Patent Owner's Presentation

Aylo Freesites Ltd and fuboTV Media Inc.

V.

DISH Technologies L.L.C.

IPR2024-00043 (U.S. Patent No. 11,677,798)*
IPR2024-00044 (U.S. Patent No. 11,470,138)
IPR2024-00045 (U.S. Patent No. 10,469,554)
IPR2024-00046 (U.S. Patent No. 10,951,680)
IPR2024-00146 (U.S. Patent No. 10,469,555)

Patent Trial and Appeal Board
January 16, 2024

*fuboTV Media Inc., which filed a petitions in IPR2024-00901 (798), IPR2024-00902 (138), IPR2024-00903 (554), IPR2024-00904 (680), and IPR2024-00905 (555), has been joined as a petitioner in each of these proceedings.

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I. Summary

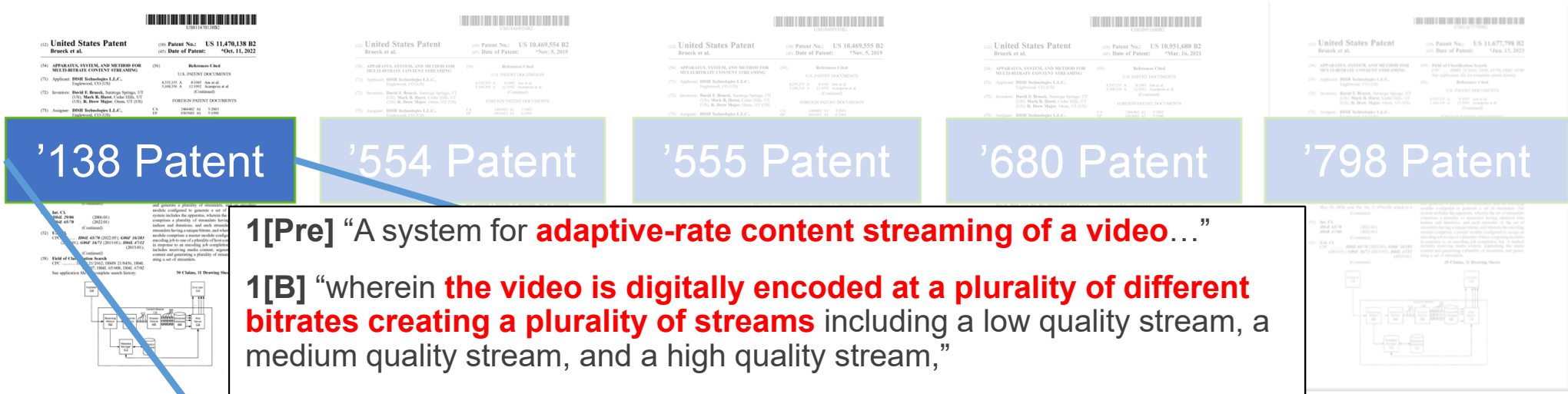
- IPR2024-00043 (U.S. Patent No. 11,677,798)
- IPR2024-00044 (U.S. Patent No. 11,470,138)
- IPR2024-00045 (U.S. Patent No. 10,469,554)
- IPR2024-00046 (U.S. Patent No. 10,951,680)
- IPR2024-00146 (U.S. Patent No. 10,469,555)

Summary of Grounds

- **Anticipation** – Petitioner challenges two claims ('555 Patent, Claims 18-19) as allegedly **anticipated by Ogdon**
- **Obviousness** – Petitioner challenges nearly all claims under §103 based on the combination of **Ogdon** and **Allen**
  - Petitioner adds **SMIL 2.0** to the combination of Ogdon and Allen to allegedly show "streamlets" of "equal [] duration"
  - Petitioner relies on **SMIL 2.0** to allegedly show dependent claim limitations reciting a "virtual timeline"
  - Petitioner relies on **Shteyn** to allegedly show "streamlets" as "separate files"
- **Objective Indicia** – Petitioner argues that DISH's overwhelming objective evidence of nonobviousness lacks a "nexus" with the Challenged Claims

Summary of Challenged Claims

- Each Challenged Claim is drawn to either a "server" or "client" for streaming video over the internet
  - The "server" claims recite streaming a larger video by encoding that video into a plurality of streams at different bitrates (quality levels), with each stream comprising a plurality of time-aligned streamlets of equal duration



'138 Patent | '554 Patent | '555 Patent | '680 Patent | '798 Patent

1[Pre] "A system for **adaptive-rate content streaming of a video**…"

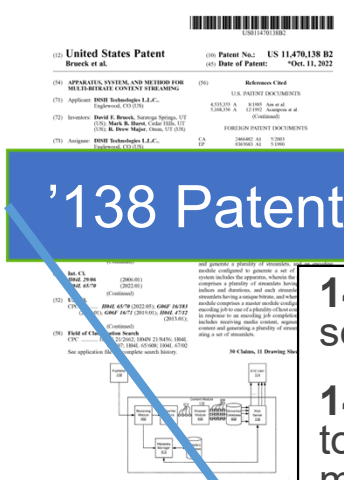
1[B] "wherein **the video is digitally encoded at a plurality of different bitrates creating a plurality of streams** including a low quality stream, a medium quality stream, and a high quality stream,"

1[C] "…each comprising a **group of streamlets**, wherein each streamlet **corresponds to a portion of the video**, and wherein each streamlet in each group of streamlets is encoded at a respective one of the plurality of different bitrates,…"

1[E] "wherein the first streamlet of each of the groups of streamlets has the **same first duration** and **encodes the same first portion of the video** in each of the low quality stream, the medium quality stream, and the high quality stream…"

Summary of Challenged Claims

- The "client" claims recite placing individual requests for streamlets of a video to a server based on a determination to select streamlets of a higher or lower bitrate version of streams of that video



'138 Patent | '554 Patent | '555 Patent | '680 Patent | '798 Patent

14[Pre] "**An end user station to stream a video** over a network from a server for playback of the video…"

14[D] "wherein **the video is encoded at a plurality of different bitrates** to create a plurality of streams … each of the low quality stream, the medium quality stream, and the high quality stream **comprising a group of streamlets encoded at the same respective one of the different bitrates, each group comprising at least first and second streamlets, each of the streamlets corresponding to a portion of the video**"

14[G] "**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"

14[H] "**place a streamlet request** to the server over the internet connection **for the first streamlet of the selected stream**;"

II. Overview of DISH's ABR Technology Recited by the Challenged Claims

ABR Streaming Technology Tutorial

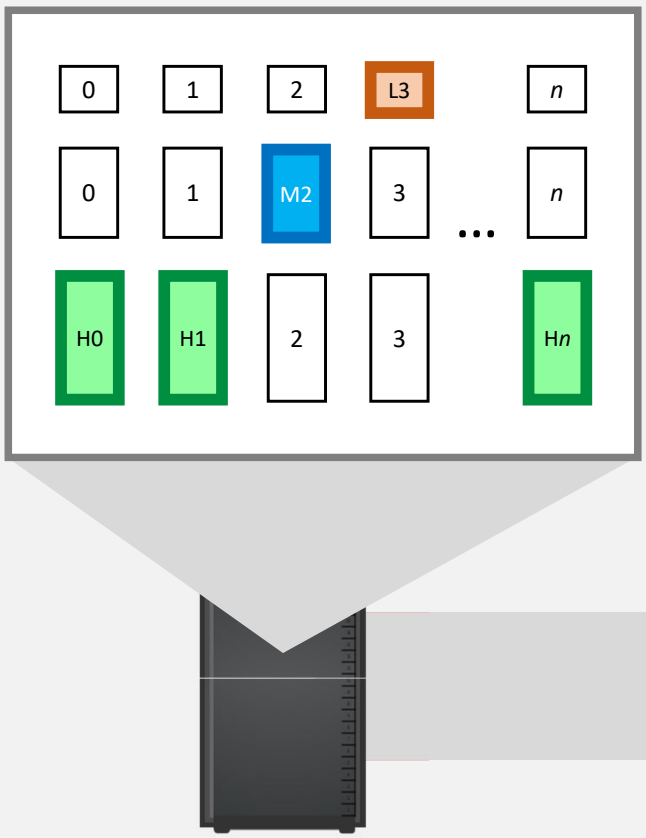


'798, 11[D] "determine whether to select a higher or lower bit rate copy of the stream… "

'798, 11[E] "place a first streamlet request to the at least one server… "

'798, 17[B] "place a second streamlet request… for a… streamlet of a different bit rate stream"

'798, 18[B] "determine an… inability to receive the digital content at the… bit rate…, and in response…, requesting a… streamlet"

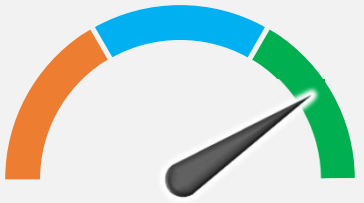




Server

Client/End User Station

ABR Streaming Technology Tutorial

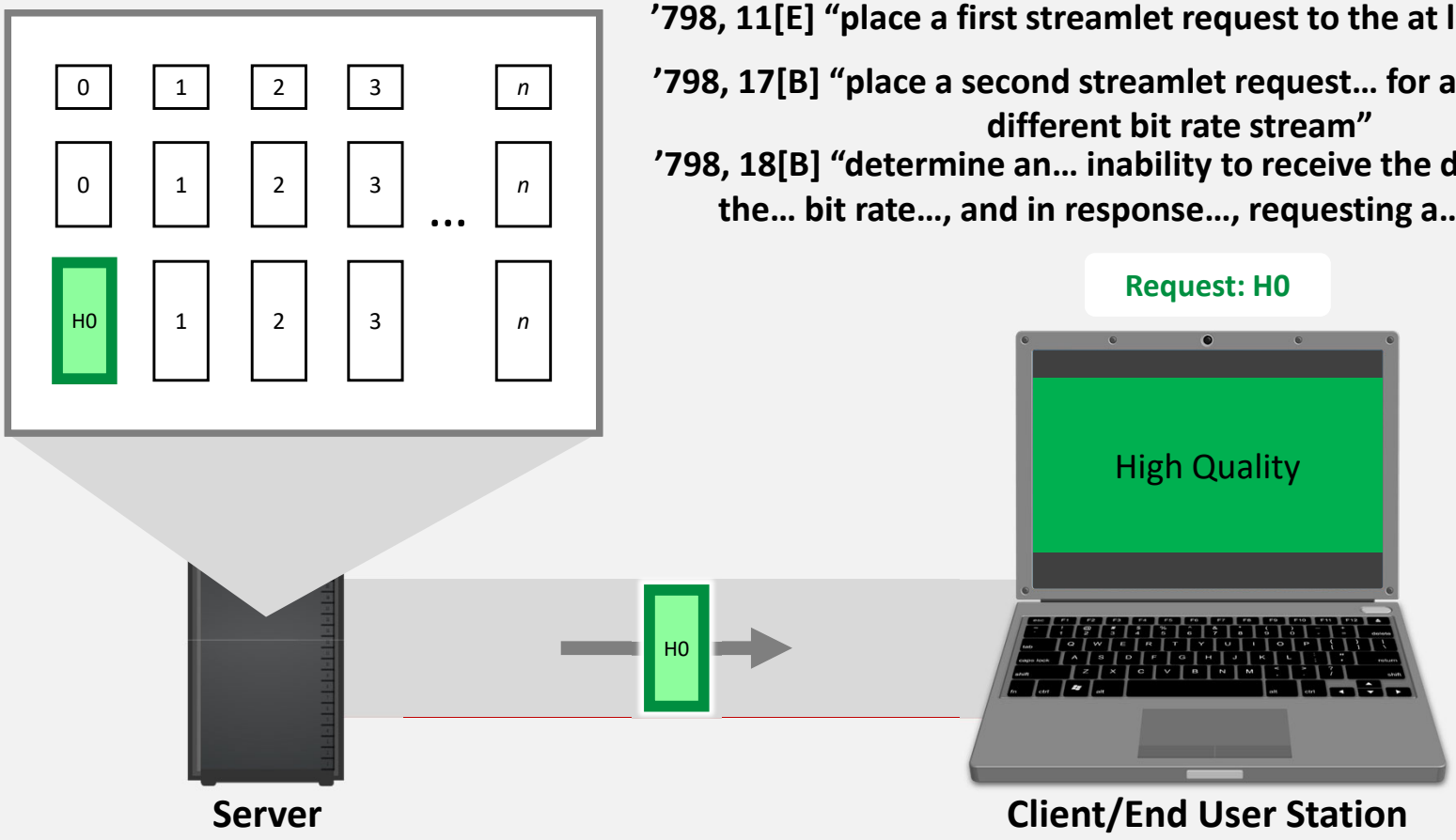


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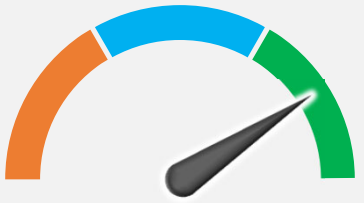
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ABR Streaming Technology Tutorial

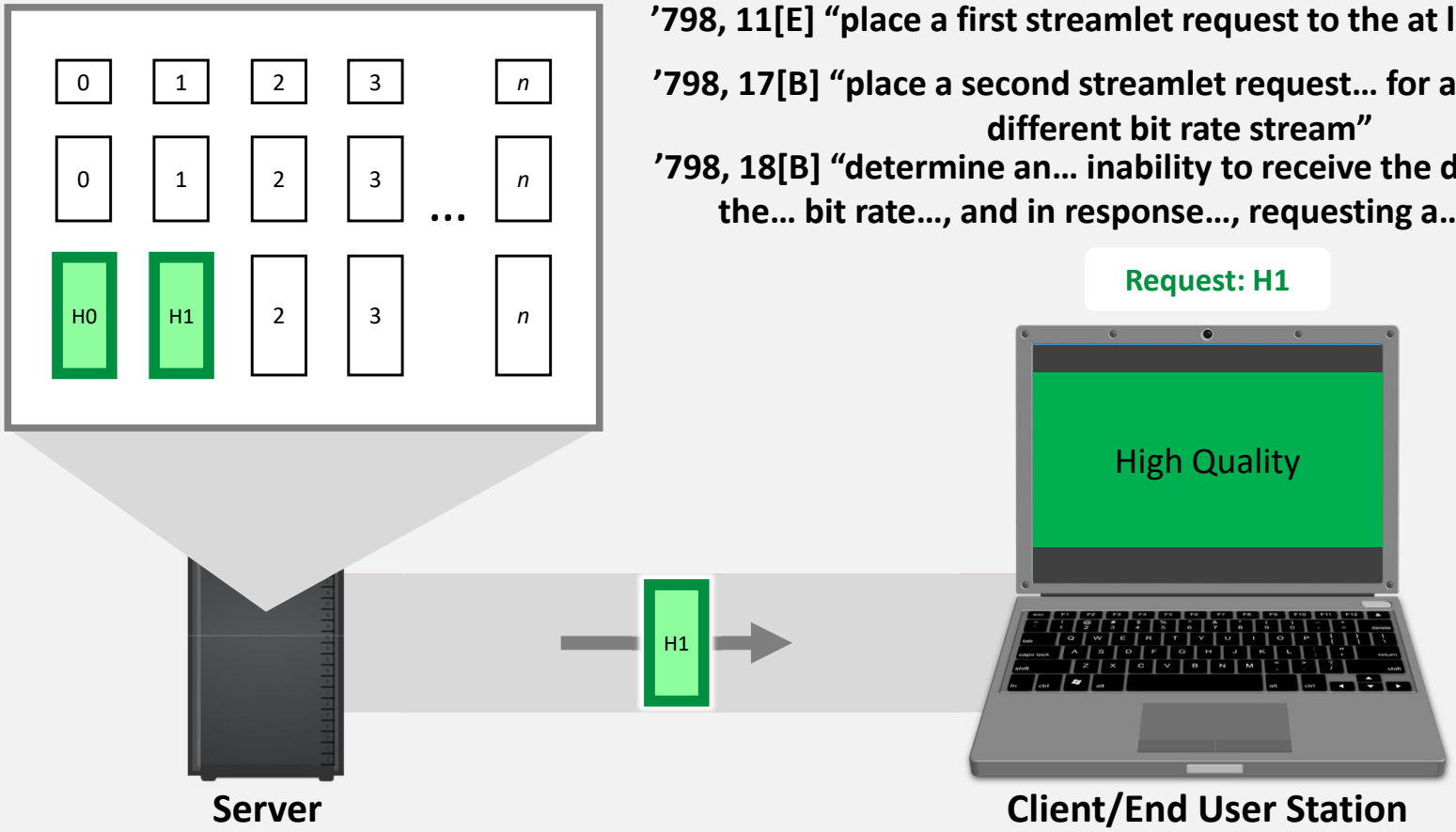


'798, 11[D] "determine whether to select a higher or lower bit rate copy of the stream… "

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ABR Streaming Technology Tutorial

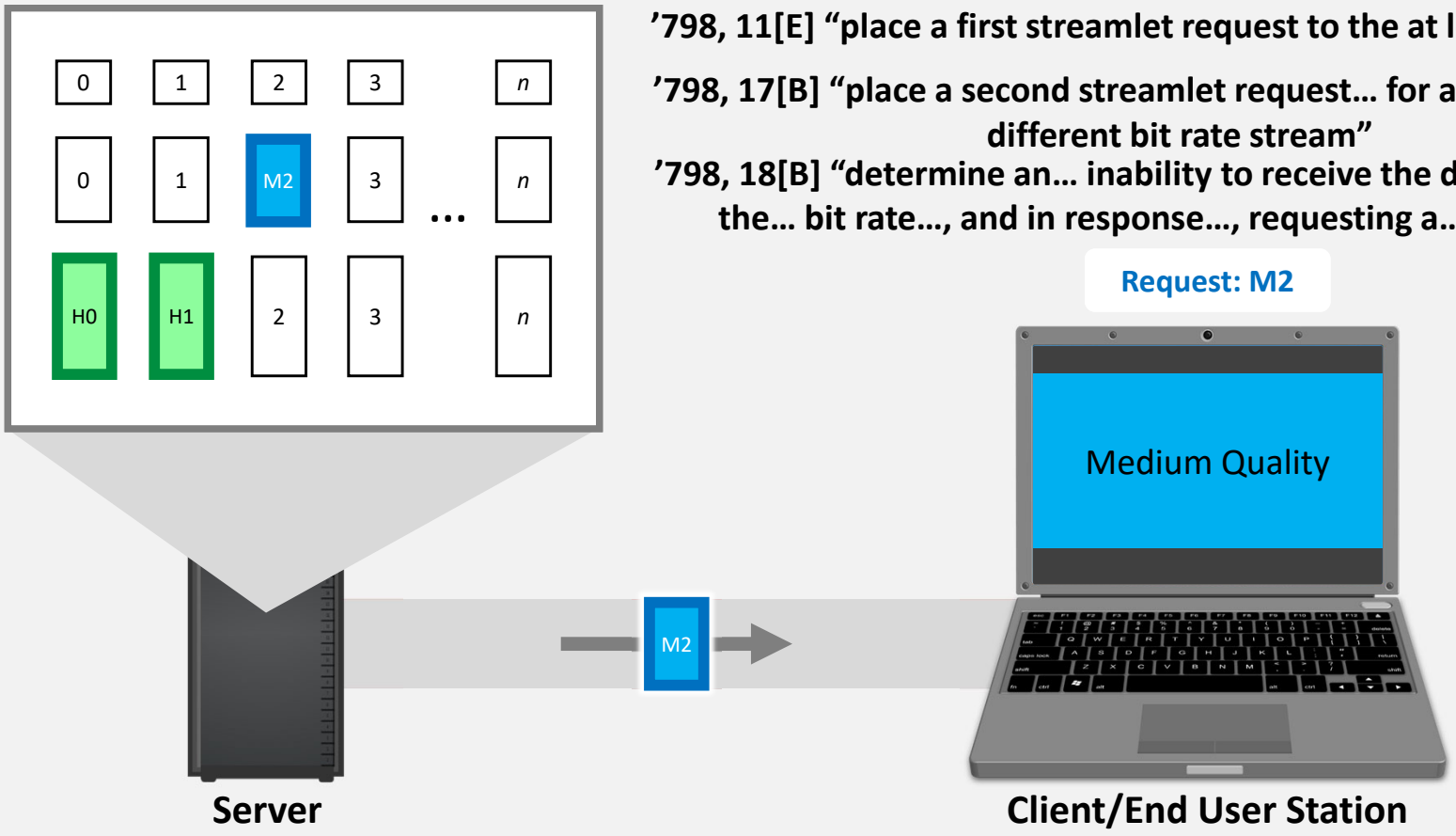


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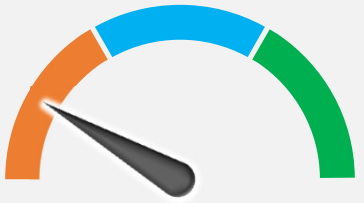
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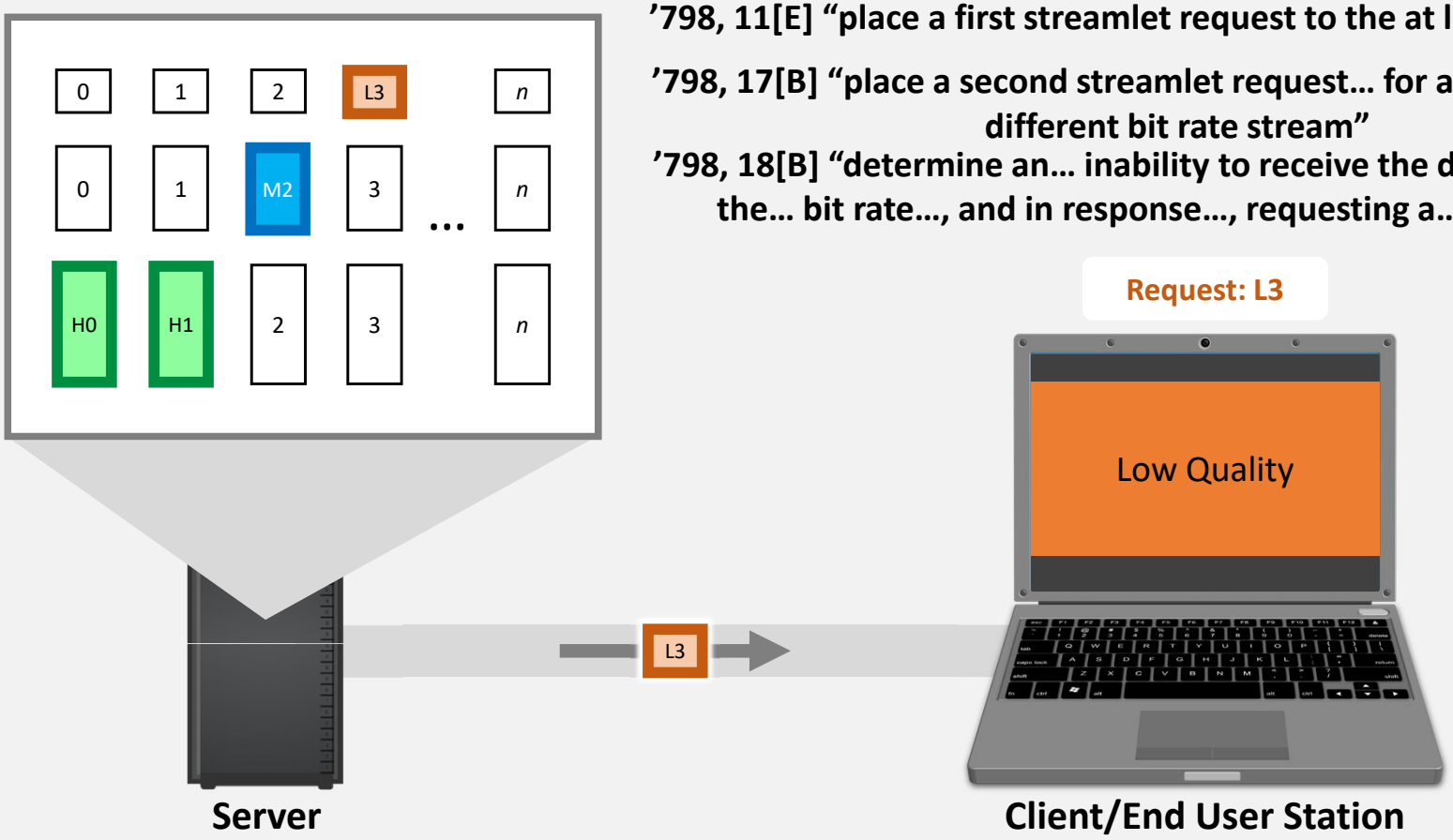


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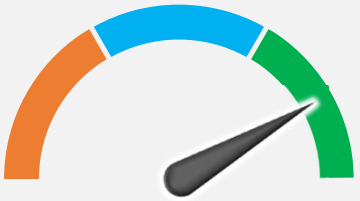
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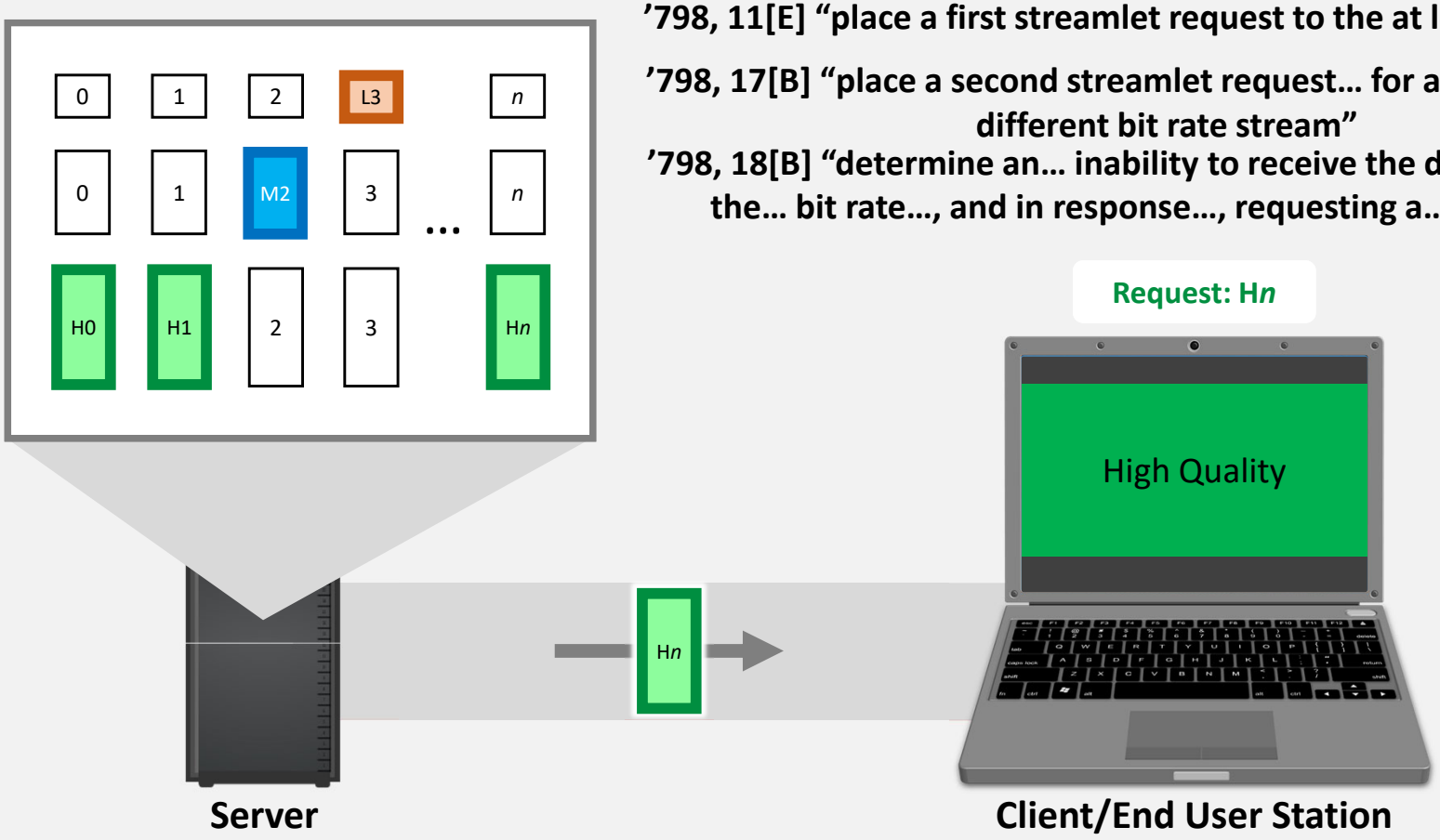


'798, 11[D] "determine whether to select a higher or lower bit rate copy of the stream… "

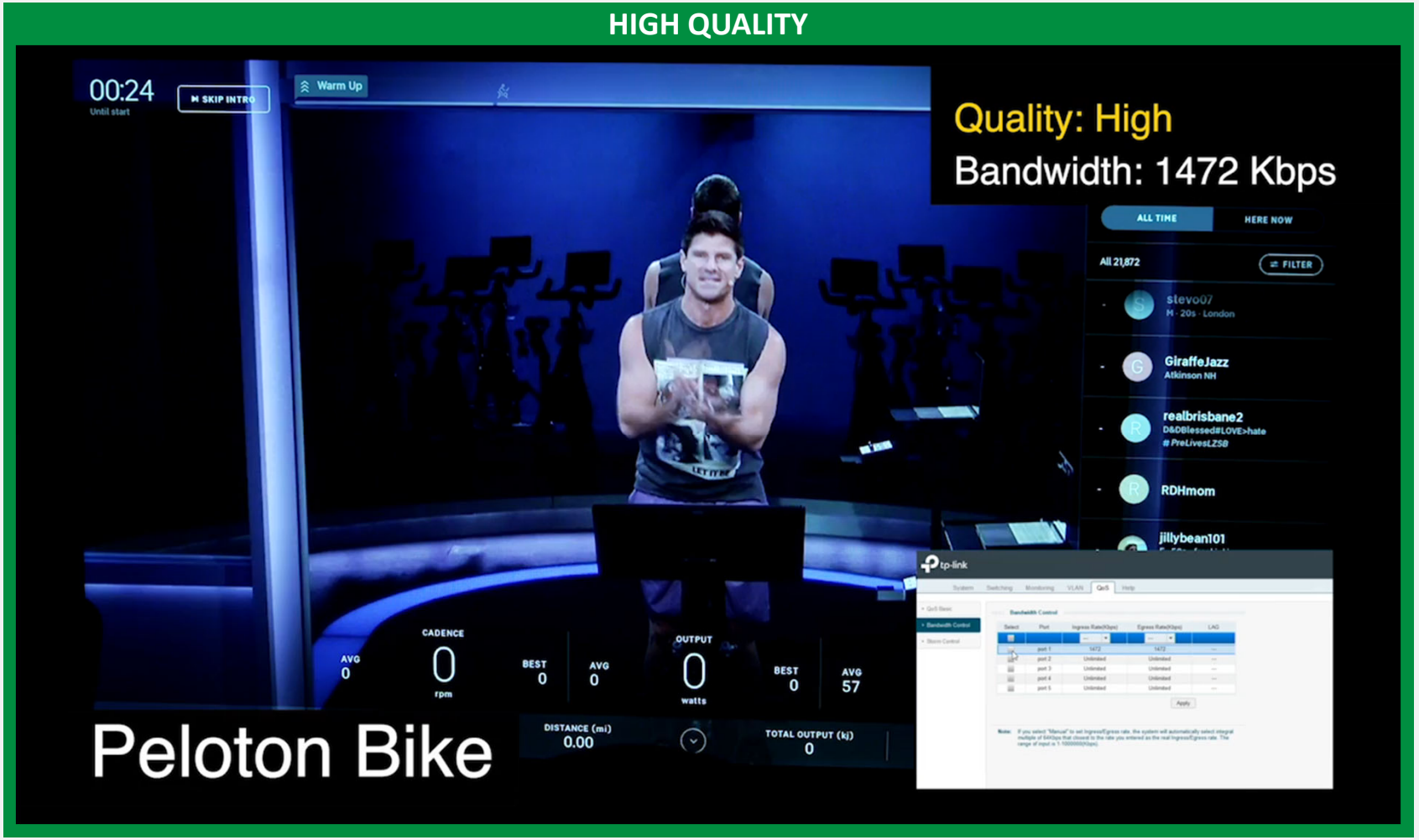
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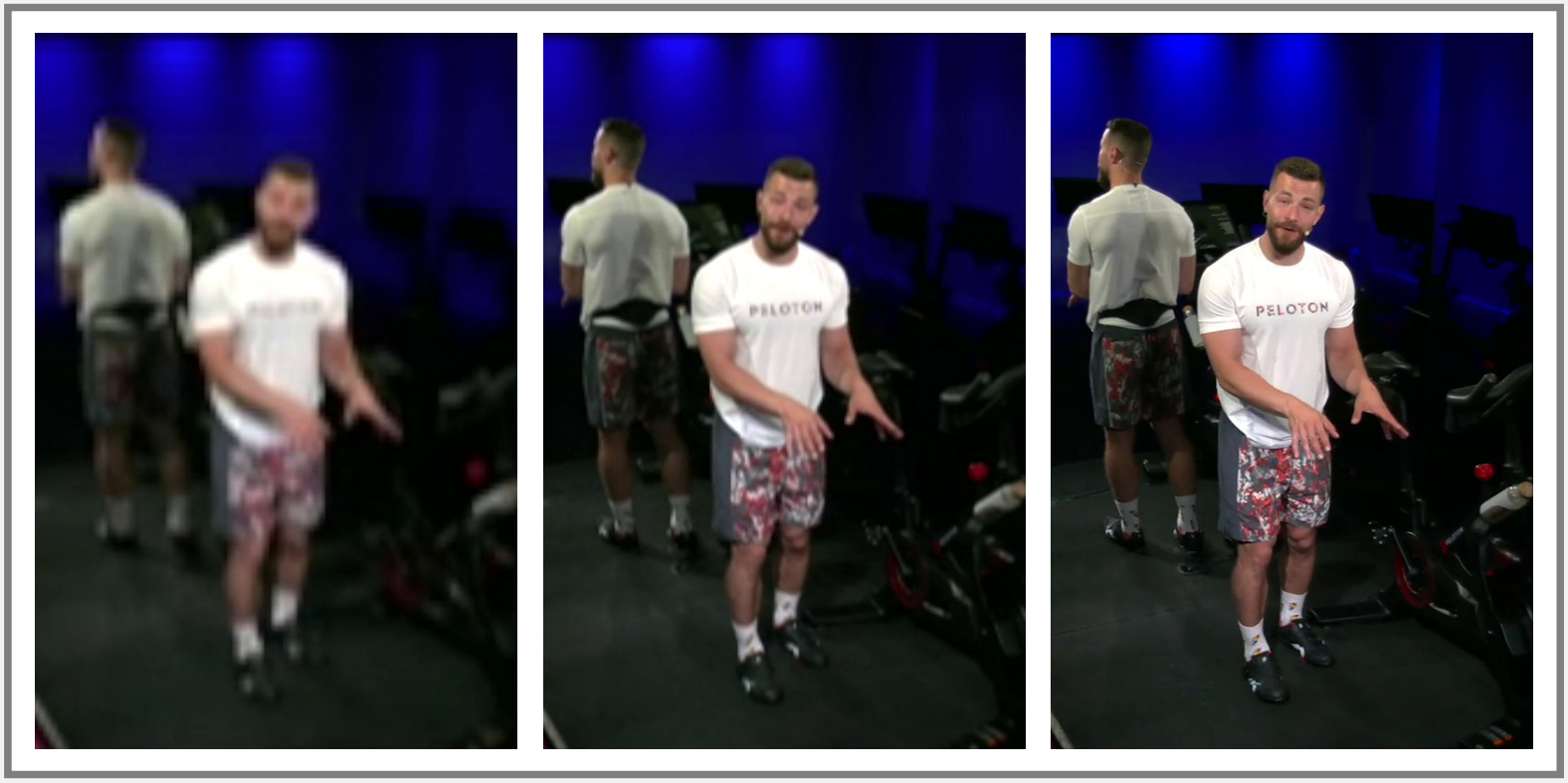
'798, 18[B] "determine an… inability to receive the digital content at the… bit rate…, and in response…, requesting a… streamlet"



ABR in Operation



DISH's Patented ABR Technology Enables Streaming of Same Video to Continue Despite Changes in Network Conditions



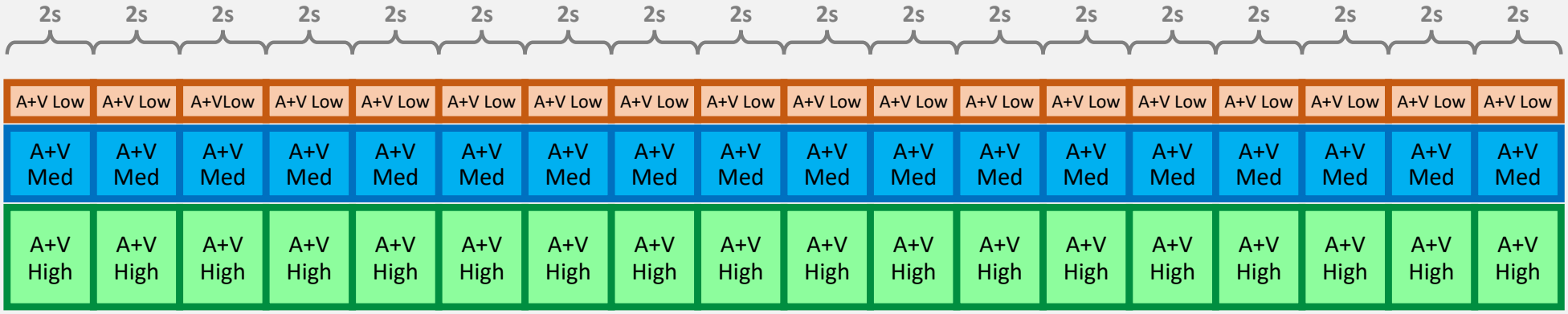
Low Quality
Small Streamlet Size

Medium Quality
Medium Streamlet Size

High Quality
Large Streamlet Size

'554 POR at 2

DISH's ABR Technology



'554 POR at 7

III. Overview of Asserted Prior Art

U.S. Patent No. 6,161,137 ("Ogdon")

- Ogdon discloses that videoconferencing and video streaming systems were extremely rare and expensive.
- Videoconferencing systems had "numerous drawbacks" because they required "expensive" and "specialized" computers, equipment, and communication networks.
- These requirements were largely attributable to the video streaming aspect of videoconferencing such that typical home and office users were excluded from participation.

'798 Sur-Reply at 2; '798 POR at 24-27; EX2006 (Jeffay Declaration), ¶¶53-59.

BACKGROUND OF THE INVENTION

Interactive or live presentations via a telecommunications network (i.e., "telepresentations" such as teleconferences etc.) are becoming a viable alternative to face-to-face meetings due to the greater cost effectiveness of such telepresentations. However, there is still substantial expense in conducting such a telepresentation, particularly when the presentation members (i.e., presentation leaders and audience members) reside at a large number of geographically scattered sites. In particular, each of the sites may require specialized video conferencing systems with high data transmission lines for connecting the telepresentation members. Thus, due to the expense of provisioning and maintaining such networked conferencing systems, corporations typically have only a small number of such conferencing systems at strategically located telepresentation centers for conducting such telepresentations. However, there are numerous drawbacks to this approach, such as:

(1.1) The dedicated telepresentation centers are expensive to maintain;

(1.2) Presentation participants are still required to travel to these centers; and

(1.3) Potential members of such a presentation who are not able to access such a center are excluded from the presentation.

EX1004 (Ogdon), 1:19-34; '798 POR at 25; '798 Sur-Reply at 2

U.S. Patent No. 6,161,137 ("Ogdon")

- Ogdon sought to increase access to remote presentations.
- Ogdon's solution was to eliminate the streaming "video" from the "videoconference" and distribute only the "presentation materials" (i.e., multimedia "segments" or "graphic slides" in "slide show") synchronized with low-bandwidth, live audio of the human presenter.

Accordingly, it would be advantageous to have a network presentation distribution system that alleviates these drawbacks, wherein such a system would allow individuals to access and/or participate in a presentation using standard telephony and Internet network connections found in most offices and many homes.

communications network. For example, the segments (subcollections) of a first version of a presentation may require a network transmission rate sufficient for real time or animated video and the segments for another version of the presentation may only require a transmission rate sufficient for graphic slides. Thus, of a set of corresponding segments (subcollections), one segment (subcollection) may merely be an audio presentation via a telephone, whereas an alternative segment (subcollection) may be a multimedia presentation element that is a combination of one or more of the following types of HTML multimedia data: audio, images, animation or video, wherein such a multimedia element plays over a set period of time and can be as simple as a single image or as complex as a combination of images, audio, animation and video. Furthermore, segments may

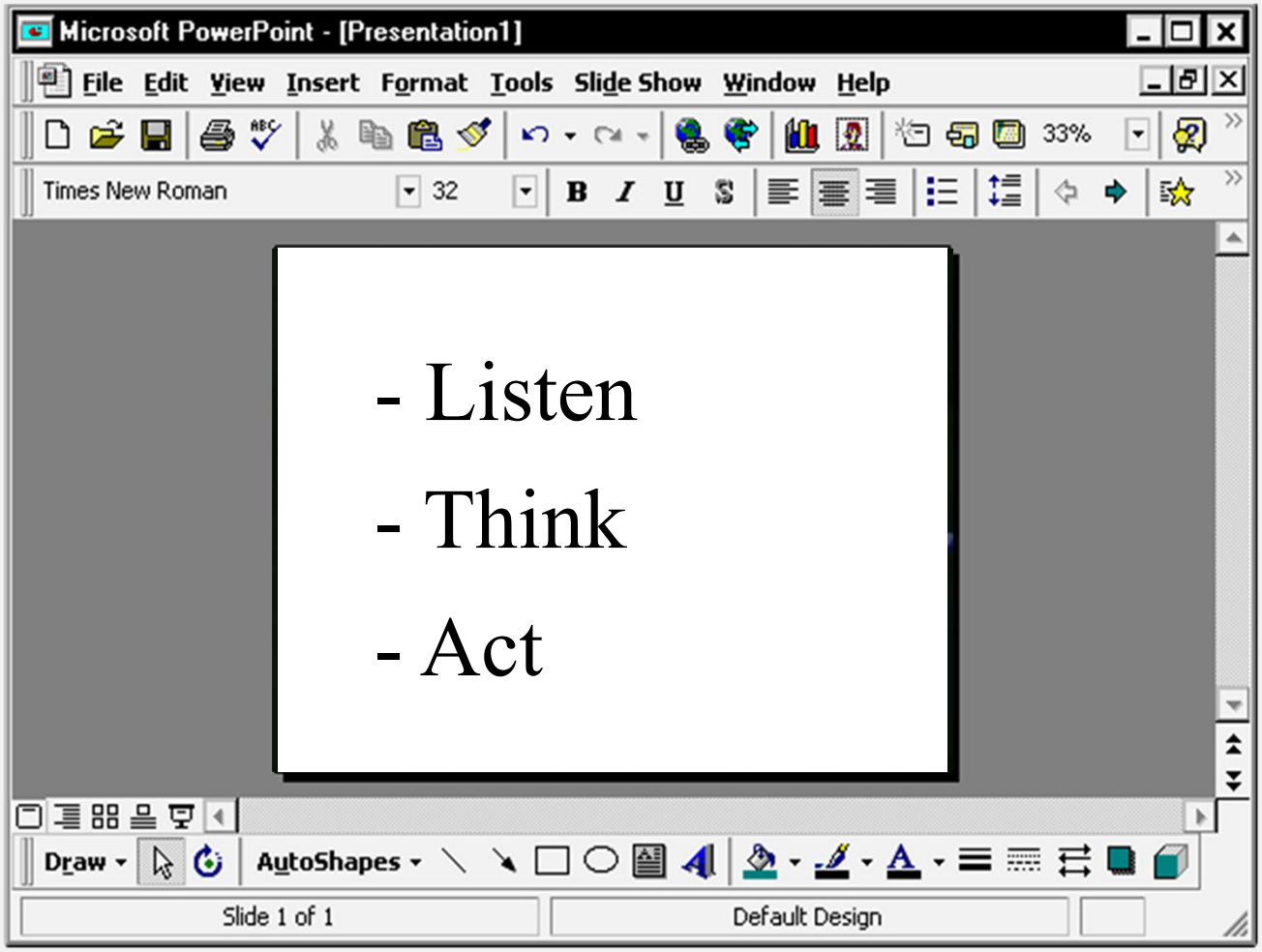
EX1004 (Ogdon) , 1:43-48, 2:61-3:8; POR at 26

responding (in content) segments of the presentation. For example, a first client (at a first client node) may experience the presentation as an ordered series of presentation segments, wherein the first and second ordered segments are presented in full animation, wherein the first of the ordered segments is obtained from a first content webserver and the second segment of the ordered segments is obtained from a second content webserver. Moreover, synchronously with the presentation to the first client, a second client (at a second client node) may experience the presentation in a slide show format from a third content webserver, wherein the initial two segments presented are corresponding alternative segments to the first and second segments presented to the first client. Additionally, a third client may synchronously experience the first segment of the presentation via network transmissions from the first content webserver but subsequently experience the corresponding slide show alternative to the second segment from the third content webserver due to, for example, network transmission slowdowns.

EX1004 (Ogdon), 3:44-63;
'798 POR at 23-24

'798 POR at 25-28

Ogdon's "Segments"



Embedded Video

Static Images

Text Only Only

'554 POR at 5

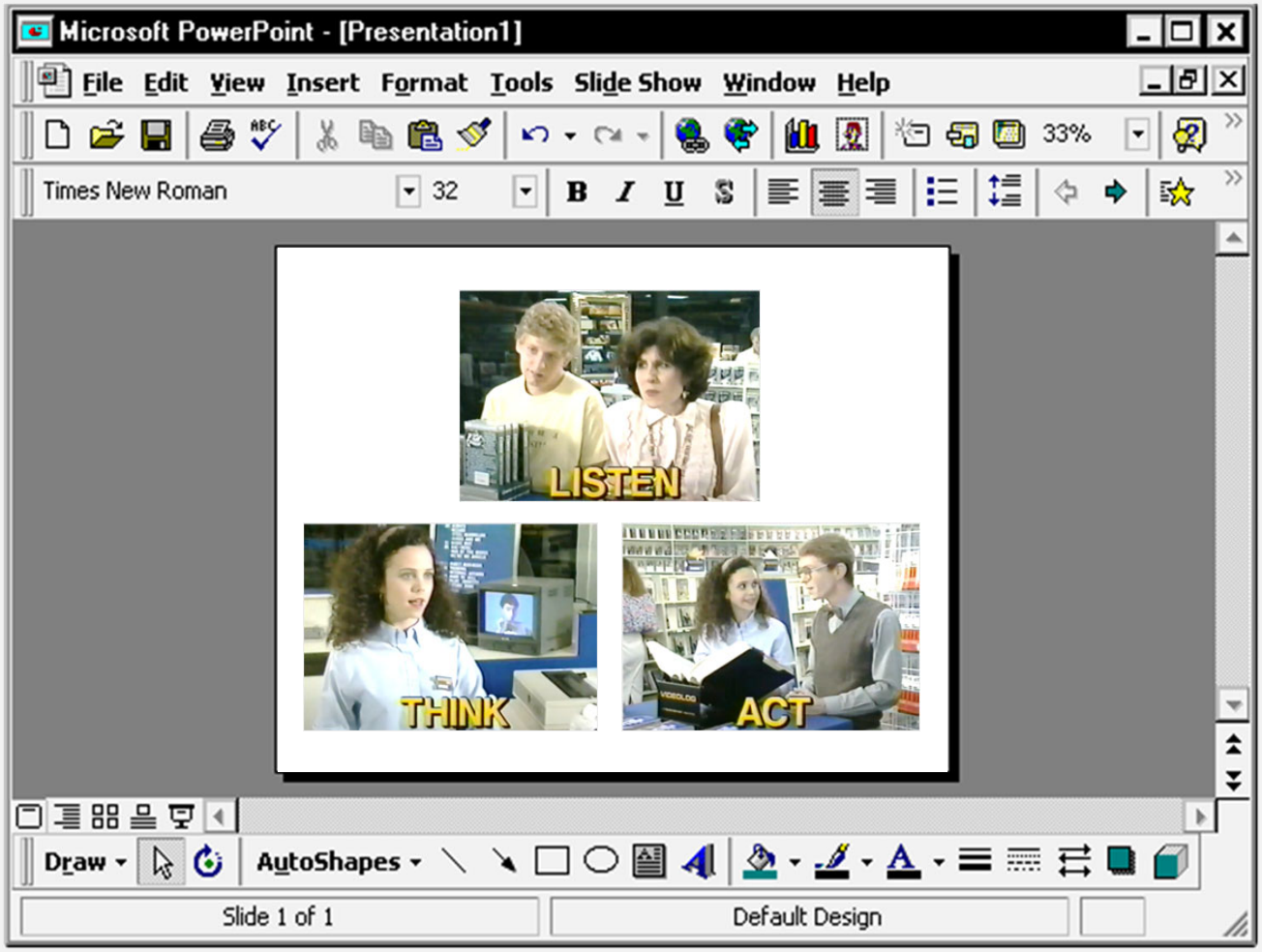
Ogdon's "Segments"



Embedded Video

'554 POR at 4

Ogdon's "Segments"



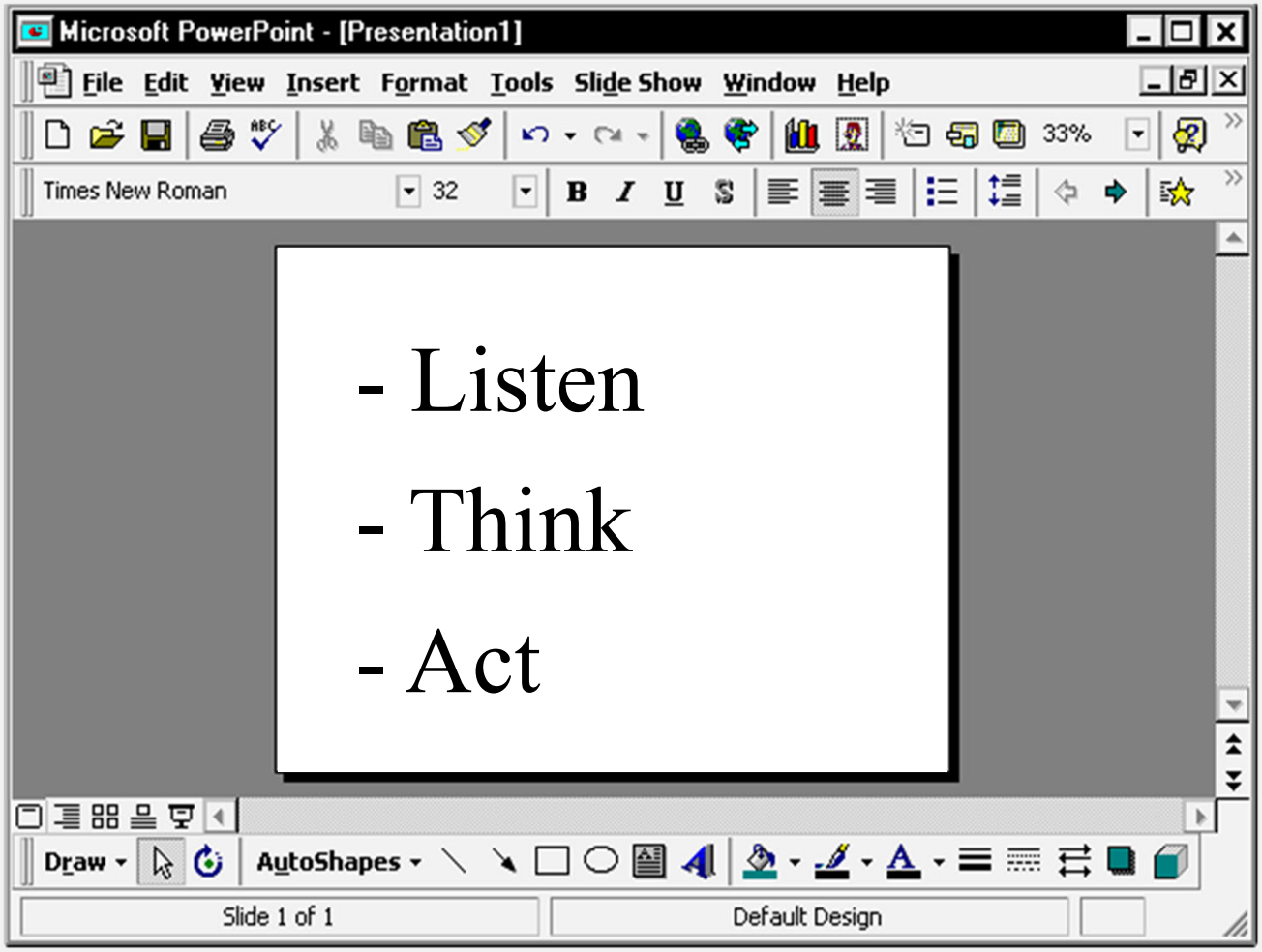
'554 POR at 4

Embedded Video

▼

Static Images

Ogdon's "Segments"



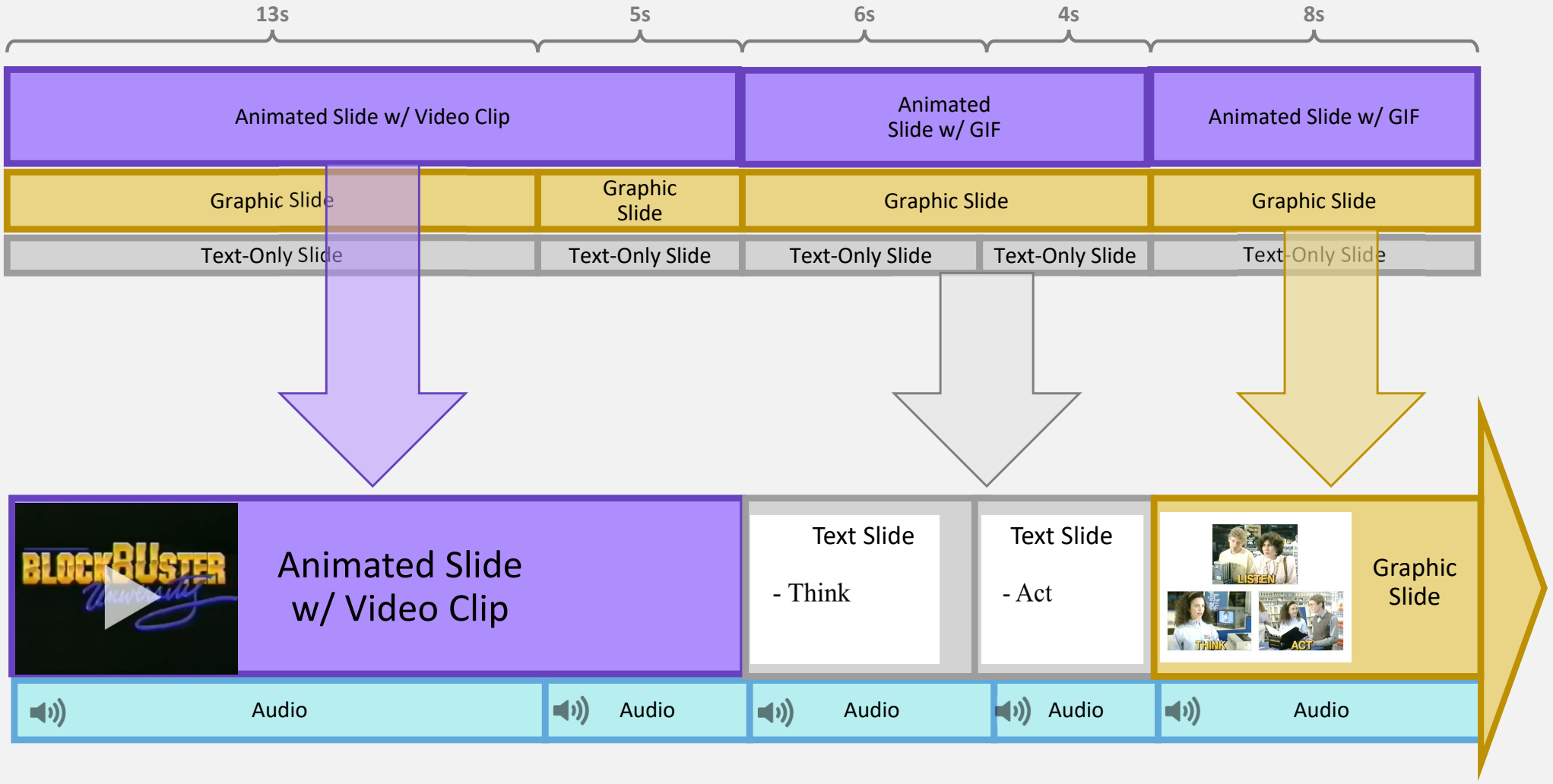
Embedded Video

Static Images

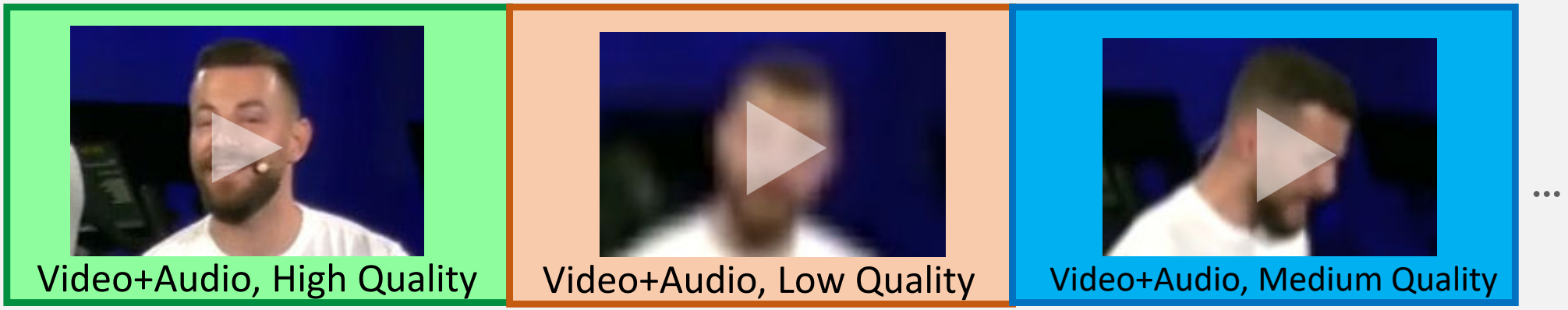
Text Only Only

'554 POR at 5

Ogdon’s “Segments”



DISH's ABR Video Streaming



'554 POR at 2

Ogdon's "Presentation"



'554 POR at 7, 14

WO 2002/075482 ("Allen")

Allen discloses eliminating the complexity required to create and serve multiple bitrate video streams by encoding video at only a ***single bitrate*** (albeit in different formats) and moving the encoding task to the "last mile," or "edge" of the network, where "all of the users have the same network speed."

'798 POR at 29–30; '798 EX2006, ¶[108]

Once the media has been processed, it is sent to one or more streaming codecs (1622) for encoding in the format appropriate to the users and their viewing devices. In the preferred embodiment, the Viewer Specific Encoder (1622) of the Edge Encoder (1616) is located one hop (in a network sense) from the end users (1626). At this point, most of the users (1626) have the same basic network characteristics and limited viewing devices. For example, at a DSL PoP or Cable Modem plant, it is likely that all of the users have the same network speed and are using a PC to view the media. Therefore, the Edge Encoder (1616) can create just two or three live Internet encoding streams using Viewer Specific Encoders (1622) in the common PC formats (at the time of this writing, the commonly used formats include Real Networks, Microsoft and QuickTime). The results of the codecs are sent to the streaming server (1624) to be viewed by the end users (1626).

Edge encoding presents some unique possibilities. One important one is when the viewing device can only handle audio (such as a cell phone). Usually, these devices are not supported because it would increase the burden on the video producer. Using Edge Encoders, the video producer can strip out the video leaving only the

EX1005, 104:9-20; '798 POR at 29-31

WO 2002/075482 ("Allen")

- Petitioner exclusively relies on Allen's "Background," which describes how an "encoding operation … might be set up" to encode a video in "three different bit rates." '798 Pet. at 18, 20.

10 **BACKGROUND OF THE INVENTION**

In the currently existing model as shown in **Fig. 10**, content is produced and encoded by the Content Producer (1002) at the point of origination. This example assumes it is pre-processed and encoded in RealSystem, Microsoft Windows Media, and Apple QuickTime formats, and that each format is encoded in three different bit rates, 56Kbps, 300Kbps, and 600Kbps. Already, nine individual streams (1004) have been created for one discrete piece of content, but at least this much effort is required to reach a reasonably wide audience. The encoded streams (1005) are then sent via a satellite- (1006) or terrestrial-based CDN (1008) and stored on specially designed edge-based streaming media servers at various points of presence (PoPs) around the world.

EX1005 (Allen), 12:1-10

'798 POR at 28

WO 2002/075482 ("Allen")

- After Allen's Background refers to the "currently existing model" & "present architecture" cited by Petitioner, Allen directly teaches away from actually using that approach. '798 POR at 29; EX1005, 13:5-8; EX2006, ¶[107].

5 expectations for quality and consistency will be very high. Unfortunately the present architecture for delivering streaming media places insurmountable burdens on everyone in the value chain, and stands directly in the way of attempts to develop a viable economic model around broadband content delivery.

EX1005 (Allen), 13:5-8

etc. This increases the size of the encoding problem exponentially, making it impossible to encode streaming media for a wireless audience of any significant size. To do so would require encoding an impossible number of streams, each one optimized for a different service provider, different technologies, different devices, and at wildly varying bit rates. However, within any single wireless service provider's system, conditions tend to be significantly more homogeneous. With edge-

EX1005 (Allen) , 116:15-21

Synchronized Multimedia Integration Language 2.0 ("SMIL 2.0")

- SMIL 2.0 is directed to "multimedia presentations," like PowerPoint slides or HTML-based webpages. It defines "an XML-based language that allows authors to ... associate hyperlinks with media objects and describe the layout of the presentation on a screen." It also allows authors to "describe the temporal behavior of a multimedia presentation," such as how long a particular slide or webpage will be displayed during a presentation.

'798 POR at 46-48; '798 EX2006 (Jeffay Declaration), ¶¶[146]–[47]

Abstract

This document specifies the second version of the Synchronized Multimedia Integration Language (SMIL, pronounced "smile"). SMIL 2.0 has the following two design goals:

- Define an XML-based language that allows authors to write interactive multimedia presentations. Using SMIL 2.0, an author can describe the temporal behavior of a multimedia presentation, associate hyperlinks with media objects and describe the layout of the presentation on a screen.
- Allow reusing of SMIL syntax and semantics in other XML-based languages, in particular those who need to represent timing and synchronization. For example, SMIL 2.0 components are used for integrating timing into XHTML [XHTML10] and into SVG [SVG].

EX1006 (SMIL 2.0) at 1; '798 POR at 46

IV. Invalidity – Ogdon

Petitioner's Ogdon-Based Arguments Fail

Petitioner relies primarily on Ogdon to disclose each and every element of the Challenged Claims

> Ogdon teaches everything DISH and its declarants describe as the "whole package," "core," and "heart of the claimed invention": adaptive-rate streaming using intelligent clients that determine available bandwidth and request segments from different quality versions of a video stored on ordinary webservers, where each version comprises ordered segments of the same corresponding video content.

'798 Reply at 1

But Ogdon fails to disclose numerous elements, including:

- Multiple copies of the same video,
- Time-aligned streamlets of the same content, and
- Individual streamlet requests

'798 POR at 12-13, 19

Ogdon Fails to Disclose Copies of the Same Video/Content

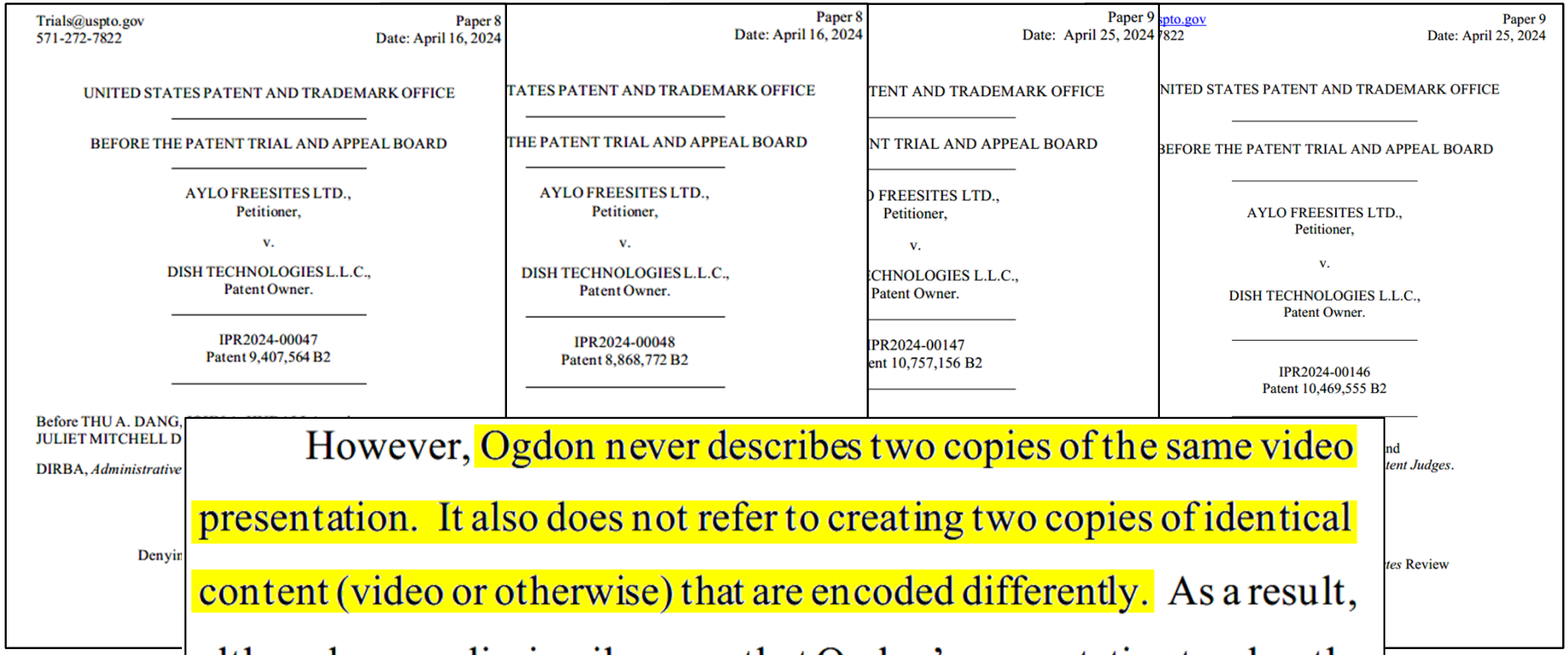
Ogdon Fails to Disclose Multiple Copies of the Same Video/Content

Patent/Claims	Representative Element
'554 Patent, All Independent Claims (1, 16, 26, 30)	Claim 1: "A system for adaptive-rate content ***streaming of live event video*** … ***the live event video encoded at a plurality of different bitrates creating a plurality of streams***."
'555 Patent, All Independent Claims (1, 10, 18, 26)	Claim 1: "A system for adaptive-rate content ***streaming of live event video*** … ***the live event video encoded at a plurality of different bitrates creating a plurality of streams***."
'680 Patent, All Independent Claims (1, 14, 22, 28))	Claim 1: "A system for adaptive-rate content ***streaming of video*** …***wherein the video encoded at a plurality of different bitrates creating a plurality of streams***"
'138 Patent, All Independent Claims (1, 14, 23, 28)	Claim 1: "A system for adaptive-rate content streaming of a video … ***wherein the video is digitally encoded at a plurality of different bitrates creating a plurality of streams***."
'798 Patent, All Independent Claims (1, 11, 22)	Claim 1: A system for adaptive-rate content ***streaming of digital content*** … ***the digital content encoded at a plurality of different bit rates creating a plurality of streams***."

'798 POR at 1-5, 23; '798 Sur-Reply at 4-6

Ogdon Fails to Disclose Copies of the Same Video/Content

The Board has repeatedly held that Ogdon does not disclose storing multiple copies of the same "content" or "video"



Trials@uspto.gov
571-272-7822
Paper 8
Date: April 16, 2024

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AYLO FREESITES LTD.,
Petitioner,

v.

DISH TECHNOLOGIES L.L.C.,
Patent Owner.

IPR2024-00047
Patent 9,407,564 B2

Before THU A. DANG,
JULIET MITCHELL D
DIRBA, *Administrative*

Denyi

Paper 8
Date: April 16, 2024

TATES PATENT AND TRADEMARK OFFICE

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Patent Owner.

IPR2024-00048
Patent 8,868,772 B2

Paper 9
Date: April 25, 2024

TENT AND TRADEMARK OFFICE

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FREESITES LTD.,
Petitioner,

v.

CHNOLOGIES L.L.C.,
Patent Owner.

IPR2024-00147
ent 10,757,156 B2

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Paper 9
Date: April 25, 2024

NITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AYLO FREESITES LTD.,
Petitioner,

v.

DISH TECHNOLOGIES L.L.C.,
Patent Owner.

IPR2024-00146
Patent 10,469,555 B2

nd
tent Judges.

tes Review

However, Ogdon never describes two copies of the same video presentation. It also does not refer to creating two copies of identical content (video or otherwise) that are encoded differently. As a result, although we preliminarily agree that Ogdon's presentation teaches the claimed "video",[9] we do not agree that Ogdon teaches storing multiple copies of *the same video*, as required by element 1[A][3].

IPR2024-00047 ID at 18

'798 POR at 5, 23, n.4; '798 Sur-Reply at 4-6

Ogdon Fails to Disclose Copies of the Same Video/Content

Ogdon discloses presenting ***different*** visual materials.

It is a further aspect of the present invention to provide the same audio presentation portion to each client, and in this manner, maintain the continuity of the presentation between clients. Thus, regardless of the version of the video presentation provided, the clients have their presentations synchronized by at least experiencing simultaneously the same audio presentation.

EX1004 (Ogdon), 4:11-17; '798 Sur-Reply at 12

Ogdon discloses the "same audio" with ***different*** visual materials

Ogdon discloses maintaining audio "***regardless***" of whether any visual materials are displayed

presentation commands from the host 200. Note, however, that even though the portion of the presentation corresponding to the collection of segments are not retrieved in time for performance, it is an aspect of the present invention that if the audio portion of the presentation is provided through the separate telephony network 74, then there may be substantial continuity in the presentation regardless of whether a portion of the video for the presentation is displayed or not.

EX1004 (Ogdon), 24:28-39; '798 Sur-Reply at 12

'798 POR at 15; '798 Sur-Reply at 12

Ogdon Fails to Disclose Copies of the Same Video/Content

Petitioner contends that "Ogdon repeatedly teaches that its different video presentation versions are copies of the '**same**' presentation." '798 Reply at 5. But Ogdon teaches the opposite. '798 Sur-Reply at 5.

Petitioner Reply

Indeed, Ogdon repeatedly teaches that its different video presentation versions are copies of the "same" presentation and each includes segments that "correspond" in content and are "interchangeable" and "replaceable" with one another. *E.g.*, 2:30 ("Different versions of the ***same*** presentation"), 2:49-55 ("any of the ***corresponding*** alternative segments … from different versions can be presented as a ***replacement*** for another such ***corresponding*** segment"); 32:36-38 ("first subcollection is ***replaceable*** with said second subcollection when presenting ***the*** presentation"); 2:36-39 ("each of the one or more presentation versions includes one or more presentation segments … that provide different portions of ***the*** presentation."); 3:38-

'798 Reply at 5

Ogdon

(2.2) Different versions of the same presentation, accessible from the one or more of the content webservers, wherein each version may be for a different group of audience members such as a group for Japanese speaking audience members, or audience members affiliated with a particular organization.

Note that each of the one or more presentation versions includes one or more presentation segments (hereinafter also denoted simply "segments") that provide different portions of the presentation. More precisely, subcollections each

other versions. Thus, assuming corresponding segments (or subcollections thereof) in different versions have approximately the same presentation duration, any of the corresponding alternative segments (or subcollections thereof) from different versions can be presented as a replacement for another such corresponding segment (or subcollection) during the presentation. Thus, it is an aspect of the present

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communications network. For example, the segments (subcollections) of a first version of a presentation may require a network transmission rate sufficient for real time or animated video and the segments for another version of the presentation may only require a transmission rate sufficient for graphic slides. Thus, of a set of corresponding segments

Ogdon Fails to Disclose Copies of the Same Video/Content

Petitioner relies on Ogdon's Claim 9 as allegedly disclosing multiple "copies" of the same video. '798 Reply at 6. But the Board already expressly addressed Ogdon's Claim 9 and found it contains no such teaching. '798 Sur-Reply at 6.

> of the same video. Finally, one of Ogdon's claims recites "a first video portion" and "a different second video portion *that corresponds in content* with said first video portion," where the "first and second video portions have substantially different expected data transmission rates." *Id.* at claim 9 (emphasis added). However, Petitioner does not sufficiently show that an ordinarily skilled artisan would have understood this (i.e., two videos with *corresponding* content) to teach two copies of the *same* video encoded at different bitrates. Dr. Houh's testimony on this point is conclusory, and thus, we give it little weight. *See* Ex. 1003 ¶ 65; 37 C.F.R. § 42.65(a); *cf.* Ex. 2001 ¶¶ 61 n.9, 70–72 (Patent Owner's expert, Dr. Jeffay, reaching contrary conclusion given other disclosures in Ogdon).

IPR2024-00047 ID at 19

Ogdon Fails to Disclose Copies of the Same Video/Content

Petitioner contends that Ogdon's Claim 9 recitation of video portions that "correspond" discloses multiple "copies" of the same video because "correspond" means "identical." '798 Reply at 6-7. But this contradicts Ogdon's use of that term. '798 Sur-Reply at 7.

Ogdon

communication. For example, the present invention may communicate the video portion of a presentation to a user site via the Internet (more generally, via any TCP/IP network) while a corresponding audio portion may be communicated to the user site via a conventional telephony network and a conventional telephone at the user site.

Audio is not "identical" to video

It is important to note that several variations of presentation content can be provided to clients based on the available bandwidth on network **70**, as well as adjunct networks of various kinds that coordinate with network **70** for transmitting presentation information to client sites **54**; e.g., such adjunct networks may be local area networks, virtual private networks, and corporate intranets. Further, note that the audio client **224** can direct the audio server **228** and the audio player **234** to supply corresponding pre-recorded audio versions of presentation segments in different languages. Accordingly, the audio player may simulta-

Audio recordings in different languages are not "identical"

EX1004 (Ogdon), 2:1-6, 13:55-57

'798 Sur-Reply at 7

Ogdon Fails to Disclose Copies of the Same Video/Content

Petitioner contends that Ogdon's Claim 9 recitation of video portions that "correspond" discloses multiple "copies" of the same video because "correspond" means "identical." '798 Reply at 6-7. Petitioner's dictionary contradicts its argument. '798 Sur-Reply at 7.

Petitioner's Dictionary

cor•re•spond (kôr′ə spond′, kor′-), *v.i.* **1.** to be in agreement or conformity; match (often fol. by *with* or *to*): *His actions don't correspond to his words.* **2.** to be similar or analogous (usu. fol. by *to*): *The U.S. Congress corresponds to the British Parliament.* **3.** to communicate by exchange of letters. [1520–30; (< MF) < ML *corrēspondēre*. See COR-, RESPOND] —**cor′re•spond′ing•ly,** *adv.*

EX1033 (Random House Dictionary), 3

Petitioner relies on the definition of "***corresponding,***" but that word is not recited in Ogdon's Claim 9. '798 Sur-Reply at 7.

EX1028, ¶¶29-32. Indeed, contemporaneous dictionaries defined "corresponding" as "***identical*** in all essentials or respects" and defined "same" as "***corresponding***." EX1033, 3; EX1034, 3 (defining "corresponding" as "having or participating in the ***same*** relationship (as kind, degree, position, correspondence, or function)"); EX1033, 4 (defining "same" as "***identical*** with what is about to be or has just been mentioned" and "agreeing in kind, amount, etc.; ***corresponding***.").

'798 Reply at 7

9. A network presentation distribution system as claimed in claim **1**, wherein said first subcollection includes a first video portion, and said second subcollection includes a different second video portion that corresponds in content with said first video portion, and wherein said first and second video portions have substantially different expected data transmission rates for being transmitted to said first client node, and wherein said first segment selector uses said different expected data transmission rates in selecting one of said first and second subcollections.

EX1004 (Ogdon), Claim 9

Ogdon Fails to Disclose Copies of the Same Video/Content

Ogdon discloses "slide show" and "graphic slide" segments. Petitioner contends these "slides" are actually "video." '798 Reply at 7-8. But, as Dr. Jeffay explained, Ogdon's "slides" are like "slides in a PowerPoint slide show"—not segments of a larger video.

Ogdon's "Slide Show" Versions

communications network. For example, the segments (subcollections) of a first version of a presentation may require a network transmission rate sufficient for real time or animated video and the segments for another version of the presentation may only require a transmission rate sufficient for graphic slides. Thus, of a set of corresponding segments (subcollections), one segment (subcollection) may merely

EX1004 (Ogdon), 3:61-67

to the first client. Additionally, a third client may synchronously experience the first segment of the presentation via network transmissions from the first content webserver but subsequently experience the corresponding slide show alternative to the second segment from the third content webserver due to, for example, network transmission slowdowns.

EX1004 (Ogdon), 3:57-63

Dr. Jeffay's Testimony

system for providing a presentation to a plurality of client nodes on a communications network. *Id.* at 1:9-15. It also describes dividing a presentation into different "segments" that have different "versions" (*e.g.*, a PowerPoint slide with "a single image," a slide with "a combination of images," a slide with an "animation," etc.). *Id.* at 2:55-3:8. But these "segments" are discrete portions of a presentation that can be "substituted" in and out with different "versions" of the same, discrete portion of the presentation. *Id.* Ogdon's "segments" correspond to slides in a PowerPoint slide show and are discrete, stand-alone pieces of content that accompany a presenter-led performance of a presentation. Ogdon's only disclosure of distributing "live" content involves distributing "live voice audio" through a "phone bridge," *i.e.*, a telephone network. *Id.* at 4:48-55. Similarly,

'798 EX2006 (Jeffay Declaration), ¶[34]

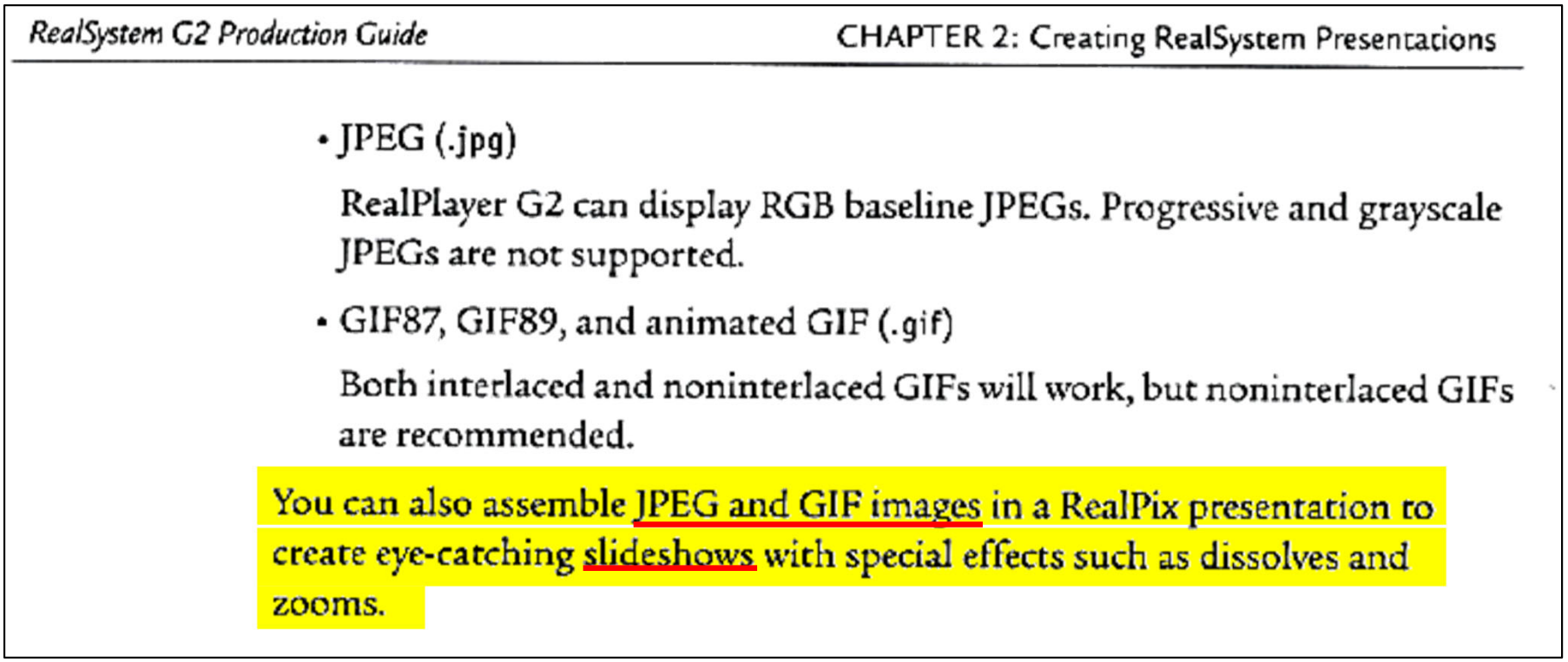
Ogdon recognizes that most of the overhead required to deliver and process video at a client could be obviated by distributing only the "presentation materials" (*i.e.*, a series of multimedia "segments" or "slides" in a presentation such as a PowerPoint presentation or HTML-based webpage) rather than the full live video stream. EX1004 at 2:13-66. By contrast, as reflected by

'798 EX2006 (Jeffay Declaration), ¶[67]

'798 Sur-Reply at 8; '798 POR at 8

Ogdon Fails to Disclose Copies of the Same Video/Content

Petitioner's support for its contention that Ogdon's "slides" are actually "videos" comes from the alleged capability of "RealNetworks." '798 Reply at 7-8. But Ogdon has no connection to "RealNetworks." Moreover, Petitioner's evidence of RealNetworks repeatedly describes RealNetworks' "slideshows" as image-based. '798 Sur-Reply at 9.



RealSystem G2 Production Guide CHAPTER 2: Creating RealSystem Presentations

- JPEG (.jpg)

  RealPlayer G2 can display RGB baseline JPEGs. Progressive and grayscale JPEGs are not supported.

- GIF87, GIF89, and animated GIF (.gif)

  Both interlaced and noninterlaced GIFs will work, but noninterlaced GIFs are recommended.

You can also assemble JPEG and GIF images in a RealPix presentation to create eye-catching slideshows with special effects such as dissolves and zooms.

EX1031 (Realsystem G2 Production Guide), 13; '798 Sur-Reply at 9

Ogdon Fails to Disclose "Streamlets"

Ogdon Fails to Disclose "Streamlets"

Claims	Representative Element
'554 Patent, All Independent Claims (Claims 1, 16, 26, 30)	Claim 1[C]: "the low quality stream, the medium quality stream, and the high quality stream each comprising ***a group of streamlets*** encoded at a respective one of the plurality of different bitrates, each group of streamlets comprising at least ***first and second streamlets***, each of the streamlets corresponding to a portion of the live event video…wherein the first streamlet of each of the groups of streamlets has the ***same first duration*** and encodes the same first portion of the live event video;"
'555 Patent, All Independent Claims (Claims 1, 10, 18, 26)	Claim 1[C]-1[E]: "the low quality stream, the medium quality stream, and the high quality stream each comprising ***a group of streamlets*** encoded at a respective one of the plurality of different bitrates … the plurality of streamlets in the low quality stream, the medium quality stream, and the high quality stream having a ***duration that is the same as each other***"
'680 Patent, All Independent Claims (Claims 1, 14, 22, 28)	Claim 1[C]-1[E]: "the low quality stream, the medium quality stream, and the high quality stream each comprising ***a group of streamlets*** encoded at a respective one of the plurality of different bitrates, each group of streamlets comprising at least ***first and second streamlets***, each of the streamlets corresponding to a portion of the video … wherein the first streamlet of each of the groups of streamlets has the ***same first duration*** and encodes the same first portion of the video "
'138 Patent, All Independent Claims (Claims 1, 13, 23, 28)	Claim 1[C]-1[E]: "the low quality stream, the medium quality stream, and the high quality stream each comprising ***a group of streamlets***, wherein each streamlet corresponds to a portion of the video, and wherein each streamlet in each group of streamlets is encoded at a respective one of the plurality of different bitrates, and wherein each group of streamlets comprises at least ***first and second streamlets …*** wherein the first streamlet of each of the groups of streamlets has the ***same first duration*** and encodes the same first portion of the video"
'798 Patent, All Independent Claims (Claims 1, 11, 22)	Claim 1[C]-1[E]: "wherein the first bit rate stream, the second bit rat stream, and the third bit rate stream each comprise ***a group of streamlets*** encoded at a respective one of the plurality of different bit rates, each group of streamlets comprising at least ***first and second streamlets***, each of the streamlets corresponding to a portion of the digital content … wherein the first streamlet of each of the groups of streamlets ***has the same first duration*** and encodes the same first temporal portion of the digital content "

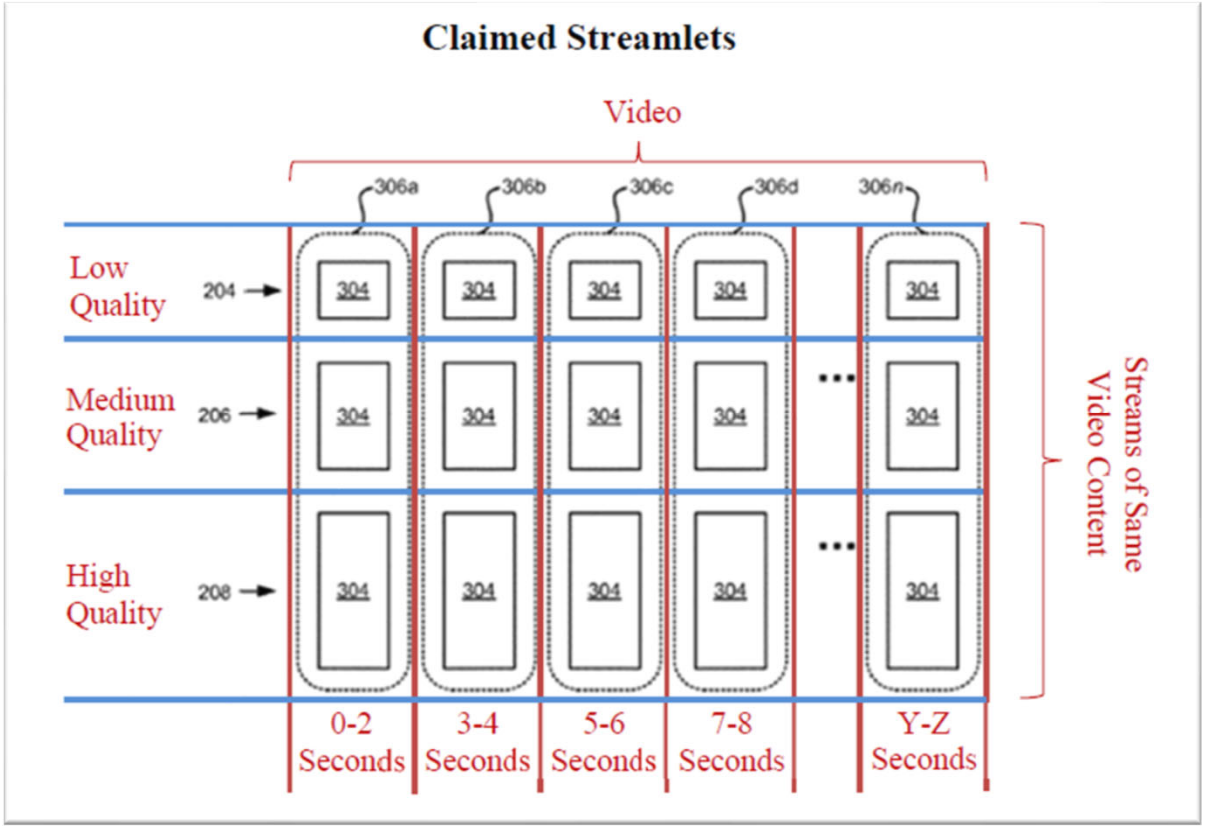
'798 POR at 13-19; '798 Sur-Reply at 17-19

Ogdon Fails to Disclose "Streamlets"

The Challenged Patents explain that "streamlets" are time-aligned portions of the same larger video stream, with the same duration but varying bitrates.

FIG. **3***b* is a schematic block diagram illustrating one embodiment of sets **306** of streamlets in accordance with the present invention. As used herein, the term "set" refers to a group of streamlets having identical time indices and durations but varying bitrates. In the depicted embodiment, the set **306***a* encompasses all streamlets having a time index of 00:00. The set **306***a* includes encoded streamlets **304** having low, medium, and high **204**, **206**, **208** bitrates. Of course each set **306** may include more than the depicted three bitrates which are given by way of example only. One skilled in the art will recognize that any number of streams having different bitrates may be generated from the original content **200**.

'554 POR at 7; '554 EX1001, 7:55-8:12



'554 POR at 7; '554 EX1001, Fig. 3b (annotations added)

Ogdon Fails to Disclose "Streamlets"

Ogdon fails to disclose "streamlets" encoding the same "portion" of a video at different bitrates because Ogdon discloses alternative presentation segments with ***different*** and "***unique***" content. '798 POR at 16-19; '798 Sur-Reply at 2-4, 8-9.

(2.2) Different versions of the same presentation, accessible from the one or more of the content webservers, wherein each version may be for a different group of audience members such as a group for Japanese speaking audience members, or audience members affiliated with a particular organization.

Note that each of the one or more presentation versions includes one or more presentation segments (hereinafter also denoted simply "segments") that provide different portions of the presentation. More precisely, subcollections each

EX1004 (Ogdon), 2:30-39

other versions. Thus, assuming corresponding segments (or subcollections thereof) in different versions have approximately the same presentation duration, any of the corresponding alternative segments (or subcollections thereof) from different versions can be presented as a replacement for another such corresponding segment (or subcollection) during the presentation. Thus, it is an aspect of the present

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communications network. For example, the segments (subcollections) of a first version of a presentation may require a network transmission rate sufficient for real time or animated video and the segments for another version of the presentation may only require a transmission rate sufficient for graphic slides. Thus, of a set of corresponding segments

EX1004 (Ogdon), 2:49-55

responding (in content) segments of the presentation. For example, a first client (at a first client node) may experience the presentation as an ordered series of presentation segments, wherein the first and second ordered segments are presented in full animation, wherein the first of the ordered segments is obtained from a first content webserver and the second segment of the ordered segments is obtained from a second content webserver. Moreover, synchronously with the presentation to the first client, a second client (at a second client node) may experience the presentation in a slide show format from a third content webserver, wherein the initial two segments presented are corresponding alternative segments to the first and second segments presented to the first client. Additionally, a third client may synchronously experience the first segment of the presentation via network transmissions from the first content webserver but subsequently experience the corresponding slide show alternative to the second segment from the third content webserver due to, for example, network transmission slowdowns.

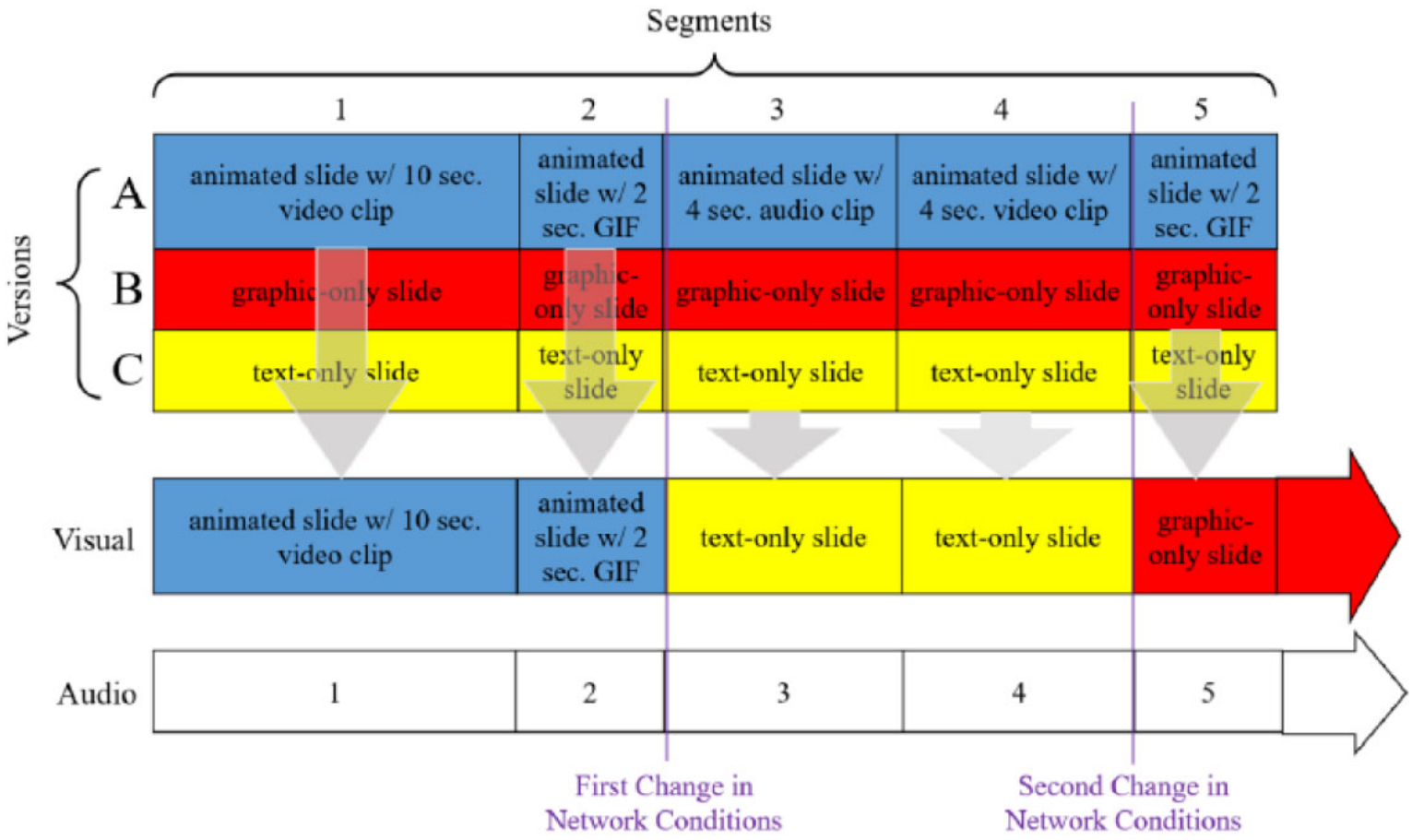
EX1004 (Ogdon), 3:44-63

Although each segment of a presentation is treated as a unique (multi)media element, the present invention is capable of delivering an entire collection of presentation segments to a client node while the presentation is being performed. This enables a more smooth flow of

EX1004 (Ogdon), 6:1-5

Ogdon's "Segments" Are Not "Streamlets"

Diagram Illustrating Ogdon's Segmented Versions



'138 Sur-Reply at 3; '138 EX2006 (Jeffay Declaration), ¶¶[116-121]

As Dr. Jeffay Explained, Ogdon's "segments" are "different types of media elements," which Ogdon describes as "a combination of one or more of … audio, images, animation or video." '138 Jeffay Dec., ¶[118]. Accordingly, "Ogdon describes changing the content of its 'segments' as network conditions deteriorate, rather than changing the quality of that content." *Id.* ¶[133]

'138 Sur-Reply at 2-4; '798 POR at 15, 34

Ogdon's "Segments" Are Not "Streamlets"

Petitioner contends the Challenged Claims do not require "streamlets" of a "larger-form video like a movie" because "segments [] ***from different videos***, could be arranged to make up a larger video." '798 Reply at 12. But the Challenged Claims recite encoding a ***single video*** into multiple streams, with each stream comprising "streamlets" corresponding to successive "portions" of that same larger video. '798 Sur-Reply at 10.

1. A system for adaptive-rate content streaming of video playable on one or more end user stations over the Internet, the system comprising:

at least one processor executing non-transitory executable instructions for generating at least one virtual timeline corresponding to the video;

wherein the video encoded at a plurality of different bitrates creating a plurality of streams including a low quality stream, a medium quality stream, and a high quality stream, the low quality stream, the medium quality stream, and the high quality stream each comprising a group of streamlets encoded at a respective one of the plurality of different bitrates, each group of streamlets comprising at least first and second streamlets, each of the streamlets corresponding to a portion of the video;

'680 EX1001, Cl. 1

Aylo's Argument



Ogdon's "Segments" Are Not the Same Duration

Petitioner relies on Ogdon's disclosure of "presentation segments" with "approximately the same presentation duration" as disclosing the "same duration" limitation. '798 Reply at 14.

Moreover, each version of a presentation typically has its subcollections of segments (i.e, presentation elements) ordered according to their presentation sequence. Moreover, substantially every segment (or subcollections thereof) in one version corresponds with a segment (or subcollections thereof) having the same presentation order, in each of the other versions. Thus, assuming corresponding segments (or subcollections thereof) in different versions have approximately the same presentation duration, any of the corresponding alternative segments (or subcollections thereof) from different versions can be presented as a replacement for another such corresponding segment (or subcollection) during the presentation. Thus, it is an aspect of the present

EX1004 (Ogdon), 2:43-55

Ogdon's "Segments" Are Not the Same Duration

But, as Dr. Jeffay explained, Ogdon's corresponding "segments" across versions cannot have the same duration because they are ***different media types***. For example, Ogdon's images have "***no length whatsoever compared to [] video***." Thus, while Ogdon's presentation leader may set the "pace" of the presentation (i.e., length each segment is displayed), the underlying duration of those segments is not the same.

115. In this regard, the length of time that any "segment" in Ogdon is displayed, if at all, is entirely ***independent*** of the content of that "segment." A "segment" that includes a single image will be displayed the same length of time as a "segment" that includes a video, even though the "segment" with the single image technically has no length whatsoever compared to the video. *See* EX1006 at 107 (recognizing that "discrete media," like an "image file," "has ***no intrinsic duration***," while "continuous media," like a "video," has "a ***measurable and well-understood duration***."). Both "segments"—the video and the single image—will be displayed until the "presentation leader" indicates that the next "segment" should be displayed, or that the presentation is over. *See, e.g.*, EX1004 at 4:29-36 (explaining how host nodes "receiv[e] ... presentation instructions from a presentation leader indicating the next presentation segment(s) to be presented"), 21:16-19 ("the leader(s) may choose to identify [the next] segments"); 21:24-29 (referring to "the leader supplied identifications for the segment collection"). And one "segment" can be substituted for the other, even though they have different durations.

'138 EX2006 (Jeffay Declaration), ¶115; '138 POR at 35

For a given presentation, the present invention directs each client node to request presentation content from a given set of communications network servers rather than having such servers push presentation content to the client node. Among other advantages, this enables dynamic control of the pace of the presentation by a presentation leader while each client node selects specific display materials to attain that pace. Moreover,

EX1004 (Ogdon), 6:40-47; '798 Sur-Reply at 12-13; '798 POR at 36

'138 POR at 35-36

Ogdon's "Segments" Are Not the Same Duration

Ogdon also describes the human presenter rearranging "segments" during the presentation or skipping "segments" if time is running short, which are operations antithetical to streaming via successive time-aligned "streamlets" that must be played in order to reproduce the source video.

An item number column **616** is provided for labeling rows so that a presentation leader can transfer to the rows having a value in this column and proceed sequentially through the script from the labeled row to which the leader transfers. This allows the leader to skip and/or rearrange portions of a presentation performance. Accordingly, there are three rows to which a leader can transfer control, namely, rows: **608***a*, **608***e*, and **608***o*.

A "virtual time" column **620** is provided wherein values in this column set and reset a presentation performance timer so that, for example, some portions of a presentation will automatically be skipped if a performance of the presentation is running behind a predetermined performance sched-

EX1004 (Ogdon), 25:55-67

'798 POR at 17-18

Ogdon's "Segments" Are Not the Same Duration

Lacking any express disclosure in Ogdon of video "streamlets" with the same "duration," Petitioner and its expert first rely on a POSITA's "common sense" to supply this limitation. This is improper.

In cases in which "common sense" is used to supply a missing limitation, as distinct from a motivation to combine, moreover, our search for a reasoned basis for resort to common sense must be searching. And, this is particularly true where the missing limitation goes to the heart of an invention.
Arendi S.A.R.L. v. Apple Inc., 832 F.3d 1355, 1363 (Fed. Cir. 2016)

Q. Right, okay. But I just want to make sure -- so two questions about that.

So first, is it your opinion that a person of ordinary skill in the art reading Ogdon would understand that the end user would experience a seamless presentation as you describe it here in paragraph 77?

A. I mean, I don't think Ogdon uses the word "seamless," right, in the specification because it's describing a system that allows a presentation to be made, that includes video presentations that may be made up of different video segments encoded to meet different network characteristics of different users.

So that's all part of the thing why doing it in a different way -- why doing it the way that I've laid out would have been obvious to a POSITA and it they would be motivated to make all of the corresponding segments in each version in equal duration of time to simplify the question, and so that each corresponding streamlet in each version could serve as a replacement for that portion of presentation content.

EX2009 (Houh Depo), 211:4-213:22; '554 POR at 37

Ogdon's "Segments" Are Not the Same Duration

In Reply, Petitioner turns to the Ogdon Provisional (EX1014) and Ogdon's file history (EX1015) to meet the "same duration" aspect of the "streamlet limitations. '138 Reply, 13-14. But these materials do not form any IPR ground and are not prior art patents or publications. Thus, this too is improper.

(b) SCOPE. –
A petitioner in an inter partes review may request to cancel as unpatentable 1 or more claims of a patent only on a ground that could be raised under section 102 or 103 and only on the basis of prior art consisting of patents or printed publications.

35 U.S.C. 311(b)

"A reference patent is only entitled to claim the benefit of the filing date of its provisional application if the disclosure of the provisional application provides support for the claims in the reference patent in compliance with § 112, ¶ 1. *In re Wertheim*, 646 F.2d 527, 537 (CCPA 1981)…. A provisional application's effectiveness as prior art depends on its written description support for the claims of the issued patent of which it was a provisional."

Dynamic Drinkware LLC v. Nat'l Graphics, Inc., 800 F.3d 1385 (Fed. Cir. 2015)

'138 Sur-Reply at 11

Ogdon's "Segments" Are Not The Same Duration

While the Ogdon Provisional is not prior art or part of any IPR ground and cannot be considered, Petitioner's cited "corresponding presentation segments [with] identical audio portions" ('798 EX1003, ¶73), does not disclose "video" portions with the same duration as claimed.

> 9. A network presentation distribution system as claimed in Claim 1, wherein the presentation includes at least a first and a second version of the presentation wherein there are, in said first collection, first and second corresponding segments for said first and second versions, respectively, having a similar presentation content and approximately a same presentation duration so that when the first version is output on a first user node synchronously with the second version on a second user node, the first and second corresponding presentation segments are output to the first and second user nodes, respectively, substantially simultaneously.

EX1014 (Ogdon Provisional), 32; '798 Sur-Reply at 12

Ogdon's "Segments" Are Not The Same Duration

- Petitioner also relies on Dr. Houh's testimony regarding Ogdon's file history to establish the "same duration" limitation. But that file history is not prior art or part of any IPR ground and cannot be considered.
- Dr. Houh omits context clarifying that the Ogdon Applicant's use of the term "identical" referred to different audience members receiving the same portions of the presentation–not that different versions have the same content.

The present invention is a system for distributing a presentation on a network, such as the Internet, wherein audience members for the presentation are synchronously provided with identical (and/or content corresponding) portions of the presentation. For example, different audience members may simultaneously be presented with different versions of the presentation, wherein the audience members receive synchronized versions of the presentation via the network. In particular, the present invention synchronizes the presentation to the audience members so that all audience members progress through the presentation substantially identically. Additionally, this synchronization of the presentation

EX1015 (Ogdon File History) at 239; '798 Sur-Reply at 12

Ogdon Fails to Disclose "Streamlet Requests"

Ogdon Fails to Disclose Requests for Individual Streamlets

Patent/Claims	Representative Element
'554 Patent, Claims 4, 7, 16, 26, 30	Claim 4: "***receive at least one streamlet request*** over one or more internet connections from the one or more end user stations ***to retrieve the first streamlet*** storing a portion of the video."
'555 Patent, Claims 4, 7, 10, 22, 23, 26	Claim 4: "***receive at least one streamlet request*** over one or more internet connections from the one or more end user stations ***to retrieve the first streamlet*** storing a portion of the video,"
'680 Patent, Claims 7, 9, 15, 22, 23, 29	Claim 7: "***receive at least one streamlet request*** over one or more internet connections from the one or more end user stations ***to retrieve the first streamlet*** storing a portion of the video,"
'138 Patent, Claims 6, 8, 14, 18, 23, 28	Claim 6: "***receive at least one streamlet request*** over one or more internet connections from a respective one of the one or more end user stations ***to retrieve the first streamlet***,"
'798 Patent, Claims 2, 5, 11, 12, 17, 22	Claim 2: "***receive at least one streamlet request*** over one or more network connections from one or more end user stations ***to retrieve the first streamlet*** storing a portion of the digital content,"

'798 POR at 39-41; '798 Sur-Reply at 9-10

Ogdon Requests "Subcollections" of Segments, Not Individual "Streamlets"

Ogdon does not disclose individual client requests for each individual streamlet (i.e., a *one-to-one* request/response relationship) because only "subcollections" of segments are retrieved.

Subsequently, in step **528**, the client node **56** provides the identity of the selected webserver and next collection of segments to the client node's browser **78** and the browser, in turn, sends a network **70** request to the selected web server for the selected (subversion) of segments. Following this step, the client presentation software **88** monitors the time elapsed before transmission of the selected collection of segments is completed, and determines whether these segments are provided within an appropriate window of time that allows them to be presented during the performance of the presentation. Thus, in step **532**, the client presentation software **88** determines whether the requested collection of segments is cached on the client node **56** within a desired time prior to the proposed performance of the collection of segments. In particular, for determining this desired time, a

EX1004 (Ogdon), 23:40-54; '554 POR at 41

'554 Sur-Reply at 9-10; '554 POR at 40-43

Ogdon Requests "Subcollections" of Segments, Not Individual "Streamlets"

Petitioner contends the claimed streamlet requests include a request for multiple streamlets. '554 Reply at 11-12. This is contrary to the plain language of the claims. '554 Sur-Reply at 9-10.

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.

'554 EX1001, Cl. 16

Ogdon Requests "Subcollections," Not Individual "Streamlets"

Petitioner does not dispute that Ogdon is limited to requesting "subcollections" of segments. Instead, Petitioner contends that Ogdon's "subcollections" could include a single "segment." '798 Reply at 12.

- But the Petition maps the claimed "group[s] of streamlets" to "subcollections" of segments. A "single-segment" subcollection would contradict Petitioner's mapping.
- There is no support in the Petition for this new argument presented in the Reply.

'798 Sur-Reply at 9-10

d. 1[C]: "the low quality stream, the medium quality stream, and the high quality stream each comprising a group of streamlets, wherein each streamlet corresponds to a portion of the video, and wherein each streamlet in each group of streamlets is encoded at a respective one of the plurality of different bitrates, and wherein each group of streamlets comprises at least first and second streamlets;"

Ogdon in view of Allen teaches 1[C]. *See* 1[B].

Ogdon further discloses that each stream (at each corresponding bitrate) comprises a group (elements, collections, or subcollections) of streamlets (segments) encoded at a respective one of the bit rates. EX1004, 2:43-49 ("each version of a

'138 Pet. at 24

Ogdon Fails to Disclose "Live Event Video"

Some of the challenged claims require "live event video"

Patent/Claims	Representative Element
'554 Patent, Claims 1, 2, 7, 8, 10, 16, 17, 20, 22, 23, 26, 27, 30	Claim 1: "A system for adaptive-rate content streaming of ***live event video***… the ***live event video*** encoded at a plurality of different bitrates…"
'555 Patent, Claims 1, 7, 8, 9, 14, 15, 16, 17, 18, 19, 25,	Claim 1: "A system for adaptive-rate content streaming of ***live event video***… the ***live event video*** encoded at a plurality of different bitrates…"
'798 Patent, Claims 6, 7	Claim 6: "the digital content comprises a ***live event video*** of ***a live event***,…"

'554 POR at 40

Ogdon Fails to Disclose "Live Event Video"

Petitioner does not dispute that Ogdon fails to disclose recording, encoding, or transmitting a "live event video." Instead, Petitioner contends that Ogdon's "presentation materials" constitute "live event video" because clients allegedly "watch[] the video presentations live at the same time 'during performance.'" '555 Reply, 19.

But Ogdon discloses that its "segments" are "***predefined***," and thus exist well in advance of any distribution of those materials. They therefore are not "live event video" as claimed. '555 Sur-Reply 19.

Note that it is also an aspect of the present invention that an ordering of predefined segments (or subcollections thereof) is capable of being presented and archived, and subsequently represented. Moreover, such an ordering can take into account alternative segments for the presentation. Thus, multiple sequentially-ordered scripts can be created so that the leader can choose to change scripts in the middle of a presentation based on user feedback. Accordingly, a presentation leader has the ability to stop presentation of a particular script and its current subcollection of segments and change to a different subcollection of segments to be delivered to the audience. Subsequently, the leader can then resume the initial script at any time.

EX1004, 3:11-23

V. Invalidity – Obviousness: Ogdon in View of Allen

The Combination Fails to Disclose "Streamlets"

The Petition applies Allen's account of encoding a video stream in a plurality of bitrates to provide motivation to encode each of Ogdon's "segments" at a different quality level.

> Additionally, as explained above in 1[B], Allen teaches encoding the same video at low, medium, and high quality levels. Since Ogdon contemplates a live video presentation that is segmented and stored at various quality levels (EX1004, Abstract, 1:62-2:1, 6:2-5, 10:7), a POSITA would have been motivated to encode each recorded video segment of Ogdon into each quality level in parallel in real-time prior to storing at the webservers (*see* 1[A]). EX1003, ¶ 67; *see also* EX1005, 5:15-

'554 Pet. at 22–23

This fails because Allen cannot cure the fact that Ogdon's "segments" are unique multimedia elements—not "streamlets" of a larger video. And Petitioner does not propose any modification to Ogdon's "segments" that might cure these deficiencies.

'798 POR at 12–13

The Combination Fails to Disclose "Streamlets"

Modifying Ogdon to have each requested "segment" be used to stream a single, larger video would be contrary to Ogdon's goal of distributing different presentation materials to users who lacked the specialized and expensive equipment required for continuous media streaming. '798 POR, 25-27; '798 Sur-Reply, 4.

> 55. Specifically, Ogdon recognizes that most of the overhead[3] required to receive and process video at a client could be obviated by distributing only the "presentation materials" (*i.e.*, a series of multimedia "segments" or "slides" in a slide deck) instead of distributing the live video of the presentation in a stream. While distribution of presentation materials alone is less desirable than live video, Ogdon teaches that its proposed solution is beneficial because it "allow[s] individuals to access and/or participate in a presentation using standard telephony and Internet network connections found in most offices and many homes." EX1004 at 1:43-48. Conference participants

'798 EX2006 (Jeffay Dec.), [55].

The Combination Fails to Disclose "Streamlets"

Like Ogdon, Allen also fails to disclose ***subdividing*** the same content into time-aligned portions at different bitrates. Instead, Allen merely discloses encoding content in "three bitrates," but not having the resulting content be divided into smaller, time-divided streamlets. '798 Sur-Reply at 15

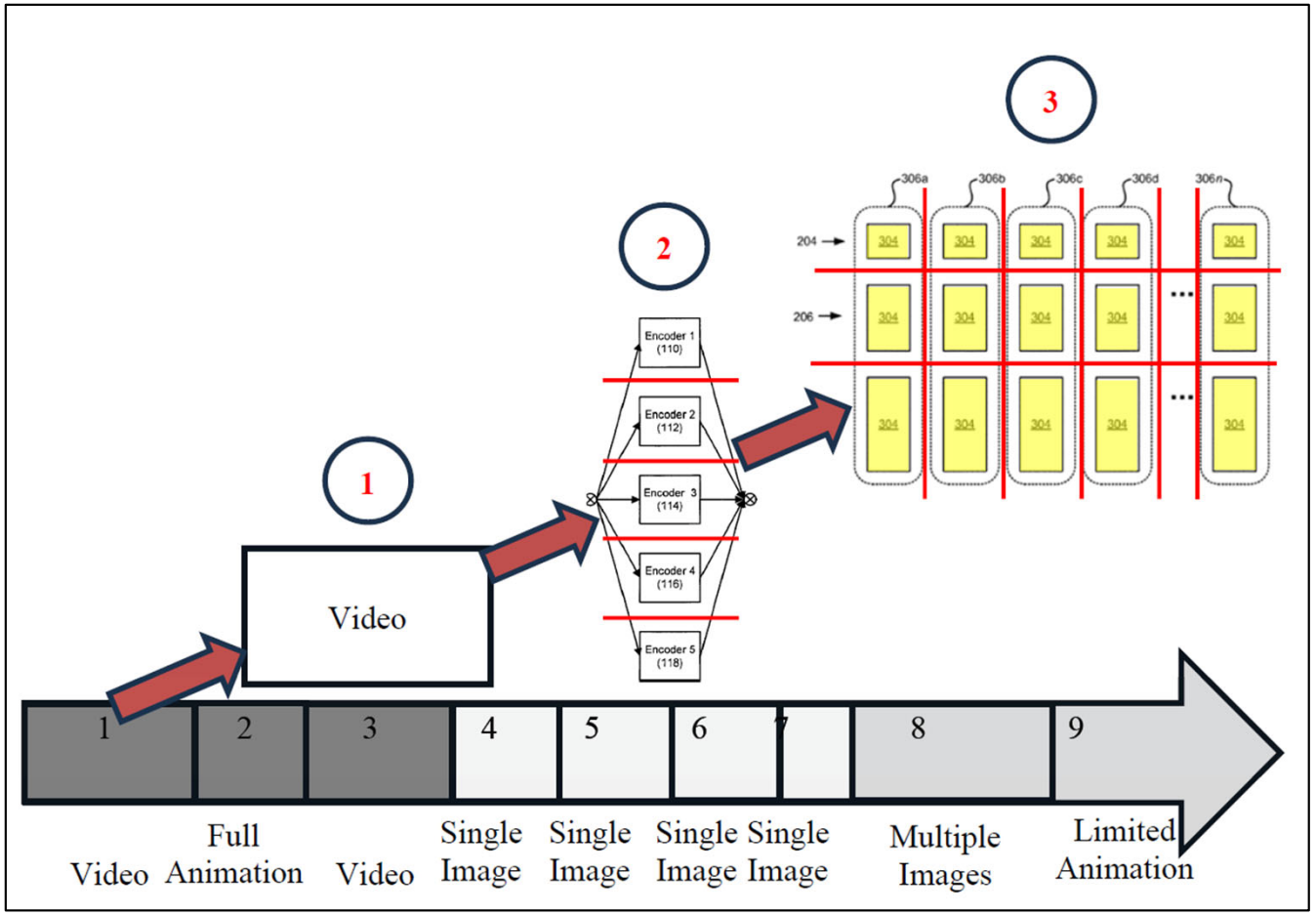
> In the currently existing model as shown in **Fig. 10**, content is produced and encoded by the Content Producer (1002) at the point of origination. This example assumes it is pre-processed and encoded in RealSystem, Microsoft Windows Media, and Apple QuickTime formats, and that each format is encoded in three different bit rates, 56Kbps, 300Kbps, and 600Kbps. Already, nine individual streams (1004) have been created for one discrete piece of content, but at least this much effort is required to reach a reasonably wide audience. The encoded streams (1005) are then sent via a satellite- (1006) or terrestrial-based CDN (1008) and stored on specially designed edge-based streaming media servers at various points of presence (PoPs) around the world.

EX1005 (Allen), 12:1-10

The Combination Fails to Disclose "Streamlets"

Dr. Jeffay identified the complex modifications to Aylo's proposed combination of Ogdon and Allen that would be required to arrive at the claimed "streamlets," including the following:

1. Extracting any video clip embedded in a "segment"
2. Encoding that video into different bitrates to create streams
3. Dividing each stream into smaller, separate portions of the larger stream



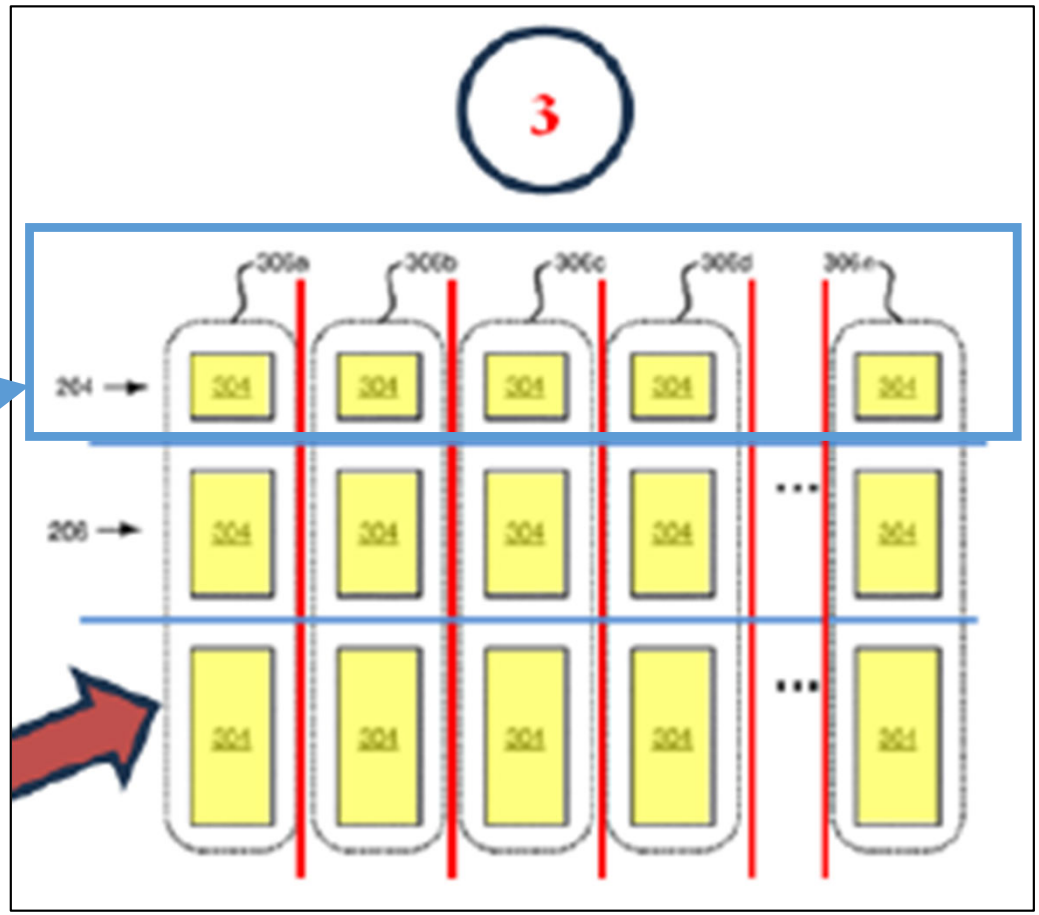
'554 POR at 20–21; '554 EX2006 (Jeffay Declaration), ¶[96]

The Combination Fails to Disclose "Streamlets"

Petitioner alleges in Reply that "segmenting" a larger video was "well-known to a POSITA." '798 Reply at 16.

This fails because the Challenged Claims require a "plurality" of streams that each comprise streamlets.

Segmenting a single stream… does not render obvious time-aligned segments across multiple bitrate versions of the same video. '798 Sur-Reply at 16.

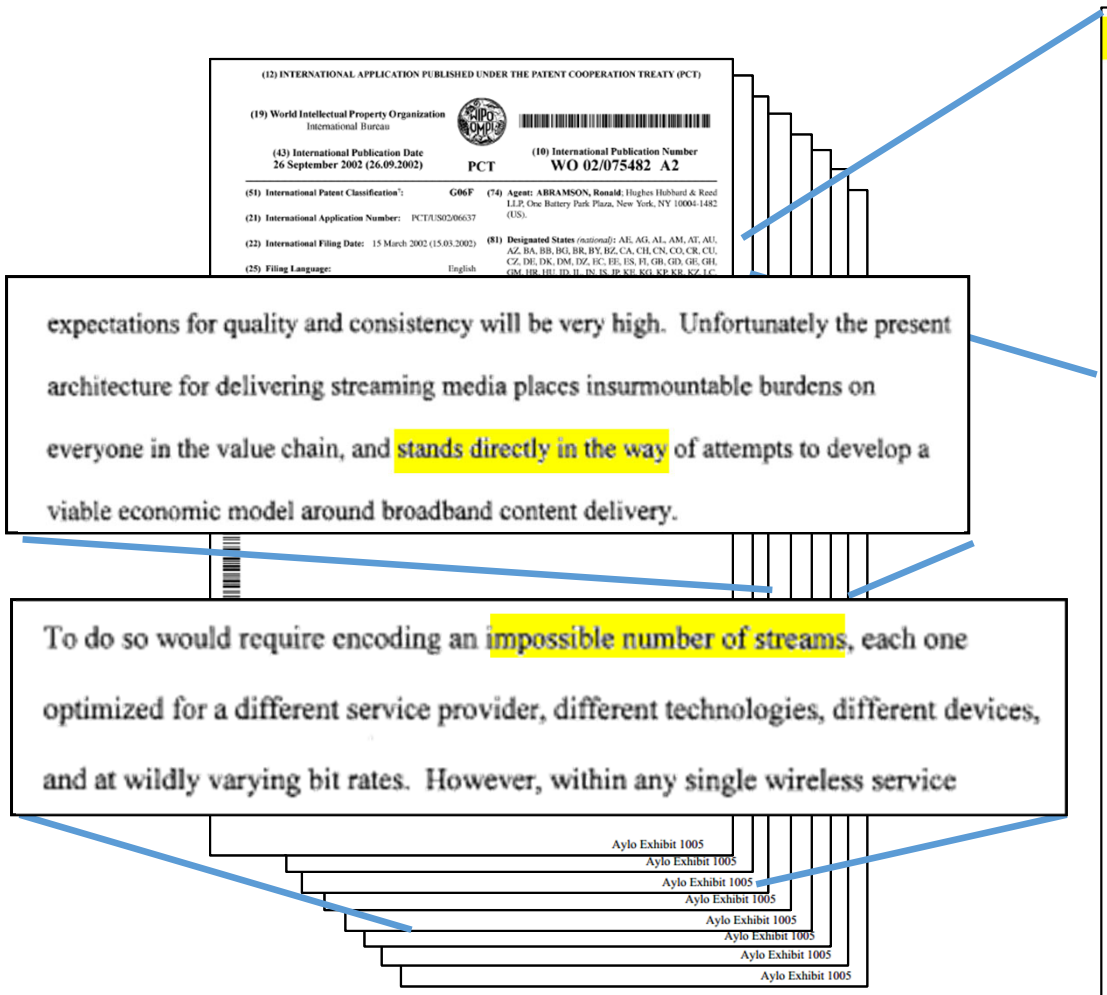


EX1001, Fig. 3b (annotated)

'798 POR at 19-22

Both References Teach Away from the Combination

Allen devotes seven pages of disclosure to disparaging the "multi-bitrate" approach Petitioner relies on.



EX1005 (Allen), 116:13-15; '554 POR at 30

The problems with the prior art approach are many, and include:

- None of the available selections may match the end users' particular requirements.
- Converting from digital to analog, and then back to digital, degrades signal quality.
- Simultaneous transmission in different formats needlessly consumes network bandwidth.
- There is no ability to localize either formats or content, i.e., to tailor the signal to a particularized local market.
- There is no means, after initial system setup, to reallocate resources among the various encoders.
- Conventional video processing equipment does not lend itself to automated adaptation of processing attributes to the characteristics of the content being processed.
- Single point failure of an encoder results in complete loss of an output format.
- Because of bandwidth requirements and complexity, the prior art approach cannot be readily scaled.

EX1005 (Allen), 4:8-25, 13:5-8; '554 POR at 30

Both References Teach Away from the Combination

"It is impermissible …to pick and choose from any one reference only so much of it as will support a given position to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to [a POSITA]."
Bausch & Lomb, Inc. v. Barnes-Hind/Hydrocurve, Inc., 796 F.2d 443, 448 (Fed. Cir. 1986)

106. After laying out these drawbacks of the multi-bitrate approach, Allen explains that the solution to these problems is to encode the video in only a ***single bitrate***, but to move this encoding task to the "last mile," or "edge" of the network (*i.e.*, "one hop (in a network sense) from the end users."). *Id.* at 104:9-11, 116:15-21. In contrast to the centralized prior art encoding approaches disparaged by Allen, where content had to be encoded in "an impossible number of streams" to accommodate clients with "wildly varying bit rates," "the problem nearly disappears" with Allen's edge-based approach because, according to Allen, "it is likely that all of the users have the ***same network speed***" when they are all just "one hop" from the edge server performing the encoding. *Id.* at 104:9-16, 116:6-19. With "edge-based encoding," the internet "service provider" (ISP) can "optimize streaming media for the known conditions within their network" by encoding content at the best ***single bitrate*** for the known connection speed of their users. *Id.* at 116:15-21.[12] Thus,

'554 EX2006 (Jeffay Declaration), 106; '554 POR at 31

Both References Teach Away from the Combination

The Board did not rely on a teaching away, but found that, on the balance of the evidence, "the literature would have dissuaded a [person of ordinary skill in the art] from using formaldehyde or paraformaldehyde in the [Chiu] modified method." 01054 Decision, at *17. Even if evidence does not "rise to the level of teaching away," it is still proper for the Board to consider evidence that "suggests reasons that a skilled artisan would be discouraged from pursuing such a combination."

Laboratory Corp. of Am. Holdings v. Ravgen, Inc., WL 32904, at *4 (Fed. Cir. Jan. 6, 2025) (*citing Arctic Cat Inc. v. Bombardier Recreational Prods. Inc.,* 876 F.3d 1350, 1363 (Fed. Cir. 2017))

Both References Teach Away from the Combination

As Dr. Jeffay explained, the combination purports to change Ogdon's principle of operation from an ***adaptive-content*** system that changes the format and content based on bandwidth, to an ***adaptive-bitrate*** system as claimed, which provides the same content but changes the bitrate based on bandwidth.

> 109. Dr. Houh, however, ignores Ogdon's express teaching that users generally *lacked* the equipment and infrastructure necessary to view streaming video and turns Ogdon's principle of operation on its ear by *reverting* Ogdon's non-streaming solution *back into* a video streaming solution—the exact thing Ogdon sought to avoid. Dr. Houh's proposed modification therefore improperly replaces the content-substituting feature Ogdon touts as its invention with a video streaming solution that would fail to support the limited-bandwidth networks of Ogdon's targeted home and office users.

'554 EX2006 (Jeffay Declaration), ¶[109]; '554 POR at 32

Both References Teach Away from the Combination

The Combination Changes Ogdon's Principle of Operation, and Is Thus Improper

> The Board therefore determined that combining Reed with Nishida would "require the alteration of the principles of operation of Reed or would render Reed inoperable for its intended purpose." … In view of the undisputed evidence of the pre-seaming differences between Reed and Nishida, we conclude that substantial evidence supports the Board's motivation to combine findings with respect to the Base Claims.
>
> *Adidas AG v. Nike, Inc.*, 963 F.3d 1355, 1358-59 (Fed. Cir. 2020)

'554 POR at 33

Ogdon Fails to Disclose a "Virtual Timeline" Request by a Client

Claims	Representative Element
'554 Patent, Claims 11-15, 23-25	Claim 11: "wherein ***the first web server is further configured to***: receive at least one virtual timeline request over the one or more internet connections from the one or more end user stations to retrieve a virtual timeline; and ***send the virtual timeline to the requesting one of the end user stations*** over the one or more network connections."
'680 Patent, Claims 1, 2, 8, 10-15, 18, 19, 22, 28, 29	Claim 8: "***a first web server configured to***: receive at least one virtual timeline request over the one or more internet connections from the one or more end user stations to retrieve a virtual timeline; and ***send the virtual timeline to the requesting one of the end user stations*** over the one or more network connections"
'138 Patent, Claims 9-12, 18-20	Claim 9: "wherein ***the first web server is further configured to***: receive at least one virtual timeline request over the one or more internet connections from the one or more end user stations to retrieve a virtual timeline; and ***send the virtual timeline to the requesting one of the end user stations*** over the one or more network connections."
'798, Claim 8	Claim 8: "wherein ***the first server is further configured to***: receive at least one virtual timeline request over the one or more network connections from the one or more end user stations to retrieve a virtual timeline; and ***send the virtual timeline to the requesting one of the end user stations*** over the one or more network connections."

'554 Sur-Reply at 19; '554 POR at 39

Ogdon Fails to Disclose a "Virtual Timeline" Request by a Client

The Petition overlooked the requirement of the Challenged Claims that the content web server sends the client a virtual timeline in response to a client request. As Dr. Jeffay explains, Ogdon's "scripts" cannot be a "virtual timeline" because Ogdon's intermediate "host"—not the claimed content web server—receives the virtual timeline from the content manager and sends it to the end user.

> 141. Although the term "virtual timeline" is broad enough to be met by a "playlist" and, therefore, is not limited to "entire content files," as discussed *supra* at §V, Ogdon's "scripts" cannot be read onto the claimed "virtual timelines" because the challenged claims require that a server (*e.g.*, a "web server") send the "virtual timeline" to the ***client*** (*e.g.*, an "end user station"). Ogdon, on the other hand, describes a "content manager 104" that "distributes presentation data, such as scripting information for a presentation." EX1004, 9:31-33. The "host 200" then must "request the one or more scripts for the presentation from the content manager 104" before providing them to "client nodes 56" for "presentation performance to their respective audience members." *Id.* at 18:37-40, 21:50-58. Thus, Ogdon's server sends a script to hosts—not clients. In other words, Ogdon fails to disclose or suggest a client requesting its "script" or a server response to the client and, therefore, does not disclose or suggest the claimed "virtual timeline."

'554 EX2006 (Jeffay Declaration), ¶[141]; '554 POR at 39

Ogdon Fails to Disclose a "Virtual Timeline" Request by a Client

In Reply, Petitioner contends that it would have been obvious to modify Ogdon to make a direct client-server request for a virtual timeline. This theory is not set forth in the Petition and is therefore improper. '798 Sur-Reply at 19.

Petitioner's belated theory also fails because it is incompatible with Ogdon's "host" computer's role in resolving placeholder resource identifiers for Ogdon's segments because it would result in "scripts" with "unresolved" placeholders. '798 Sur-Reply at 20.

data resides. Thus, since the presentation scripts received by the hosts **200** from the content manager **104** are generic in that the scripts have variables or placeholders for content webserver **96** identities, each host **200** uses information from the corresponding resource file **212** (retrieved according to presentation identification) for resolving the undefined content webserver variables of the generic scripts, and thereby instantiating presentation scripts and presentation data with specific content webserver **96** references. Note that

EX1004 (Ogdon), 12:44-52

Claim Construction: "Virtual Timeline"

Non-issue because the parties' validity arguments do not turn on adoption of either party's construction

PO and the Board agree that "virtual timeline requires no explicit construction"

> For purposes of this Decision, we determine that no aspects of the challenged claims require explicit construction. *See, e.g.*, *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) ("The Board is required to construe 'only those terms . . . that are in controversy, and only to the extent necessary to resolve the controversy.'" (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

'554 ID at 11

> A POSITA would readily understand the meaning of the term "virtual timeline" from the plain language of the claims themselves, which is consistent with the use of the term in the specification. EX2006, ¶[42]. The term "virtual timeline" therefore does not require a specific construction.

'554 POR at 10

Petitioner contends that "virtual timeline" requires a playlist of "entire" content files.

> Additionally, Petitioner submits that "virtual timeline" may require construction. The '554 Patent describes a "virtual timeline" as "a file that is configured to define a playlist for a user to view" which "may indicate that the publisher desires a user to watch a first show QMX 602a followed by QMX 602b and QMX 602c" such that "the publisher may define a broadcast schedule in a manner similar to a television station." EX1001, 12:31-44, FIGs. 6a-6c. The '554 Patent further explains that the Quantum Media Extension (QMX) files each "describe an entire content file." *Id.* 12:35-36. Thus, Petitioner submits that "virtual timeline" should be construed as "a playlist of entire content files." EX1003, ¶¶ 43-

'554 Pet. at 10–11

Petitioner's construction is wrong. The specification includes an embodiment where "entire" content files are not required.

'554 POR at 10-11

> FIG. **6***b* is a schematic block diagram illustrating an alternative embodiment of a VT **600** in accordance with the present invention. In the depicted embodiment, the VT **600** may include a single QMX **602** which indicates that the publisher desires the same content to be looped over and over again. For example, the publisher may wish to broad-

'554 EX1001, 12:44-49

VI. Invalidity – Obviousness: Ogdon in View of Allen and SMIL 2.0

SMIL 2.0 Does Not Disclose Streamlets with Same Duration

The Petition relied on SMIL 2.0 as allegedly disclosing streamlets of the same duration based on SMIL 2.0's "dur" element, as applied to a series of colored squares.

In one example, SMIL 2.0 teaches providing three sequential media elements and three alternative sequential media elements (annotated below as purple, yellow, and red) each having an equal playback duration of 5 seconds due to the "dur=5s":

```
<switch>
  <seq systemRequired="BrushMedia">
    <brush dur="5s" color="#0000FF" region="colorbox"/>
    <brush dur="5s" color="#00FF00" region="colorbox"/>
    <brush dur="5s" color="#FF0000" region="colorbox"/>
  </seq>
  <seq>
    <img dur="5s" src="blue.jpg"  region="colorbox"/>
    <img dur="5s" src="green.jpg" region="colorbox"/>
    <img dur="5s" src="red.jpg"   region="colorbox"/>
  </seq>
</switch>
```

'138 Pet. at 57–58

SMIL 2.0 Does Not Disclose Streamlets with Same Duration

But, as Dr. Jeffay explained, SMIL 2.0's "dur" elements do not describe the actual duration of a video segment (i.e., the "intrinsic duration"). Rather, the "dur" element merely describes the length of time that the content element is displayed. '138 POR at 51. For example, SMIL describes how a ten-second video clip can be repeated over a 33 second period. '138 POR at 49 (citing EX1006, 124).

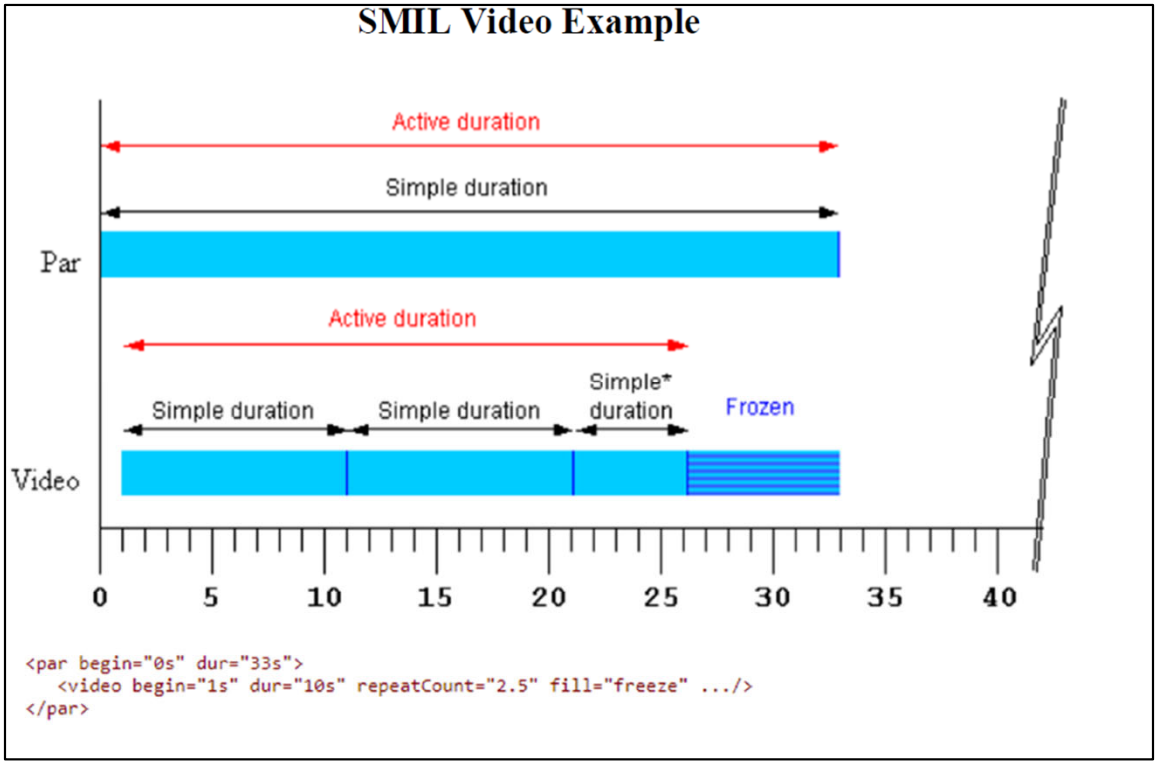
153. In this regard, SMIL 2.0 explains that continuous media, like video, is "intrinsically time-based," and thus has an "intrinsic duration defined by the media" itself, which differs from the duration that the media is played back. EX1006 at 107, 123. Thus, while the "dur" attribute defines the duration that the video resource is played back,[18] it has no effect on the actual, "intrinsic" duration of the underlying video. A POSITA would draw no motivation to modify the "intrinsic duration" Ogdon's "segments" (*i.e.*, to time-divide each into equal portions such that they have the same duration) based on this disclosure. Simply put, none of the prior art references cited by the Petition teach or suggest subdividing the same video content into time-aligned portions of different bitrates in the manner claimed by the '138 Patent.

'138 EX2006 (Jeffay Declaration), ¶[153]

SMIL 2.0 Does Not Disclose Streamlets with Same Duration

Indeed, SMIL 2.0 explains that the "implicit," or actual, duration of the content element is either extended or cut short based on timing in the "dur" element.

> If the author specifies a value for **dur** that is *shorter* than the implicit duration for an element, the implicit duration will be cut short by the specified simple duration.



EX1006 (SMIL 2.0), 127–28; '554 POR at 50

SMIL 2.0 Does Not Disclose Streamlets with Same Duration

In Reply, Petitioner failed to address DISH's arguments and Dr. Jeffay's testimony. Instead, Petitioner wrongly claims that "DISH does not and cannot counter this point."

XII. SMIL 2.0 TEACHES STREAMLETS OF THE SAME DURATION

As explained above, Ogdon teaches streamlets of the same duration. *Supra* §VII. But even if Ogdon's alternative segments are not precisely the same duration, SMIL teaches using the "dur" element to ensure that all interchangeable alternatives of a media are precisely the same duration. Pet., 56-58. DISH does not and cannot counter this point. Instead, it deflects to other disclosures in SMIL to make irrelevant arguments (POR, 47-51). Those arguments do nothing to undermine SMIL's express "dur" teaching. EX1028, ¶69.

'138 Reply at 21

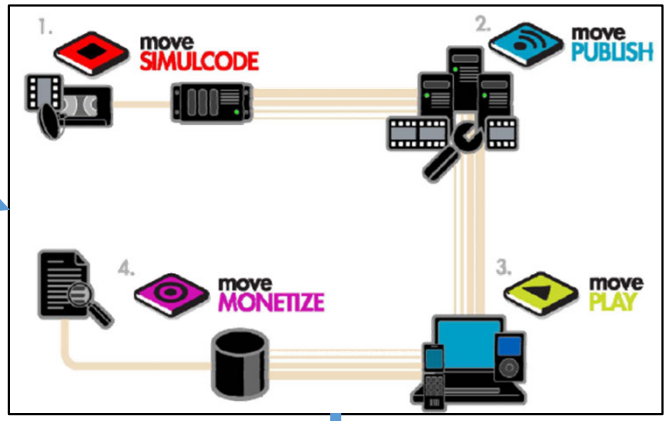
VII. Objective Indicia of Non-Obviousness

Sling TV Evolved Out of MOVE's Technology

POR, at 62; PO Sur-Reply, at 21

move networks, inc

EX2012



EX2012

ECHOSTAR

dish

sling

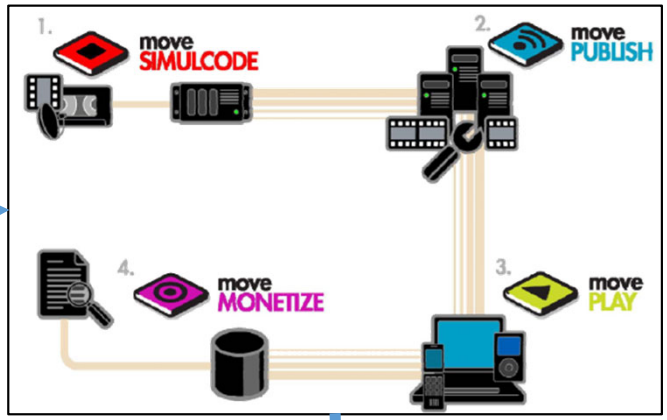
EX2013

Sling TV Evolved Out of MOVE's Technology

DISH's predecessor (EchoStar Advanced Techs.) acquired Move Networks in 2010.

move networks, inc

EX2012



EX2012

dish

sling

EX2013

POR, at 62; PO Sur-Reply, at 21

[redacted] Emmy Award [redacted] and Recognition as Groundbreaking

At the 71st annual Technology & Engineering Emmy Awards, **Sling TV** won the Emmy Award in the category of "Pioneering Development of Large Scale, Cloud Served, Broadcast Quality, Linear Channel Transmission" – April 19, 2020

EX2006 (Jeffay Declaration), ¶¶[188], [244]; EX2013 (Sling Emmy Article)
POR, at 6, 52, 64

[redacted]



Dr. Houh Fails to Rebut the Indicia of Nonobviousness

PO Sur-Reply, at 20-21

"Objective indicia of nonobviousness must be considered in every case where present." *Apple, Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1048 (Fed. Cir. 2016).

Q. And you reviewed [the ITC's Initial Determination], correct?

A. Yes, certain portions of it.

Q. And you knew that the ITC [and] ALJ …, found evidence of objective indicia, correct?

A. I don't remember everything I read,

Q. Well you didn't address any of the ITC initial determinations, comments or findings regarding objective indicia in your first declaration, correct?

A. Yes, I believe that's correct in general.

Houh Tr., 100:8-21.

"Any supposed long-felt need, surprising results, or commercial success was simply a result of improved bandwidth available on the Internet that reduced the cost and made video streaming over the Internet more prevalent…Indeed, the evidence provided by Dr. Jeffay and Patent Owner shows that MOVE was not a commercial success and that Microsoft and Apple released their own adaptive bitrate streaming solutions, which pushed MOVE toward the brink of extinction."

EX1028 (Houh Supplemental Declaration), ¶[83]

Move's Success Is Tied To the Claimed Features

Petitioners and Dr. Houh attribute Move's success on increased bandwidth:

"Any supposed long-felt need, surprising results, or commercial success was simply a result of improved bandwidth available on the Internet that reduced the cost and made video streaming over the Internet more prevalent."

EX1028 (Houh Supplemental Declaration), ¶[83]
Petitioner's Reply, at 26

DISH's Evidence Confirms the Opposite:

John,

Thank you for the time you and your team gave us today. We really appreciated it very much. As discussed I'll follow up directly with an outline of potential collaboration areas.

[***]

Whether intentional or not the switch from your streaming to the Flash ad was in itself an ad for you! But, in your opinion ***why are other streaming protocols broken? There is enough bandwidth but they cannot get the results you do.***

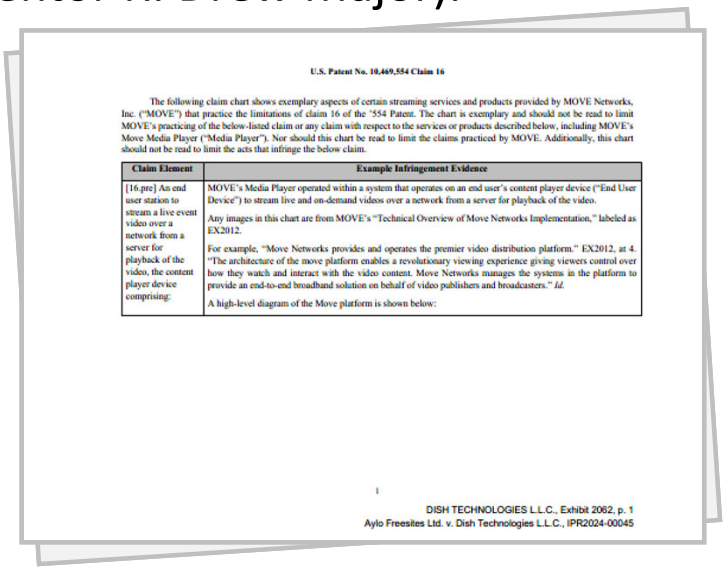
EX2031 (5.15.07 Move Email) at 1; POR, at 57; PO Sur-Reply, at 27

Move's System and Sling TV Practice the Claims

POR, at 53-54

The ITC Correctly Found a Presumption of Nexus Applies

- **"Move's success is tied to the 'unique characteristics of the claimed invention.' As Dr. Jeffay testified, the Move system.'"** EX1009 (ITC ID) at 213 (quoting *Fox Factory*, 944 F.3d at 1373-74).
- "EchoStar [(now merged with DISH)] used [the ABR] technology from MOVE Networks to develop a streaming platform to process and distribute video. The platform is now used for the Sling TV video streaming service," which was launched in 2015 as "the nation's first paid, packaged live television streaming service provided over the Internet." EX2010 at 8 (Decl. of Inventor R. Drew Major).



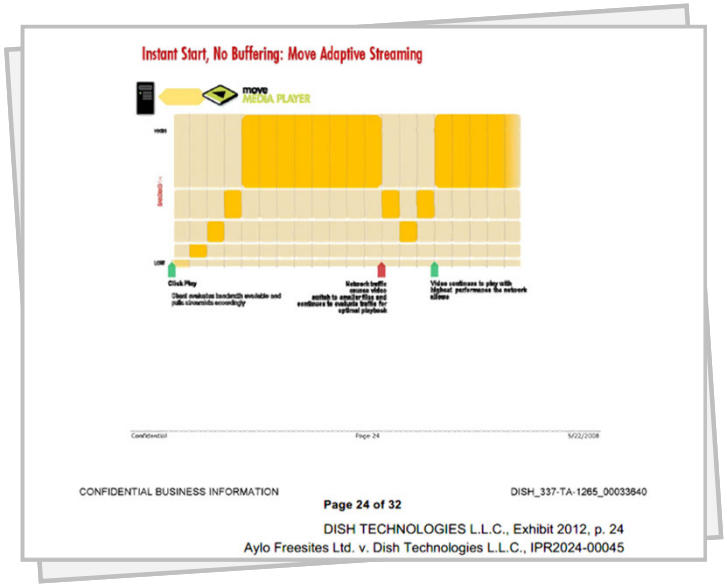
U.S. Patent No. 10,469,554 Claim 16

The following claim chart shows exemplary aspects of certain streaming services and products provided by MOVE Networks, Inc. ("MOVE") that practice the limitations of claim 16 of the '554 Patent. The chart is exemplary and should not be read to limit MOVE's practicing of the below-listed claim or any claim with respect to the services or products described below, including MOVE's Move Media Player ("Media Player"). Nor should this chart be read to limit the claims practiced by MOVE. Additionally, this chart should not be read to limit the acts that infringe the below claim.

Claim Element	Example Infringement Evidence
[16.pre] 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:	MOVE's Media Player operated within a system that operates on an end user's content player device ("End User Device") to stream live and on-demand videos over a network from a server for playback of the video. Any images in this chart are from MOVE's "Technical Overview of Move Networks Implementation," labeled as EX2012. For example, "Move Networks provides and operates the premier video distribution platform." EX2012, at 4. "The architecture of the move platform enables a revolutionary viewing experience giving viewers control over how they watch and interact with the video content. Move Networks manages the systems in the platform to provide an end-to-end broadband solution on behalf of video publishers and broadcasters." *Id.* A high-level diagram of the Move platform is shown below:

DISH TECHNOLOGIES L.L.C., Exhibit 2062, p. 1
Aylo Freesites Ltd. v. Dish Technologies L.L.C., IPR2024-00045

EX2062 (554 Claim 16 Chart)



EX2012 (Move Tech Overview) at 24

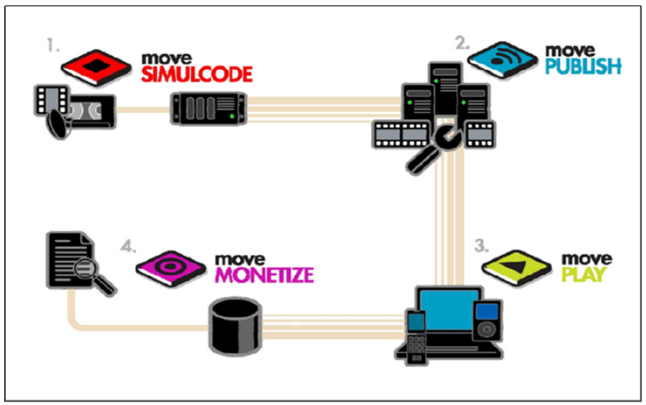
Move's Success is Tied to the Claimed Features

The use of streamlets combined with our other innovative concepts makes possible:

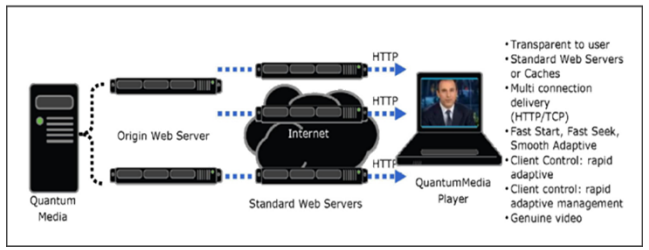
(1) Fast startup of playback when selecting content with automatic rate selection,
(2) Adjustment of the streaming rate for a client up or down very quickly in response to changing network performance conditions,
(3) Enhanced Rewind, Fast-Forward, Scrubbing (dragging the sliding position indicator to select the playback time index),
(4) Instant jump to related content,
(5) Reliable and efficient transport of content,
(6) Elimination of specialized media servers and their attendant management,
(7) Containment of all content selection, seeking operations, and rate adaptation logic to clients (as opposed to a combination of client and special media server),
(8) Radically enhanced, network-wide scalability.

POR, at 53-54

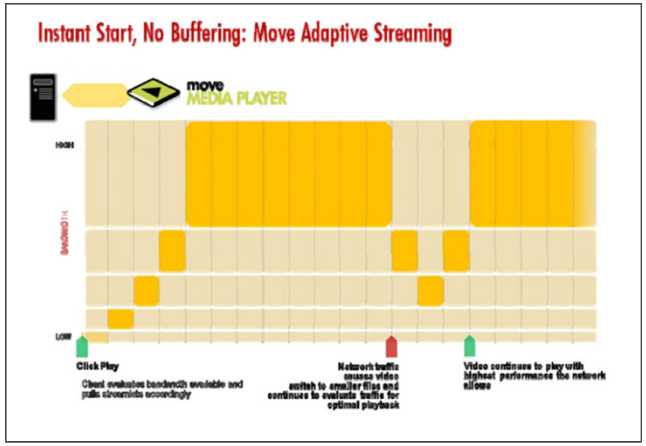
EX2011 at 3 (Overview of Move Network's Streaming Media Technology)



EX2012 (Move Tech Overview), 6



EX2012 (Move Tech Overview), 22



EX2012 (Move Tech Overview), 24

Early Public Uses Highlighted the Novelty of Move's Player



- "One of our early tests include[ed] streaming the bi-annual conference for the Church of Jesus Christ of Latter-Day Saints in October 2005. **We worked with Brigham Young University Television, BYU.tv, to stream the conference live over the Internet. Tens of thousands of people watched the conference live.** As a result, we proved our technology worked and no one was doing anything of this kind at the time." EX2010 (Major Declaration), ¶ 23.

- "Through bleeding-edge technology pioneered by alumni John W. Edwards (BS '87) and R. Drew Major (BS '80) (a founder of Novell), both [BYU.tv] channels are available to anyone with an Internet connection, anywhere in the world…**Move is at the forefront of the Web-television movement, with client-publishers like ABC, FOX, ESPN, and Disney—though not one of those networks maintains a station that airs online 24 hours a day, seven days a week. 'They are thinking about it, dreaming about it,' Edwards says, 'but BYU Television is doing is**.'" EX2051 (Y Magazine Article) at 6.

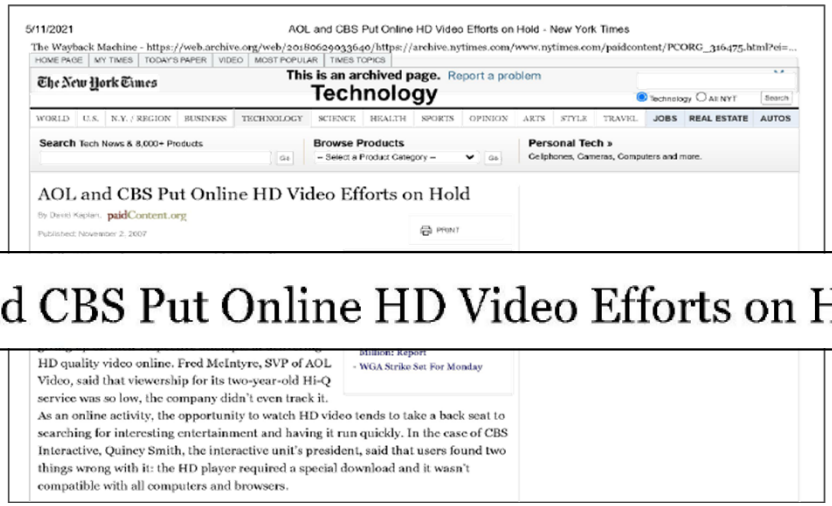
- "The most-watched program on BYU Television, general conference first streamed online through Move Networks' servers in April 2006, **garnered hundreds of thousands of unique user sessions**. EX2051 (Y Magazine Article) at 7.

Long-Felt Need But Failure of Others

POR, at 54-58

Move's Player Accomplished What Others Could Not

- Prior to Move's player, "the quality, fluidity and reliability of most broadband [] streaming rarely ever matched that of typical cable, DBS, or terrestrial television." EX2040 ("ABC.Com to Stream HD Video Online") at 1; POR, at 59.
- "Unfortunately, anyone who has tried knows that current streaming technologies are fraught with problems—including delayed starts, poor video quality, and long buffering interruptions. Additionally, the size of most streaming video frames is too small to satisfy users who are accustomed to large-screen, high-definition television sets." EX2067 at 1; PO Sur-Reply, at 23.


5/11/2021 AOL and CBS Put Online HD Video Efforts on Hold - New York Times

The Wayback Machine - https://web.archive.org/web/20180629033640/https://archive.nytimes.com/www.nytimes.com/paidcontent/PCORG_316475.html?ei=...

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AOL and CBS Put Online HD Video Efforts on Hold

By David Kaplan, paidContent.org

Published: November 2, 2007

PRINT

HD quality video online. Fred McIntyre, SVP of AOL Video, said that viewership for its two-year-old Hi-Q service was so low, the company didn't even track it.

As an online activity, the opportunity to watch HD video tends to take a back seat to searching for interesting entertainment and having it run quickly. In the case of CBS Interactive, Quincy Smith, the interactive unit's president, said that users found two things wrong with it: the HD player required a special download and it wasn't compatible with all computers and browsers.

Briefing: Report

- WGA Strike Set For Monday

AOL and CBS Put Online HD Video Efforts on Hold

EX2037 (NYT Article)

Surprising Results and Praise

Unlike other peer-to-peer competitors such as BitTorrent and Joost, Move delivers its video as a standard web object that's cached in small bits—making its service infinitely more ISP-friendly than traditional streaming technology. Move also doesn't use special media servers, and adjusts the video quality based on available bandwidth. This means no buffering, no stalling, and backwards and forwards navigation within a live stream while you're watching.

Move's bottom-line technology advantage: its service is profoundly more efficient and less expensive, and it provides a dramatically better viewing experience.

EX2026 at 2 (Move Over, Joost).

POR, at 58-60

"ABC uses a player by Move Networks, which offers a much clearer picture quality … [I]t's clear that ABC has the superior product."

EX2043 at 1 (ABC Offering Full Screen Streaming HD Content).

The best news here is that while only a year ago one would have thought we would be waiting years to see viable streaming HD technology, it now appears to be coming faster than I thought.

I just got back from a trip to L.A., where I talked to a lot of people with insight into what's going on with technology that enables the content providers to more expediently delivery HD. There are many companies working to speed up HD downloads, including **Move Networks**, **FastSoft**, **Itiva**, and **BitGravity** (there are many more -- those just came of the top of my mind). Judging from the ABC site, the Move Networks stuff really works. I've also recently seen impressive demos by BitGravity and FastSoft.

EX2027 at 1 (Online HD: Coming Faster Than You Think).

Anatomy, *Ugly Betty*, and more, right on your computer screen. Until a few days ago, however, the picture was rather small. Now ABC.com has launched a new full-screen "HD-quality" video player, and the "broadcast" looks shockingly good.

EX2022 at 1 (ABC.com makes watching TV at work better).

MOVE's Commercial Success was Revolutionary

- **MOVE's player attracted strategic investors**, including: POR, at 60-62
  - Microsoft (*see* EX2045)
  - Steamboat Ventures (*see* EX2047)
  - Level 3 Comm'cns. (*see* EX2029)
  - Comcast (*see* EX2028)
  - Cisco (*see* EX2014)
  - Hummer Winblad Venture Partners (*see* EX2014)

POR, at 61; PO Sur-Reply, at 26

- **MOVE's patents were, and still are, used to deliver content for**:
  - FOX
  - ESPN
  - ABC
  - Disney
  - Oprah Book Club
  - Televisa
  - Democratic National Convention
  - Comcast
  - The CW
  - ProSieben
  - lululemon
  - Peloton
  - Univision Communications
  - ViacomCBS
  - iFit
  - and more.

POR, at 61, 62; EX2028; EX2053; EX2083, EX2084, EX2085

Industry giants considered MOVE "a leader in HTTP-based video delivery" and that **MOVE helped them "a competitive edge in a crowded marketplace."**

EX2045 at 4

Move's Player Fundamentally Changed Online Streaming

POR, at 57-58

"**[P]eople today are spending more than an hour per session watching content Move provides**. [John Edwards, CEO of Move Networks,] also said that the company has crossed the 34 million viewer mark. This is an increase from the 50-minute average viewing time and 20 million viewers Move announced in November.

[T]his means that viewers are sticking around for entire programs (and the ads)."

EX2064 (Move Crosses the Hour Threshold); POR, at 58-60

"**In the first year online after its founding in 2005, Move gained more than 35 million unique viewers**. The company **continues to add an additional 100,000 new unique viewers every day**, leading Move to become a valued partner of some of the largest streaming media companies."

"**Move's mantra is to 'put the mass back in mass media**.'"

EX2077 (Move Put Mass Back Into Mass Media); POR, at 58-60

Objective Evidence Supports Copying

POR, at 62

"Following [Move's] market introduction in 2006, practically every major online video provider – including Akamai, Apple, Adobe, Limelight, Microsoft, Netflix, Widevine, and several others – has deployed an adaptive bit rate architecture inspired by our inspiration. We are pleased to see that the USPTO has recognized our technical achievements that make quality IP video delivery a reality."

EX2014 (Move Awarded Fundamental Pat); POR at 62

"**Adaptive bitrate streaming was brought to the fore by Move Networks and now being pushed by Adobe, Microsoft, and Apple**, is one of the more interesting things going on in video today."

EX2036 (The Lowdown on Apple) at 1

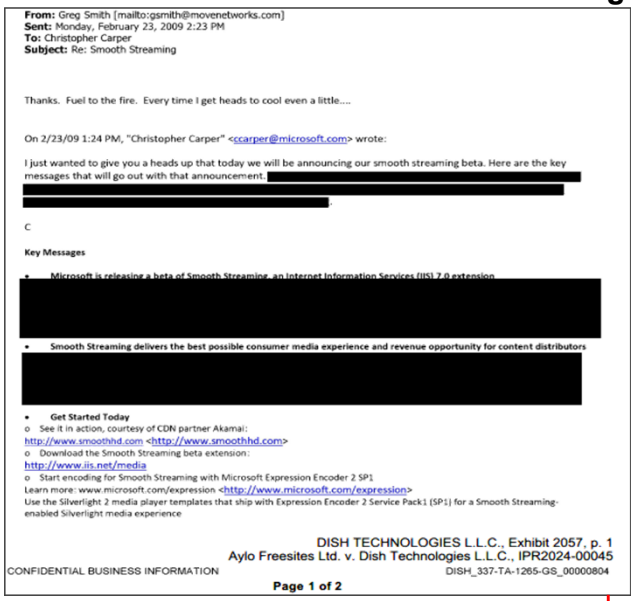
"The most significant recognition of all, however, is that almost all video streaming that happens over the Internet today for live or on-demand content is based on the ` Adaptive Bitrate approach that we invented. The then-current state-of-the-art approaches used by others have been pretty much abandoned."

EX2010, ¶ 35

Objective Evidence Suggests Copying

POR, at 62

Microsoft Announces Smooth Streaming



From: Greg Smith [mailto:gsmith@movenetworks.com]
Sent: Monday, February 23, 2009 2:23 PM
To: Christopher Carper
Subject: Re: Smooth Streaming

Thanks. Fuel to the fire. Every time I get heads to cool even a little....

On 2/23/09 1:24 PM, "Christopher Carper" <ccarper@microsoft.com> wrote:

I just wanted to give you a heads up that today we will be announcing our smooth streaming beta. Here are the key messages that will go out with that announcement. [redacted]

C

Key Messages

- Microsoft is releasing a beta of Smooth Streaming, an Internet Information Services (IIS) 7.0 extension
- Smooth Streaming delivers the best possible consumer media experience and revenue opportunity for content distributors
- **Get Started Today**
  - See it in action, courtesy of CDN partner Akamai:
    http://www.smoothhd.com <http://www.smoothhd.com>
  - Download the Smooth Streaming beta extension:
    http://www.iis.net/media
  - Start encoding for Smooth Streaming with Microsoft Expression Encoder 2 SP1
    Learn more: www.microsoft.com/expression <http://www.microsoft.com/expression>
    Use the Silverlight 2 media player templates that ship with Expression Encoder 2 Service Pack1 (SP1) for a Smooth Streaming-enabled Silverlight media experience

DISH TECHNOLOGIES L.L.C., Exhibit 2057, p. 1
Aylo Freesites Ltd. v. Dish Technologies L.L.C., IPR2024-00045
CONFIDENTIAL BUSINESS INFORMATION DISH_337-TA-1265-GS_00000804
Page 1 of 2

EX2057

First MOVE/Apple NDA

EX2055

Second MOVE/Apple NDA

EX2056

2005	2006	2007	2008	2009

a service of BYU BROADCASTING
BYU Television

First Public Use of Move's Product

EX2010 ¶ 23



From: Thomas Damico [mailto:damico@windows.microsoft.com]
Sent: Tuesday, May 29, 2007 11:30 PM
To: John Edwards; Bob Bryson
Subject: Move Networks presentation on Thursday?
Importance: High

Hi John and Bob,

[redacted]

We're hoping a meeting Thursday afternoon will work, but I am not sure who has offered or confirmed a date and time with you. Is Thursday a possibility? We'd hope you could provide a business and technology overview – [redacted]

Let's talk in the morning to sort out schedule and agenda –

Many thanks,

Tom

Thomas Damico
Business Development | Windows Vista Media Center
office: +1 425 706 7191
mobile: +1 206 227 2420
fax: +1 425 708 5356

MOVE confidentially demonstrates technology to Microsoft

EX2032

MOVE technology used for Democratic National Convention

EX2081



The Lowdown on Apple's HTTP Adaptive Bitrate Streaming

Page 1 of 4
DISH TECHNOLOGIES L.L.C., Exhibit 2036, p. 1
Aylo Freesites Ltd. v. Dish Technologies L.L.C., IPR2024-00045

Apple Announces HTTP Live Streaming

EX2036

Industry Praise and Recognition is Voluminous

POR, at 63-64



Move Networks

OnMedia 100 Winner

EX2018

Move Networks

Red Herring Global 100

EX2019

Move Networks

On Hollywood 100

Company Recognized for Leadership in Internet Television Technologies

EX2016

Move Networks

TechCrunchies Finalist

EX2020

Move Networks

OnHollywood 100 Winner

EX2017

Industry Praise and Recognition is Voluminous

POR, at 63-64

"But the most awesome (I have probably never used that word in seven years of this site) online video feed is on the official Democratic Convention site, on DemConvention.com site. It is in HD, and uses Move Networks' plugin and using Microsoft Silverlight." **Rafat Ali, *Paid Content & Washington Post***

EX2081

"Meanwhile Move burnishes its reputation for high-quality delivery gained through deals with ABC, Discovery, Fox and others. These two are natural partners." **Will Richmond- *VideoNuze***

EX2081

"The deal also signals continued momentum for Move Networks, a supplier of high-definition video-delivery technology to publishers including ABC, Discovery, ESPN, and Fox" **–Stephanie Olson- *CNET***

EX2081

"The live, online webcast of the Democratic National Convention was the first large demonstration of the integration of Move Networks and Silverlight. **It was a technological success and tremendously popular, with visitors to the official convention Web site viewing more than 350,000 hours of video. It allowed viewers to experience the convention online like never before.**"

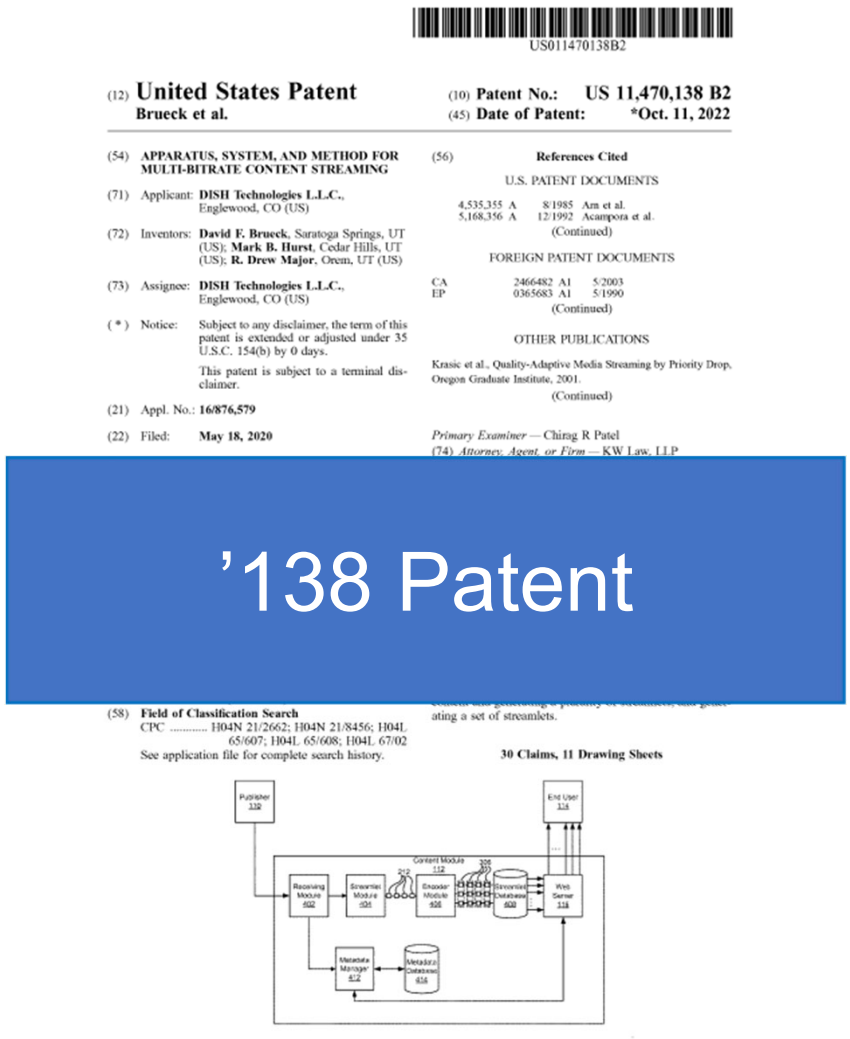
EX2060 (Microsoft 2008 Article)

VIII. Grounds and Claim Appendix

Summary

Patent No. 11,677,798	Patent No. 11,470,138	Patent No. 10,469,554	Patent No. 10,951,680	Patent No. 10,469,555
IPR2024-00043 • **Ground 1**: § 103 over Ogdon and Allen (Claims 1-9, 11-19, and 21-24) • **Ground 2**: § 103 over Ogdon, Allen, and SMIL 2.0 (Claims 1-9, 11-19, and 21-24) • **Ground 3**: § 103 over Ogdon, Allen, and Shteyn (Claim 16)	**IPR2024-00044** • **Ground 1**: § 103 over Ogdon and Allen (Claims 1, 3-12, 14-20, 22-25, and 27-29) • **Ground 2**: § 103 over Ogdon, Allen, and SMIL2.0 (Claims 1, 3-12, 14-20, 22-25, and 27-29)	**IPR2024-00045** • **Ground 1**: § 103 over Ogdon and Allen (Claims 1-5, 7-8, 10-14, 16-20, 22-28, and 30) • **Ground 2**: § 103 over Ogdon, Allen, and SMIL 2.0 (Claims 1-5, 7-8, 10-14, 16-20, 22-28, and 30)	**IPR2024-00046** • **Ground 1**: § 103 over Ogdon and Allen (Claims 1, 2, 4-12, 14-19, 21-25, and 27-29) • **Ground 2**: § 103 over Ogdon, Allen, and SMIL 2.0 (Claims 1, 2, 4-12, 14-19, 21-25, and 27-29)	**IPR2024-00146** • **Ground 1**: § 102 over Ogdon (Claims 18-19) • **Ground 2**: § 103 over Ogdon and Allen (Claims 1, 3-5, 7-11, 13-20, and 22-27) • **Ground 3**: § 103 over Ogdon, Allen, and SMIL 2.0 (Claims 1, 3-5, 7-11, 13-20, and 22-27)

U.S. Patent No. 11,470,138 (“’138 Patent”)



US011470138B2

(12) **United States Patent**
Brueck et al.

(10) **Patent No.: US 11,470,138 B2**
(45) **Date of Patent: *Oct. 11, 2022**

(54) **APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE CONTENT STREAMING**

(71) Applicant: **DISH Technologies L.L.C.**, Englewood, CO (US)

(72) Inventors: **David F. Brueck**, Saratoga Springs, UT (US); **Mark B. Hurst**, Cedar Hills, UT (US); **R. Drew Major**, Orem, UT (US)

(73) Assignee: **DISH Technologies L.L.C.**, Englewood, CO (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **16/876,579**

(22) Filed: **May 18, 2020**

(56) **References Cited**

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(Continued)

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EP 0365683 A1 5/1990
(Continued)

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(Continued)

Primary Examiner — Chirag R Patel
(74) *Attorney, Agent, or Firm* — KW Law, LLP

(58) **Field of Classification Search**
CPC H04N 21/2662; H04N 21/8456; H04L 65/607; H04L 65/608; H04L 67/02
See application file for complete search history.

ating a set of streamlets.

30 Claims, 11 Drawing Sheets

’138 Patent

’138 EX1001

1[Pre]

“A system for **adaptive-rate content streaming of a video**…”

1[B]

“wherein **the video is digitally encoded at a plurality of different bitrates creating a plurality of streams** including a low quality stream, a medium quality stream, and a high quality stream,”

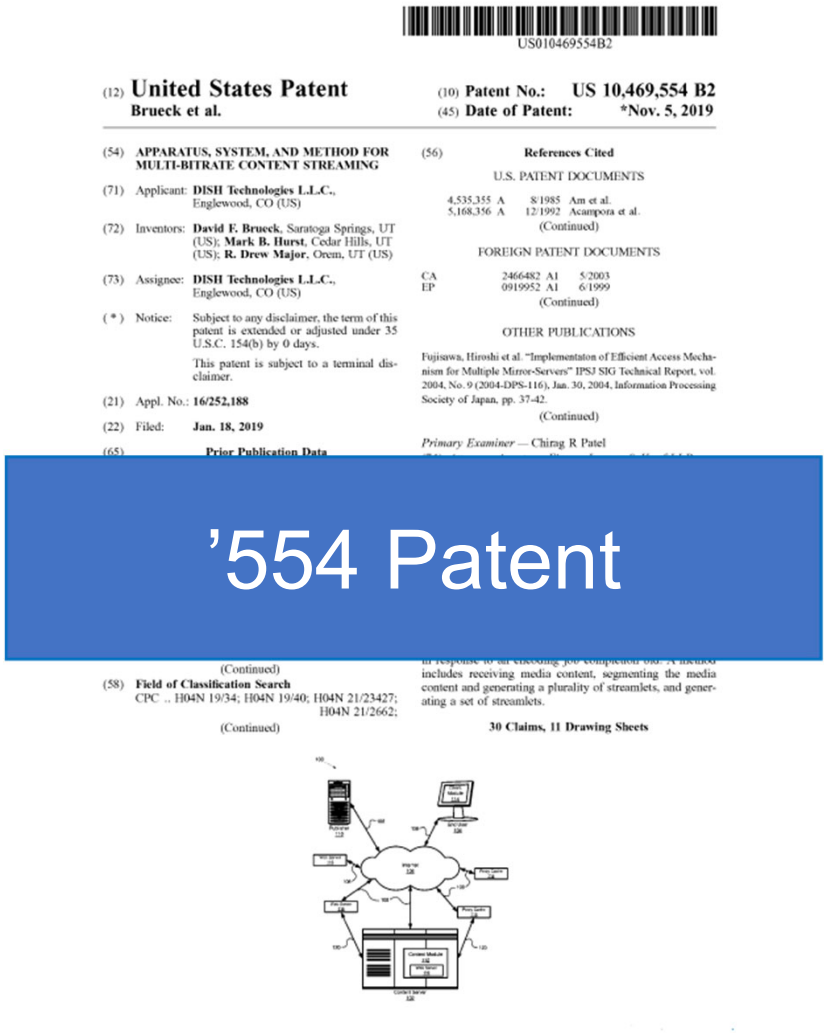
1[C]

“…each comprising a **group of streamlets**, wherein each streamlet **corresponds to a portion of the video**, and wherein each streamlet in each group of streamlets is encoded at a respective one of the plurality of different bitrates,…”

1[E]

“wherein the first streamlet of each of the groups of streamlets has the **same first duration** and **encodes the same first portion of the video** in each of the low quality stream, the medium quality stream, and the high quality stream…”

U.S. Patent No. 10,469,554 ("'554 Patent")



US010469554B2

(12) **United States Patent**
Brueck et al.

(10) **Patent No.: US 10,469,554 B2**
(45) **Date of Patent: *Nov. 5, 2019**

(54) **APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE CONTENT STREAMING**

(71) Applicant: **DISH Technologies L.L.C.**, Englewood, CO (US)

(72) Inventors: **David F. Brueck**, Saratoga Springs, UT (US); **Mark B. Hurst**, Cedar Hills, UT (US); **R. Drew Major**, Orem, UT (US)

(73) Assignee: **DISH Technologies L.L.C.**, Englewood, CO (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **16/252,188**

(22) Filed: **Jan. 18, 2019**

(65) **Prior Publication Data**

(56) **References Cited**

U.S. PATENT DOCUMENTS

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(Continued)

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EP 0919952 A1 6/1999
(Continued)

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(Continued)

Primary Examiner — Chirag R Patel

(Continued)

(58) **Field of Classification Search**
CPC .. H04N 19/34; H04N 19/40; H04N 21/23427; H04N 21/2662;
(Continued)

includes receiving media content, segmenting the media content and generating a plurality of streamlets, and generating a set of streamlets.

30 Claims, 11 Drawing Sheets

'554 Patent

'554 EX1001

1[Pre]

"A system for **adaptive-rate content streaming of live event video**…"

1[B]

"**the live event video encoded at a plurality of different bitrates creating a plurality of streams** including a low quality stream, a medium quality stream, and a high quality stream,"

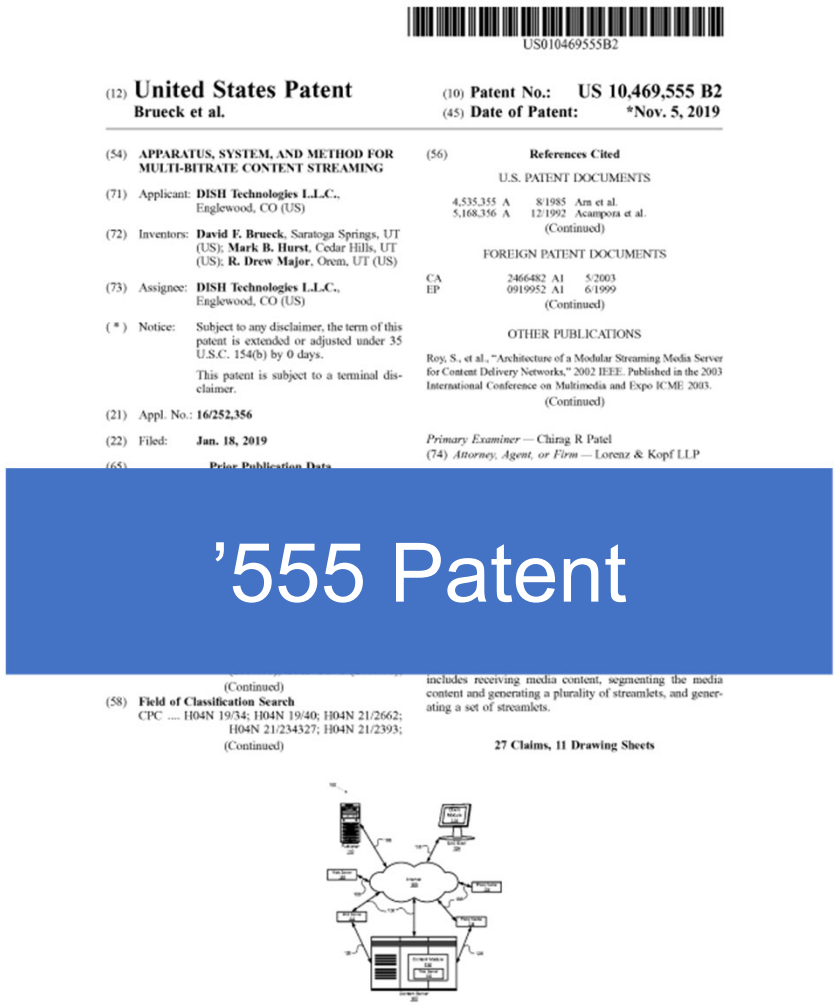
1[C]

"each comprising a **group of streamlets encoded at a respective one of the plurality of different bitrates**…each of the streamlets corresponding to a portion of the live event video;"

1[E]

"wherein the first streamlet of each of the groups of streamlets has the **same first duration** and encodes the **same first portion** of the live event video…"

U.S. Patent No. 10,469,555 (“’555 Patent”)



US010469555B2

(12) **United States Patent**
Brueck et al.

(10) **Patent No.: US 10,469,555 B2**
(45) **Date of Patent: *Nov. 5, 2019**

(54) **APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE CONTENT STREAMING**

(71) Applicant: **DISH Technologies L.L.C.**, Englewood, CO (US)

(72) Inventors: **David F. Brueck**, Saratoga Springs, UT (US); **Mark B. Hurst**, Cedar Hills, UT (US); **R. Drew Major**, Orem, UT (US)

(73) Assignee: **DISH Technologies L.L.C.**, Englewood, CO (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **16/252,356**

(22) Filed: **Jan. 18, 2019**

(56) **References Cited**

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5,168,356 A 12/1992 Acampora et al.
(Continued)

FOREIGN PATENT DOCUMENTS

CA 2466482 A1 5/2003
EP 0919952 A1 6/1999
(Continued)

OTHER PUBLICATIONS

Roy, S., et al., “Architecture of a Modular Streaming Media Server for Content Delivery Networks,” 2002 IEEE. Published in the 2003 International Conference on Multimedia and Expo ICME 2003.
(Continued)

Primary Examiner — Chirag R Patel
(74) *Attorney, Agent, or Firm* — Lorenz & Kopf LLP

(Continued)

(58) **Field of Classification Search**
CPC H04N 19/34; H04N 19/40; H04N 21/2662; H04N 21/234327; H04N 21/2393;
(Continued)

includes receiving media content, segmenting the media content and generating a plurality of streamlets, and generating a set of streamlets.

27 Claims, 11 Drawing Sheets

’555 Patent

’555 EX1001

18[Pre]

“A system for **adaptive-rate content streaming of live event video**…”

18[B]

“**the live event video encoded at a plurality of different bitrates creating a plurality of streams** including at least a low quality stream and a high quality stream;”

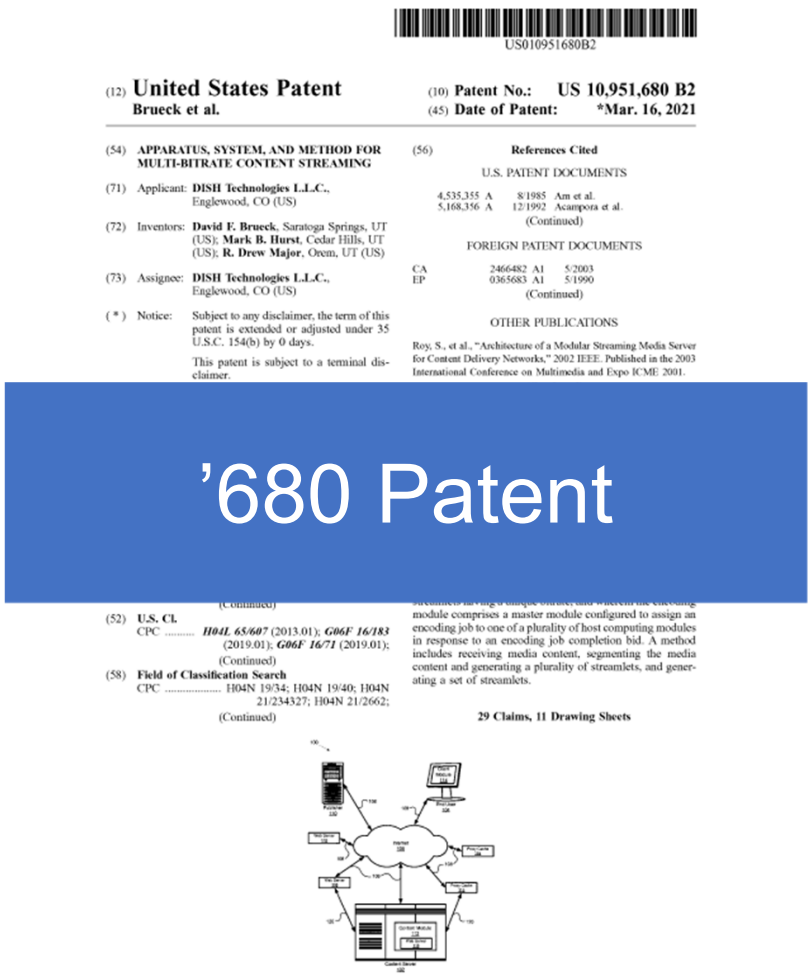
18[C]

“the low quality stream and the high quality stream **each encoding the same portion of the live event video** with a streamlet that is encoded at a different one of the different bitrates;”

18[D]

“wherein the plurality of streamlets in the low quality stream and the plurality of streamlets in the high quality stream **have durations that are equal to each other**.”

U.S. Patent No. 10,951,680 ("'680 Patent")



US010951680B2

(12) **United States Patent**
Brueck et al.

(10) **Patent No.: US 10,951,680 B2**
(45) **Date of Patent: *Mar. 16, 2021**

(54) **APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE CONTENT STREAMING**

(71) Applicant: **DISH Technologies L.L.C.**, Englewood, CO (US)

(72) Inventors: **David F. Brueck**, Saratoga Springs, UT (US); **Mark B. Hurst**, Cedar Hills, UT (US); **R. Drew Major**, Orem, UT (US)

(73) Assignee: **DISH Technologies L.L.C.**, Englewood, CO (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

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Roy, S., et al., "Architecture of a Modular Streaming Media Server for Content Delivery Networks," 2002 IEEE. Published in the 2003 International Conference on Multimedia and Expo ICME 2001.

(52) **U.S. Cl.**
CPC ***H04L 65/607*** (2013.01); ***G06F 16/183*** (2019.01); ***G06F 16/71*** (2019.01);
(Continued)

(58) **Field of Classification Search**
CPC H04N 19/34; H04N 19/40; H04N 21/234327; H04N 21/2662;
(Continued)

module comprises a master module configured to assign an encoding job to one of a plurality of host computing modules in response to an encoding job completion bid. A method includes receiving media content, segmenting the media content and generating a plurality of streamlets, and generating a set of streamlets.

29 Claims, 11 Drawing Sheets

'680 Patent

'680 EX1001

1[Pre]

"A system for **adaptive-rate content streaming of video**…"

1[B]

"wherein **the video encoded at a plurality of different bitrates creating a plurality of streams** including a low quality stream, a medium quality stream, and a high quality stream,"

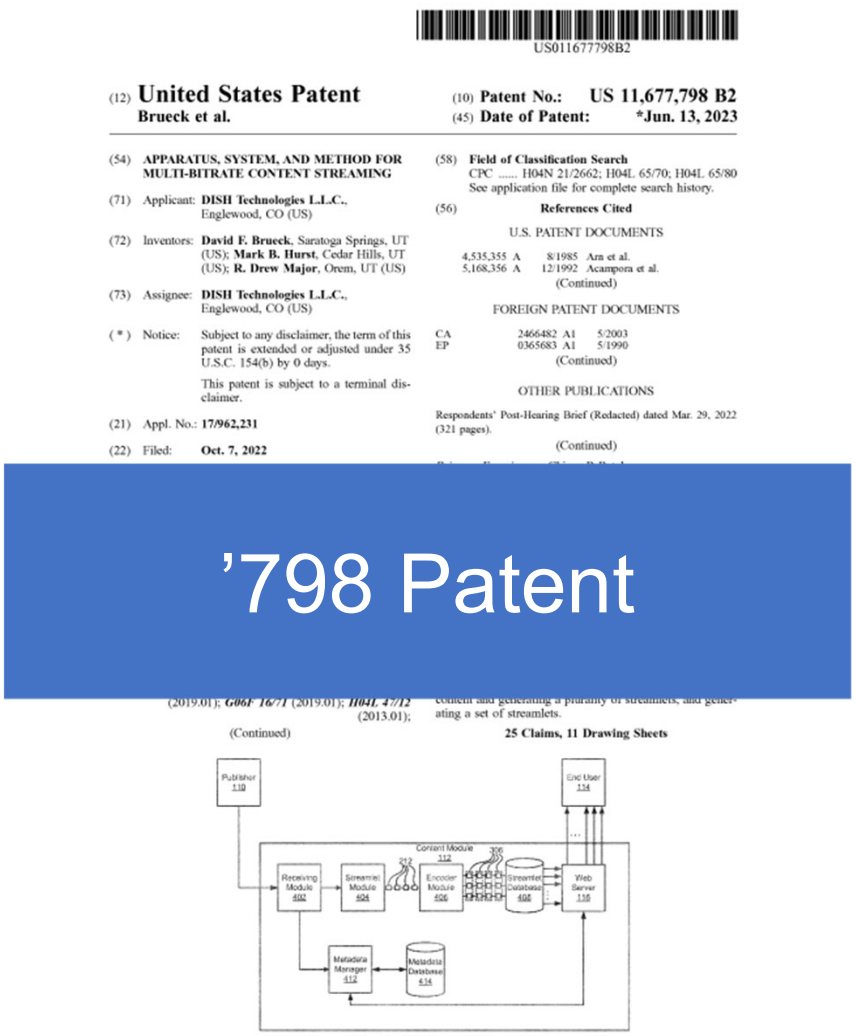
1[C]

"…each comprising a **group of streamlets encoded at a respective one of the plurality of different bitrates**…"

[1E]

"wherein the first streamlet of each of the groups of streamlets has the **same first duration** and encodes the **same first portion** of the video in each of the low quality stream, the medium quality stream, and the high quality stream…"

U.S. Patent No. 11,677,798 (“’798 Patent”)



US011677798B2

(12) **United States Patent**
Brueck et al.

(10) **Patent No.: US 11,677,798 B2**
(45) **Date of Patent: *Jun. 13, 2023**

(54) **APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE CONTENT STREAMING**

(71) Applicant: **DISH Technologies L.L.C.**, Englewood, CO (US)

(72) Inventors: **David F. Brueck**, Saratoga Springs, UT (US); **Mark B. Hurst**, Cedar Hills, UT (US); **R. Drew Major**, Orem, UT (US)

(73) Assignee: **DISH Technologies L.L.C.**, Englewood, CO (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **17/962,231**

(22) Filed: **Oct. 7, 2022**

(58) **Field of Classification Search**
CPC H04N 21/2662; H04L 65/70; H04L 65/80
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

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5,168,356 A 12/1992 Acampora et al.
(Continued)

FOREIGN PATENT DOCUMENTS

CA 2466482 A1 5/2003
EP 0365683 A1 5/1990
(Continued)

OTHER PUBLICATIONS

Respondents' Post-Hearing Brief (Redacted) dated Mar. 29, 2022 (321 pages).
(Continued)

(2019.01); *G06F 16/71* (2019.01); *H04L 47/12* (2013.01);
(Continued)

ating a set of streamlets.

25 Claims, 11 Drawing Sheets

’798 Patent

’798 EX1001

1[Pre]

“A system for **adaptive-rate content streaming** of digital content…”

1[B]

“**the digital content encoded at a plurality of different bit rates creating a plurality of streams** including a first bit rate stream, a second bit rate stream, and a third bit rate stream,”

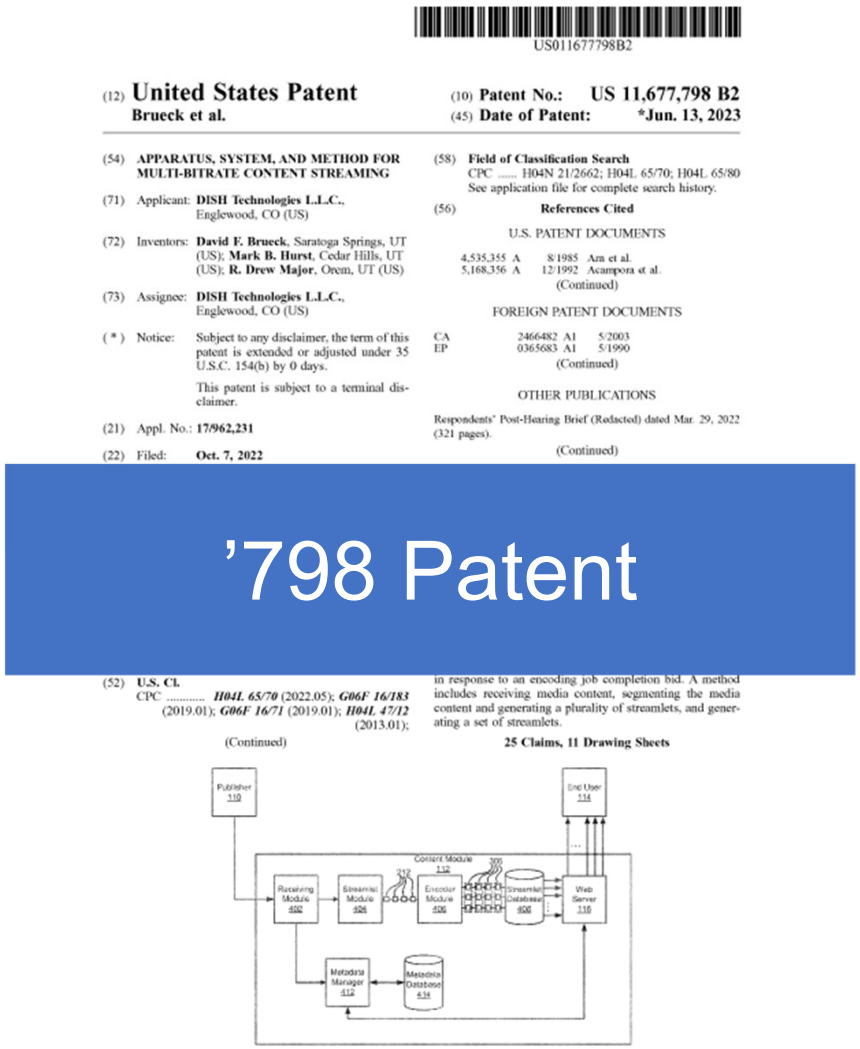
1[C]

“wherein the first bit rate stream, the second bit rate stream, and the third bit rate stream **each comprise a group of streamlets** encoded at a respective one of the plurality of different bit rates each group of streamlets comprising at least first and second streamlets, **each of the streamlets corresponding to a portion of the digital content**;”

1[E]

“wherein the first streamlet of each of the groups of streamlets has the **same first duration** and encodes the **same first temporal portion of the digital content** in each of the first bit rate stream, the second bit rate stream, and the third bit rate stream…”

U.S. Patent No. 11,677,798 (“’798 Patent”)



US011677798B2

(12) **United States Patent**
Brueck et al.

(10) **Patent No.: US 11,677,798 B2**
(45) **Date of Patent: *Jun. 13, 2023**

(54) **APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE CONTENT STREAMING**

(71) Applicant: **DISH Technologies L.L.C.**, Englewood, CO (US)

(72) Inventors: **David F. Brueck**, Saratoga Springs, UT (US); **Mark B. Hurst**, Cedar Hills, UT (US); **R. Drew Major**, Orem, UT (US)

(73) Assignee: **DISH Technologies L.L.C.**, Englewood, CO (US)

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This patent is subject to a terminal disclaimer.

(21) Appl. No.: **17/962,231**

(22) Filed: **Oct. 7, 2022**

(58) **Field of Classification Search**
CPC H04N 21/2662; H04L 65/70; H04L 65/80
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,535,355 A 8/1985 Arn et al.
5,168,356 A 12/1992 Acampora et al.
(Continued)

FOREIGN PATENT DOCUMENTS

CA 2466482 A1 5/2003
EP 0365683 A1 5/1990
(Continued)

OTHER PUBLICATIONS

Respondents' Post-Hearing Brief (Redacted) dated Mar. 29, 2022 (321 pages).
(Continued)

(52) **U.S. Cl.**
CPC ***H04L 65/70*** (2022.05); ***G06F 16/183*** (2019.01); ***G06F 16/71*** (2019.01); ***H04L 47/12*** (2013.01);
(Continued)

in response to an encoding job completion bid. A method includes receiving media content, segmenting the media content and generating a plurality of streamlets, and generating a set of streamlets.

25 Claims, 11 Drawing Sheets

’798 Patent

’798 EX1001

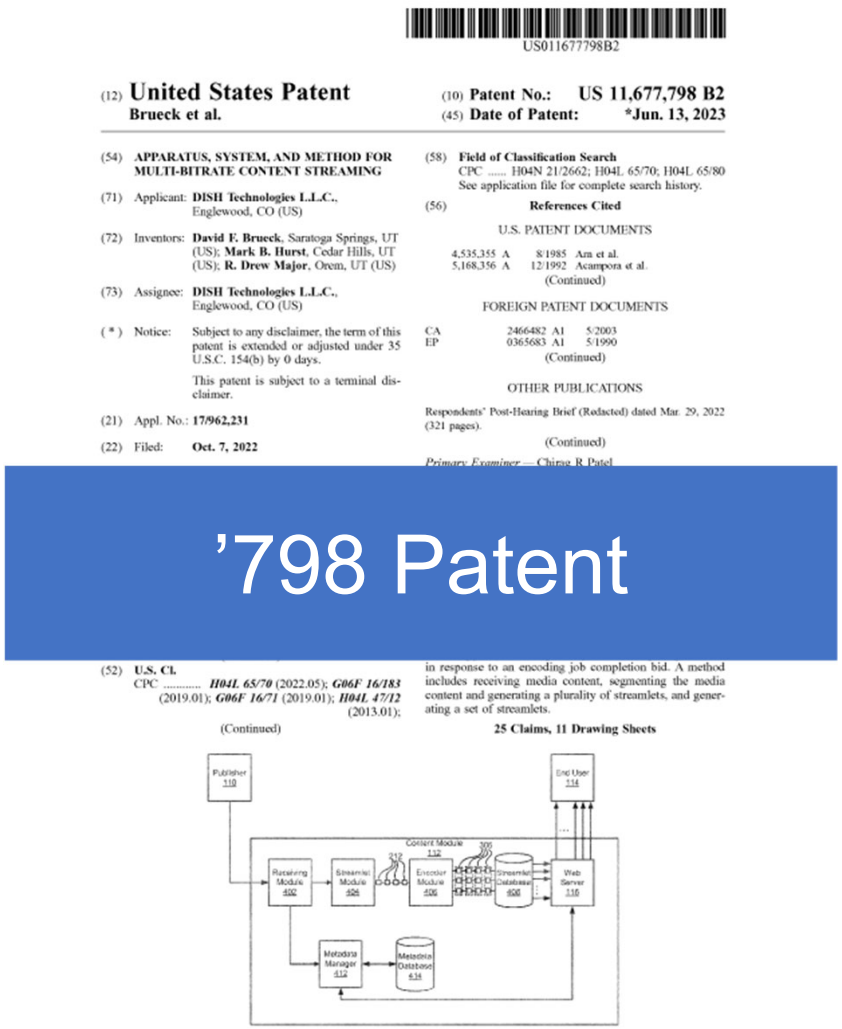
1. A system for adaptive-rate content streaming of digital content playable on one or more end user stations over the Internet, the system comprising:

at least one storage device storing digital content, the digital content encoded at a plurality of different bit rates creating a plurality of streams including a first bit rate stream, a second bit rate stream, and a third bit rate stream, wherein the first bit rate stream, the second bit rate stream, and the third bit rate stream each comprise a group of streamlets encoded at a respective one of the plurality of different bit rates, each group of streamlets comprising at least first and second streamlets, each of the streamlets corresponding to a portion of the digital content;

wherein at least one of the first bit rate stream, the second bit rate stream, and the third bit rate stream is encoded at a bit rate of no less than 600 kbps; and

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

U.S. Patent No. 11,677,798 (“’798 Patent”)



US011677798B2

(12) **United States Patent**
Brueck et al.

(10) **Patent No.: US 11,677,798 B2**
(45) **Date of Patent: *Jun. 13, 2023**

(54) **APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE CONTENT STREAMING**

(71) Applicant: **DISH Technologies L.L.C.**, Englewood, CO (US)

(72) Inventors: **David F. Brueck**, Saratoga Springs, UT (US); **Mark B. Hurst**, Cedar Hills, UT (US); **R. Drew Major**, Orem, UT (US)

(73) Assignee: **DISH Technologies L.L.C.**, Englewood, CO (US)

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This patent is subject to a terminal disclaimer.

(21) Appl. No.: **17/962,231**

(22) Filed: **Oct. 7, 2022**

(58) **Field of Classification Search**
CPC H04N 21/2662; H04L 65/70; H04L 65/80
See application file for complete search history.

(56) **References Cited**

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5,168,356 A 12/1992 Acampora et al.
(Continued)

FOREIGN PATENT DOCUMENTS

CA 2466482 A1 5/2003
EP 0365683 A1 5/1990
(Continued)

OTHER PUBLICATIONS

Respondents' Post-Hearing Brief (Redacted) dated Mar. 29, 2022 (321 pages).
(Continued)

Primary Examiner — Chirag R Patel

(52) **U.S. Cl.**
CPC ***H04L 65/70*** (2022.05); ***G06F 16/183*** (2019.01); ***G06F 16/71*** (2019.01); ***H04L 47/12*** (2013.01);
(Continued)

in response to an encoding job completion bid. A method includes receiving media content, segmenting the media content and generating a plurality of streamlets, and generating a set of streamlets.

25 Claims, 11 Drawing Sheets

’798 Patent

’798 EX1001

1[Pre]

“A system for **adaptive-rate content streaming** of digital content…”

1[B]

“the digital content **encoded at a plurality of different bit rates** creating a **plurality of streams** including a first bit rate stream, a second bit rate stream, and a third bit rate stream,”

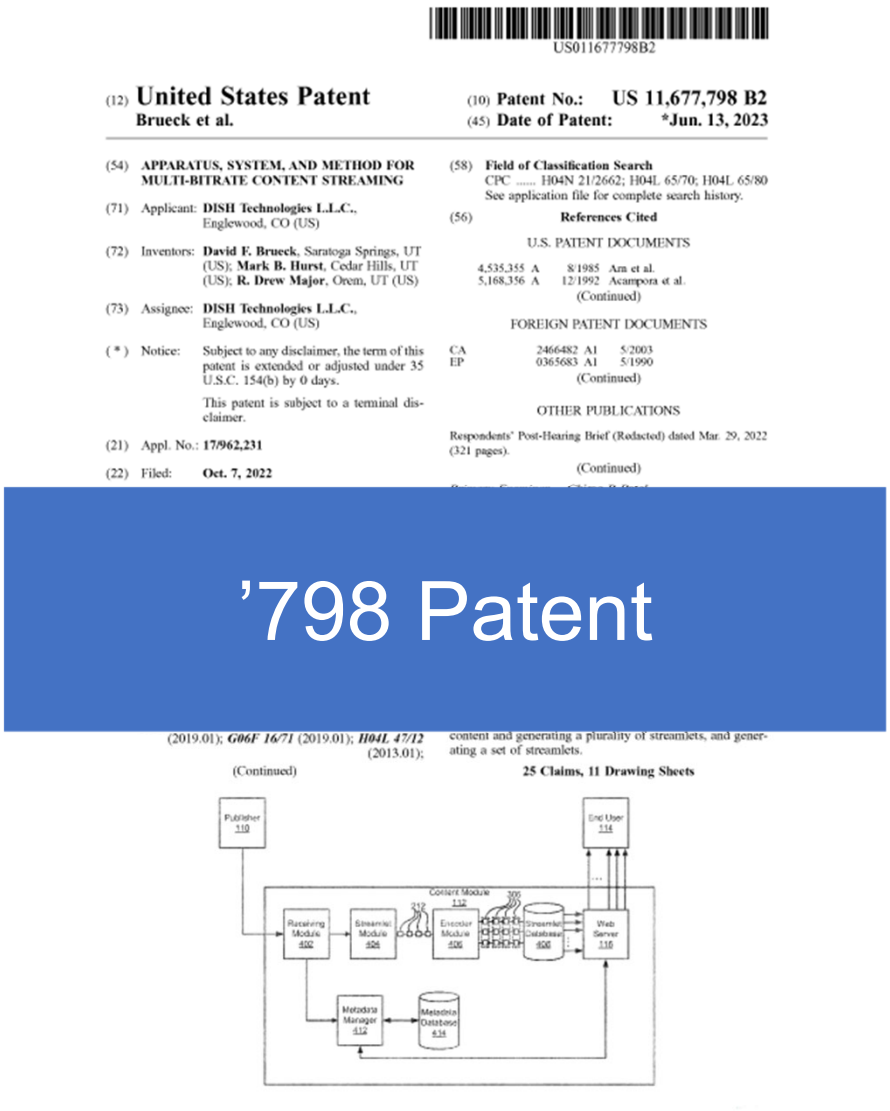
1[C]

“wherein the first bit rate stream, the second bit rate stream, and the third bit rate stream **each comprise a group of streamlets** encoded at a respective one of the plurality of different bit rates each group of streamlets comprising at least first and second streamlets, **each of the streamlets corresponding to a portion of the digital content**;”

1[E]

“wherein the first streamlet of each of the groups of streamlets has the **same first duration** and encodes the **same first temporal portion of the digital content** in each of the first bit rate stream, the second bit rate stream, and the third bit rate stream…”

U.S. Patent No. 11,677,798 (“’798 Patent”)



US011677798B2

(12) **United States Patent**
Brueck et al.

(10) **Patent No.: US 11,677,798 B2**
(45) **Date of Patent: *Jun. 13, 2023**

(54) **APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE CONTENT STREAMING**

(71) Applicant: **DISH Technologies L.L.C.**, Englewood, CO (US)

(72) Inventors: **David F. Brueck**, Saratoga Springs, UT (US); **Mark B. Hurst**, Cedar Hills, UT (US); **R. Drew Major**, Orem, UT (US)

(73) Assignee: **DISH Technologies L.L.C.**, Englewood, CO (US)

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(21) Appl. No.: **17/962,231**

(22) Filed: **Oct. 7, 2022**

(58) **Field of Classification Search**
CPC H04N 21/2662; H04L 65/70; H04L 65/80
See application file for complete search history.

(56) **References Cited**

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(Continued)

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(Continued)

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(Continued)

(2019.01); ***G06F 16/71*** (2019.01); ***H04L 47/12*** (2013.01);
(Continued)

content and generating a plurality of streamlets, and generating a set of streamlets.

25 Claims, 11 Drawing Sheets

’798 Patent

’798 EX1001

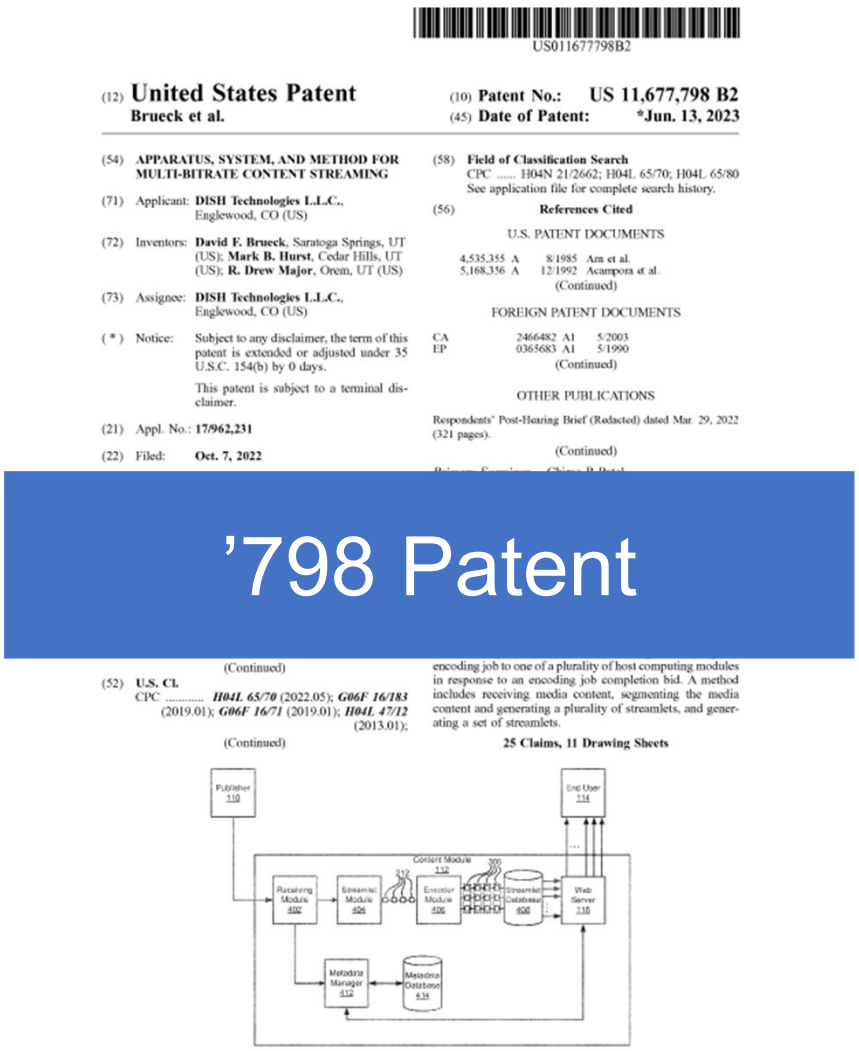
Claim 2

“…**a plurality of servers located at different locations across the Internet**, **each server configured to**: receive at least one **streamlet request** …; **retrieve from the at least one storage device the requested first streamlet** from the currently selected one of the first bit rate stream, the second bit rate stream, and the third bit rate stream; ….”

Claim 5

“…a first server configured to: receive at least one **streamlet request** over one or more network connections from the one or more end user stations to retrieve the first streamlet storing the first temporal portion of the digital content,;…”

U.S. Patent No. 11,677,798 (“’798 Patent”)



US011677798B2

(12) **United States Patent**
Brueck et al.

(10) **Patent No.: US 11,677,798 B2**
(45) **Date of Patent: *Jun. 13, 2023**

(54) **APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE CONTENT STREAMING**

(71) Applicant: **DISH Technologies L.L.C.**, Englewood, CO (US)

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(22) Filed: **Oct. 7, 2022**

(58) **Field of Classification Search**
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See application file for complete search history.

(56) **References Cited**

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(Continued)

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OTHER PUBLICATIONS

Respondents' Post-Hearing Brief (Redacted) dated Mar. 29, 2022 (321 pages).
(Continued)

(Continued)

(52) **U.S. Cl.**
CPC ***H04L 65/70*** (2022.05); ***G06F 16/183*** (2019.01); ***G06F 16/71*** (2019.01); ***H04L 47/12*** (2013.01);
(Continued)

encoding job to one of a plurality of host computing modules in response to an encoding job completion bid. A method includes receiving media content, segmenting the media content and generating a plurality of streamlets, and generating a set of streamlets.

25 Claims, 11 Drawing Sheets

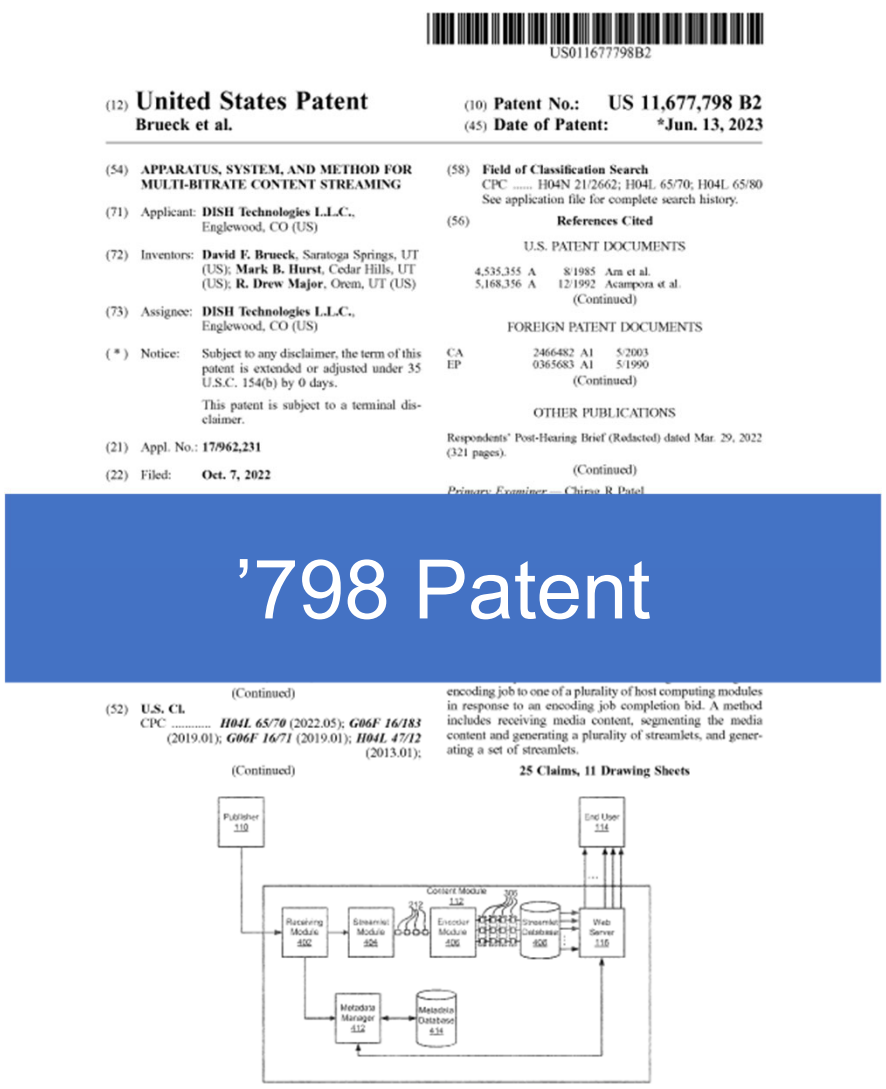
’798 Patent

’798 EX1001

Claim 8

“…wherein the first server is further configured to: receive at least one **virtual timeline** request over the one or more network connections from the one or more end user stations to retrieve a **virtual timeline**; and send the **virtual timeline** to the requesting one of the end user stations over the one or more network connections."

U.S. Patent No. 11,677,798 (“’798 Patent”)



US011677798B2

(12) **United States Patent**
Brueck et al.

(10) **Patent No.: US 11,677,798 B2**
(45) **Date of Patent: *Jun. 13, 2023**

(54) **APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE CONTENT STREAMING**

(71) Applicant: **DISH Technologies L.L.C.**, Englewood, CO (US)

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(73) Assignee: **DISH Technologies L.L.C.**, Englewood, CO (US)

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(21) Appl. No.: **17/962,231**

(22) Filed: **Oct. 7, 2022**

(58) **Field of Classification Search**
CPC H04N 21/2662; H04L 65/70; H04L 65/80
See application file for complete search history.

(56) **References Cited**

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(Continued)

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(Continued)

OTHER PUBLICATIONS

Respondents' Post-Hearing Brief (Redacted) dated Mar. 29, 2022 (321 pages).
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Primary Examiner — Chirag R Patel

(Continued)

(52) **U.S. Cl.**
CPC ***H04L 65/70*** (2022.05); ***G06F 16/183*** (2019.01); ***G06F 16/71*** (2019.01); ***H04L 47/12*** (2013.01);
(Continued)

encoding job to one of a plurality of host computing modules in response to an encoding job completion bid. A method includes receiving media content, segmenting the media content and generating a plurality of streamlets, and generating a set of streamlets.

25 Claims, 11 Drawing Sheets

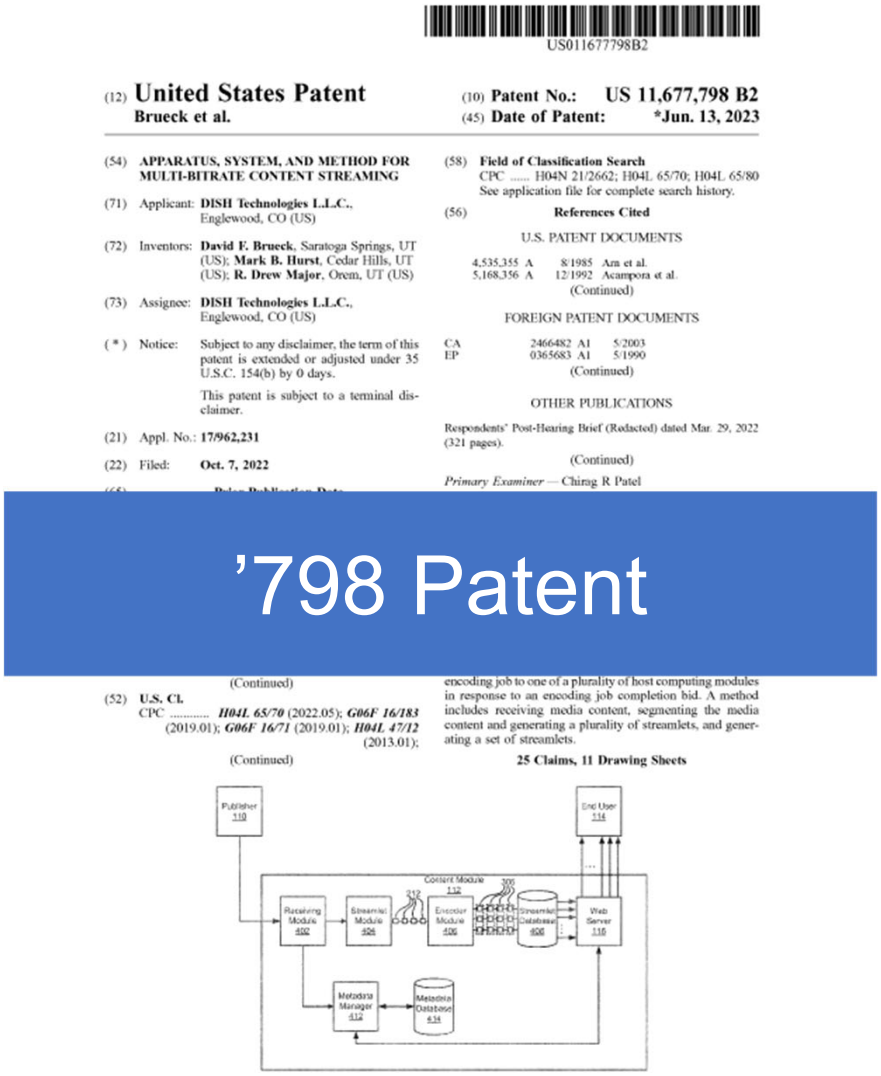
’798 Patent

’798 EX1001

Claim 11

An end user station comprising:…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 at least one server**,….wherein the digital content is encoded at a plurality of different bit rates to create a plurality of streams including at least a first bit rate stream, a second bit rate stream, and a third bit rate stream, ….;…wherein the first streamlets of each…has an equal playback duration and each…encodes the same portion of the digital content at a different one of the different bit rates; determine whether to select a higher or lower bit rate copy of the stream and based on that determination, **select a specific one of the first bit rate stream, the second bit rate stream, and the third bit rate stream**; place a first **streamlet request** to the at least one server over the one or more network connections for the first streamlet of the selected stream;…”

U.S. Patent No. 11,677,798 (“’798 Patent”)



US011677798B2

(12) **United States Patent**
Brueck et al.

(10) **Patent No.: US 11,677,798 B2**
(45) **Date of Patent: *Jun. 13, 2023**

(54) **APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE CONTENT STREAMING**

(71) Applicant: **DISH Technologies L.L.C.**, Englewood, CO (US)

(72) Inventors: **David F. Brueck**, Saratoga Springs, UT (US); **Mark B. Hurst**, Cedar Hills, UT (US); **R. Drew Major**, Orem, UT (US)

(73) Assignee: **DISH Technologies L.L.C.**, Englewood, CO (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **17/962,231**

(22) Filed: **Oct. 7, 2022**

(58) **Field of Classification Search**
CPC H04N 21/2662; H04L 65/70; H04L 65/80
See application file for complete search history.

(56) **References Cited**

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(Continued)

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Respondents' Post-Hearing Brief (Redacted) dated Mar. 29, 2022 (321 pages).
(Continued)

Primary Examiner — Chirag R Patel

(52) **U.S. Cl.**
CPC ***H04L 65/70*** (2022.05); ***G06F 16/183*** (2019.01); ***G06F 16/71*** (2019.01); ***H04L 47/12*** (2013.01);
(Continued)

encoding job to one of a plurality of host computing modules in response to an encoding job completion bid. A method includes receiving media content, segmenting the media content and generating a plurality of streamlets, and generating a set of streamlets.

25 Claims, 11 Drawing Sheets

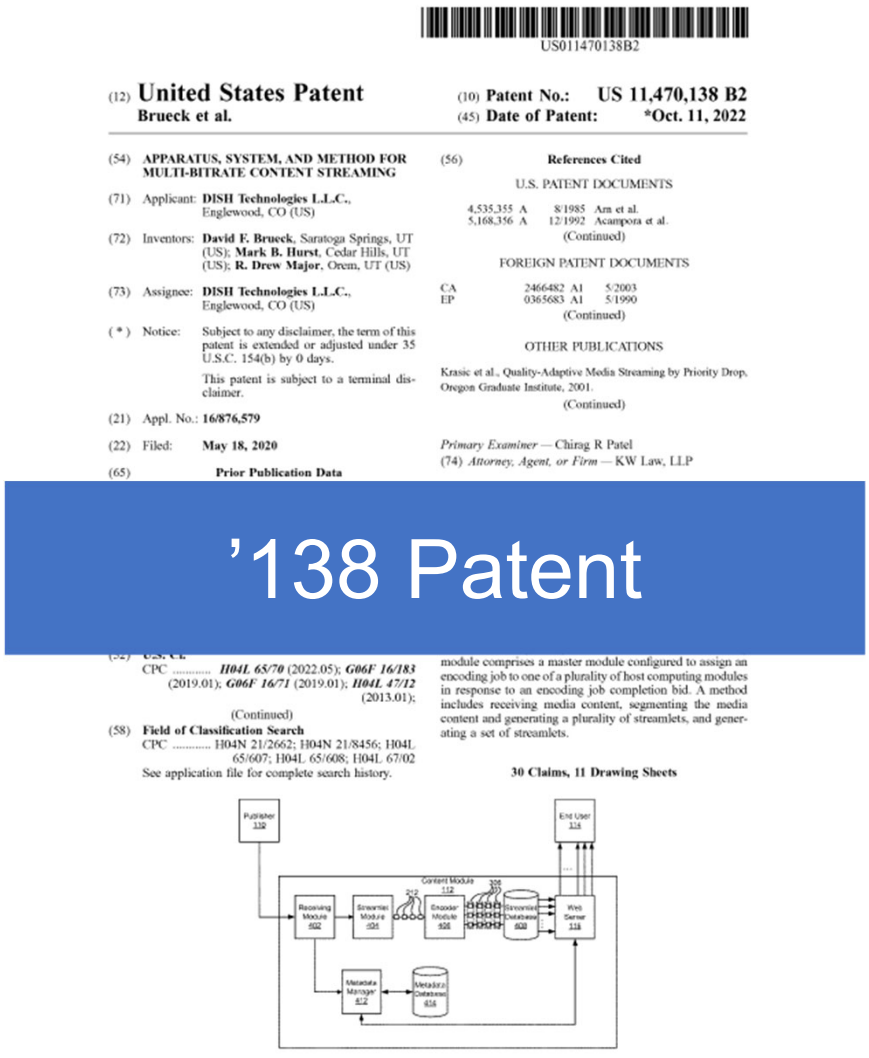
’798 Patent

Claim 16

“The end user station of claim 11, wherein at least a **plurality of streamlets are separate files** stored by the at least one server.”

’798 EX1001

U.S. Patent No. 11,470,138 (“’138 Patent”)



US011470138B2

(12) **United States Patent**
Brueck et al.

(10) **Patent No.: US 11,470,138 B2**
(45) **Date of Patent: *Oct. 11, 2022**

(54) **APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE CONTENT STREAMING**

(71) Applicant: **DISH Technologies L.L.C.**, Englewood, CO (US)

(72) Inventors: **David F. Brueck**, Saratoga Springs, UT (US); **Mark B. Hurst**, Cedar Hills, UT (US); **R. Drew Major**, Orem, UT (US)

(73) Assignee: **DISH Technologies L.L.C.**, Englewood, CO (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **16/876,579**

(22) Filed: **May 18, 2020**

(65) **Prior Publication Data**

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,535,355 A 8/1985 Arn et al.
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(Continued)

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(Continued)

Primary Examiner — Chirag R Patel
(74) *Attorney, Agent, or Firm* — KW Law, LLP

(52) U.S. Cl.
CPC ***H04L 65/70*** (2022.05); ***G06F 16/183*** (2019.01); ***G06F 16/71*** (2019.01); ***H04L 47/12*** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC H04N 21/2662; H04N 21/8456; H04L 65/607; H04L 65/608; H04L 67/02
See application file for complete search history.

module comprises a master module configured to assign an encoding job to one of a plurality of host computing modules in response to an encoding job completion bid. A method includes receiving media content, segmenting the media content and generating a plurality of streamlets, and generating a set of streamlets.

30 Claims, 11 Drawing Sheets

’138 Patent

1. A system for adaptive-rate content streaming of a video that is playable on one or more end user stations over the internet, the system comprising:

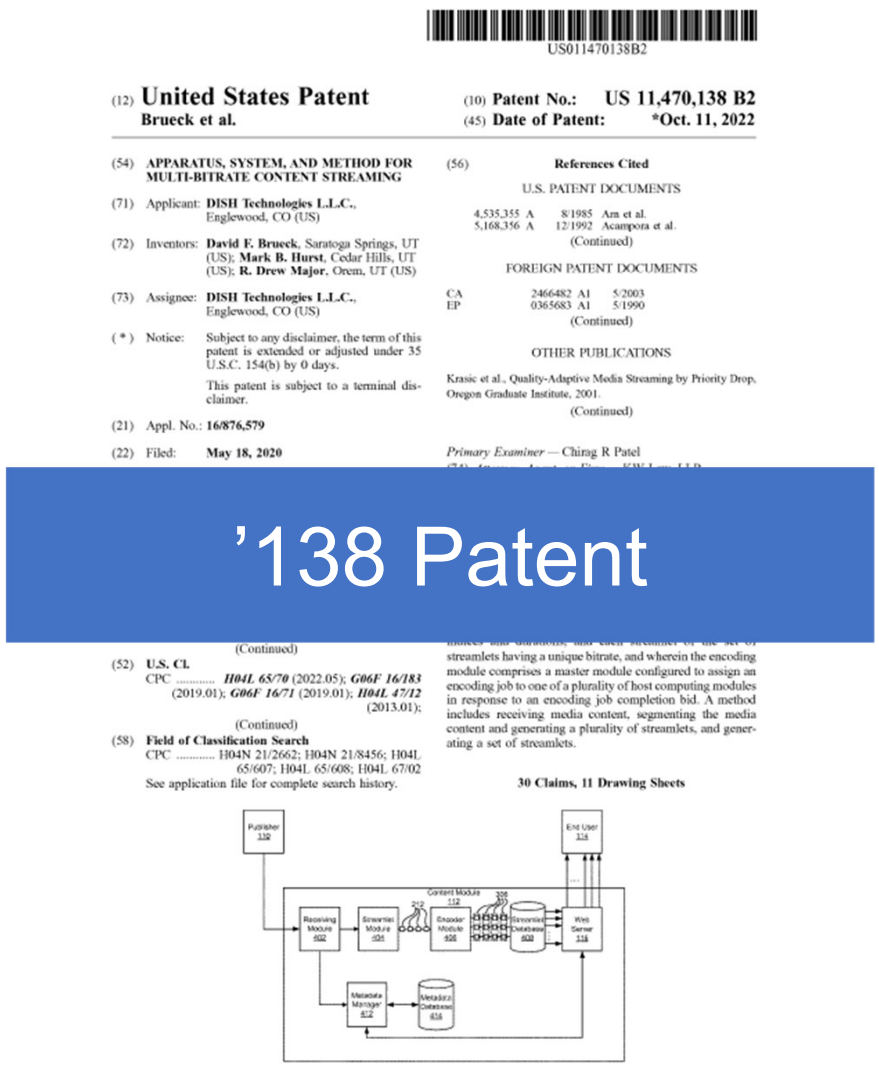
at least one storage device storing the video, wherein the video is digitally encoded at a plurality of different bitrates creating a plurality of streams including a low quality stream, a medium quality stream, and a high quality stream, the low quality stream, the medium quality stream, and the high quality stream each comprising a group of streamlets, wherein each streamlet corresponds to a portion of the video, and wherein each streamlet in each group of streamlets is encoded at a respective one of the plurality of different bitrates, and wherein each group of streamlets comprises at least first and second streamlets;

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

wherein the first streamlet of each of the groups of streamlets has the same first duration and encodes the same first portion of the video in each of the low quality stream, the medium quality stream, and the high quality stream, and wherein the first streamlet of the low quality stream encodes the same first portion of the video at a lower bitrate than the first streamlet of the high quality stream and the first streamlet of the medium quality stream.

’138 EX1001

U.S. Patent No. 11,470,138 (“’138 Patent”)



US011470138B2

(12) **United States Patent**
Brueck et al.

(10) **Patent No.: US 11,470,138 B2**
(45) **Date of Patent: *Oct. 11, 2022**

(54) **APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE CONTENT STREAMING**

(71) Applicant: **DISH Technologies L.L.C.**, Englewood, CO (US)

(72) Inventors: **David F. Brueck**, Saratoga Springs, UT (US); **Mark B. Hurst**, Cedar Hills, UT (US); **R. Drew Major**, Orem, UT (US)

(73) Assignee: **DISH Technologies L.L.C.**, Englewood, CO (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **16/876,579**

(22) Filed: **May 18, 2020**

(56) **References Cited**

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4,535,355 A 8/1985 Arn et al.
5,168,356 A 12/1992 Acampora et al.
(Continued)

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(Continued)

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Krasic et al., Quality-Adaptive Media Streaming by Priority Drop, Oregon Graduate Institute, 2001.
(Continued)

Primary Examiner — Chirag R Patel

(Continued)

(52) **U.S. Cl.**
CPC ***H04L 65/70*** (2022.05); ***G06F 16/183*** (2019.01); ***G06F 16/71*** (2019.01); ***H04L 47/12*** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC H04N 21/2662; H04N 21/8456; H04L 65/607; H04L 65/608; H04L 67/02
See application file for complete search history.

streamlets having a unique bitrate, and wherein the encoding module comprises a master module configured to assign an encoding job to one of a plurality of host computing modules in response to an encoding job completion bid. A method includes receiving media content, segmenting the media content and generating a plurality of streamlets, and generating a set of streamlets.

30 Claims, 11 Drawing Sheets

’138 Patent

’138 EX1001

1[Pre]

“A system for **adaptive-rate content streaming of a video**…”

1[B]

“wherein the video is digitally encoded at a **plurality of different bitrates** creating a plurality of streams including a low quality stream, a medium quality stream, and a high quality stream,”

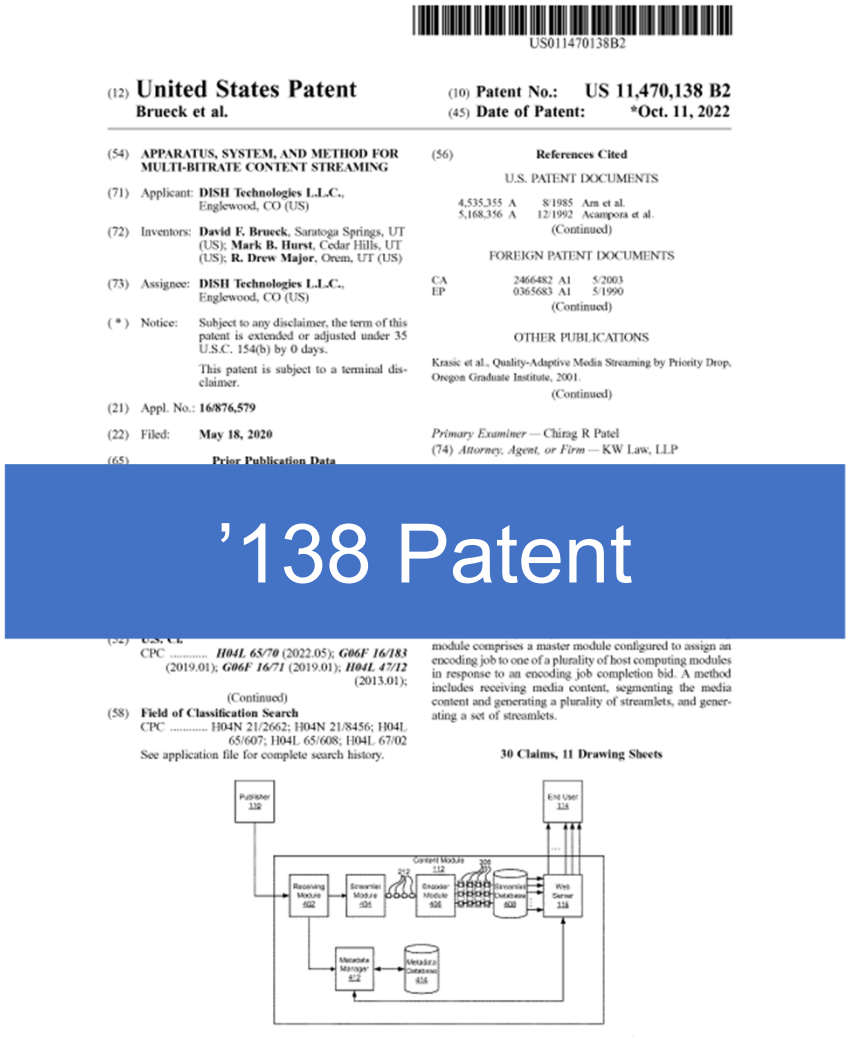
1[C]

“…each comprising a **group of streamlets**, wherein each streamlet **corresponds to a portion of the video**, and wherein each streamlet in each group of streamlets is encoded at a respective one of the plurality of different bitrates,…”

1[E]

“wherein the first streamlet of each of the groups of streamlets has the **same first duration** and **encodes the same first portion of the video** in each of the low quality stream, the medium quality stream, and the high quality stream…”

U.S. Patent No. 11,470,138 (“’138 Patent”)



US011470138B2

(12) **United States Patent**
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(21) Appl. No.: **16/876,579**

(22) Filed: **May 18, 2020**

(65) **Prior Publication Data**

(56) **References Cited**

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(Continued)

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(Continued)

OTHER PUBLICATIONS

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(Continued)

Primary Examiner — Chirag R Patel
(74) *Attorney, Agent, or Firm* — KW Law, LLP

’138 Patent

CPC ***H04L 65/70*** (2022.05); ***G06F 16/183*** (2019.01); ***G06F 16/71*** (2019.01); ***H04L 47/12*** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC H04N 21/2662; H04N 21/8456; H04L 65/607; H04L 65/608; H04L 67/02
See application file for complete search history.

module comprises a master module configured to assign an encoding job to one of a plurality of host computing modules in response to an encoding job completion bid. A method includes receiving media content, segmenting the media content and generating a plurality of streamlets, and generating a set of streamlets.

30 Claims, 11 Drawing Sheets

’138 EX1001

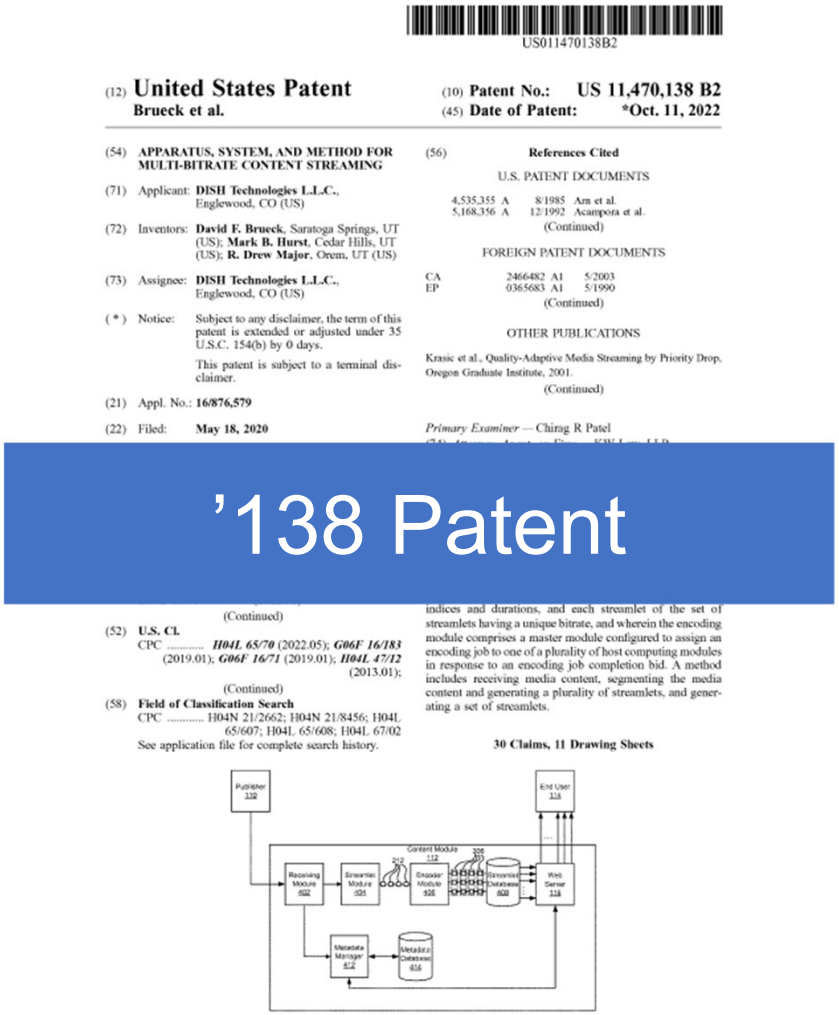
Claim 6

“…**a plurality of web servers located at different locations across the internet, each web server configured to**: receive at least one streamlet request over one or more internet connections from a respective one of the one or more end user stations to retrieve the first streamlet, wherein the at least one **streamlet request** from the respective one of the one or more end user stations includes a request for a currently selected first streamlet from one of the low quality stream, the medium quality stream, and the high quality stream based upon a determination by the respective one of the one or more end user stations to select a higher or lower bitrate version of a respective one of the plurality of streams; **retrieve from the at least one storage device** the requested first streamlet from the currently selected one of the low quality stream, the medium quality stream, and the high quality stream…”

Claim 8

“a first web server configured to: receive at least one **streamlet request** over one or more internet connections from the one or more end user stations to retrieve the first streamlet storing the first portion of the video, wherein the at least one streamlet request from the one or more end user stations includes a request for a currently selected first streamlet from one of the 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 video;…”

U.S. Patent No. 11,470,138 (“’138 Patent”)



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(Continued)

Primary Examiner — Chirag R Patel

(Continued)

(52) **U.S. Cl.**
CPC ***H04L 65/70*** (2022.05); ***G06F 16/183*** (2019.01); ***G06F 16/71*** (2019.01); ***H04L 47/12*** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC H04N 21/2662; H04N 21/8456; H04L 65/607; H04L 65/608; H04L 67/02
See application file for complete search history.

indices and durations, and each streamlet of the set of streamlets having a unique bitrate, and wherein the encoding module comprises a master module configured to assign an encoding job to one of a plurality of host computing modules in response to an encoding job completion bid. A method includes receiving media content, segmenting the media content and generating a plurality of streamlets, and generating a set of streamlets.

30 Claims, 11 Drawing Sheets

’138 Patent

’138 EX1001

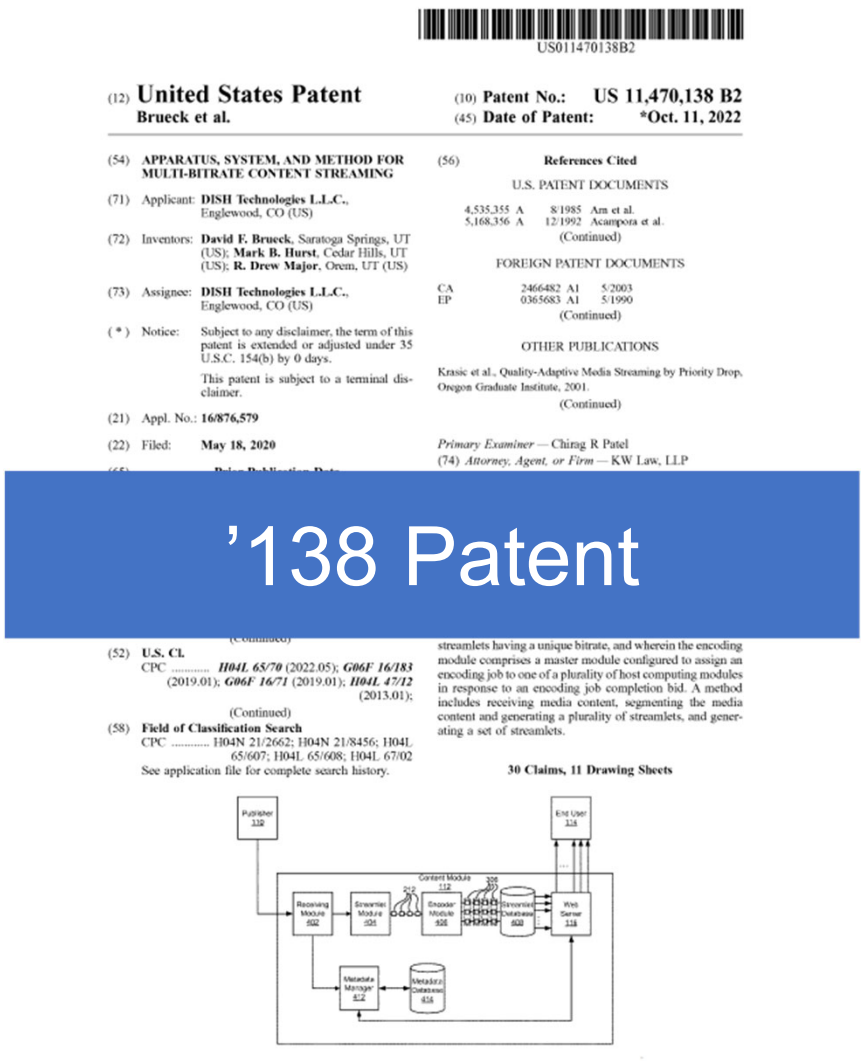
Claim 9

“The system of claim 8, wherein the first web server is further configured to: receive at least one **virtual timeline** request over the one or more internet connections from the one or more end user stations to retrieve a virtual timeline; and send the virtual timeline to the requesting one of the end user stations over the one or more network connections.”

Claim 14

“An end user station to stream a video over a network from a server for playback of the video, the end user station comprising: a digital processing apparatus memory device comprising non-transitory machine-readable instructions that, when executed, cause the processor to:…wherein the server is configured to access at least one of a plurality of groups of streamlets; 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, each of the low quality stream, the medium quality stream, and the high quality stream comprising a group of streamlets encoded at the same respective one of the different bitrates, each group comprising at least first and second streamlets, each of the streamlets corresponding to a portion of the video;…**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**; . . .”

U.S. Patent No. 11,470,138 (“’138 Patent”)



US011470138B2

(12) **United States Patent**
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(10) **Patent No.: US 11,470,138 B2**
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(54) **APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE CONTENT STREAMING**

(71) Applicant: **DISH Technologies L.L.C.**, Englewood, CO (US)

(72) Inventors: **David F. Brueck**, Saratoga Springs, UT (US); **Mark B. Hurst**, Cedar Hills, UT (US); **R. Drew Major**, Orem, UT (US)

(73) Assignee: **DISH Technologies L.L.C.**, Englewood, CO (US)

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(22) Filed: **May 18, 2020**

(56) **References Cited**

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(Continued)

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(Continued)

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Krasic et al., Quality-Adaptive Media Streaming by Priority Drop, Oregon Graduate Institute, 2001.
(Continued)

Primary Examiner — Chirag R Patel
(74) *Attorney, Agent, or Firm* — KW Law, LLP

(52) **U.S. Cl.**
CPC ***H04L 65/70*** (2022.05); ***G06F 16/183*** (2019.01); ***G06F 16/71*** (2019.01); ***H04L 47/12*** (2013.01);
(Continued)

(58) **Field of Classification Search**
CPC H04N 21/2662; H04N 21/8456; H04L 65/607; H04L 65/608; H04L 67/02
See application file for complete search history.

streamlets having a unique bitrate, and wherein the encoding module comprises a master module configured to assign an encoding job to one of a plurality of host computing modules in response to an encoding job completion bid. A method includes receiving media content, segmenting the media content and generating a plurality of streamlets, and generating a set of streamlets.

30 Claims, 11 Drawing Sheets

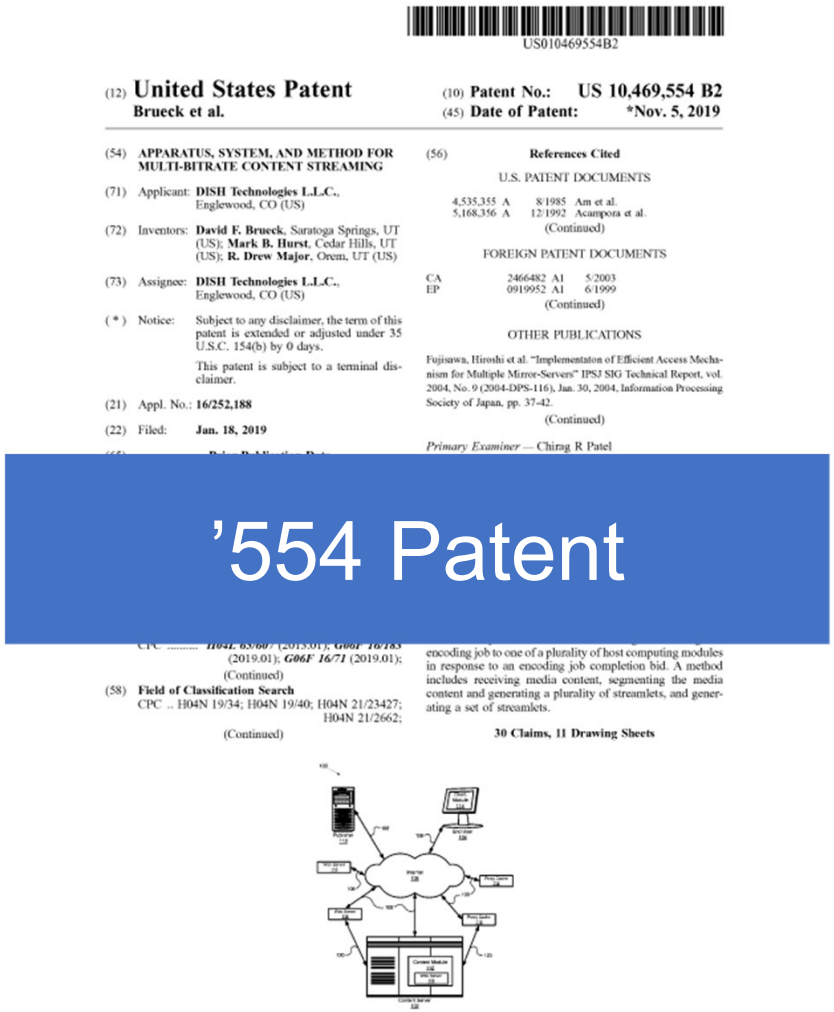
’138 Patent

’138 EX1001

Claim 23

“A process executable by one or more severs to stream a video for playback by one or more end user stations, the process comprising: …; receiving at least one streamlet request over an internet connection from a respective one of the one or more end user stations to retrieve the first streamlet storing the first portion of the video, wherein the at least one streamlet request from the respective one of the one or more end user stations includes a request for **a currently selected first streamlet** from one of the low quality stream, the medium quality stream, and the high quality stream based upon a determination by the respective one of the one or more end user stations to select a higher or lower bitrate version of the video;…”

U.S. Patent No. 10,469,554 (“’554 Patent”)



US010469554B2

(12) **United States Patent**
Brueck et al.

(10) **Patent No.: US 10,469,554 B2**
(45) **Date of Patent: *Nov. 5, 2019**

(54) **APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE CONTENT STREAMING**

(71) Applicant: **DISH Technologies L.L.C.**, Englewood, CO (US)

(72) Inventors: **David F. Brueck**, Saratoga Springs, UT (US); **Mark B. Hurst**, Cedar Hills, UT (US); **R. Drew Major**, Orem, UT (US)

(73) Assignee: **DISH Technologies L.L.C.**, Englewood, CO (US)

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(21) Appl. No.: **16/252,188**

(22) Filed: **Jan. 18, 2019**

(56) **References Cited**

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(Continued)

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(Continued)

Primary Examiner — Chirag R Patel

(2019.01); ***G06F 16/71*** (2019.01);
(Continued)

(58) **Field of Classification Search**
CPC .. H04N 19/34; H04N 19/40; H04N 21/23427; H04N 21/2662;
(Continued)

encoding job to one of a plurality of host computing modules in response to an encoding job completion bid. A method includes receiving media content, segmenting the media content and generating a plurality of streamlets, and generating a set of streamlets.

30 Claims, 11 Drawing Sheets

’554 Patent

’554 EX1001

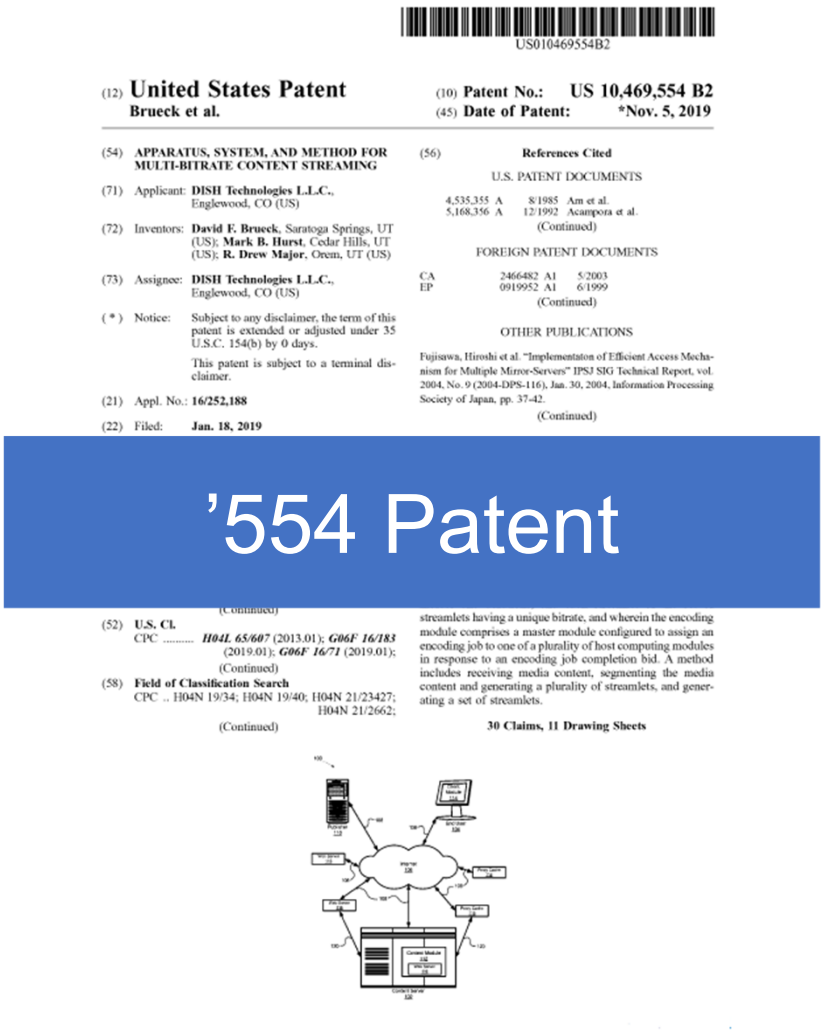
1. A system for adaptive-rate content streaming of live event video playable on one or more end user stations over the Internet, the system comprising:

at least one storage device storing live event video, the live event video encoded at a plurality of different bitrates creating a plurality of streams including a low quality stream, a medium quality stream, and a high quality stream, the low quality stream, the medium quality stream, and the high quality stream each comprising a group of streamlets encoded at a respective one of the plurality of different bitrates, each group of streamlets 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 bitrate of no less than 600 kbps; and

wherein the first streamlet of each of the groups of streamlets has the same first duration and encodes the same first portion of the live event video in each of the low quality stream, the medium quality stream, and the high quality stream, and wherein the first streamlet of the low quality stream encodes the same first portion of the live event video at a different bitrate than the first streamlet of the high quality stream and the first streamlet of the medium quality stream.

U.S. Patent No. 10,469,554 (“’554 Patent”)



US010469554B2

(12) **United States Patent**
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(10) **Patent No.: US 10,469,554 B2**
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(71) Applicant: **DISH Technologies L.L.C.**, Englewood, CO (US)

(72) Inventors: **David F. Brueck**, Saratoga Springs, UT (US); **Mark B. Hurst**, Cedar Hills, UT (US); **R. Drew Major**, Orem, UT (US)

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(Continued)

(52) **U.S. Cl.**
CPC ***H04L 65/607*** (2013.01); ***G06F 16/183*** (2019.01); ***G06F 16/71*** (2019.01);
(Continued)

(58) **Field of Classification Search**
CPC .. H04N 19/34; H04N 19/40; H04N 21/23427; H04N 21/2662;
(Continued)

streamlets having a unique bitrate, and wherein the encoding module comprises a master module configured to assign an encoding job to one of a plurality of host computing modules in response to an encoding job completion bid. A method includes receiving media content, segmenting the media content and generating a plurality of streamlets, and generating a set of streamlets.

30 Claims, 11 Drawing Sheets

’554 Patent

’554 EX1001

1[Pre]

“A system for **adaptive-rate content streaming of live event video**…”

1[B]

“the live event video encoded at a **plurality of different bitrates** creating a **plurality of streams** including a low quality stream, a medium quality stream, and a high quality stream,”

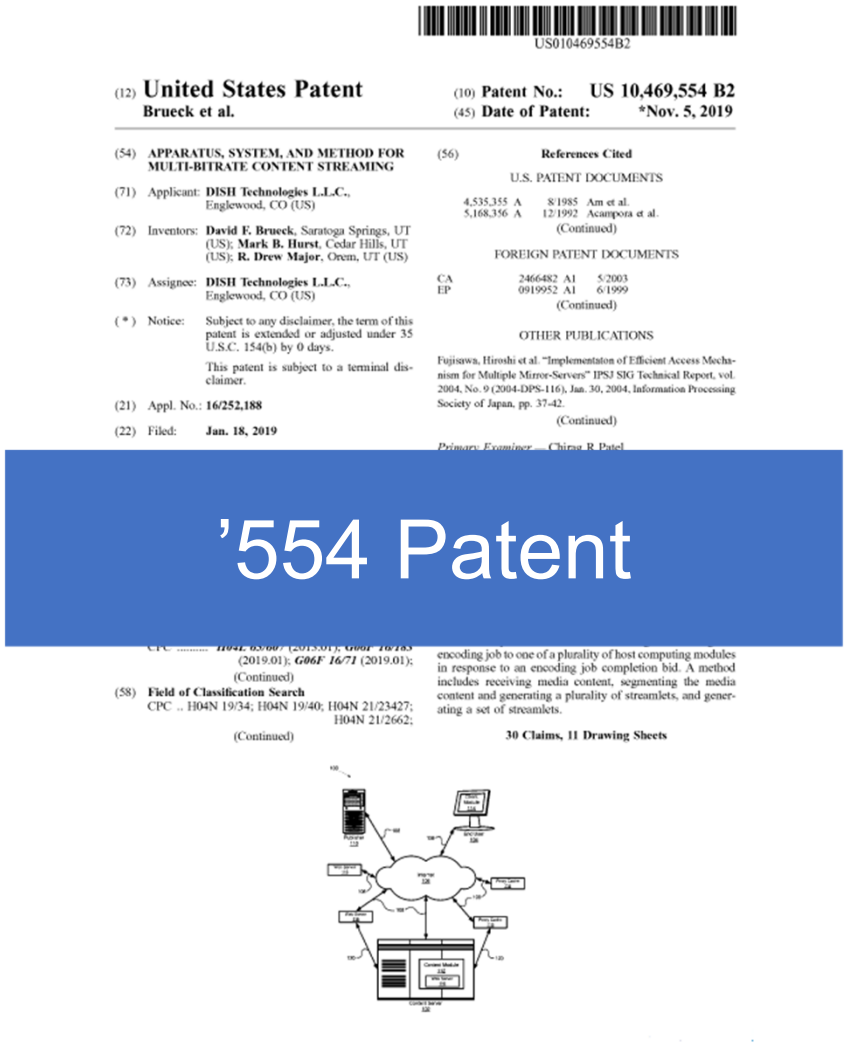
1[C]

“each comprising a **group of streamlets encoded at a respective one of the plurality of different bitrates**…each of the streamlets corresponding to a portion of the live event video;”

1[E]

“wherein the first streamlet of each of the groups of streamlets has the **same first duration** and encodes the **same first portion** of the live event video…”

U.S. Patent No. 10,469,554 (“’554 Patent”)



US010469554B2

(12) **United States Patent**
Brueck et al.

(10) **Patent No.: US 10,469,554 B2**
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Primary Examiner — Chirag R Patel

(2019.01); ***G06F 16/71*** (2019.01);
(Continued)

(58) **Field of Classification Search**
CPC .. H04N 19/34; H04N 19/40; H04N 21/23427; H04N 21/2662;
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30 Claims, 11 Drawing Sheets

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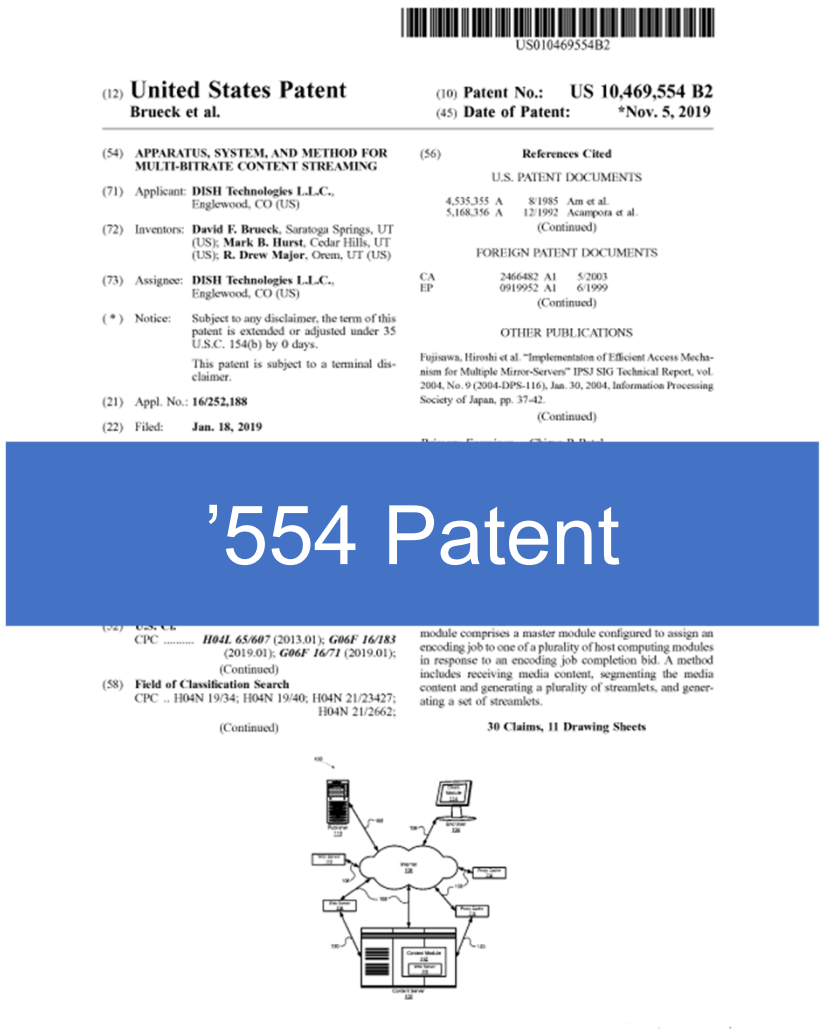
Claim 4

“…a **plurality of web servers located at different locations across the internet**, each web server configured to: receive at least one streamlet request over one or more internet connections from the one or more end user stations to retrieve the first streamlet storing a portion of the video, wherein the at least one streamlet request from the one or more end user stations includes a request for a currently selected first streamlet from one of the 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; **retrieve from the storage device** the requested first streamlet from the currently selected one of the low quality stream, the medium quality stream, and the high quality stream; …”

Claim 7

“…a first web server configured to: receive at least one streamlet request over one or more internet connections from the one or more end user stations to retrieve the first streamlet storing the first portion of the live event video, wherein the at least one streamlet request from the one or more end user stations includes a request for **a currently selected first streamlet from one of the 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 live event video;…”

U.S. Patent No. 10,469,554 (“’554 Patent”)



US010469554B2

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Brueck et al.

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CPC ***H04L 65/607*** (2013.01); ***G06F 16/183*** (2019.01); ***G06F 16/71*** (2019.01);
(Continued)

(58) **Field of Classification Search**
CPC .. H04N 19/34; H04N 19/40; H04N 21/23427; H04N 21/2662;
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30 Claims, 11 Drawing Sheets

’554 Patent

’554 EX1001

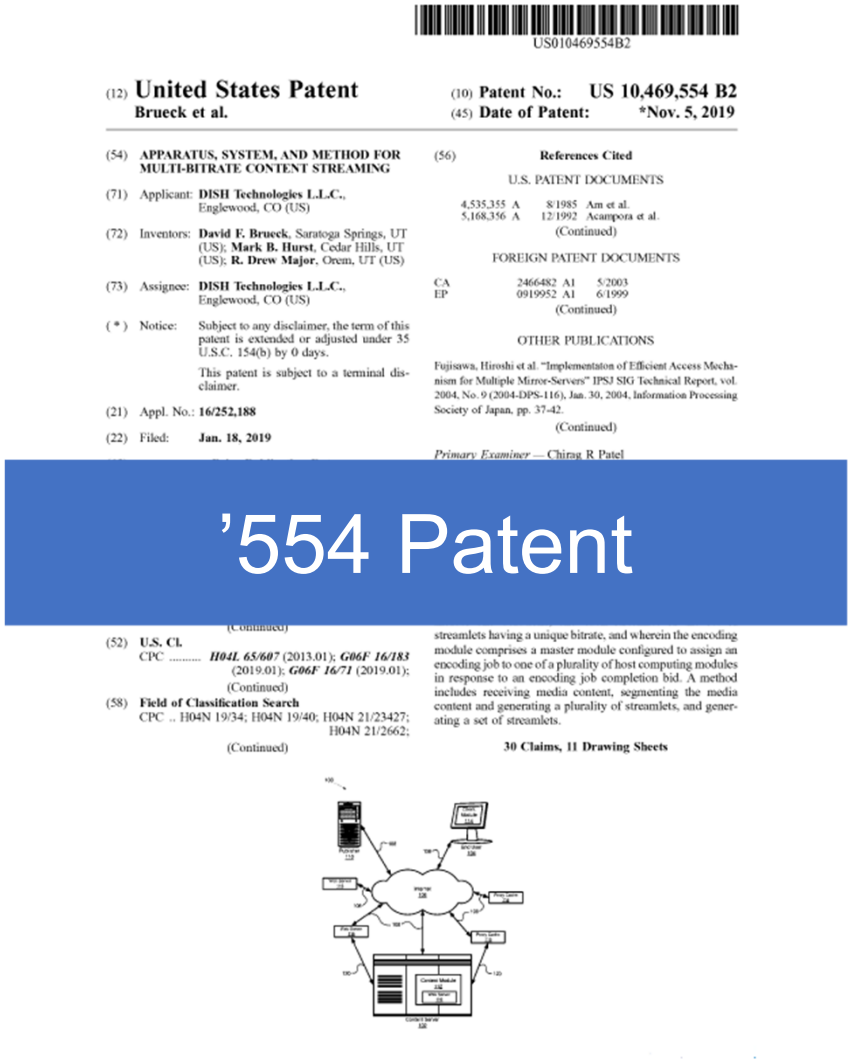
Claim 11

“The system of claim 7, wherein the first web server is further configured to: receive at least one **virtual timeline** request over the one or more internet connections from the one or more end user stations to retrieve a virtual timeline; and send the virtual timeline to the requesting one of the end user stations over the one or more network connections.”

Claim 16

“An end user station to stream **a live event video**…the content layer device comprising:…a digital processing apparatus memory device comprising non-transitory machine-readable instructions that, when executed, cause the processor to: . . . **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; ….”

U.S. Patent No. 10,469,554 (“’554 Patent”)



US010469554B2

(12) **United States Patent**
Brueck et al.

(10) **Patent No.: US 10,469,554 B2**
(45) **Date of Patent: *Nov. 5, 2019**

(54) **APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE CONTENT STREAMING**

(71) Applicant: **DISH Technologies L.L.C.**, Englewood, CO (US)

(72) Inventors: **David F. Brueck**, Saratoga Springs, UT (US); **Mark B. Hurst**, Cedar Hills, UT (US); **R. Drew Major**, Orem, UT (US)

(73) Assignee: **DISH Technologies L.L.C.**, Englewood, CO (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **16/252,188**

(22) Filed: **Jan. 18, 2019**

(56) **References Cited**

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(Continued)

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(Continued)

Primary Examiner — Chirag R Patel

’554 Patent

(Continued)

(52) **U.S. Cl.**
CPC ***H04L 65/607*** (2013.01); ***G06F 16/183*** (2019.01); ***G06F 16/71*** (2019.01);
(Continued)

(58) **Field of Classification Search**
CPC .. H04N 19/34; H04N 19/40; H04N 21/23427; H04N 21/2662;
(Continued)

streamlets having a unique bitrate, and wherein the encoding module comprises a master module configured to assign an encoding job to one of a plurality of host computing modules in response to an encoding job completion bid. A method includes receiving media content, segmenting the media content and generating a plurality of streamlets, and generating a set of streamlets.

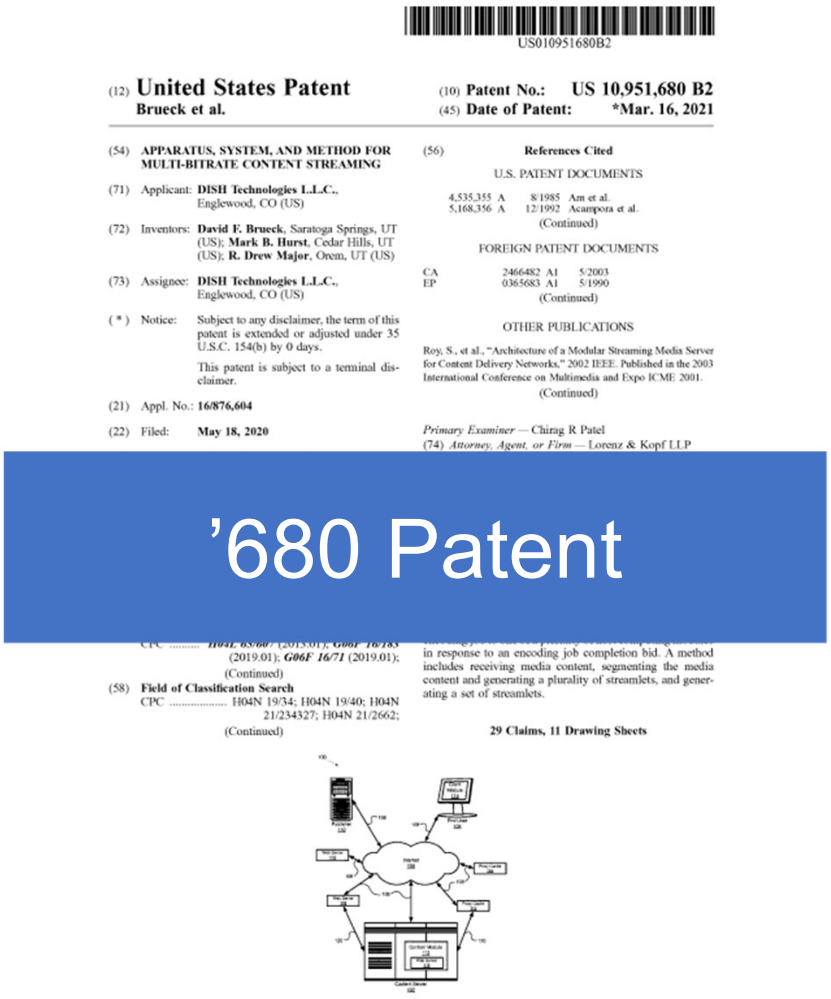
30 Claims, 11 Drawing Sheets

’554 EX1001

Claim 26

“A process executable by one or more servers to stream a live event video…the process comprising: …;…wherein the first streamlet of each of the groups of streamlets has the same first duration and encodes the same first portion of the live event video in the low quality stream, the medium quality stream, and the high quality stream,…receiving at least one streamlet request over one or more internet connections…to retrieve the first streamlet storing the first portion of the live event video,…; retrieving from the storage device the requested first streamlet from the **currently selected** one of the low quality stream, the medium quality stream, and the high quality stream.”

U.S. Patent No. 10,951,680 (“’680 Patent”)



US010951680B2

(12) **United States Patent**
Brueck et al.

(10) **Patent No.: US 10,951,680 B2**
(45) **Date of Patent: *Mar. 16, 2021**

(54) **APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE CONTENT STREAMING**

(71) Applicant: **DISH Technologies L.L.C.**, Englewood, CO (US)

(72) Inventors: **David F. Brueck**, Saratoga Springs, UT (US); **Mark B. Hurst**, Cedar Hills, UT (US); **R. Drew Major**, Orem, UT (US)

(73) Assignee: **DISH Technologies L.L.C.**, Englewood, CO (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **16/876,604**

(22) Filed: **May 18, 2020**

(56) **References Cited**

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(Continued)

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(Continued)

OTHER PUBLICATIONS

Roy, S., et al., “Architecture of a Modular Streaming Media Server for Content Delivery Networks,” 2002 IEEE. Published in the 2003 International Conference on Multimedia and Expo ICME 2001.
(Continued)

Primary Examiner — Chirag R Patel
(74) *Attorney, Agent, or Firm* — Lorenz & Kopf LLP

(2019.01); ***G06F 16/71*** (2019.01);
(Continued)

(58) **Field of Classification Search**
CPC H04N 19/34; H04N 19/40; H04N 21/234327; H04N 21/2662;
(Continued)

in response to an encoding job completion bid. A method includes receiving media content, segmenting the media content and generating a plurality of streamlets, and generating a set of streamlets.

29 Claims, 11 Drawing Sheets

’680 Patent

’680 EX1001

1. A system for adaptive-rate content streaming of video playable on one or more end user stations over the Internet, the system comprising:

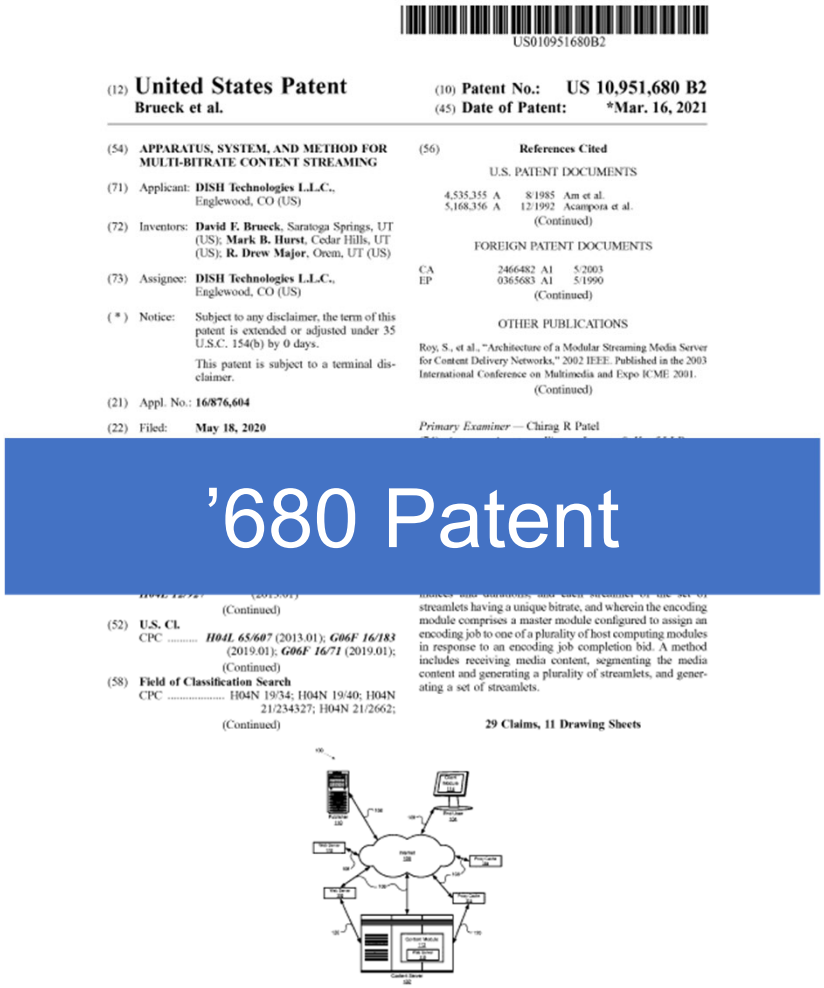
at least one processor executing non-transitory executable instructions for generating at least one virtual timeline corresponding to the video;

wherein the video encoded at a plurality of different bitrates creating a plurality of streams including a low quality stream, a medium quality stream, and a high quality stream, the low quality stream, the medium quality stream, and the high quality stream each comprising a group of streamlets encoded at a respective one of the plurality of different bitrates, each group of streamlets comprising at least first and second streamlets, each of the streamlets corresponding to a portion of the video;

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

wherein the first streamlet of each of the groups of streamlets has the same first duration and encodes the same first portion of the video in each of the low quality stream, the medium quality stream, and the high quality stream, and wherein the first streamlet of the low quality stream encodes the same first portion of the video at a different bitrate than the first streamlet of the high quality stream and the first streamlet of the medium quality stream.

U.S. Patent No. 10,951,680 (“’680 Patent”)



US010951680B2

(12) **United States Patent**
Brueck et al.

(10) **Patent No.: US 10,951,680 B2**
(45) **Date of Patent: *Mar. 16, 2021**

(54) **APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE CONTENT STREAMING**

(71) Applicant: **DISH Technologies L.L.C.**, Englewood, CO (US)

(72) Inventors: **David F. Brueck**, Saratoga Springs, UT (US); **Mark B. Hurst**, Cedar Hills, UT (US); **R. Drew Major**, Orem, UT (US)

(73) Assignee: **DISH Technologies L.L.C.**, Englewood, CO (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **16/876,604**

(22) Filed: **May 18, 2020**

(56) **References Cited**

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(Continued)

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Roy, S., et al., "Architecture of a Modular Streaming Media Server for Content Delivery Networks," 2002 IEEE. Published in the 2003 International Conference on Multimedia and Expo ICME 2001.
(Continued)

Primary Examiner — Chirag R Patel

(Continued)

(52) **U.S. Cl.**
CPC ***H04L 65/607*** (2013.01); ***G06F 16/183*** (2019.01); ***G06F 16/71*** (2019.01);
(Continued)

(58) **Field of Classification Search**
CPC H04N 19/34; H04N 19/40; H04N 21/234327; H04N 21/2662;
(Continued)

streamlets having a unique bitrate, and wherein the encoding module comprises a master module configured to assign an encoding job to one of a plurality of host computing modules in response to an encoding job completion bid. A method includes receiving media content, segmenting the media content and generating a plurality of streamlets, and generating a set of streamlets.

29 Claims, 11 Drawing Sheets

’680 Patent

’680 EX1001

1[Pre]

“A system for **adaptive-rate content streaming of video**…”

1[A]

“generating at least one **virtual timeline** corresponding to the video;,”

1[B]

“wherein the video encoded at a **plurality of different bitrates** creating a plurality of streams including a low quality stream, a medium quality stream, and a high quality stream,”

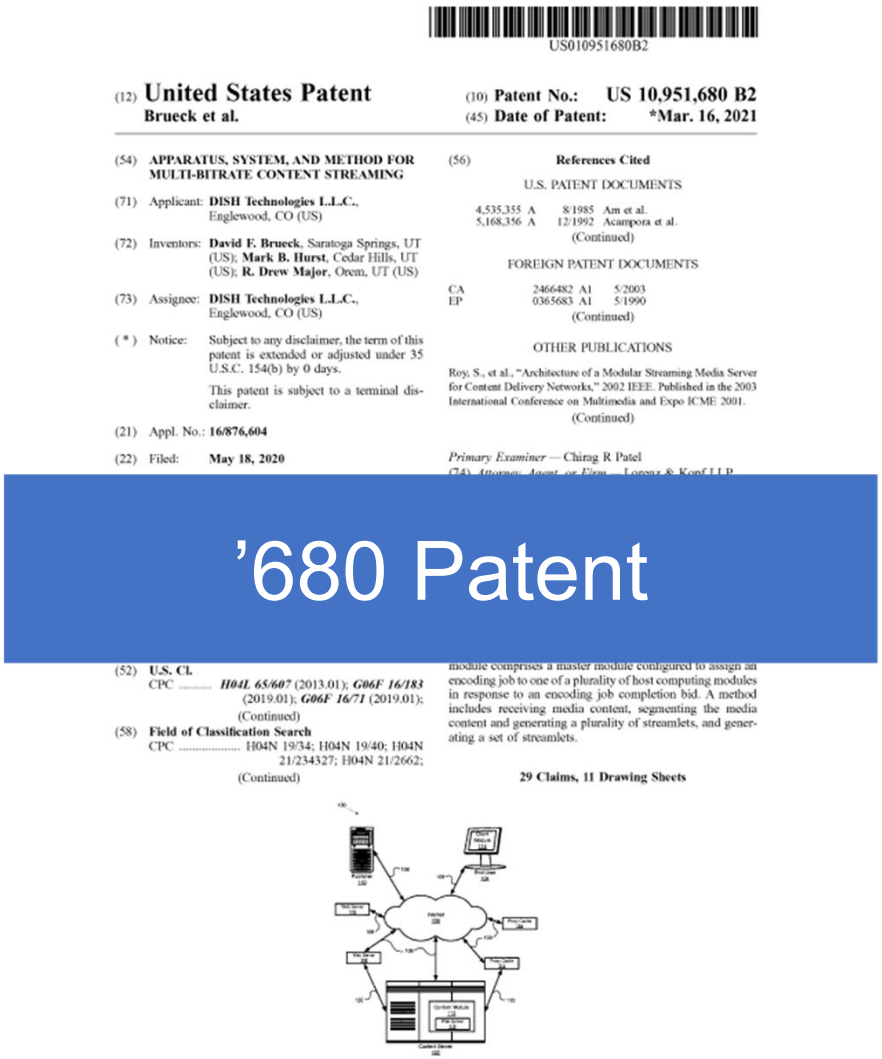
1[C]

“…each comprising a **group of streamlets encoded at a respective one of the plurality of different bitrates**…”

[1E]

“wherein the first streamlet of each of the groups of streamlets has the **same first duration** and encodes the **same first portion** of the video in each of the low quality stream, the medium quality stream, and the high quality stream…”

U.S. Patent No. 10,951,680 (“’680 Patent”)



US010951680B2

(12) **United States Patent**
Brueck et al.

(10) **Patent No.: US 10,951,680 B2**
(45) **Date of Patent: *Mar. 16, 2021**

(54) **APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE CONTENT STREAMING**

(71) Applicant: **DISH Technologies L.L.C.**, Englewood, CO (US)

(72) Inventors: **David F. Brueck**, Saratoga Springs, UT (US); **Mark B. Hurst**, Cedar Hills, UT (US); **R. Drew Major**, Orem, UT (US)

(73) Assignee: **DISH Technologies L.L.C.**, Englewood, CO (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **16/876,604**

(22) Filed: **May 18, 2020**

(56) **References Cited**

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(Continued)

FOREIGN PATENT DOCUMENTS

CA 2466482 A1 5/2003
EP 0365683 A1 5/1990
(Continued)

OTHER PUBLICATIONS

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(Continued)

Primary Examiner — Chirag R Patel

(52) **U.S. Cl.**
CPC ***H04L 65/607*** (2013.01); ***G06F 16/183*** (2019.01); ***G06F 16/71*** (2019.01);
(Continued)

(58) **Field of Classification Search**
CPC H04N 19/34; H04N 19/40; H04N 21/234327; H04N 21/2662;
(Continued)

module comprises a master module configured to assign an encoding job to one of a plurality of host computing modules in response to an encoding job completion bid. A method includes receiving media content, segmenting the media content and generating a plurality of streamlets, and generating a set of streamlets.

29 Claims, 11 Drawing Sheets

’680 Patent

’680 EX1001

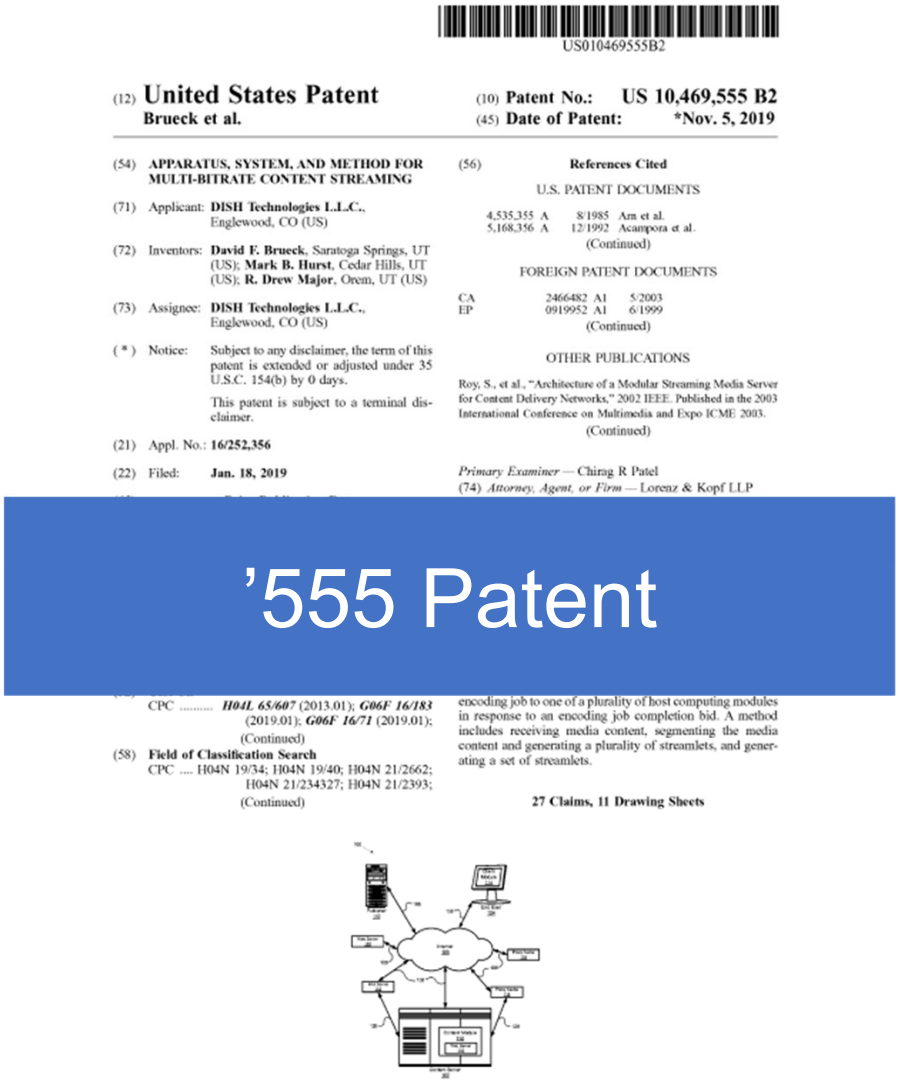
Claim 7

“The system of claim 1 , further comprising: **a plurality of web servers located at different locations across the internet, each web server configured to** receive at least one **streamlet request** over one or more internet connections from the one or more end user stations to retrieve the first streamlet storing a portion of the video, wherein the at least one streamlet request from the one or more end user stations includes a request for a **currently selected** first streamlet from one of the 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; **retrieve from the storage device** the requested first streamlet from the currently selected one of the low quality stream, the medium quality stream, and the high quality stream;…”

Claim 8

“…**a first web server** configured to: receive at least one virtual timeline request over the one or more internet connections from the one or more end user stations to **retrieve a virtual timeline**…”

U.S. Patent No. 10,469,555 (“’555 Patent”)



US010469555B2

(12) **United States Patent**
Brueck et al.

(10) **Patent No.: US 10,469,555 B2**
(45) **Date of Patent: *Nov. 5, 2019**

(54) **APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE CONTENT STREAMING**

(71) Applicant: **DISH Technologies L.L.C.**, Englewood, CO (US)

(72) Inventors: **David F. Brueck**, Saratoga Springs, UT (US); **Mark B. Hurst**, Cedar Hills, UT (US); **R. Drew Major**, Orem, UT (US)

(73) Assignee: **DISH Technologies L.L.C.**, Englewood, CO (US)

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This patent is subject to a terminal disclaimer.

(21) Appl. No.: **16/252,356**

(22) Filed: **Jan. 18, 2019**

(56) **References Cited**

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(Continued)

OTHER PUBLICATIONS

Roy, S., et al., “Architecture of a Modular Streaming Media Server for Content Delivery Networks,” 2002 IEEE. Published in the 2003 International Conference on Multimedia and Expo ICME 2003.
(Continued)

Primary Examiner — Chirag R Patel
(74) *Attorney, Agent, or Firm* — Lorenz & Kopf LLP

CPC ***H04L 65/607*** (2013.01); ***G06F 16/183*** (2019.01); ***G06F 16/71*** (2019.01);
(Continued)

(58) **Field of Classification Search**
CPC H04N 19/34; H04N 19/40; H04N 21/2662; H04N 21/234327; H04N 21/2393;
(Continued)

encoding job to one of a plurality of host computing modules in response to an encoding job completion bid. A method includes receiving media content, segmenting the media content and generating a plurality of streamlets, and generating a set of streamlets.

27 Claims, 11 Drawing Sheets

’555 Patent

1. A system for adaptive-rate content streaming of live event video playable on one or more end user stations over the Internet, the system comprising:

at least one storage device storing live event video, the live event video encoded at a plurality of different bitrates creating a plurality of streams including a low quality stream, a medium quality stream, and a high quality stream, the low quality stream, the medium quality stream, and the high quality stream each comprising a group of streamlets encoded at a respective one of the plurality of different bitrates;

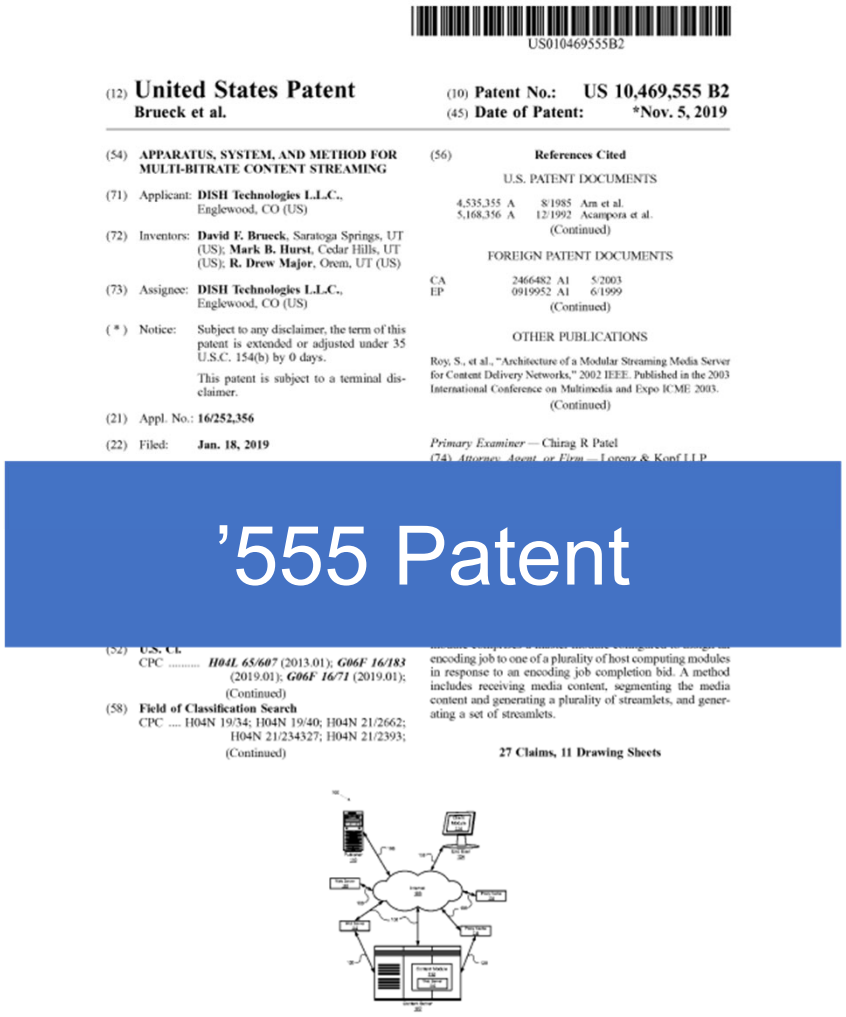
wherein at least one of the low quality stream, the medium quality stream, and the high quality stream is encoded at a bitrate of no less than 600 kbps;

wherein the amount of data in each streamlet corresponding to the same part of the live event video in the low quality stream, the medium quality stream, and the high quality stream varies according to the different bitrates; and

the plurality of streamlets in the low quality stream, the medium quality stream, and the high quality stream having a duration that is the same as each other.

’555 EX1001

U.S. Patent No. 10,469,555 ("'555 Patent")



US010469555B2

(12) **United States Patent**
Brueck et al.

(10) **Patent No.: US 10,469,555 B2**
(45) **Date of Patent: *Nov. 5, 2019**

(54) **APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE CONTENT STREAMING**

(71) Applicant: **DISH Technologies L.L.C.**, Englewood, CO (US)

(72) Inventors: **David F. Brueck**, Saratoga Springs, UT (US); **Mark B. Hurst**, Cedar Hills, UT (US); **R. Drew Major**, Orem, UT (US)

(73) Assignee: **DISH Technologies L.L.C.**, Englewood, CO (US)

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This patent is subject to a terminal disclaimer.

(21) Appl. No.: **16/252,356**

(22) Filed: **Jan. 18, 2019**

(56) **References Cited**

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(Continued)

Primary Examiner — Chirag R Patel

(74) *Attorney, Agent, or Firm* — Lorenz & Kopf LLP

(52) U.S. Cl.
CPC ***H04L 65/607*** (2013.01); ***G06F 16/183*** (2019.01); ***G06F 16/71*** (2019.01);
(Continued)

(58) **Field of Classification Search**
CPC H04N 19/34; H04N 19/40; H04N 21/2662; H04N 21/234327; H04N 21/2393;
(Continued)

encoding job to one of a plurality of host computing modules in response to an encoding job completion bid. A method includes receiving media content, segmenting the media content and generating a plurality of streamlets, and generating a set of streamlets.

27 Claims, 11 Drawing Sheets

'555 Patent

'555 EX1001

1[Pre]

"A system for **adaptive-rate content streaming of live event video**…"

1[B]

"the live event video encoded at a **plurality of different bitrates** creating a **plurality of streams** including a low quality stream, a medium quality stream, and a high quality stream."

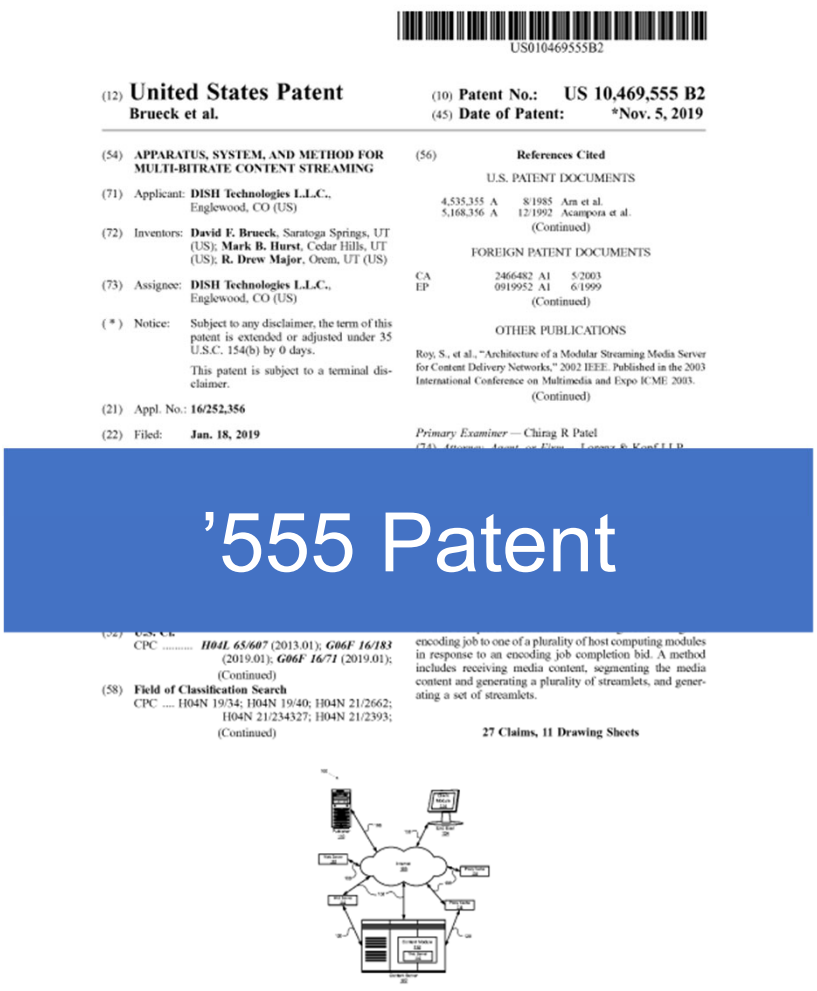
1[C]

"the low quality stream, the medium quality stream, and the high quality stream **each comprising a group of streamlets** encoded at a respective one of the plurality of different bitrates;"

1[E]

"wherein the amount of data in each streamlet corresponding to the **same part of the live event video** in the low quality stream, the medium quality stream, and the high quality stream varies according to the different bitrates; and the plurality of streamlets in the low quality stream, the medium quality stream, and the high quality stream **having a duration that is the same as each other**."

U.S. Patent No. 10,469,555 (“’555 Patent”)



US010469555B2

(12) **United States Patent**
Brueck et al.

(10) **Patent No.: US 10,469,555 B2**
(45) **Date of Patent: *Nov. 5, 2019**

(54) **APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE CONTENT STREAMING**

(71) Applicant: **DISH Technologies L.L.C.**, Englewood, CO (US)

(72) Inventors: **David F. Brueck**, Saratoga Springs, UT (US); **Mark B. Hurst**, Cedar Hills, UT (US); **R. Drew Major**, Orem, UT (US)

(73) Assignee: **DISH Technologies L.L.C.**, Englewood, CO (US)

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(21) Appl. No.: **16/252,356**

(22) Filed: **Jan. 18, 2019**

(56) **References Cited**

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(Continued)

Primary Examiner — Chirag R Patel

CPC ***H04L 65/607*** (2013.01); ***G06F 16/183*** (2019.01); ***G06F 16/71*** (2019.01);
(Continued)

(58) **Field of Classification Search**
CPC H04N 19/34; H04N 19/40; H04N 21/2662; H04N 21/234327; H04N 21/2393;
(Continued)

encoding job to one of a plurality of host computing modules in response to an encoding job completion bid. A method includes receiving media content, segmenting the media content and generating a plurality of streamlets, and generating a set of streamlets.

27 Claims, 11 Drawing Sheets

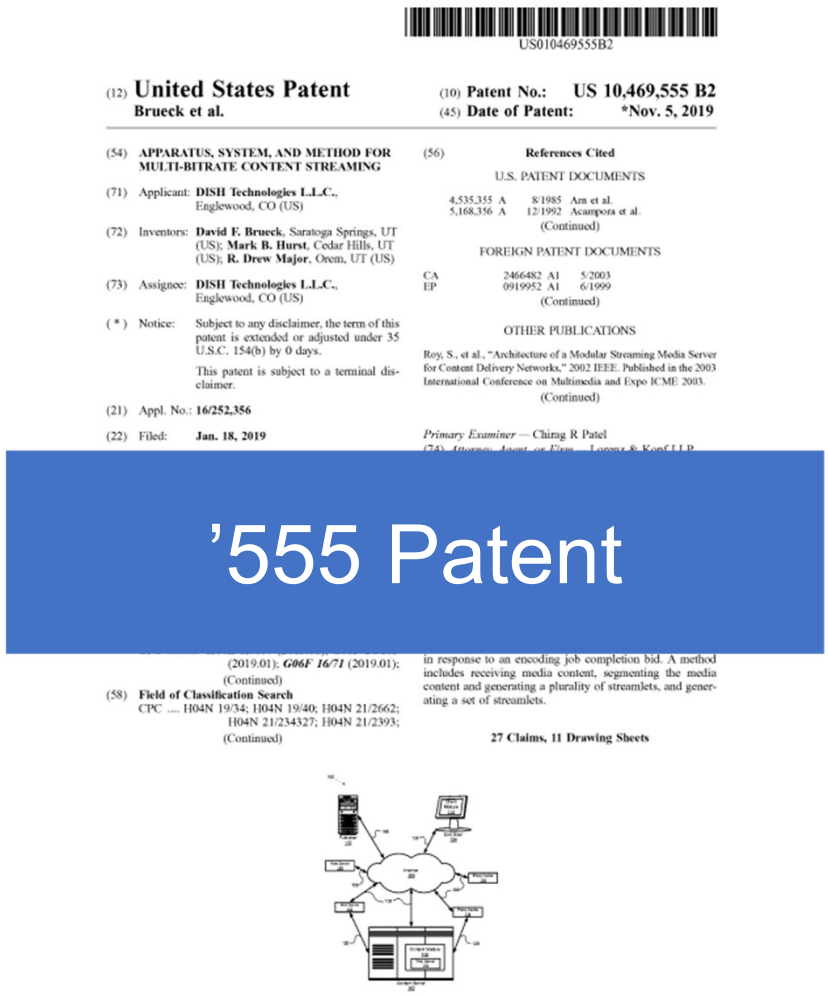
’555 Patent

’555 EX1001

Claim 4

“….**a plurality of web servers located at different locations across the internet**, each web server configured to: receive at least one streamlet request over one or more internet connections from the one or more end user stations to retrieve the first streamlet storing a portion of the video, wherein the at least one streamlet request from the one or more end user stations includes a request for a currently selected first streamlet from one of the 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; **retrieve from the storage device** the requested first streamlet from the currently selected one of the low quality stream, the medium quality stream, and the high quality stream; ….”

U.S. Patent No. 10,469,555 (“’555 Patent”)



US010469555B2

(12) **United States Patent**
Brueck et al.

(10) **Patent No.: US 10,469,555 B2**
(45) **Date of Patent: *Nov. 5, 2019**

(54) **APPARATUS, SYSTEM, AND METHOD FOR MULTI-BITRATE CONTENT STREAMING**

(71) Applicant: **DISH Technologies L.L.C.**, Englewood, CO (US)

(72) Inventors: **David F. Brueck**, Saratoga Springs, UT (US); **Mark B. Hurst**, Cedar Hills, UT (US); **R. Drew Major**, Orem, UT (US)

(73) Assignee: **DISH Technologies L.L.C.**, Englewood, CO (US)

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This patent is subject to a terminal disclaimer.

(21) Appl. No.: **16/252,356**

(22) Filed: **Jan. 18, 2019**

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(Continued)

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(Continued)

OTHER PUBLICATIONS

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(Continued)

Primary Examiner — Chirag R Patel

(2019.01); ***G06F 16/71*** (2019.01);
(Continued)

(58) **Field of Classification Search**
CPC H04N 19/34; H04N 19/40; H04N 21/2662; H04N 21/234327; H04N 21/2393;
(Continued)

in response to an encoding job completion bid. A method includes receiving media content, segmenting the media content and generating a plurality of streamlets, and generating a set of streamlets.

27 Claims, 11 Drawing Sheets

’555 Patent

’555 EX1001

Claim 10

“A content player device to stream a video over a network … comprising: … 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; 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;…**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; 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; and provide the received streamlets for playback of the video.