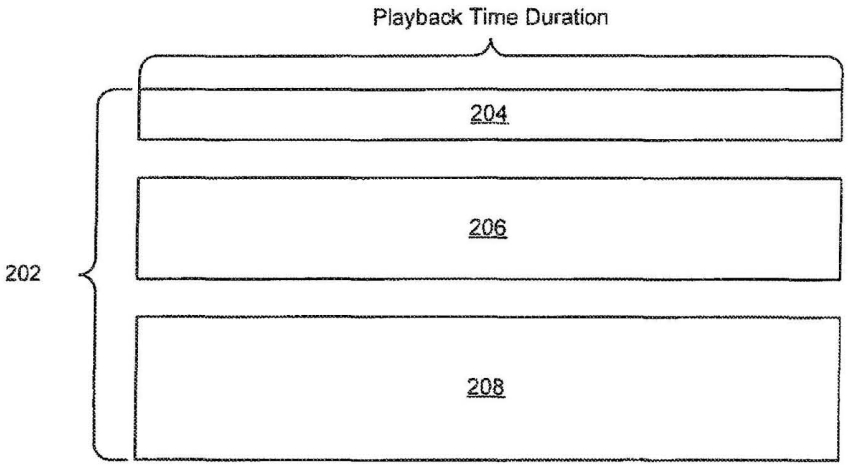
Joint Technology Stip. at 2 (Oct. 15, 2021), EDIS Doc. ID 754337.

The parties also stipulated to definitions of four terms from the asserted patents:

> **Bandwidth**: the maximum rate of data transfer across a given network path.
>
> **Bitrate**: the amount of data (in bits) transferred per unit of time, such as one second.
>
> **TCP/IP**: Transmission Control Protocol/Internet Protocol (TCP/IP) refers to the set of communication protocols used in the Internet and similar computer networks.
>
> **HTTP**: Hypertext Transfer Protocol (HTTP) is an application layer protocol in the Internet protocol that allows the fetching of resources.

Id. at 3-4.

The asserted patents relate to "adaptive bitrate" streaming, which is a technique for delivering content, such as video, over the Internet. *See* JX-0001 ('564 patent) at 1:31-41. The adaptive bitrate streaming technology includes encoding the content file into at least three different "quality" streams, as shown in Figure 2b of the '564 patent, reproduced below:

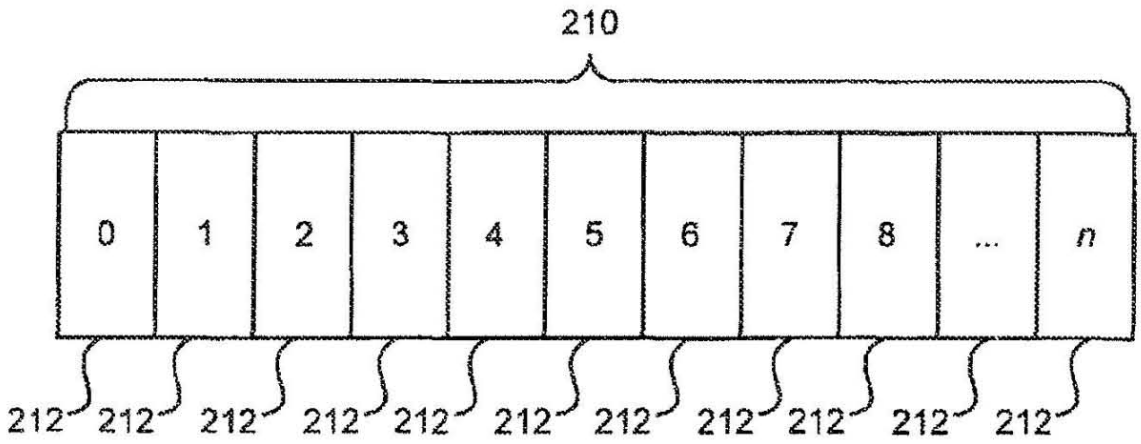


JX-0001 ('564 patent) at Fig. 2b.

As shown in Figure 2b, the plurality of streams 202 have varying degrees of quality and bandwidth, and include a low-quality stream 204, a medium-quality stream 206, and a high-quality stream 208. *See* JX-0001 ('564 patent) at 6:46-50. Each of the streams 204, 206, 208 is a copy of the content file encoded and compressed to varying bit rates. *See id.* at 6:51-52.

[redacted]

Each of the streams 204, 206, 208 (referred to generally as stream 210 in the figure below) is then further subdivided into discrete portions called "streamlets" 212, as shown in Figure 2c of the '564 patent, reproduced below. *See id.* at 6:58-60.



JX-0001 ('564 patent) at Fig. 2c.

Each streamlet 212 comprises a portion of the content contained in stream 210. *See id.* at 6:61-62. Streamlets are aligned by starting time and duration across the different quality streams such that a particular streamlet in, *e.g.*, a low-quality stream and a medium-quality stream correspond to the same portion of the content file. *See id.* at 6:62-7:7. This allows end users to switch between different quality streamlets in response to changing network conditions.

Figure 7 of the '564 patent depicts a method whereby the determination of which quality streamlets to use is based upon a factor relating to network performance:

[redacted]

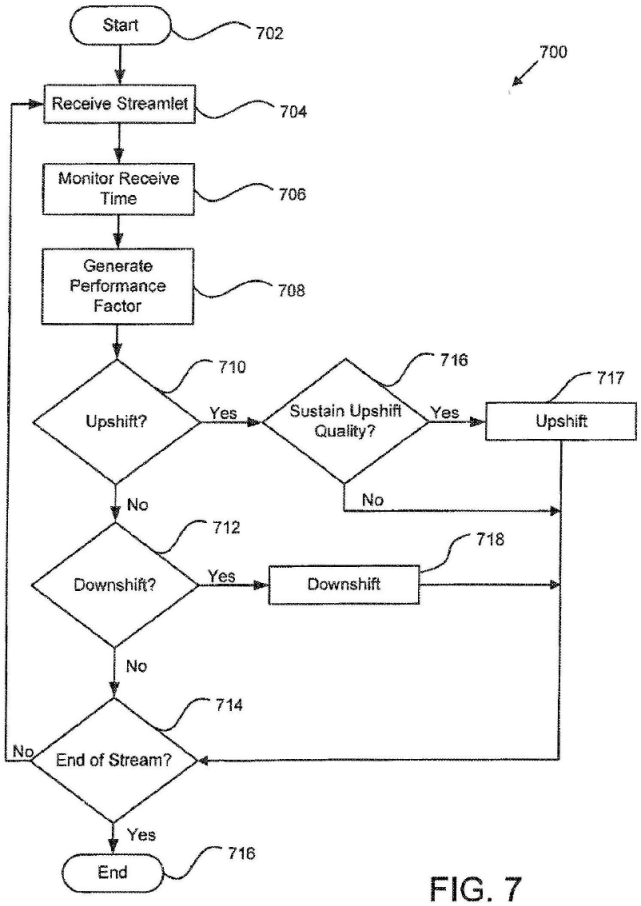


FIG. 7

JX-0001 ('564 patent) at Fig. 7.

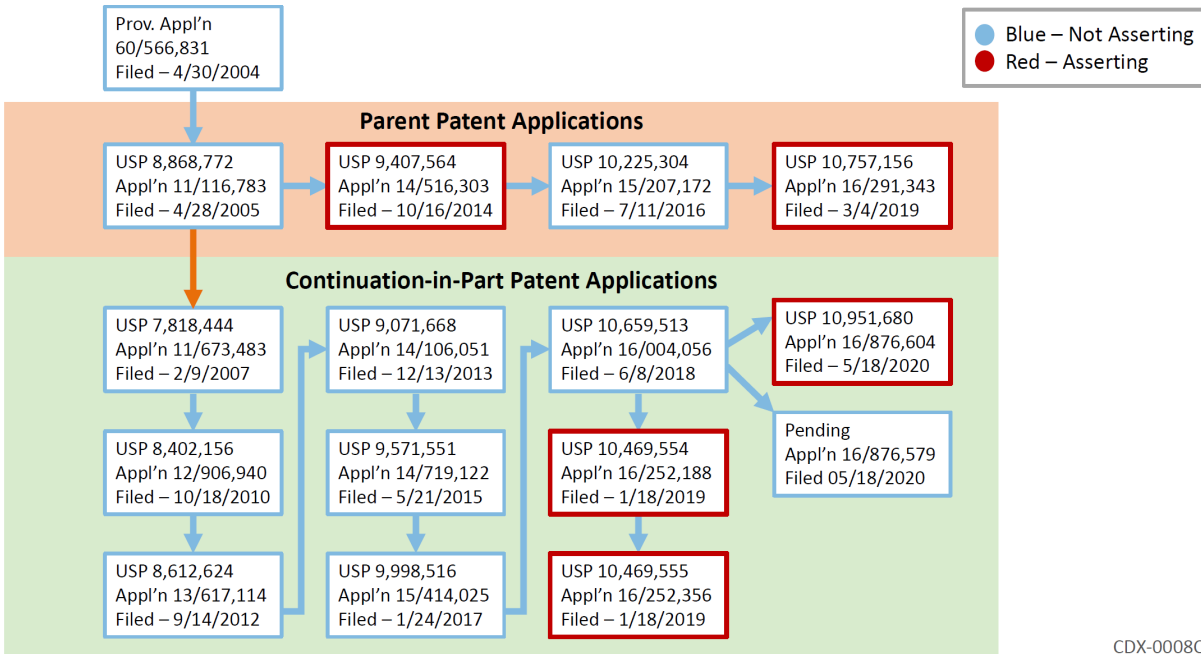
If the performance factor indicates that a higher-quality stream (comprised of higher-quality streamlets) can be used, for example, then the system shifts to the higher-quality stream. *See id*. at 12:53-60. If the factor indicates that a higher-quality stream cannot be used, then the system determines whether it should shift to a lower-quality stream, and if so, the system shifts to a lower-quality stream (and requests lower-quality streamlets). *See id*. at 14:65-15:8.

D. The Asserted Patents

DISH asserts four patents in this investigation: the '564 patent, the '156 patent, the '554 patent, and the '555 patent (collectively, the "asserted patents"). The asserted patents all claim

[redacted]

priority to U.S. App. No. 60/566,831, which was filed on April 30, 2004. *See* '564 patent at Cover; '156 patent at Cover; '554 patent at Cover; '555 patent at Cover; JX-0029 at 2. The following demonstrative illustrates the family of patents and patent applications that are related to the asserted patents:



CDX-0008C at 8; *see also* RDX-0001 (patent family map).[1] As can be seen in the figure above, the '564 and '156 patents issued from continuation applications claiming priority to the parent application for all the asserted patents, U.S. Application No. 11/116,783. The specifications of the '564 and '156 patents are similar, and may be referred to herein as the "continuation specification." As can be seen in the figure above, the '554 and '555 patents issued from a continuation-in-part ("CIP") application, U.S. Application No. 11/673,483. The specifications of the '554 and '555 patents are likewise similar and may be referred to herein as the "CIP specification."

[1] As explained above in Section I.A, DISH is no longer asserting the '680 patent.

1. U.S. Patent No. 9,407,564

The '564 patent, titled "Apparatus, System, and Method for Adaptive-Rate Shifting of Streaming Content," issued on August 2, 2016, and names Robert Drew Major and Mark B. Hurst as inventors. '564 patent at cover page. The '564 patent issued from application no. 14/516,303, filed on October 16, 2014. *Id.*; *see* Compl. ¶ 5.6.

DISH asserts independent claim 1 and dependent claims 3-5 of the '564 patent. *See* Compls. Br. at 2. These claims read as follows:

[1pre] An end user station for adaptive-rate content streaming of digital content from a video server over a network, the end user station comprising:

[1a] a media player operating on the end user station configured to stream a video from the video server via at least one transmission control protocol (TCP) connection over the network,

[1b] wherein multiple different copies of the video encoded at different bit rates are stored on the video server as multiple sets of files,

[1c] wherein each of the files yields a different portion of the video on playback,

[1d] wherein the files across the different copies yield the same portions of the video on playback, and

[1e] wherein each of the files comprises a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video, and

[1f] wherein the media player streams the video by: requesting a plurality of sequential files of one of the copies from the video server based on the time indexes;

[1g] automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies,

[1h] the automatically requesting including repeatedly generating a

factor indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies, wherein the set of one or more factors relate to the performance of the network;

[1i] making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files of the highest quality one of the copies determined sustainable at that time so that the media player upshifts to a higher quality one of the different copies when the factor is greater than a first threshold and downshifts to a lower quality one of the different copies when the factor is less than a second threshold; and

[1j] presenting the video by playing back the requested media files with the media player on the end user station in order of ascending playback time.

[3] The end user station of claim 1, wherein the media player is configured to generate the factor according to the responses to segment requests.

[4] The end user station of claim 1, wherein the media player is configured to upshift to the higher quality copy when the factor is greater than the first threshold and the media player determines the higher quality playback can be sustained according to a combination of factors.

[5] The end user station of claim 1 wherein the media player is configured to upshift to the higher quality copy when the performance factor is greater than the first threshold and the media player determines that the higher quality playback can be sustained according to an amount of contiguously available files stored by the media player.

Id. at 13:20-61, 13:65-14:11. The limitations of claim 1 have been separated for clarity. *See generally* Compls. Br, Staff Br.

DISH relies on claims 1, 3 and 5 of the '564 patent to satisfy the technical prong of the domestic industry requirement. *See* Compls. Br. at 122.

2. U.S. Patent No. 10,757,156

The '156 patent, titled "Apparatus, System, and Method for Adaptive-Rate Shifting of Streaming Content," issued on August 25, 2020, and names Robert Drew Major and Mark B. Hurst

as inventors. '156 patent at cover page. The '156 patent issued from application no. 16/291,343, filed on March 4, 2019. *Id.*; *see* Compl. ¶ 5.8.

DISH asserts independent claim 1 and dependent claims 2, 4 and 5 of the '156 patent. *See* Compls. Br. at 2. These claims read as follows:

[1pre] An apparatus for rendering a video that is adaptively received as a digital stream from a video server over a network, the apparatus comprising;

[1a] a media player operating on the apparatus, wherein the media player is configured to stream the video from the video server via at least one transmission control protocol (TCP) connection over the network,

[1b] wherein the video server stores multiple different copies of the video encoded at different bit rates as multiple sets of streamlets,

[1c] wherein each of the streamlets yields a different portion of the video on playback,

[1d] wherein the streamlets across the different copies yield the same portions of the video on playback, and

[1e] wherein the streamlets in the different copies are aligned in time such that the streamlets that play back the same portion of the video for the different copies each begin at the same playback time in relation to the beginning of the video, and

[1f] wherein the media player streams the video by: requesting sequential streamlets of one of the copies from the video server according to the playback times of the streamlets by transmitting hypertext transport protocol (HTTP) GET requests that identify the selected streamlets stored by the video server,

[1g] wherein the sequential streamlets are selected by the media player from the based upon successive determinations to shift the playback quality to a higher or lower quality one of the different copies of the video;

[1h] repeatedly generating, by the media player, a factor relating to the performance of the network that is indicative of an ability to sustain the streaming of the video;

[1i] adapting the successive determinations to shift the playback quality

based on the factor to achieve continuous playback of the video using the streamlets of the highest quality copy of the video that is determined to be sustainable at that time; and

[1j] presenting the video for playback by providing the requested streamlets in order of ascending start time.

[2] The apparatus of claim 1, wherein the apparatus is configured to establish multiple Transmission Control Protocol (TCP) connections with a content server, and request streamlets of varying bitrates.

[4] The apparatus of claim 1, wherein the requesting the sequential streamlets comprises the apparatus transmitting hypertext transport protocol (HTTP) GET requests for selected streamlets, wherein each of the HTTP GET requests identifies the separate file stored by the video server that corresponds to the requested streamlet.

[5] The apparatus of claim 1 wherein each of the streamlets of each of the different copies is independently requestable and playable by the apparatus.

Id. at 13:52-14:26, 14:30-38. The limitations of claim 1 have been separated for clarity. *See generally* Compls. Br, Staff Br.

DISH relies on claims 1 and 4 of the '156 patent to satisfy the technical prong of the domestic industry requirement. *See* Compls. Br. at 156.

3. U.S. Patent No. 10,469,554

The '554 patent, titled "Apparatus, System, and Method for Multi-Bitrate Content Streaming," issued on November 5, 2019, and names David F. Brueck, Mark B. Hurst, and R. Drew Major as inventors. '554 patent at cover page. The '554 patent issued from application no. 16/252,188, filed on January 18, 2019. *Id.*; *see* Compl. ¶ 5.11.

DISH asserts independent claim 16 and dependent claims 17 and 20 of the '554 patent. *See* Compls. Br. at 2. These claims read as follows:

[16pre] An end user station to stream a live event video over a network from a server for playback of the video, the content player device comprising:

[16a] a processor;

[16b] a digital processing apparatus memory device comprising non-transitory machine-readable instructions that, when executed, cause the processor to:

[16c] establish one or more network connections between the end user station and the server, wherein the server is configured to access at least one of a plurality of groups of streamlets;

[16d] wherein the live event 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, 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 live event video;

[16e] wherein at least one of the low quality stream, the medium quality stream, and the high quality stream is encoded at a bit rate of no less than 600 kbps; and

[16f] 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 live event video at a different one of the different bitrates;

[16g] 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;

[16h] place a streamlet request to the server over the one or more network connections for the first streamlet of the selected stream;

[16i] receive the requested first streamlet from the server via the one or more network connections; and

[16j] provide the received first streamlet for playback of the live event video.

[17] The end user station of claim 16, wherein the second streamlet of each of the groups of streamlets each has the same second duration and corresponds to the same second portion of the live event video in the low quality stream, the medium quality stream, and the high quality stream, the second streamlet of the low quality stream having the same bitrate as the first

streamlet of the low quality stream.

[20] The end user station of claim 16, wherein the first streamlets of the low quality stream, the medium quality stream, and the high quality stream are available before the live event is complete.

Id. at 20:3-54, 20:60-63. The limitations of claim 16 have been separated for clarity. *See generally* Compls. Br, Staff Br.

DISH relies on claims 16 and 17 of the '554 patent to satisfy the technical prong of the domestic industry requirement. *See* Compls. Br. at 139.

4. U.S. Patent No. 10,469,555

The '555 patent, titled "Apparatus, System, and Method for Multi-Bitrate Content Streaming," issued on November 5, 2019, and names David F. Brueck, Mark B. Hurst, and R. Drew Major as inventors. '555 patent at cover page. The '555 patent issued from application no. 16/252,356, filed on January 18, 2019. *Id.*; *see* Compl. ¶ 5.13.

DISH asserts independent claim 10 and dependent claims 11, 14 and 15 of the '555 patent. *See* Compls. Br. at 2. These claims read as follows:

[10pre] A content player device to stream a video over a network from a server for playback of the video, the content player device comprising:

[10a] a processor;

[10b] a digital processing apparatus memory device comprising non-transitory machine-readable instructions that, when executed, cause the processor to:

[10c] establish one or more network connections between the client module and the server, wherein the server is configured to access at least one of a plurality of groups of streamlets;

[10d] 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, wherein each of the low quality stream, the medium quality stream, and the high quality stream comprises a streamlet that encodes the same portion

of the video at a different one of the plurality of different bitrates;

[10e] wherein at least one of the low quality stream, medium quality stream, and high quality stream is encoded at a bit rate of no less than 600 kbps; and

[10f] wherein the streamlet encoding the same portion of the video in the low quality stream has an equal playback duration as the streamlet encoding the same portion of the video in the high quality stream;

[10g] select a specific one of the streams based upon a determination by the client module to select a higher or lower bitrate version of the streams;

[10h] place a streamlet request to the server over the one or more network connections for the selected stream;

[10i] receive the requested streamlets from the server via the one or more network connections; and

[10j] provide the received streamlets for playback of the video.

[11] The content player device of claim 10 wherein each streamlet of the plurality of streamlets in the low quality stream, the medium quality stream, and the high quality stream has a duration that is the same as each other.

[14] The content player device of claim 10, wherein the video is a video of a live event.

[15] The content player device of claim 14, wherein the streamlets of the low quality stream, the medium quality stream, and the high quality stream are available before the live event is complete.

Id. at 19:45-20:19, 20:28-33. The limitations of claim 10 have been separated for clarity. *See generally* Compls. Br, Staff Br.

DISH relies on claims 10, 11 and 14 of the ’555 patent to satisfy the technical prong of the domestic industry requirement. *See* Compls. Br. at 151.

E. The Accused Products

The accused products in this investigation are “Internet-streaming enabled video displays and components thereof that are capable of using adaptive bit-rate streaming to stream content for

fitness devices, and fitness devices containing such internet-streaming video displays and components." Compl., ¶ 4.1. The parties listed the accused products in a joint filing required by the procedural schedule. See Order No. 5 (requiring a "joint statement regarding identification of accused products"). By listing a product in the joint filing, respondents have not admitted infringement. Nevertheless, the joint filing indicates the final extent of DISH's accusations in this investigation. See Joint Statement Regarding Identification of Accused Products (EDIS Doc. No. 755507).

1. Models Accused by DISH

DISH alleges that the respondents infringe certain claims of the asserted patents with respect to the following products:

Respondent(s)	Representative Product	Accused Product(s)
Peloton	Peloton Bike running Peloton application software available on April 13, 2021, as it operates when receiving on demand and live content in the format created, used, or provided by Peloton as of April 13, 2021	The Peloton Bike running Peloton application software available on April 13, 2021, as it operates when receiving on demand and live content in the format created, used, or provided by Peloton as of April 13, 2021, is representative of Peloton Bike; Peloton Bike+; Peloton Tread; Peloton Tread+; Touchscreen [redacted] products running versions of Peloton application software available on April 13, 2021, as they operated when receiving on demand and live content in the format created, used, or provided by Peloton as of April 13, 2021, for purposes of determining infringement of the Accused Peloton Products when receiving on demand and live content in the format created, used, or provided by Peloton as of April 13, 2021, in this Investigation

Respondent(s)	Representative Product	Accused Product(s)
iFit	NordicTrack Commercial S15i running iFit application software available on April 13, 2021	NordicTrack Commercial S15i running iFit application software available on April 13, 2021 is representative, for the purposes of determining DISH's allegations of infringement in this Investigation, of ProForm Vue, NordicTrack Vault (complete), NordicTrack Vault (standalone), ProForm Studio Bike Pro, ProForm Studio Bike Pro 22, FreeMotion r22.9, FreeMotion u22.9, FreeMotion Coachbike, NordicTrack Commercial S15i, NordicTrack Commercial S22i, NordicTrack Commercial VR25, NordicTrack Commercial R35, NordicTrack Commercial VU 19, NordicTrack Commercial VU 29, ProForm R10, NordicTrack RW600, NordicTrack RW700, NordicTrack RW900, ProForm Carbon T7, ProForm Carbon T10, ProForm Pro 2000, ProForm Pro 9000, ProForm Carbon E7, ProForm Pro E14, ProForm Carbon HIIT H7, ProForm Carbon HIIT H14, FreeMotion i22.9, FreeMotion t22.9, FreeMotion e22.9 Elliptical, NordicTrack X22i, NordicTrack X32i, NordicTrack Commercial 1750, NordicTrack Commercial 2450, NordicTrack Commercial 2950, NordicTrack EXP 7i, NordicTrack EXP 10i, NordicTrack T 6.5 Si, NordicTrack FS10i, NordicTrack FS14i, NordicTrack Commercial 9.9, NordicTrack Commercial 14.9, and NordicTrack SpaceSaver SE9iproducts running iFit application software available on April 13, 2021

Respondent(s)	Representative Product	Accused Product(s)
iFit	NordicTrack Fusion CST Pro, if running iFit application software that was available on April 13, 2021	NordicTrack Fusion CST Pro, if running iFit application software that was available on April 13, 2021, is representative, for the purposes of determining DISH's allegations of infringement in this Investigation, of NordicTrack Fusion CST and NordicTrack Fusion CST Pro products running iFit application software available on April 13, 2021
MIRROR	MIRROR V1.0 product running MIRROR application software available for purchase in the United States on April 13, 2021	The MIRROR V1.0 product running MIRROR application software available for purchase in the United States on April 13, 2021, is representative of MIRROR V1.0 products running any version of MIRROR application software as of October 29, 2021, and is representative of MIRROR V1.1 products running any version of MIRROR application software as of October 29, 2021

See Joint Stipulation of DISH and Peloton as to Representative Products, at 1-2 (Oct. 29, 2021), (EDIS Doc. ID 755504); Joint Stipulation of DISH and iFIT as to Representative Products, at 1-2 (Oct. 29, 2021), (EDIS Doc. ID 755539); Joint Stipulation of DISH and MIRROR as to Representative Products, at 1 (Oct. 29, 2021), (EDIS Doc. ID 755525); Staff Br. at 16-21.

Additional background on the technology used in the accused products will be useful throughout the infringement analysis below.

2. Technology in the Accused Products

a) HTTP Live Streaming (HLS)

All of the accused products employ a protocol called HTTP Live Streaming (also known as HLS) to stream video from servers to viewers. Negus Tr. 118. HLS is an HTTP-based adaptive bitrate streaming communications protocol developed by Apple Inc. and released in 2009. CX-0836 (RFC 8216) at 1, 4. Support for the protocol is widespread in media players, web browsers, mobile devices, and streaming media servers. HLS incorporates mechanisms to adapt to unreliable network conditions without causing user-visible playback stalling. *See* CX-0836 (RFC 8216) at 1, 30. For example, on an unreliable wireless network, HLS allows transition to a lower quality video, thus reducing bandwidth usage. *See id.* at 5. HLS systems also can employ multiple servers for the same video. *See* RX-0004C (Snoeren RWS) at Q/A 25-26. If one of the servers fails, content from another server can be used, allowing a seamless transition from the viewer's perspective. *See id.*

HLS works by breaking a video stream into a sequence of small HTTP-based file downloads. *See* CX-0836 (RFC 8216) at 6, 38. Streams are encoded at different bit rates. *See id.* at 5. A list of available streams, called an extended M3U playlist, is sent to the client. *See id.* at 9.

The respondents' accused products employ HLS.

b) MPEG-DASH

Some of the accused products also employ a protocol called MPEG-DASH. *See* RX-0004C (Snoeren RWS) at Q/A 88-90. MPEG-DASH was the first adaptive bit-rate HTTP-based streaming solution to become an international standard. Like HLS, MPEG-DASH is an adaptive bitrate streaming technique that enables streaming of media content over the Internet.

See CX-0612 (ISO-IEC DASH) at 9. MPEG-DASH works in a similar way to HLS, by breaking the content into a sequence of small segments. *See id.* at 19-20. Each segment contains a short interval of content. *See id.* at 21. The content is made available at a variety of different bit rates. *See id.* at 22-24. While the content is being played back by an MPEG-DASH client, the client uses a bit rate adaptation (ABR) algorithm to automatically select the segment with the highest bit rate possible that can be downloaded in time for playback without causing stalls or re-buffering events in the playback. *See id.* Thus, an MPEG-DASH client can seamlessly adapt to changing network conditions and provide high quality playback with few stalls or re-buffering events.

MPEG-DASH uses existing HTTP web server infrastructure that is used for delivery of essentially all World Wide Web content. *See id.* at 9. It allows devices like Internet-connected televisions, TV set-top boxes, desktop computers, smartphones, tablets, etc., to consume multimedia content (video, TV, radio, etc.) delivered via the Internet, coping with variable Internet receiving conditions.

The MIRROR accused products employ MPEG-DASH for certain functionality.

c) MIRROR's HLS and MPEG-DASH Technology

The MIRROR accused products use both HLS and MPEG-DASH to stream content. The MIRROR accused products use [redacted] *See* RX-0008C (D'Ambrosio-Correll DWS) at Q/A 16-21, 24-29; RX-0004C (Snoeren RWS) Q/A 88-90. MIRROR's "On Demand" classes are recorded and then transmitted to [redacted] video files. *Id*.

In addition to denying infringement in general, MIRROR raises additional arguments specific to the alleged infringement of the MPEG-DASH functionality. *See, e.g.*, Resps. Br. at 61-62, 66, 69. Those arguments are addressed in the infringement analysis below.

d) Peloton's [redacted]

As noted in the chart above, DISH accuses Peloton products running versions of Peloton application software available on April 13, 2021. While the Peloton accused products employ HLS, Peloton has implemented a [redacted]. *See* RX-0004C (Snoeren RWS) at Q/A 69 (citing RX-0006C (Shanahan DWS) at Q/A 29-31); Shanahan Tr. at 208–211. Peloton requests adjudication of [redacted] as a design-around. *See* Resps. Br. at 22-25. DISH does not dispute whether [redacted] is within the scope of the investigations and in fact accuses Peloton of infringement based on that system. *See id.* at 93; *id.* at 103.

In determining whether a respondent has met its burden for adjudication of a design-around, the Commission considers four factors: (1) whether the product is within the scope of the investigation; (2) whether the product has been imported; (3) whether the design-arounds are sufficiently fixed in design, and; (4) whether the design-arounds have been sufficiently disclosed by respondent during discovery. *See, e.g.*, *Certain Human Milk Oligosaccharides and Methods of Producing the Same*, Inv. No. 337-TA-1120, Comm'n Op. at 18 (June 8, 2020) (citing *Certain Two-Way Radio Equipment and Systems, Related Software and Components Thereof*, Inv. No. 337-TA-1053, Comm'n Op. (Nov. 16, 2018)).

Here, DISH accuses Peloton of infringing claims 1, 2, and 5 of the '156 patent and claims 10 and 11 of the '555 patent through implementation of [redacted], thus drawing [redacted] into the investigation. *See id.* at 93, 103. Peloton adduced evidence showing that [redacted] has been implemented and used with Peloton's imported accused products

[redacted]

since [redacted]. *See* RX-0006C (Shanahan DWS) at Q/A 30. Peloton further adduced evidence regarding the [redacted]. See RX-0004C (Snoeren RWS) at Q/A 69-72; RX-0006C (Shanahan DWS) at Q/A 29-31. Moreover, Peloton disclosed details on [redacted] during discovery, including deposition testimony, documents and native files, interrogatory responses, and the expert report of Dr. Snoeren. CX-0180C (Peloton's Fifth Supplemental Interrogatory Responses) at 31-35; RX-0088C (sample class); RX-0089C (configuration file).

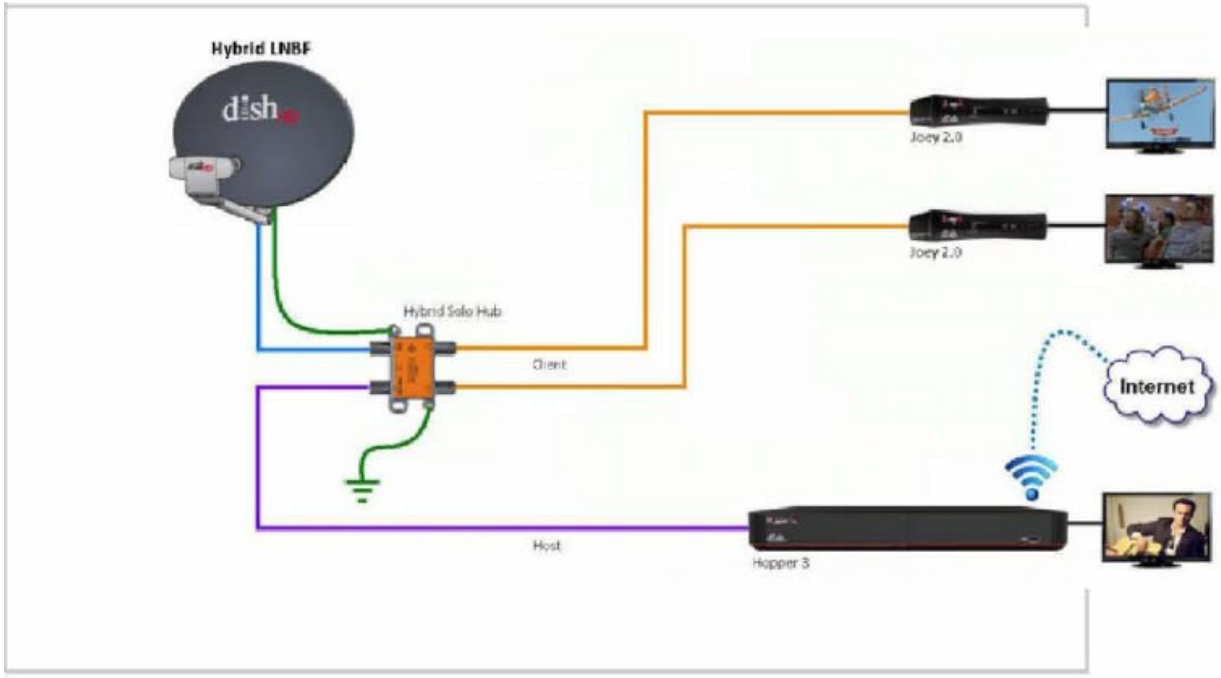
In view of the record evidence, I find the Peloton [redacted] is a fixed design that has been used with Peloton imported products since at least [redacted]. I also find [redacted] has been sufficiently disclosed during discovery. I therefore find [redacted] to be within the scope of the investigation and it will be included within the definition of accused products adjudicated in this final initial determination. *See Certain Human Milk Oligosaccharides*, Inv. No. 337-TA-1120, Comm'n Op. at 18.

F. The Domestic Industry Products

DISH contends that its set-top boxes practice the asserted domestic industry claims. *See* Compls. Br. at 117. These include the Hopper, Hopper with Sling, Hopper 3, Hopper Duo, and Wally products (collectively, DISH Set-Top Boxes). *See id.* DISH further contends the Sling TV Application ("Sling App") for the Amazon Fire, the Sling App for iOS, and the Sling App for Roku practice the asserted domestic industry claims. *See id.* at 120-21. DISH additionally argues that its "DISH TV" and "Sling TV" brands have a direct relationship to exploitation of the patented technology because they are the real-world manifestation of the patented technology. *See id.* at 6-7. DISH also avers that the domestic infrastructure and domestic workforce that DISH relies on

to provide these services "have a direct relationship to exploitation of the patented technology" because, without them, DISH could not deliver these services in the first instance. *See id.*

The DISH Set-Top Boxes function to provide both satellite-TV and Internet-streaming functionality to the user's television or other display, as shown in the figure below. *See* CX-0002C (Kroonenberg DWS) at Q/A 53-54.

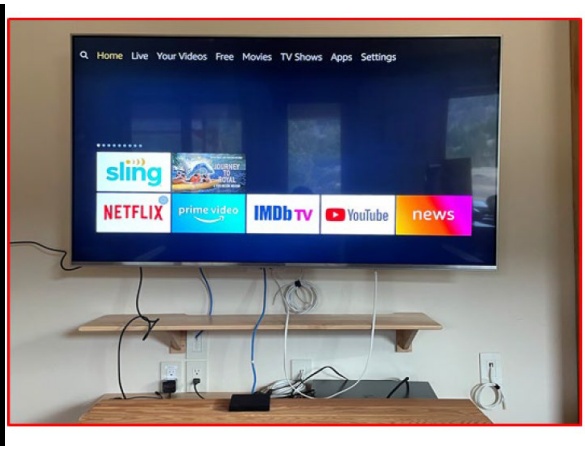


CX-0062 (Hopper Installation Guide) at 1.

The Sling App "delivers television programming and other content under the Sling TV brand, but solely via the Internet." CX-0002C (Kroonenberg DWS) at Q/A 19. DISH provides the Sling App for a variety of different platforms, including the "Amazon Fire, Apple TV, Roku, Samsung Smart TV, LG Smart TV, and Xbox game console." *Id.*

[redacted]

[redacted]



CX-0445C (Sling TV Overview) at 2; CDX-0010C.TEST.157.

To satisfy the domestic industry requirement, DISH further relies on: (1) the servers that segment and encode content into streamlets; (2) the servers that create manifests for these streamlets and publish them to content delivery networks; and (3) the servers within these content delivery networks that actually "serve" the streamlets to consumers. *See* Compls. Br. at 7-8.

II. JURISDICTION

A. Subject Matter Jurisdiction

Section 337 of the Tariff Act prohibits the importation, the sale for importation, or the sale after importation of articles that infringe a valid and enforceable patent if an industry exists in the United States relating to articles protected by the patent. 19 U.S.C. §§ 1337(a)(1)-(2). DISH's complaint states a cause of action under section 337 by alleging that respondents Peloton, iFit, and MIRROR import, sell for importation, and sell after importation certain fitness devices, streaming components, and systems containing same that infringe the asserted patents. *See* Compl., ¶¶ 3.23-47. No party has contested the Commission's subject matter jurisdiction over this investigation. I determine the Commission has subject matter jurisdiction over this investigation.

B. Personal Jurisdiction

By filing a complaint and participating in this investigation, DISH has consented to personal jurisdiction at the Commission. *See Certain Toner Cartridges, Components Thereof, and Systems Containing the Sam*e, Inv. No. 337-TA-1174, ID at 34-35 (July 23, 2020), *unreviewed*, Comm'n Notice (Sept. 8, 2020). Respondents Peloton, iFit, and MIRROR have participated in this investigation by, among other things, responding to the complaint and notice of investigation and participating in discovery, thereby submitting themselves to the personal jurisdiction of the Commission. I therefore find that the Commission has personal jurisdiction over all parties. *See, e.g.*, *Certain Strontium-Rubidium Radioisotope Infusion Systems, and Components Thereof Including Generators*, Inv. No. 337-TA-1110, ID at 9 (Aug. 1, 2019), *not reviewed in pertinent part*, Comm'n Notice (Sept. 30, 2019).

C. *In Rem* Jurisdiction

As the parties have stipulated that the accused products have been imported into the United States, I find the Commission has *in rem* jurisdiction over the accused products in this investigation. *See* Joint Stipulation Regarding Peloton's Importation, Sale, and U.S. Inventory, EDIS Doc. ID No. 758953 ("Peloton Importation, Sale, and Inventory Stipulation"); Joint Stipulation Regarding iFIT's Importation, Sale, and Inventory in the U.S., EDIS Doc. ID No. 758184 ("iFIT Importation, Sale, and Inventory Stipulation"); and Joint Stipulation Regarding MIRROR's Importation, Inventory, Sale in the U.S., EDIS Doc. ID No. 756162 ("MIRROR Importation, Sale, and Inventory Stipulation"); RX-0006C (Shanahan DWS) at Q/A 30 ("[redacted]"); Resps. Br. at 25; *Sealed Air Corp. v. Int'l*

Trade Comm'n, 645 F.2d 976, 985–86 (C.C.P.A. 1981) (noting that the Commission has jurisdiction over imported goods).

III. STANDING

Respondents do not dispute DISH's ownership of the asserted patents. *See* Resps. Br. at 25. The record evidence demonstrates that DISH has standing in this investigation due to its ownership of the asserted patents. *See* JX-0011 ('564 patent), JX-0012 ('554 patent), JX-0013 ('555 patent), and JX-0014 ('156 patent).

IV. IMPORTATION

As indicated in the notice of investigation, quoted above, this investigation was instituted to determine whether a violation of section 337 has occurred in "the importation into the United States, the sale for importation, or the sale within the United States after importation" of certain fitness products. *See* 86 Fed. Reg. 27106 (May 19, 2021); 19 U.S.C. § 1337(a)(1)(B) (making unlawful, in certain circumstances, the "importation into the United States, the sale for importation, or the sale within the United States after importation by the owner, importer, or consignee, of articles that . . . infringe a valid and enforceable United States patent . . . ."). It has long been recognized that an importation of even one accused product can satisfy the importation requirement of section 337. *See Certain Trolley Wheel Assemblies*, Inv. No. 337-TA-161, Comm'n Op. at 7-8, USITC Pub. No. 1605 (Nov. 1984) (deeming the importation requirement satisfied by the importation of a single product of no commercial value).

In this investigation, it is uncontested that the importation requirement is satisfied with respect to all accused products. Each respondent has stipulated to the importation of accused products into the United States, and no respondent contests that the importation requirement of section 337 has been met. EDIS Doc. ID Nos. 758953, 758184, 756162; Resps. Br. at 25. With

respect to Peloton products using [redacted], Peloton admits products using that system have been imported into the United States since [redacted]. *See* RX-0006C (Shanahan DWS) at Q/A 30.

V. LEGAL PRINCIPLES

A. Claim Construction

Claim construction begins with the plain language of the claim.[2] Claims should be given their ordinary and customary meaning as understood by a person of ordinary skill in the art, viewing the claim terms in the context of the entire patent.[3] *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2005), *cert. denied*, 546 U.S. 1170 (2006).

The specification usually is the best guide to the meaning of the term. *Phillips*, 415 F.3d at 1315. As a general rule, the particular examples or embodiments discussed in the specification are not to be read into the claims as limitations. *Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 979 (Fed. Cir. 1995) (*en banc*), *aff'd*, 517 U.S. 370 (1996). The specification is, however, always highly relevant to the claim construction analysis, and is usually dispositive. *Phillips*, 415 F.3d at 1315 (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). Moreover, "[t]he construction that stays true to the claim language and most naturally aligns with the patent's description of the invention will be, in the end, the correct construction." *Id.* at 1316.

[2] Only those claim terms that are in controversy need to be construed, and only to the extent necessary to resolve the controversy. *Vanderlande Indus. Nederland BV v. Int'l Trade Comm'n*, 366 F.3d 1311, 1323 (Fed. Cir. 2004); *Vivid Tech., Inc. v. American Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

[3] Factors that may be considered when determining the level of ordinary skill in the art include: "(1) the educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of active workers in the field." *Environmental Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 696 (Fed. Cir. 1983), *cert. denied*, 464 U.S. 1043 (1984).

Claims are not necessarily, and are not usually, limited in scope to the preferred embodiment. *RF Delaware, Inc. v. Pacific Keystone Techs., Inc.*, 326 F.3d 1255, 1263 (Fed. Cir. 2003); *Decisioning.com, Inc. v. Federated Dep't Stores, Inc.*, 527 F.3d 1300, 1314 (Fed. Cir. 2008) ("[The] description of a preferred embodiment, in the absence of a clear intention to limit claim scope, is an insufficient basis on which to narrow the claims).

B. Infringement

1. Direct Infringement

Under 35 U.S.C. § 271, direct infringement consists of making, using, offering to sell, selling, or importing a patented invention without consent of the patent owner. The complainant in a section 337 investigation bears the burden of proving infringement of the asserted patent claims by a "preponderance of the evidence." *Enercon GmbH v. Int'l Trade Comm'n*, 151 F.3d 1376 (Fed. Cir. 1998).

Literal infringement of a claim occurs when every limitation recited in the claim appears in the accused device, *i.e.*, when the properly construed claim reads on the accused device exactly.[4] *Amhil Enters., Ltd. v. Wawa, Inc.*, 81 F.3d 1554, 1562 (Fed. Cir. 1996); *Southwall Tech. v. Cardinal IG Co.*, 54 F.3d 1570, 1575 (Fed Cir. 1995).

If the accused product does not literally infringe the patent claim, infringement might be found under the doctrine of equivalents. "Under this doctrine, a product or process that does not literally infringe upon the express terms of a patent claim may nonetheless be found to infringe if there is 'equivalence' between the elements of the accused product or process and the claimed

[4] Each patent claim element or limitation is considered material and essential. *London v. Carson Pirie Scott & Co.*, 946 F.2d 1534, 1538 (Fed. Cir. 1991). If an accused device lacks a limitation of an independent claim, the device cannot infringe a dependent claim. *See Wahpeton Canvas Co. v. Frontier, Inc.*, 870 F.2d 1546, 1552 n.9 (Fed. Cir. 1989).

elements of the patented invention." *Warner-Jenkinson Co., Inc. v. Hilton Davis Chemical Co.*, 520 U.S. 17, 21 (1997) (citing *Graver Tank & Mfg. Co. v. Linde Air Products Co.*, 339 U.S. 605, 609 (1950)). "The determination of equivalence should be applied as an objective inquiry on an element-by-element basis."[5] *Id*. at 40.

"An element in the accused product is equivalent to a claim limitation if the differences between the two are insubstantial. The analysis focuses on whether the element in the accused device 'performs substantially the same function in substantially the same way to obtain the same result' as the claim limitation." *AquaTex Indus. v. Techniche Solutions*, 419 F.3d 1374, 1382 (Fed. Cir. 2005) (quoting *Graver Tank*, 339 U.S. at 608); *accord Absolute Software*, 659 F.3d at 1139-40.[6]

Prosecution history estoppel can prevent a patentee from relying on the doctrine of equivalents when the patentee relinquished subject matter during the prosecution of the patent, either by amendment or argument. *AquaTex*, 419 F.3d at 1382. In particular, "[t]he doctrine of prosecution history estoppel limits the doctrine of equivalents when an applicant makes a narrowing amendment for purposes of patentability, or clearly and unmistakably surrenders subject matter by arguments made to an examiner." *Id*. (quoting *Salazar v. Procter & Gamble Co.*, 414 F.3d 1342, 1344 (Fed. Cir. 2005)).

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[5] "Infringement, whether literal or under the doctrine of equivalents, is a question of fact." *Absolute Software, Inc. v. Stealth Signal, Inc.*, 659 F.3d 1121, 1130 (Fed. Cir. 2011).

[6] "The known interchangeability of substitutes for an element of a patent is one of the express objective factors noted by *Graver Tank* as bearing upon whether the accused device is substantially the same as the patented invention. Independent experimentation by the alleged infringer would not always reflect upon the objective question whether a person skilled in the art would have known of the interchangeability between two elements, but in many cases it would likely be probative of such knowledge." *Warner-Jenkinson*, 520 U.S. at 36.

2. Inducement of Infringement

Section 271(b) of the Patent Act provides: "Whoever actively induces infringement of a patent shall be liable as an infringer." 35 U.S.C. § 271(b).

Under 35 U.S.C. § 271(b), whoever actively induces infringement of a patent shall be liable as an infringer. Liability for inducing infringement attaches if the defendant knew of the patent and that the induced acts constituted patent infringement. *Commil USA, LLC v. Cisco Sys., Inc.*, 575 U.S. 632, 638-39 (2015); *see also Microsoft Corp. v. Datatern, Inc.*, 755 F.3d 899, 904 (Fed. Cir. 2014) (to prove induced infringement, patentee must show that accused inducer took an affirmative act to encourage infringement with knowledge that the induced acts constitute patent infringement); *Suprema, Inc. v. Int'l Trade Comm'n*, 796 F.3d 1338, 1346 (Fed. Cir. 2015) (the term infringement "encompasses both direct and indirect infringement, including infringement by importation that induces direct infringement of a method claim").

C. Validity

One cannot be held liable for practicing an invalid patent claim. *See Pandrol USA, LP v. AirBoss Railway Prods., Inc.*, 320 F.3d 1354, 1365 (Fed. Cir. 2003). Nevertheless, each claim of a patent is presumed to be valid, even if it depends from a claim found to be invalid. 35 U.S.C. § 282; *DMI Inc. v. Deere & Co.*, 802 F.2d 421 (Fed. Cir. 1986).

A respondent that has raised patent invalidity as an affirmative defense must overcome the presumption by "clear and convincing" evidence of invalidity. *i4i Ltd. Partnership v. Microsoft Corp.*, 564 U.S. 91, 95 (2011).

1. Anticipation

A prior art reference anticipates a claimed invention when it discloses or contains all the claimed limitations "arranged or combined in the same way as in the claim." *Wm. Wrigley Jr. Co.*

v. Cadbury Adams USA LLC, 683 F.3d 1356, 1361 (Fed. Cir. 2012). However, the reference "need not satisfy an *ipsissimis verbis* test." *In re Gleave*, 560 F.3d 1331, 1334 (Fed. Cir. 2009). Anticipation under 35 U.S.C. § 102 is a question of fact. *z4 Techs., Inc. v. Microsoft Corp.*, 507 F.3d 1340, 1347 (Fed. Cir. 2007).

2. Obviousness

Under Section 103 of the Patent Act, a patent claim is invalid "if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains."[7] 35 U.S.C. § 103 (pre-AIA). While the ultimate determination of whether an invention would have been obvious is a legal conclusion, it is based on "underlying factual inquiries including: (1) the scope and content of the prior art; (2) the level of ordinary skill in the art; (3) the differences between the claimed invention and the prior art; and (4) objective evidence of nonobviousness." *Eli Lilly and Co. v. Teva Pharmaceuticals USA, Inc.*, 619 F.3d 1329 (Fed. Cir. 2010).

Objective evidence of nonobviousness, also known as "secondary considerations," includes commercial success, long felt need, and failure of others. *Graham v. John Deere Co.*, 383 U.S. 1, 13-17 (1966); *Dystar Textilfarben GmbH v. C.H. Patrick Co.*, 464 F.3d 1356, 1361 (Fed. Cir. 2006). "[E]vidence arising out of the so-called 'secondary considerations' must always when present be considered en route to a determination of obviousness." *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538 (Fed. Cir. 1983). Secondary considerations, such as

[7] The standard for determining whether a patent or publication is prior art under section 103 is the same as under 35 U.S.C. § 102, which is a legal question. *Panduit Corp. v. Dennison Mfg. Co.*, 810 F.2d 1561, 1568 (Fed. Cir. 1987).

commercial success, may not be dispositive in the obviousness analysis. *See, e.g., KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 426 (2007) (commercial success did not alter conclusion of obviousness).

In raising an obviousness defense, "the burden falls on the patent challenger to show by clear and convincing evidence that a person of ordinary skill in the art would have had reason to attempt to make the composition or device, or carry out the claimed process, and would have had a reasonable expectation of success in doing so." *PharmaStem Therapeutics, Inc. v. ViaCell, Inc.*, 491 F.3d 1342, 1360 (Fed. Cir. 2007); *see KSR*, 550 U.S. at 416 (a combination of elements must do more than yield a predictable result; combining elements that work together in an unexpected and fruitful manner would not have been obvious).[8]

3. Indefiniteness

Paragraph 2 of Section 112 of the Patent Act requires that the patent claims particularly point out and distinctly claim the subject matter that the patentee regards to be the invention. *See* 35 U.S.C. § 112, ¶ 2 (pre-AIA). A patent claim is invalid for indefiniteness if it fails to inform those skilled in the art about the scope of the invention "with reasonable certainty" when it is viewed in light of the specification and prosecution history. *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 910 (2014). An accused infringer has the burden of proving indefiniteness by clear and convincing evidence. *BASF Corp. v. Johnson Matthey Inc*., 875 F.3d 1360, 1365 (Fed. Cir. 2017).

[8] Further, "when the prior art teaches away from combining certain known elements, discovery of a successful means of combining them is more likely to be nonobvious." *KSR*, 550 U.S. at 416 (citing *United States v. Adams*, 383 U.S. 39, 52 (1966)).

4. Inventorship

Section 116 of the Patent Act provides the standard for joint inventorship:

> When an invention is made by two or more persons jointly, they shall apply for patent jointly and each make the required oath, except as otherwise provided in this title. Inventors may apply for a patent jointly even though (1) they did not physically work together or at the same time, (2) each did not make the same type or amount of contribution, or (3) each did not make a contribution to the subject matter of every claim of the patent.

35 U.S.C. § 116.

"Because conception is the touchstone of inventorship, each joint inventor must generally contribute to the conception of the invention." *Ethicon, Inc. v. U.S. Surgical Corp.,* 135 F.3d 1456, 1460 (Fed. Cir. 1998). Conception exists "when a definite and permanent idea of an operative invention, including every feature of the subject matter sought to be patented, is known." *Sewall v. Walters,* 21 F.3d 411, 415 (Fed. Cir. 1994). In other words, conception is only complete when the "idea is so clearly defined in the inventor's mind that only ordinary skill would be necessary to reduce the invention to practice, without extensive research or experimentation." *Burroughs Wellcome Co. v. Barr Labs., Inc.,* 40 F.3d 1223, 1228 (Fed. Cir. 1994).

Inventorship is a question of law based on underlying factual determinations. *Vapor Point LLC v. Moorhead*, 832 F.3d 1343, 1348 (Fed. Cir. 2016).

5. Inequitable Conduct

"To prevail on a claim of inequitable conduct, the accused infringer must prove that the patentee acted with the specific intent to deceive the PTO." *Therasense, Inc. v. Becton, Dickinson & Co.*, 649 F.3d 1276, 1290 (Fed. Cir. 2011) (*en banc*). "In other words, the accused infringer must prove by clear and convincing evidence that the applicant knew of the reference, knew that it was material, and made a deliberate decision to withhold it." *Id.* "[T]o meet the clear and

convincing evidence standard, the specific intent to deceive must be the single most reasonable inference able to be drawn from the evidence," and thus, "when there are multiple reasonable inferences that may be drawn, intent to deceive cannot be found." *Id.* at 1290-91 (citations omitted). "Intent and materiality are separate requirements," and thus a court "may not infer intent solely from materiality. Instead, a court must weigh the evidence of intent to deceive independent of its analysis of materiality." *Id.* at 1290. "The absence of a good faith explanation for withholding a material reference does not, by itself, prove intent to deceive." *Id.* at 1291.

D. Domestic Industry

For a patent-based complaint, a violation of section 337 can be found "only if an industry in the United States, relating to the articles protected by the patent . . . concerned, exists or is in the process of being established." 19 U.S.C. § 1337(a)(2). The complainant bears the burden of establishing that the domestic industry requirement is satisfied. *John Mezzalingua Assocs., Inc. v. Int'l Trade Comm'n*, 660 F.3d 1322, 1331 (Fed. Cir. 2011). The domestic industry requirement of section 337 is often described as having an economic prong and a technical prong. *InterDigital Commc'ns, LLC v. Int'l Trade Comm'n*, 707 F.3d 1295, 1298 (Fed. Cir. 2013); *Certain Stringed Musical Instruments and Components Thereof*, Inv. No. 337-TA-586, Comm'n Op. at 12-14, USITC Pub. No. 4120 (Dec. 2009).

1. Economic Prong

Section 337(a)(3) sets forth the following economic criteria for determining the existence of a domestic industry in such investigations:

> (3) For purposes of paragraph (2), an industry in the United States shall be considered to exist if there is in the United States, with respect to the articles protected by the patent, copyright, trademark, mask work, or design concerned –

(A) significant investment in plant and equipment;

(B) significant employment of labor or capital; or

(C) substantial investment in its exploitation, including engineering, research and development, or licensing.

19 U.S.C. § 1337(a)(3). Because the statutory criteria are listed in the disjunctive, satisfaction of any one of them will be sufficient to meet the economic prong of the domestic industry requirement. *See InterDigital Commc'ns*, 707 F.3d at 1303 n.4; *Certain Variable Speed Wind Turbines and Components Thereof*, Inv. No. 337-TA-376, Comm'n Op. at 15, USITC Pub. No. 3003 (Nov. 1996).

2. Technical Prong

The technical prong of the domestic industry requirement is satisfied when the complainant in a patent-based section 337 investigation establishes that it is practicing or exploiting the patents at issue. *See* 19 U.S.C. § 1337(a)(2) and (3); *Certain Microsphere Adhesives, Process for Making Same and Prods. Containing Same, Including Self-Stick Repositionable Notes*, Inv. No. 337-TA-366, Comm'n Op. at 8, USITC Pub. No. 2949 (Jan. 1996). "The test for satisfying the 'technical prong' of the industry requirement is essentially [the] same as that for infringement, *i.e.*, a comparison of domestic products to the asserted claims." *Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1375 (Fed. Cir. 2003). To prevail, the patentee must establish by a preponderance of the evidence that the domestic product practices one or more valid claims of the patent. *See id.*; *Spansion*, 629 F.3d at 1349; *Certain Vision-Based Driver Assistance System Cameras and Components Thereof*, Inv. No. 337-TA-907, Comm'n Op. at 36, USITC Pub. No. 4866 (Feb. 2019). It is sufficient to show that the products practice any claim of that patent, not necessarily an asserted claim of that patent. *See Certain Male Prophylactic Devices*, Inv. No. 337-TA-546, Comm'n Op. at 38, USITC Pub. No. 4005 (May 2008).

VI. LEVEL OF ORDINARY SKILL IN THE ART

DISH contends a person of ordinary skill in the art at the time of invention of each of the asserted patents would have 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. *See* Compls. Br. at 9 (citing CX-0008C (Jeffay RWS) at Q/A 23; CX-0010C (Negus DWS) at Q/A 16; RX-0001C (Richardson DWS) at Q/A 117).

Respondents submitted the following proposal: "[S]omeone with at least a bachelor's degree in electrical engineering or computer science, or an equivalent degree or experience in a related field, with practical experience or coursework in the design or development of network-based communication between computer systems." Resps. Br. at 27 (quoting RX-0001C (Richardson DWS) at Q/A 117).

The Staff contends that there does not appear to be a material difference between the private parties' proposals, but finds that DISH's proposed definition is more appropriate because practical experience or coursework in the design or development of distributed multimedia delivery systems more closely aligns with the technology at issue. *See* Staff Br. at 38.

No party has explained how any proposed differences in an ordinary artisan's skill are material to this investigation. To the extent a finding on the ordinary level of skill in the art is necessary, I adopt DISH's description of the ordinary artisan in this field. *Cf. Genzyme Therapeutic Prod. Ltd. P'ship v. Biomarin Pharm. Inc.*, 825 F.3d 1360, 1372 (Fed. Cir. 2016) (failure to make a specific finding about the required level of skill in the art is not reversable error where the record did not show any meaningful differences in proposed definitions or that the outcome of the case would have been different based on which definition was selected). DISH's

proposal accords with Dr. Jeffay's knowledge of colleagues and others working in those fields as of and for several years before the applicable time frame, and the types of problems encountered in the art. *See* CX-0008C (Jeffay RWS) at Q/A 25. Respondents' proposal has not been demonstrated to differ in any material way, and respondents' expert did not provide substantive explanation justifying his proposal. *See* RX-0001C (Richardson DWS) at Q/A 117.

VII. CLAIM CONSTRUCTION

A. Agreed Constructions

Pursuant to Ground Rule 6.d, the parties filed a Joint Claim Construction Chart ("JCCC") on September 22, 2021. JX-0016. In that submission, the parties agreed that the preamble for claim 1 of the '564 patent is limiting in its entirety. *See id.* at 1.[9]

B. Disputed Constructions[10]

1. "streamlet(s)" ('554 patent, claims 16, 17, and 20; '555 patent, claims 10, 11, and 15; '156 patent, claims 1, 2, 4, and 5)

Below is a chart showing the parties' proposed claim constructions.

DISH's Proposed Construction	Respondents' Proposed Construction	The Staff's Proposed Construction
any sized portion(s) of the content file	any sized portion of a content file each of which is stored separately	any sized portion(s) of the content file

See JX-0016 at 3.

[9] As stated in the JCCC, the parties agreed that the preambles to both claims 1 and 8 of the '564 patent are limiting in their entirety. However, DISH is no longer asserting claim 8 of the '564 patent. *See supra* Sec. I.A.

[10] This section addresses only the claim terms identified by the parties as needing construction under Ground Rule 11. *See* Ground Rule 11 (attached to Order No. 2 (Ground Rules)); Comprehensive Joint Outline of Issues (EDIS Doc. Nos. 767242, 768188) ("GR11 Filing").

The dispute between the parties is whether a streamlet can be a portion of the content file—no matter the size of the portion or how it is stored—or whether streamlets must be separately stored portions of the content file.

The terms "streamlet" or "streamlets" appear in independent claim 16 and dependent claims 17 and 20 of the '554 patent (JX-0002 ('554 patent) at claims 16, 17, 20); independent claim 10 and dependent claims 11 and 15 of the '555 patent (JX-0003 ('555 patent) at claims 10, 11, 15); and independent claim 1 and dependent claims 2, 4 and 5 of the '156 patent (JX-0004 ('156 patent) at claims 1, 2, 4, 5).

For the reasons provided below, a "streamlet" will be construed to be "any sized portion of the content file." This construction is consistent with the unambiguous lexicography in the patent specifications, which states: "As used herein, streamlet refers to any sized portion of the content file 200." *See* JX-0004 ('156 patent) at 7:11-12; JX-0002 ('554 patent) at 7:39-40 (same).

Respondents' proposed construction, which requires streamlets to be stored separately, is undermined by at least one other patent claim which expressly recites that requirement. Specifically, dependent claim 7 of the '156 patent adds an additional limitation to the streamlets of claim 1, requiring that "each of the streamlets in each of the plurality of different copies is a separate file stored by the video server." JX-0004 ('156 patent) at claim 7. Because respondents' proposed construction would render at least portions of claim 7 superfluous, it is not favored. *See InterDigital Commc'ns, LLC v. Int'l Trade Comm'n*, 690 F.3d 1318, 1324-25 (Fed. Cir. 2012).

Respondents argue that the patentees limited the meaning of a streamlet under the doctrine of prosecution history disclaimer. *See* Resps. Br. at 29. Respondents point to statements made by the applicant during the prosecution of U.S. Pat. App. No. 11/116,783 ("the '783 Application"), the predecessor application to all of the asserted patents. *See id.*; *supra* Sec. I.D. During

prosecution of the '783 Application, the applicants distinguished a prior art reference called Birney by arguing the reference "discloses combining several different video streams into one Windows media stream." *Ex Parte R. Drew Major and Mark B. Hurst*, Appeal Brief, 2011 WL 12464422 (April 18, 2011) (discussing the reference "Intelligent Streaming," Bill Birney, May 2003, Microsoft ("Birney")). The applicants noted that the single encoded video stream of Birney does not constitute "a plurality of commonly-indexed files for each of the different copies of the video," as was required in the then-pending claim. *Id*. The Board agreed, stating that the cited portions of the Birney reference fail to show "different copies of the video are stored as multiple files" and instead discloses audio and video streams "encoded into a *single* Windows Media stream." *Ex Parte R. Drew Major and Mark B. Hurst*, No. 2011-008734, 2014 WL 3840509, at *2 (P.T.A.B. July 21, 2014) (emphasis in original). The Board elaborated that because the audio and video streams of Birney "are encoded into a single stream, they are not stored as multiple files as the claim limitation requires." *Id*.

Thus, in the '783 Application, the applicants distinguished Birney from claim language requiring "copies of the video," a different term and a different concept from "streamlets." Claims 1 and 7 of the '156 patent confirm the distinction between these two concepts. Claim 1 recites "streamlets *in* the different copies" of the video, and claim 7 similarly recites streamlets "*in* each of the plurality of different copies." JX-0004 ('156 patent) at claims 1, 7 (emphasis added). In addition, the '156 patent specification indicates that "[e]ach streamlet may further comprise a portion of a content file." *Id.* at 3:19-20; *see also id.* at 7:12-14. In contrast, the cited passages from the '783 Application record do not discuss the term streamlet or indicate in any way that streamlets themselves must be stored in separate files. There are no "clear and unmistakable

statements by the patentee that limit the claims" in the manner respondents suggest. *See GE Lighting Sols., LLC v. AgiLight, Inc.*, 750 F.3d 1304, 1309 (Fed. Cir. 2014).

Respondents further argue that, during prosecution of U.S. App. No. 14/516,303 ("the '303 Application"), which issued as the '564 patent, the applicant (1) replaced the word "streamlet" with "file" in certain proposed claims, and (2) distinguished the Birney prior reference described above from the invention, in which copies of the video are "stored as multiple files." Resps. Br. at 29-30. Neither argument limits the scope of the term "streamlet."

First, in replacing the word "streamlet" with "file" in certain proposed claims, the applicant was responding to a non-final rejection under 35 U.S.C. § 112, second paragraph, where the examiner noted that "the phrase 'streamlet' is unclear as to what makes up a streamlet." JX-0006 ('564 Patent FH) at 312. In response, the applicant stated that "the word 'streamlet' is consistently used throughout our specification to refer to a segment of a video stream." *Id.* at 405 (citing Figure 2c and accompanying text). The examiner similarly noted an understanding that "[f]or the furthering of prosecution, the phrase will be taken to mean a packet or segment." *Id*. at 312. Thus, both the examiner and the applicant described a streamlet in a manner substantially similar to DISH's argument here.

Additionally, in replacing the word "streamlet" with "file," the applicant did not define all streamlets as separate files but instead chose to focus on an embodiment of the invention in which streamlets were separate files "in the interest of advancing prosecution" of that particular application. JX-0006 ('564 Patent FH) at 405-06. The applicant did not disclaim the broader disclosure in the specification common to all of the asserted patents that "[e]ach streamlet may further comprise a portion of a content file." JX-0004 ('156 patent) at 3:19-20.

As for the characterization of Birney in the '303 Application record, the patentees' arguments concerning Birney do not refer to "streamlets" at all as the term had been eliminated from the pending claims. The patentees merely stated that Birney fails to disclose "each of a plurality of different copies of the video encoded at different bit rates is stored as multiple files." JX-0006 ('564 Patent FH) at 405-06. As noted above, the discussion of Birney in the '783 Application history addresses "copies of the video," a different term and a different concept from "streamlets." *See* 2014 WL 3840509, at *2. The cited prosecution history from the '303 Application does not contain a clear and unmistakable disclaimer of the scope of the term "streamlet." *See GE Lighting Sols.*, 750 F.3d at 1309.

Respondents also cite the prosecution of U.S. Pat. App. No. 15/207,172 ("the '172 Application"), characterizing the record as containing an argument by the patentee that "Birney did not disclose 'multiple sets of streamlets' based on the Board's decision that Birney did not disclose video 'stored as multiple files.'" Resps. Br. at 30 (quoting RX-0171 at 191). The passage cited is much more vague than might be inferred from respondents' selective quotations. In it, the applicants explained that they moved the phrase "multiple sets of streamlets" from the preamble to the body of the proposed claim to clarify that the limitation is "an affirmative recitation of the claim." RX-0171 at 191. The applicants stated that at least this language distinguishes the invention over the prior art, and then, in a "*see*" signal citation, identified the 2014 Board Decision which addressed the Birney reference. *Id.* Nothing in this passage manifests a "clear and unmistakable" intent to limit the scope of "streamlets."

The construction proposed by DISH and the Staff comports with the language of the claims and the definition of "streamlet" given in the specification, and it is not contradicted by the

prosecution history of any related patent application. Accordingly, the disputed claim term "streamlet" is construed to mean "any sized portion of the content file."

2. "place a streamlet request to the server over the one or more network connections for the selected stream; receive the requested streamlets from the server via the one or more network connections" ('555 patent, claim 10)

Below is a chart showing the parties' proposed claim constructions.

DISH's Proposed Construction	Respondents' Proposed Construction	The Staff's Proposed Construction
Plain and ordinary meaning (*e.g.*, request a plurality of streamlets over the one or more network connections for the selected stream; and receive the requested streamlets from the server via the one or more network connections)	request a plurality of streamlets simultaneously over the one or more network connections for the selected stream; and subsequently receive the plurality of streamlets from the server via the one or more network connections	Plain and ordinary meaning (*e.g.*, request a plurality of streamlets over the one or more network connections for the selected stream; and receive the requested streamlets from the server via the one or more network connections)

See JX-0016 at 3.

The dispute between the parties is whether the claimed "streamlet request" must be "a single request for multiple streamlets simultaneously," as respondents contend (Resps. Br. at 32), or whether the "streamlet request . . . [for] the requested streamlets" would also be satisfied by serial, non-simultaneous requests for a plurality of streamlets, as DISH and the Staff argue.

For the reasons discussed below, the phrases in question will be construed according to their plain and ordinary meaning, which may be satisfied by a request for a single streamlet.

The disputed language appears in independent claim 10 of the '555 patent. JX-0003 ('555 patent) at claim 10. Claim 10 provides "substantial guidance as to the meaning of" the phrases in question. *See Phillips*, 415 F.3d at 1314. Claim 10 recites, in part:

> place a streamlet request to the server over the one or more network connections for the selected stream;
>
> receive the requested streamlets from the server via the one or more network connections . . .

JX-0003 ('555 patent) at claim 10.

As can be seen, claim 10 requires "a streamlet request . . . for the selected stream" but it contains no requirement as to the number of streamlets of the selected stream that must be included in the request. Respondents admit the patent specification teaches the request may be for one streamlet or multiple streamlets. Resps. Br. at 32 ("The parties and the Staff agree that the specification discloses different embodiments, including: (1) one in which a single request is placed for a single streamlet, and (2) another in which a single request is placed for multiple streamlets simultaneously."). The ordinary meaning of the phrase "place a streamlet request . . . for the selected stream" is broad enough to cover both scenarios in the specification, and "neither the claims nor the specification . . . require a departure from this ordinary meaning." *See Network-1 Techs., Inc. v. Hewlett-Packard Co.*, 981 F.3d 1015, 1024 (Fed. Cir. 2020) (where the specification described embodiments with AC power sources and embodiments with DC power sources, a claim requiring a "power source" could be satisfied by either).

Respondents contend that because the "receive" step of claim 10 speaks of "requested streamlets" in the plural, then the earlier "request" must necessarily be for multiple streamlets. But given the teachings of the specification, the "receive" step is more properly interpreted as "receive one or more requested streamlets." This conclusion is consistent with the idiomatic use of the plural in this context, which "can describe a universe ranging from one to some higher number." *See Versa Corp. v. Ag-Bag Int'l Ltd.*, 392 F.3d 1325, 1330 (Fed. Cir. 2004) (a claim requiring a "means for creating air channels" in the plural "does not imply that multiple channels are required

by the claim"); *Dayco Prod., Inc. v. Total Containment, Inc*., 258 F.3d 1317, 1328 (Fed. Cir. 2001) (a claim requiring "projections with recesses therebetween" should be construed to cover "a single recess where there are only two projections").

Respondents further argue that their construction is supported by differing language in claim 16 of the '554 patent, in which the "receive" step uses the term "streamlet" in the singular:

> place a streamlet request to the server over the one or more network connections for the first streamlet of the selected stream;
>
> receive the requested first streamlet from the server via the one or more network connections;

See JX-0002 ('554 patent), claim 16; Resps. Br. at 33. However, the applicability of claim differentiation is at its weakest when it is based on a comparison to another independent claim. *See, e.g.*, *Atlas IP, LLC v. Medtronic, Inc.*, 809 F.3d 599, 607 (Fed. Cir. 2015) (discounting the doctrine of claim differentiation "where it is invoked based on independent claims rather than the relation of an independent and dependent claim."). Patentees are entitled to "use different language to capture the same invention" in independent claims. *Id*. Here, respondents admit that the specification clearly teaches the embodiment they seek to exclude (Resps. Br. at 32), and the ordinary meaning of the claim language covers that embodiment. In this context, the comparison to claim 16 of the '554 patent—an independent claim in another patent—is not persuasive.

The limitations "place a streamlet request to the server over the one or more network connections for the selected stream" and "receive the requested streamlets from the server via the one or more network connections" will be given their ordinary meaning.

3. "quality" terms: "low/medium/high quality stream" ('554 patent, claims 16, 17, and 20; '555 patent, claims 10, 11, and 15)

Below is a chart showing the parties' proposed claim constructions.

Term	DISH's Proposed Construction	Respondents' Proposed Construction	The Staff's Proposed Construction
low quality stream	Plain and ordinary meaning (*e.g.*, encoded at a bitrate/quality that is lower than the "medium" and "high" quality streams)	Indefinite	"a stream encoded and compressed to a bit rate that is lower than a medium quality stream (*i.e.*, a bit rate between approximately 0 and 100 kilobits per second)"
medium quality stream	Plain and ordinary meaning (*e.g.*, encoded at a bitrate/quality level that is higher than the "low" and lower than the "high" quality stream)	Indefinite	"a stream encoded and compressed to a bit rate that is lower than a high quality stream and higher than a low quality stream (*i.e.*, a bit rate between approximately 100 and 600 kilobits per second)"
high quality stream	Plain and ordinary meaning (*e.g.*, encoded at a bitrate/quality level that is higher than the "low" and "medium" quality streams)	Indefinite	"a stream encoded and compressed to a bit rate that is higher than a medium quality stream (*i.e.*, a bit rate of approximately 600 kilobits per second or faster)"

See JX-0016 at 5-6.

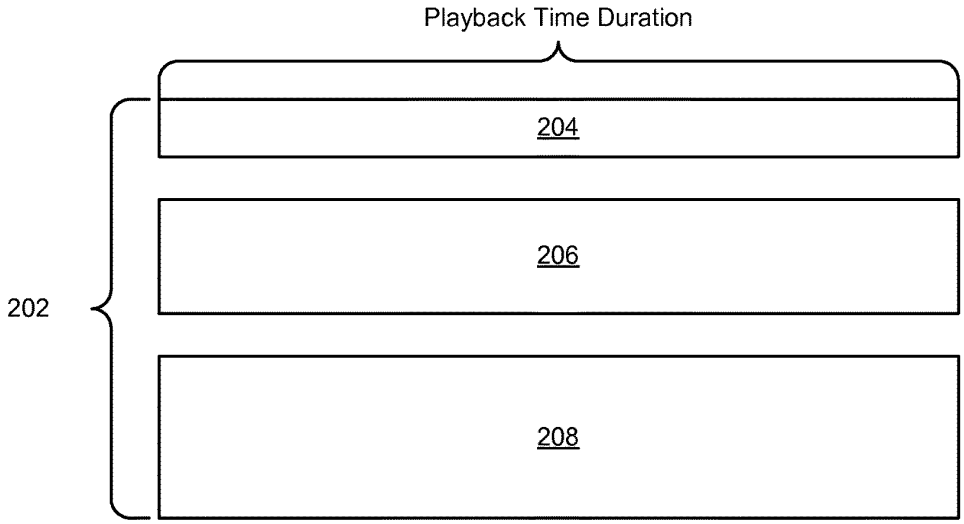
The quality terms appear in independent claim 16 and dependent claims 17 and 20 of the '554 patent, and in independent claim 10 and dependent claims 11 and 15 of the '555 patent. JX-0002 ('554 patent) at claims 16, 17, 20; JX-0003 ('555 patent) at claims 10, 11, 15.

The parties dispute whether these quality terms are indefinite, and, if not indefinite, whether certain numerical ranges are required to define each term. For the reasons discussed below, I have determined that the terms "low quality stream," "medium quality stream," and "high quality stream" have not been shown to be indefinite and should be construed to have their plain and ordinary meaning.

a) Definiteness

The CIP specification of the '554 and '555 patents describes a low-quality video stream 204, a medium-quality video stream 206, and a high-quality video stream 208. Figure 2b of those patents illustrates the connection bandwidth required for each stream quality, with the low-quality stream 204 represented by a narrow block, the medium-quality stream 206 represented by a wider block, and the high-quality stream represented by the widest block:

[redacted]



JX-0002 ('554 patent) at FIG. 2b.

The CIP specification goes on to explain:

> Each of the streams 204, 206, 208 is a copy of the content file 200 encoded and compressed to varying bit rates. For example, the low quality stream 204 may be encoded and compressed to a bit rate of 100 kilobits per second (kbps), the medium quality stream 206 may be encoded and compressed to a bit rate of 200 kbps, and the high quality stream 208 may be encoded and compressed to 600 kbps.

JX-0002 ('554 patent) at 7:30-36. The CIP specification discloses that an agent controller module will upshift or downshift between the different quality streams based upon a determination as to the available bandwidth of the viewer's internet connection. *See id.* at 17:55-18:14.

Each time the low-quality, medium-quality, and high-quality streams are referenced in the CIP specification, they are used in a relative sense to one another. *See, e.g.*, JX-0002 ('554 patent) at 7:25-36, 8:57-67; *see also id.* at claims 1, 2, 4, 7-10, 12, 16, 17, 20-22, 24, 26-27, 29-30; JX-0003 ('555 patent) at claims 1-4, 7-13, 15-27. The CIP specification identifies a 600 kbps-encoded stream as an example of a high-quality stream, and it gives numerical examples of bitrates for medium-quality and low-quality streams in comparison. *See* '554 patent at 7:30-36; '555 patent

at 7:30-36. These teachings in the CIP specification inform the ordinary artisan as to whether a given stream falls within one of the quality categories defined in the claims. *See Sonix Tech. Co. v. Publications Int'l, Ltd*., 844 F.3d 1370, 1378 (Fed. Cir. 2017) ("the written description is key to determining whether a term of degree is indefinite").

The claims themselves also inform the meaning of the quality categories. *See Phillips*, 415 F.3d at 1314. Claim 16 of the '554 patent expressly ties stream quality to bitrate by specifying that each of the three streams contains the same live video event "encoded at a plurality of different bitrates." '554 patent at claim 16. Claim 16 also quantifies a threshold for a high quality stream: it must have "a bit rate of no less than 600 kbps." *Id*. Claim 10 of the '555 patent similarly states that each of the three streams contains the same video "encoded at a plurality of different bitrates" and the high quality stream must be "encoded at a bit rate of no less than 600 kbps." JX-0003 ('555 patent) at claim 10. The claims therefore provide an objective scale for understanding quality (bitrate), a reference point on that scale (600 kbps and above for high quality), and easily understood descriptors for different quality categories along the scale (low, medium, and high).

Finally, the record contains evidence that a person of ordinary skill in the art would understand that a low-quality stream is encoded at a lower bitrate than a medium-quality stream and a high-quality stream, and that a high-quality stream is encoded at a higher bitrate than a low-quality stream and a medium-quality stream. *See* CX-0008C (Jeffay RWS) at Q/A 381.

Despite the teachings of the specification, the clear language of the claims, and the record evidence noted above, respondents contend that the claims are indefinite, arguing that "they are subjective, context-dependent adjectives with no objective definition . . ." Resps. Br. at 43-44. But context-dependent adjectives are not necessarily subjective; they can still provide notice of the metes and bounds of a claim with reasonable certainty. Indeed, the Federal Circuit has expressly

[redacted]

"rejected the proposition that claims involving terms of degree are inherently indefinite." *Sonix Tech.*, 844 F.3d at 1377.

In the *Sonix* case, for example, the Federal Circuit held that the term "visually negligible" was not subjective and not indefinite because the question of whether something interferes with a user's perception can be measured against "what can be seen by the normal human eye," an objective reference point. *Id*. at 1378. Claim 16 of the '554 patent and claim 10 of the '555 patent similarly provide an objective reference point: the high-quality stream must be "encoded at a bit rate of no less than 600 kbps," and a prospective implementer can concretely evaluate from there whether two streams of differing lower quality are within the patent claims by comparing bitrates.

The Federal Circuit's decision in *Orthokinetics, Inc. v. Safety Travel Chairs, Inc*., 806 F.2d 1565, 1575 (Fed. Cir. 1986) is also informative. There the claim language involved a leg of a therapeutic chair "so dimensioned as to be insertable through the space between the doorframe of an automobile and one of the seats thereof." 806 F.2d at 1568. The Federal Circuit held that the phrase was not indefinite even though different cars have different spacing between the doorframe and the seat, noting that the patent law "does not require that all possible lengths corresponding to the spaces in hundreds of different automobiles be listed in the patent, let alone that they be listed in the claims." *Id.* at 1576. The claim language was "as accurate as the subject matter permits." *Id*.

So also here. The law does not require all possible bitrates having a lower, higher, and still higher relationship be recited numerically in the claims. As long as those skilled in the art can determine whether three different streams fall within the claims with reasonable certainty, section 112, paragraph 2, is satisfied. *See Nautilus*, 572 U.S. at 901.

Respondents also argue that the quality claim terms are indefinite "because improvements in streaming technology have changed views on what 'low', 'medium' or 'high' quality means since the effective filing date of the patents." Resps. Br. at 45. This argument is akin to the argument in *Orthokinetics* that cars might come in "varying sizes," rendering indefinite a claimed dimension dependent on "the space between the doorframe of an automobile and one of the seats thereof." *See* 806 F.2d at 1575-76. But the potential for variation in *Orthokinetics* was "of no moment" because the dimensions of a car "could be easily obtained" by a person of skill in the art, and the artisan could use those dimensions to undertake the comparison required by the claims. *Id*. So also here. Improvements in technology may increase bitrates of video streams in the future, but respondents do not dispute that, at that future date, an ordinary artisan will still be able to readily ascertain the bitrate of three given streams and make comparisons to determine which bitrate is higher than the other two, which bitrate is lower than the other two, and which bitrate falls between the other two.

In sum, respondents have not shown by clear and convincing evidence that the asserted claims of the '554 patent and '555 patent are indefinite due to their use of the terms "low quality," "medium quality," and "high quality."

b) Construction

The Staff argues that a person of ordinary skill in the art would understand boundaries of the quality terms with reasonable certainty so long as those terms are construed to include numerical ranges. *See* Staff Br. at 50-52. Thus, the Staff proposes constructions that recite particular bitrate ranges for each of the low-quality, medium-quality, and high-quality streams. *See id.*

The Staff's argument is erroneous. The numerical limits proposed by the Staff come from the following passage of the CIP specification:

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

'554 patent at 7:31-36 (emphasis added). The numbers in this passage are specifically identified as an "example," and the CIP specification goes on to state that the invention encompasses streams "having varying degrees of quality and bandwidth" and describes multiple encoding schemes that can be used with the invention, including "DivX®, Windows Media Video®, Quicktime Sorenson 3®, On2, OGG Vorbis. MP3, or Quicktime 6.5/MPEG-4® encoded content." '554 patent at 7:20-24. It would be error, therefore, to read into the claims the numbers of one particular example in the specification where the disclosed invention is plainly broader than that example. *See Phillips*, 415 F.3d at 1323 ("although the specification often describes very specific embodiments of the invention, we have repeatedly warned against confining the claims to those embodiments").

The Staff further argues that "*any streaming system with three or more different streams encoded at different bitrates* would necessarily infringe the asserted patent claim limitations reciting low, medium, and high quality streams." Staff Br. at 51-52 (emphasis in original) (citing Jeffay Tr. 646). "But a claim is not indefinite just because it is broad." *Niazi Licensing Corp. v. St. Jude Med. S.C., Inc*., 30 F.4th 1339, 1347 (Fed. Cir. 2022). "[T]he canon that claims should be construed to preserve their validity, if possible, applies only if the scope of the claims is ambiguous." *Liebel-Flarsheim Co. v. Medrad, Inc*., 358 F.3d 898, 914 (Fed. Cir. 2004). As discussed above, the scope of the claims here is reasonably certain, not ambiguous, and the canon

does not apply. "[R]eading into a claim a limitation that it does not contain" in this circumstance would be error. *See Texas Instruments Inc. v. U.S. Int'l Trade Comm'n*, 871 F.2d 1054, 1065 (Fed. Cir. 1989) ("It was not permissible for the ALJ, in order to preserve the validity of the claims, to rewrite them to add a limitation . . .").

c) Conclusion

The terms "low quality stream," "medium quality stream," and "high quality stream" do not render the relevant claims indefinite. The three terms will be construed to have their plain and ordinary meaning.

4. "factor" terms ('564 patent, claim 1; '156 patent, claim 1)

Below is a chart showing the parties' proposed claim constructions.

Term	DISH's Proposed Construction	Respondents' Proposed Construction	The Staff's Proposed Construction
"a factor indicative of the current ability to sustain the streaming [of the video … wherein the set of one or more factors relate to the performance of the network]" '564 patent, claim 1	Plain and ordinary meaning (*e.g.*, one or more factors relating to the performance of the network that is indicative of an ability to sustain the streaming of the video)	Indefinite	Plain and ordinary meaning (*e.g.*, one or more factors relating to the performance of the network that is indicative of an ability to sustain the streaming of the video)
"a factor relating to the performance of the network that is indicative of an ability to sustain the streaming of the video" '156 patent, claim 1	Plain and ordinary meaning (*e.g.*, one or more factors relating to the performance of the network that is indicative of an ability to sustain the streaming of the video)	Indefinite	Plain and ordinary meaning (*e.g.*, one or more factors relating to the performance of the network that is indicative of an ability to sustain the streaming of the video)

See JX-0016 at 7-8.

The claim term "a factor indicative of the current ability to sustain the streaming" appears in claim 1 of the '564 patent. JX-0001 ('564 patent) at claim 1. The claim term "a factor relating to the performance of the network that is indicative of an ability to sustain the streaming of the video" appears in claim 1 of the '156 patent. JX-0004 ('156 patent) at claim 1.

The dispute between the parties is whether the plain and ordinary meaning of the words should be applied or whether the claim terms are indefinite. Respondents argue that the claims reciting the "factor" terms are indefinite for three reasons: (1) a person of skill would not have

understood the scope of "sustain the streaming," which respondents contend is distinct from the separately recited concept of "continuous playback"; (2) the '564 patent claims are further ambiguous because they refer to the "current ability" to sustain the streaming and the timeframe for "current" cannot be ascertained; and (3) the scopes of both "repeatedly generating a factor" and "successive determinations" are unbounded and unclear. *See* Resps. Br. at 36-39.

DISH and the Staff essentially argue the ordinary meaning of the phrases should apply.

Claim 1 of the '564 patent recites gives context to the parties' dispute. It recites in part:

> 1. An end user station for adaptive-rate content streaming of digital content from a video server over a network, the end user station **comprising**:
>
> a media player . . . wherein the media player streams the video by:
>
> * * *
>
> automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies, the automatically requesting including **repeatedly generating a factor indicative of the current ability to sustain the streaming of the video** using the files from different ones of the copies, **wherein the set of one or more factors relate to the performance of the network**;
>
> **making the successive determinations** to shift the playback quality **based on the factor to achieve continuous playback of the video** using the files of the highest quality one of the copies determined sustainable at that time so that the media player upshifts to a higher quality one of the different copies when the factor is greater than a first threshold and downshifts to a lower quality one of the different copies when the factor is less than a second threshold; . . .

JX-0001 ('564 patent) at claim 1 (emphasis added). Claim 1 of the '156 patent is similar, and respondents make no separate arguments regarding the factor terms in that claim. *See* JX-0004 ('156 patent) at claim 1 ("repeatedly generating, by the media player, a factor relating to the performance of the network that is indicative of an ability to sustain the streaming of the video; adapting the successive determinations to shift the playback quality based on the factor to achieve

continuous playback of the video using the streamlets of the highest quality copy of the video that is determined to be sustainable at that time").

I organize my analysis around respondents' arguments as they bear the burden to show by clear and convincing evidence that the patent claims are invalid for being indefinite.

a) "sustain the streaming of the video"

Respondents contend a person of ordinary skill in the art would not have understood the scope of the phrase "sustain the streaming of the video." Resps. Br. at 36.[11] But respondents' own brief and testimony from respondents' own expert both counter that argument. First, respondents admit that the concept of streaming was understood in the art at the time of the invention. Resps. Br. at 37 (citing JX-0001 ('564 patent) at 1:31-33 ("'Streaming media' 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.")). As to the word "sustain," respondents cite testimony from their expert Dr. Richardson that "streaming could be sustained, for example: (a) so long as the TCP connection between the server and client is not broken, (b) when there is a certain level of bandwidth utilization, (c) based on the latency between request and response, or (d) when the network is able to transfer at a certain bitrate." Resps. Br. at 38 (citing RX-0001C (Richardson DWS) Q/A 134-35). Dr. Richardson's testimony supports a conclusion that an ordinary artisan at the time of the invention would have known the conditions that could interrupt a sustained video stream, which undercuts a conclusion that the disputed language is indefinite.

Respondents next argue "the streaming of data in a packet-based network, like the internet, is inherently inconsistent and unpredictable," and therefore it would be unclear to an ordinary

[11] Respondents concede "at least in concept, a person of skill may have understood what it means to 'achieve continuous playback' (uninterrupted viewing of the content)." Resps. Br. at 37-38.

artisan "*how* a factor could be indicative of an ability to 'sustain the streaming of a video.'" Resps. Br. at 38 (emphasis added). But criticism of a patent's explanation of "how" an invention works sounds more properly in the enablement provision of section 112, not the definiteness requirement of that section. As Judge Giles Rich, a primary author of the 1952 Patent Act explained, "subject matter as to which the specification is not 'enabling' should be rejected under the first paragraph of § 112 rather than the second," and an accurate evaluation of patentability requires a clear understanding of "exactly which of the several requirements of § 112 are thought not to have been met." *In re Borkowski*, 422 F.2d 904, 909 (C.C.P.A. 1970); *see also Kinetic Concepts, Inc. v. Blue Sky Med. Grp., Inc*., 554 F.3d 1010, 1015 (Fed. Cir. 2009) (rejecting an argument that the claim phrase "a screen adapted to prevent overgrowth of wound tissue" was indefinite because an artisan would not know "how a 'screen' could prevent it"); *All Dental Prodx, LLC v. Advantage Dental Prod., Inc*., 309 F.3d 774, 779 (Fed. Cir. 2002) ("The primary purpose of the definiteness requirement is to ensure that the claims are written in such a way that they give notice to the public of the extent of the legal protection afforded by the patent . . ."). Respondents' contention that the '564 and '156 patents supposedly fail to explain "how" the performance factor works is inapt to the definiteness requirement of section 112.

In any event, a person of skill in the art at the time of the invention *would* know how to generate a factor indicative of an ability to sustain the streaming of a video. In column 12 of the '564 patent, the specification describes an embodiment in which a controller calculates a performance ratio across a number of samples, taking into the playback length of the streamlets involved. *See* JX-0001 ('564 patent) at 12:15-27. The specification also contemplates variations that "better judge the central tendency of the performance ratio" using "a geometric mean, or

alternatively an equivalent averaging algorithm." *Id*. at 12:28-39. These calculations culminate in a performance factor. *Id*.

The specification goes on to explain how the invention uses the performance factor to sustain streaming in response to changes in network conditions. The current factor is compared to a threshold value to determine whether the quality of the stream can be shifted up, taking into account a "safety margin" of ready-to-present streamlets that will mitigate against unexpected "network disruptions." *Id*. at 12:40-64. Depending on conditions, the invention may also compare the current factor to another threshold value to determine whether the quality of the stream should be shifted down. *Id*. at 12:65-13:10.

Respondents also implicitly concede that the performance factor teachings in the patent specification would have been understood by those skilled in the art at the time of the invention, and that a person of skill in the art would have understood how to extend these teachings to make "similar calculations." Resps. Br. at 39 ("*Unless* the claims are limited to the column 12 example (*and similar calculations*), a [person of ordinary skill in the art] would have no idea as to the boundaries of these claims." (emphasis added)). That statement further undermines a conclusion that the claims are indefinite.

To the extent that Respondents argue a person of ordinary skill in the art would not understand what it means to "achieve continuous playback" and what it means to "sustain the streaming," any such confusion is not present in the plain language of the claims. The claims state the invention "repeatedly generat[es] a factor indicative of the current ability to sustain the streaming of the video," and the factor "relate[s] to the performance of the network." The claims also state the invention makes "successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video." Thus, "the current ability to sustain the

[redacted]

streaming of the video" relates to an analysis of network conditions, while the phrase "continuous playback of the video" is the goal sought through the "determinations to shift" playback quality.

In sum, the fact that there may be a variety of complex conditions that must align for streaming to be sustained does not mean a person of skill in the art would not know whether a factor reflects an evaluation of those conditions. *See Personalized Media Commc'ns, LLC v. Int'l Trade Comm'n*, 161 F.3d 696, 706 (Fed. Cir. 1998) ("The invention's operability may say nothing about a skilled artisan's understanding of the bounds of the claim."); *see also Invitrogen Corp. v. Biocrest Mfg., L.P.*, 424 F.3d 1374, 1384 (Fed. Cir. 2005) (arguments about "the difficulty of avoiding infringement" are not relevant to the indefiniteness inquiry).

Respondents have not demonstrated that the phrase "sustain the streaming" is indefinite. The ordinary meaning of the words in the claim will apply.

b) "current ability"

Respondents next argue that because the patent specification describes averaging several "past" samples to calculate a performance factor, an ordinary artisan "would not know how to determine the '*current* ability to sustain streaming,'" rendering the claims with that phrase indefinite. Resps. Br. at 40-41 (emphasis in original). Respondents' argument fails on multiple levels. First, as noted above, criticizing disclosure of "how" an invention works is not clear and convincing evidence of indefiniteness. *See In re Borkowski*, 422 F.2d at 909; *Kinetic Concepts, Inc. v. Blue Sky Med. Grp., Inc.*, 554 F.3d at 1015 (rejecting an argument that the claim phrase "a screen adapted to prevent overgrowth of wound tissue" was indefinite because an artisan would not know "how a 'screen' could prevent it").

Next, to the extent respondents argue that the continuation specification does not help to inform an ordinary artisan about the scope of the claims, respondents ignore the full scope of that

disclosure. Column 12 of the '564 patent specification and corresponding passages in the '156 patent plainly describe an embodiment that "monitors [ ] the receive time of the requested streamlet." JX-0001 ('564 patent) at 12:8-10. Such a measurement reflects a current condition, and that current condition is used in the calculation labeled $\phi_{current}$. *Id*. at 12:28-49. Although the continuation specification describes one embodiment of the invention that "*may* calculate a geometric mean, or alternatively an equivalent averaging algorithm" "across a window of samples," that disclosure does not limit the claims. *See* JX-0001 ('564 patent) at 12:15-39 (emphasis added); *Phillips*, 415 F.3d at 1323 ("although the specification often describes very specific embodiments of the invention, we have repeatedly warned against confining the claims to those embodiments"). And even in the disclosed embodiments, samples within an averaged "window" can occur within seconds of each other. *See, e.g*., JX-0001 ('564 patent) at 6:65-67. An ordinary artisan would understand calculations derived from samples in such a window to be "indicative of the current ability to sustain the streaming of the video." *See id*. at claim 1; CX-0008C (Jeffay RWS) at Q/A 390-91.

Respondents have not demonstrated that the phrase "current ability" is indefinite. The ordinary meaning of the words in the claim will apply.

c) "repeatedly generating a factor" and "successive determinations" ('564 patent, claim 1; '156 patent, claim 1)

Below is a chart showing the parties' proposed claim constructions.

Term	DISH's Proposed Construction	Respondents' Proposed Construction	The Staff's Proposed Construction
"repeatedly generating a factor" '564 patent, claim 1; '156 patent, claim 1	"generating a factor more than once"	Indefinite	"generating a factor more than once"
"successive determinations" '564 patent, claim 1; '156 patent, claim 1	Plain and ordinary meaning (e.g., more than one determination)	Indefinite	"more than one determination"

See JX-0016 at 7-8.

The claim term "repeatedly generating a factor" appears in claim 1 of the '564 patent and claim 1 of the '156 patent. JX-0001 ('564 patent) at claim 1; JX-0004 ('156 patent) at claim 1. The claim term "successive determinations" appears in claim 1 of the '564 patent and claim 1 of the '156 patent. JX-0001 ('564 patent) at claim 1; JX-0004 ('156 patent) at claim 1.

Respondents argue these terms are indefinite. DISH and the Staff argue that "repeatedly generating a factor" should be construed to mean "generating a factor more than once." Regarding "successive determinations," DISH argues the ordinary meaning of the words should be applied, while the Staff contends that this term should be construed to mean "more than one determination."

For the reasons discussed below, (1) "repeatedly generating a factor" will be construed to mean "generating a factor more than once," and (2) "successive determinations" will be construed to have its plain and ordinary meaning, an example of which is "multiple determinations."

Respondents argue that it would have been unclear to one of ordinary skill in the art how many times a factor must be generated before it can be considered to be "repeated." *See* Resps.

Br. at 41-42. However, it is well understood in the art that an action performed repeatedly requires at least two occurrences. *See* CX-0008C (Jeffay RWS) Q/A 392. The teachings in the continuation specification are consistent with this understanding. The '564 patent describes decisional logic for generating a performance factor more than once. *See* JX-0001 ('564 patent) at 13:5-8 ("If the end of the stream has not been reached 714, the agent controller module 402 begins to request and receive 704 lower quality streamlets and the method 618 starts again."). This is illustrated in Figure 7 of the '564 patent, reproduced below:

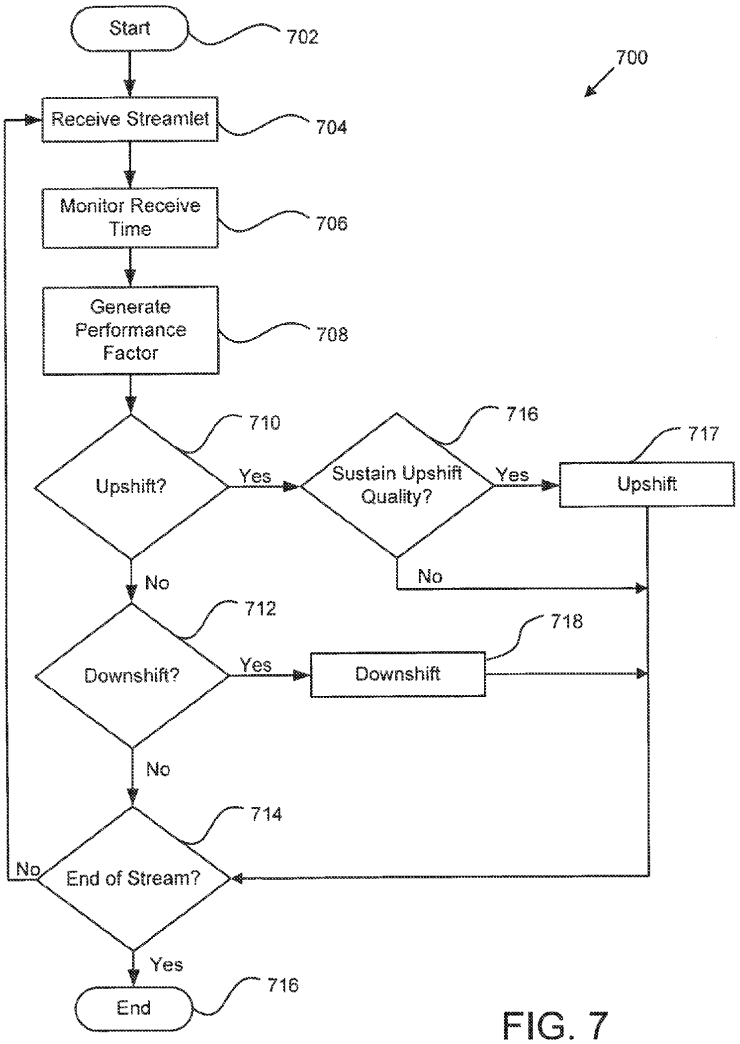


FIG. 7

JX-0001 ('564 patent) at Fig. 7. As shown in Figure 7, step 708 (Generate Performance Factor) is performed each time the logic loop reaches step 714 and it is determined that the end of the stream has not been reached. These teachings confirm that an ordinary artisan would understand what it means to repeatedly generate a factor.

The prosecution history for the parent '772 patent further informs an ordinary artisan that the inventors used the term "repeatedly" in its normal sense. In a non-final rejection under 35 U.S.C. § 112, ¶ 2, the examiner noted that that "the phrase 'regularly generating a set of one or more factors' is vague and unclear because it is not known how often 'regularly' encompasses," and that the phrase "will be taken to mean generating a set of one or more factors at any time set." JX-0030 ('772 patent FH) at 3111-12. In response, the applicant amended the subject claim to instead recite "repeatedly generating a set of one or more factors." The applicant explained that the claim also recites "making the successive determinations to shift the playback quality based on at least one of the set of factors," and argued that "[b]ecause more than one determination is made and the determinations are based on the set of factors, the set of one or more factors are generated more than once." *Id*. at 3112. The applicant then provided an explicit definition: "[a]s such, the phrase 'repeatedly generating' means that the set of factors are generated more than once, not just 'at any time set,' as alleged by the Examiner." *Id.* The applicant, therefore, provided clear notice that "repeatedly generating" means that the set of factors are "generated more than once."

Regarding "successive determinations," Respondents argue that "successive" and "repeatedly" are different terms, and are presumed to have different meanings. *See* Resps. Br. at 42-43 (citing *Ethicon Endo-Surgery, Inc. v. U.S. Surgical Corp.*, 93 F.3d 1572, 1579 (Fed. Cir. 1996). While such a presumption may apply, that does not mean a person of skill in the art would not know how to interpret them. "Successive" refers to an order, implying one event occurs after

another, and does not necessarily imply that the two events are identical. On the other hand, stating that an action is performed "repeatedly" does not necessarily identify which instance occurred after another, but it does imply that the same action has occurred multiple times. Neither term excludes the possibility of intervening events. Respondents cite no evidence—intrinsic or extrinsic—that contradicts these ordinary understandings.

Respondents question whether "a determination needs to be made for every generation of a factor for them to be considered 'successive.'" Resps. Br. at 43. But the claims have no such requirement, and respondents point to no disclaimer in the continuation specification that would limit the invention in that way. *See Epistar Corp. v. Int'l Trade Comm'n*, 566 F.3d 1321, 1334 (Fed. Cir. 2009) (applying "a heavy presumption that claim terms carry their full ordinary and customary meaning, unless it can show the patentee expressly relinquished claim scope").

Respondents have not demonstrated that the phrases "repeatedly generating a factor" and "successive determinations" are indefinite.

As for the differences between the constructions advanced by DISH and by the Staff, neither party has explained how those differences are material to the investigation. *See U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1570 (Fed. Cir. 1997) (neither the Federal Circuit nor the Supreme Court have held "that the trial judge must conduct such a rote exercise" as construing claims "whether or not there is an issue in material dispute as to the meaning"). To the extent a construction is necessary, I have determined to construe: (1) "repeatedly generating a factor" to mean "generating a factor more than once," and (2) "successive determinations" to have its plain and ordinary meaning.

5. "device" terms: "An end user station," "the content player device," and "client module"

a) "An end user station" and "the content player device" ('554 patent, claim 16)

Below is a chart showing the parties' proposed claim constructions.

Term	DISH's Proposed Construction	Respondents' Proposed Construction	The Staff's Proposed Construction
"An end user station" '554 patent, claim 16	Plain and ordinary meaning (*e.g.*, network-connected client device that is configured to play content)	Indefinite for lack of antecedent basis and to the extent it is equated to "content player device" in the identified claims	Plain and ordinary meaning (*e.g.*, a network-connected electronic system configured to present content to a user); identified claims are indefinite
"the content player device" '554 patent, claim 16	Plain and ordinary meaning (*e.g.*, network-connected client device that is configured to play content)	Indefinite for lack of antecedent basis and to the extent it is equated to "end user station(s)" in the identified claims	Plain and ordinary meaning (*e.g.*, a device that plays content); identified claims are indefinite

See JX-0016 at 8-9.

The claim terms "[a]n end user station" and "the content player device" appear in the preamble of independent claim 16 of the '554 patent, which recites:

> **An end user station** to stream a live event video over a network from a server for playback of the video, **the content player device** comprising:

JX-0002 ('554 patent) at claim 16 (emphasis added). Respondents assert claim 16 is indefinite because the phrase "the content player device" lacks antecedent basis. DISH and the Staff propose

the terms be given their plain meaning, though the Staff concludes that this renders the claim indefinite.

(1) Whether the Preamble Is Limiting

Respondents argue that "the preamble of claim 16 of the '554 patent is limiting because it serves as the antecedent basis for a limitation in the body of the claims." Resps. Br. at 51 n.13. The Staff agrees that the preamble is limiting because "the patentee decided to use the preamble to help define the invention by using the preamble to provide antecedent basis for three terms used in the body of the claim." Staff Br. at 72.

In general, "the preamble does not limit the claims." *Allen Eng'g Corp. v. Bartell Indus., Inc.*, 299 F.3d 1336, 1346 (Fed. Cir. 2002). Nonetheless, the preamble may be construed as limiting "if it recites essential structure or steps, or if it is 'necessary to give life, meaning, and vitality' to the claim." *Catalina Mktg. Int'l, Inc. v. Coolsavings.com, Inc.*, 289 F.3d 801, 808 (Fed. Cir. 2002) (quoting *Pitney Bowes, Inc. v. Hewlett-Packard Co.*, 182 F.3d 1298, 1305 (Fed. Cir. 1999)). "If the body of the claim 'describes a structurally complete invention such that deletion of the preamble phrase does not affect the structure or steps of the claimed invention,' the preamble is generally not limiting unless there is 'clear reliance on the preamble during prosecution to distinguish the claimed invention from the prior art.'" *Intirtool, Ltd. v. Texar Corp.*, 369 F.3d 1289, 1295 (Fed. Cir. 2004) (citations omitted) (quoting *Catalina Mktg.*, 289 F.3d at 808, 809).

Claim 16 recites:

> An end user station to stream a live event video over a network from a server for playback of the video, the content player device comprising:
>
> a processor;
>
> a digital processing apparatus memory device comprising non-transitory machine-readable instructions that, when executed, cause the processor to:

establish one or more network connections between the end user station and the server, wherein the server is configured to access at least one of a plurality of groups of streamlets;

wherein the live event 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, 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 live event video;

wherein at least one of the low quality stream, the medium quality stream, and the high quality stream is encoded at a bit rate of no less than 600 kbps; and

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 live event video at a different one of the different bitrates;

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;

place a streamlet request to the server over the one or more network connections for the first streamlet of the selected stream;

receive the requested first streamlet from the server via the one or more network connections; and

provide the received first streamlet for playback of the live event video.

JX-0002 ('554 patent) at claim 16. As can be seen, the preamble states that the purpose of the invention is "to stream a live event video over a network from a server for playback of the video." *Id*. The claim body recites a structurally complete invention including all of the elements necessary for achieving that purpose. The body recites a processor structure, a memory structure, and instructions stored in that memory that enable the invention's purpose of streaming a live event video. "[T]he claim drafters did not rely on the preamble language to define or refine the scope of the asserted claims." *See Am. Med. Sys., Inc. v. Biolitec, Inc.*, 618 F.3d 1354, 1358-59 (Fed. Cir.

2010) (finding the preamble non-limiting where the preamble recited the word "tissue" as part of a description of the purpose of the invention but the preamble did not provide any context essential to understanding the meaning of "the tissue" in the body of the claim).

Indeed, when the preamble "is reasonably susceptible to being construed to be merely duplicative of the limitations in the body of the claim," it is "not construe[d] [ ] to be a separate limitation." *Symantec Corp. v. Computer Assocs. Int'l, Inc*., 522 F.3d 1279, 1289 (Fed. Cir. 2008). In the case at hand, each of the phrases between "[a]n end user station" and "the content player device" duplicates a limitation found in the body of the claim, suggesting that the patentee used the preamble to state the intended use of the invention, rather than to limit the claim's scope.

For example, while the preamble states the invention's purpose is streaming content "over a network from a server," the body of the claim correspondingly specifies content is transferred over "one or more network connections between the end user station and the server." The preamble further describes the invention's purpose is "to stream a live event video . . . for playback of the video," and the claim's body likewise recites that "the live event video is encoded" into "streamlets corresponding to a portion of the live event video" and the processor "provide[s] the received first streamlet for playback of the live event video." The duplication between the preamble and the claim body at issue here is a strong indication that there should be no departure from "the general rule" that a preamble is not limiting. *See Symantec*, 522 F.3d at 1289. I determine the preamble of claim 16 of the '554 patent is not limiting.

(2) Interchangeability of "content player device" and "end user station"

Respondents focus on the terms "content player device" and "end user station" to argue the claim is indefinite. Resps. Br. at 49-50. They contend the claims at issue "use the terms 'end user

[redacted]

station' and 'content player device' interchangeably, while "the specification provides different meanings for each of those terms." *Id*. Respondents assert that this purported conflict means an ordinary artisan "would not understand with reasonable certainty the scope of the terms." *Id*.

As an initial matter, the term "content player device" only appears in the preamble of claim 16, while the term "end user station" appears both in the preamble and in the body of the claim. Because I have determined that the preamble is not limiting, the term "content player device" introduces no conflict in meaning with the term "end user station." Respondents' argument is rejected on at least that basis.

But there are other reasons for rejecting respondents' argument. Although respondents are correct that the general assumption is that different terms have different meanings, "the same generally is not true for terms in the preamble." *Symantec*, 522 F.3d at 1289. A tribunal should "assume[ ] that the preamble language is duplicative of the language found in the body of the claims or merely provides context for the claims, absent any indication to the contrary in the claims, the specification or the prosecution history." *Id.* Moreover, it is error to parse claim language "without regard to the surrounding language in the claims and the written description of the invention." *Pavo Sols. LLC v. Kingston Tech. Co., Inc*., 711 F. App'x 1020, 1028 (Fed. Cir. 2017) ("[T]he [PTAB] . . . created a distinction that does not exist in the specification, solely because the words 'on' and 'formed on' are literally different.").

Here, there is no indication in the claims that the "content player device" in the preamble means anything other than the previously-recited "end user station." The preamble recites no separate purpose for the "content player device"; it is the same as for the invention as a whole: "to stream a live event video over a network from a server for playback of the video." The body of the claim leads to no different conclusion. In the claim body, "end user station" appears in the

phrases "establish one or more network connections between the end user station and the server," and "select a specific . . . stream based upon a determination by the end user station." Neither of these phrases distinguishes the "end user station" from the "content player device." Thus, the claim as a whole indicates that the "content player device" in the preamble means the "end user station." *See Bid for Position, LLC v. AOL, LLC*, 601 F.3d 1311, 1317 (Fed. Cir. 2010) ("The claim language uses the terms 'bid' and 'value of the bid' interchangeably, such that the two cannot be read to have separate meanings.").

The specification provides further support for the conclusion that the "content player device" in the preamble is the "end user station." The specification recites, "The end user station 104 may comprise a personal computer (PC), an entertainment system configured to communicate over a network, or a portable electronic device configured to present content." JX-0002 ('554 patent) at 6:44-47. Hence, one of the three listed examples of the end user station is "a portable electronic device configured to present content." In other words, one embodiment of an "end user station" is a content-playing device. The presumption that different terms have different meanings has been overcome here, where "the evidence indicates that the patentee used the two terms interchangeably." *Baran v. Med. Device Techs., Inc*., 616 F.3d 1309, 1316 (Fed. Cir. 2010); *see also Tehrani v. Hamilton Med., Inc*., 331 F.3d 1355, 1361 (Fed. Cir. 2003) ("[T]he intrinsic evidence indicates that the patentee meant for those two terms to be interchangeable and to carry the same meaning within the claims.").

Moreover, the record contains evidence from both opposing experts that the term "content player device," as it is recited in the preamble of claim 16, would be understood by one of ordinary skill in the art to be the same as the "end user station." For example, DISH's expert Dr. Jeffay opined that an ordinary artisan would understand the invention "is interchangeably described and

instantiated in the claims, specifications, and prosecution histories" as a "content player device" and as an "end user station." CX-0008C (Jeffay RWS) at Q/A 385. Although Respondents' expert Dr. Richardson gave an opinion that the claim term was indefinite because it could be interpreted multiple ways, he nevertheless testified that a person of ordinary skill would understand that one "feasible" interpretation of the terms is that "content player device" and "end user station" are interchangeable terms. RX-0001C (Richardson DWS) at Q/A 139. In their briefing, respondents also state that "the terms 'end user station' and 'content player device' are used interchangeably within the same claim." Resps. Br. at 48; *see also id.* at 49 ("'554 Patent's Claims Indefinite For Using 'End User Station' And 'Content Player Device' Interchangeably And Without Antecedent Basis"), 49 (the relevant claims "use the terms 'end user station' and 'content player device' interchangeably"), 51 ("[T]he claims' interchangeable use of these two terms makes it such that the meaning and relationship of the terms would not be reasonably understood by a [person of ordinary skill in the art] considering the intrinsic evidence . . . .").

Accordingly, I have determined that the term "content player device" does not limit the scope of the claim, is interchangeable with "end user station,"[12] and requires no construction. Furthermore, respondents have not presented clear and convincing evidence that claim 16 of the '554 patent is indefinite.

b) "the client module" ('555 patent, claim 10)

Below is a chart showing the parties' proposed claim constructions.

[12] A different way to state the conclusion herein is that the first words of the preamble—"[a]n end user station"—provide antecedent basis for the later "content player device" because both terms refer to the same object. *See Fisher-Price, Inc. v. Graco Children's Prod., Inc.*, 154 F. App'x 903, 909 (Fed. Cir. 2005) (claim term "upper seating surface" was "by implication the antecedent basis for 'seating area'").

Term	DISH's Proposed Construction	Respondents' Proposed Construction	The Staff's Proposed Construction
"client module" '555 patent, claim 10	Plain and ordinary meaning (*e.g.*, subcomponent of the content player device / end user station)	Indefinite for lack of antecedent basis in the identified claims	"the part of the end user station that interacts with one or more servers and plays content"

See JX-0016 at 9.

The claim term "client module" appears in independent claim 10 of the '555 patent. JX-0003 ('555 patent) at claim 10. Respondents argue claim 10 is indefinite because the term "the client module" lacks antecedent basis. DISH and the Staff do not view the claim as indefinite but disagree as to its proper construction.

Claim 10 is reproduced in part below to give context to the dispute. As can be seen, the term "client module" is first introduced by the definite article "the" rather than the indefinite article "a":

[10pre] A content player device to stream a video over a network from a server for playback of the video, the content player device comprising:

[10a] a processor;

[10b] a digital processing apparatus memory device comprising non-transitory machine-readable instructions that, when executed, cause the processor to:

[10c] establish one or more network connections between **the client module** and the server, . . .

* * *

[10g] select a specific one of the streams based upon a determination by **the client module** to select a higher or lower bitrate version of the streams . . .

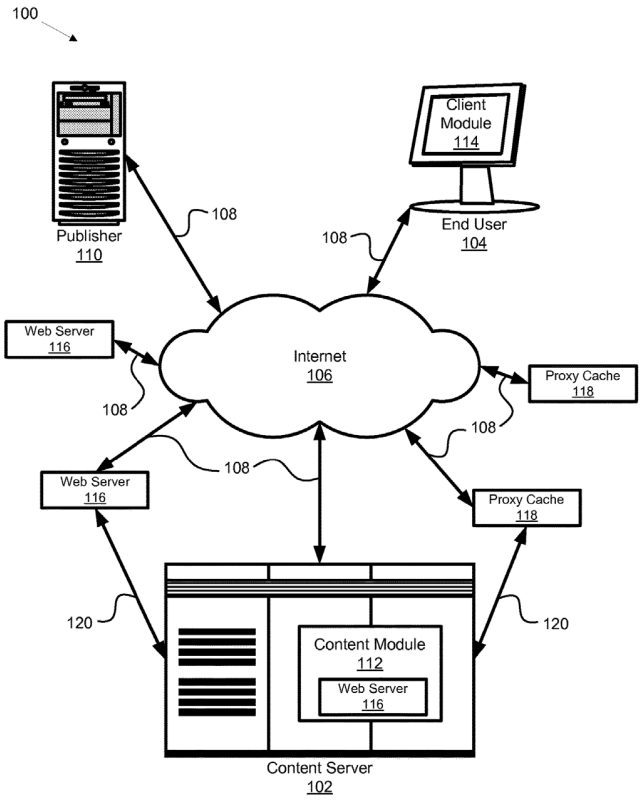
JX-0003 ('555 patent) at claim 10 (emphasis added).

The requirement of antecedent basis is a rule of patent drafting, administered during patent examination. *Energizer Holdings, Inc. v. Int'l Trade Comm'n*, 435 F.3d 1366, 1370 (Fed. Cir. 2006). "Obviously, however, the failure to provide explicit antecedent basis for terms does not always render a claim indefinite." MPEP § 2173.05(e) (9th ed. 2019). "If the scope of a claim would be reasonably ascertainable by those skilled in the art" when read in light of the rest of the specification, a technical deficiency in antecedent basis does not doom the claim. *See Energizer Holdings*, 435 F.3d at 1370.

The language of claim 10 "provide[s] substantial guidance as to the meaning" of the claim term in question. *Phillips*, 415 F.3d at 1314. The term "client module" appears in the claim's description of operations performed by a processor in the claimed content player device. The claim states that the processor establishes a network connection between the client module and the server. *See* '555 patent at claim 10. This accords with the description of the client module given in the CIP specification, which states that in one embodiment "the client module 114 may request

and receive content from any of the plurality of web servers 116." '555 patent at 6:60-67. In particular, claim 10 recites that the client module interacts with the server via a network connection, and makes a determination as to the selection of a higher or lower bitrate version of the streams. *See* '555 patent at claim 10. This accords with the description of the client module given in the CIP specification, which states that in one embodiment "the client module 114 may request and receive content from any of the plurality of web servers 116." '555 patent at 6:60-67.

In addition, the client module 114 is described as a part of end user station 104 in Figure 1 of the CIP specification:



JX-0003 ('555 patent) at Fig. 1. The end user station 104, in turn, "may comprise a personal computer (PC), an entertainment system configured to communicate over a network, or a portable electronic device configured to present content." *Id.* at 6:44-47. Because an end user station may

be a content player device, as discussed above in section VII.B.5.a)(2), the specification informs an ordinary artisan that a client module may be part of a content player device, consistent with the language of claim 10.

Extrinsic evidence confirms one of ordinary skill in the art, upon reading claim 10 in view of the CIP specification, would understand what "the client module" is. As Dr. Jeffay testified,

> [T]he patents describe an "apparatus" for streaming content that is identified in the claims by the interchangeable phrases "end user station(s)," "end user device," and "content player device," and within that apparatus may be "a logic unit containing a plurality of modules," such as the claimed "client module" and "media player." For example, the '564 Patent (JX-0001) at 2:60-62 explains that "[t]he apparatus for adaptive-rate content streaming is provided with a logic unit containing a plurality of modules configured to functionally execute the necessary steps." . . .
>
> . . . [T]he "logic unit containing a plurality of modules" provided with the apparatus is described and instantiated in the claims, specification, and prosecution histories as a "client module," which is part of the client device that interacts with the server. . . .

CX-0008 (Jeffay RWS) at Q/A 385. Dr. Richardson likewise testified that claim 10 "disclose[s] a 'content player device' with software that causes the 'content player device' to perform a series of steps for streaming video over a network." RX-0001C (Richardson DWS) at Q/A 139. Dr. Richardson explained that claim 10 states certain of those steps are "performed by 'the client module.'" Dr. Richardson's testimony is consistent with an understanding that "the" client module in claim 10 is part of the "content player device" and that it connects to as server over a network.

Thus, the intrinsic and extrinsic evidence confirms that, despite a technical lack of antecedent basis, the term "the client module" informs those of ordinary skill in the art about the scope of the invention "with reasonable certainty." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 910 (2014). I determine that respondents have not shown by clear and convincing evidence that claim 10 is invalid because it is indefinite.

Turning to the interpretation of the term "the client module," there is no meaningful difference between the construction proposed by DISH, the construction proposed by the Staff, and the plain language of the claim. Accordingly, I will construe the claim term "the client module" according to its plain meaning.

VIII. REPRESENTATIVE PRODUCTS FOR DOMESTIC INDUSTRY (TECHNICAL PRONG)

DISH's domestic industry evidence involves two groups of products: (1) television set-top boxes and (2) software applications for streaming television content (apps). DISH has proffered a representative product for each group. For set-top boxes, DISH contends that its Hopper 3 set-top box is representative of its Hopper, Hopper with Sling, Hopper Duo, and Wally set-top boxes (collectively, the "DISH Set-Top Boxes"). Compls. Br. at 117. For streaming apps, DISH contends that its Sling TV Application for Amazon Fire ("Sling Fire App") is representative of the Sling TV Apps for iOS and Roku (collectively, the "Sling TV Apps"). S*ee id.* at 120.

Respondents dispute whether the Hopper 3 is representative of the other DISH Set-Top Boxes and whether the Sling Fire App is representative of the other two Sling TV Apps. *See* Resps. Br. at 90-94.

A. DISH Set-Top Boxes

DISH argues its investments with respect to articles protected by the asserted patents go back to at least 2016. *See* Compls. Br. at 283-84, 289-90. DISH contends that, for purposes of the technical prong of the domestic industry requirement, the Hopper 3 is representative of all other DISH Set-Top Boxes made from 2016 to the present. *See* Compls. Br. at 117. DISH relies on source code analysis and testimony by Dr. Bystrom and testimony by corporate witness Paul Marshall to show similarity between the various DISH Set-Top Boxes. *See id*. (citing CX-0006C

(Bystrom DWS) at Q/A 13-19; CX-0003C (Marshall DWS) at Q/A 24, 45). Dr. Bystrom examined source code from all DISH Set-Top Boxes models produced after December 2017 and confirmed that the various models used [redacted] to practice the asserted claims.

Respondents do not dispute that [redacted] was used on all DISH Set-Top Boxes models produced after December 2017. *See id.* at 92-93 (citing CX-0003C (Marshall DWS) at Q/A 37-40). Instead, respondents critique the adequacy of DISH's proof. Respondents argue that neither Mr. Marshall nor Dr. Bystrom reviewed any of the asserted patents, nor did either witness compare the features of the DISH Set-Top Boxes to the claims of the asserted patents. *See* Resps. Br. at 92. Respondents also note that DISH's expert Dr. Bystrom examined source code for only one of many products released before December 2017.

The evidence shows that DISH's corporate witness Mr. Marshall has personal knowledge of video streaming functionality for DISH Set-Top Boxes via his day-to-day responsibilities. *See* CX-0003C at Q/A 10-14. Mr. Marshall testified all of the DISH Set-Top Boxes at issue in this investigation have used [redacted] for streaming content since December 2017. *See id.* at Q/A 40. For DISH Set-Top Boxes produced after December 2017, Mr. Marshall elaborated, "the exact same [redacted] are used for Hopper, Hopper 2 [(Hopper with Sling)], Hopper 3, Hopper Duo, and Wally" DISH Set-Top Boxes. *See id.* at Q/A 52-53; CX-0006C (Bystrom DWS) at Q/A 17. Additionally, Dr. Bystrom confirmed source code for all DISH Set-Top Boxes produced after December 2017 have [redacted] are compiled and included in the DISH Set-Top Boxes. *See* CX-0006C at Q/A 13-17.

With respect to DISH Set-Top Boxes produced *before* December 2017, the record is equivocal. DISH's source code expert Dr. Bystrom only reviewed a specific release of source

code for one of several pre-December 2017 DISH Set-Top Boxes. *See* CX-0006C at Q/A 18. Dr. Bystrom opined that the streaming code in all versions before December 2017 worked "in much the same way to perform adaptive bitrate streaming," *see id.* at Q/A 19, but her conclusory analysis is insufficient to show that the post-December 2017 code operates in an identical way to the pre-December 2017 code in all respects relevant to the asserted claims. Moreover, DISH's corporate witness Mr. Marshall admitted the source code for the pre-December 2017 player was subject to frequent revision. *See* CX-0003 at Q/A 37. Weighing the relevant record evidence together, I find DISH has not met its burden to show that the Hopper 3 is representative of DISH Set-Top Boxes produced before December 2017.[13]

In sum, DISH has adduced persuasive evidence showing that the Hopper 3 is representative of only DISH Set-Top Boxes produced after December 2017, which is when [redacted] was integrated and released in the other identified DISH Set-Top Boxes.

B. Sling TV Apps

DISH asserts that the Sling Fire App is representative of the Sling TV Apps for iOS and Roku. DISH cites testimony from Dr. Negus, Mr. Marshall, and Dr. Bystrom as evidence that the Sling Apps for Roku and iOS operate in substantially the same way as the Sling Fire App. *See* Compls. Br. at 120-21. Respondents contend that there are significant, material differences between the three Sling TV Apps. *See* Resps. Br. at 91.

DISH called expert Dr. Negus to present evidence regarding satisfaction of the domestic industry technical prong by the Sling TV Apps, but he provided a claim-by-claim analysis for only the Sling Fire App. *See* CX-0010C (Negus DWS) at Q/A 671, 674-75. DISH source code expert

[13] I examine the consequence of this finding later in my analysis of the economic prong of the domestic industry requirement. *See* section XV below.

Dr. Bystrom testified as to reviewing source code for all three Sling TV Apps, but she did not offer an opinion as to the whether the source code for the Amazon Fire App was representative of that for the iOS. *See* CX-0006C (Bystrom DWS) at Q/A 20. DISH corporate witness Mr. Marshall further testified that he does not have personal knowledge of the video streaming functionality of Sling TV Apps via his day-to-day responsibilities. *See* CX-0003C (Marshall DWS) at Q/A 47.

Respondents' expert Dr. Snoeren gave testimony that each of the three Sling TV Apps "has different source code, and the player used for video playback varies among the different products." RX-0004C (Snoeren RWS) at Q/A 365. More specifically, the Sling Fire App uses the ExoPlayer media player, the Sling TV App for Roku uses the roVideoPlayer, and the Sling TV App for iOS uses the AVPlayer. *See id.* Additionally, the Sling TV Apps for the Amazon Fire and Roku use the DASH protocol and HTTP Live Streaming ("HLS"), while the Sling TV Application for iOS uses only HLS. *See id.*; CX-0010C (Negus DWS) at Q/A 671; CX-0003C (Marshall DWS) at Q/A 26.

I find that each of the three Sling TV Apps employ different media players, employ different protocols, and run on different operating systems. Given these differences, DISH has not shown that the Sling Fire App is representative of the Sling TV Apps for iOS and Roku. Because DISH did not present independent evidence that the Sling TV iOS App and the Sling TV Roku App practice any asserted patent claim, I find that DISH has not shown that articles utilizing the Sling TV iOS App and the Sling TV Roku App are "articles protected by" the asserted patents. *See* 19 U.S.C. § 1337(a)(2).

IX. THE '564 PATENT

A. Infringement

DISH contends that iFit, Peloton, and MIRROR infringe independent claim 1 and dependent claims 3, 4, and 5 of the '564 patent with accused products that implement the HLS Standard.[14] *See* Compls. Br. at 47. The Staff agrees with DISH that respondents infringe claims 1 and 3-5. *See* Staff Br. at 80.

1. Claim 1

a) (1pre) An end user station for adaptive-rate content streaming of digital content from a video server over a network, the end user station comprising:

The parties agreed that the preamble to claim 1 is limiting. *See* JX-0016 at 1.

Respondents' accused products that implement the HLS Standard meet the preamble. *See* CX-0010C (Negus DWS) at Q/A 232-59. The relevant accused products use ExoPlayer software to retrieve live and on-demand fitness classes from content delivery network video servers over the Internet. *See id.*; RX-0004C (Snoeren RWS) at Q/A 50, 52-54; CX-0836 (RFC 8216) at Abstract, § 1. ExoPlayer software is an open-source "application-level media player for Android." RX-0004C (Snoeren RWS) at Q/A 51. Google provides the ExoPlayer software, which implements the accused HLS functionality. *See* CX-0010C (Negus DWS) at Q/A 184, 195, 207; CX-1000 (Google ExoPlayer 2.11.6); CX-0999 (Google ExoPlayer 2.13.3); CX-1001 (Google ExoPlayer 2.12.1). Respondents' expert Dr. Snoeren confirmed that each of the respondents in this investigation use HLS, and DISH's Dr. Negus confirmed that each of the respondents' accused

[14] DISH does not accuse Peloton products that [redacted] and MIRROR products that use MPEG-DASH of infringing the '564 patent. *See* Compls. Reply Br. at 17.

products use ExoPlayer and the HLS protocol in "generally the same way." RX-0004C (Snoeren) at Q/A 32; Negus Tr. 118.

Respondents do not contest that the accused products satisfy the preamble. *See* Resps. Br. at 53-66.

b) (1a) a media player operating on the end user station configured to stream a video from the video server via at least one transmission control protocol (TCP) connection over the network,

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 267-80. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 53-66.

c) (1b) wherein multiple different copies of the video encoded at different bit rates are stored on the video server as multiple sets of files,

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 282-305.

Respondents argue that DISH has not shown that the video servers used with the various accused products store the content. *See* Resps. Br. at 62. However, DISH has adduced evidence showing that respondents' videos are stored on their respective content delivery network servers ("CDNs"). *See* CX-0010C (Negus DWS) at Q/A 282-305. For example, a Peloton witness confirmed that "[redacted]." JX-0076C (Shanahan Dep.) at 68:15-21. Another Peloton witness confirmed that [redacted]" JX-0077C (Santos Dep.) at 93:21-94:24. MIRROR and iFIT witnesses also testified that their respective videos are stored on the respective

servers. *See* JX-0079C (D'Ambrosio-Correll Dep.) at 182:4-184:8; JX-0080C (Brammer Dep.) at 110:21-24. As Dr. Negus testified, the respondents' streaming assets are necessarily stored on that server for at least some period of time because the accused products transmit HTTP GET requests for HLS streaming assets to a contracted CDN server and receive the requested assets back from that same server over the TCP connection between the accused product and that same server. *See* CX-0010C (Negus DWS) at Q/A 102, 300, 305.

Respondents further argue that DISH has not shown that content is stored as files on a server. *See* Resps. Br. at 62-63. As discussed above, each of respondents' accused products uses HLS "generally the same way." *See supra* Sec. IX.A.1.a) (quoting Negus Tr. 118). Under the HLS Standard, a multimedia presentation is specified by a Uniform Resource Identifier (URI) to a Playlist. CX-0836 (RFC 8216 – HLS Standard) at 4. A Playlist may be either a Media Playlist or a Master Playlist, and it contains "URIs and descriptive tags." *Id.* A Master Playlist "provides a set of Variant Streams,[15] each of which describes a different version of the same content." *Id.* at 5. In contrast, a "Media Playlist contains a list of Media Segments, which, when played back sequentially, will play the multimedia presentation." *Id.* at 4.

Witness testimony confirms that the URI for a Media Segment "include[s] the filenames on the server" and ends in a ".ts" file extension, indicating that each of the Media Segments is an "individual file[ ]." RX-0004C (Snoeren RWS) at Q/A 36, 118, 131, 132; JX-0076C (Shanahan Dep.) at 55:25-56:7. Dr. Snoeren testified that a Uniform Resource Locator (URL) for each Media Segment provides the "address" and location of the Media Segment file on the server. RX-0004C

[15] A Variant Stream "includes a Media Playlist that specifies media encoded at a particular bit rate, in a particular format, and at a particular resolution for media containing video." CX-0836 (RFC 8216 – HLS Standard) at 5. The Standard further recites, "Clients should switch between different Variant Streams to adapt to network conditions." *Id.*

(Snoeren RWS) at Q/A 118, 125. Dr. Negus similarly testified that the URI and URL for each Media Segment file identify (1) the "set" of Variant Streams to which each segment belongs and (2) the location on the server where the segment is stored. CX-0010C (Negus DWS) at Q/A 282-305.

Respondents further argue that they rely upon third-party providers to provide a variety of server functions and DISH failed to demonstrate "one single server performs all the functions" necessary for respondents' service. Resps. Br. at 62. Respondents also content that DISH failed to address the "possibility" that different servers are involved in streaming a video to a customer. Resps. Br. at 62. As explained below, respondents' arguments misapprehend the requirements of claim 1 and the record evidence.

First, claim 1 is directed to an "end user station" having a "media player" that is "configured" to operate in a certain environment. That environment includes a "video server" having "multiple different copies of the video encoded at different bit rates" stored "as multiple sets of files" thereon. So long as the media player streams a video from a server that has at least two different copies of the same video stored as at least two sets of files, this claim limitation is met. The claim does not require "one single server" to perform "all of the functions" for which respondents engage third-party server providers. Additionally, because the claim uses the open-ended transition term "comprising," respondents "may not avoid infringement" by pointing to "additional elements," like additional servers, in the systems they employ. *See Free Motion Fitness, Inc. v. Cybex Int'l, Inc*., 423 F.3d 1343, 1353 (Fed. Cir. 2005).

The record evidence, including evidence from respondents' own witnesses, shows that this limitation is met. It is undisputed that respondents all use third-party video servers to stream videos to the accused products. *See* Resps. Br. at 63 ("[A]ll the Accused Products communicate with

[redacted]

multiple servers, including at least [redacted] (for Accused Peloton Products), [redacted] (for Accused iFIT Products), and [redacted] (for Accused MIRROR Products).”). The record contains evidence that each accused product interacts with at least one server having multiple files. For example, with respect to the MIRROR and iFit accused products, respondents’ expert Dr. Snoeren testified about multiple files on a single server, stating that “the segment URIs (which include the *file names* on *the* server) are used to request and download segments.” RX-0004 (Snoeren RWS) at Q/A 131-32 (emphasis added). With respect to the Petoton accused products, Dr. Snoeren stated that Peloton’s use of the HLS protocol “suggests” that “there are segment files” but the standard itself does not explain “how they are stored on a server.” *Id*. at Q/A 200. Dr. Snoeren’s statement implies that the Peloton system interacts with “a” single server on which multiple files are stored; he criticizes only a purported lack of detail in the standard concerning “how” those files “are stored on *a* server.” *Id*. (emphasis added). Dr. Snoeren made similar statements about the use of HLS with the MIRROR and iFIT accused products, questioning only “how” multiple files “are stored on *a* server.” *Id*. at Q/A 206, 210 (emphasis added).

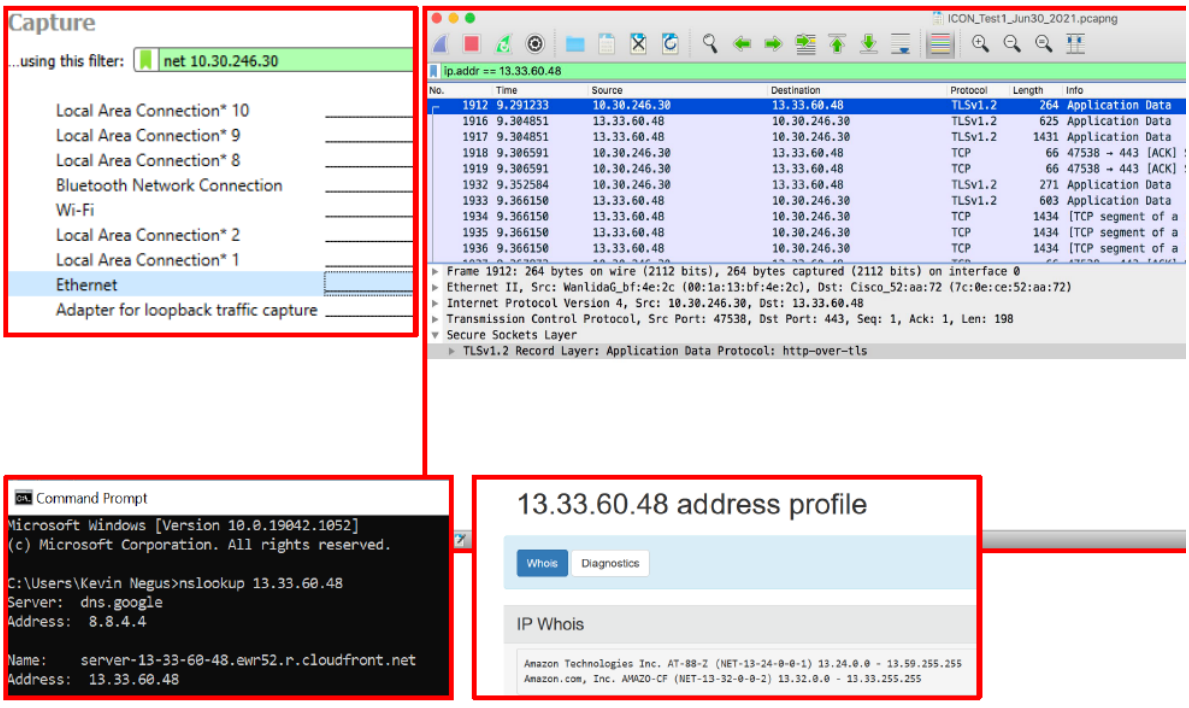
Respondents relatedly argue that DISH failed to show that multiple different copies of the video are in fact stored on the video server as multiple sets of files. *See* Resps. Br. at 62-64. As discussed above, however, the evidence shows that the video servers employed by respondents in fact store the videos streamed to respondents’ accused products. An exemplary Media Playlist in the HLS Standard makes explicit reference to specific files “first.ts,” “second.ts,” and “third.ts,” which are to be streamed in sequence, as shown below:

[redacted]

8.1. Simple Media Playlist

```
#EXTM3U
#EXT-X-TARGETDURATION:10
#EXT-X-VERSION:3
#EXTINF:9.009,
http://media.example.com/first.ts
#EXTINF:9.009,
http://media.example.com/second.ts
#EXTINF:3.003,
http://media.example.com/third.ts
#EXT-X-ENDLIST
```

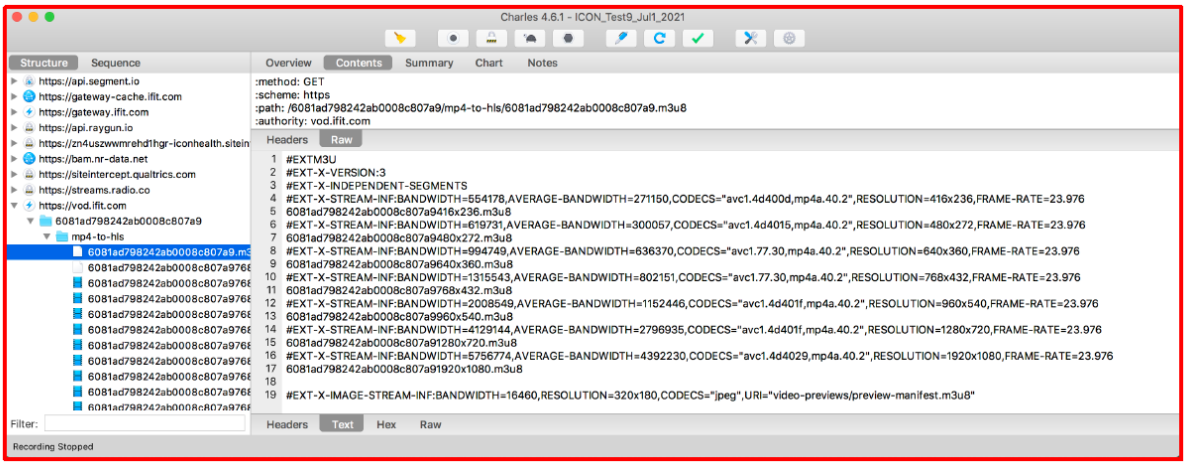
RX-0112 (RFC8216) at 50-51; RX-0004C (Snoeren RWS) at Q/A 36. Moreover, Dr. Negus's testing confirmed that the source of video segment files streamed to an iFIT product was an identifiable Amazon server at a particular IP address, as shown below:



[redacted]

CDX-0010.TEST.13 (CX-0746 (ICON_Test1_Jun30_2021.pcapng). Dr. Negus obtained similar test results for other accused products. CDX-0010.TEST.14-17 (CX-0747-51); CDX-0010C.TEST.62-67 (CX-0707-11); CDX-0010C.TEST.103-07 (CX-0613-17).

Dr. Negus's testing further demonstrates that the server in fact stores multiple different copies of the video. As discussed above, the Master Playlist used in HLS allows for multiple Variant Streams, where the client may switch between the Variant Streams, which may be encoded at different bitrates. *See* CX-0836 (RFC 8216) 4, § 2. As shown below, Dr. Negus conducted a test using an iFit accused product to demonstrate that multiple Variant Streams stored as a set of Media Segment files could each be retrieved from storage on a server by a unique filename:



CDX-0010C.TEST.42 (CX-0754 (ICON_Test9_Jul1_2021.chls)). Dr. Negus obtained similar test results for other accused products. CDX-0010C.TEST.87 (CX-0715 (Peloton_Test9_Jul1_2021.chls)); CDX-0010C.TEST.124 (CX-0620 (Mirror_Test8_Jul2_2021.chls)). Thus, Dr. Negus's testing convincingly shows that multiple copies of a video are stored on the server as multiple sets of files.

Respondents contend that Dr. Negus's testing only shows an IP address from which content is retrieved but it does not establish that the IP address is indeed that of a server that stores content.

However, respondents' own expert Dr. Snoeren testified that Dr. Negus's testing "shows *a* server address." RX-0004C (Snoeren RWS) at Q/A 203, 208, 212 (emphasis added). The evidence recounted above more than persuasively shows that a server at the address identified by Dr. Negus stores multiple different copies of a single video as multiple sets of files.

Respondents additionally contend that Dr. Negus's testing of the respondents' unaccused iOS Apps also does not show whether the accused products meet the video server limitations. *See* Resps. Br. at 64. Respondents' argument is irrelevant. There is no dispute that Dr. Negus tested the accused products, all of which utilize the Android operating system and ExoPlayer from Google. CX-0010C (Negus DWS) at Q/A 28, 55-59, 64-65, 116-118, 123, 145, 146. Respondents' own witnesses confirmed that, for a given fitness class, the accused products of each respondent stream the same video files as their respective iOS mobile applications. CX-0010C (Negus DWS) at Q/A 296 (quoting JX-0076C (Shanahan Dep.) 134:5-135:3, 136:6-15); *id.* at Q/A 94 (quoting JX-0077C (Santos Dep.) at 85:6-86:4); *id*. at Q/A 288 (quoting JX-0080C (Brammer Dep.) 261:5-18, 262:4-8); *id*. at Q/A 69, 544. By streaming the same fitness class offered by a respondent on that respondent's accused product and that respondent's iOS application, Dr. Negus was able to obtain and inspect the HLS streaming asset files that are streamed by the accused products. Negus Tr. 138–139.

Dr. Negus did not rely on his testing to impute the operation of the iOS application executables or media players onto the accused products. *Id.* at 141. As noted above, claim 1 describes a media player that operates in a certain environment, and Dr. Negus' testing confirmed the environment in which the accused products operate. Testimony from respondents' witnesses and Dr. Negus's testing confirm that the accused products and the respective iOS applications stream the same fitness class videos from the same CDNs. *See e.g.*, CX-0010C (Negus DWS) at

Q/A 148, 152, 156; CDX-0010C.TEST.62, 71 (CX-0707 (PelotonTest1); CX-0712 (PelotonTest6)). Dr. Negus determined through his testing that the videos streamed by the accused products are encoded into multiple HLS variant streams of varying bitrates that correspond to "multiple different copies of the video encoded at different bitrates." CX-0010C (Negus DWS) at Q/A 282-303. The testing also confirmed that each Variant Stream is comprised of the "set" of Media Segment transport stream files listed in the HLS media playlist for the Variant Stream, such that the sets across the multiple Variant Streams correspond to "multiple sets of files." *Id.* Testing further demonstrated that the individual and unique URI for each Media Segment file of each set, which ends in a file extension of ".ts" to denote a transport stream file and identifies the "set" to which the segment belongs, is an individual file. *Id*. The URI for each Media Segment also specifies the location and address of that file on the server. *Id.* By retrieving the files from the specified location addresses using HTTP/HTTPS GET requests, the testing confirmed that the individual Media Segment files of the multiple sets are stored on the CDN video server at their specified location addresses. *Id*.

Notably, respondents' expert Dr. Snoeren never offered an affirmative opinion that the accused products *do not* stream videos from a single server that stores multiple copies of that video in multiple files.

The record evidence thus demonstrates that respondents' accused products, with the exception of [redacted],[16] include a media player configured to stream a video from

[16] Peloton argues that its [redacted] lacks this limitation. *See* Resps. Br. at 66. Peloton presented evidence that its [redacted] does not have "multiple sets of files" because "the video for each bitrate variant is [redacted] and to the extent that [redacted] is ever stored in a filesystem, it [redacted]." *Id*.; RX-0004C (Snoeren RWS) at Q/A 319-22. DISH, however, does not accuse Peloton's [redacted] of infringing the '564 patent, rendering Peloton's argument moot.

a server that stores multiple different copies of the video encoded at different bit rates as multiple sets of files. *See* CX-0010C (Negus DWS) at Q/A 282-305.

d) (1c) wherein each of the files yields a different portion of the video on playback,

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 306-15. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 53-66.

e) (1d) wherein the files across the different copies yield the same portions of the video on playback, and

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 316-28. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 53-66.

f) (1e) wherein each of the files comprises a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video, and

Respondents' accused products, with the exception of MIRROR's MPEG-DASH system, meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 332-43.

Respondents concede the definition of "the term 'time index' is not at issue . . . because the plain and ordinary meaning of the term is clear." Resps. Br. at 54. Accordingly, all that remains is a factual question as to whether each of the relevant files comprises a time index.

Respondents argue that the accused products do not include time indexes because "they do not request files based on time indexes, and instead place requests based on Uniform Resources Identifiers (URIs), a unique identifier similar to a file name composed of letters and numbers, that do not include a time index or any information indicative of time." Resps. Br. at 56 (citing

RX-0004C (Snoeren RWS) at Q/A 118, 121; Snoeren Tr. 303–304). However, as Dr. Snoeren testified, the accused products request segments "based on their filenames" and the filenames include a unique identifying number that "correspond[s] to their spot in the playback sequence." RX-0004C (Snoeren RWS) at Q/A 123; Snoeren Tr. 305 ("it is a fact that that portion of the [Uniform Resource Identifier] string does have a number"), 319 (the incrementing numbers are "not random"), 320 (the numbers "correspond[] to their position in that media playlist").

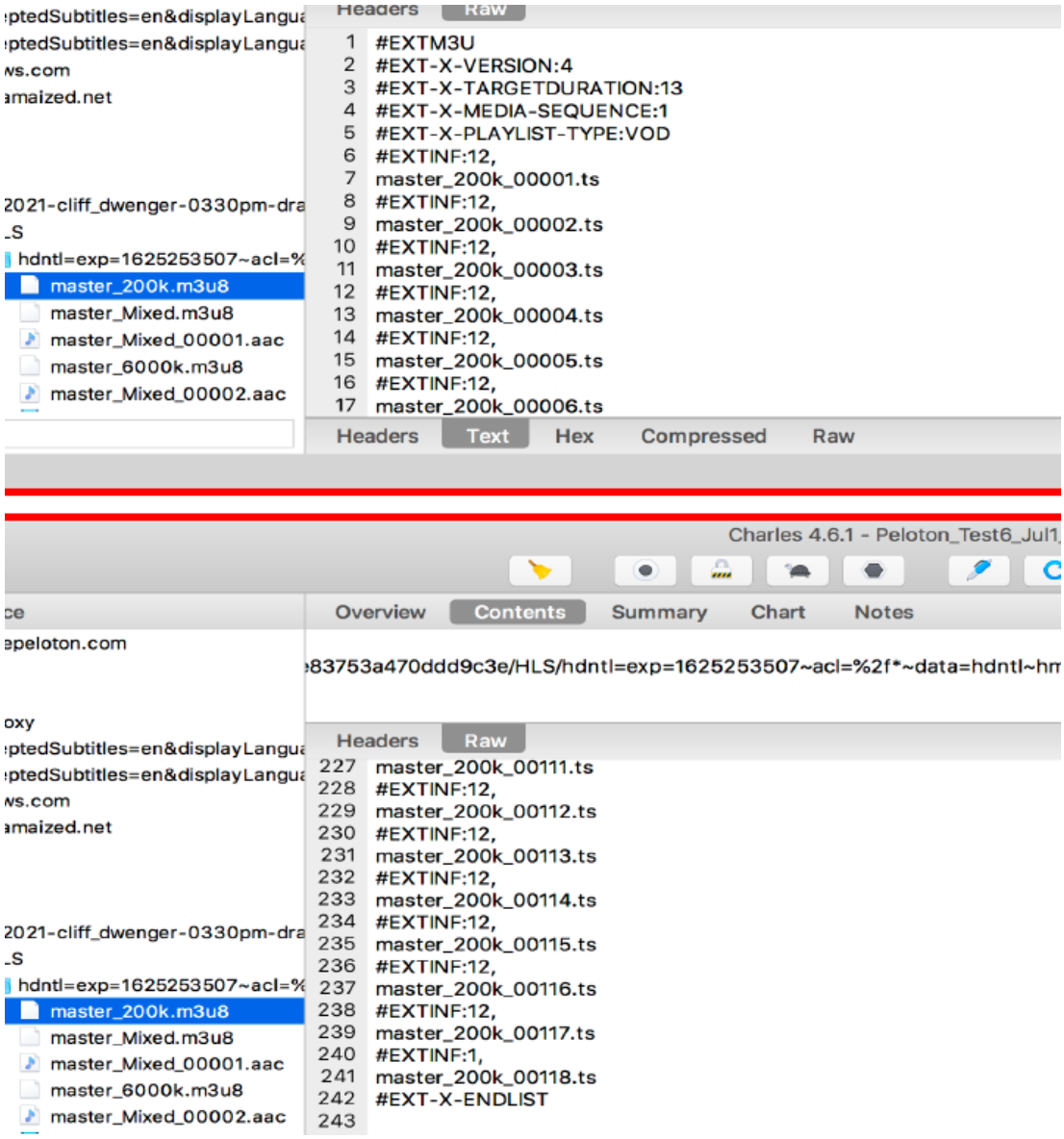
Respondents further contend that "the [Uniform Resource Identifiers] used to place the requests are not included with the requested HLS media segment." Resps. Br. at 57 (citing RX-0004C (Snoeren RWS) at Q/A 118). However, the HLS standard explicitly states that "[e]ach segment in a Media Playlist has a unique integer Media Sequence Number." CX-0836 (RFC 8216) 6, 23 § 3; § 4.3.3.3. Thus, the Media Sequence Number is contained in filename metadata such that each Media Segment has a unique Media Sequence Number, which is within the Media Segment file. Negus Tr. 142.

Respondents next object that DISH's testing was flawed and that "the HLS protocol is not a compulsory protocol requiring strict compliance to play an HLS stream." Resps. Br. at 59-60. However, DISH has adduced evidence demonstrating that respondents' accused products indeed practice the HLS protocol using sequential Media Sequence Numbers. *See, e.g.*, JX-0080C (Brammer Dep.) 76:13-15, 77:23-78:6, 100:13-17, 157:13-16, 158:20-159:10; CX-0803 ([redacted] User Guide) at 81; CX-0806 ([redacted] User Guide) at 44-50, 97; JX-0077C (Santos Dep.) 155:4-7, 158:10-22, 159:14-160:24, 158:24-159:13.

As shown in Dr. Negus's tests, each Media Segment includes a sequential Media Sequence number that starts at an initial value (00001 in CX-0712 below) for the first Media Segment and

[redacted]

increases sequentially to end at a larger number for the last Media Segment (00118 in CX-0712 below):



CDX-0010C.TEST.70 (CX-0712 (Peloton_Test6_Jul1_2021.chls)). Dr. Negus obtained similar test results for other accused products. CDX-0010C.TEST.148 (CX-0622 (Mirror_Test10_Jul2_2021.chls)); CDX-0010C.TEST.22 (CX-0751 (ICON_Test6_Jul1_2021.chls)).

[redacted]

Respondents additionally cite CX-0836 (RFC 8216) and RX-0055C (MIRROR .m3u8 file) to argue that the URI identified by DISH "is a string of characters that point to data." Resps. Br. at 56. In computer code, characters readable by humans are representative of information. The factual issue here is whether the data conveyed by the characters is a time index. The URI contains information that is an index for the relative position in time of the Media Segment within the larger Media Sequence. As shown below, both CX-0836 and RX-0055C explicitly show multiple file names each having a unique integer Media Sequence Number that indexes the relative order of the file in time:

8.1. Simple Media Playlist #EXTM3U #EXT-X-TARGETDURATION:10 #EXT-X-VERSION:3 #EXTINF:9.009, http://media.example.com/first.ts #EXTINF:9.009, http://media.example.com/second.ts #EXTINF:3.003, http://media.example.com/third.ts #EXT-X-ENDLIST	chunklist.m3u8 #EXTM3U #EXT-X-VERSION:3 #EXT-X-DISCONTINUITY-SEQUENCE:0 #EXT-X-TARGETDURATION:3 #EXT-X-MEDIA-SEQUENCE:1213 #EXT-X-PROGRAM-DATE-TIME: 2021-10-14T13:53:55.104Z #EXTINF:1.869, 0001566q/media_1213.ts #EXTINF:1.868, 0001566q/media_1214.ts #EXTINF:1.869, 0001566q/media_1215.ts #EXTINF:1.868, 0001566q/media_1216.ts #EXTINF:2.803, 0001566q/media_1217.ts #EXTINF:1.869, 0001566q/media_1218.ts
CX-0836 (RFC 8216) at 51	RX-0055C (MIRROR .m3u8 file)

DISH has thus adduced evidence showing that each of the respondents' accused products, with the exception of MIRROR's MPEG-DASH system,[17] satisfy this claim limitation. *See, e.g.*, CX-0010C (Negus DWS) Q/A 332-43.

[17] MIRROR argues that DISH did not adduce evidence showing that the MPEG-DASH system in the accused products utilizes "time indexes." Resps. Br. at 61; RX-0004C (Snoeren RWS) at Q/A

g) (1f) wherein the media player streams the video by: requesting a plurality of sequential files of one of the copies from the video server based on the time indexes;

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 345-60.

Respondents contend that the accused products do not request the accused files based on time indexes. *See* Resps. Br. at 54-61. However, as I found above, each of the relevant files comprises a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video. *See supra* Sec. IX.A.1.f). Moreover, the ExoPlayer of each accused product requests the files "based on their filenames" and these filenames include a unique Media Sequence Number for each Media Segment. RX-0004C (Snoeren RWS) at Q/A 123; *see also* Snoeren Tr. 319–320. I thus find that the media player of each accused product streams the video by requesting a plurality of sequential files of one of the copies from the video server based on the time indexes. *See* CX-0010C (Negus DWS) at Q/A 345-60.

h) (1g) automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies,

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 364-70.

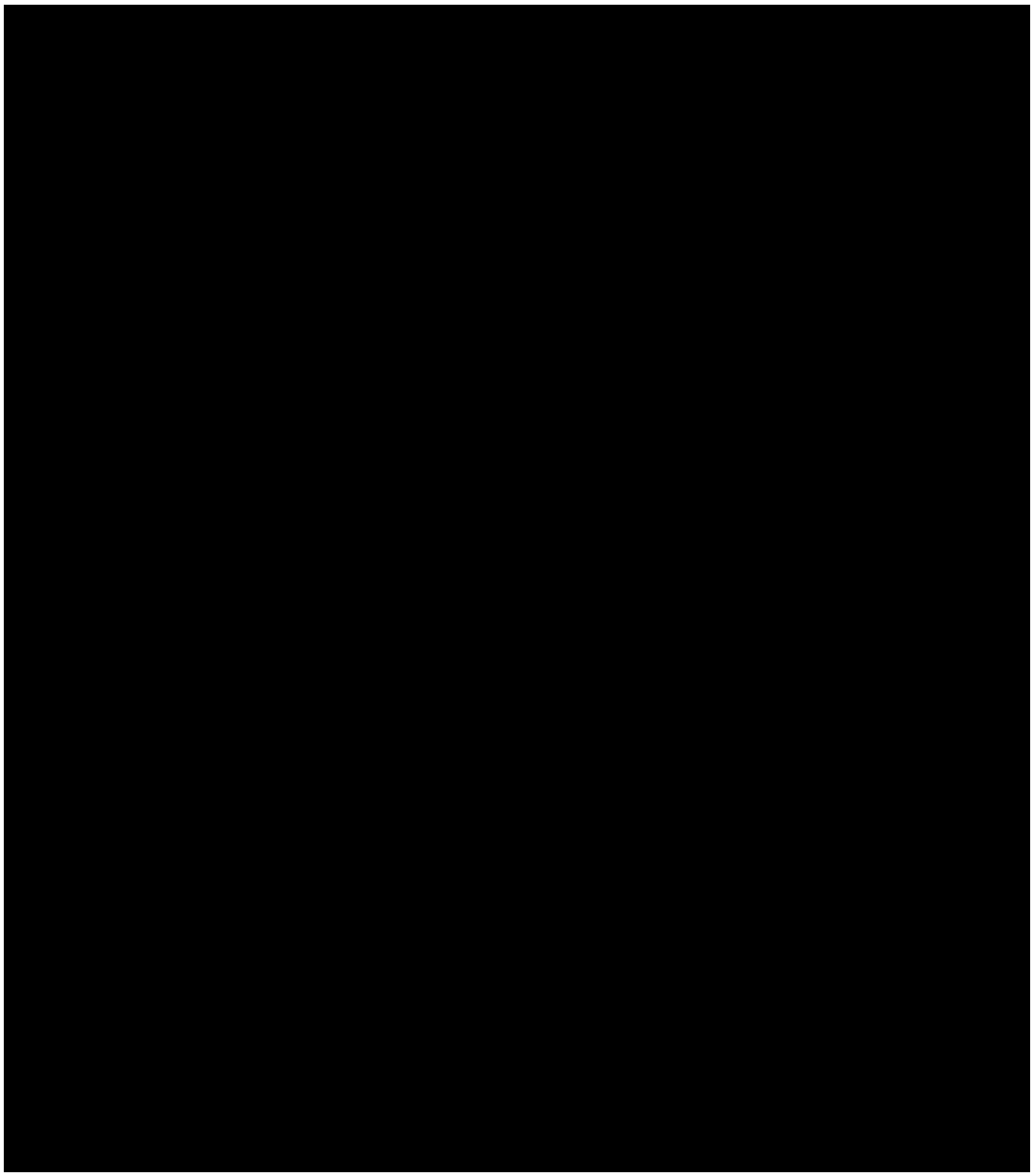
Respondents argue that "there is no evidence that the Accused Products select or playback videos based on quality. Instead, DISH pointed to the Accused Products selecting or playing back

131. DISH, however, does not accuse MIRROR's MPEG-DASH system of infringing the '564 patent, rendering MIRROR's argument moot.

videos based on bitrate." Resps. Br. at 65. However, Dr. Negus identified and quoted the portions of respondents' ExoPlayer source code demonstrating that streams are selected based on quality. CX-0010C (Negus DW) at Q/A 191, 203, 211. Specifically, the source code shows that the ExoPlayer within each accused product automatically requests video segments "dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies." *See id.* at Q/A 365-66.

Comments in the source code itself demonstrate that the developers understood that the player shifts playback quality through selecting segments. As shown in the figure below, each time ExoPlayer retrieves a segment, it calls a function "[redacted]," which calls a function "[redacted]," which calls a function "[redacted]." *Id.* at Q/A 363-67 (citing CDX-0010C.IS.6–8 (CX-1000 (ExoPlayer r2.11.6)); CDX-0010C.PS.5-10 (CX-1001 (ExoPlayer r2.12.1)); CDX-0010C.MS.8 (CX-0999 (ExoPlayer r2.13.3)).

[redacted]



CDX-0010C.IS.7 (CX-1000 (ExoPlayer r2.11.6)) (modified). The emphasized comments refer to "higher quality" and "lower quality," and indicate that the developers understood that the determination of the selected Variant Stream, which may indeed also relate to the bitrate of the Variant Stream, was nevertheless a shift in the playback quality to a higher or lower quality one of the different copies.

This source code analysis confirmed what Dr. Negus observed during his testing of the accused products. CX-0010C (Negus DWS) at Q/A 369 (citing CDX-0010C.TEST.15-17 for iFit (CX-0748, CX-0749, CX-0750), CDX-0010C.TEST.74, 80, 86, 93 for Peloton (CX-0713, CX-0714, CX-0715, CX-0716), and CDX-0010C.TEST.107-108, 146-155 for MIRROR (CX-0617, CX-0622). In particular, the functions "[redacted]" and "[redacted]" make a "determination" to shift to one of a "higher quality" or a "lower quality" Variant Stream or not. *See id.* at Q/A 366. These functions can result in the ExoPlayer deciding to shift the playback quality to a higher or lower copy by changing which Variant Stream is the currently selected Variant Stream. *Id.*

[redacted]

CDX-0010C.IS.8 (CX-1000 ([redacted])).

As Dr. Negus testified:

> [W]henever ExoPlayer executes the source code within the function "[redacted]" so as to set the value of "[redacted]" to the value of "[redacted]", as shown for iFIT at CDX-0010C.IS.6–8, or so as to set the value of "[redacted]" to the value of "[redacted]", as shown for Peloton at CDX-0010C.PS.5-10 and MIRROR at CDX-0010C.MS.8,

then this represents a "successive determination" by the "media player" NOT "to shift the playback quality to a higher or lower quality one of the different copies", while, conversely, NOT setting the value of "[redacted]" to the value of "[redacted]", as shown for iFIT at CDX-0010C.IS.6 – 8, or NOT setting the value of "[redacted]" to the value of "[redacted]", as shown for Peloton at CDX-0010C.PS.6-8 and MIRROR at CDX-0010C.MS.8, represents a "successive determination" by the "media player to shift the playback quality to a higher or lower quality one of the different copies".

CX-0010C (Negus DWS) at Q/A 366.

Accordingly, I find that the accused products satisfy this limitation.

i) (1h) the automatically requesting including repeatedly generating a factor indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies, wherein the set of one or more factors relate to the performance of the network;

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 372-92.

All products accused of infringing claim 1 use the ExoPlayer. DISH's expert Dr. Negus identified four factors within the ExoPlayer source code that are indicative of the current ability to sustain the streaming of a video:

[redacted]

[redacted]

Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 53-66.

> **j) (1i) making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files of the highest quality one of the copies determined sustainable at that time so that the media player upshifts to a higher quality one of the different copies when the factor is greater than a first threshold and downshifts to a lower quality one of the different copies when the factor is less than a second threshold; and**

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 393-408.

Respondents contend that the accused products do not select or request video files by quality. *See* Resps. Br. at 65. However, above I found that each of respondents' accused products requests subsequent portions of a video dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality. *See supra* Sec. IX.A.1.h); CX-0010C (Negus DWS) at Q/A 393, 394, 400.

With respect to shifting based on thresholds, I found above that Dr. Negus identified at least four factors in the source code of the accused products that are indicative of the current ability to sustain the streaming of the video. Dr. Negus showed that ExoPlayer in each accused product performs such "successive determinations to shift the playback quality" specifically based on whether those factors are greater or less than different thresholds. CX-0010C (Negus DWS) at Q/A 393-408. The ExoPlayer therefore "upshifts to a higher quality one of the different copies

when the factor is greater than a first threshold and downshifts to a lower quality one of the different copies when the factor is less than a second threshold."

I find the accused products meet this limitation.

k) (1j) presenting the video by playing back the requested media files with the media player on the end user station in order of ascending playback time.

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 409-17. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 53-66.

l) Infringement Conclusion

With the exception of Peloton's [redacted] and MIRROR's MPEG-DASH system, which are not accused of infringing claim 1 of the '564 patent, I find that respondents' accused products meet each limitation of claim 1, and therefore respondents infringe that claim.

2. Claim 3

a) The end user station of claim 1, wherein the media player is configured to generate the factor according to the responses to segment requests.

As discussed above, the respondents' accused products, with the exception of Peloton's [redacted] and MIRROR's MPEG-DASH system, satisfy all limitations of independent claim 1.

DISH has adduced evidence showing that each of the accused products comprises a media player configured to generate the factor according to the responses to segment requests. *See* CX-0010C (Negus DWS) at Q/A 418-22. Respondents do not contest that the accused products satisfy the additional limitation of claim 3. *See* Resps. Br. at 53-66.

With the exception of Peloton's [redacted] and MIRROR's MPEG-DASH system, which are not accused of infringing claim 3 of the '564 patent, I find that respondents' accused products meet claim 3, and therefore respondents infringe that claim.

3. Claim 4

a) The end user station of claim 1, wherein the media player is configured to upshift to the higher quality copy when the factor is greater than the first threshold and the media player determines the higher quality playback can be sustained according to a combination of factors.

As discussed above, the respondents' accused products, with the exception of Peloton's [redacted] and MIRROR's MPEG-DASH system, satisfy all limitations of independent claim 1.

DISH has adduced evidence showing that each of the accused products comprises a media player configured to upshift to the higher quality copy when the factor is greater than the first threshold and the media player determines the higher quality playback can be sustained according to a combination of factors. *See* CX-0010C (Negus DWS) at Q/A 423-28. Respondents do not contest that the accused products satisfy the additional limitation of claim 4. *See* Resps. Br. at 53-66.

With the exception of Peloton's [redacted] and MIRROR's MPEG-DASH system, which are not accused of infringing claim 4 of the '564 patent, I find that respondents' accused products meet claim 4, and therefore respondents infringe that claim.

4. Claim 5

a) The end user station of claim 1 wherein the media player is configured to upshift to the higher quality copy when the performance factor is greater than the first threshold and the media player determines that the higher quality playback can be sustained according to an amount of contiguously available files stored by the media player.

As discussed above, the respondents' accused products, with the exception of Peloton's [redacted] and MIRROR's MPEG-DASH system, satisfy all limitations of independent claim 1.

DISH has adduced evidence showing that each of the accused products comprises a media player configured to upshift to the higher quality copy when the performance factor is greater than the first threshold and the media player determines that the higher quality playback can be sustained according to an amount of contiguously available files stored by the media player. *See* CX-0010C (Negus DWS) at Q/A 429-35. Respondents do not contest that the accused products satisfy the additional limitation of claim 5. *See* Resps. Br. at 53-66.

With the exception of Peloton's [redacted] and MIRROR's MPEG-DASH system, which are not accused of infringing claim 5 of the '564 patent, I find that respondents' accused products meet claim 5, and therefore respondents infringe that claim.

B. Domestic Industry (Technical Prong)

DISH contends that the DISH Set-Top Boxes and the Sling TV Apps practice independent claim 1 of the '564 patent. *See* Compls. Br. at 122. Above I found that the Hopper 3 is representative of all DISH Set-Top Boxes after December 2017. *See supra* Sec. VIII.A. I also found, however, that DISH has not established that the Sling Fire App is representative of the Sling TV Apps. *See supra* Sec. VIII.B. The Staff argues that DISH has not established that the DISH

Set-Top Boxes and the Sling TV Apps practice claim 1 of the '564 patent because these products lack a display. *See* Staff Br. at 149-57.

1. Claim 1

a) (1pre) An end user station for adaptive-rate content streaming of digital content from a video server over a network, the end user station comprising:

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) Q/A 679-83. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfy this limitation. *See* Resps. Br. at 99-108. To the extent the preamble of claim 1 is limiting, I find that use of the DISH Set-Top Boxes and the Sling Fire App satisfies the preamble.

b) (1a) a media player operating on the end user station configured to stream a video from the video server via at least one transmission control protocol (TCP) connection over the network,

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) Q/A 684-88. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfy this limitation. *See* Resps. Br. at 99-108.

c) (1b) wherein multiple different copies of the video encoded at different bit rates are stored on the video server as multiple sets of files,

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 685-95.

Respondents argue that "DISH failed to show a particular server that stores 'Media Segment files,' nor does it show how a particular server would meet all of the claim requirements for 'the video server.'" Resps. Br. at 99 (citing RX-0004C (Snoeren RWS) at Q/A 375-76).

[redacted]

As noted above in the infringement analysis of this same limitation, the limitation is met by a media player that streams a video from a server having at least two different copies of the same video stored in a least two sets of files. *See supra* Sec. IX.A.1.c). The claim does not preclude DISH from using multiple servers to provide its service.

The record evidence persuasively shows that the DISH Set-Top Boxes and the Sling Fire App each stream video from a single server that stores files as described in the claim. Dr. Negus testified that both the DISH Set-Top Boxes and the Sling Fire App use HTTP GET requests and responses in accordance with the HLS Standard to stream a video "composed of Media Segments from a 'video server' *including the specific case wherein such 'video server' is one* of DISH's Covered Servers." CX-0010C (Negus DWS) at Q/A 685, 687 (emphasis added). Dr. Negus substantiated this testimony with test results showing multiple files stored on the same server. *Id*. (citing CDX-0010C.TEST.158-164, 168-170, 173-174). Dr. Negus also noted an internal DISH document supported his expert opinion. *Id*. at 690. That document—prepared long before this litigation—states that a DISH Set-Top Box [redacted] CX-0445C (Sling TV Overview) at 14. The media player in the device operates by [redacted] *Id*. (emphasis added). Dr. Negus testified that the DISH document reinforced his expert conclusion that "multiple different copies of the video encoded at different bit rates are stored on *the* video server as multiple sets of files." CX-0010C (Negus DWS) at Q/A 690 (emphasis added).

Respondents further argue that DISH failed to show that in the DISH system content is stored as files on a server. *See* Resps. Br. at 99-100. However, as Dr. Negus testified, the servers within DISH's content delivery networks store multiple Media Segment files, which make up the Variant Streams encoded at different bitrates. *See* CX-0010C (Negus DWS) at Q/A 690-92.

Moreover, Dr. Negus's testing identified the Uniform Resource Locator address of a particular movetv.com content delivery network server that stores the content that was streamed during the testing. *See, e.g.*, CDX-0010C.TEST.158 (CX-0812 (Live News Oct. 21)) (identifying a content delivery network server at Uniform Resource Locator "http://p-cdn1-a-cg14-linear-cbd46b77.movetv.com" for Sling Fire App testing); CDX-0010C.TEST.168 (CX-0814 (Live Sports Oct. 21)) (identifying a content delivery network server at Uniform Resource Locator "p-cdn1-601-cg15-linear-cbd46b77.movetv.com" for Hopper 3 testing). Dr. Negus's testing confirmed that the identified segments were in fact stored on the identified content delivery network server by (1) requesting the segments from the sets according to their Uniform Resource Identifiers and Uniform Resource Locators, (2) confirming those requests were successful, and (3) confirming that the requested segments were received from the content delivery network server. *See* CX-0010C (Negus DWS) at Q/A 693-95.

I find that use of the DISH Set-Top Boxes and the Sling Fire App includes a media player configured to stream a video from a server that stores multiple different copies of the video encoded at different bit rates as multiple sets of files, meeting this limitation. *See* CX-0010C (Negus DWS) at Q/A 685-95.

d) (1c) wherein each of the files yields a different portion of the video on playback,

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 697-98. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 99-108.

e) (1d) wherein the files across the different copies yield the same portions of the video on playback, and

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 700-01. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 99-108.

f) (1e) wherein each of the files comprises a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video, and

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 703-04.

Respondents argue that "[t]he Sling TV for Amazon Fire does not perform this limitation for the same reasons why Respondents' Accused Products do not meet this limitation." Resps. Br. at 99. Respondents argue similarly regarding the Hopper 3. *See id.* at 103-04. As noted above with respect to the infringement analysis of this limitation, Respondents concede the definition of "the term 'time index' is not at issue . . . because the plain and ordinary meaning of the term is clear." *See* Resps. Br. at 54; *supra* Sec. IX.A.1.f). Accordingly, all that remains is a factual question as to whether each of the relevant files comprises a time index.

Dr. Negus testified that the ExoPlayer in the Sling Fire App streams a video by using Media Segment files that incorporate Media Segment numbering, and this numbering functions as the recited "time index." CX-0010C (Negus DWS) at Q/A 704. Dr. Negus also testified that [redacted] in the Hopper 3 operates "using the HLS standard," and that standard explicitly states that "[e]ach segment in a Media Playlist has a unique integer Media Sequence Number." *Id*. at Q/A 686, 703, 706; CX-0836 (RFC 8216) 6, 23 §3; §4.3.3.3; Negus Tr. 142. Dr. Negus confirmed these operations through testing. For example, when the Hopper 3 Set Top Box

[redacted]

selected [redacted] CX-0010C (Negus DWS) at Q/A 706; CDX-0010C.TEST.164, 168-170, 173, 174; CX-0814 (Hopper 3 Live News Oct 21.pcapng). When the Hopper 3 selected [redacted] *Id.*; *see also* CX-0010C (Negus DWS) at Q/A 703, 706.

I find that use of the DISH Set-Top Boxes and the Sling Fire App includes a media player configured to stream video files comprising a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video . *See* CX-0010C (Negus DWS) at Q/A 702-707.

g) (1f) wherein the media player streams the video by: requesting a plurality of sequential files of one of the copies from the video server based on the time indexes;

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 706-07. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 99-108.

h) (1g) automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies,

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 710-17.

Respondents argue the Sling TV for Amazon Fire and the DISH Hopper 3 do not meet this limitation "for the same reasons as why Respondents' Accused Products do not meet this

limitation." Resps. Br. at 100-105. However, as I found above, respondents' accused products include a media player that streams the video by automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies. *See supra* Sec. IX.A.1.h).

Moreover, as Dr. Negus testified, the Sling Fire App source code indicates that the ExoPlayer media player selects and identifies DASH streams by "quality." CDX-0010.AS.7 (CX-0998 (Amazon ExoPlayer port r2.11.3)) (CX-0998 (Exoplayer)\\AdaptiveTrackSelection.java, lines 82-94) (showing ExoPlayer determines if "[t]he selected track is a higher quality" or if "[t]he selected track is a lower quality"). Likewise, the source code for [redacted] selects and identifies HTTP Live Streaming Streams by "quality." [redacted]

Use of the DISH Set-Top Boxes and the Sling Fire App thus meets this limitation. *See* CX-0010C (Negus DWS) Q/A 710-17.

i) (1h) the automatically requesting including repeatedly generating a factor indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies, wherein the set of one or more factors relate to the performance of the network;

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) Q/A 719-32. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 99-108.

j) (1i) making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files of the highest quality one of the copies determined sustainable at that time so that the media player upshifts to a higher quality one of the different copies when the factor is greater than a first threshold and downshifts to a lower quality one of the different copies when the factor is less than a second threshold; and

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) Q/A 733-44.

As with limitation 1g, respondents contend that the DISH Set-Top Boxes and the Sling Fire App do not select or request by quality for the same reasons that the accused products do not satisfy this limitation. *See* Resps. Br. at 100, 105. However, as I found above, each of respondents' accused products includes a media player that streams the video by making successive determinations to shift the playback quality to achieve continuous playback of the video using the files of the highest quality one of the different copies determined sustainable at that time. *See supra* Sec. IX.A.1.j); CX-0010C (Negus DWS) at Q/A 733-44. As Dr. Negus testified, [redacted] of the Hopper 3 selects and identifies the HLS Streams by "quality," and source code for the Sling Fire App similarly indicates that the ExoPlayer media player also selects and identifies DASH streams by "quality." *See id*.

k) (1j) presenting the video by playing back the requested media files with the media player on the end user station in order of ascending playback time.

Respondents argue that "DISH cannot establish a technical domestic industry because its two domestic industry products (a set-top box and software application) do not include anything

that can present or provide a video to a user for playback of that video." *See* Resps. Br. at 88-89.[18] Respondents contend that DISH has failed to identify the "articles protected by the patent" because DISH has only asserted products lacking a display as its domestic industry products. *See id.* at 89; 19 U.S.C. § 1337(a)(2), (3). The Staff agrees with respondents that DISH has not met its burden to show that its domestic industry products practice this limitation because DISH's domestic industry products lack displays. *See* Staff Br. at 149-57.

DISH does not contend that the DISH Set-Top Boxes and the Sling Fire App include a display, and instead argues that it satisfies the technical prong because its products are used with compatible third-party displays. *See* Compls. Br. at 161-67.

If a complainant's products do not practice a patented invention standing alone, "the technical prong of the domestic industry requirement may still be satisfied if it can be established that [the complainant] or its customers configure the allegedly covered products in a manner that practices the claims within the United States." *Certain Optoelectronic Devices, Components Thereof, and Products Containing Same*, Inv. No. 337-TA-669, ID at 101 (Mar. 12, 2010) (unreviewed). The Commission has also found that the technical prong of the domestic industry may be satisfied when a complainant's domestic industry product is used with compatible third-party devices. *See Certain Magnetic Tape Cartridges and Components Thereof*, Inv. No. 337-TA-1058, Comm'n Op. at 29 (Apr. 9, 2019).

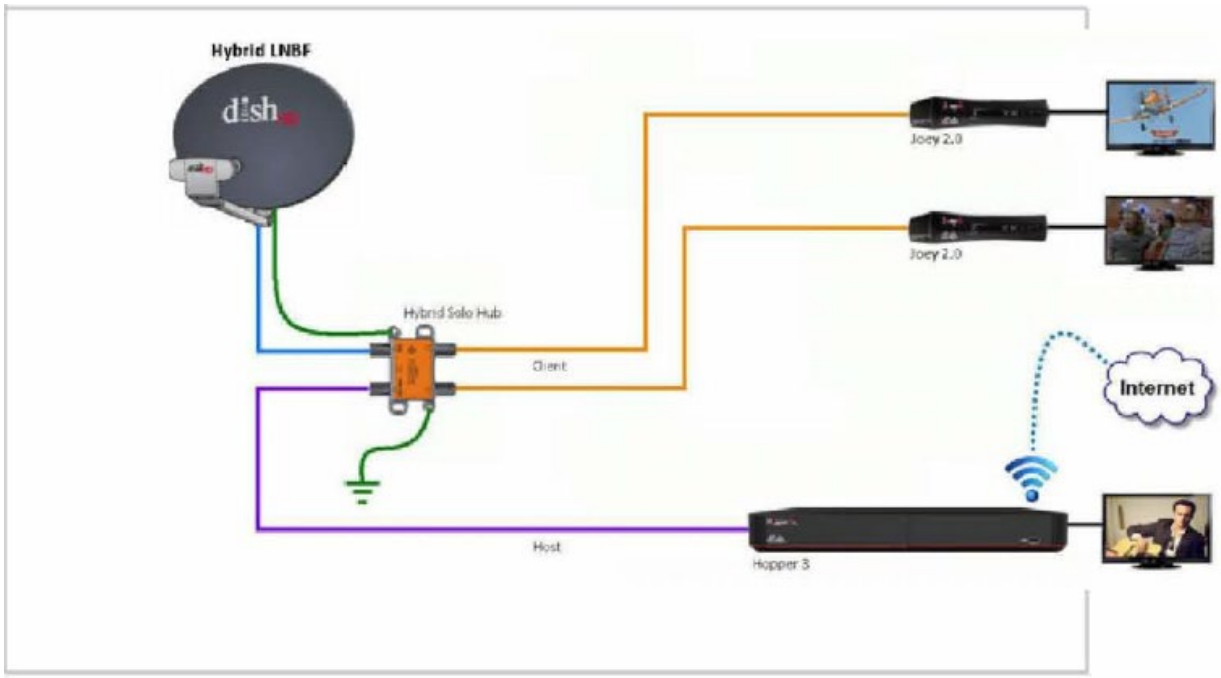
[18] Respondents and the Staff argue that practicing this limitation requires a display. *See* Resps. Br. at 94-96, Staff Br. at 149-58. DISH argues that it does not. *See* Compls. Br. at 11-25. No party presented this as an issue of claim construction. I need not decide whether claim 1 requires a display because, no matter whether the claims require a display or not, the record demonstrates that the DISH Set-Top Boxes and the Sling Fire App in fact provide data streams to displays viewed by users.

Based on the evidence and arguments of the parties, I find that DISH established by a preponderance of the evidence that: (1) DISH's customers use the invention of claim 1 of the '564 patent when they view videos streamed through the DISH Set-Top Boxes onto their televisions or other displays, and (2) DISH's customers use the invention of claim 1 of the '564 patent when they use the Sling Fire App to stream videos onto their televisions or other displays.

First, DISH adduced evidence of actual usage data, showing that DISH TV and Sling TV customers in fact use the DISH Set-Top Boxes and the Sling Fire App to view streaming content in the intended manner. *See* CX-0002C (Kroonenberg DWS) at Q/A 23; CX-0007C (Vander Veen DWS) at Q/A 31, 35; CX-0038C; CX-0039C; Mulhern Tr. 593-600; CX-0072C (2020 Market Data) at "Custom" Tab, Rows 78-84. This evidence weighs in favor of a finding that DISH's customers use the Set-Top Boxes and the Sling Fire App in a manner that practices claim 1 of the '564 patent. *See, e.g.*, *Certain Elec. Imaging Devices*, Inv. No. 337-TA-850, Comm'n Op. at 15 (Apr. 21, 2014) (citing *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1318-19 (Fed. Cir. 2009)).

Second, DISH presented evidence showing that DISH instructs customers to connect the DISH Set-Top Boxes and the Sling Fire App to displays, such as the customers' televisions. *See* CX-0002C (Kroonenberg DWS) at Q/A 55; CX-0062 (Hopper Installation Manual) 1, 3, 4; CX-0214C-SC ([14] av_digital_display_interface) 29, 34; CX-0445C (Sling TV Overview) at 2.

[redacted]



CX-0062 (Hopper Installation Guide) at 1.

Indeed, federal regulatory filings confirm that DISH has described the use of its services with third-party devices that include "televisions, streaming media devices, tablets, phones and computers." CX-1037 (DDBS Corp. 2019 10-K) at 40.

Respondents cite *Certain Mobile Devices, Associated Software and Components Thereof* ("*Mobile Devices"*), Inv. No. 337-TA-744, and argue that DISH, like the complainant in that investigation, failed to provide sufficient proof of an actual domestic industry product that practices the patent. *See* Resps. Reply Br. at 31. However, the administrative law judge in *Mobile Devices* found that there was insufficient proof of the technical prong when complainant's expert only examined source code provided by the complainant, and it was undisputed that additional source code provided by a third party was necessary to practice the claim. *See Mobile Devices*, ID at 204-05, *Microsoft Corp. v. Int'l Trade Comm'n*, 731 F.3d 1354, 1363 (Fed. Cir. 2013) (complainant "did not offer sufficient evidence to prove that any third-party mobile device

implements a hardware-dependent driver layer as required by the patent"). In contrast, the record here contains abundant evidence that DISH customers connect DISH Set-Top Boxes and the Sling Fire App to televisions, phones, computers, and tablets, as noted above.

Respondents further cite *Broadcom Corp. v. International Trade Commission*, where the Federal Circuit affirmed that the complainant failed to identify any "specific" integration of the domestic industry product with necessary third-party firmware to meet the technical prong of the domestic industry requirement. *See* Resps. Reply Br. at 31-32 (citing 28 F.4th 240, 250 (Fed. Cir. 2022)). But *Broadcom* is readily distinguished from the facts here. In *Broadcom*, both the ALJ and the Commission found insufficient documentary or testimonial evidence to support an assertion that devices were integrated in manner that resulted in the claimed invention. *Certain Infotainment Systems, Components Thereof, and Automobiles Containing the Same*, Inv. No. 337-TA-1119, Comm'n Op. at 20-23 (May 28, 2020). No such deficiency exists here. DISH has adduced specific evidence showing that DISH's customers in fact use the DISH Set-Top Boxes and the Sling Fire App in a manner that practices claim 1 of the '564 patent and that DISH actively assists its customers in implementing the Set-Top Boxes and the Sling Fire App with third-party devices that include displays. *See supra.* DISH has also presented specific, corroborated evidence showing that both the Set-Top Boxes and the Sling Fire App, when combined with the customer's television or other display, are indeed used to present a video to the user. *See, e.g.*, CX-0062 (Hopper Installation Manual); CX-0445C (Sling TV Overview). DISH has identified actual instances of usage where the Set-Top Boxes and the Sling Fire App are used to present video to users. *See* CX-0038C (DISH TV Usage); CX-0039C (Sling TV Usage); CX-0072C (2020 Market Data) at "Custom" Tab, Rows 78-84.

l) Technical Prong Conclusion

I find that each limitation of claim 1 is met at least when DISH's customers use the DISH Set-Top Boxes and the Sling Fire App in their intended and authorized manner. Indeed, if those uses were not authorized by DISH, there would be infringement, and that is the test for the technical prong of the domestic industry requirement. *Alloc, Inc. v. Int'l Trade Comm'n*, 342 F.3d 1361, 1375 (Fed. Cir. 2003) ("The test for satisfying the 'technical prong' of the industry requirement is essentially [the] same as that for infringement, *i.e.*, a comparison of domestic products to the asserted claims."). The DISH Set-Top Boxes and the Sling Fire App are therefore "articles protected by the patent" within the meaning of section 337. *See* 19 U.S.C. § 1337(a)(3). I determine DISH has satisfied the technical prong of the domestic industry requirement for claim 1 of the '564 patent.

2. Claim 3

a) The end user station of claim 1, wherein the media player is configured to generate the factor according to the responses to segment requests.

As discussed above, use of the DISH Set-Top Boxes and the Sling Fire App satisfies all limitations of independent claim 1.

DISH has adduced evidence showing that use of each of the DISH Set-Top Boxes and the Sling Fire App comprises a media player configured to generate the factor according to the responses to segment requests. *See* CX-0010C (Negus DWS) Q/A 751-56. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies the additional limitation of claim 2. *See* Resps. Br. at 94-108.

I find that use of the DISH Set-Top Boxes and the Sling Fire App meets claim 3. I therefore determine that DISH has satisfied the technical prong of the domestic industry requirement with respect to claim 3.

3. Claim 5

a) The end user station of claim 1 wherein the media player is configured to upshift to the higher quality copy when the performance factor is greater than the first threshold and the media player determines that the higher quality playback can be sustained according to an amount of contiguously available files stored by the media player.

As discussed above, use of the DISH Set-Top Boxes and the Sling Fire App satisfies all limitations of independent claim 1.

DISH has adduced evidence showing that use of each of the DISH Set-Top Boxes and the Sling Fire App comprises a media player configured to upshift to the higher quality copy when the performance factor is greater than the first threshold and the media player determines that the higher quality playback can be sustained according to an amount of contiguously available files stored by the media player. *See* CX-0010C (Negus DWS) at Q/A 764-69. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies the additional limitation of claim 5. *See* Resps. Br. at 94-108.

I find that use of the DISH Set-Top Boxes and the Sling Fire App meets claim 5. I therefore determine that DISH has satisfied the technical prong of the domestic industry requirement with respect to claim 5.

X. THE '156 PATENT

A. Infringement

DISH contends that iFit, Peloton, and MIRROR infringe independent claim 1 and dependent claim 5 of the '156 patent with accused products that implement the HLS Standard

(including Peloton's [redacted]) and MPEG-DASH. *See* Compls. Br. at 103. DISH contends that Peloton infringes dependent claim 2 of the '156 patent with accused products that implement the HLS Standard (including Peloton's [redacted]). *See id.* DISH contends that the iFit, Peloton, and MIRROR accused products infringe dependent claim 4 of the '156 patent when practicing live streaming with accused products that implement the HLS Standard (including Peloton's [redacted]). *See id*. The Staff argues that respondents do not infringe claim 1 of the '156 patent because the accused products do not request sequential streamlets of one of the copies from the video server according to the playback times of the streamlets. *See* Staff Br. at 100-03. The Staff further argues that DISH has not met its burden of showing that the accused products infringe claim 5 of the '156 patent. *See id.* at 109.

1. Claim 1

a) (1pre) An apparatus for rendering a video that is adaptively received as a digital stream from a video server over a network, the apparatus comprising:

The parties do not appear to dispute whether the preamble to claim 1 is limiting. *See* Compls. Br. at 103, Resps. Br. at 66-76. Respondents do not contest that the accused products satisfy the preamble. *See* Resps. Br. at 66-76. To the extent that the preamble is limiting, I find that each of respondents' accused products is an apparatus for rendering a video that is adaptively received as a digital stream from a video server over a network. *See* CX-0010C (Negus DWS) at Q/A 614-15.

b) (1a) a media player operating on the apparatus, wherein the media player is configured to stream the video from the video server via at least one transmission control protocol (TCP) connection over the network,

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 616. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 66-76.

c) (1b) wherein the video server stores multiple different copies of the video encoded at different bit rates as multiple sets of streamlets,

DISH has adduced evidence showing that respondents' accused products practice this limitation.

Respondents argue that "[b]ecause DISH failed to show that Respondents infringe claim 1(b) of the '564 patent, DISH has also failed to show that Respondents infringe claims 1, 4, and 7 of the '156 patent." Resps. Br. at 70. However, above I found that the accused products stream video from a server that stores multiple different copies of the video encoded at different bit rates as multiple sets of files. *See infra* Sec. IX.A.1.c). A "streamlet" is "any sized portion of the content file." *See supra* Sec. VII.B.1. The files I examined with respect to claim 1 of the '564 patent included files which are a portion of a content file. For example, Dr. Negus testified that the .ts Media Segment files he downloaded were "portions of the video for multiple Variant Stream[s] of the program." *See* CX-0010C (Negus DWS) at Q/A 150, 154, 158. I therefore find that these files are streamlets. The record evidence demonstrates that respondents' accused products interact with a video server that stores multiple different copies of the video encoded at different bit rates as multiple sets of streamlets. *See* CX-0010C (Negus DWS) at Q/A 617-18.

Respondents also contend that Peloton's [redacted] does not infringe under respondents' construction of the term "streamlets." *See* Resps. Br. at 76. As Dr. Negus testified,

each HLS Media Segment for an [redacted] is "a different portion of the overall video content." *See* CX-0010C (Negus DWS) at Q/A 621.

I find respondents' accused products satisfy this limitation.

d) (1c) wherein each of the streamlets yields a different portion of the video on playback,

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 619-22. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 66-76.

e) (1d) wherein the streamlets across the different copies yield the same portions of the video on playback, and

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 623-25. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 66-76.

f) (1e) wherein the streamlets in the different copies are aligned in time such that the streamlets that play back the same portion of the video for the different copies each begin at the same playback time in relation to the beginning of the video, and

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 626-28. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 66-76.

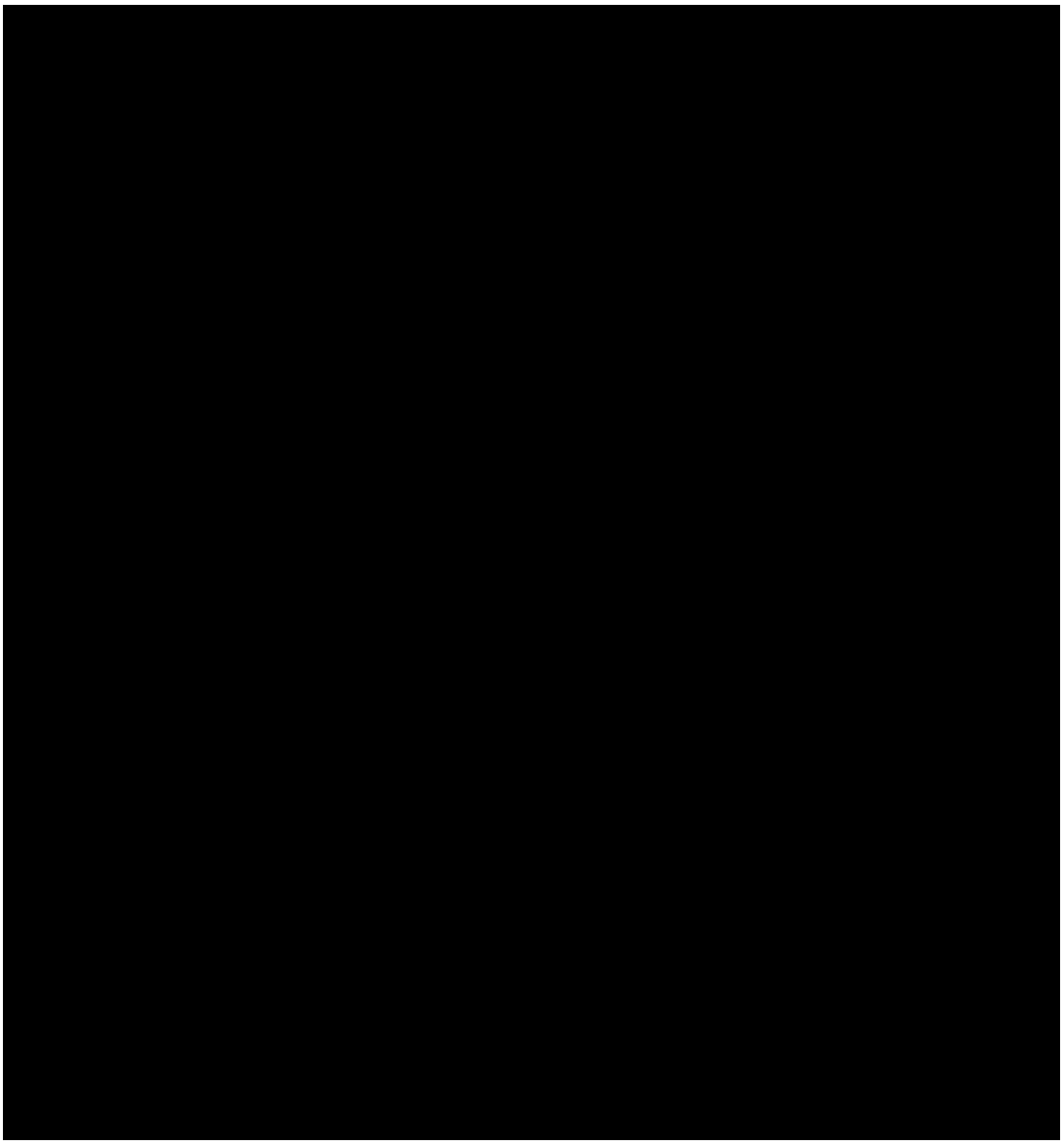
g) (1f) wherein the media player streams the video by: requesting sequential streamlets of one of the copies from the video server according to the playback times of the streamlets by transmitting hypertext transport protocol (HTTP) GET requests that identify the selected streamlets stored by the video server;

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 629-35.

Respondents argue that "claim 1 of the '156 patent requires requesting files based on a playback time that indicates the beginning playback time of the video contained in the portion of the requested streamlet." Resps. Br. at 67. However, as Dr. Snoeren testified, the accused products request segments "based on their filenames" and the filenames include a unique identifying number that "correspond[s] to their spot in the playback sequence." RX-0004C (Snoeren RWS) at Q/A 123; Snoeren Tr. 305 ("it is a fact that that portion of the [Uniform Resource Identifier] string does have a number"), 319 (the incrementing numbers are "not random"), 320 (the numbers "correspond[] to their position in that media playlist"). Moreover, the HLS Standard explicitly states that "[e]ach segment in a Media Playlist has a unique integer Media Sequence Number." CX-0836 (RFC 8216) 6, 23 § 3; § 4.3.3.3. Thus, the Media Sequence Number is contained in streamlet metadata and it corresponds to the playback times of the streamlets. Negus Tr. 142.

Respondents further argue that DISH's analysis does not show that the streamlets are requested based on playback times, because the analysis only shows how the streamlets are played back. *See* Resps. Br. at 68. In this regard, Dr. Negus analyzed the following source code of the ExoPlayer:

[redacted]



CDX-0010C.PS.6 (CX-1001 (ExoPlayer-r2.12.1)); *see also* CDX-0010C.IS.6 (CX-1000 (ExoPlayer-r2.11.6)); CDX-0010C.MS.6 (CX-0999 (ExoPlayer-r2.13.3)). Regarding the above source code, Dr. Negus testified:

> Yeah, so overall this is an excerpt within a demonstrative that I made to help, help anyone on this project. And so this is from a source code file. [redacted]
>
> And it does two important things relative to the asserted claims. Kind of the first, if you look at below the double slash where it says [redacted] in there, yeah,

[redacted]

that part is basically how it determines whether it wants to upshift or downshift. It calls other functions and the details are in the other functions. But then if we go to the next part, just below that, that says [redacted]

In other words, how do you put together that URI that we were speaking about. [redacted], and that's calling a function. And this function considers a number of parameters.

And among them are what's called -- the very last one there is called [redacted].

[redacted] **is simply where you are in the overall video measured in playback time. So measured in time relative to the beginning of the video**. And so that's what's used in order to figure out what is the next media sequence or media sequence number that will be played or will be downloaded, I should say, using HTTP, will be retrieved from the server.

So, in other words, when it is requesting the sequential files, it is doing it according to the playback times.

Negus Tr. 148-149 (emphasis added). As Dr. Negus testified, the ExoPlayer source code of each accused product demonstrates that the requesting of sequential files based on the media sequence numbers is performed "according to the playback time … relative to the beginning of the video." *Id*.

The Staff argues that "Respondents' sequential Media Sequence numbers in [Uniform Resource Identifier] filenames are requested by the Accused Products based on where the files, or media segments, are in relation to the video. This request may be *indicative* of time, but it is not *according* to the *times* at which the streamlets are *played*." Staff Br. at 100 (emphasis in original). Yet the evidence shows each of respondents' Media Segments are listed or identified in sequential order according to their sequential playback times and ExoPlayer individually requests each Media Segment in that sequential order according to "where you are in the overall video measured in

playback time." Negus Tr. 149; CX-0836 (RFC 8216) 4. Thus, the accused products request sequential streamlets "according to the playback times."

Respondents further argue that "[t]he plain language of claim 1(f) of the '156 Patent requires making a request for 'sequential streamlets' and thus requires placing ***one*** request for ***multiple*** files." Resps. Br. at 69 (emphasis in original). This argument is a variation of respondents' claim construction argument in connection with claim 10 of the '555 patent, where respondents argued that the phrase "receive the requested streamlets" requires more than one streamlet to be received in response to a single request. *See supra* Sec. VII.B.2. Neither argument is persuasive. In both circumstances, respondents' interpretation of the claim is inconsistent with the specification and the idiomatic use of the plural in each context. Respondents admit the patent specification teaches the request may be for one streamlet or multiple streamlets. Resps. Br. at 32 ("The parties and the Staff agree that the specification discloses different embodiments, including: (1) one in which a single request is placed for a single streamlet, and (2) another in which a single request is placed for multiple streamlets simultaneously."). The idiomatic use of the plural in this context "can describe a universe ranging from one to some higher number." *See Versa Corp. v. Ag-Bag Int'l Ltd*., 392 F.3d 1325, 1330 (Fed. Cir. 2004) (claimed "means for creating air channels" did not require more than one channel to be created). The phrase "requesting sequential streamlets" in claim 1 of the '156 patent does not mean that a single request must seek multiple files. As has been discussed at length, the evidence shows the accused products request sequential streamlets.

Respondents further argue that this limitation requires transmission of an "(HTTP) GET request" but the accused products instead use an encrypted HTTPS GET request. Resps. Br. at 70. I find the accused products transmit an HTTP GET request because the encrypted HTTPS GET

request used by the accused products is a type of HTTP GET request. *See* CX-0010C (Negus DWS) at Q/A 635. As Dr. Negus testified, the primary difference between HTTP and HTTPS is that HTTPS adds encryption to HTTP, which means that a given HTTPS request "includes an HTTP request." *See id*.

(1) MPEG-DASH

DISH relies on different evidence to show that MIRROR's MPEG-DASH system meets this limitation. DASH (Dynamic Adaptive Streaming over HTTP) is a "media-streaming model for delivery of media content in which control lies primarily with the client," which allows clients to "request data using the HTTP protocol from standard web servers that have no DASH-specific capabilities." CX-0612 (DASH 2019) at 21. In DASH, a Media Presentation Description (MPD) "defines formats to announce resource identifiers for Segments and to provide the context for these identified resources within a Media Presentation" wherein such "resource identifiers are HTTP-URLs possibly combined with a byte range, or with a data URL." *Id.* at 19.

[redacted]

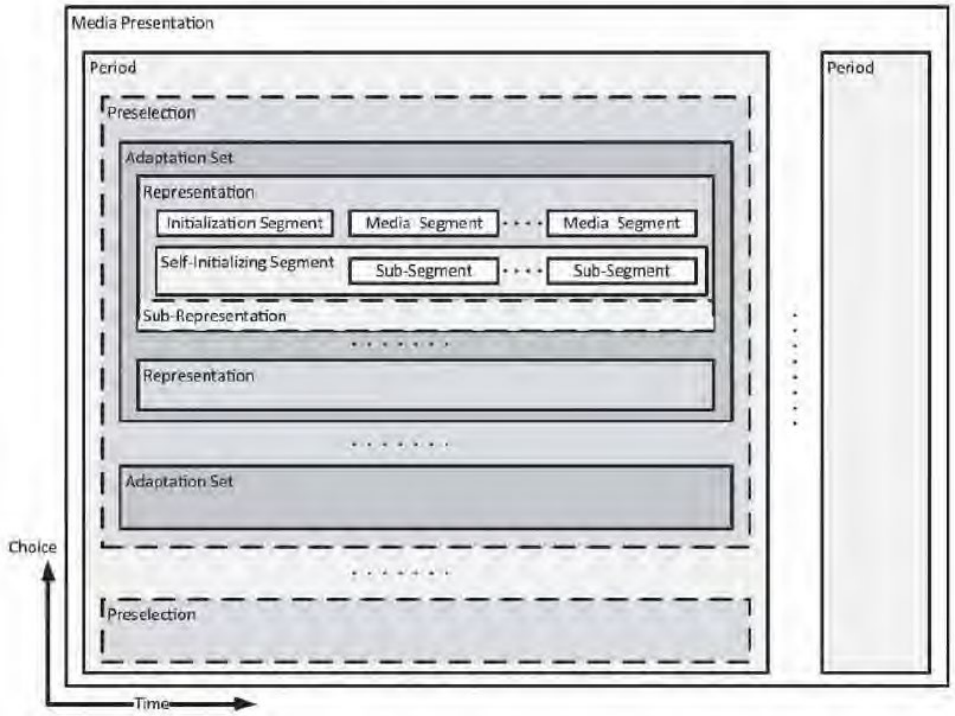


Figure 3 — DASH High-Level Data Model

CX-0612 (DASH 2019) at 22.

In MPEG-DASH, each representation "share[s] a common timeline" such that the "presentation time of each access unit within the media content is mapped to the global common presentation timeline for synchronization of different media components and to enable seamless switching of different coded versions of the same media components." CX-0010C (Negus DWS) at Q/A 630 (quoting CX-0612 (DASH 2019)).

Respondents argue that DISH's expert, Dr. Negus, did not provide any evidence that MIRROR's MPEG-DASH implementation practices this limitation. *See* Resps. Br. at 69. Yet Dr. Negus testified:

> The third depicted step in my block diagram of CDX-0010C.MS.3 includes creating or updating a media segment list, whether for HLS or DASH, that reflects the currently selected HLS Variant Stream or DASH Representation. In ExoPlayer, a

[redacted]

particular HLS Variant Stream or DASH Representation is usually referred to as a "track" (see, for example, CX-0462 https://exoplayer.dev/track-selection.html). . .

. . .

For either HLS or DASH, a key function for these combined steps is [redacted]

CX-0010C (Negus DWS) at Q/A 201.

[redacted]

CDX-0010C.MS.5. Hence, [redacted]

[redacted]

[redacted]. *See* CX-0010C (Negus DWS) at Q/A 201. DISH has

adduced evidence showing that the ExoPlayer in MIRROR's MPEG-DASH system requests sequential streamlets of one of the copies from the video server according to the playback times.

Accordingly, respondents' accused products, including the MIRROR MPEG-DASH system, meet this limitation.

h) (1g) wherein the sequential streamlets are selected by the media player from the based upon successive determinations to shift the playback quality to a higher or lower quality one of the different copies of the video,

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 636-38.

Respondents argue that "[b]ecause DISH failed to prove infringement of claim 1 of the '564 patent for this claim element (*see supra* Section VII.A.3), it also failed to prove infringement of claim 1 of the '156 patent." Resps. Br. at 72. However, above I found that DISH has adduced evidence showing that respondents' accused products include a media player that selects sequential streamlets based upon successive determinations to shift the playback quality to a higher or lower quality one of the different copies of the video. *See supra* Sec. IX.A.1.h); CX-0010C (Negus DWS) at Q/A 636-38.

Accordingly, DISH has adduced evidence showing that the accused products satisfy this limitation.

i) (1h) repeatedly generating, by the media player, a factor relating to the performance of the network that is indicative of an ability to sustain the streaming of the video;

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 639-41. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 66-76.

j) (1i) adapting the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the streamlets of the highest quality copy of the video that is determined to be sustainable at that time; and

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 642-46.

Respondents contend that the accused products do not select or request by quality. *See* Resps. Br. at 72. However, as I found above, each of respondents' accused products adapts the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the streamlets of the highest quality copy of the video that is determined to be sustainable at that time. *See supra* Sec. IX.A.1.j). Dr. Negus's analysis of the source code shows that ExoPlayer performs such "successive determinations to shift the playback quality" specifically "based on the factor." *See* CX-0010C (Negus DWS) at Q/A 642-46.

k) (1j) presenting the video for playback by providing the requested streamlets in order of ascending start time.

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 647-49. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 66-76.

l) Infringement Conclusion

I find that respondents' accused products meet each limitation of claim 1 of the '156 patent, and therefore respondents infringe that claim.

2. Claim 2

a) The apparatus of claim 1, wherein the apparatus is configured to establish multiple Transmission Control Protocol (TCP) connections with a content server, and request streamlets of varying bitrates.

DISH only accuses Peloton of infringing claim 2. As discussed above, the Peloton accused products satisfy all limitations of independent claim 1.

DISH has adduced evidence showing that the Peloton accused products are configured to establish multiple Transmission Control Protocol (TCP) connections with a content server and request streamlets of varying bitrates. *See* CX-0010C (Negus DWS) at Q/A 650-55.

Peloton argues that "the claim requires two separate components—a video server and a content server—and there is no evidence that a single IP address establishes that two separate computers are present." Resps. Br. at 75 (citing RX-0004C (Snoeren RWS) at Q/A 217). However, the specification teaches that "video" is a type of "content," so the "content server" recited in claim 2 is broad enough to encompass the "video server" recited in claim 1. JX-0004 ('156 patent) at 6:57-59. Because the Peloton accused products establish multiple TCP connections with a video server, and because that video server is a content server, the Peloton accused products meet claim 2. I therefore find Peloton infringes that claim.

3. Claim 4

a) The apparatus of claim 1, wherein the requesting the sequential streamlets comprises the apparatus transmitting hypertext transport protocol (HTTP) GET requests for selected streamlets, wherein each of the HTTP GET requests identifies the separate file stored by the video server that corresponds to the requested streamlet.

As discussed above, the respondents' accused products satisfy all limitations of independent claim 1.

DISH has adduced evidence showing that each of the accused products satisfies this claim limitation when practicing live streaming. *See* CX-0010C (Negus DWS) at Q/A 656-58. Respondents argue that the accused products do not transmit HTTP GET requests when requesting streamlets because they transmit HTTPS GET requests. *See* Resps. Br. at 70-72. However, above I found that an HTTPS GET request is a type of HTTP GET request. *See supra* Sec. IX.A.1.g).

With the exception of Peloton's [redacted] and MIRROR's MPEG-DASH system,[19] I find that respondents' accused products meet claim 4, and therefore respondents infringe that claim.

4. Claim 5

a) The apparatus of claim 1 wherein each of the streamlets of each of the different copies is independently requestable and playable by the apparatus.

As discussed above, the respondents' accused products satisfy all limitations of independent claim 1.

For the reasons discussed below, DISH has not adduced evidence showing that each of the streamlets of each of the different copies is independently requestable and playable by the apparatus.

DISH argues that "the Media Segments are each 'specified by a [Uniform Resource Identifier]' and are retrieved by individual HTTP GET requests are therefore 'individually

[19] The Peloton [redacted]. *See* Compls. Reply Br. at 24 n.11. DISH only asserts claim 4 against accused products used for live streaming. *See* Compls. Br. at 112. I therefore find that DISH has not adduced evidence showing that Peloton infringes claim 4 of the '156 patent with [redacted]. Similarly, as DISH does not contend that MIRROR's MPEG-DASH system is used for live streaming, *see* Compls. Br. at 94, 103, I find that DISH has not adduced evidence showing that MIRROR infringes claim 4 of the '156 patent with its MPEG-DASH system.

requestable.'" Compls. Br. at 112-13 (quoting CX-0010C (Negus DWS) at Q/A at 660). However, even though each Media Segment is requested individually, it is not independently requestable because each Media Segment cannot be requested until the Media Segment immediately before it is requested. *See* RX-0004C (Snoeren RWS) at Q/A 168-82. As Dr. Snoeren testified, the ExoPlayer cannot request a Media Segment in the middle of the order listed in the Media Playlist unless the preceding Media Segment has already been requested. *See id*.

I find that respondents' accused products do not meet each limitation of claim 5, and therefore respondents do not infringe that claim.

B. Domestic Industry (Technical Prong)

DISH contends that the DISH Set-Top Boxes and the Sling TV Apps practice independent claim 1 and dependent claim 4 of the '156 patent. *See* Compls. Br. at 122. Above I found that the Hopper 3 is representative of all DISH Set-Top Boxes after December 2017. *See supra* Sec. VIII.A. I also found, however, that DISH has not established that the Sling Fire App is representative of the Sling TV Apps. *See supra* Sec. VIII.B. The Staff argues that DISH has not established that the DISH Set-Top Boxes and the Sling TV Apps practice claim 1 of the '156 patent because these products lack a display, *see* Staff Br. at 149-57, and because these products do not request sequential streamlets of one of the copies from the video server according to the playback times of the streamlets, *see id*. at 146-49.

1. Claim 1

a) (1pre) An apparatus for rendering a video that is adaptively received as a digital stream from a video server over a network, the apparatus comprising:

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 853. Respondents do not contest that use of the DISH Set-Top

Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108. To the extent the preamble of claim 1 is limiting, I find that use of the DISH Set-Top Boxes and the Sling Fire App satisfies the preamble.

b) (1a) a media player operating on the apparatus, wherein the media player is configured to stream the video from the video server via at least one transmission control protocol (TCP) connection over the network,

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 854. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfy this limitation. *See* Resps. Br. at 94-108.

c) (1b) wherein the video server stores multiple different copies of the video encoded at different bit rates as multiple sets of streamlets,

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 855.

Respondents argue that DISH failed to show that the Sling Fire App and the Hopper 3 practice the "video server" limitation for the same reasons as those argued regarding the '564 patent. *See* Resps. Br. at 101, 106. However, as I found above, the Sling Fire App and the Hopper 3 practice the "video server" limitation of the '564 patent. *See supra* Sec. IX.B.1.c).

The record evidence thus demonstrates that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* CX-0010C (Negus DWS) at Q/A 690-94, 855-56.

d) (1c) wherein each of the streamlets yields a different portion of the video on playback,

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 857. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

e) (1d) wherein the streamlets across the different copies yield the same portions of the video on playback, and

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 858. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

f) (1e) wherein the streamlets in the different copies are aligned in time such that the streamlets that play back the same portion of the video for the different copies each begin at the same playback time in relation to the beginning of the video, and

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 859. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

g) (1f) wherein the media player streams the video by: requesting sequential streamlets of one of the copies from the video server according to the playback times of the streamlets by transmitting hypertext transport protocol (HTTP) GET requests that identify the selected streamlets stored by the video server;

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 860-61.

Respondents contend that the Sling Fire App and the Hopper 3 do not meet the "playback times of the streamlets" claim limitation for the same reasons that respondents' accused products do not meet this limitation. *See* Resps. Br. at 54-61. However, above I found that respondents' accused products do meet this limitation. *See supra* Sec. X.A.1.g). Moreover, DISH has adduced evidence showing that the HTTP Live Streaming standard explicitly states that "[e]ach segment in a Media Playlist has a unique integer Media Sequence Number." CX-0836 (RFC 8216) 6, 23 §3; §4.3.3.3. Thus, the Media Sequence Number is contained in filename metadata such that each Media Segment has a unique Media Sequence Number, which is within the Media Segment file. Negus Tr.

142. As Dr. Negus testified, the ExoPlayer of the Sling Fire App streams the video by using HTTP GETs to individually retrieve time sequenced Media Segments based on the DASH Media Segment number. *See* CX-0010C (Negus DWS) at Q/A 707. Hence, the Media Sequence Numbers satisfy the "playback times of the streamlets" limitation. *See id.* at Q/A 860-61.

h) (1g) wherein the sequential streamlets are selected by the media player from the based upon successive determinations to shift the playback quality to a higher or lower quality one of the different copies of the video,

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 862-63.

Respondents argue that DISH failed to show that the Sling Fire App and the Hopper 3 identify a video stream by "quality" to shift or select a stream for playback for the same reasons as argued regarding the '564 patent. *See* Resps. Br. at 101, 106. However, above I found that the Sling Fire App and the Hopper 3 practice the "quality" limitation of the '564 patent. *See supra* Sec. IX.B.1.h).

Moreover, as Dr. Negus testified, the Sling Fire App source code indicates that the ExoPlayer media player selects and identifies DASH streams by "quality." *See* CDX-0010C.AS.7 (CX-0998). The source code for [redacted] likewise selects and identifies HLS Streams by "quality." *See* CDX-0010C.HS.8 (CX-0387C-SC); CDX-0010C.HS.10 (CX-0387C-SC).

The record evidence thus demonstrates that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* CX-0010C (Negus DWS) at Q/A 862-63.

i) (1h) repeatedly generating, by the media player, a factor relating to the performance of the network that is indicative of an ability to sustain the streaming of the video;

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) Q/A 864. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

j) (1i) adapting the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the streamlets of the highest quality copy of the video that is determined to be sustainable at that time; and

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) Q/A 865-66.

Respondents contend that the DISH Set-Top Boxes and the Sling Fire App do not select or request by quality for the same reasons as argued regarding the '564 patent. *See* Resps. Br. at 101, 106. However, above I found that, with respect to the '564 patent, the DISH Set-Top Boxes and the Sling Fire App do shift the playback quality. *See supra* Sec. IX.B.1.j); CX-0010C (Negus DWS) at Q/A 865-66. Dr. Negus's analysis of the source code shows that the Sling Fire App and the Hopper 3 meet this limitation regardless of whether Media Segments were specified by a HLS, DASH, or a byte range. *See id.* at Q/A 865.

k) (1j) presenting the video for playback by providing the requested streamlets in order of ascending start time.

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation.

Respondents argue that use of the DISH Set-Top Boxes and the Sling Fire App does not meet this limitation for the same reasons as discussed above regarding the '564 patent. *See* Resps. Br. at 96. However, above I found that the conventional use of the DISH Set-Top Boxes and the Sling Fire App does indeed display the video to the user. *See supra* Sec. IX.B.1.k).

l) Technical Prong Conclusion

I find that each limitation of claim 1 of the '156 patent is met at least when DISH's customers use the DISH Set-Top Boxes and the Sling Fire App in their intended and authorized manner, and that DISH has satisfied the technical prong of the domestic industry requirement for claim 1 of the '156 patent.

2. Claim 4

a) The apparatus of claim 1, wherein the requesting the sequential streamlets comprises the apparatus transmitting hypertext transport protocol (HTTP) GET requests for selected streamlets, wherein each of the HTTP GET requests identifies the separate file stored by the video server that corresponds to the requested streamlet.

As discussed above, use of the DISH Set-Top Boxes and the Sling Fire App satisfies all limitations of independent claim 1.

DISH has adduced evidence showing that the HLS Media Segments are each specified by a Uniform Resource Identifier unique to each Media Segment, and that these HLS Media Segments are each "separate files" retrieved by HTTP GET requests. *See* CX-0010C (Negus DWS) at Q/A 70. DASH Media Segments are likewise separate files obtained via HTTP GET requests. *See id.* Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies the additional limitation of claim 4. *See* Resps. Br. at 94-108.

I find that use of the DISH Set-Top Boxes and the Sling Fire App meets claim 4 of the '156 patent. I therefore determine that DISH has satisfied the technical prong of the domestic industry requirement with respect to claim 4.

XI. THE '554 PATENT

A. Infringement

DISH contends that iFit, Peloton, and MIRROR infringe independent claim 16 and dependent claims 17 and 20 of the '554 patent with accused products that implement the HLS Standard. *See* Compls. Br. at 82. The Staff agrees with DISH that respondents infringe claims 16, 17, and 20 under the adopted construction for the "quality" terms. *See* Staff Br. at 111-22.

1. Claim 16

a) (16pre) An end user station to stream a live event video over a network from a server for playback of the video, the content player device comprising:

Respondents argue that "the Accused Products do not meet the 'live event' limitations when streaming on-demand/pre-recorded content." Resps. Br. at 79 (citing RX-0004C (Snoeren RWS) at Q/A 243-44). However, as I found above, the preamble of claim 16 is not limiting. *See supra* Sec. VII.B.5.a)(1). Respondents' argument fails for at least that reason.

Even if the preamble were limiting, respondents' accused products, with the exception of Peloton's [redacted] and MIRROR's MPEG-DASH system,[20] meet the preamble. *See* CX-0010C (Negus DWS) at Q/A 438-43. Respondents admit that "[u]sers who elect to become monthly subscribers ('Peloton Members') can receive access to and view 'Live' or 'On Demand' workout classes on a Peloton bike or treadmill," and "the Live classes are released on a schedule made available to Peloton Members." Resps. Br. at 7 (citing RX-0004C (Snoeren RWS) at Q/A

[20] All parties agree that the Peloton [redacted]. *See* Compls. Reply Br. at 24 n.11; Resps. Br. at 23-24. DISH does not accuse Peloton of infringing claims requiring "live" streaming via [redacted]. *See* Compls. Reply Br. at 24 n.11. Similarly, DISH does not contend that MIRROR's MPEG-DASH system is used for live streaming. *See* Compls. Br. at 94.

56-57); *see also id.* at 12-14, 16 (MIRROR), 18-20 (iFIT). Hence, respondents admit that, except in the case of the Peloton [redacted] and the MIRROR MPEG-DASH product, the accused products are used to stream live classes. I find that the preamble of claim 16, if limiting, is met for all accused products except the Peloton [redacted] and the MIRROR MPEG-DASH.

b) (16a) a processor,

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 444-47.

Respondents argue that "Dr. Negus's statement (and the record) is completely silent as to *how* (or even the fact that) the identified processor and memory for each of the Accused Products perform the required steps." Resps. Br. at 85 (citing RX-0004C (Snoeren RWS) Q/A 313-18) (emphasis in original). However, DISH has adduced evidence showing that the iFIT accused products have "a processor," the accused Peloton products have a "CPU" that is ">1.5Ghz," and the accused MIRROR products have a "Snapdragon 410 (APQ8016) Application Processor." *See* CX-0010C (Negus DWS) at Q/A 444, 448; JX-0080C (Brammer Dep.) at 68:2-21; CX-0472C (RFQ for Peloton Console) at PTON-ITC005760-63; RX-0070 (MIRROR Hardware Diagram).

Respondents' accused products thus satisfy this claim limitation.

c) (16b) a digital processing apparatus memory device comprising non-transitory machine-readable instructions that, when executed, cause the processor to:

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 448.

DISH has adduced evidence showing that the iFIT accused products have "memory," "RAM" and "SD card" storage; the accused Peloton products have "RAM" of "2GB" and "NVRAM" of "16GB"; and the accused MIRROR products have an "LPDDR memory and eMMC

storage." *See* CX-0010C (Negus DWS) at Q/A 444, 448; JX-0080C (Brammer Dep.) at 68:2-21; CX-0472C (RFQ for Peloton Console) at PTON-ITC005760-63; RX-0070 (MIRROR Hardware Diagram).

All of the accused products have executable applications, including the ExoPlayer, containing instructions executed by the processors within respondents' accused products, and those instructions enable the features of the claimed invention as described with respect to each claim limitation below. *See* CX-0010C (Negus DWS) at Q/A 448; JX-0080C (Brammer Dep.) at 68:2-3, 68:8-21; CX-0472C ("Request for Quotation") at 8; CX-0510 (Peloton User Manual); RX-0703C ("Compare Peloton Bike and Bike+"); CX-0183C (Peloton's 8th Supp. Resps.); RX-0070 (MIRROR Hardware Diagram).

Respondents argue that DISH has failed to identify a processor that performs all of the steps recited in claim 16. *See* Resps. Br. at 85-86. Respondents point out that Dr. Negus cited to evidence identifying multiple processors in the accused products, thus demonstrating that DISH is relying on a plurality of processors to perform the claimed steps. *See id*.

DISH argues that there need not be a single identified processor that performs all of the recited claim steps in each instance because this argument contravenes the general rule that "the words 'a' or 'an' in a patent claim carry the meaning of 'one or more.'" Compls. Br. at 84 (quoting *01 Communique Lab., Inc. v. LogMeIn, Inc.*, 687 F.3d 1292, 1297 (Fed. Cir. 2012); CX-0010C (Negus DWS) at Q/A 446-47).

The Federal Circuit has "repeatedly emphasized that an indefinite article 'a' or 'an' in patent parlance carries the meaning of 'one or more' in open-ended claims containing the transitional phrase 'comprising.'" *KCJ Corp. v. Kinetic Concepts, Inc.*, 223 F.3d 1351, 1356 (Fed. Cir. 2000). The exceptions to this rule are "extremely limited: a patentee must 'evince [ ] a clear

intent' to limit 'a' or 'an' to 'one.'" *Baldwin Graphic Sys., Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1342 (Fed. Cir. 2008). Thus, absent a clear intent in the claims themselves, the specification, or the prosecution history, "a processor" is generally interpreted as "one or more processors."

For example, in *Convolve, Inc. v. Compaq Computer Corp.*, the Federal Circuit considered whether a claim to "a processor" executing certain recited steps required all steps to be performed by a single processor. 812 F.3d 1313, 1320-22 (Feb. 10, 2016). The Federal Circuit explained that it has "repeatedly emphasized that an indefinite article 'a' or 'an' in patent parlance carries the meaning of 'one or more' in open-ended claims containing the transitional phrase 'comprising.'" *Id*. at 1321(citations omitted). The court found the specification's disclosure of an embodiment with more than one processor bolstered a conclusion that "a processor" should be construed as "one or more processors." *Id*.

Here, the '554 patent specification provides support that the steps of claim 16 may be performed by a plurality of processors. The specification recites:

> Modules may also be implemented in software for execution by various types of **processors**. An identified module of executable code may, for instance, comprise one or more physical or logical blocks of computer instructions which may, for instance, be organized as an object, procedure, or function. Nevertheless, **the executables of an identified module need not be physically located together**, but may comprise disparate instructions stored in different locations which, when joined logically together, comprise the module and achieve the stated purpose for the module.

JX-0002 ('554 patent) at 5:41-50. The '554 patent thus discloses that modules may be implemented in software for execution by various types of processors and that instructions in modules need not be physically located together, all of which suggests that more than one processor may be used in implementing the different modules. Moreover, respondents have cited

no evidence from the specification or the prosecution history to support their argument that a single processor must perform all the claimed steps. *See Convolve*, 812 F.3d at 1320.

Based on the foregoing, in view of the claim language and specification, "the processor" recited in claim 16 of the '554 patent may refer to more than one processor.

Moreover, regardless of whether the claimed processor can be met by more than one processor, DISH's expert Dr. Negus offered his expert opinion "that *the* processor in each of Respondents' Accused Products satisfies this limitation." CX-0010C (Negus DWS) at Q/A 448 (emphasis added). The only evidence respondents offered in their attempt to contradict that opinion was evidence related to the MIRROR accused products. *See* Resps. Br. at 85-86. Thus, Dr. Negus' opinion is not specifically rebutted for the iFit and Peloton accused products.

With respect to the MIRROR accused products, respondents argue [redacted] *See* Resps. Br. at 86. But evidence that the accused products have specialized subsidiary chips to assist in digital communication in no way contradicts Dr. Negus' opinion. The main processor identified in each accused device still ultimately controls any subsidiary chips and executes instructions from memory that cause the claimed steps to be performed.

I find the accused products have a memory comprising non-transitory machine-readable instructions that, when executed, cause a single processor to perform the steps of the claim.

d) (16c) establish one or more network connections between the end user station and the server, wherein the server is configured to access at least one of a plurality of groups of streamlets;

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 450-62. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 76-86.[21]

e) (16d) wherein the live event 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, 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 live event video;

Respondents argue that "Claim 16 of the '554 Patent requires segmenting of videos ***before*** the individual segments are encoded." Resps. Br. at 77 (emphasis in original). However, no such requirement appears in the claim.

Respondents further argue that the prosecution history of a related application supports a requirement of segmenting a video before encoding segments. But the arguments made in that application were directed to claims that have elements not included in claim 16, such as "a "streamlet module … to segment video … to generate … a plurality of sequential raw streamlets" and an "encoding module … to encode each raw streamlet to generate … a set including an encoded streamlet." RX-0004C (Snoeren RWS) at Q/A 186. The claims at issue here do not

[21] Respondents dispute whether Peloton's [redacted] satisfies the "streamlets" limitation. *See* Resps. Br. at 86. DISH does not accuse Peloton's "[redacted]" of infringing the claims of the '554 patent. *See* Compls. Reply Br. at 24 n.11. Accordingly, respondents' argument is moot with respect to [redacted].

include a "streamlet module" or "raw streamlet." The prosecution history cited by respondents does not limit the invention at issue in claim 16.

Respondents further argue that the accused products do not identify the video streams by their "quality." *See* Resps. Br. at 85. However, respondents' accused products each use three different Variant Streams encoded at three different respective bit rates using a common video codec. *See* CX-0010C (Negus DWS) at Q/A 467-68. As I found above, the terms "low quality stream," "medium quality stream," and "high quality stream" are construed to have their plain and ordinary meanings. *See supra* Sec. VII.B.3. I find the highest bitrate Variant Stream is a "high quality stream," the lowest bitrate Variant Stream is a "low quality stream," and a Variant Stream with an intermediate bitrate is a "medium quality stream." CX-0010C (Negus DWS) at Q/A 467-68; *see also id*. at Q/A 473-79. Each Variant Stream in respondents' accused products is defined by a Media Playlist and comprised of a sequence of Media Segments that constitute a "group of streamlets" for each respective variant. *Id.* at Q/A 467, 468. Additionally, each Variant Stream comprises at least two or more Media Segments. *Id.*; *see also id.* at Q/A 469-71; CX-0836 (RFC 8216).

Respondents contend that "bitrate" and "quality" are different terms and are presumed to have different meanings. *See* Resps. Br. at 80-81 (citing *CAE Screenplates Inc. v. Heinrich Fiedler GmbH & Co. KG*, 224 F.3d 1308, 1317 (Fed. Cir. 2000)). However, there is a known relationship between bitrate and quality. As Dr. Richardson testified, "[W]here the same source file is compressed with the same codec at different bitrates, higher bitrate tends to correspond to higher decoded image quality and lower bitrate tends to correspond to lower image quality." RX-0001C (Richardson DWS) at Q/A 84; *see also id.* at Q/A 81, 353; *cf.* RX-0004C (Snoeren RWS) at Q/A 257. Indeed, at the evidentiary hearing, Dr. Richardson testified that bitrate and quality "are often

related, particularly if the encoding is the same, then as you increase the bitrate, you typically increase the quality." Richardson Tr. 427–428. Dr. Negus testified that in his testing he observed both differing bitrates and differing quality among the relevant Variant Streams. CX-0010C (Negus DWS) at Q/A 473-79. Thus, even granting that the two terms have different meanings, the evidence shows both.

I thus find that the accused products satisfy this limitation.

f) (16e) wherein at least one of the low quality stream, the medium quality stream, and the high quality stream is encoded at a bit rate of no less than 600 kbps; and

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 490-91. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 76-86.

g) (16f) 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 live event video at a different one of the different bitrates;

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 492-93. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 76-86.

h) (16g) 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,

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 494-98.

Respondents contend that the accused products do not select or request by quality. *See* Resps. Br. at 85. However, above I found that each of respondents' accused products streams the video by selecting a specific stream based upon a determination by the end user station to select a higher or lower bitrate version of the streams. *See supra* Sec. IX.A.1.h). Dr. Negus's analysis of the source code shows that ExoPlayer selects a specific one of the available HLS Variant Streams during live streaming based upon multiple determinations that each compare a factor relating to the performance of the network with certain thresholds in order to upshift ("select") a "higher quality one" of the variants ("higher … bitrate version of the streams") when the factor is greater than a first threshold and in order to downshift ("select") a "lower quality one" of the variants ("lower bitrate version of the streams") when the factor is less than a second threshold." CX-0010C (Negus DWS) at Q/A 495.

i) (16h) place a streamlet request to the server over the one or more network connections for the first streamlet of the selected stream;

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 499-503. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 76-86.

j) (16i) receive the requested first streamlet from the server via the one or more network connections; and

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 504. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 76-86.

k) (16j) provide the received first streamlet for playback of the live event video.

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 506-07. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 76-86.

l) Infringement Conclusion

I find that respondents' accused products, with the exception of Peloton's [redacted] and MIRROR's MPEG-DASH system, meet each limitation of claim 16 of the '554 patent, and therefore respondents infringe that claim.

2. Claim 17

a) The end user station of claim 16, wherein the second streamlet of each of the groups of streamlets each has the same second duration and corresponds to the same second portion of the live event video in the low quality stream, the medium quality stream, and the high quality stream, the second streamlet of the low quality stream having the same bitrate as the first streamlet of the low quality stream.

As discussed above, the respondents' accused products, with the exception of Peloton's [redacted] and MIRROR's MPEG-DASH system, satisfy all limitations of independent claim 16.

DISH has adduced evidence showing that each of the accused products satisfies the additional limitation of claim 17. *See* CX-0010C (Negus DWS) at Q/A 509-11. Respondents contend the accused products can be used with recorded content and therefore do not satisfy the "live event" requirement of claim 17. *See* Resps. Br. at 79. However, as I found above, the accused products can be and are used to steam live classes. *See supra* Sec. XI.A.1.a).

With the exception of Peloton's [redacted] and MIRROR's MPEG-DASH system, I find that respondents' accused products meet each limitation of claim 17, and therefore respondents infringe that claim.

3. Claim 20

a) The end user station of claim 16, wherein the first streamlets of the low quality stream, the medium quality stream, and the high quality stream are available before the live event is complete.

As discussed above, the respondents' accused products, with the exception of Peloton's [redacted] and MIRROR's MPEG-DASH system, satisfy all limitations of independent claim 16.

DISH has adduced evidence showing that each of the accused products satisfies the additional limitation of claim 20. *See* CX-0010C (Negus DWS) at Q/A 513-20. Respondents contend the accused products can be used with recorded content and therefore do not satisfy the "live event" requirement of claim 20. *See* Resps. Br. at 79. However, above I found the accused products can be and are used to stream live classes. *See supra* Sec. XI.A.1.a).

With the exception of Peloton's [redacted] and MIRROR's MPEG-DASH system, I find that respondents' accused products meet each limitation of claim 20, and therefore respondents infringe that claim.

B. Domestic Industry (Technical Prong)

DISH contends that the DISH Set-Top Boxes and the Sling TV Apps practice independent claim 16 and dependent claim 17 of the '554 patent. *See* Compls. Br. at 139. Above I found that the Hopper 3 is representative of the DISH Set-Top Boxes after December 2017. *See supra* Sec. VIII.A. I also found, however, that DISH has not established that the Sling Fire App is representative of the Sling TV Apps. *See supra* Sec. VIII.B. The Staff argues that DISH has not

established that the DISH Set-Top Boxes and the Sling Fire App practice claim 16 of the '554 patent because these products lack a display. *See* Staff Br. at 149-57. The Staff further argues that DISH has not established that the Sling Fire App practices claim 16 because it lacks a processor and a memory. *See id.* at 157-60.

1. Claim 16

a) (16pre) An end user station to stream a live event video over a network from a server for playback of the video, the content player device comprising:

Respondents contend that DISH failed to show that the Sling Fire App and the Hopper 3 meet the "live event video" aspect of the preamble. *See* Resps. Br. at 101, 106. However, above I found the preamble of claim 16 is not limiting. *See supra* Sec. VII.B.5.a)(1). Respondents' argument fails for at least that reason.

Even if the preamble were limiting, I find that use of the Sling Fire App and the Hopper 3 meet the "live event video" aspect of the preamble. Dr. Negus's testing of the Sling Fire App and Hopper 3 involved streaming a "live" news or "live" sports program. *See* CX-0010C (Negus DWS) at Q/A 165-79. The record evidence thus demonstrates that use of the DISH Set-Top Boxes and the Sling Fire App satisfies the preamble. *See* CX-0010C (Negus DWS) at Q/A 771-72.

b) (16a) a processor,

There is no dispute that the DISH Set-Top Boxes comprise a processor. Respondents argue, however, that DISH failed to show that the Sling Fire App includes a processor. *See* Resps. Br. at 97. The Staff agrees that the Sling Fire App, which is a software application, does not include a processor. *See* Staff Br. at 157-58.

As discussed in detail s*upra*, Sec. IX.B.1.k), "the technical prong of the domestic industry requirement may still be satisfied if it can be established that [the complainant] or its customers

configure the allegedly covered products in a manner that practices the claims within the United States." *Certain Optoelectronic Devices, Components Thereof, and Prod. Containing Same*, Inv. No. 337-TA-669, ID at 101 (Mar. 12, 2010) (unreviewed).

Based on the evidence and arguments of the parties, I find that DISH established by a preponderance of the evidence that DISH's customers use the invention of claim 16 of the '554 patent when they use the Sling Fire App to stream videos onto their televisions, tablets, smart phones, and computers.

First, DISH presented evidence showing that DISH customers use the Sling Fire App with at least televisions, tablets, and computers. *See* CX-0010C (Negus DWS) at Q/A 669, 671, 684; CX-0002C (Kroonenberg DWS) at Q/A 55; CX-0445C (Sling TV Overview) at 2. All of those devices have processors that, when executing the instructions within the Sling Fire App, perform the steps recited in claim 16. Additionally, DISH adduced evidence of actual usage data, showing that Sling TV customers in fact use the Sling Fire App on devices with processors to view streaming content in the intended manner. *See* CX-0002C (Kroonenberg DWS) at Q/A 23; CX 0007C (Vander Veen DWS) at Q/A 31, 35; CX-0038C; CX-0039C; Mulhern Tr. 593-600; CX-0072C (2020 Market Data) at "Custom" Tab, Rows 78-84.

The Staff argues that DISH's evidence is outdated because it relies on a teardown of an Amazon Fire product from 2014, while the '554 patent did not issue until November 5, 2019. *See* Staff Br. at 157-58. However, the Staff does not contend that a more current Amazon Fire product would lack the claimed processor. *See id.* Indeed, as Dr. Richardson testified, a processor is a necessary component in any computing device, including the Amazon Fire. *See* RX-0001C (Richardson DWS) Q/A 216.

The record evidence thus demonstrates that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* CX-0010C (Negus DWS) at Q/A 774-75.

c) (16b) a digital processing apparatus memory device comprising non-transitory machine-readable instructions that, when executed, cause the processor to:

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 776-78.

There is no dispute that the DISH Set-Top Boxes contain a memory device. Respondents argue, however, that DISH failed to show that the Sling Fire App includes the claimed memory. *See* Resps. Br. at 98. The Staff agrees that the Sling Fire App, which is a software application, does not include a memory device. *See* Staff Br. at 158-60.

For similar reasons to those regarding the claimed "processor," when a viewer uses the Sling Fire App on the Amazon Fire, the combination includes the claimed "digital processing apparatus memory device." As noted above, the technical prong can be satisfied when customers configure a product in a manner that practices a patent claim within the United States. *Optoelectronic Devices*, Inv. No. 337-TA-669, ID at 101.

The Staff further argues that DISH's evidence is outdated because it relies on a teardown of an Amazon Fire product from 2014, while the '554 patent did not issue until November 5, 2019. *See* Staff Br. at 158-60. However, the Staff does not contend that a more current Amazon Fire would lack the claimed memory device. *See id.* Indeed, as Dr. Richardson testified, one of ordinary skill in the art would understand that a "computing environment," such as the Amazon Fire, includes a "memory device." *See* RX-0001C (Richardson DWS) Q/A 353, 379.

The record evidence thus demonstrates that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* CX-0010C (Negus DWS) at Q/A 776-78.

d) (16c) establish one or more network connections between the end user station and the server, wherein the server is configured to access at least one of a plurality of groups of streamlets;

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) Q/A 779-84. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

e) (16d) wherein the live event 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, 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 live event video;

Respondents argue that this limitation requires that the streamlets be first segmented and then encoded, and that DISH has failed to show this for either the Sling Fire App and the Hopper 3. *See* Resps. Br. at 101, 103. However, above I found that claim 16 does not require a video to be segmented before streamlets are encoded. *See supra* Sec. XI.A.1.e).

Respondents further argue that DISH has failed to show: (1) that the DISH Set-Top Boxes and the Sling Fire App identify a video stream by "quality" as opposed to some other characteristic, and (2) that the DISH Set-Top Boxes and the Sling Fire App have a "low quality stream." *See* Resps. Br. at 102, 107. Respondents' arguments refer back to arguments to the effect that respondents' accused products do not meet this limitation. *See id.* The terms "low quality stream," "medium quality stream," and "high quality stream" are construed to have their plain and ordinary meanings. *See supra* Sec. VII.B.3. As I found above, respondents' accused products do in fact identify a video stream by "quality." *See supra* Sec. XI.A.1.h). Dr. Negus's testing identified at least one of a "low quality stream," at least one of a "medium quality stream," and at least one of

a "high quality stream" when operating the Sling Fire App and the Hopper 3. *See* CX-0010C (Negus WS) at Q/A 787-91; CDX-0010C.TEST.162 (CX-0813); CDX-0010C.TEST.164 (CX-0814). Dr. Negus further confirmed this through source code analysis. *See* CX-0010C (Negus DWS) at Q/A 788-91.

Use of the DISH Set-Top Boxes and the Sling Fire App thus satisfies this limitation.

f) (16e) wherein at least one of the low quality stream, the medium quality stream, and the high quality stream is encoded at a bit rate of no less than 600 kbps; and

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) Q/A 794. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

g) (16f) 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 live event video at a different one of the different bitrates;

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 796-97.

Respondents contend that the DISH Set-Top Boxes and the Sling Fire App do not identify a stream for playback by "quality." *See* Resps. Br. at 102, 107. However, I found above those DISH products in fact identify a stream for playback by "quality." *See supra*, Sec. IX.B.1.j); see also CX-0010C (Negus DWS) at Q/A 796, 797. For the same reasons, I find use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation.

[redacted]

h) (16g) 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,

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 799.

As with the previous limitation, respondents contend that the DISH Set-Top Boxes and the Sling Fire App do not identify a stream for playback by "quality." *See* Resps. Br. at 102, 107. However, above I found that respondents' accused products do in fact identify a video stream by "quality." *See supra* Sec. XI.B.1.g). I find use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation.

i) (16h) place a streamlet request to the server over the one or more network connections for the first streamlet of the selected stream;

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 801. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

j) (16i) receive the requested first streamlet from the server via the one or more network connections; and

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 803. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

k) (16j) provide the received first streamlet for playback of the live event video.

Use of the DISH Set-Top Boxes and the Sling Fire App meet this limitation.

Respondents argue that use of the DISH Set-Top Boxes and the Sling Fire App does not meet this limitation for the same reasons as discussed above regarding the '564 patent, namely,

that those products have no display for playback of a video. *See* Resps. Br. at 96-97. However, above I found that DISH customers in fact use the DISH Set-Top Boxes and the Sling Fire App with a display and the combination provides the received first streamlet for playback of the live event video. *See supra* Sec. IX.B.1.k). To the extent that this claim limitation requires a display, I find use of the DISH Set-Top Boxes and the Sling Fire App meet this limitation.

l) Technical Prong Conclusion

I find that each limitation of claim 16 is met at least when DISH's customers use the DISH Set-Top Boxes and the Sling Fire App in their intended and authorized manner, and that DISH has satisfied the technical prong of the domestic industry requirement for claim 16 of the '554 patent.

2. Claim 17

a) The end user station of claim 16, wherein the second streamlet of each of the groups of streamlets each has the same second duration and corresponds to the same second portion of the live event video in the low quality stream, the medium quality stream, and the high quality stream, the second streamlet of the low quality stream having the same bitrate as the first streamlet of the low quality stream.

As discussed above, use of the DISH Set-Top Boxes and the Sling Fire App satisfies all limitations of independent claim 16.

Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies the additional limitation of claim 17. *See* Resps. Br. at 94-108. DISH has adduced evidence showing that each of the DISH Set-Top Boxes and the Sling Fire App comprises a second streamlet of each of the groups of streamlets that each has the same second duration and corresponds to the same second portion of the live event video in the low quality stream, the medium quality stream, and the high quality stream, the second streamlet of the low quality stream

having the same bitrate as the first streamlet of the low quality stream. *See* CX-0010C (Negus DWS) at Q/A 806.

I find that use of the DISH Set-Top Boxes and the Sling Fire App meets each limitation of claim 17. I therefore determine that DISH has satisfied the technical prong of the domestic industry requirement with respect to claim 17.

XII. THE '555 PATENT

A. Infringement

DISH contends that iFit, Peloton, and MIRROR infringe independent claim 10 and dependent claims 11, 14, and 15 of the '555 patent with accused products that implement the HLS Standard (including Peloton's [redacted]) and MPEG-DASH. *See* Compls. Br. at 93. The Staff agrees with DISH that respondents infringe claims 10-11 and 14-15 under the adopted construction for the "quality" terms. *See* Staff Br. at 124-32.

1. Claim 10

a) (10pre) A content player device to stream a video over a network from a server for playback of the video, the content player device comprising:

Respondents contend the preamble of claim 10 of the '555 patent is limiting. *See* Resps. Br. at 52 n.15. The Staff agrees with respondents. *See* Staff Br. at 75-76. No party has explained why any limiting effect of the preamble is relevant to any issue I must decide in this investigation. To the extent such a determination is necessary, I find that the preamble of claim 10 is limiting as it provides antecedent basis for the terms "the content player device," "the video," and "the server." *See Bio-Rad Labs., Inc. v. 10X Genomics Inc.*, 967 F.3d 1353, 1371 (Fed. Cir. 2020).

In any event, respondents' accused products satisfy this preamble. *See* CX-0010C (Negus DWS) at Q/A 542-44. Respondents do not contest that the accused products satisfy the preamble. *See* Resps. Br. at 86-88.

b) (10a) a processor,

Respondents contend that the accused products do not have a processor for the same reasons argued above regarding limitations 16a and 16b of the '554 patent. *See* Resps. Br. at 87. However, above I found that the accused products do include the claimed processor. *See supra* Secs. XI.A.1.b) and c); CX-0010C (Negus DWS) at Q/A 546.

c) (10b) a digital processing apparatus memory device comprising non-transitory machine-readable instructions that, when executed, cause the processor to:

As with the previous limitation, respondents argue that the accused products do not include the claimed processor for the same reasons argued above with respect to limitations 16a and 16b of the '554 patent. *See* Resps. Br. at 87. However, as I found above, the accused products do include the claimed processor. *See supra* Secs. XI.A.1.b) and c); CX-0010C (Negus DWS) at Q/A 546-547. Respondents' accused products meet this limitation.

d) (10c) establish one or more network connections between the client module and the server, wherein the server is configured to access at least one of a plurality of groups of streamlets;

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 548-64.

Respondents only contest this limitation with respect to Peloton's [redacted], arguing that product does not have streamlets as claimed. *See* Resps. Br. at 87. However, Peloton's

[redacted]

[redacted]

[redacted]. *See* CX-0010 (Negus DWS) at Q/A 556-57. While [redacted] CX-0010C (Negus DWS) at Q/A 559; JX-0076C (Shanahan Dep.) 215:25-216:20. The term "streamlet(s)" is construed to mean "any sized portion(s) of the content file." *See supra* VII.B.1. I find that the segments [redacted] are streamlets. Other than the differences between [redacted], the rest of [redacted] "is the same" as the Peloton systems that use HLS. JX-0076C (Shanahan Dep.) 215:25-216:20; CX-0010C (Negus WS) at Q/A 556-63.

e) (10d) 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, wherein each of the low quality stream, the medium quality stream, and the high quality stream comprises a streamlet that encodes the same portion of the video at a different one of the plurality of different bitrates;

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 565-75. Respondents contend that this limitation is not met for the same reasons as argued above regarding limitation 16d of the '554 patent. *See* Resps. Br. at 86-87. However, above I found that respondents' accused products satisfy the corresponding claim limitation of the '554 patent. *See supra* Sec. XI.A.1.e).

f) (10e) wherein at least one of the low quality stream, medium quality stream, and high quality stream is encoded at a bit rate of no less than 600 kbps; and

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 576. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 86-88.

[redacted]

g) (10f) wherein the streamlet encoding the same portion of the video in the low quality stream has an equal playback duration as the streamlet encoding the same portion of the video in the high quality stream;

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 577-78. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 86-88.

h) (10g) select a specific one of the streams based upon a determination by the client module to select a higher or lower bitrate version of the streams,

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 579. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 86-88.

i) (10h) place a streamlet request to the server over the one or more network connections for the selected stream;

Respondents argue that this limitation "requires making a request and receiving 'requested streamlets' and thus requires placing ***one*** request for ***multiple*** files." Resps. Br. at 87 (emphasis in original). However, nothing in the plain language of this limitation requires a single request to be a request for multiple streamlets. *See supra* Sec. VII.B.2; Sec. X.A.1.g). I found above that respondents' accused products place a streamlet request to the server over the one or more network connections for the selected stream. *See supra* Sec. X.A.1.g). I therefore find respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 580-82.

j) (10i) receive the requested streamlets from the server via the one or more network connections; and

As with the limitation above, respondents argue that this limitation receiving multiple streamlets from a single request. However, nothing in the plain language of this limitation requires a single request to be a request for multiple files. *See supra* Sec. VII.B.2; Sec. X.A.1.g). I found

above that respondents' accused products receive streamlets from the server via the one or more network connections. *See supra* Sec. IX.A.1.c). I therefore find respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 583-84.

k) (10j) provide the received streamlets for playback of the video.

Respondents' accused products meet this limitation. *See* CX-0010C (Negus DWS) at Q/A 585. Respondents do not contest that the accused products satisfy this limitation. *See* Resps. Br. at 86-88.

l) Infringement Conclusion

I find that respondents' accused products meet each limitation of claim 10 of the '555 patent, and therefore respondents infringe that claim.

2. Claim 11

a) The content player device of claim 10 wherein each streamlet of the plurality of streamlets in the low quality stream, the medium quality stream, and the high quality stream has a duration that is the same as each other.

As discussed above, the respondents' accused products satisfy all limitations of independent claim 10.

DISH has adduced evidence showing that each of the accused products comprises a media player configured to generate the factor according to the responses to segment requests. *See* CX-0010C (Negus DWS) at Q/A 588-89. Respondents do not contest that the accused products satisfy the additional limitation of claim 11. *See* Resps. Br. at 86-88.

I find that respondents' accused products meet the additional limitation of claim 11, and therefore respondents infringe that claim.

3. Claim 14

a) The content player device of claim 10, wherein the video is a video of a live event.

As discussed above, the respondents' accused products satisfy all limitations of independent claim 10.

DISH has adduced evidence showing that each of the accused products, with the exception of Peloton's [redacted] and MIRROR's MPEG-DASH system,[22] satisfies this limitation. *See* CX-0010C (Negus DWS) at Q/A 590-91. Respondents argue that the accused products "do not infringe claims 14 and 15 of the '555 patent for the same reasons that Respondents do not infringe claims 16, 17, and 20 of the '554 patent," namely, because the accused products are used to stream recorded events. Resps. Br. at 87. However, respondents admit that "[u]sers who elect to become monthly subscribers ('Peloton Members') can receive access to and view 'Live' or 'On Demand' workout classes on a Peloton bike or treadmill," and "the Live classes are released on a schedule made available to Peloton Members." Resps. Br. at 7 (citing RX-0004C (Snoeren RWS) at Q/A 56-57); *see also* 12-14, 16 (MIRROR), 18-20 (iFIT). Hence, respondents admit that, except in the case of the Peloton [redacted] and the MIRROR MPEG DASH product, the accused products are used to stream live classes.

I find that claim 14 is met for all accused products except the Peloton [redacted] and the MIRROR MPEG-DASH. I therefore find respondents infringe claim 14.

[22] All parties agree that the Peloton [redacted]. *See* Compls. Reply Br. at 24 n.11; Resps. Br. at 23-24. DISH does not accuse Peloton of infringing claims requiring "live" streaming via the Peloton [redacted]. *See* Compls. Reply Br. at 24 n.11. Similarly, DISH does not contend that MIRROR's MPEG-DASH system is used for live streaming. *See* Compls. Br. at 94.

4. Claim 15

a) The content player device of claim 14, wherein the streamlets of the low quality stream, the medium quality stream, and the high quality stream are available before the live event is complete.

As discussed above, the respondents' accused products, with the exception of Peloton's [redacted] and MIRROR's MPEG-DASH system, satisfy all limitations of independent claim 14.

DISH has adduced evidence showing that each of the accused products, with the exception of Peloton's [redacted] and MIRROR's MPEG-DASH system, satisfies this limitation. *See* CX-0010C (Negus DWS) at Q/A 592-93. Respondents argue that the accused products "do not infringe claims 14 and 15 of the '555 patent for the same reasons that Respondents do not infringe claims 16, 17, and 20 of the '554 patent," namely, that the accused products are used to stream recorded events. Resps. Br. at 87. However, above I found that, except in the case of the Peloton [redacted] and the MIRROR MPEG-DASH product, the accused products are used to stream live classes. *See supra* Sec. XI.A.1.a).

With the exception of Peloton's [redacted] and MIRROR's MPEG-DASH system, I find that respondents' accused products meet each limitation of claim 15, and therefore respondents infringe that claim.

B. Domestic Industry (Technical Prong)

DISH contends that the DISH Set-Top Boxes and the Sling TV Apps practice independent claim 10 and dependent claims 11 and 14 of the '555 patent. *See* Compls. Br. at 151. Above I found that the Hopper 3 is representative of all DISH Set-Top Boxes after December 2017. *See supra* Sec. VIII.A. I also found, however, that DISH has not established that the Sling Fire App is representative of the Sling TV Apps. *See supra* Sec. VIII.B. The Staff argues that DISH has

not established that the DISH Set-Top Boxes and the Sling Fire App practice claim 10 of the '555 patent because these products lack a display. *See* Staff Br. at 149-57. As discussed further below, the Staff further argues that DISH has not established that the Sling Fire App practices claim 10 because it lacks a processor and a memory. *See id.* at 157-60.

1. Claim 10

a) (10pre) A content player device to stream a video over a network from a server for playback of the video, the content player device comprising:

Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies the preamble. *See* Resps. Br. at 94-108. To the extent the preamble of claim 10 is limiting, I find that use of the DISH Set-Top Boxes and the Sling Fire App satisfies the preamble. *See* CX-0010C (Negus DWS) Q/A 824.

b) (10a) a processor,

There is no dispute that the DISH Set-Top Boxes comprise a processor. Respondents argue, however, that DISH failed to show that the Sling Fire App includes a processor. *See* Resps. Br. at 98. The Staff agrees that the Sling Fire App, which is a software application, does not include a processor. *See* Staff Br. at 157-58.

As discussed in detail s*upra*, Sec. IX.B.1.k), "the technical prong of the domestic industry requirement may still be satisfied if it can be established that [the complainant] or its customers configure the allegedly covered products in a manner that practices the claims within the United States." *Certain Optoelectronic Devices, Components Thereof, and Prod. Containing Same*, Inv. No. 337-TA-669, ID at 101 (Mar. 12, 2010) (unreviewed).

Based on the evidence and arguments of the parties, I find that DISH established by a preponderance of the evidence that DISH's customers use the invention of claim 10 of the '555

patent when they use the Sling Fire App to stream videos onto their televisions, tablets, smart phones, and computers. As I found above, DISH adduced evidence showing that DISH customers use the Sling Fire App with compatible devices that include processors configured to execute instructions corresponding to the steps recited in claim 10. *See supra* XI.B.1.b) (citing CX-0010C (Negus DWS) at Q/A 669, 671, 684; CX-0002C (Kroonenberg DWS) at Q/A 55; CX-0445C (Sling TV Overview) at 2). Moreover, DISH adduced evidence of actual usage data demonstrating that Sling TV customers in fact use the Sling Fire App on devices with processors. *See id.* (citing CX-0002C (Kroonenberg DWS) at Q/A 23; CX 0007C (Vander Veen DWS) at Q/A 31, 35; CX-0038C; CX-0039C; Mulhern Tr. 593-600; CX-0072C (2020 Market Data) at "Custom" Tab, Rows 78-84).

The Staff argues that DISH's evidence is outdated because it relies on a teardown from 2014, while the '555 patent did not issue until November 5, 2019. *See* Staff Br. at 157-58. However, the Staff does not contend that a more current Amazon Fire would lack the claimed processor. *See id.* Indeed, as Dr. Richardson testified, a processor is a necessary component in any computing device, including the Amazon Fire. *See* RX-0001C (Richardson DWS) at Q/A 216.

The record evidence thus demonstrates that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* CX-0010C (Negus DWS) at Q/A 825.

c) (10b) a digital processing apparatus memory device comprising non-transitory machine-readable instructions that, when executed, cause the processor to:

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 776-78.

There is no dispute that the DISH Set-Top Boxes contain a memory device. Respondents argue, however, that DISH failed to show that the Sling Fire App includes the claimed memory. *See* Resps. Br. at 98. The Staff agrees that the Sling Fire App, which is a software application, does not include a memory device. *See* Staff Br. at 158-60.

For similar reasons to those regarding the claimed "processor," when a viewer uses the Sling Fire App on the Amazon Fire, the combination includes the claimed "digital processing apparatus memory device." As noted above, the technical prong can be satisfied when customers configure a product in a manner that practices a patent claim within the United States. *Optoelectronic Devices*, Inv. No. 337-TA-669, ID at 101.

The Staff further argues that DISH's evidence is outdated because it relies on a teardown from 2014, while the '555 patent did not issue until November 5, 2019. *See* Staff Br. at 158-60. However, the Staff does not contend that a more current Amazon Fire would lack the claimed memory device. *See id.* Indeed, as Dr. Richardson testified, one of ordinary skill in the art would understand that a "computing environment," such as the Amazon Fire, includes a "memory device." *See* RX-0001C (Richardson DWS) at Q/A 353, 379.

The record evidence thus demonstrates that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* CX-0010C (Negus DWS) at Q/A 826.

d) (10c) establish one or more network connections between the client module and the server, wherein the server is configured to access at least one of a plurality of groups of streamlets;

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) Q/A 827-29. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

[redacted]

e) (10d) 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, wherein each of the low quality stream, the medium quality stream, and the high quality stream comprises a streamlet that encodes the same portion of the video at a different one of the plurality of different bitrates;

Respondents argue that this limitation requires that the streamlets be first segmented and then encoded, and that DISH has failed to show this for either the Sling Fire App or the Hopper 3. *See* Resps. Br. at 103, 107. However, above I found that claim 10 does not require a video to be segmented before streamlets are encoded. *See supra* Sec. XII.A.1.e).

Respondents further argue that DISH has failed to show that the DISH Set-Top Boxes and the Sling Fire App have a "low quality stream" for the same reasons that respondents' accused products do not meet this limitation. *See* Resps. Br. at 105, 108. The terms "low quality stream," "medium quality stream," and "high quality stream" are construed to have their plain and ordinary meanings. *See supra* Sec. VII.B.3. As I found above, respondents' accused products do in fact identify a video stream by "quality." *See supra* Sec. XI.A.1.h). Dr. Negus's testing identified at least one of a "low quality stream," at least one of a "medium quality stream," and at least one of a "high quality stream" when operating the Sling Fire App and the Hopper 3. *See* CX-0010C (Negus WS) at Q/A 787-91, 831; CDX-0010C.TEST.162 (CX-0813); CDX-0010C.TEST.164 (CX-0814). Dr. Negus further confirmed this through source code analysis. *See* CX-0010C (Negus DWS) at Q/A 788-91, 831.

Use of the DISH Set-Top Boxes and the Sling Fire App thus satisfies this limitation.

f) (10e) wherein at least one of the low quality stream, medium quality stream, and high quality stream is encoded at a bit rate of no less than 600 kbps; and

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 833. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

g) (10f) wherein the streamlet encoding the same portion of the video in the low quality stream has an equal playback duration as the streamlet encoding the same portion of the video in the high quality stream;

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 835. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

h) (10g) select a specific one of the streams based upon a determination by the client module to select a higher or lower bitrate version of the streams,

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) Q/A 837-38. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

i) (10h) place a streamlet request to the server over the one or more network connections for the selected stream;

As an initial matter, the term "place a streamlet request to the server over the one or more network connections for the selected stream; receive the requested streamlets from the server via the one or more network connections" is construed to have its plain and ordinary meaning (*e.g.*, request a plurality of streamlets over the one or more network connections for the selected stream; and receive the requested streamlets from the server via the one or more network connections)." *See supra* Sec. VII.B.2.

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 839-40. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

j) (10i) receive the requested streamlets from the server via the one or more network connections; and

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation. *See* CX-0010C (Negus DWS) at Q/A 841-42. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

k) (10j) provide the received streamlets for playback of the video.

Use of the DISH Set-Top Boxes and the Sling Fire App meets this limitation.

Respondents argue that use of the DISH Set-Top Boxes and the Sling Fire App does not meet this limitation for the same reasons as discussed above regarding the '564 patent, namely, that those products have no display for playback of a video. *See* Resps. Br. at 97. However, above I found that DISH customers in fact use the DISH Set-Top Boxes and the Sling Fire App with a display and the combination provides the received streamlets for playback of the video. *See supra* Sec. IX.B.1.k). To the extent that this claim limitation requires a display, I find use of the DISH Set-Top Boxes and the Sling Fire App meet this limitation.

l) Technical Prong Conclusion

I find that each limitation of claim 10 is met at least when DISH's customers use the DISH Set-Top Boxes and the Sling Fire App in their intended and authorized manner, and that DISH has satisfied the technical prong of the domestic industry requirement for claim 10 of the '555 patent.

2. Claim 11

a) The content player device of claim 10 wherein each streamlet of the plurality of streamlets in the low quality stream, the medium quality stream, and the high quality stream has a duration that is the same as each other.

As discussed above, use of the DISH Set-Top Boxes and the Sling Fire App satisfies all limitations of independent claim 10.

DISH has adduced evidence showing that each streamlet of the plurality of streamlets in the low quality stream, the medium quality stream, and the high quality stream has a duration that is the same as each other. *See* CX-0010C (Negus DWS) at Q/A 846-47. Respondents do not contest that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* Resps. Br. at 94-108.

I find that use of the DISH Set-Top Boxes and the Sling Fire App meets each limitation of claim 11. I therefore determine that DISH has satisfied the technical prong of the domestic industry requirement with respect to claim 11.

3. Claim 14

a) The content player device of claim 10, wherein the video is a video of a live event.

As discussed above, use of the DISH Set-Top Boxes and the Sling Fire App satisfies all limitations of independent claim 10.

DISH has adduced evidence showing the streaming of a live event video. *See* CX-0010C (Negus DWS) at Q/A 849. Respondents argue that DISH failed to show that use of the Sling Fire App and the Hopper 3 meets the "live event video" limitation for the same reasons as argued regarding the respondents' accused products. *See* Resps. Br. at 103, 108. However, above I found

that respondents' accused products meet the "live event video" limitation. *See supra* Sec. XI.A.1.a).

The record evidence further demonstrates that use of the DISH Set-Top Boxes and the Sling Fire App satisfies this limitation. *See* CX-0010C (Negus DWS) at Q/A 849. Dr. Negus's testing of the Sling Fire App and Hopper 3 involved streaming a "live" news or "live" sports program. *See id*.

I find that use of the DISH Set-Top Boxes and the Sling Fire App meets each limitation of claim 14. I therefore determine that DISH has satisfied the technical prong of the domestic industry requirement with respect to claim 14.

XIII. INDIRECT INFRINGEMENT

DISH contends that respondents have induced their customers to infringe the asserted patents. *See* Compls. Br. at 115-16. For induced infringement, the complainant must show that the defendant knew of the patent and that the induced acts constituted patent infringement. *Commil USA, LLC v. Cisco Sys., Inc.*, 575 U.S. 632, 638-39 (2015). Induced infringement requires a finding that the infringer possessed a specific intent to encourage another's infringement. *i4i Ltd. Partnership v. Microsoft Corp.*, 598 F.3d 831, 851 (Fed. Cir. 2010), *aff'd*, 564 U.S. 91 (2011).

A. Knowledge of the Patent

DISH contends that respondents have each had knowledge of the asserted patents "[s]ince the May 13, 2021 institution of this Investigation." Compls. Br. at 115. The Commission has held that service of a section 337 complaint is sufficient to satisfy the knowledge requirement for indirect infringement after the date of service. *Certain Beverage Brewing Capsules, Components Thereof, and Products Containing the Same*, Inv. No. 337-TA-929, Comm'n Op. at 19 (Apr. 5, 2016). Respondents do not contest that they were served with the complaint. *See* Resps. Br. at

87. The record shows that respondents continued to infringe after obtaining knowledge of the asserted patents. *See* Peloton Importation, Sale, and Inventory Stipulation, EDIS Doc. ID 758953; iFIT Importation, Sale, and Inventory Stipulation, EDIS Doc. ID 758184; and MIRROR Importation, Sale, and Inventory Stipulation, EDIS Doc. ID 756162; CX-0098C (Peloton Sales).

B. Inducement

Respondents argue that DISH has not offered any evidence to support its induced infringement claim. *See id.* However, DISH adduced evidence showing that respondents induced their customers' direct infringement by supplying them with the accused products and instructing them to use the accused products in an infringing manner. CX-0501 (NordicTrack Manual instructing users to stream videos on the device) at 24; CX-0839 (NordicTrack Manual instructing users to stream videos on the device) at 23-24; CX-0510 (Peloton Bike User Manual instructing users to stream videos on the device) at 15; RX-0094 (Peloton Product Manuals instructing users to stream videos on the device) at 16; RX-0050 (MIRROR webpage instructing users to stream videos on the device); RX-0040 (MIRROR webpage instructing users to stream videos on the device) at 5. DISH further adduced evidence showing that respondents induced infringement by soliciting customers, encouraging and guiding their infringing use, and servicing the infringing products for customers. RX-0684 (MIRROR webpage listing device for sale and offering "unlimited live and on-demand workouts risk-free for 30 days") at 31; RX-0033 (iFit webpage offering "Free Trial" and for customers to "Use our equipment") at 10; RX-0664 (noting "iFit's commitment to delivering personalized connected health and fitness experiences to its growing community"); RX-0703 ("Compare the Peloton Bike and Bike+"); RX-0077 (Peloton Financing Plans for Customers); RX-0078 (Peloton Story) ("Our library of classes … keep[s] you coming

back"); RX-0095 (Peloton Membership); RX-0096 (Shop the Original Peloton Bike) ("All-Access Membership is required with all Bike packages").

Respondents further argue that there can be no liability for indirect infringement because DISH has failed to prove direct infringement. Resps. Br. at 88. However, as determined above, respondents' accused products infringe asserted claims of each of the asserted patents. *See supra* Secs. IX.A, X.A, XI.A, XII.A. In view of the evidence presented by DISH, coupled with evidence of ongoing sales of the accused products post-dating service of the complaint,[23] DISH has met its burden of showing that respondents induced infringement of the asserted claims.

XIV. VALIDITY

A. Priority Date

Respondents argue that claims 16, 17 and 20 of the '554 patent and claims 14 and 15 of the '555 patent cannot claim priority to the April 30, 2004, filing date of U.S. Application No. 60/566,831 ("the '831 Application") because the "live event" aspect of the invention in those claims is not sufficiently described and enabled in the '831 Application. *See* Resps. Br. at 108. DISH contends that the '831 Application describes and enables the asserted claims. *See* Compls. Br. at 167-70.

The '831 Application is the provisional application to which all the asserted patents claim priority. *See supra* Sec. I.D. While respondents concede that the '831 Application refers to "live" video, they nevertheless argue that "there is no description of how live video transfer could be

[23] *See* Peloton Importation, Sale, and Inventory Stipulation, EDIS Doc. ID 758953; iFIT Importation, Sale, and Inventory Stipulation, EDIS Doc. ID 758184; and MIRROR Importation, Sale, and Inventory Stipulation, EDIS Doc. ID 756162; CX-0098C (Peloton Sales).

done using the system described in the specification such that a [person of ordinary skill in the art] would understand the inventors to actually possess the invention." Resps. Br. at 108.

The '831 Application recites:

> [0007] In the depicted embodiment, the system 100 also includes a publisher 110, and a web server 116. The publisher 110 may be a creator or distributor of content. For example, if the content to be streamed were a broadcast of a television program, the publisher may be a television or cable network channel such as NBC®, or MTV®. Content may be transferred over the internet 106 to the content server 102, where the content is received by a content module 112. The content module 112 may be configured to receive, process, and store content. In one embodiment, processed content is accessed by a client module 114 configured to play the content on the end user station 104. In a further embodiment, the client module 114 is configured to receive different portions of a content stream from a plurality of locations simultaneously. For example, the client module 114 may request and receive content from any of the plurality of web servers 116.
>
> [0008] Figure 2a is a schematic block diagram graphically illustrating one embodiment of a content file 200. In one embodiment, the content file 200 is distributed by the publisher 110. **The content file 200 may comprise a television broadcast, sports event, movie, music, concert, etc**. **The content file 200 may also be live or archived content**. The content file 200 may comprise uncompressed video and audio, or alternatively, video or audio. Additionally, the content file 200 may be compressed. Examples of a compressed content file 200 include, but are not limited to, DivX®, Windows Media Video 9®, Quicktime 6.5 Sorenson 3®, or Quicktime 6.5/MPEG-4® encoded content.

JX-0029 ('831 Application), ¶¶ [0007-08] (emphasis added). As shown in the above-recited paragraphs, the '831 Application expressly discloses that the "content file 200" may be a "live" event. The '831 Application further describes methods of streaming content in more detail:

> [0026] Figure 5 is a schematic flow chart diagram illustrating one embodiment of a method 500 for processing content in accordance with the present invention. In one embodiment the method 500 starts 502, and the content module 112 receives 504 content from the publisher 110. Receiving content 504 may comprise receiving 504 a digital copy of the content file 200, or digitizing a physical copy of the content file 200. Alternatively, **receiving 504 content may comprise capturing a radio or television broadcast**. Once received 504, the stream module 302 generates 506 a plurality of streams 202, each stream 202 having a different quality. The quality may be predefined, or automatically set according to end user bandwidth, or in response to pre-designated publisher guidelines

[redacted]

> [0027] The streamlet module 304 receives the streams 202 and generates 508 a plurality of streamlets 212. In one embodiment, **generating 508 streamlets comprises dividing the stream 202 into a plurality of two second streamlets 212**. Alternatively, the streamlets may have any length less than or equal to the length of the stream 202. **The encoder module 306 then encodes 510 the streamlets according to a compression algorithm**. In a further embodiment, the algorithm comprises a proprietary codec such as WMV9®. The encoder module 306 then stores 512 the encoded streamlets in the streamlet database 308. Once stored 512, the web server 116 may then serve 514 the streamlets. In one embodiment, serving 514 the streamlets comprises receiving streamlet requests from the client module 114, retrieving the requested streamlet from the streamlet database 308, and subsequently transmitting the streamlet to the client module 114. The method 500 then ends 516.

Id., ¶¶ [0026-27] (emphasis added). As can be seen, the '831 Application teaches that live video streaming may be performed by dividing a content stream into streamlets, for example streamlets of two seconds in length, and then encoding the streamlets at multiple bitrates. *See id.*, ¶ [0027]. A person of skill in the art would understand from these teachings how to make a stream of a live event available to a viewer before the live event is complete. *See* CX-0008C (Jeffay RWS) Q/A 36.

Respondents argue that "all the disclosure of how 'live' video could be handled was added in a continuation-in-part application [U.S. Pat. Application No. 11/673,483], filed February 9, 2007." Resps. Br. at 109 (citing RX-0001C (Richardson DWS) at Q/A 77). However, as explained above, the '831 Application teaches the creation and encoding of two-second streamlets that enable and describe the claimed subject matter. As Dr. Jeffay testified, the additional disclosure in CIP specification relates to specific improvements that use two-pass or multi-pass encoding with parallel encoders. *See* CX-0008C (Jeffay RWS) at Q/A 35.

Respondents have failed to show by clear and convincing evidence that the asserted "live event" claims are not entitled to the priority date of the '831 Application.[24]

B. Validity Under 35 U.S.C. §§ 102 and 103

1. Anticipation – Carmel

Respondents contend that U.S. Patent No. 6,389,473 to Carmel anticipates each of the asserted claims. *See* Resps. Br. at 114-55. Carmel was filed on March 24, 1999, and therefore qualifies as prior art to the asserted patents. *See* RX-0221 (Carmel). The Staff agrees with respondents that Carmel anticipates each asserted claim. *See* Staff Br. at 170-90. For the reasons below, I find that respondents have not shown by clear and convincing evidence that Carmel anticipates any of the asserted claims because each independent claim requires a "request" that Carmel does not disclose.

a) Request Limitations – '564 Patent Limitation 1g; '156 Patent Limitation 1f; '554 Patent Limitations 16h-16i; '555 Patent Limitations 10h-10i

Respondents have not shown by clear and convincing evidence that Carmel discloses the "request" limitations of the asserted claims.

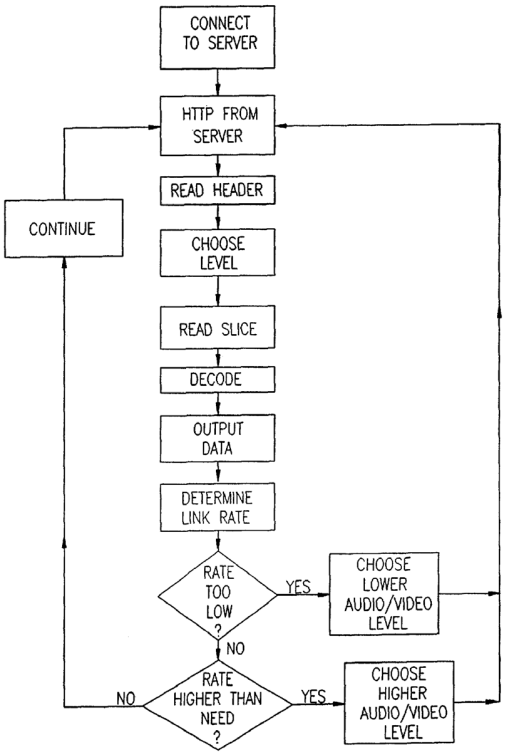
(1) '564 Patent Limitation 1g

Claim 1 of the '564 patent recites, in part, "automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback

[24] Respondents further contend that DISH's position on priority is incompatible with DISH's position on inventorship. *See* Resps. Br. at 109. That argument will be addressed with respondents' inventorship challenge. See infra Sec. XIV.D.

quality to a higher or lower quality one of the different copies." JX-0001 ('564 patent) at claim 1 (referred to above as limitation 1g of the '564 patent).

Regarding this limitation of claim 1, respondents argue that Carmel's Figure 6B illustrates automatic, repeated requests by a client for slices of video content. *See* Resps. Br. at 129 (citing RX-0001C (Richardson DWS) at Q/A 192-93). Respondents also contend that in columns 10 and 11 Carmel discloses a client 30 "periodically assessing data transfer rate and requesting portions (slices) from one of a plurality of copies (quality levels)." *Id*. (citing RX-0221 (Carmel) at 10:36-54, 11:9-22). Figure 6B of Carmel is reproduced below:



RX-0221 (Carmel) at. Fig. 6B.

Regarding Figure 6B, Carmel recites:

> FIG. 6B is a flow chart illustrating the operation of clients 30 in downloading and playing back multi-level data stream 41 (FIG. 3D) transmitted

[redacted]

> from server 36, in accordance with another preferred embodiment of the present invention. As in the method of FIG. 6A, each client 30 connects to the server, generally using a single HTTP link. After reading header 43 and, preferably, making an initial assessment of the link bandwidth, **the client selects one of the available quality levels in the stream**. Responsive to the selection, **server 36 begins to transmit data slices at the chosen quality level**. The slices are received, decoded and output by the client.
>
> Periodically, **client 30** makes an assessment of the rate of data transfer over the link from the server and, if necessary, **changes the quality level** accordingly.

Id. at. 10:64-11:11 (emphasis added).

As can be seen above, Carmel discloses that the client "selects one of the available quality levels"; Carmel does not disclose a client "requesting portions (slices) from one of a plurality of copies (quality levels)" as respondents contend. *Compare id*. *with* Resps. Br. at 129. More importantly, Carmel does not disclose a request for "one of the files" or streamlets on the server, as limitation 1g requires. *See, e.g.*, RX-0221 (Carmel) at 9:6-10, 10:64-11:22, Fig. 6B. As respondents' expert Dr. Richardson was forced to concede upon cross-examination, merely selecting "one of the available quality levels," as Carmel discloses, is not a request for a specific file. Richardson Tr. 385-386. DISH's expert Dr. Jeffay confirmed that the client in Carmel is limited to selecting a quality level rather than requesting individual files. *See* CX-0008C (Jeffay RWS) at Q/A 111.

Respondents further argue that Carmel describes client 30 using HTTP to download the video sequence, which "typically" entails requesting data located at a Uniform Resource Locator. *See* Resps. Br. at 129-30 (citing RX-0001C (Richardson DWS) at Q/A 192-93). However, Dr. Jeffay testified that Carmel's system could be implemented using HTTP "chunked transfer encoding" by pushing the slices to the client without the client requesting individual portions or slices of the video. Jeffay Tr. 639–640; CX-0008C (Jeffay RWS) at Q/A 111. In any event,

anticipation requires every limitation is "'necessarily present,' not merely probably or possibly present, in the prior art." *Trintec Indus., Inc. v. Top-U.S.A. Corp*., 295 F.3d 1292, 1295 (Fed. Cir. 2002). It requires "strict identity." *Id*. That standard is not met by hypothesizing that HTTP would "typically" be used to send a request for a file in Carmel. Also, Carmel itself gives reason to doubt Dr. Richardson's hypothesis that a client could request a file from a server. Figure 6B of Carmel recites "HTTP ***FROM*** SERVER." RX-0221 (Carmel) at. Fig. 6B (emphasis added). Nothing in the decision flow in Figure 6B shows a request from the client ***to*** the server.

Respondents further argue that claims 11 and 12 of Carmel disclose a request for a file. *See* Resps. Br. at 130. As an initial matter, claim 12 depends on claim 11, which depends on claim 2, which depends on claim 1. The relevant claims read:

> 1. A method for real-time broadcasting from a transmitting computer to one or more client computers over a network, comprising:
>
> providing at the transmitting computer a data stream having a given data rate;
>
> dividing the stream into a sequence of slices, each slice having a predetermined data size associated therewith;
>
> encoding the slices in a corresponding sequence of files, each file having a respective index; and
>
> uploading the sequence to a server at an upload rate generally equal to the data rate of the stream, such that the one or more client computers can download the sequence over the network from the server at a download rate generally equal to the data rate.
>
> 2. A method according to claim 1, and comprising downloading the sequence using an Internet protocol over the network from the server to the one or more client computers.
>
> 11. A method according to claim 2, wherein encoding the slices comprises encoding slices at a plurality of different quality levels, such that the files corresponding to a given one of the slices have a different, respective data size for each of the quality levels.

> 12. A method according to claim 11, wherein downloading the sequence comprises determining a data bandwidth of the network between the server and the client computer and selecting one of the quality levels responsive to the determined bandwidth.

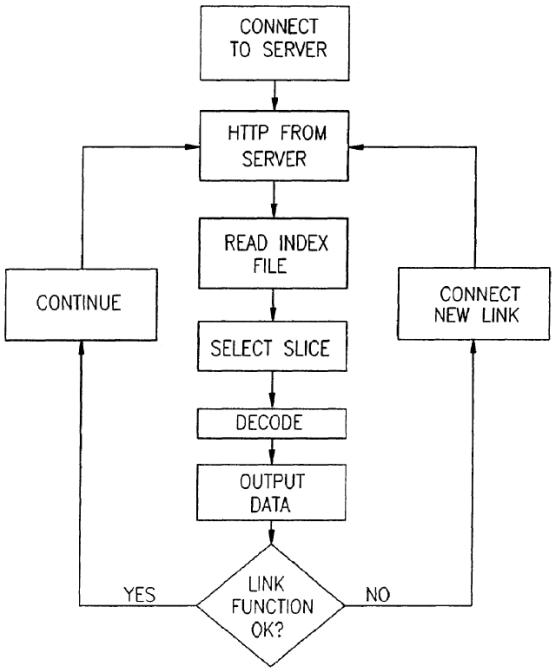
As can be seen, claims 1, 2, 11, and 12 do not disclose that the client requests a specific file. Claim 1 recites that the transmitting computer "upload[s] the sequence to a server at an upload rate generally equal to the data rate of the stream," and the "one or more client computers can download the sequence over the network from the server at a download rate generally equal to the data rate." On its face, claim 1 does not disclose more than the general concept of dividing the stream into a sequence of slices to be stored on a server for the client to download.

Claim 2 of Carmel, which depends on claim 1, discloses using an Internet protocol for downloading the sequence of slices, but does not disclose any request from the client to the server for a particular file. Claim 11, dependent on claim 2, discloses encoding the slices at a plurality of different quality levels, producing a separate encoded file corresponding to each encoded slice, and uploading the files to the server. Claim 12 depends on claim 11, and recites, in part, "wherein downloading the sequence comprises determining a data bandwidth of the network between the server and the client computer and **selecting one of the quality levels** responsive to the determined bandwidth." *Id.* at claim 12 (emphasis added). Thus, consistent with Carmel's disclosure regarding Figure 6B, Carmel's method of claim 12 clearly differs from the system of claim 1 of the '564 patent, where the client "request[s] for each such portion one of the files from one of the copies" stored on the server rather than merely "select[s] one of the quality levels."

The Staff agrees with respondents that Carmel invalidates the asserted claims, and argues that Carmel's Figure 6B discloses this element, relying in part on disclosure in Carmel regarding Figure 6A. *See* Staff Br. at 177-79.

[redacted]

The dispute here centers on whether or not Carmel discloses combining Figure 6A with Figure 6B. As shown below, Figure 6A discloses that the client selects an appropriate starting slice after reading the index file:



RX-0221 (Carmel) at Fig. 6A. Regarding Figure 6A, Carmel recites:

> Each client 30 connects to server 36, optionally using multiple HTTP links, in a manner similar to that shown and described above with reference to FIG. 4. Typically, client 30 opens one or two HTTP links, over which files 42, 44, 46, etc., are downloaded in successive alternation, but as in the case of transmitting computer 34, a greater number of links may similarly be opened. The client first reads index file 50 (FIG. 3B), and graphic 56 (FIG. 3C) is displayed by the client, so that **a user can decide and indicate at which slice of data stream 40 to begin downloading. Responsive to a user input, client 30 selects an appropriate starting slice and begins to download and decode (decompress) files 42, 44, 46, etc**. In the case of a multimedia stream, client 30 reconstructs and outputs the multimedia data for the appreciation of a user. Time stamps in the data stream are used to synchronize the data, so that the multimedia sequence is played back just as it was input at computer 34, preferably with only a minimal necessary transmission and decoding delay.

Id. at 10:35-54 (emphasis added). Respondents and the Staff rely on this disclosure to demonstrate that Carmel discloses "automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies." *See* Resps. Br. at 129; Staff Br. at 178. But this passage expressly states that the selection described is "[r]esponsive to user input"; it does not happen "automatically," as the claim requires.

Additionally, while this passage of Carmel discloses that the client "selects an appropriate ***starting*** slice," Carmel does not disclose "subsequent" requests for files corresponding to "***each*** such portion" of the video. RX-0221 (Carmel) at 10:46 (emphasis added); JX-0001 ('564 patent) at claim 1 (emphasis added). All of those elements are necessary to anticipate claim 1 of the '564 patent.

Staff argues that the combination of Figures 6A and 6B would result in the claimed system where the client selects a specific slice according to the bandwidth limitations between the client and the server. *See* Staff Br. at 178-79. Yet "anticipation is not proven by multiple, distinct teachings that the artisan might somehow combine to achieve the claimed invention." *Microsoft Corp. v. Biscotti, Inc.*, 878 F.3d 1052, 1069 (Fed. Cir. 2017). Anticipation requires "every element of the claimed invention arranged as in the claim." *Id*. Moreover, even if the figures of Carmel could be combined, Carmel would still fail to disclose any subsequent request after that of the initial selection of the starting slice.

Respondents have not shown by clear and convincing evidence that Carmel anticipates claim 1 of the '564 patent.

(2) '156 Patent Limitations 1f and Claim 4

Claim 1 of the '156 patent recites, in part, "requesting sequential streamlets of one of the copies from the video server according to the playback times of the streamlets by transmitting

hypertext transport protocol (HTTP) GET requests that identify the selected streamlets stored by the video server." JX-0004 ('156 patent) at claim 1 (referred to above as element 1f of the '156 patent). Respondents argue, "Carmel discloses 1[a][6][i] for the same reason it discloses 1[b][5][i] of the '564 patent." Resps. Br. at 140. As I found above, Carmel does not disclose 1[b][5][i] of the '564 patent. Respondents further argue that use of HTTP "typically" entails HTTP GET requests. *See id.* at 140-41. However, as discussed above, such arguments do not meet the strict standard for anticipation.

The Staff argues that Carmel discloses this limitation based on Figure 6A. *See* Staff Br. at 180. However, as noted above, there is no single teaching or disclosure in Carmel that clearly discloses the claimed invention "without any need for picking, choosing, and combining various disclosures not directly related to each other." *Application of Arkley*, 455 F.2d 586, 587 (C.C.P.A. 1972).

The Staff further argues that Carmel discloses the HTTP GET request portion of the limitation because the HTTP protocol disclosed in Carmel supported GET requests and using another method would have required special-purpose software. *See* Staff Br. at 180-81. However, given Carmel's admitted lack of an express disclosure regarding HTTP GET requests, *see* Staff Br. at 181, it is the Staff's burden to show that HTTP GET requests are "necessarily present in the thing described in the reference," *Continental Can Co. USA v. Monsanto Co.*, 948 F.2d 1264, 1268, 1269 (Fed. Cir. 1991). As discussed above, DISH has adduced evidence that such HTTP GET requests were not "necessarily present" in Carmel's method.

Respondents have not shown by clear and convincing evidence that Carmel anticipates claim 1 of the '156 patent.

Claim 4 of the ’156 patent recites, in part, “wherein the requesting the sequential streamlets comprises the apparatus transmitting hypertext transport protocol (HTTP) GET requests for selected streamlets, wherein each of the HTTP GET requests identifies the separate file stored by the video server that corresponds to the requested streamlet.” JX-0004 (’156 patent) at claim 4. For similar reasons, Carmel does not anticipate either limitation of claim 4 of the ’156 patent.

(3) ’554 Patent Limitations 16h-16i

Claim 16 of the ’554 patent recites, in part, “place a streamlet request to the server over the one or more network connections for the first streamlet of the selected stream; receive the requested streamlets from the server via the one or more network connections.” JX-0002 (’554 patent) at claim 16 (referred to above as elements 16h and 16i of the ’554 patent). Respondents argue that “Carmel discloses encoding individual slices and storing them onto a server where they are requested through HTTP GET requests before being received at the clients, one individual encoded slice file at a time, pursuant to the repeated HTTP requests.” Resps. Br. at 152 (citing RX-0001C (Richardson DWS) at Q/A 218). However, above I found that Carmel does not disclose that the individual slices are requested through HTTP GET requests. Carmel does not anticipate claim 16 of the ’554 patent.

(4) ’555 Patent Limitations 10h-10i

Claim 10 of the ’555 patent similarly recites, in part, “place a streamlet request to the server over the one or more network connections for the selected stream; receive the requested streamlets from the server via the one or more network connections.” JX-0003 (’555 patent) at claim 10 (referred to above as elements 10h and 10i of the ’555 patent). To meet their burden with respect to this limitation, respondents refer back to argument regarding the similar limitation in the ’554 patent. *See* Resps Br. at 155.

I find Carmel does not disclose processor instructions to "place a streamlet request" for the same reasons that Carmel does not disclose requesting a file, as discussed above. Respondents have not shown clear and convincing evidence that Carmel anticipates claim 10 of the '555 patent.

b) Video Server Limitation – '564 Patent Limitation 1b

The parties dispute whether claim 11 of Carmel discloses that "multiple different copies of the video encoded at different bit rates are stored on the video server as multiple sets of files," as required by element 1b in claim 1 of the '564 patent. *See* Resps. Br. at 116-21; Compls. Br. at 189-91. For the reasons below, I find that it does.

Claim 11 of Carmel recites, "A method according to claim 2, wherein encoding the slices comprises encoding slices at a plurality of different quality levels, such that the files corresponding to a given one of the slices have a different, respective data size for each of the quality levels." RX-0221 (Carmel) at claim 11.

DISH argues that claim 11 is directed to an embodiment of Carmel which does not disclose storing different copies of a video encoded as multiple sets of files on a server. *See* Compls. Br. at 190 (citing CX-0008C (Jeffay RWS) at Q/A 104). However, claim 1 of Carmel recites, in part, "uploading the sequence to a server at an upload rate generally equal to the data rate of the stream, such that the one or more client computers can download the sequence over the network from the server at a download rate generally equal to the data rate." RX-0221 (Carmel) at claim 1. Uploading the sequence such that one or more client computers could download the sequence necessarily requires storing different copies of the video encoded as multiple sets of files on a server. *See* RX-0001C (Richardson DWS) at Q/A 180. Claim 11 specifically discloses plural files being created for each slice. *See id.* at Q/A 155. Each of the plural files has a data size for each of the quality levels. *Id.*

Carmel thus discloses the limitation, "wherein multiple different copies of the video encoded at different bit rates are stored on the video server as multiple sets of files," in claim 1 of the '564 patent.

c) Contiguously Available Files Stored Limitation – '564 Patent Claim 5

The parties dispute whether Carmel discloses the "amount of contiguously available files stored" limitation in claim 5 of the '564 patent. *See* Resps. Br. at 136-39; Compls. Br. at 192. For the reasons below, I find that it does not.

Respondents' argument is built around a contention that "a buffer at the input to the media player is implicit" in Carmel "otherwise the media player would stall whenever there was the slightest variation in transfer rate." *See* Resps. Br. at 136-37 (citing RX-0001C (Richardson DWS) at Q/A 202). Respondents note that Carmel teaches that if the current data transfer rate "is substantially higher than what is needed to receive the successive slices [of content] on time, the client may select a higher quality level to take advantage of the available bandwidth." RX-0221 at col. 11. Respondents also point out that Carmel teaches the duration of a content slice is "typically between 1 and 5 sec." *Id*. Stitching these teachings together, respondents reason that if slice durations are relatively short (1 to 5 seconds) and available bandwidth for transfer is high, Carmel's client "would naturally build up a number of contiguous slices waiting to be decoded" in an input buffer that would be inherently present. *See* Resps. Br. at 136-37. Respondents conclude that the client in Carmel makes a determination that "higher quality playback can be sustained because there are contiguously available files stored in the [inherently present] input buffer." *Id*. at 138. Therefore, respondents argue, the media player in Carmel "determines that

the higher quality playback can be sustained according to an amount of contiguously available files stored by the media player," as required by claim 5 of the '564 patent.

I find respondents' argument is not convincing. While all parties may agree that buffers are common or even desirable in video streaming systems, the fact remains that Carmel does not disclose a buffer. Arguments that Carmel "probably" used a buffer are insufficient. *Trintec Indus., Inc. v. Top-U.S.A. Corp*., 295 F.3d 1292, 1295 (Fed. Cir. 2002) (anticipation requires every limitation is "'necessarily present,' not merely probably or possibly present, in the prior art").

Indeed, the "build up" problem respondents posit is also never discussed in Carmel. Carmel did take "Internet bottlenecks" into account, but such delays were outside the client. *See* RX-0221 (Carmel) at 11:53-12:12. Given that Carmel contemplated and proposed mitigating processes to address Internet delays, it is not at all clear why Carmel avoided mention of supposed "build up" of slices in the client if Carmel's device in fact contemplated and addressed that problem.

Moreover, respondents' chain of reasoning depends on the client device in Carmel performing a non-disclosed evaluation of the amount of non-disclosed content in a non-disclosed buffer and making a non-disclosed determination on how to sustain streaming based on that evaluation. That argument is entirely unsupported by Carmel. Carmel discloses determinations in reaction to more available bandwidth, not determinations based on how many files are in a non-disclosed buffer. For example, Carmel "determines a compression ratio by which to compress the data, based on the collective bandwidth of its open links with server 36." *Id.* at 11:40-42. Additionally, Carmel discloses that it is tolerable if streaming is not sustained: if there are transmission delays, Carmel teaches "it may be preferrable simply to drop the file rather than send it." *Id.* at 12:56-57. That and other disclosures in Carmel cut against a conclusion that a buffer

and evaluation of buffer content is inherent in Carmel. *See* RX-0221 (Carmel) at 11:40-45; 12:13-17, 12:25-35, 12:54-58, 13:30-35) (disclosing options of changing the data compression, changing the duration of the slice of content requested, and utilizing multiple FTP links to maintain a reliable download path, each of which could obviate the need for a buffer).

Because Carmel does not disclose that the client device evaluates the content of a buffer, as respondents suggest, I find that respondents have not shown that Carmel discloses the "amount of contiguously available files stored" limitation in claim 5 of the '564 patent.

d) Independently Requestable Limitation – '156 Patent Claim 5

Respondents argue that Carmel discloses the limitation "wherein each of the streamlets of each of the different copies is independently requestable and playable by the apparatus" in claim 5 of the '156 patent. *See* Resps. Br. at 143-46. I find that it does not.

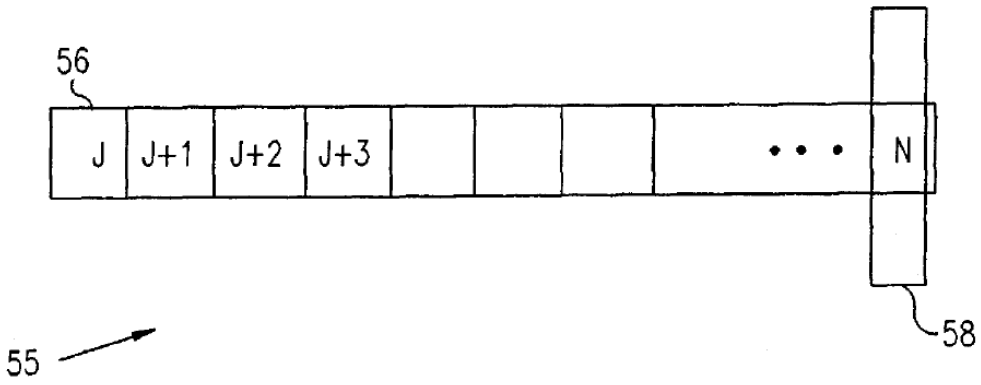
Respondents argue that Carmel discloses that "the user can choose where to start playback of a stream." *Id.* at 143. However, claim 5 of the '156 patent recites that "each of the streamlets *of each of the different copies* is independently requestable and playable by the apparatus." JX-0004 ('156 patent) at claim 5. Respondents have not shown that Carmel discloses that the user can choose where to start playback of the stream from more than one particular stream.

Carmel recites:

> When one of computers 30 reads index file 50 and begins to download stream 40, indicator 58 preferably marks the most recent slice, as shown in FIG. 3C. This is the point at which the download will begin, unless the user of the computer chooses otherwise. If the user wishes to begin the download at an earlier point, he may move indicator 58 to the left along bar 56 to that point, preferably using a mouse or other pointing device, as is known in the art. Indicator 58 may be moved back and forth along bar 56 to jump back and forth along stream 40.

RX-0221 (Carmel) at 8:32-41. This passage refers to Figure 3C of Carmel, which does not display more than a single quality stream:

[redacted]



RX-0221 (Carmel) at FIG. 3C. Dr. Jeffay testified as to this portion of Carmel at the hearing:

> So what Carmel allows a user to do via the client is to choose when, effectively when, they want to start in a stream that -- so, remember, Carmel is a system of -- of real-time broadcasting. So the servers are broadcast -- can be broadcasting media, and the user through the app on the client can select a time -- effectively a time to start watching the broadcast.
>
> When that happens, the disclosures in Carmel indicate that the server will simply start pushing data to the client at the appropriate starting point. And the point that I'm making here is that just merely a disclosure of selecting a -- a quality level, plus a starting time, is not -- does not disclose a request for a streamlet and certainly not an independently requestable streamlet.

Jeffay Tr. 641.

Indeed, claim 1 of Carmel recites a "method for real-time broadcasting . . ." and there is no indication in Carmel that a user is able to independently request or play any of the streamlets from a different copy of the stream. Moreover, as I found above, the user in Carmel requests a quality level; there is no evidence of individually selectable streamlets. *See supra* Sec. XIV.B.1.a)(2).

Respondents have not shown that Carmel discloses the limitation "wherein each of the streamlets of each of the different copies is independently requestable and playable by the apparatus" in claim 5 of the '156 patent.

e) Live Event Video Limitations – '554 Patent Limitation 1p; '555 Patent Claims 14 and 15

DISH argues that Carmel's only multi-level data stream embodiment (multi-level data stream 41 and Figure 3D) is not disclosed in the context of a "live" or "real-time" broadcast, and that thus would suggest to one of ordinary skill in the art that it was limited to pre-encoded or on demand applications. *See* Compls. Br at 196-97 (citing CX-0008C (Jeffay RWS) at Q/A 123). However, claim 1 of Carmel recites, "A method for real-time broadcasting . . ." RX-0221 (Carmel) at claim 1. Carmel also discusses "the case of a live broadcast." *Id*. at 12:54-58. As Dr. Richardson testified, claims 11 and 12 of Carmel describe Carmel's multi-level stream format and depend from claim 1. *See* RX-0001C (Richardson DWS) at Q/A 172. I find that Carmel discloses the "live event video" limitations in the '554 and '555 patents.

f) Conclusion

Respondents have not shown by clear and convincing evidence that Carmel anticipates any of the asserted claims.

2. Anticipation – Akiyama

Respondents contend that U.S. Patent Application No. 2004/0202109 to Akiyama anticipates each of the asserted claims. *See* Resps. Br. at 164-78. Akiyama was filed on August 28, 2003, and published October 14, 2004, and therefore qualifies as prior art to the asserted patents under pre-AIA 35 U.S.C. § 102(e). RX-0368 (Akiyama). The Staff argues that Akiyama does not anticipate any of the asserted claims. *See* Staff Br. at 194-201. For the reasons below, I find that respondents have not shown by clear and convincing evidence that Akiyama anticipates any of the asserted claims because each independent claim requires a "request" that Akiyama does not disclose.

a) Request Limitations – ’564 Patent Limitation 1g; ’156 Patent Limitation 1f; ’554 Patent Limitations 16h-16i; ’555 Patent Limitations 10h-10i

Respondents have not shown by clear and convincing evidence that Akiyama anticipates the asserted claims because respondents have not shown that Akiyama discloses requesting specific files from the video server.

For instance, claim 1 of the ’564 patent recites, in part, “automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies.” JX-0001 (’564 patent) at claim 1. Respondents contend that “the receiving terminal unit 100 requests a plurality of fragments from the server based on the time index starting with T_0 when the receiving terminal requests to stream a video.” Resps. Br. at 166 (citing RX-0368 (Akiyama), ¶ [0049]; RX-0001C (Richardson DWS) Q/A 261-63). Respondents cite Akiyama at paragraph 49, which does not refer to a request. Respondents additionally cite Akiyama at paragraph 39, which recites:

> The receiving bit rate-monitoring unit 110 performs a monitoring operation with respect to the received bit rate from a time in which the trigger is applied from the monitoring trigger control unit 109. In the case where a result of monitoring is displaced out of a predetermined bit rate range, a command transmission unit 111 requests an image data bit rate switching in the distribution server 200. When the result of the monitoring operation is in a predetermined bit rate range, it does not request a bit rate switching in the distribution server 200. The command transmission unit transmits commands of a start of distribution of image data, a stopping of the distribution of image data and an image bit rate switching request and the like to the distribution server 200.

RX-0368 (Akiyama), ¶ [0039]. Akiyama discloses that the “command transmission unit 111 requests an image data bit rate switching in the distribution server 200,” but this portion of Akiyama does not disclose “requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies.” Rather, Akiyama

[redacted]

discloses that the receiving terminal monitors the received bit rate in transmissions from the distribution server and "requests an image data bit rate switching in the distribution server" when the "result of monitoring is displaced out of a predetermined bit rate range." *Id.*, ¶ [0041].

Respondents further argue that this "request could be, for example, when the receiving terminal unit switches bit rates based on the determination made by the receiving terminal unit when it determines it should switch bit rates and sends a request to the server to switch bit rates." Resps. Br. at 167 (citing RX-0368 (Akiyama), ¶¶ 39, 79; RX-0001C (Richardson DWS) at Q/A 264-65). However, the cited portion of Akiyama recites a client transmission of "an image bit rate switching request," that refers to a request to change the bitrate of the transmitted content, not a request for an individual portion from one of the copies of a stream as required by the claim. Akiyama's bit rate switching request is merely a request sent sporadically and only when the monitoring criteria require adjustment to the incoming stream. It is not a request for each individual portion in a stream. *See* CX-0008C (Jeffay RWS) at Q/A 138.

Respondents additionally cite paragraph 79 of Akiyama, but this paragraph only discloses requests for starting and stopping the distribution, rather than requests for individual files. In this regard, Akiyama's distribution server 200 distributes the fragments without specific requests for specific files from the receiving terminal 100.

Respondents contend that "if the receiving terminal in Akiyama requests when the bit rate should be switched, the bit rate switch request is effectively a request for fragments starting with the next available time index." Resps. Br. at 166-67. Although requesting a switch in the bit rate might be related to a request for a different quality level, it is not a request for specific files stored on the server.

Similarly, claim 1 of the ’156 patent recites, in part, “requesting sequential streamlets of one of the copies from the video server according to the playback times of the streamlets.” JX-0004 (’156 patent) at claim 1. Respondents refer back to their argument regarding the ’564 patent. *See* Resps Br. at 171. Akiyama does not disclose “requesting sequential streamlets of one of the copies from the video server according to the playback times of the streamlets” because Akiyama does not disclose requesting individual portions stored on the video server.

Claim 16 of the ’554 patent recites, in part, “place a streamlet request to the server over the one or more network connections for the first streamlet of the selected stream; receive the requested streamlets from the server via the one or more network connections.” JX-0002 (’554 patent) at claim 16. Respondents argue that Akiyama discloses “requesting fragments from the server, including a request when the receiving terminal unit requests a switch to a different bit rate.” Resps Br. at 175 (citing RX-0368 (Akiyama) ¶¶ 39, 79; RX-0001C (Richardson DWS) at Q/A 287-89). However, switching to a different bit rate based on changing conditions does not disclose the recited portions of claim 16 of the ’554 patent because there is no specific “streamlet request.”

Claim 10 of the ’555 patent similarly recites, in part, “place a streamlet request to the server over the one or more network connections for the selected stream; receive the requested streamlets from the server via the one or more network connections.” JX-0003 (’555 patent) at claim 10. Respondents refer back to argument regarding the ’554 patent. *See* Resps Br. at 177. Akiyama does not disclose processor instructions to “place a streamlet request” because of the absence of disclosure regarding specific streamlets.

b) TCP Limitations – '564 Patent Limitation 1a; '156 Patent Limitation 1a and Claim 2

Respondents have not shown by clear and convincing evidence that Akiyama anticipates claim 1 of the '564 patent and claims 1 and 2 of the '156 patent because Akiyama does not disclose streaming via a TCP connection over the Internet.

Respondents do not contend that Akiyama explicitly discloses streaming via a TCP connection, but rely on inherency, arguing that one of ordinary skill in the art would have understood that the Internet communications used in Akiyama would have involved the use of TCP/IP for data transfer. *See* Resps. Br. at 165.

An element may be inherently disclosed only if it "is 'necessarily present,' not merely probably or possibly present, in the prior art." *Rosco, Inc. v. Mirror Lite Co.*, 304 F.3d 1373, 1380 (Fed. Cir. 2002) (quoting *Trintec Indus., Inc. v. Top-U.S.A. Corp.*, 295 F.3d 1292, 1295 (Fed. Cir. 2002)). Respondents do not contend that TCP/IP data transfer is "necessarily present" in the use of Akiyama's invention. *See id.* Respondents cite paragraph 38 of Akiyama, Resps. Br. at 165, which recites:

> Image data received by the receiving terminal unit 100 is data that has been compressed by a predetermined coding system, such as MPEG or the like, and the image data is distributed from a distribution server 200 to the receiving terminal 100 through a radio communication network 112 and a relay station 113.

RX-0368 (Akiyama), ¶ [0038]. The above-recited paragraph refers to distributing the image data "through a radio communication network 112 and a relay station 113," not through the use of TCP/IP. Respondents further cite the testimony of Dr. Richardson, who testifies as follows:

> Akiyama (RX-0368) discloses a receiving terminal connected to a distribution server to download content via the web, including HTML data. In my opinion, a person of skill in the art would recognize that Web and HTML data is most commonly distributed over TCP/IP connections via HTTP. It is therefore my opinion that a person of ordinary skill would have recognized that the adaptive bit

> rate streaming system described in Akiyama would have used a TCP connection or it would have been obvious to use a TCP connection. In the alternative, it is my opinion that a person of ordinary skill would have understood that this connection between the client device and server device could have been any one of several types of connection, including a "transport control protocol (TCP) connection" over the internet, which was one of the most common protocols in the internet at the time of the alleged invention.

RX-0001C (Richardson DWS) at Q/A 247. This conclusory testimony is insufficient to demonstrate that Akiyama inherently discloses the use of TCP/IP. *See Koito Mfg. Co. v. Turn-Key-Tech, LLC*, 381 F.3d 1142, 1152 (Fed. Cir. 2004) ("General and conclusory testimony . . . does not suffice as substantial evidence of invalidity."). Dr. Richardson does not even cite a specific paragraph in Akiyama as allegedly disclosing the limitation in question.

Moreover, Akiyama explicitly compares his invention, which uses a radio communication network, RX-0368 (Akiyama), ¶ [0038], to a system that uses the Internet. Akiyama recites:

> Also, in the case of image distribution under application of only a wired line, **such as the internet**, variation in the data transfer speed is generated under the influence of the applied state of the line. However, in general, **the wired line** frequently has a far wider data transfer area as compared with that of **the radio line** and the variation of the receiving bit rate at the terminal hardly produces a problem. In turn, it is difficult in practice to assure a wide data transfer area with the radio line in view of the restrictions on the international standards or limitations on performance of the communication device or the like. Further, due to a characteristic of the radio network, the device may easily be influenced by attenuation or reflection of the electromagnetic wave and by the surrounding environment, and, additionally, a variation in the data transferring speed frequently happens. As described above, the method for effecting the image distributing operation of the present invention, which has been described up to now, is particularly effective in the case wherein it is applied to an image distributing system **using a radio line where a variation in the data transfer speed may easily occur**.

Id., ¶ [0100] (emphasis added). As Dr. Jeffay testified, "The 'radio' distribution context that Akiyama is addressing does not involve TCP/IP communications, which are a set of protocols for communicating via the Internet. For example, an ordinary artisan would understand that TCP is

one of the foundational Internet communications protocols for communication via computer networks." CX-0008C (Jeffay RWS) at Q/A 140.

Therefore, respondents have not shown by clear and convincing evidence that Akiyama discloses the use of TCP.

c) Conclusion

Respondents have not shown by clear and convincing evidence that Akiyama anticipates any of the asserted claims.

3. Obviousness – Carmel

Respondents argue that: (1) Carmel alone renders obvious limitations 1a, 1b and 5 of the '564 patent, and limitations 16a and 16e of the '554 patent, *see* Resps. Br. at 156-61; (2) Carmel in view of U.S. Patent No. 7,386,627 to Lango renders obvious limitation 1b of the '564 patent and limitation 1b of the '156 patent, *see id.* at 161-63; and (3) Carmel in view of Lango and International Patent Publication WO2002-45372 to Walker renders obvious limitation 16e of the '554 patent, *see id.* at 163.

Lango was filed on January 29, 2002, and is prior art to the asserted patents. RX-0387 (Lango). International Patent Publication WO2002-45372 to Walker was filed on November 28, 2001, was published on June 6, 2002, and is prior art to the asserted patents. RX-0388 (Walker). For the reasons below, I find that respondents have not shown by clear and convincing evidence that Carmel, with or without Lango and Walker, renders obvious any of the asserted claims at least because each independent claim requires a "request" and the proposed combinations do not arrive at an invention having every limitation of the claims, including the claimed "request."

a) Carmel Alone

(1) Request Limitations – '564 Patent Limitation 1g; '156 Patent Limitation 1f; '554 Patent Limitations 16h-16i; '555 Patent Limitations 10h-10i

Respondents argue that it would have been obvious to one of ordinary skill in the art to combine the separate embodiments of Carmel. *See* Resps. Br. at 156-57. The Staff argues that Carmel itself expressly combines the embodiments, and that the evidence shows that Carmel does not teach away from combining its embodiments. *See* Staff Br. at 193. However, neither respondents nor the Staff address whether one of ordinary skill in the art would find that the proposed combination would yield predictable results, would have involved simple substitution of known methods, or would have been "obvious to try" the combination with some expectation of success to arrive at the claimed invention, as required to establish obviousness. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 401 (2007).

Moreover, as discussed above, Carmel discloses that the client selects a quality level rather than a specific file. *See* RX-0221 (Carmel) at. 10:64-11:8. Carmel recites that the client 30 "periodically … makes an assessment of the rate of data transfer over the link from the server and, if necessary, changes the quality level accordingly." RX-0221 (Carmel) at 11:9-11. As Dr. Richardson testified, Carmel's disclosure of selecting "one of the available quality levels in the stream" in Figure 6B and the related descriptions in Carmel's column 11 do not state that the client is actually selecting portions of files or making a specific file request. Richardson Tr. 385–386. Carmel's client is limited to selecting a quality level rather than individual files. *See* CX-0008C (Jeffay RWS) at Q/A 111.

Respondents have not shown that Carmel alone would render obvious an invention having the claimed "request" functionality.

(2) Video Server Limitation – '564 Patent Limitation 1b

I find that respondents have shown that Carmel inherently discloses limitation 1b of claim 1 of the '564 patent: "wherein multiple different copies of the video encoded at different bit rates are stored on the video server as multiple sets of files."

As noted above, claim 1 of Carmel recites, in part, "uploading the sequence to a server at an upload rate generally equal to the data rate of the stream, such that the one or more client computers can download the sequence over the network from the server at a download rate generally equal to the data rate." RX-0221 (Carmel) at claim 1. Uploading the sequence such that one or more client computers could download the sequence necessarily requires storing the video on a server. *See* RX-0001C (Richardson DWS) at Q/A 180. Claim 11 of Carmel specifically discloses plural files being created for each slice. *See id.* at Q/A 155. Each of the plural files has a data size for each of the quality levels. *Id.* Thus, Carmel discloses different copies of the video encoded as multiple sets of files on a server.

Respondents have thus shown that Carmel inherently discloses "multiple different copies of the video encoded at different bit rates are stored on the video server as multiple sets of files."

However, as I found above, respondents have not that Carmel discloses the "request" limitations of each of the asserted independent claims. *See supra* Sec. XIV.B.3.a)(1). Neither have respondents shown why an invention embodying the "request" limitations would have been obvious to a person of ordinary skill in the art viewing Carmel alone at the time of the invention.

(3) Contiguously Available Files Stored Limitation – '564 Patent Claim 5

As I found above, Carmel does not disclose the "amount of contiguously available files stored" limitation in claim 5 of the '564 patent. *See supra* Sec. XIV.B.1.c). Respondents argue it

would have been obvious to one of ordinary skill in the art to assess the quantity of data stored in Carmel's buffer, because with an adequate amount of data in the buffer, "the upshift to a higher quality would be more likely to continue playback without interruption." Resps. Br. at 160.

Again, respondents rely on an undisclosed buffer in Carmel, and argue that an ordinary artisan would have found it obvious to have a buffer to store data on the media player. *See id.* at 159 (citing RX-0001C (Richardson DWS) at Q/A 202). But Carmel discloses multiple alternatives that would not necessarily require a buffer, including allowing an interruption in streaming, changing the data compression, changing the duration of the slice of content requested, and utilizing multiple FTP links to maintain a reliable download path. *See* RX-0221 (Carmel) at 11:40-45; 12:13-17, 12:25-35, 12:54-58, 13:30-35).

Moreover, respondents find no support in Carmel for their theory and only cite their own expert's testimony to contend that Carmel renders obvious this claim. *See* Resps. Br. at 158-60. Unsupported expert opinion cannot demonstrate inherent disclosure of this limitation. *See TQ Delta, LLC v. CISCO Sys., Inc.*, 942 F.3d 1352, 1360 (Fed. Cir. 2019).

Respondents have not shown that Carmel renders obvious the "amount of contiguously available files stored" limitation in claim 5 of the '564 patent.

b) Motivation to Combine Carmel and Lango

I find that respondents have not adduced evidence demonstrating a motivation to combine Carmel and Lango. Respondents argue that companies in the streaming industry would look at the technology that others were using at the time, including how files are stored, in streaming video systems such as those disclosed in Carmel and Lango. *See* Resps. Br. at 162 (citing RX-0001C (Richardson DWS) at Q/A 181). This is insufficient motivation to combine Carmel and Lango.

Carmel and Lango are not directed to the achieving the same purposes. Lango requires specialized components, including an intelligent application-layer protocol aware router and specialized streaming media caches or accelerators within a specialized data network to improve data streaming and improve storage methods. RX-0387 (Lango) at 4:42-5:1, 1:58-61. Carmel, by contrast, is directed to using "common, existing server and network infrastructure" components without the need for "dedicated broadcast computer system[s]" enabled via a "personal computer." *See* RX-0221 (Carmel) at 1:50-67. As Lango's improvements are directed to optimizing storage on dedicated streaming cache devices, one of ordinary skill in the art would not have been motivated to apply Lango's teachings to the general purpose web server of Carmel. *See* CX-0008C (Jeffay RWS) at Q/A 108.

As respondents have not shown a motivation to combine Carmel and Lango, they have also failed to show a motivation to combine Carmel, Lango, and Walker. I determine that respondents have not shown by clear and convincing evidence that Carmel, whether alone or combined with Lango and Walker, renders obvious any of the asserted claims.

4. Obviousness – Akiyama

Respondents argue that: (1) Akiyama alone renders obvious limitations 1a-1e of the '564 patent, limitation 1f and claim 2 of the '156 patent, and limitations 16p, 16e, and 16f of the '554 patent, *see* Resps. Br. at 178-82; (2) Akiyama in view of U.S. Patent No. 5,414,455 to Hooper renders obvious limitation 1b of the '564 patent, limitations 1b and 1f and claims 4 and 5 of the '156 patent,[25] limitations 16c-16d of the '554 patent, and limitations 10c-10d of the '555 patent,

[25] Respondents additionally contend that Akiyama in view of Hooper renders obvious claim 7 of the '156 patent. *See* Resps. Br. at 184. However, DISH is no longer asserting claim 7 of the '156 patent. *See supra* Sec. I.A. Respondents' argument about claim 7 is therefore moot.

see id. at 182-85; and (3) Akiyama in view of Hooper and Walker renders obvious the preamble of 16 and claim 20 of the '554 patent and claims 14 and 15 of the '555 patent, *see id.* at 163. U.S. Patent No. 5,414,455 to Hooper was filed on July 7, 1983, and is prior art to the asserted patents. RX-0374 (Hooper). As discussed above, Walker was filed on November 28, 2001, and is prior art to the asserted patents. RX-0388 (Walker). For the reasons below, I find that respondents have not shown by clear and convincing evidence that Akiyama, with or without Hooper or Walker, renders obvious any of the asserted claims at least because each independent claim requires a "request" and the proposed combinations do not arrive at an invention having every limitation of the claims, including the claimed "request."

a) Request Limitations – '564 Patent Limitation 1g; '156 Patent Limitation 1f; '554 Patent Limitations 16h-16i; '555 Patent Limitations 10h-10i

As I found above, respondents have not shown that Akiyama discloses the request limitations. *See supra* Sec. XIV.B.2.a). Respondents do not argue that Akiyama, either alone or when combined with Hooper or Walker, results in an invention with these limitations. *See* Resps. Br. at 178-87.

Respondents have not shown by clear and convincing evidence that an invention including the "request" limitations would have been obvious if an ordinary artisan considered Akiyama alone or with the Hooper or Walker references.

b) TCP Limitations – '564 Patent Limitation 1a; '156 Patent Limitation 1a and Claim 2

Respondents have not shown by clear and convincing evidence that Akiyama renders obvious an invention including the TCP limitations in claim 1 of the '564 patent and claims 1 and 2 of the '156 patent. As discussed above with respect to anticipation, Akiyama does not disclose

streaming via a TCP connection over the Internet but rather addresses problems encountered in radio communication networks. *See supra* Sec. XIV.B.2.b). Respondents argue that it "would have been obvious to a person of skill that the connection between the receiving terminal 100 and the server could have been any one of several types of connection, including TCP connections." Resps. Br. at 178. However, Akiyama only discloses the receiving terminal streaming via radio infrastructure. *See* RX-0368 (Akiyama), ¶ [0041]; CX-0008C (Jeffay RWS) at Q/A 140. Akiyama discloses transmitting a TV broadcast to a distribution server over the Internet (Figure 21), but the distribution server nevertheless then transmits the content via radio transmission. *See* RX-0368 (Akiyama), ¶¶ [0091-92]; CX-0008C (Jeffay RWS) at Q/A 140. Given those teachings, it is unclear why a person of skill in the art would even consider a TCP connection between the server and the receiving terminal. Thus, respondents have not shown by clear and convincing evidence that Akiyama renders obvious an invention including the TCP limitations.

c) HTTP GET Limitations – '156 Patent Limitation 1f

Respondents have not shown that Akiyama, with or without Hooper, renders obvious an invention including the HTTP GET limitation in claim 1 of the '156 patent.

Respondents argue that it would have been obvious to modify "the system in Akiyama so that the receiving terminal 100 issues HTTP GET requests with a time index for specific fragments," and that "[b]ecause Akiyama discloses that it is for distributing content over the web, including HTML data, a person of skill would have recognized that web data and HTML content is most commonly distributed over TCP/IP connections using HTTP standard messages, like HTTP GET requests." Resps. Br. at 181. However, as discussed above, Akiyama does not teach distributing content over the Internet from a server to the receiving terminal. *See supra* Sec. XIV.B.2.b). Hence, Akiyama does not teach or suggest distributing content via HTTP GET

requests. Accordingly, the evidence does not clearly and convincingly support finding that Akiyama renders claim 1 of the '156 patent obvious. *See* CX-0008C (Jeffay RWS) at Q/A 152.

With respect to Hooper, respondents have not adduced evidence does not clearly and convincingly explaining how or why one of ordinary skill in the art would combine Hooper with Akiyama. *See id.* at Q/A 153. Furthermore, respondents argue that "person of skill would have further realized that the requests for specific segments in Hooper could have been implemented in any number of a different protocols," but Hooper is silent on using HTTP GET requests to access any such streamlets and respondents provide no convincing explanation of why one of ordinary skill in the art would have found it obvious to do so. *See id*.

d) Video Server Limitations – '564 Patent Limitation 1b; '156 Patent Limitation 1b

Respondents have not shown that Akiyama, with or without Hooper, renders obvious an invention including the video server limitations in claim 1 of the '564 patent and claim 1 of the '156 patent.

Respondents argue that "would have been obvious to a person of skill that the different image bit rates could have been stored separately on the server since those bit rates were already broken up into different fragments." Resps. Br. at 179. However, Akiyama implies that the fragments should be already broken up when stored because it depicts the fragments separately in the data structure. *See id.* (citing RX-0368 (Akiyama), ¶¶ 43-44, Fig. 5; RX-0001C (Richardson DWS) at Q/A 250). The information encoded into each fragment in Akiyama is only generated at distribution time, not beforehand during storage. *See* CX-0008C (Jeffay RWS) at Q/A 142-43. Those teachings cut against a conclusion of obviousness.

Hooper does not render obvious storing multiple versions or copies of a video as multiple

sets of files. Hooper discloses encoding archived video into multiple time-based "frames" which can be addressed for on demand retrieval, playback, and control by multiple devices. Hooper (RX-0374) at 1:61-2:31. Hooper is also silent on storing its segments as separate "files." *See* CX-0008C (Jeffay RWS) Q/A 144.

Respondents have not shown by clear and convincing evidence that Akiyama, with or without Hooper, renders obvious an invention having the video server limitations in claim 1 of the '564 patent and claim 1 of the '156 patent.

e) Live Event Video Limitations – '554 Patent Limitation 1p; '555 Patent Claims 14 and 15

Above I found that Akiyama does not disclose or render obvious an invention with instructions for a "streamlet request" or instructions to "place a streamlet request" because of the absence of disclosure in Akiyama regarding specific streamlets. *See supra* Secs. XIV.B.2.a), XIV.B.4.a). Respondents have not shown that Akiyama, with or without Hooper or Walker, renders obvious claim 16 of the '554 patent, which recites, in part, "place a streamlet request to the server over the one or more network connections for the first streamlet of the selected stream; receive the requested streamlets from the server via the one or more network connections." JX-0002 ('554 patent) at claim 16. Similarly, claim 10 of the '555 patent recites, in part, "place a streamlet request to the server over the one or more network connections for the selected stream; receive the requested streamlets from the server via the one or more network connections." JX-0003 ('555 patent) at claim 10. Respondents have thus not shown that Akiyama, with or without Hooper or Walker, renders obvious claim 10 of the '555 patent.

* * *

Respondents have thus not shown by clear and convincing evidence that Akiyama, with or without Hooper or Walker, renders any of the asserted claims obvious.

5. Obviousness – RealNetworks

Respondents contend that RealNetworks' RealSystem, including RealSystem G2, RealSystem 7, RealSystem 8, and the RealOnePlayer, renders obvious all of the asserted claims. *See* Resps. Br. at 187-227. Respondents additionally contend that RealNetworks in view of Hooper renders obvious limitations 1b-1e of the '564 patent, *see id.* at 227-31, and that RealNetworks in view of Hooper and Walker renders obvious limitation 16e of the '554 patent, *see id.* at 231-32. For the reasons below, I find that respondents have not shown by clear and convincing evidence that Akiyama, with or without Hooper or Walker, renders obvious any of the asserted claims at least because each independent claim requires a "request" and the proposed combinations do not arrive at an invention having every limitation of the claims, including the claimed "request."

a) Status as Prior Art

DISH argues that respondents have not established that the RealNetworks system qualifies as prior art under pre-AIA § 102(b) because "[r]espondents have not identified a specific 'system' that was available, and instead rely on a scattered collection of documents, programs, testing, and testimony that describe many different products and many different versions of those products." Compls. Br. at 219. Yet Dr. Jeffay testified as to the public availability and prior art status of the RealNetworks system. Jeffay Tr. 612–613.

Dr. Richardson tested a version of the RealNetworks system that was publicly available before 2004. Mr. Jerry Black, an employee of RealNetworks from 1995 to 2009, testified that RealNetworks' RealSystems was used to stream live video content prior to 2004 and that

[redacted]

RealPlayer G2, RealPlayer 7, RealPlayer 8, RealProducer, and RealServer were publicly available before 2004. *See, e.g.*, RX-0003 (Black DWS) at Q/A 3, 25, 28. Respondents further adduced evidence demonstrating that the associated manuals were accessible on the Internet before 2004. RX-0568 (RealNetworks declaration); RX-0569 and RX-0570 (Internet Archive declarations).

Respondents have thus provided sufficient evidence establishing that the RealNetworks system qualifies as prior art.

b) Obviousness

(1) Request Limitations – '564 Patent Limitation 1g; '156 Patent Limitation 1f; '554 Patent Limitations 16h-16i; '555 Patent Limitations 10h-10i

Respondents contend that the RealNetworks system "discloses automatically requesting subsequent portions of the video, including requests for when to switch bit rates based on a determination made by the client." Resps. Br. at 199. Specifically, respondents argue that, when the user sends a request for a different bitrate in the RealNetworks system, that same request is also a request for "'subsequent portions of the video or subsequent groups of pictures beginning with an I-frame' from the next switch point, or Presentation Time Stamp onward." *Id.* at 200 (quoting RX-0001C (Richardson DWS) Q/A 325).[26]

Dr. Richardson testified as follows:

> During our testing, as discussed above in relation to claim elements **1[b][3]** and **1[b][5][i]**, the **media player**, **RealPlayer 8**, running on an end user station, created a network connection with the **video server**, **RealServer**, and **automatically requested subsequent portions of the video** from **RealServer** by sending new "SET_PARAMETER" requests whenever bandwidth availability was throttled and cleared. The decision to send these requests was made by RealPlayer independently of any actions of the end user, hence these requests were made **automatically**.

[26] An I-frame refers to an intra-coded picture used as a reference frame in streaming the video. *See* RX-0001C (Richardson DWS) at Q/A 316 (citing RX-0374 (Hooper) at 6:63-64).

> Using NetBalancer, throttling was applied to limit the bandwidth available for the connection between RealPlayer 8 and RealServer. Subsequently, in the Wireshark log at Packet Number 6328, RealPlayer 8 sent a new "SET_PARAMETER" request to subscribe to new ASM Rules. In this packet, RealPlayer 8 unsubscribed from Rules 10 and 11, which correspond to the highest quality video, and subscribed to Rules 8 and 9, which correspond to the SureStream encoding at 193.0 Kbps. This constitutes RealPlayer requesting to shift to a different stream within the SureStream .rm container, *i.e.*, to **automatically request subsequent portions of the video**, or subsequent groups of pictures beginning with an I-frame. Likewise, after throttling was cleared via NetBalancer, at Packet Number 8449, we saw RealPlayer 8 send a new "SET_PARAMETER" request to RealServer. In this packet, RealPlayer 8 unsubscribed from Rules 8 and 9 and subscribed to Rules 10 and 11, which correspond to the video encoded at 385.9 Kbps. This too is an **automatic request** from **RealPlayer 8** to **RealServer** for **subsequent portions of the video**, or subsequent groups of pictures beginning with an I-frame.

RX-0001C (Richardson DWS) at Q/A 325.

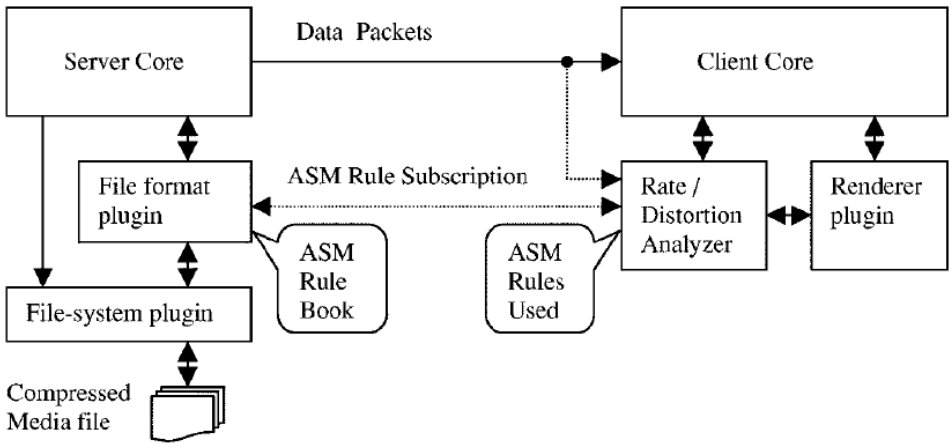
Respondents argue that the decision to send new "SET_PARAMETER" requests and switch streams is made by RealPlayer independently of any actions of the end user, thus demonstrating that these requests were made automatically. *See* Resps. Br. at 199 (citing RX-0001C (Richardson DWS) at Q/A 325). However, as Dr. Jeffay testified, the "SET_PARAMETER" packet sent from the RealNetworks client to the server "subscribe[s] to a rule" and does not individually request specific files or streamlets from a server. CX-0008C (Jeffay RWS) at Q/A 173.

Respondents argue that the "SET_PARAMETER" requests "are also requests for 'subsequent portions of the video or subsequent groups of pictures beginning with an I-frame' from the next switch point, or Presentation Time Stamp onward." Resps. Br. at 200 (quoting RX-0001C (Richardson DWS) at Q/A 325). However, Dr. Richardson described the "SET_PARAMETER" packet in combination with an "ASM Rulebook." *See* RX-0001C (Richardson DWS) at Q/A 319. Specifically, Dr. Richardson quoted the Conklin (RX-0228) reference at length:

[redacted]

ASM is a mechanism that allows the client (RealPlayer) to communicate efficiently the type of the encoding that should be "synthesized" by the server in order to minimize the distortion of the received information. We present the structure of the server's and client's components involved in the ASM process in Fig. 6. Compressed media files are accessed by server with the help of the *file system* and *file format* plug-ins. The file format plug-in has knowledge about the way data are compressed and stored in the media file, and is capable of producing various combinations of the encoded streams as they are requested by the client. To produce such combinations, the file format plug-in uses so-called *ASM rules*. **These rules are based on sophisticated, fully programmable syntax and can be used to describe various means of channel adaptation ranging from simple priorities assigned to different packets, to expressions describing various combinations of bandwidth, packet loss, and efforts of loss on the reconstructed signal that can be measured by the client**. The complete set of the *ASM rules* is stored in the compressed media file as the *ASM rule book*. **At the initial phase of the communication, the ASM rule book is transferred to the client. In turn, the client collects the information about the channel, parses the ASM rule book, and sends the server a request to *subscribe* to a rule or combination of rules that match current statistics in the channel.** When the server **receives the request to subscribe to a rule**, it passes it to the file format plugin, which in turn begins to mix data according to its knowledge of their structure.

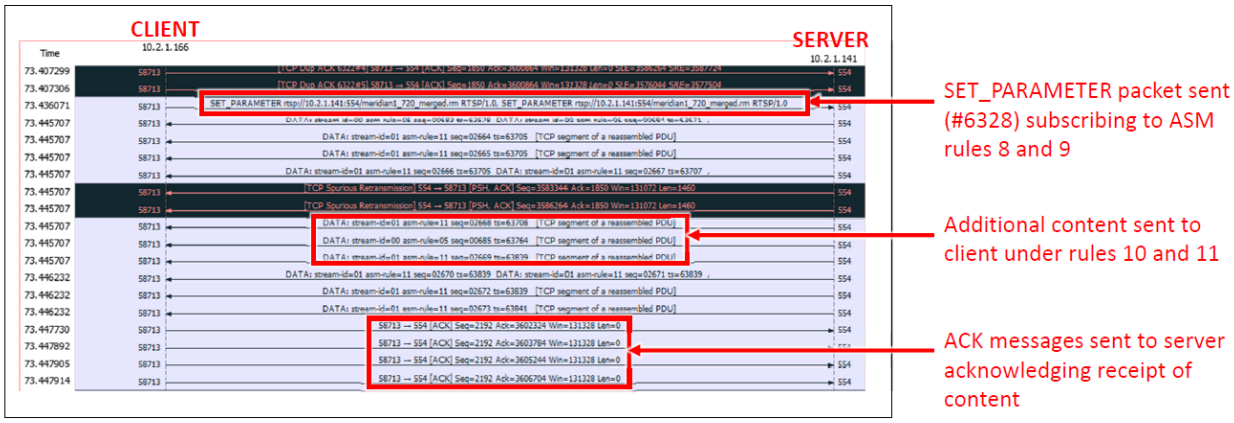
Id. (quoting RX-0228 (Conklin) at 277) (emphasis added in RX-0001C). Figure 6 of Conklin is reproduced below.



RX-0228 (Conklin) at Fig. 6.

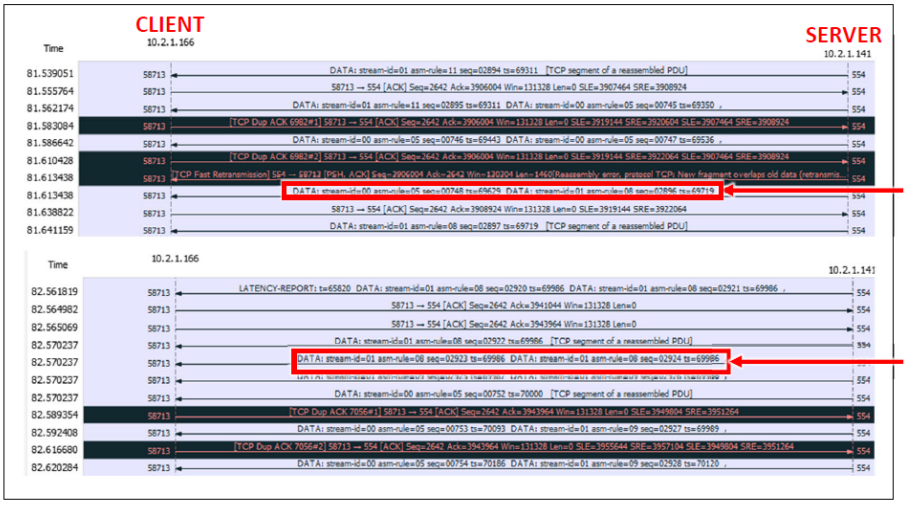
[redacted]

As shown in Conklin, the ASM rules do not disclose or render obvious an invention having instructions for "automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies." In the event that the media player sends a "SET_PARAMETER" packet to request subscription to new ASM Rules, the RealServer uses that information to determine which version and from what point needs to be sent to the media player and will continue to do so unless otherwise instructed without additional requests or messages sent from the RealPlayer. *See* CX-0008C (Jeffay RWS) at Q/A 175. This is further shown by Dr. Richardson's Wireshark capture, as modified by Dr. Jeffay, reproduced below.



CDX-0008C (Jeffay Demonstratives (RX-0554 (2021-11-18_Wireshark_Log.pcapng))) at 48.

[redacted]



CDX-0008C (Jeffay Demonstratives (RX-0554 (2021-11-18_Wireshark_Log.pcapng))) at 49.

As shown at CDX-0008C at 48, a "SET_PARAMETER" packet is sent from the client to the server subscribing to ASM rules 8 and 9. After this, the RealServer continues to send data in accordance with rules 10 and 11 as it has not yet reached the next I-frame. The only communication from the Client to the Server are ACK messages to acknowledge receipt of the data from the Server. *See* CX-0008C (Jeffay RWS) at Q/A 175. Then, in CDX-0008C at 49, the Server selects and sends data in accordance with rules 8 and 9 starting with Packet #6988. The server then sends data for the next I-frame beginning at Packet #7052 without receiving any additional "SET_PARAMETER" requests from the Client. Again, the only communication from the Client to the Server are the same ACK messages seen on the prior demonstrative. *See* CX-0008C (Jeffay RWS) at Q/A 175.

Similarly, claim 1 of the '156 patent recites, in part, "requesting sequential streamlets of one of the copies from the video server according to the playback times of the streamlets." JX-0004 ('156 patent) at claim 1. Respondents refer back to their argument regarding the '564 patent. *See* Resps Br. at 208. RealPlayer does not render obvious "requesting sequential streamlets

of one of the copies from the video server according to the playback times of the streamlets" because RealPlayer does not teach or suggest requesting individual streamlets stored on the video server.

Claim 16 of the '554 patent recites, in part, "place a streamlet request to the server over the one or more network connections for the first streamlet of the selected stream; receive the requested streamlets from the server via the one or more network connections." JX-0002 ('554 patent) at claim 16. Respondents argue that "RealNetworks discloses this limitation because RealPlayer 'chooses which files to receive based on its available bandwidth.'" Resps Br. at 220 (quoting RX-0236 (RealSystem G2 Production Guide) at RESP-PA03522). However, subscribing to a different rule based on changing conditions does not disclose the recited portions of claim 16 of the '554 patent because there is no specific "streamlet request."

Claim 10 of the '555 patent similarly recites, in part, "place a streamlet request to the server over the one or more network connections for the selected stream; receive the requested streamlets from the server via the one or more network connections." JX-0003 ('555 patent) at claim 10. Respondents refer back to argument regarding the '554 patent. *See* Resps Br. at 226. RealPlayer does not teach or suggest "place a streamlet request" because of the absence of disclosure regarding specific streamlets.

Respondents have not shown by clear and convincing evidence that RealPlayer renders obvious any of the asserted claims.

(2) Video Server Limitation – '564 Patent Limitation 1b

Respondents have not shown that RealPlayer renders obvious the limitation "wherein multiple different copies of the video encoded at different bit rates are stored on the video server as multiple sets of files" in claim 1 of the '564 patent.

Respondents argue that "RealNetworks' single SureStream file consists of multiple encodings and multiple segments (multiple groups of pictures beginning with an I-frame)." Resps. Br. at 192 (citing RX-0001C (Richardson DWS) at Q/A 316). Hence, respondents concede that RealNetworks does not disclose storing "multiple different copies of the video encoded at different bit rates" as "multiple sets of files." *See* CX-0008C (Jeffay RWS) at Q/A 176. Dr. Richardson also testified that he "observed that SureStream saved one file to RealServer containing therein these multiple different copies of the video at different bit rates" and that "RealNetworks discloses storing multiple different copies of the video encoded at different bit rates as one file at RealServer." RX-0001C (Richardson DWS) at Q/A 316. Thus, the RealNetworks' client cannot access subfiles or streamlet portions by file requests.

Respondents further argue that "it would have been obvious to a [person of ordinary skill in the art] that these multiple groups of pictures each beginning with an I-frame would meet the claim element of multiple sets of files." Resps. Br. at 193 (citing RX-0001C (Richardson DWS) at Q/A 316). However, the prior art suggests that storing streams in a "single SureStream file" actually "facilitates their efficient retrieval by the server" in the RealNetworks system such that one of ordinary skill in the art would not be motivated to implement a less efficient option of using multiple sets of files. RX-0228 (Conklin) at 3. Moreover, RealNetworks had access to both technologies and did not combine them. Accordingly, the evidence does not show that the disclosure of the RealNetworks system alone would render this limitation obvious.

Respondents further argue that it would have been obvious to combine RealNetworks with Hooper because "'RealNetworks and Hooper both disclose systems for streaming video.'" Resps. Br. at 227 (quoting RX-0001C (Richardson DWS) at Q/A 316). However, Dr. Richardson does not explain why one of ordinary skill in the art would seek to "store or cache" RealNetworks'

"groups of pictures beginning with an I-frame" as multiple sets of files. CX-0008C (Jeffay RWS) at Q/A 180. Moreover, as shown in Figure 6 of Hooper, "the video 100 is transferred as a moving or rolling viewing window called a video segment 200 having a time-interval based span or size. The video 100 is transferred by moving the viewing window or video segment 200 forward, from the start to the end, at a substantially constant speed to coincide with the play-back speed of the video 100." RX-0374 (Hooper) at 9:49-56; Fig. 6. Respondents have not adduced a convincing reason as to why one of ordinary skill in the art would have been motivated to combine the SureStream technology with Hooper's disclosures.

Respondents have not shown by clear and convincing evidence that RealPlayer, with or without Hooper, renders obvious claim 1 of the '564 patent.

(3) Time Indexes– '564 Patent Limitation 1e

Respondents argue that RealNetworks' "Presentation Time Stamps" are the claimed "time indexes." *See* Resps. Br. at 198 (citing RX-0001C (Richardson DWS) at Q/A 322). However, respondents have not shown that the ASM Rules or the "SET_PARAMETER" packet, which respondents map to the "requesting" element, request based on the "Presentation Time Stamps." *See* CX-0008C (Jeffay RWS) at Q/A 183; RX-0559 (2021-11-18_ASM_Rulebook.rtf); RX-0554 (2021-11-18_Wireshark_Log.pcapng). Accordingly, even if the Presentation Time Stamps were considered "time indexes," RealNetworks does not disclose or suggest requesting files "based on the time indexes" as claimed.

Respondents have thus not shown by clear and convincing evidence that RealPlayer renders obvious claim 1 of the '564 patent.

(4) Live Event Video Limitations – ’554 Patent Limitation 1p; ’555 Patent Claims 14 and 15

Respondents have shown that RealPlayer could and did stream live event videos during the relevant time period.

As Jerry G. Black testified, RealNetworks streamed live events prior to 2004. RX-0003 (Black DWS) at Q/A 24-25. Similarly, Level 3 Communication’s Sandpiper Footprint content delivery network, which was integrated with RealSystem G2 in 1999, was used to stream live events. *E.g.,* RX-0230 (Sandpiper Adds RealSystem G2 to its CDN (August 4, 1999)) RESP-PA02644; RX-0231 (Sandpiper Networks Signs Partner Deals (October 7, 1999)) RESP-PA0263 (Sandpiper and RealSystem G2 integrated in 1999).

DISH argues that “Dr. Richardson’s analysis relies on his testing of RealPlayer 8, in which he did not stream a ‘live event video.’” Compls. Br. at 228 (quoting CX-0008C (Jeffay RWS) at Q/A 188). RealNetworks’ documentation, however, provides extensive disclosures of its capability to stream live event programming, including the availability of the functionality in the RealProducer application. RX-0001C (Richardson DWS) at Q/A 353, 355-56.

However, as I found above, RealPlayer does not disclose instructions for “streamlet request” or instructions to “place a streamlet request” because of the absence of disclosure regarding specific streamlets. *See supra* Sec. XIV.B.5.b)(1). Respondents have not shown that RealPlayer, with or without Hooper or Walker, renders obvious claim 16 of the ’554 patent, which recites, in part, “place a streamlet request to the server over the one or more network connections for the first streamlet of the selected stream; receive the requested streamlets from the server via the one or more network connections.” JX-0002 (’554 patent) at claim 16. Similarly, claim 10 of the ’555 patent recites, in part, “place a streamlet request to the server over the one or more network

connections for the selected stream; receive the requested streamlets from the server via the one or more network connections." JX-0003 ('555 patent) at claim 10. Respondents have thus not shown that RealPlayer, with or without Hooper or Walker, renders obvious claim 10 of the '555 patent or any of the asserted claims.

6. Secondary Considerations

Objective evidence of non-obviousness must always, when present, be considered en route to a determination of obviousness. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538 (Fed. Cir. 1983). This objective evidence, also known as "secondary considerations," includes evidence of commercial success, long felt need, and failure of others. *Graham v. John Deere Co.*, 383 U.S. 1, 13-17 (1966); *Dystar Textilfarben GmbH v. C.H. Patrick Co.*, 464 F.3d 1356, 1361 (Fed. Cir. 2006). Such evidence will not always dislodge a determination of obviousness based on analysis of the prior art. *See KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 426 (2007) (commercial success did not alter conclusion of obviousness).

a) Nexus

For objective evidence of non-obviousness to hold weight, there must be a connection or nexus between the evidence and the claimed invention. The patentee must show that the objective evidence is tied to a specific product and that product is the invention disclosed and claimed in the patent. *WBIP, LLC v. Kohler Co*., 829 F.3d 1317, 1329 (Fed. Cir. 2016).

Here, respondents argue that DISH is not entitled to a presumption of a nexus between its secondary considerations evidence and the claimed invention because DISH has failed to show that its product is coextensive with the patented invention. *See* Resps. Br. at 241-42. The Staff agrees that DISH is not entitled to the presumption of nexus because it has not shown that the

product "embodies the claimed features." Staff Br. at 220 (quoting *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1373 (Fed. Cir. 2019).

DISH argues that it is entitled to a presumption of nexus because the product it relies on, the Move Media Player, is "the invention disclosed and claimed" and is coextensive with the asserted claims. *See* Compls. Br. at 232-33 (quoting *Fox Factory*, 944 F.3d at 1373). The inventors listed on the asserted patents worked for a company called Move, which was later acquired by DISH. CX-0001C (Major DWS) Q/A 3, 13. DISH argues that respondents and the Staff have conceded that the Move Media Player embodies the claimed invention because those parties argued that public use of the Move Media Player in 2005 was an invalidating use meeting every element of the asserted claims. *See id.* at 233; *infra* Sec. XIV.C.

I find that the Move Media Player embodies the claimed invention. *See* Compls. Br. at 232-36; Resps. Br. at 232-41. Accordingly, DISH is entitled to a presumption that the commercial success of the Move system is due to the patented features of the invention. *WBIP*, 829 F.3d at 1329. To overcome that presumption, respondents must present "evidence that shows the proffered objective evidence was due to extraneous factors other than the patented invention." *Id*. (cleaned up). "[A] patent challenger cannot successfully rebut the presumption with argument alone — it must present evidence." *Id*.

Respondents have proffered the testimony of Dr. Richardson to rebut the presumption of nexus. *See* Resps. Br. at 242 (citing RX-0001C (Richardson DWS) at Q/A 471, 484-85, 467-69). Dr. Richardson testified that "there were advancements in compression and encoding technologies, protocols, server technologies, bandwidth available to consumers, consumer processor performance and memory and the quality of displays," implying that those advancements, not the patented technology, explained the popularity of Move's system. RX-0001C (Richardson DWS)

at Q/A 471. I find Dr. Richardson's testimony on this point is conclusory and unsupported by other corroborating evidence. Accordingly, I give it little weight.

In contrast, Dr. Jeffay demonstrated through corroborating evidence that Move's success is tied to the "unique characteristics of the claimed invention." *See Fox Factory*, 944 F.3d at 1373-74. As Dr. Jeffay testified, the Move system was described as early as 2008 as offering " a smooth end user experience as the Move Media Player up-shifts and down-shifts in response to network and client CPU availability." CX-0008C (Jeffay RWS) at Q/A 304 (quoting CX-1096C (Move Networks Tech Overview) at 19). Moreover, the Move Media Player's encoding technique allowed streaming via HTTP, and the use of "[s]imple HTTP protocol transfer of media files from standard Web servers rather than deployment of expensive media servers' reduces cost and complexity." *Id.* at Q/A 324 (quoting CX-1096C at 22). DISH further adduced evidence demonstrating that the Move Media Player was recognized as superior in streaming performance relative to its competitors, rebutting respondents' argument that "advancements in compression and encoding technologies," etc. account for the Move Media Player's success. *See* CX-1047C (Email 5.15.07); CX-0005C (Smith RWS) Q/A 10; JX-0063C (Mitchell Dep.) 87:16-88:19; 90:22-91:6.

In view of this record evidence, I find DISH is entitled to a presumption that there is a nexus between the objective evidence of non-obvious DISH proffers and the claimed invention. I find respondents have not rebutted that presumption.

b) Long-Felt But Unresolved Need and Failure of Others

Respondents argue that adaptive bitrate streaming was known and in use prior to the priority dates of the asserted patents. *See* Resps. Br. at 242 (citing RX-0001C (Richardson DWS) at Q/A 470-73). It is further argued that a significant number of other advances and well-known

solutions, such as RealNetworks or QuickTime, were available in the relevant timeframe. *See id.* The Staff agrees that DISH has not demonstrated long-felt but unresolved need nor failure of others because its contentions on the topic are overbroad. *See* Staff Br. at 220-21.

The record evidence demonstrates a long-felt but unresolved need for improved Internet streaming, and that others failed to provide the requisite streaming performance. RealNetworks broadcasts were "too choppy and too fuzzy, with a viewing window far too small to enjoy." CX-1151 (Baseball Tests Online Broadcasts). Other streaming protocols at the time, like Adobe's Flash, were "broken" even with "enough bandwidth." CX-1047C (Email 5.15.07). Similarly, Microsoft had been working on adaptive streaming for years, but the record shows that customer Disney preferred Move's Media Player over Microsoft's Silverlight, which failed to natively adapt to network conditions. JX-0073C (Carper Dep.) at 26:5-16, 35:15-23, 36:24-37:14; CX-1050C (Email 11.26.07); JX-0062C (Major Dep.) at 186:10-188:7.

I thus find that DISH has demonstrated long-felt but unresolved need and failure of others.

c) Surprising Results

DISH argues that users expressed a substantial amount of surprise when they first experienced Move's technology. *See* Compls. Br. at 237-38 (citing CX-0008C (Jeffay RWS) at Q/A 342-43). Move's product was described as being "shockingly good," JX-0021, and one user stated that he was "a bit shocked to come home one night and find Lost streaming across a 19" flat-screen computer monitor in crisp, clear glory," JX-0023 ("Judging from the ABC site, the Move Networks stuff really works.").

Respondents and the Staff argue that DISH has not presented evidence showing that the alleged surprising results are attributable to aspects of a particular product tied to the asserted patents as opposed to other factors. *See* Resps. Br. at 244; Staff Br. at 222. However, as discussed

above, I find that DISH has demonstrated a nexus between the Move Media Player and the asserted claims.

I find that DISH has adduced evidence demonstrating surprising results.

d) Commercial Success

DISH argues that the Move Media Player has exhibited substantial commercial success. *See* Compls. Br. at 238-41. By March 2008, viewership using Move Media Player rose to more than 34 million and users were averaging 50 minutes or more per session. CX-0008C (Jeffay RWS) at Q/A 357. By October 2008, both ESPN and ABC employed the Move Media Player to stream content on their websites. *See* CX-1105; CX-1132. In October 2010, [redacted] solicited a license to Move's ABR technology covered by the parent '783 application. CX-1061C. [redacted] invested in Move Networks in June 2007, CX-1071C, and DISH acquired Move in 2010, and used its technology to create Sling TV, a successful Internet streaming television platform, CX-0008C (Jeffay RWS) at Q/A 366. DISH has since licensed the asserted patents to [redacted]s. JX-0034C; JX-0033C.

Respondents and the Staff argue that DISH has not presented evidence showing that the alleged commercial success of any product is attributable to the asserted patents as opposed to other factors. *See* Resps. Br. at 244; Staff Br. at 222. However, as discussed above, I find that DISH has demonstrated a nexus between the Move Media Player and the asserted claims.

I find that DISH has adduced evidence demonstrating commercial success.

e) Praise By Others

DISH argues that recognition and praise from users, content distributors, content providers, and industry-wide organizations confirm the non-obviousness of the asserted patents. *See* Compls.

Br. at 242-44 (citing CX-0008C (Jeffay RWS) at Q/A 369-73; CX-1134; CX-1105; CX-1125; CX--1113; CX-1047C; CX-1090; CX-1092).

Respondents and the Staff argue that DISH has not presented evidence tying to the praise to the claimed invention. *See* Resps. Br. at 244; Staff Br. at 222. However, as discussed above, I find that DISH has demonstrated a nexus between the Move Media Player and the asserted claims.

I find that DISH has adduced sufficient evidence demonstrating praise by others.

f) Copying

DISH argues that [redacted] is "very similar" to Move's technology, *see* Compls. Br. at 241 (quoting JX-0069C (Ericson Dep.) 39:4-11), and that [redacted] also implemented ABR technology into [redacted] shortly after its [redacted], *see id.* It is argued that both [redacted] pitched their ABR technologies as providing nearly the exact same benefits as Move's technology. *See id.*

Respondents argue that DISH has not adduced sufficient evidence that either [redacted] in fact copied DISH's specific product. *See* Resps. Br. at 245. The Staff also argues that DISH did not provide direct evidence that [redacted], or another party, copied the inventions embodied in the asserted claims. *See* Staff Br. at 222-23.

I find that DISH has not adduced sufficient evidence showing "the replication of a specific product." *Iron Grip Barbell Co., Inc. v. USA Sports, Inc*., 392 F.3d 1317, 1325 (Fed. Cir. 2004). DISH has provided no actual evidence of copying by [redacted] or any other entity. *See* RX-0001C (Richardson DWS) at Q/A 481.

I therefore find that DISH has not demonstrated copying.

g) Conclusion

Having considered the claimed invention, the prior art, the objective indicia of non-obviousness, and the record as a whole, I find that the objective indicia support a determination of non-obviousness. Thus, even if a hindsight combination of the prior art references identified by respondents would comprise every element of the claimed invention, I find that the objective evidence indicates a person of skill in the art at the time of the invention would not have found the invention to be obvious in view of those references.

C. Public Use

Respondents contend that Move publicly used its adaptive bitrate streaming technology to live stream a church event to a public audience over the Internet in October 2005, and that Move continued to use its adaptive bitrate streaming technology to livestream BYUtv channel content over the Internet until at least February 7, 2006. *See* Resps. Br. at 232. Respondents contend that claims 16, 17 and 20 of the '554 patent and claims 14 and 15 of the '555 patent are not entitled to a priority date before these admitted public uses. *See supra* Sec. XIV.A.

I found above that the '554 and '555 patent claims are entitled to the priority date established by the filing of U.S. Application No. 60/566,831, which is April 30, 2004. *See supra* Sec. XIV.A. Because the public use in question was well after that priority date, respondents' prior public use argument fails. Respondents have not shown by clear and convincing evidence that claims 16, 17 and 20 of the '554 patent and claims 14 and 15 of the '555 patent are invalid based on the alleged public use.

D. Inventorship

Respondents contend that named inventor Mark Hurst alone conceived of the virtual timeline concept claimed in the '554 patent. Resps. Br. at 249. DISH contends that Dave Brueck,

another listed inventor, also contributed to the virtual timeline concept. *See* Compls. Br. at 245-46. Respondents argue that the '554 and '555 patents are invalid for misjoinder of Mr. Brueck. *See* Resps. Br. at 247-50.

The evidence shows Mr. Brueck and Mr. Hurst jointly conceived the virtual timeline aspect of the invention and worked together to reduce it to practice. JX-0065C (Brueck Dep.) at 99:2-6. Mr. Brueck's contributions are corroborated by Mr. Major, who testified that the virtual timeline concept was "invented by Mark Hurst and Dave Brueck." JX-0062C (Major Dep.) at 123:4-5; CX-0001C (Major DWS) at Q/A 53. Indeed, Mr. Hurst's own testimony contradicts respondents' contention that Mr. Hurst alone invented virtual timelines. *See* JX-0084C (Hurst Dep.) at 48:5-10, 52:10-20 ("I believe [Mr. Brueck] contributed to ongoing development and expansion of the QVT capabilities.").

Respondents further argue that the '156, '564, and '555 patents are invalid for misjoinder of named inventor Mark Hurst. *See* Resps. Br. at 250-53. Respondents contend that "the claims in these patents were conceived in April 2003 – and Mr. Hurst did not work for Move until May 2003." *Id.* at 250. However, Mr. Major provided testimony contradicting respondents' contended facts, including testimony that Mr. Hurst was in fact hired in April 2003. *See* CX-0001C (Major DWS) at Q/A 39 ("[W]e had to have hired [Mr. Hurst] sometime in April 2003."). Moreover, Mr. Major further testified that Mr. Hurst "invented the algorithms and heuristics that determined when to upshift and when to downshift." JX-0062C (Major Dep.) at 200:10-19.

Respondents have not shown by clear and convincing evidence that Mr. Hurst is improperly named as an inventor on the '156, '564, and '555 patents.

E. Inequitable Conduct

1. Carmel and Related Materials

On September 15, 2010, Move received a notice of allowance for its continuation-in-part application, U.S. Pat. Appl. No. 11/673,483 ("the '483 CIP Application"), which was set to issue on October 19, 2010. *See* JX-0031 ('483 CIP Application File History) at 67, 70. On October 12, 2010, third-party Microsoft sent a letter to Move discussing Carmel, which had not been disclosed, considered, or identified during prosecution of the '483 CIP Application. *See* JX-0027C (Microsoft Letter); JX-0070C (Grange Dep.) 31:21-25. Microsoft's letter included a "possible claim chart" comparing Carmel to the '483 CIP Application claims. *See* JX-0027C at 4-7. On October 13, 2010, the day after receiving Microsoft's letter, Move filed an Information Disclosure Statement ("IDS") identifying the Carmel reference to the USPTO. *See* JX-0031 at 63-64.

On October 18, 2010, Move filed a continuation application, U.S. Application No. 12/906,940 (the "'940 Application"), wherein it included nearly identical independent claims copied from the '483 CIP Application. *See* JX-0032 ('940 Application file history) at 2201. Carmel was included in an IDS filed concomitantly with the application. *See id.* at 2196. Move then filed preliminary amendment remarks on December 22, 2010, wherein it: (1) explained the circumstances of the IDS disclosure of Carmel in the '483 CIP Application; (2) requested that the patentability of the independent claims copied from the '483 CIP Application be assessed (claims 22 and 23); and (3) included approximately thirty pages of argument concerning how the claims were patentable over Carmel. *See id*. at 1128-68. The same examiner that handled the prosecution of the '483 CIP Application handled the prosecution of the '940 Application. *See* CX-0119 ('940 Application June 6, 2012, First OA); CX-1228 ('483 CIP Application Notice of Allowance).

[redacted]

Thereafter, Move received a Non-Final Office Action in the '940 Application allowing claims 22 and 23 after "[a] thorough review of the prior art." CX-0119 at 15-16.

Respondents argue that once Move received the Microsoft letter, Move knew it was required to withdraw the '483 CIP Application from issuance and file a request for continued examination ("RCE") in order for the examiner to consider Carmel before issuance. Resps. Br. at 255-57. Respondents further contend that filing the '940 Application and disclosing Carmel in that application demonstrates that Move believed Carmel to be material to the '483 CIP Application. *Id*.

To meet the clear and convincing evidence standard required to prove unenforceability due to inequitable conduct, respondents must show that "the single most reasonable inference able to be drawn from the evidence" is that the inventors intended to deceive the Patent Office. *Therasense*, 649 F.3d at 1290 (quoting *Star Scientific Inc. v. R.J. Reynolds Tobacco Co*., 537 F.3d 1357, 1365 (Fed. Cir. 2008)). The weight of the evidence here does not meet that standard. It is undisputed that Move received the Microsoft letter within days of the expected issue date of the '483 CIP Application and took immediate action to submit the letter to the Patent Office. CX-1227 ('483 CIP Application IDS filed Oct. 13, 2010); JX-0032 ('940 Application file history) at 2201. Move also submitted Carmel in an IDS in U.S. App. No. 11/116,783 in accordance with 37 C.F.R. § 1.97(d). CX-1236. Whether or not other conduct, such as requesting the '483 CIP Application be withdrawn, would have been appropriate also, it is reasonable to infer that Move acted candidly after learning of Carmel. That defeats respondents' contention of intent to deceive. *See Therasense*, 649 F.3d at 1290-91.

Furthermore, above I found that Carmel neither anticipates nor renders obvious the asserted claims in this investigation. *See supra* Secs. XIV.B.1 and 3. As noted above, the examiner of the

'940 and '483 CIP Applications found claims 22 and 23 of the '483 CIP Application to be patentable over Carmel. *See* CX-0119 at 15-16. Respondents have not shown that Carmel is "but for" material to either the '940 or the '483 CIP Application. *See* CX-0008C (Jeffay RWS) at Q/A 268-73; *see also Therasense*, 649 F.3d at 1291-92.

Respondents argue that Move's preliminary amendment in the '940 Application was an affirmative misrepresentation of the content of Carmel rising to the level of inequitable conduct. *See* Resps. Br. at 261-63. However, respondents do not dispute that the examiner had the Carmel reference. The examiner was under no obligation to accept Move's interpretation of Carmel as true. *See* CX-0009C (Rea RWS) at Q/A 35-36. The record supports an inference that Move's preliminary amendment comprised "legitimate attorney argument" regarding the distinctions of the claims over Carmel, rather than an affirmative misrepresentation of Carmel. *See Rothman v. Target Corp.*, 556 F.3d 1310, 1328-29 (Fed. Cir. 2009). Respondents therefore have not met the clear and convincing standard on that point either. *See Therasense*, 649 F.3d at 1291-93 (material misconduct from affirmative misrepresentations is usually limited to circumstances involving an "unmistakably false affidavit" or false testing data, which the examiner cannot independently verify).

Respondents further argue that the Microsoft Letter, including its claim charts, were material and never disclosed. *See* Resps. Br. at 263-65. However, the Microsoft Letter (including its claim charts) was cumulative of Carmel. JX-0027C (Microsoft Letter); CX-0008C (Jeffay RWS) at Q/A 285. Because Carmel itself is not "but for" material, a reference cumulative of Carmel cannot be "but for" material. *See Therasense*, 649 F.3d at 1291-93.

2. Public Use

Respondents additionally argue that Move's public use of its adaptive bitrate streaming technology in 2005 and 2006 also should have been disclosed to the Patent Office. *See* Resps. Br. at 266-67. But I have determined above that the public use of the invention in 2005 and 2006 was not before the priority date to which the claims were entitled. *See supra* Sec. XIV.C. Therefore, that prior use is not prior art and withholding it does not satisfy the "but for" materiality standard. *See Therasense*, 649 F.3d at 1291-92.

3. Conclusion

Respondents have not shown by clear and convincing evidence that the asserted claims are invalid based on inequitable conduct.

F. Eligibility Under 35 U.S.C. § 101

Respondents contend that all of the asserted claims of all of the asserted patents are directed to ineligible subject matter under § 101 of the Patent Act.

Section 101 of the Patent Act permits patenting of "any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof." 35 U.S.C. § 101. Prohibited, however, are patents claiming "[l]aws of nature, natural phenomena, and abstract ideas" because they "are basic tools of scientific and technological work." *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 70 (2012). While these narrow exceptions to the broad scope of patentability are necessary to "promote the progress of science and useful arts," as stated in Art. I., Sec. 8, Cl. 8, of the U.S. Constitution, "too broad an interpretation of this exclusionary principle could eviscerate patent law." *Mayo*, 566 U.S. at 70. Caution in an analysis under § 101 is warranted because "all inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas." *Id*.

To determine whether a patent's claims fall within one of the narrow exemptions to patentability, courts must engage in a two-step inquiry. First, the court must "determine whether the claims at issue are directed to one of those patent-ineligible concepts." *Alice Corp. Pty. v. CLS Bank Int'l*, 573 U.S. 208, 216 (2014). If not, the inquiry ends, and the claims are not directed to ineligible subject-matter under § 101. *Id.* This inquiry "focus[es] on the language of the Asserted Claims themselves . . . considered in light of the specification." *See TecSec, Inc. v. Adobe Inc.*, 978 F.3d 1278, 1292 (Fed. Cir. 2020) (cleaned up).

Only if one or more claims are found to be directed to a patent-ineligible concept does the inquiry then turn to the second step: examination of the elements of each claim "both individually and 'as an ordered combination' to determine whether the additional elements 'transform the nature of the claim' into a patent-eligible application." *Alice*, 573 U.S. at 217 (quoting *Mayo*, 566 U.S. at 79). A patent is directed to ineligible subject-matter only if it fails both steps. *See id.*

a) The '564 and '156 Patents

(1) *Alice* Step One

Respondents argue that the asserted claims of the '564 and '156 patents are directed to the abstract idea of "delivering content at different quality levels based on network availability." Resps. Br. at 279.

In *Free Stream*, the Federal Circuit emphasized that Alice Step 1 requires examination of "whether the claims in the patent focus on a specific means or method that improves the relevant technology or are instead directed to a result or effect that itself is the abstract idea and merely invoke generic processes and machinery." *Free Stream Media Corp. v. Alphonso Inc.*, 996 F.3d 1355, 1363 (Fed. Cir. 2021) (quoting *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d

1299, 1314 (Fed. Cir. 2016)). Thus, *Alice* Step 1 requires me to focus on the words of the claims to determine if they are "directed to a result or effect."

Claim 1 of the '564 patent states:

> 1. An end user station for adaptive-rate content streaming of digital content from a video server over a network, the end user station comprising:
>
> a media player operating on the end user station configured to stream a video from the video server via at least one transmission control protocol (TCP) connection over the network,
>
> wherein multiple different copies of the video encoded at different bit rates are stored on the video server as multiple sets of files,
>
> wherein each of the files yields a different portion of the video on playback,
>
> wherein the files across the different copies yield the same portions of the video on playback, and
>
> wherein each of the files comprises a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video, and
>
> wherein the media player streams the video by: requesting a plurality of sequential files of one of the copies from the video server based on the time indexes;
>
> automatically requesting from the video server subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies,
>
> the automatically requesting including repeatedly generating a factor indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies, wherein the set of one or more factors relate to the performance of the network;
>
> making the successive determinations to shift the playback quality based on the factor to achieve continuous playback of the video using the files of the highest quality one of the copies determined sustainable at that time so that the media player upshifts to a higher

> quality one of the different copies when the factor is greater than a first threshold and downshifts to a lower quality one of the different copies when the factor is less than a second threshold; and
>
> presenting the video by playing back the requested media files with the media player on the end user station in order of ascending playback time.

JX-0001 ('564 patent) at claim 1. Respondents identify claim 1 of the '564 patent as representative of the asserted and domestic industry claims in the '564 and '156 patents. Respondents concede other asserted claims of the '564 and '156 patents do not differ materially for the purposes of this analysis.

On their face, the claims of the '564 and '156 patents recite specific actions performed by the inventive media player to provide improved video streaming. The claims describe a definite environment in which the invention operates, which includes a video server and a network. The claims do not merely claim a desired result.

Respondents argue that the asserted claims of the '564 and '156 patents are directed to the "patent-ineligible abstract idea of delivering content at different quality levels based on network availability." Resps. Br. at 279. However, the claimed end user station of the '564 patent requests portions of video content, where those portions are created by segmenting a complete video into multiple different bitrate portions to create streamlets with equal durations and time indexes. The playback of those streamlets on the end user station is repeatedly adjusted to higher or lower bitrate streamlets according to a factor that accounts for changing network conditions. *See generally, Finjan, Inc. v. Blue Coat Sys., Inc.*, 879 F.3d 1299, 1305 (Fed. Cir. 2018) (holding that claims did not recite an abstract idea where they "employ[ed] a new kind of file that enables a computer security system to do things it could not do before.").

The claimed apparatus of the ’156 patent similarly requests sequential streamlets from the video server according to the playback times of the streamlets, which are also segmented from the content file into multiple bitrate portions, and playback of those streamlets on the end user station is similarly adjusted to higher or lower bitrate streamlets according to a factor that accounts for changing network conditions. These claims go beyond claiming the general concept of streaming, and even the general concept of adaptive bitrate streaming; they are an improvement on earlier streaming systems. *See Alice*, 573 U.S. at 217 (claims patent-eligible as a matter of law if “they improve an existing technological process”).

The specification provides further evidence that this claimed system is a significant departure and improvement over then-existing computer functionality. For example, the specification explains how prior streaming implementations, such as “progressive downloads,” did not fully support functionalities like rewind, fast forward, and direct seek during streaming, and were vulnerable to network failures or congestion.” *See* JX-0001 (’564 patent) at 2:1-22. The specification further explains how the claimed adaptive bitrate streaming offered improvements to existing problems with streaming reliability, efficiency, and latency, such that users could enjoy to enable more reliable and continuous streaming. *See id*. at 2:25-57; CX-0008C (Jeffay RWS) at Q/A 243 (explaining how the ’564 and ’156 patents provided improvements concerning reliability, efficiency, and latency). Thus, the ’564 and ’156 patents specifically purport to improve user content streaming to overcome problems existing from prior streaming solutions. *See Uniloc USA, Inc. v. LG Elecs. USA, Inc.*, 957 F.3d 1303, 1307 (Fed. Cir. 2020) (reversing section 101 ineligibility holding because “the claims at issue are directed to a patent-eligible improvement to computer functionality, namely the reduction of latency experienced by parked secondary stations in communication systems.”); *Packet Intel. LLC v. NetScout Sys., Inc.*, 965 F.3d 1299, 1309 (Fed.

Cir. 2020) (finding claims patent-eligible because they "meet a challenge unique to computer networks, identifying disjointed connection flows in a network environment").

Respondents have not shown that the asserted claims of the of the '564 and '156 patents are directed to an abstract idea. Consideration of step two of *Alice* is therefore unnecessary because the claims are not directed to ineligible subject-matter. *Alice*, 573 U.S. at 216.

(2) *Alice* Step Two

Even had respondents shown that the asserted claims of the of the '564 and '156 patents were directed to abstract ideas, the particular arrangements of claimed elements demonstrate the claims are directed to eligible subject matter under step two of *Alice*. In particular, the asserted claims of the '564 and '156 patents are directed toward improvements in adaptive bitrate streaming that include partitioning/segmenting the content file and making successive determinations as to whether to change the stream quality based on network conditions. *See Bascom Glob. Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1350 (Fed. Cir. 2016) (the patent-eligible inventive concept identified was "the installation of a filtering tool at a specific location, remote from the end-users, with customizable filtering features specific to each end user. This design gives the filtering tool both the benefits of a filter on a local computer and the benefits of a filter on the ISP server.").

As the patents themselves confirm, conventional streaming encounters three basic challenges with regard to data transport over a network such as the Internet: reliability, efficiency, and latency. *See* JX-0001 ('564 patent) and JX-0004 ('156 patent) at 2:16-60. Addressing these issues, the claims are purportedly directed to a specific end user station and apparatus designed to implement a specific solution to known problems with streaming content over the Internet, which includes delivering streaming content using adaptive bitrate streaming by segmenting the content

file into streamlets to permit seamless transitions between different bitrates and shifting control of switching between the bitrates to the client from the server. *See* CX-0008C (Jeffay RWS) at Q/A 246; JX-0001 ('564 patent) at claim 1; JX-0004 ('156 patent) at claim 1.

(3) Conclusion

Accordingly, respondents have not demonstrated that the asserted claims of the '564 and '156 patents are directed toward ineligible subject matter.

b) The '554 and '555 Patents

(1) *Alice* Step One

Respondents have not shown that the asserted claims of the '554 and '555 patents are directed to an abstract idea, devoid of a concrete or tangible application. Rather, the asserted claims are directed to technical improvements in video streaming. *See Alice*, 573 U.S. at 223 ("[T]he claims in [*Diamond v. Diehr*, 450 U.S. 175, 188 (1981)] were patent eligible because they improved an existing technological process, not because they were implemented on a computer.").

Respondents contend that the asserted claims of the '554 and '555 patents are "directed to the similar patent-ineligible abstract idea of delivering content at different speeds based on network availability." Resps. Br. at 282. Yet, the asserted claims of the '554 and '555 patents provide a concrete solution to a problem in the form of partitioning the content file to permit seamless transitions between different bitrates and shifting control of switching between the bitrates to the client from the server. *See* CX-0008C (Jeffay RWS) at Q/A 255. The inventions in the '554 and '555 patents improve the functionality of a communication network used to provide digital media services like video streaming—they are an improvement on earlier streaming systems. The specifications of the '554 and '555 patents explain that "three basic challenges exist with regard to data transport streaming over a network such as the Internet that has a varying amount of data

loss." JX-0002 ('554 patent) at 2:23-25; JX-0003 ('555 patent) at 2:23-25. These disclosures show that the claims recite technical solutions to then-existing technical problems.

The claimed end user station and content player device "provide an apparatus, system, and method for adaptive-rate content streaming that overcome many or all of the above-discussed shortcomings in the art." JX-0002 ('554 patent) at 3:8-10; JX-0003 ('555 patent) at 3:8-10. Respondents have not shown that the asserted claims of the of the '554 and '555 patents are directed to an abstract idea, devoid of a concrete or tangible application. Consideration of step two of *Alice* is therefore unnecessary because the claims are not directed to ineligible subject-matter.

(2) *Alice* Step Two

Even if respondents had met their burden of showing that the asserted claims of the '554 and '555 patents were directed to abstract ideas, the particular arrangements of elements in the asserted claims demonstrate the claims are directed to eligible subject matter under step two of *Alice*. In particular, the asserted claims of the '554 and '555 patents are be directed toward specific apparatuses for delivering streaming content using adaptive bitrate streaming wherein the content file is segmented into streamlets and shifting control of switching between the bitrates to the client from the server. *See Bascom*, 827 F.3d at 1350 (the patent-eligible inventive concept identified was "the installation of a filtering tool at a specific location, remote from the end-users, with customizable filtering features specific to each end user. This design gives the filtering tool both the benefits of a filter on a local computer and the benefits of a filter on the ISP server.").

As the patents themselves confirm, conventional streaming encounters three basic challenges with regard to data transport over a network such as the Internet: reliability, efficiency, and latency. *See* JX-0002 ('554 patent) and JX-0003 ('555 patent) at 2:23-67. Addressing these

issues, the claims are directed to a specific end user station and apparatus designed to implement a specific solution to known problems with streaming content over the Internet, which includes delivering streaming content using adaptive bitrate streaming by segmenting the content file into streamlets to permit seamless transitions between different bitrates and shifting control of switching between the bitrates to the client from the server. *See* CX-0008C (Jeffay RWS) at Q/A 255; JX-0002 ('554 patent) at claim 16; JX-0003 ('555 patent) at claim 10.

(3) Conclusion

Respondents have not demonstrated that the asserted claims of the '554 and '555 patents are directed toward ineligible subject matter.

XV. ECONOMIC PRONG OF THE DOMESTIC INDUSTRY REQUIREMENT

For a patent-based complaint, a violation of section 337 can be found "only if an industry in the United States, relating to the articles protected by the patent . . . exists or is in the process of being established." 19 U.S.C. § 1337(a)(2). The complainant bears the burden of establishing that the domestic industry requirement is satisfied. *John Mezzalingua Assocs., Inc. v. Int'l Trade Comm'n*, 660 F.3d 1322, 1331 (Fed. Cir. 2011).

Section 337(a)(3) sets forth the following economic criteria for determining whether the economic prong of the domestic industry requirement is satisfied in such investigations:

> [A]n industry in the United States shall be considered to exist if there is in the United States, with respect to the articles protected by the patent, copyright, trademark, mask work, or design concerned –
>
> (A) significant investment in plant and equipment;
>
> (B) significant employment of labor or capital; or
>
> (C) substantial investment in its exploitation, including engineering, research and development, or licensing.

19 U.S.C. § 1337(a)(3). Given that these criteria are listed in the disjunctive, satisfaction of any one of them will be sufficient to meet the economic prong of the domestic industry requirement. *See Certain Printing and Imaging Devices and Components Thereof*, Inv. No. 337-TA-690, Comm'n Op. at 25, USITC Pub. No. 4289 (Nov. 2011).

The establishment of the "economic prong" is not dependent on any "minimum monetary expenditure" and there is no need for the complainant "to define the industry itself in absolute mathematical terms." *Certain Stringed Musical Instruments and Components Thereof* ("*Stringed Instruments*"), Inv. No. 337-TA-586, Comm'n Op. at 25-26 (May 16, 2008). The Commission has clarified that investments in plant and equipment, labor, and capital that may fairly be considered investments in research and development under subsection (C) are eligible for consideration under subsections (A) and (B) as well. *Certain Solid State Storage Drives, Stacked Electronics Components, and Products Containing Same*, Inv. No. 337-TA-1097, Comm'n Op. at 14 (June 29, 2018).

As for accounting and allocations, the complainant need not provide a "precise accounting" of its investments to determine their numerical value, "as most people do not document their daily affairs in contemplation of possible litigation." *Stringed Instruments*, Inv. No. 337-TA-586, Comm'n Op. at 15. Reasonable and appropriate allocation methodologies, such as sales-based allocations, have been employed and accepted by the Commission to satisfy the domestic industry economic prong. *See Certain Marine Sonar Imaging Devices, Including Downscan and Sidescan Devices, Products Containing the Same, and Components Thereof*, Inv. No. 337-TA-921, Comm'n Op. at 61-62 (approving use of weighted sales-based allocation to arrive at investment amounts) (Jan. 6, 2016).

DISH argues that it has satisfied the economic prong of the domestic industry requirement of section 337(a)(3)(A)-(C) through significant investment in plant and equipment, as well as labor and capital, with respect to the articles protected by the asserted patents, and substantial investment in exploitation of the asserted patents. *See* Compls. Br. at 269-96. Respondents oppose any such findings. *See* Resps. Br. at 283-94. The Staff argues that DISH has satisfied the economic prong of the domestic industry requirement under subsections (A) and (B), but not subsection (C). *See* Staff Br. at 247-78. For the reasons below, I find that DISH satisfies the economic prong of the domestic industry requirement.

A. Findings of Fact Relating to the Domestic Industry

DISH identifies [redacted] U.S. facilities that are purportedly used to research, design, develop, remanufacture, market, sell, and support the relevant products and services:

[redacted]

Together, these [redacted] facilities add up to approximately [redacted] square feet. *See* CX-0002C (Kroonenberg DWS) at Q/A 31. DISH further employs approximately [redacted] full-time employees and approximately [redacted] contract employees at these facilities who install, repair, and replace DISH Set-Top Boxes; operate and maintain servers and other equipment; and provide technical customer support and other activities. *See* CX-0016C (DISH Headcount); CX-0002C (Kroonenberg DWS) at Q/A 32.

Respondents argue that DISH's domestic industry calculations are flawed because DISH relies on "Covered Servers"[27] in its analysis without sufficiently tying the Covered Servers to the asserted patents.

DISH argues that it is entitled to rely on the Covered Servers because it could not exploit the technology of the asserted patents without the Covered Servers, and thus these servers are "'necessary to bring the patented technology to the consumer market.'" Compls. Br. at 272 (quoting *Certain Magnetic Tape Cartridges and Components Thereof* ("*Magnetic Tape Cartridges*"), Inv. No. 337-TA-1058, Comm'n Op. at 56 (Apr. 9, 2019)). It is argued that the proprietary nature of DISH's technology renders them incompatible with other systems, and that DISH's investments in critical, non-patented products and services, such as "compression and decompression technologies," should likewise be credited toward DISH's domestic industry here. *See id.* at 273-74.

[27] The DISH Covered Servers include DISH's Streamlet Servers, Media Servers, and CDN Servers. *See* CX-0010 (Negus DWS) at Q/A 673; CX-0003C (Marshall DWS) at Q/A 28-30; CX-0529C. DISH's Streamlet Servers and Media Servers are located in [redacted], *see* CX-0003C (Marshall DWS) at Q/A 29-30, while DISH's CDN Servers are located throughout the United States, *see id.* at Q/A 28.

[redacted]

The Staff agrees with DISH that the Covered Servers should be included in the claimed domestic industry because the Covered Servers are essential components that enable the exploitation of the patented technology, and the claimed end user products cannot alone implement the claimed streaming technology without the Covered Servers. *See* Staff Br. at 256-58.

Customers cannot use DISH's Set-Top Boxes or Amazon Fire App without the Covered Servers. As Mr. Kroonenberg testified, [redacted] CX-0002C (Kroonenberg DWS) at Q/A 54. The claims themselves directly implicate the Covered Servers with reference to server content "encoded," "stored," and "accessed." *Id.* at Q/A 53; CX-0986C (System Architecture); CX-0003C (Marshall DWS) at Q/A 31.

Respondents argue that the Covered Servers "could be substituted for commercially available third-party CDN services." Resps. Br. at 286. However, this argument implicitly recognizes that at least a server of some sort is a necessary component to exploit the patented inventions and should be credited for DISH's domestic industry. Moreover, Mr. Marshall testified as to the proprietary nature of DISH's software and also confirmed that these servers are "critical" to implementing this technology:

[redacted]

Based on the record evidence discussed above, I find that the Covered Servers are necessary to exploit the patented technology. The Commission has found investments in articles

that do not themselves practice the patent can contribute to the domestic industry where those investments were "central to enabling" exploitation of the article covered by the patented claims. *See, e.g.*, *Magnetic Tape Cartridges*, Comm'n Op. at 47-57.

For the reasons stated above, I include DISH's investments related to the Covered Servers in my analysis of DISH's domestic industry.

B. DISH's Allocation Methodology

Respondents argue that DISH's allocation methodology is flawed because, with regard to the Set-Top Boxes, DISH did not proportion DISH customer usage between satellite and Internet streaming. *See* Resps. Br. at 288-89. Because the claims cover only Internet streaming, respondents contend that complainant's expert Dr. Vander Veen provided an unreliable allocation. *See id.*

DISH argues that its allocation methodology is reasonable because all asserted claims are apparatus claims, and DISH captures whether the Set-Top Boxes are used for Internet streaming each month. *See* Compls. Br. at 274-75. The Staff agrees that Dr. Vander Veen's methodology is reasonable and fact-based and argues that a DISH Set-Top Box "is an article protected by the Asserted Patents" if it has been used even once with the patented technology. Staff Br. at 261.

I find that DISH's usage-based allocation is reasonable. DISH's allocation methodology is based on the average percentages of total DISH Set-Top Boxes that are used to stream content using the patented ABR technology each month, from 2016 through June 2021, and DISH tracks this type of usage as part of its ordinary course of business. *See* CX-0002C (Kroonenberg DWS) at Q/A 23. DISH's allocation methodology is therefore "appropriate to [its] circumstances" and "supported by the evidence in the record." *Certain Mobile Device Holders and Components Thereof*, Inv. No. 337-TA-1028, Comm'n Op. at 18 (Mar. 22, 2018).

[redacted]

Using this allocation methodology, DISH captured individual instances of practicing the asserted patents by tracking number of the Set-Top Box in a particular month. *See* CX-0002C (Kroonenberg DWS) at Q/A 23). This data shows that the average percentages of the Set-Top Boxes used to stream content by practicing the asserted claims each month from 2016 through June 2021 were as follows:

[redacted]

DISH argues that that no allocation is required with respect to the Sling TV Apps, because these are 100% Internet-based streaming (*i.e.*, there is no satellite-based alternative service). Compls. Br. at 275-76. That said, Dr. Vander Veen did offer two alternative allocation methodologies accordingly to the monthly usage rate of Sling TV Apps by platform. *See id*. His first alternative allocation methodology aggregates the monthly usage percentage of Sling TV Apps for the three claimed domestic industry platforms, Amazon, iOS, and Roku, "if it were determined that DISH could only rely on those platforms to satisfy Section 337(a)(3)." *Id*. at 276. Dr. Vander Veen's second alternative allocation methodology accounts for the monthly usage rate of only the Sling Fire App, "if it were determined that DISH could only rely on the Amazon platform to satisfy Section 337(a)(3)." *Id.* Respondents do not dispute whether Dr. Vander Veen should have allocated DISH's investments by asserted patent. *See* Resps. Br. at 283-94.

I find that Dr. Vander Veen's allocation methodology accounting for the monthly usage rate of only Sling Fire App is appropriate. As I found above, DISH has not shown that the Sling

[redacted]

Fire App is representative of the Sling TV Apps for iOS and Roku. *See supra* Sec. VIII.B. Thus, the claimed investments relating to Sling TV should be allocated according to the following methodology:

[redacted]

C. DISH's Investments in Plant and Equipment

I find that DISH has demonstrated [redacted] in plant and equipment expenses with respect to articles protected by the asserted patents. DISH's plant and equipment investments are comprised of five categories: (1) buildings, land, and improvements; (2) furniture, fixtures, and equipment; (3) rent, utilities, and maintenance; (4) leased equipment; and (5) payments to third party CDNs. *See* Compls. Br. at 276-82.

1. Buildings, Land, and Improvements

DISH maintains U.S. facilities in [redacted] *See* CX-0002C (Kroonenberg DWS) at Q/A 33-40. These facilities includes DISH's headquarters, digital broadcast and data centers, facilities where

[redacted]

DISH Set-Top Boxes, IT facilities, customer call centers, and warehouse and distribution centers.

See id.

[redacted]

As of June 30, 2021, DISH's net book value of the buildings, land, and improvements associated with the identified facilities were [redacted] for DISH TV and [redacted] for Sling TV. CX-0029C (Buildings, Land, and Improvements).

[redacted]

When the corresponding investments in DISH TV and Sling TV are allocated as described above, the net book value of buildings, land, and improvements allocable to the asserted patents is: [redacted] for Engineering/R&D, [redacted] for Manufacturing/Distribution, [redacted] for Broadcast/Data Centers, and [redacted] for Installation. CX-0007C (Vander Veen DWS) at Q/A 40.

2. Furniture, Fixtures, and Equipment

DISH's U.S. facilities include servers and other equipment associated with providing streaming content, and these investments play a direct role in delivering the claimed technology to consumers. *See* CX-0986C (System Architecture); CX-0003C (Marshall DWS) at Q/A 17, 28-30. DISH's data centers in [redacted] house equipment needed to prevent service interruptions, such as generators and battery packs. *See* CX-0002C (Kroonenberg

[redacted]

DWS) at Q/A 53 ([redacted]).

[redacted]

As of June 30, 2021, DISH's net book value of the furniture, fixtures, and equipment within DISH's identified U.S. facilities were [redacted] for DISH TV and [redacted] for Sling TV. CX-0031C (Furniture, Fixtures, and Equipment).

[redacted]

[redacted]

[redacted]

When the corresponding investments in DISH TV and Sling TV are allocated as described above, the net book value of furniture, fixtures, and equipment allocable to the asserted patents is:

[redacted]

3. Rent, Utilities, and Maintenance

DISH's rent, utilities, and maintenance for DISH's identified U.S. facilities were [redacted] in 2016, [redacted] in 2017, [redacted] in 2018, [redacted] in 2019, [redacted] in 2020, and [redacted] through June 2021. CX-0018C (Rent, Utilities, and Maintenance); CX-0030C (Rent, Utilities, and Maintenance).

[redacted]

[redacted]

When the corresponding investments in DISH TV are allocated as described above, the net book value of rent, utilities, and maintenance allocable to the asserted patents is:

[redacted]

With respect to Sling TV, DISH's rent, utilities, and maintenance for DISH's identified U.S. facilities were [redacted] in 2016, [redacted] in 2017, [redacted] in 2018, [redacted] in 2019, [redacted] in 2020, and [redacted] through June 2021. CX-0018C (Rent, Utilities, and Maintenance); CX-0030C (Rent, Utilities, and Maintenance).

[redacted]

[redacted]

CX-0030C (Rent, Utilities, and Maintenance) at 6.

When the corresponding investments in Sling TV are allocated as described above, the net book value of rent, utilities, and maintenance allocable to the asserted patents is:

[redacted]

CX-0007C (Vander Veen DWS) at Q/A 45.

4. Leased Equipment

DISH TV services are only available to customers that lease or own certain proprietary equipment from DISH. *See* CX-0003C (Marshall DWS) at Q/A 34, 48. The net book value of the equipment that was leased to customers in the United States totaled [redacted] as of June 30, 2021. CX-0032C (Leased Equipment).

[redacted]

[redacted]

CX-0032C (Leased Equipment) at 1.

The Set-Top Boxes comprises approximately [redacted] of the total cost of this equipment, and of these Set-Top Boxes, [redacted] were Set-Top Boxes that practice the asserted patents as of 2021, CX-0007C (Vander Veen DWS) at Q/A 33. Combining these two percentages, in turn, shows that [redacted] of the value of the equipment owned or leased by DISH TV customers, or [redacted] was attributable to leased Set-Top Boxes that practice the asserted patents. *See id.* at Q/A 33, 47.

[redacted]

CDX-0007C (Vander Veen Demonstratives) at 36.

Respondents argue that Dr. Vander Veen's analysis overvalues the Set-Top Boxes as a portion of the net book value of leased equipment. *See* Resps. Br. at 293. Respondents rely on Ms. Mulhern's critique that Dr. Vander Veen's "methodology fails to account for evidence that Set-Top Boxes have a shorter useful life than other leased equipment." RX-0005C (Mulhern RWS) at Q/A 72. However, DISH argues that it only considers the depreciated value of its equipment. Compls. Reply Br. at 89. I find that respondents have not adduced sufficient evidence

rebutting Dr. Vander Veen's analysis. Ms. Mulhern cites generalized articles, *see* RX-0005C (Mulhern RWS) at Q/A 73, and it has not been shown that Dr. Vander Veen's analysis is unreliable.

5. Third-Party CDN Servers

DISH seeks to include payments to third parties to host Covered CDN Servers in the United States as part of its domestic industry investments. CX-0003C (Marshall DWS) at Q/A 28. I need not resolve whether these payments should be considered part of DISH's domestic industry because, as noted below, DISH's domestic industry investments are significant even when these payments are excluded.

6. Total Allocated Investments in Plant and Equipment

As discussed above, the evidence shows that DISH's Sling TV investments should be allocated according to the Sling TV App for Amazon methodology. Likewise, the investments based on payments to third-party CDNs should be excluded. Thus, using the Amazon Only allocation methodology, and also deducting payments to third-party CDNs, the evidence shows that DISH's claimed investments in plant and equipment should be reduced accordingly.

As discussed above, the net book value of buildings, land, and improvements allocable to the asserted patents is: [redacted] for Engineering/R&D, [redacted] for Manufacturing/Distribution, [redacted] for Broadcast/Data Centers, and [redacted] for Installation. *See supra* Sec. XV.C.1. This sums to [redacted] Likewise, the net book value of furniture, fixtures, and equipment allocable to the asserted patents is: [redacted] for Engineering/R&D, [redacted] for Manufacturing/Distribution, [redacted] for for Broadcast/Data Centers, and [redacted] for Installation. *See supra* Sec. XV.C.2. The sum total here is [redacted]

For rent, utilities, and maintenance, the following table is based on the calculations discussed above in Sec. XV.C.3. As DISH can only show representativeness of the DISH Set-Top

Boxes after December 2017, *see supra* Sec. VIII.A, DISH cannot be credited for the investments made in DISH TV prior to 2018.

[redacted]

Finally, the net bulk value of DISH's leased equipment is [redacted]. *See supra* Sec. XV.C.4.

The total amount of allocated investments in plant and equipment thus attributable to articles protected by the asserted patents is [redacted].[28]

D. DISH'S Investments in Labor and Capital

I find that DISH has demonstrated [redacted] in labor and capital expenses with respect to articles protected by the asserted patents.

1. Salaries and Benefits

DISH employs approximately [redacted] full-time employees and approximately [redacted] contract employees at its the [redacted] facilities that support DISH TV and Sling TV operations. *See* CX-0002C (Kroonenberg DWS) at Q/A 32; CX-0016C (DISH headcount).

As of June 30, 2021, DISH paid its domestic employees working on DISH TV [redacted] in 2016, [redacted] in 2017, [redacted] in 2018, [redacted] in 2019, [redacted]

[28] DISH argues that its sales and marketing expenses should be credited as well because it is more than a mere importer. *See* Compls. Br. at 283-84. Respondents contend that such expenditures should be excluded from the domestic industry investments. *See* Resps. Br. at 293-94. I need not reach this issue because DISH's total investments in plant and equipment are significant and substantial irrespective of its sales and marketing expenditures. *See infra* Sec. XV.F. However, if such expenditures are considered, DISH's total investments in plant and equipment exceed [redacted]. *See* CX-0007C (Vander Veen DWS) at Q/A 52.

[redacted] in 2020, and [redacted] through June 2021. CX-0020C (Salaries and Benefits); CX-0033C (Salaries and Benefits).

[redacted]

CX-0033C (Salaries and Benefits) at 3.

[redacted]

CDX-0007C (Vander Veen Demonstratives) at 71.

[redacted]

When the corresponding investments in DISH TV are allocated as described above, the net salaries and benefits allocable to the asserted patents is:

[redacted]

CX-0007C (Vander Veen DWS) at Q/A 56.

For Sling TV, the salaries and benefits DISH paid its domestic employees totaled [redacted] in 2016, [redacted] n 2017, [redacted] in 2018, [redacted] in 2019, [redacted] in 2020, and [redacted] through June 2021. CX-0020C (Salaries and Benefits); CX-0033C (Salaries and Benefits).

[redacted]

CX-0033C (Salaries and Benefits) at 5.

[redacted]

CDX-0007C (Vander Veen Demonstratives) at 73.

When the corresponding investments in Sling TV are allocated as described above, the net salaries and benefits allocable to the asserted patents is:

[redacted]

CX-0007C (Vander Veen DWS) at Q/A 56.

2. Total Allocated Investments in Labor and Capital

As discussed above, the evidence shows that DISH's Sling TV investments should be allocated according to the Sling TV App for Amazon methodology, and that DISH can only show representativeness of the DISH Set-Top Boxes after December 2017. *See supra* Secs. VIII.A and B. Hence, the evidence shows that DISH's claimed investments in engineering, R&D, manufacturing, distribution, broadcast/data, and installation activities are summarized in the following table:

[redacted]

[redacted]

CX-0007C (Vander Veen DWS) at Q/A 63.[29]

E. DISH'S Investments in Exploiting the Asserted Patents

DISH contends that its subsection (C) investments include: (1) DISH's acquisition of Move's assets in 2010, which included [redacted] of in-progress R&D for the patented ABR technology; and (2) [redacted] on R&D directed to the patented ABR technology from 2018 through June 2021, as summarized in the following table:

[redacted]

CX-0037C (Move Networks R&D). DISH thus contends it has invested at least [redacted] in R&D that is allocable to the asserted patents. *See* Compls. Br. at 291.

DISH argues there is a nexus between these R&D expenses and the asserted patents because each of these investments was in the patented adaptive bitrate streaming technology, and this technology is and always has been Move's business. *See* Compls. Br. at 290-91.

[29] DISH argues that its sales and marketing expenses should be credited as well because it is more than a mere importer. *See* Compls. Br. at 289-90. Respondents contend that such expenditures should be excluded from the domestic industry investments. *See* Resps. Br. at 293-94. I need not reach this issue because DISH's total investments in labor and capital are significant and substantial irrespective of its sales and marketing expenditures. *See infra* Sec. XV.F. However, if such expenditures are considered, DISH's total investments in labor and capital exceed [redacted] *See* CX-0007C (Vander Veen DWS) at Q/A 64-65.

I need not determine whether DISH satisfies the domestic industry requirement under prong (C) of the statute because, as explained below, I find that a domestic industry exists under prongs (A) and (B).

F. Significance Analysis

I find that DISH's investments of [redacted] in plant and equipment expenses with respect to articles protected by the asserted patents are qualitatively and quantitatively significant under 19 U.S.C. § 1337(a)(1)(A). I find that DISH's investments of [redacted] in labor and capital expenses with respect to articles protected by the asserted patents are qualitatively and quantitatively significant under 19 U.S.C. § 1337(a)(1)(B).

All of DISH's "principal properties" are located in the United States. CX-0044 (2020 Annual Report) at 43. With respect to plant and equipment, for example, DISH's properly allocated domestic expenditures are [redacted] larger in comparison compared to DISH's total foreign investments of in buildings, land, rent, utilities, taxes, furniture, and fixtures over the same time period. *See* CX-0007C (Vander Veen DWS) at Q/A 78; CX-0036C (DISH's Foreign Investments). Similarly, with respect to labor or capital, DISH's total properly allocated domestic investments in salaries and benefits of is larger than DISH's total foreign investments in salaries and benefits from over the same time period. *See id.* Indeed, over [redacted]% of DISH's workforce is located in the United States. *See* CX-0016C (DISH Headcount).

Moreover, DISH's evidence has appropriately demonstrated the nature and relative importance of its domestic activities to the Set-Top Boxes and Amazon Fire App in view of the relevant industry. *See Certain Male Prophylactic Devices*, Inv. No. 337-TA-546, Comm'n Op. at 45-46 (Aug. 1, 2007). Since 2017, between [redacted]% of DISH's remanufactured Set-Top Boxes have been remanufactured in the United States. CX-0059C (Set-Top Box Remanufacture).

Between [redacted]% of the DISH Set-Top Boxes in customer homes were remanufactured devices. CX-0007C (Vander Veen DWS) at Q/A 76 (citing CX-0024C (Set-Top Box Summary)). All of the infrastructure that is critical to implementing the patented adaptive bitrate technology on these set-top boxes is located in the United States. *See supra* Sec. XV.A. DISH TV operates within the multichannel video programming distributor market, while Sling TV operates within the virtual multichannel video programming distributor market, which is made up of service providers that deliver "over the top" services. CX-0007C (Vander Veen DWS) at Q/A 79. DISH TV consistently accounts for between [redacted]% of its market, while Sling TV accounts for between [redacted]% of its market. *See id.* at Q/A 80-81.

Respondents contend that DISH's significance analysis is flawed for multiple reasons, including the limited role of streaming video in the DISH TV service, a failure to adequately consider the contribution of foreign investments in the manufacturing of the DISH Set-Top Boxes, and a failure to consider the importance of DISH Anywhere to DISH streaming video services. *See* Resps. Br. at 290-91 (citing RX-0005C (Mulhern RWS) Q/A 76-84).

As to the limited role of streaming as a total portion of DISH's costs and expenses, the fact that DISH's company-wide costs were much greater than the claimed domestic expenditures does not defeat the significance of DISH's domestic industry investments. *See Certain Mobile Electronic Devices, Including Wireless Communication Devices, Portable Music and Data Processing Devices, and Tablet Computers*, Inv. No. 337-TA-794, Comm'n Op. at 104 (July 5, 2013) ("The fact that Samsung's total sales revenues in 2010 and 2011 were much greater than its domestic engineering and research and development expenses, as Apple argues, does not negate the fact that Samsung has invested millions of dollars domestically relating to protected articles."). Respondents contend that DISH's investments are not quantitatively significant because they total

only about [redacted]% of DISH's total costs and expenses. Resps. Br. at 290. However, the total size of a company relative to its investments in the articles protected by the patent does not negate the possibility that those investments are still "significant" and substantial." *See Carburetors* at 28 ("Significance is based on the marketplace conditions regarding the articles protected by the Asserted Patents. The fact that a complainant may have substantial sales of other products is not pertinent to this analysis.")).

As for the failure of DISH to consider the contribution of foreign investments in the manufacturing of the DISH Set-Top Boxes, there is "no indication in the language of subparagraph (A) or (B) that the foreign sourcing of equipment and materials defeats the inclusion of such equipment under subparagraphs (A) or (B) when the equipment and materials are located in the United States for continuous use in the United States." Compls. Reply Br. at 87-88 (quoting *Certain Concealed Cabinet Hinges and Mounting Plates*, Inv. No. 337-TA-289, ID, 1989 WL 608804, at *24-*25 (Sept. 28, 1989)). DISH's Set-Top Boxes are located in the United States for continuous use in the United States.

Regarding DISH Anywhere, it is argued that "DISH Anywhere is not a domestic industry product but does account for a growing portion of DISH's streaming offerings." Resps. Br. at 291. Yet, as Mr. Marshall testified, "You have to have a DISH TV account and those people with a Dish TV account will have a DISH set-top box" to use the DISH Anywhere website or app. CX-0003C (Marshall DWS) at Q/A 48. Dr. Vander Veen properly accounted for the usage of DISH Anywhere because all set-top boxes and all customer accounts are captured in the denominators of his allocations. *See* CX-0007C (Vander Veen DWS) at Q/A 37.

The Staff agrees that DISH has shown that its investments in plant and equipment and labor and capital are quantitatively and qualitatively significant under subsections (A) and (B). *See* Staff

Br. at 276-78. The Staff argues that DISH's properly allocated domestic expenditures in both plant and equipment and labor and capital are several times larger than its corresponding foreign investments in these categories. *See* Staff Br. at 277 (citing CX-0007C (Vander Veen DWS) at Q/A 78; CX-0036C (DISH's Foreign Investments).

As explained above, DISH has demonstrated approximately [redacted] in qualifying expenses in plant and equipment under prong (A), and approximately [redacted] in labor and capital under prong (B) of the statute with respect to articles protected by the asserted patents. *See supra* Secs. XIV.C.6, XIV.D.2. DISH has also appropriately demonstrated that its domestic investments in plant and equipment, and in labor or capital, are quantitatively significant in comparison to the entirety of DISH's foreign investments across relevant categories.

Based on the record evidence discussed above, DISH's investments are quantitatively and qualitatively significant under subsections (A) and (B). DISH has proved a domestic industry exists in articles protected by the asserted patents.

XVI. CONCLUSIONS OF LAW

1. The Commission has subject matter, personal, and *in rem* jurisdiction in this investigation.

2. The importation requirement has been satisfied.

3. DISH has standing to assert the asserted patents.

4. Claims 1 and 3-5 of the '564 patent have been infringed by the importation, sale, and use of all accused products, with the exception of Peloton's [redacted] and MIRROR's MPEG-DASH system.

5. Claim 1 of the '156 patent has been infringed by the importation, sale, and use of all accused products.

6. Claim 2 of the ’156 patent has been infringed by the importation, sale, and use of all Peloton accused products.

7. Claim 4 of the ’156 patent has been infringed by the importation, sale, and use of all accused products, with the exception of Peloton’s [redacted] and MIRROR’s MPEG-DASH system.

8. Claim 5 of the ’156 patent has not been infringed by the importation, sale, and use of all accused products.

9. Claims 16, 17, and 20 of the ’554 patent have been infringed by the importation, sale, and use of all accused products, with the exception of Peloton’s [redacted] and MIRROR’s MPEG-DASH system.

10. Claims 10 and 11 of the ’555 patent have been infringed by the importation, sale, and use of all accused products.

11. Claims 14 and 15 of the ’555 patent have been infringed by the importation, sale, and use of all accused products, with the exception of Peloton’s [redacted] and MIRROR’s MPEG-DASH system.

12. The technical prong of the domestic industry requirement has been satisfied with respect to the asserted patents.

13. The economic prong of the domestic industry requirement has been satisfied with respect to the asserted patents.

14. The asserted claims have not been shown invalid in view of the prior art.

15. The asserted claims have not been shown to be unenforceable.

16. No asserted claim has been shown invalid as failing to satisfy the requirements of 35 U.S.C. § 112.

17. No asserted claim has been shown to be directed to ineligible subject matter under 35 U.S.C. § 101.

18. A violation of 19 U.S.C. § 1337 has been shown by the importation and sale of articles that infringe claims 1 and 3-5 of the ’564 patent.

19. A violation of 19 U.S.C. § 1337 has been shown by the importation and sale of articles that infringe claims 1, 2, and 4 of the ’156 patent.

20. A violation of 19 U.S.C. § 1337 has been shown by the importation and sale of articles that infringe claims 16, 17, and 20 of the ’554 patent.

21. A violation of 19 U.S.C. § 1337 has been shown by the importation and sale of articles that infringe claims 10, 11, 14, and 15 of the ’555 patent.

XVII. RECOMMENDED DETERMINATION ON REMEDY AND BOND

The Commission’s Rules provide that the administrative law judge shall issue a recommended determination concerning the appropriate remedy in the event the Commission finds a violation of section 337 and the amount of bond to be posted by respondents during Presidential review of any Commission remedies. *See* 19 C.F.R. § 210.42(a)(l)(ii).

A. Limited Exclusion Order

The Commission has broad discretion in selecting the form, scope, and extent of the remedy in a section 337 proceeding. *Viscofan, S.A. v. U.S. Int’l Trade Comm’n*, 787 F.2d 544, 548 (Fed. Cir. 1986). A limited exclusion order directed to a respondent’s infringing products is among the remedies that the Commission may impose. *See* 19 U.S.C. § 1337(d).

With respect to a limited exclusion order, DISH argues that “a permanent [limited exclusion order] should issue excluding from entry into the United States all of Respondents’ fitness devices, streaming components thereof, and systems containing same that infringe one or

more of the Asserted Claims, not just those adjudicated to infringe in this Investigation." Compls. Br. at 296 (citing *Certain Audio Players and Controllers, Components Thereof, and Products Containing the Same*, Inv. No. 337-TA-1191, Comm'n Op. at 24 (Feb. 1, 2022)).

Respondents dispute that a limited exclusion order would be an appropriate remedy for a violation of section 337, and further contend that, in the event a limited exclusion order is imposed, it "should be limited to include only those products specifically found to infringe, should explicitly exempt any products found not to infringe, and should include a certification provision to minimize the possibility that non-infringing products would be excluded from entry." Resps. Br. at 295. Respondents further argue that the limited exclusion order "should include a provision delaying enforcement for a period of at least six months to permit implementation of [] non-infringing alternatives." *Id.*

The Staff recommends including a certification provision because "it is something that '[U.S. Customs and Border Protection] typically requests.'" Staff Br. at 280 (quoting *Certain Road Construction Machines and Components Thereof*, Inv. No. 337-TA-1088, Comm'n Op., at 50 (July 15, 2019)); *see also Certain Composite Aerogel Insulation Materials and Methods for Manufacturing the Same*, Inv. No. 337-1003, Comm'n Op., at 62 (Feb. 22, 2018).

If the Commission determines that a violation of section 337 has occurred, I recommend that the Commission issue a limited exclusion order barring entry of products that infringe the asserted patents. I further recommend, in the event the Commission does issue a limited exclusion order in this investigation, the exclusion order should include a provision that allows the respondents to certify, pursuant to procedures to be specified by U.S. Customs and Border Protection, that they are familiar with the terms of the order, that they have made appropriate inquiry, and that, to the best of their knowledge and belief, the products being imported are not

excluded from entry under the order. *Certain Chemical Mechanical Planarization Slurries and Components Thereof*; Inv. No. 337-TA-1204, Comm'n Op. at 26 (Jan. 6, 2022).

I also do not recommend that the limited exclusion order be subject to a six-month enforcement delay to implement any redesigns. Respondents propose Peloton's [redacted] and MIRROR's MPEG-DASH system as potential redesigns, but I have found that neither would suffice as a non-infringing alternative. *See supra* Sec. X, XII.

B. Cease and Desist Order

Section 337 provides that in addition to, or in lieu of, the issuance of an exclusion order, the Commission may issue a cease and desist order as a remedy for a violation of section 337. *See* 19 U.S.C. § 1337(f)(1). The Commission may issue a cease and desist order when it has personal jurisdiction over the party against whom the order is directed. *Gamut Trading Co. v. U.S. Int'l Trade Comm'n*, 200 F.3d 775, 784 (Fed. Cir. 1999).

Under Commission precedent, "[c]ease and desist orders are generally issued when, with respect to the imported infringing products, respondents maintain commercially significant inventories in the United States or have significant domestic operations that could undercut the remedy provided by an exclusion order." *Certain Air Mattress Systems, Components Thereof, and Methods of Using the Same*, Inv. No. 337-TA-971, Comm'n Op. at 49 (May 17, 2017) (citations and footnote omitted). Additionally, at least one Commissioner is of the opinion that the "presence of some infringing domestic inventory, regardless of the commercial significance, provides a basis to issue a cease and desist order." *Certain L-Tryptophan, L-Tryptophan Products, and Their Methods of Production*, Inv. No. 337-TA-1005, Comm'n Op. at 52 n.49 (Jan. 11, 2018).

DISH requests that the Commission issue a cease and desist order directed to each respondent in the event a violation of section 337 is found. *See* Compls. Br. at 297-98. DISH

argues that each respondent holds a commercially significant amount of U.S. inventory of its accused products. *See id.* (citing CX-0007C (Vander Veen DWS) at Q/A 86-88).

The record evidence shows that each respondent maintains a commercially significant inventory of fitness devices, streaming components thereof, and systems containing same in the United States. As of September 27, 2021, Peloton held [redacted] of its accused products in inventory, which equates to [redacted]. *See* CX-0007C (Vander Veen DWS) at Q/A 88-89. As of November 8, 2021, iFIT held [redacted] of its accused products in inventory, which equates to [redacted]. *See id.* at Q/A 87. As of August 2021, MIRROR held [redacted] of accused products in inventory, which equates to [redacted] *See id*. at Q/A 86.

Respondents argue that any cease and desist order should include exceptions to allow for respondents' continued service and repair of any products already sold to consumers before the effective date of any remedial order and to complete any pending contracts or purchase orders. *See* Resps. Br. at 296. Respondents argue that otherwise customers owning an accused product would be harmed, for example by losing access to warranty repairs. *See id.*

The Staff argues that respondents did not cite to any evidence in their pre-hearing brief substantiating a need for the requested exemption. *See* Staff Br. at 282.

Based on the arguments of the parties and the evidence of record, I recommend that the Commission issue a cease and desist order in the event a violation of section 337 is found. DISH has adduced sufficient evidence showing that each respondent maintains commercially significant amounts of infringing products in the United States. Furthermore, respondents' request for a service/repair exemption should be denied because respondents have failed to provide evidence that the public interest supports this request and because respondents did not produce any evidence

to identify which spare parts are of particular importance or should be permitted entry. *See Certain Unmanned Aerial Vehicles and Components Thereof*, Inv. No. 337-TA-1133, Comm'n Op. (Sept. 8, 2020).

C. Bond During Presidential Review

Pursuant to section 337(j)(3), the Commission must determine the amount of bond to be required of a respondent, during the 60-day Presidential review period following the issuance of permanent relief, in the event that the Commission determines to issue a remedy. The purpose of the bond is to protect the complainant from any injury. 19 U.S.C. § 1337(j)(3); 19 C.F.R. §§ 210.42(a)(1)(ii), 210.50(a)(3).

When reliable price information is available, the Commission has often set bond by eliminating the differential between the domestic product and the imported, infringing product. *Certain Microsphere Adhesives, Processes for Making Same, and Products Containing Same, Including Self-Stick Repositionable Notes*, Inv. No. 337-TA-366, Comm'n Op. at 24 (1995). In other cases, the Commission has turned to alternative approaches, especially when the level of a reasonable royalty rate could be ascertained. *Certain Integrated Circuit Telecommunication Chips and Products Containing Same, Including Dialing Apparatus*, Inv. No. 337-TA-337, Comm'n Op. at 41 (1995). A 100% bond has been required when no effective alternative existed. *Certain Flash Memory Circuits and Products Containing Same*, Inv. No. 337-TA-382, USITC Pub. No. 3046, Comm'n Op. at 26-27 (July 1997) (a 100% bond imposed when price comparison was not practical because the parties sold products at different levels of commerce, and the proposed royalty rate appeared to be *de minimis* and without adequate support in the record).

The parties agree that a price comparison between the domestic industry products and the accused products is impractical and that there is no basis for setting a bond rate according to a

reasonable royalty rate based on the license agreements produced. *See* CX-0007 (Vander Veen DWS) at Q/A 91; RX-0005C (Mulhern RWS) at Q/A 93.

DISH requests that bond be set at 100% and argues that it would suffer injury because it has licensed the asserted patents in the past. *See* Compls. Br. at 298-300. While DISH concedes that its products do not compete with respondents' accused products, it is argued that DISH has shown that it can generate revenue via licensing. *See id.*

Respondents argue that DISH has failed to meet its burden to show that any bond should issue, and that DISH is not entitled to the 100% bond that it requests. *See* Resps. Br. at 297-98. It is argued that, when the products do not compete with one another, and there is no basis on which to set a bond rate according to a reasonable royalty, a zero percent bond is appropriate. *See id.*

The Staff argues that that DISH has not met its burden to establish the need for a 100% bond because it has not articulated any concrete, alleged injury that it would suffer during the Presidential Review Period. *See* Staff Br. at 283-84. The Staff argues that DISH has not met its burden to show injury, and the absence of such a showing here warrants a recommendation of zero bond. *See id.*

DISH's Pre-Hearing brief did not contain any analysis as to how it allegedly suffered an injury that warrants a bond. *See* Compls. Pre-Hearing Br. at 298-300. DISH thus waived the argument that it will be harmed by the loss of potential licensing revenue. *See* Ground Rule 7.c. Moreover, DISH's argument regarding potential licensing revenue is not tied to any injury caused by sales of the accused products during the Presidential Review Period. Accordingly, no bond should issue.

XVIII. INITIAL DETERMINATION ON VIOLATION

For the reasons set forth above, it is my initial determination that a violation of section 337 of the Tariff Act, as amended, has occurred in the importation into the United States and the sale within the United States after importation of certain fitness devices, streaming components thereof, and systems containing same, with respect to U.S. Patent No. 9,407,564; U.S. Patent No. 10,469,554; U.S. Patent No. 10,469,555; and U.S. Patent No. 10,757,156.

I hereby certify to the Commission this Initial Determination and the Recommended Determination.

The Secretary shall serve the confidential version of this Initial Determination upon counsel who are signatories to the Protective Order (Order No. 1) issued in this investigation. A public version will be served at a later date upon all parties of record.

Pursuant to 19 C.F.R. § 210.42(h), this Initial Determination shall become the determination of the Commission unless a party files a petition for review pursuant to 19 C.F.R. § 210.43(a) or the Commission, pursuant to 19 C.F.R. § 210.44, orders on its own motion a review of the Initial Determination or certain issues therein.

XIX. ORDER

To expedite service of the public version of this document, the parties shall file a joint proposed public version, on the date and in the manner required by Order No. 20.

SO ORDERED.

Clark S. Cheney
Administrative Law Judge