

EXHIBIT G

EXEMPLARY INFRINGEMENT CHART FOR U.S. PATENT NO. 8,868,772¹

The following claim chart shows exemplary aspects of certain streaming services and products owned or operated by Gaia Media LLC (“Gaia”), using the Gaia website, available at www.gaia.com (“Gaia Site”), that infringe at least claim 1 of U.S. Patent No. 8,868,772 (“the ’772 Patent”). Upon information and belief, Gaia operates streaming services that infringe one or more claims of the ’772 Patent (the “Accused Services”), including at least the Gaia Site.

The chart is exemplary and should not be read to limit the assertions of Plaintiffs DISH Technologies L.L.C. and Sling TV L.L.C. (collectively, “DISH”) against Gaia as to the services or products described below. The chart should not be read to limit DISH’s assertions to the patent claims charted below. Nor should the chart below be read to limit how Gaia infringes the claims below.

The following evidence and descriptions, including tests conducted on the Gaia Site, show that the Accused Services meet each element of at least claim 1 of the ’772 Patent in substantially the same manner described below.

To the extent users are required to perform any claim limitation, Gaia induces that performance by designing and operating the Gaia Site to stream videos using HLS and by providing user-facing instructions and support materials directing users to access and stream Gaia videos through the Gaia Site and related Gaia applications, including the support materials cited below. *See, e.g., GAIA on my TV / Device and Tech Support*, Gaia.com, <https://gaiasupportcenter.zendesk.com/hc/en-us/categories/203067127-GAIA-on-my-TV-Device-and-Tech-Support>; *What is Gaia?*, Gaia.com, <https://gaiasupportcenter.zendesk.com/hc/en-us/articles/221752368-What-is-Gaia>; *Gaia Subscription Plans, Pricing, Discounts, and Accepted Payments*, Gaia.com, <https://gaiasupportcenter.zendesk.com/hc/en-us/articles/28271540036891-Gaia-Subscription-Plans-Pricing-Discounts-and-Accepted-Payments>.

To the extent DISH asserts contributory infringement, Gaia’s Accused Services include ABR components that constitute material parts of the claimed invention, including client-side adaptive-bitrate selection logic, server-side multi-bitrate encoding and segment storage infrastructure, and HLS manifest and playlist delivery functionality. As deployed in the Gaia Site, those components are especially made or adapted for infringing ABR streaming and have no substantial non-infringing use in that configuration.

This chart provides the element-by-element technical mapping of the Accused Services to claim 1 of the ’772 Patent.

¹ All citations to or cross-references to claim elements within a respective section refer to the claim elements of the ’772 Patent addressed in that section unless otherwise indicated.

Exemplary Infringement Chart for U.S. Patent No. 8,868,772

I. U.S. Patent No. 8,868,772**A. Claim 1***1[pre] A method for presenting rate-adaptive streams, the method comprising*

The Gaia Site provides information that permits a client device accessing the Gaia Site to output rate-adaptive streams received via fulfilled HTTP GET requests to one or more servers associated with Gaia connected to the client device via at least one TCP connection. Example client devices include personal computers, Macintosh computers, Apple iPhones, Apple iPads, Android phones, Android tablets, and smart TV devices equipped to access the internet via one or more network connections. The client devices include a media player configured to enable video streaming. Further, upon information and belief, employees and/or agents of Gaia tested and used the Gaia Site on devices in the U.S. during the relevant time period.

The images in this chart are from the Gaia Site accessed through a computing device that includes a web browser, such as Microsoft Edge, Google Chrome, or iOS Safari. In addition, the media player embedded in the web page of, and executed based upon instructions given by, the Gaia Site is available to run on content player devices supporting all the latest versions of major web browsers. *See, e.g., GAIA on my TV / Device and Tech Support*, Gaia.com, <https://gaiasupportcenter.zendesk.com/hc/en-us/categories/203067127-GAIA-on-my-TV-Device-and-Tech-Support>.

Tests were conducted on videos offered over the Gaia Site executed on a personal computer. As part of the testing, Microsoft Edge DevTools was used on a personal computer accessing the Gaia Site to capture and view DevTools Network data and to throttle the network's available bandwidth. Thus, the test simulated how the Gaia Site responded to lower and higher bandwidths. For the current test, a video titled "The 900-Year Secret of the Knights Templar - Part 1" was selected, and at various times throughout the playback of the video, bandwidth was restricted to download speeds of 1024 kbps. As observed through the tests, when the user selects a video from the available videos, the media player embedded in the web page of the Gaia Site displays more details regarding the video and provides the user with the option to view the video.

Selecting the icon corresponding to a video causes that video and other materials to be streamed and displayed on the client device.

With respect to adaptively receiving the digital stream from Gaia's video server over the network, the Gaia Site's adaptive bitrate streams are provided to the media player embedded in the web page of the Gaia Site from a server over a network using the HTTP Live Streaming ("HLS") adaptive bitrate streaming protocol. HLS is "a protocol for transferring unbounded streams of multimedia data." Request For Comments: 8216 – HTTP Live Streaming, August 2017 ("RFC 8216") at 1. Using HLS, "a client can receive a continuous stream of media from a server for concurrent presentation." RFC 8216 at 4. HLS "allows a receiver to adapt the bitrate of the media to the current network conditions in order to maintain uninterrupted playback at the best possible quality." RFC 8216 at 4. With HLS, "[c]lients should switch between different Variant Streams to adapt to network conditions." RFC 8216 at 5.

Exemplary Infringement Chart for U.S. Patent No. 8,868,772

When executed, the Gaia Site operates a media player operating on a client device, which is configured to request Gaia's digital content from one or more servers via at least one TCP connection over the network.

Gaia's content is stored on one or more servers over a network and is displayed to client devices via a media player embedded in the web page of the Gaia Site. Gaia confirms that it provides videos to client devices through media players on its website. *Which devices are supported on Gaia?*, Gaia.com, <https://gaiasupportcenter.zendesk.com/hc/en-us/articles/223618027-Which-devices-are-supported-on-Gaia> ("Once you decide which method you'll use to access Gaia at either Gaia.com, an App (i.e. Amazon APP, ROKU etc.) or with a Streaming Service (i.e. Amazon Prime, YouTube TV or Xfinity-Comcast), you'll enjoy streaming Gaia on all your devices associated with your membership."). Further, on information and belief, employees, affiliates, and/or agents of Gaia have tested and used the Gaia Site on devices in the U.S. during the relevant time period.

The one or more servers accessible to the client device through the embedded media player store streamlets corresponding to particular segments of a video, and each segment is encoded at one of numerous resolutions. Together, the streamlets of one resolution are known as a "variant stream" or a "bandwidth version."

The Media Playlist for each of the variant streams identifies a group of streamlets associated with each of the different copies. *See* RFC 8216 at 38 ("The server must create a Media Playlist file (Section 4) that contains a URI for each Media Segment that the server wishes to make available, in the order in which they are to be played."); *see also* RFC 8216 at 4 ("A multimedia presentation is specified by a Uniform Resource Identifier (URI) [RFC3986] to a Playlist."); RFC 8216 at 4 ("A Media Playlist contains a series of Media Segments that make up the overall presentation. A Media Segment is specified by a URI and optionally a byte range.").

Thus, the limitations for this claim element are met. Gaia provides a method for presenting rate-adaptive streams.

To the extent Gaia contends that the Accused Services do not literally satisfy this limitation, Gaia infringes under the doctrine of equivalents because the Accused Services perform substantially the same function, in substantially the same way, to achieve the same result.

1[a] streaming by a media player operating on an end user station a video from a set of one or more servers,

As shown above in element 1[pre], which is incorporated fully herein, the limitations of this claim are met. *See* § A.1[pre].

The Gaia Site includes a media player configured to stream the video from one or more servers via at least one TCP connection over the network.

As shown by the DevTools Network data, partially reproduced below, the streamlet video files are hosted on a server accessible via **gaia.brightcovecdn.com**.

Exemplary Infringement Chart for U.S. Patent No. 8,868,772

² Method	Host	Path	...	Status
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment6.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment7.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment8.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment9.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-	...	Complete

² Any highlighting presented throughout this chart is intended to exemplify certain elements of Gaia's operation and is not intended to limit DISH's position with respect to how Gaia practices any element of the claims.

- ORANGE = one or more servers
- BLUE = media segment
- YELLOW = variant streams

Exemplary Infringement Chart for U.S. Patent No. 8,868,772

² Method	Host	Path	...	Status
		aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment10.m4f		
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment11.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment12.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment13.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment14.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-	...	Complete

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² Method	Host	Path	...	Status
		aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment15.m4f		
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment16.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment17.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment18.m4f	...	Complete

The URI **gaia.brightcovecdn.com** is affiliated with the below IP addresses:

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PS C:\> nslookup gaia.brightcovecdn.com
Server:  HOUDC01.bakerbotts.net
Address:  10.20.254.81

Non-authoritative answer:
Name:     dualstack.brightcove.map.fastly.net
Addresses: 2a04:4e42:200::539
           2a04:4e42::539
           2a04:4e42:400::539
           2a04:4e42:600::539
           151.101.194.27
           151.101.66.27
           151.101.130.27
           151.101.2.27
Aliases:  gaia.brightcovecdn.com

```

Windows PowerShell nslookup for gaia.brightcovecdn.com (highlights added). A reverse IP geolocation lookup at <https://www.geolocation.com/?ip=151.101.2.27#ipresult> shows this IP address associated with one or more servers in San Francisco, California. A reverse IP geolocation lookup at <https://www.geolocation.com/?ip=151.101.130.27#ipresult> shows this IP address associated with one or more servers in San Francisco, California. A reverse IP geolocation lookup at <https://www.geolocation.com/?ip=151.101.194.27#ipresult> shows this IP address associated with one or more servers in San Francisco, California. A reverse IP geolocation lookup at <https://www.geolocation.com/?ip=151.101.66.27#ipresult> shows this IP address associated with one or more servers in San Francisco, California.

Thus, the Gaia Site operates a client module configured to be connected to a network having at least one server and further configured to request digital content over the network via at least one transmission control protocol (TCP) connection.

The one or more servers, whose content is accessible by the client devices through a web page on the Gaia Site, store individually-requestable streamlets corresponding to particular segments of a video, and each streamlet is encoded at one of numerous resolutions. Thus, Gaia stores on one or more servers at least two different copies of the digital content, each encoded at different bit rates.

The numerous variant streams of the video displayed by the media player embedded in the web page of the Gaia Site include at least a low quality stream, a medium quality stream, and a high quality stream.

For example, in the instant test of a video titled “The 900-Year Secret of the Knights Templar - Part 1,” the client device made an HTTP GET request to **manifest.prod.boltdns.net** for a master manifest located at the following path:
/manifest/v2/hls/v7/aes128/avc1_mp4a/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/10s/master.m3u8?fastly_token=NmEyZGNhOTBfODAzZjY4ZGIxYjE5NWJiM2ViNzk1OGIyYjdmZDYzOTZlM2I2YTllNzE4MzlyYzclZGQwZmM3MjBmMTBi

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ZWExZg%253D%253D (hereafter referred to as the “**Master Manifest**” or “**master.m3u8**”). The Master Manifest returned the contents below.

³#EXTM3U

#EXT-X-VERSION:7

#EXT-X-MEDIA:TYPE=AUDIO,GROUP-ID="audio-0",NAME="en (Main)",DEFAULT=YES,AUTOSELECT=YES,LANGUAGE="en",CHANNELS="2",URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/287c1657-b0f2-4bed-b9dd-0fb1b8d0cf99/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfMjNmYjY0MDRiYjhjMmZkNGEyZTY0MDMyNGJkYTQzMTBmMTAyYTljNDFjZGI5OGFjMjVkOGUxNjk4Y2IzMjdiOA%3D%3D"

#EXT-X-STREAM-INF:PROGRAM-ID=0,**BANDWIDTH=872300**,CODECS="mp4a.40.2,avc1.42001e",RESOLUTION=640x360,AUDIO="audio-0",CLOSED-CAPTIONS=NONE

https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/d519f960-099b-443c-838a-6eedf24b6b1/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfNGI1ZGY2MzE5MzA1ZDUxYWZlNTVlYWRjZjM2MmY2YjczNjJjMjc5MzI3YWZlMjZkM2JiN2RhODM2ZTNhNzFhYg%3D%3D

#EXT-X-I-FRAME-STREAM-INF:PROGRAM-ID=0,BANDWIDTH=872300,CODECS="mp4a.40.2,avc1.42001e",RESOLUTION=640x360,URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/d519f960-099b-443c-838a-6eedf24b6b1/iframe.m3u8?fastly_token=NmEyZGRhMjZfZDMxYjEwMDY1MDQ5OTdmMGIOYWNjYmY4MGFkYzdhNGVjYzBhNjYjZjZkM2JiN2RhODM2ZTNhNzFhYg%3D%3D"

#EXT-X-MEDIA:TYPE=AUDIO,GROUP-ID="audio-1",NAME="en (Main)",DEFAULT=YES,AUTOSELECT=YES,LANGUAGE="en",CHANNELS="2",URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/f29b42ce-293f-4ef2-9298-8de77bdceb77/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfMDc5YTE3MzIzZWU5OTY2ODk0NjYyNzQxN2Y5N2I3YWZlMjZkM2JiN2RhODM2ZTNhNzFhYg%3D%3D"

³ Any highlighting presented throughout this chart is intended to exemplify certain elements of Gaia’s operation and is not intended to limit DISH’s position with respect to how Gaia practices any element of the claims.

- **YELLOW** = variant streams
- **RED** = bitrates of variant streams

Exemplary Infringement Chart for U.S. Patent No. 8,868,772

#EXT-X-STREAM-INF:PROGRAM-

ID=0,BANDWIDTH=563200,CODECS="mp4a.40.2,avc1.420015",RESOLUTION=480x270,AUDIO="audio-1",CLOSED-CAPTIONS=NONE

[https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-](https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfNjk0MGRlOGY5ZWl0NjE5NjAyMzUwYzM4ZTk5MGIxNDk3NmVkYmFkZGY4OTIzZWExMzFhZTU1OWUwZWVjZQ%3D%3D)[996ab8cff02c/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfNjk0MGRlOGY5ZWl0NjE5NjAyMzUwYzM4ZTk5MGIxNDk3NmVkYmFkZGY4OTIzZWExMzFhZTU1OWUwZWVjZQ%3D%3D](https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfNjk0MGRlOGY5ZWl0NjE5NjAyMzUwYzM4ZTk5MGIxNDk3NmVkYmFkZGY4OTIzZWExMzFhZTU1OWUwZWVjZQ%3D%3D)

#EXT-X-I-FRAME-STREAM-INF:PROGRAM-

ID=0,BANDWIDTH=563200,CODECS="mp4a.40.2,avc1.420015",RESOLUTION=480x270,URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/iframe.m3u8?fastly_token=NmEyZGRhMjZfNjk0MzA4ZmYwYWI1M2U4NW MwNDM2MDliOGI0ZGVlMDY2MjhhYzE3NWQ4ODY5YjEwNzQ2NTQ5MDBmN2Q3MD U4OQ%3D%3D"

#EXT-X-MEDIA:TYPE=AUDIO,GROUP-ID="audio-2",NAME="en

(Main)",DEFAULT=YES,AUTOSELECT=YES,LANGUAGE="en",CHANNELS="2",URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/49f40932-1740-41c3-897d-f4c40bb9b5e0/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfMDJhMjZfZWY2ZGM5OG RiNDUwZGFhY2IwNDM0N2M0OGRkMzUzM2Q2MjA5NGNlMDg5MDBiMzQyYzhjMjRjY zlmZg%3D%3D"

#EXT-X-STREAM-INF:PROGRAM-

ID=0,BANDWIDTH=1128600,CODECS="mp4a.40.2,avc1.4d001e",RESOLUTION=640x360,AUDIO="audio-2",CLOSED-CAPTIONS=NONE

[https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-](https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfY2YzZWJlNDM5Y2VhNzY1OGM3ODA1YWE5ZjE5YjQ4Zjk0YmU5OGU0NzVhYmUxZjhjNDgzZTgxMWQxOTEyZm Y2MA%3D%3D)[aea6eb598879/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfY2YzZWJlNDM5Y2VhNzY1OGM3ODA1YWE5ZjE5YjQ4Zjk0YmU5OGU0NzVhYmUxZjhjNDgzZTgxMWQxOTEyZm Y2MA%3D%3D](https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfY2YzZWJlNDM5Y2VhNzY1OGM3ODA1YWE5ZjE5YjQ4Zjk0YmU5OGU0NzVhYmUxZjhjNDgzZTgxMWQxOTEyZm Y2MA%3D%3D)

#EXT-X-I-FRAME-STREAM-INF:PROGRAM-

ID=0,BANDWIDTH=1128600,CODECS="mp4a.40.2,avc1.4d001e",RESOLUTION=640x360,URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/iframe.m3u8?fastly_token=NmEyZGRhMjZfNzg0NGY1Njg5ZDIwZTUxNmVi NTJmM2ZmYWlyY2ZmYWI5ZmRlMGM0Yjk0NDI1OTQzNTg3YjFmMmI3NGE5NGEyNw %3D%3D"

#EXT-X-MEDIA:TYPE=AUDIO,GROUP-ID="audio-3",NAME="en

(Main)",DEFAULT=YES,AUTOSELECT=YES,LANGUAGE="en",CHANNELS="2",URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-

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43f9-90f8-a8d20b6a3b2d/e5579988-5223-4aa2-b00b-0cad5e0cdeb6/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfMDZhOTBjOTY0NDViZjE4YWYwMjc3YzYzMGFhMjQ2MjQwNDYzYTZhNGJkZWU2OGVINWEwNThkNmVjYmE1ZDAwNg%3D%3D"

#EXT-X-STREAM-INF:PROGRAM-

ID=0,BANDWIDTH=1525700,CODECS="mp4a.40.2,avc1.4d001f",RESOLUTION=960x540,AUDIO="audio-3",CLOSED-CAPTIONS=NONE

https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-
aafd-43f9-90f8-a8d20b6a3b2d/e2ebaf05-f22c-492d-8245-
356a09c84824/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfZjMxMTFmMjYyYTI5ODh
kZWJkMTM1MzkyODRkMTQ2OTU0M2FiZWFiYjRlODI0MjRlODQ3ODczMTU5YjYwMT
kyMQ%3D%3D

```
#EXT-X-I-FRAME-STREAM-INF:PROGRAM-
```

ID=0,BANDWIDTH=1525700,CODECS="mp4a.40.2,avc1.4d001f",RESOLUTION=960x540,
URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d
36-aa fd-43f9-90f8-a8d20b6a3b2d/e2ebaf05-f22c-492d-8245-
356a09c84824/iframe.m3u8?fastly_token=NmEyZGRhMjZfMTc3NTIwMDU0N2M0YjU4ZG
U2OWI0ZTZkMDBkZjA5ZDRkN2Q0YjM1NDkzMmE3Y2EyZjZmMmJiNDdkNDBmMGFhZ
A%3D%3D"

```
#EXT-X-STREAM-INF:PROGRAM-
```

ID=0,BANDWIDTH=2076800,CODECS="mp4a.40.2,avc1.4d001f",RESOLUTION=960x540,AUDIO="audio-3",CLOSED-CAPTIONS=NONE

https://manifest.prod.bolddns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/160979c7-2a99-40f0-9667-4c0980356790/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfZDdiNmFhZTBmYjkwNzk1Njg2Y2U2Y2NmNGQ1M2NhODJiYzM3YzczM2EwMjYwNjIwM2NIYjYzMDI1MWJlNDI2ZA%3D%3D

#EXT-X-I-FRAME-STREAM-INF:PROGRAM-

ID=0,BANDWIDTH=2076800,CODECS="mp4a.40.2,avc1.4d001f",RESOLUTION=960x540,
URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d
36-aa fd-43f9-90f8-a8d20b6a3b2d/160979c7-2a99-40f0-9667-
4c0980356790/iframe.m3u8?fastly_token=NmEyZGRhMjZfYzIOTk5ZGVhZmQ3MmVjMGN
mNzVINmExN2QzODZkZTMxYjZkZDRjOWE5NTIwMmVINWJlYWU0NTkxOGEzMzdiOQ
%3D%3D"

```
#EXT-X-STREAM-INF:PROGRAM-
```

ID=0,BANDWIDTH=2406800,CODECS="mp4a.40.2,avc1.4d001f",RESOLUTION=1280x720,AUDIO="audio-3",CLOSED-CAPTIONS=NONE

https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-
aafd-43f9-90f8-a8d20b6a3b2d/d2a5e81c-b340-4a45-b5c4-
ebac17a18abe/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfNjRlN2JhNDI2YzQ3NTlmM

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jZIN2I1YjZjZmNiMmRiNGM2NWVhMmI1MGRhZDRhN2Y5NTQxZTAwYTQyNDgwNTY1Yg%3D%3D

#EXT-X-I-FRAME-STREAM-INF:PROGRAM-ID=0,BANDWIDTH=2406800,CODECS="mp4a.40.2,avc1.4d001f",RESOLUTION=1280x720,URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/d2a5e81c-b340-4a45-b5c4-ebac17a18abe/iframe.m3u8?fastly_token=NmEyZGRhMjZfNmRINTI3MDM0MTVmYjk4Yzg4MDM5NWYzYjI0ZDM1ZTI3OGU1NTg4OTA5MDc5Mjc2YWQyYmRhYjNmODlmYTU5OA%3D%3D"

#EXT-X-STREAM-INF:PROGRAM-ID=0,BANDWIDTH=4052400,CODECS="mp4a.40.2,avc1.640028",RESOLUTION=1920x1080,AUDIO="audio-3",CLOSED-CAPTIONS=NONE

https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/6a2634e2-4237-4e5a-a3ce-fb07a3b2d1a3/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfZjExYTlkODI1ZWY3M2E5YTY3YjRkNWJhZDNmMjRmZTBjNjZmNWRhMDEzMzYzMmQ3YmVmN2NkZjMxNGRiMGYwNw%3D%3D

#EXT-X-I-FRAME-STREAM-INF:PROGRAM-ID=0,BANDWIDTH=4052400,CODECS="mp4a.40.2,avc1.640028",RESOLUTION=1920x1080,URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/6a2634e2-4237-4e5a-a3ce-fb07a3b2d1a3/iframe.m3u8?fastly_token=NmEyZGRhMjZfYzdiYzE4MTMyYzYwM2Y4ZjQxM2EzNjc0NDA4Njc2ZTE2NDhmZjE2YjhiZGNIN2FmODAyODUzNTQ0ZDkzOTViNQ%3D%3D"

File path: **master.m3u8**

The Master Manifest shows at least three bandwidth versions, or variant streams, of the video at the following bandwidths:

- 563200 (referred to herein as the “563200 Bandwidth”) having a resolution of 480x270
- 1128600 (referred to herein as the “1128600 Bandwidth”) having a resolution of 640x360
- 2406800 (referred to herein as the “2406800 Bandwidth”) having a resolution of 1280x720

For each of these bandwidth versions, the Master Manifest provides a link to a playlist for the specified version of the selected video at a particular bandwidth and resolution. Each variant stream or bandwidth version playlist is defined by the token associated with the stream file path. For example:

Exemplary Infringement Chart for U.S. Patent No. 8,868,772

Bandwidth	Token ⁴
563200 Bandwidth	/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/10s/rendition.m3u8?...
1128600 Bandwidth	/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/10s/rendition.m3u8?...
2406800 Bandwidth	/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/d2a5e81c-b340-4a45-b5c4-ebac17a18abe/10s/rendition.m3u8?...

Each of the variant stream playlists includes segments, or streamlets, that encode the same portion of the video at various resolutions. For example, the **563200 Bandwidth** version can be considered a low-quality stream, the **1128600 Bandwidth** version can be considered a medium-quality stream, and the **2406800 Bandwidth** version can be considered a high-quality stream.

A client device accessing the Gaia Site through a web browser uses HTTP GET requests to retrieve the segments, or streamlets, of the encoded video specified in the file above from the one or more servers hosting Gaia content.

The Media Playlist for each of the variant streams identifies a group of streamlets associated with each of the different copies, as the exemplary Media Playlist shown below illustrates. *See* RFC 8216 at 38 (“The server must create a Media Playlist file (Section 4) that contains a URI for each Media Segment that the server wishes to make available, in the order in which they are to be played.”); *see also* RFC 8216 at 4 (“A multimedia presentation is specified by a Uniform Resource Identifier (URI) [RFC3986] to a Playlist.”); RFC 8216 at 4 (“A Media Playlist contains a series of Media Segments that make up the overall presentation. A Media Segment is specified by a URI and optionally a byte range.”).

As shown in the test data, the client device accessing the Gaia Site selects the **1128600 Bandwidth** version of the stream and makes a request for the corresponding playlist pursuant to the instructions received from the Gaia Site. The Gaia Server(s) returns the playlist file with the contents below.

⁵#EXTM3U

#EXT-X-VERSION:7

⁴ URL path abbreviated for readability throughout.

⁵ Any highlighting presented throughout this chart is intended to exemplify certain elements of Gaia’s operation and is not intended to limit DISH’s position with respect to how Gaia practices any element of the claims.

- YELLOW = variant streams
- BLUE = media segment

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#EXT-X-KEY:METHOD=AES-128,URI="https://manifest.prod.boltdns.net/license/v1/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/e957634b-6a80-40e6-b19d-e7217ac25931?fastly_token=NmEyZGRhMjZfNDY2MDg3NmQ3NmFjYmNjYTQ5MGlyMzk2ZjA2MmVmYmJjYThiYzY5OWUyM2JjYTdkMmYzMDVmMWNjY2Q2Zjk1MA%3D%3D",IV=0xdb9d69d96ec08a7de38bbd163f8200e4

#EXT-X-MAP:URI="https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/init.m4f"

#EXT-X-PLAYLIST-TYPE:VOD

#EXT-X-MEDIA-SEQUENCE:0

#EXT-X-TARGETDURATION:10

#EXTINF:10.010,

<https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment0.m4f>

#EXTINF:10.010,

<https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment1.m4f>

#EXTINF:10.010,

<https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment2.m4f>

#EXTINF:10.010,

<https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment3.m4f>

#EXTINF:10.010,

<https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment4.m4f>

Exemplary Infringement Chart for U.S. Patent No. 8,868,772

#EXTINF:10.010,

<https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment5.m4f>

[***]

The variant playlist file is an HLS playlist. Each line in the file path “/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/10s/rendition.m3u8?...” that begins with “#EXTINF” specifies the length of the segments in seconds. The line below the #EXTINF file is the location of the video file. Most of the streamlets, with a few exceptions, are 10.010 seconds long and return sequential segments of the video.

Similarly shown in the test data, when the client device accessing the Gaia Site selects the **563200 Bandwidth** version of the stream, it makes a request for the corresponding playlist. The Gaia Server(s) returns the playlist file for the **563200 Bandwidth** with the contents below.

#EXTM3U

#EXT-X-VERSION:7

#EXT-X-KEY:METHOD=AES-

128,URI="https://manifest.prod.boltdns.net/license/v1/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/e957634b-6a80-40e6-b19d-e7217ac25931?fastly_token=NmEyZGRhNDhfZDZlOWNmYjMxOWQ3MGM0YzUzODU2O
DJmOThjMjQ3MjA0ZWZyZDhlODhMTdkOTBhZTc3NjAzM2ZmYmUzZGNmNA%3D%3D",IV=0xdb9d69d96ec08a7de38bbd163f8200e4

#EXT-X-

MAP:URI="https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/init.m4f"

#EXT-X-PLAYLIST-TYPE:VOD

#EXT-X-MEDIA-SEQUENCE:0

#EXT-X-TARGETDURATION:10

#EXTINF:10.010,

<https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment0.m4f>

#EXTINF:10.010,

Exemplary Infringement Chart for U.S. Patent No. 8,868,772

<https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment1.m4f>

#EXTINF:10.010,

<https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment2.m4f>

#EXTINF:10.010,

<https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment3.m4f>

#EXTINF:10.010,

<https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment4.m4f>

#EXTINF:10.010,

<https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment5.m4f>

[***]

As with the variant playlist file for the **1128600 Bandwidth** version, the variant playlist file for the **563200 Bandwidth** version is an HLS playlist. Each line in the file path “/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/10s/rendition.m3u8?...” that begins with “#EXTINF” specifies the length of the segments in seconds. The line below the #EXTINF file is the location of the video file. Most of the streamlets, with few exceptions, are 10.010 seconds long and return sequential segments of the video. Discussed further below, the number of streamlets in each variant playlist for the test video is the same. Similarly, the segments of each streamlet (identified by “segment[#].m4f”) are the same duration across variant playlists. For example, the streamlet beginning “segment2.m4f” in the **1128600 Bandwidth** variant playlist and the streamlet beginning “segment2.m4f” in the **563200 Bandwidth** variant playlist each has a duration of 10.010 seconds and is equally distant in time from the first streamlet.

Thus, the limitations for this claim element are met. Gaia provides a method for presenting rate-adaptive streams including streaming by a media player operating on an end user station a video from a set of one or more servers.

Exemplary Infringement Chart for U.S. Patent No. 8,868,772

To the extent Gaia contends that the Accused Services do not literally satisfy this limitation, Gaia infringes under the doctrine of equivalents because the Accused Services perform substantially the same function, in substantially the same way, to achieve the same result.

1[b] wherein each of a plurality of different copies of the video encoded at different bitrates is stored as multiple files on the set of servers,

As shown above in elements 1[pre]-[a], which are incorporated fully herein, the limitations of this claim are met. *See* §§ A.1[pre]-[a].

The one or more servers, whose content is accessible by the client device through a web page on the Gaia Site, store streamlets corresponding to particular segments of a video, and each streamlet is encoded at one of numerous resolutions.

The numerous variant streams of the video displayed by the media player embedded in the web page of the Gaia Site include a low quality stream, a medium quality stream, and a high quality stream.

For example, in the instant test of a video titled “The 900-Year Secret of the Knights Templar - Part 1,” the client device made an HTTP GET request to **manifest.prod.boltdns.net** for the **Master Manifest**. The Master Manifest returned the contents below.

```

6#EXTM3U

#EXT-X-VERSION:7

#EXT-X-MEDIA:TYPE=AUDIO,GROUP-ID="audio-0",NAME="en
(Main)",DEFAULT=YES,AUTOSELECT=YES,LANGUAGE="en",CHANNELS="2",URI="ht
tps://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-
43f9-90f8-a8d20b6a3b2d/287c1657-b0f2-4bed-b9dd-
0fb1b8d0cf99/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfMjNmYjY0MDRiYjhjMmZk
NGEyZTY0MDMyNGJkYTQzMTBmMTAyYTljNDZjZGI5OGFjMjVhOGUxNjk4Y2IzMjdiO
A%3D%3D"

#EXT-X-STREAM-INF:PROGRAM-
ID=0,BANDWIDTH=872300,CODECS="mp4a.40.2,avc1.42001e",RESOLUTION=640x360,A
UDIO="audio-0",CLOSED-CAPTIONS=NONE

https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-
aafd-43f9-90f8-a8d20b6a3b2d/d519f960-099b-443c-838a-
6eedf24b6b1/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfNGI1ZGY2MzE5MzA1ZDU

```

⁶ Any highlighting presented throughout this chart is intended to exemplify certain elements of Gaia’s operation and is not intended to limit DISH’s position with respect to how Gaia practices any element of the claims.

- YELLOW = variant streams
- RED = bitrates of variant streams

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xYWZINTVIYWRjZjM2MmY2YjczNjJjMjc5MzI3YWlzMjZkM2JiN2RhODM2ZTNhNzFhYg%3D%3D

#EXT-X-I-FRAME-STREAM-INF:PROGRAM-ID=0,BANDWIDTH=872300,CODECS="mp4a.40.2,avc1.42001e",RESOLUTION=640x360,URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/d519f960-099b-443c-838a-6eedf24b6b1/iframe.m3u8?fastly_token=NmEyZGRhMjZfZDMxYjEwMDY1MDQ5OTdmMGI0YWNjYmY4MGFkYzdhNGVjYzBhNjkxMTRjZDNkOWYwZmJjNGNhN2RiMjgxZmVmZg%3D%3D"

#EXT-X-MEDIA:TYPE=AUDIO,GROUP-ID="audio-1",NAME="en (Main)",DEFAULT=YES,AUTOSELECT=YES,LANGUAGE="en",CHANNELS="2",URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/f29b42ce-293f-4ef2-9298-8de77bdceb77/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfMDc5YTE3MzIzZWU5OTY2ODk0NjYyNzQxN2Y5N2I3YWZhYmRkODVjYjEzNTNiOWJhYzhkMzQ2NDQwYTc1ZDIwZA%3D%3D"

#EXT-X-STREAM-INF:PROGRAM-ID=0,BANDWIDTH=563200,CODECS="mp4a.40.2,avc1.420015",RESOLUTION=480x270,AUDIO="audio-1",CLOSED-CAPTIONS=NONE

https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfNjk0MGRIOGY5ZWl0NjE5NjAyMzUwYzZkMzI3YWZhYmRkODVjYjEzNTNiOWJhYzhkMzQ2NDQwYTc1ZDIwZA%3D%3D

#EXT-X-I-FRAME-STREAM-INF:PROGRAM-ID=0,BANDWIDTH=563200,CODECS="mp4a.40.2,avc1.420015",RESOLUTION=480x270,URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/iframe.m3u8?fastly_token=NmEyZGRhMjZfNjk0MzA4ZmYwYWI1M2U4NWUwNDM2MDliOGI0ZGVhMDY2MjhhYzE3NWQ4ODY5YjEwNzQ2NTQ5MDBmN2Q3MDU4OQ%3D%3D"

#EXT-X-MEDIA:TYPE=AUDIO,GROUP-ID="audio-2",NAME="en (Main)",DEFAULT=YES,AUTOSELECT=YES,LANGUAGE="en",CHANNELS="2",URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/49f40932-1740-41c3-897d-f4c40bb9b5e0/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfMDBiZmZlZWY2ZGM5OGRI0YWNjYmY4MGFkYzdhNGVjYzBhNjkxMTRjZDNkOWYwZmJjNGNhN2RiMjgxZmVmZg%3D%3D"

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#EXT-X-STREAM-INF:PROGRAM-

ID=0,BANDWIDTH=1128600,CODECS="mp4a.40.2,avc1.4d001e",RESOLUTION=640x360,AUDIO="audio-2",CLOSED-CAPTIONS=NONE

https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfY2YzZWJNDM5Y2VhNzY1OGM3ODA1YWE5ZjE5YjQ4Zjk0YmU5OGU0NzVhYmUxZjhjNDgzZTgxMWQxOTExZmY2MA%3D%3D

#EXT-X-I-FRAME-STREAM-INF:PROGRAM-

ID=0,BANDWIDTH=1128600,CODECS="mp4a.40.2,avc1.4d001e",RESOLUTION=640x360,URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/iframe.m3u8?fastly_token=NmEyZGRhMjZfNzg0NGY1Njg5ZDIwZTUxNmViNTJmM2ZmYWlyY2ZmYWI5ZmRlMGM0Yjk0NDI1OTQzNTg3YjFmMmI3NGE5NGE5Nw%3D%3D"

#EXT-X-MEDIA:TYPE=AUDIO,GROUP-ID="audio-3",NAME="en

(Main)",DEFAULT=YES,AUTOSELECT=YES,LANGUAGE="en",CHANNELS="2",URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/e5579988-5223-4aa2-b00b-0cad5e0cdeb6/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfMDZhOTBjOTY0NDViZjE4YWYwMjc3YzYzMGFhMjQ2MjQwNDYzYTZhNGJkZWU2OGVINWEwNThkNmVjYmE1ZDAwNg%3D%3D"

#EXT-X-STREAM-INF:PROGRAM-

ID=0,BANDWIDTH=1525700,CODECS="mp4a.40.2,avc1.4d001f",RESOLUTION=960x540,AUDIO="audio-3",CLOSED-CAPTIONS=NONE

https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/e2ebaf05-f22c-492d-8245-356a09c84824/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfZjMxMTFmMjYyYTI5ODhkZWJkMTM1MzkyODRkMTQ2OTU0M2F1ZWFiYjRlODI0MjRlODQ3ODczMTU5YjYwMTkyMQ%3D%3D

#EXT-X-I-FRAME-STREAM-INF:PROGRAM-

ID=0,BANDWIDTH=1525700,CODECS="mp4a.40.2,avc1.4d001f",RESOLUTION=960x540,URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/e2ebaf05-f22c-492d-8245-356a09c84824/iframe.m3u8?fastly_token=NmEyZGRhMjZfMTc3NTIwMDU0N2M0YjU4ZGU2OWI0ZTZkMDBkZjA5ZDRkN2Q0YjM1NDkzMmE3Y2EyZjZmMmJiNDdkNDBmMGFhZA%3D%3D"

#EXT-X-STREAM-INF:PROGRAM-

ID=0,BANDWIDTH=2076800,CODECS="mp4a.40.2,avc1.4d001f",RESOLUTION=960x540,AUDIO="audio-3",CLOSED-CAPTIONS=NONE

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https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/160979c7-2a99-40f0-9667-4c0980356790/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfZDdiNmFhZTBmYjkwNzk1Njg2Y2U2Y2NmNGQ1M2NhODJiYzYzM3YzYzM2EwMjYwNjIwM2NlYjYzMDI1MWJINDI2ZA%3D%3D

#EXT-X-I-FRAME-STREAM-INF:PROGRAM-ID=0,BANDWIDTH=2076800,CODECS="mp4a.40.2,avc1.4d001f",RESOLUTION=960x540,URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/160979c7-2a99-40f0-9667-4c0980356790/iframe.m3u8?fastly_token=NmEyZGRhMjZfYzI2OTk5ZGVhZmQ3MmVjMGNmNzVINmExN2QzODZkZTMxYjZkZDRjOWE5NTIwMmVINWJlYjYwU0NTkxOGEzMzdiOQ%3D%3D"

#EXT-X-STREAM-INF:PROGRAM-ID=0,BANDWIDTH=2406800,CODECS="mp4a.40.2,avc1.4d001f",RESOLUTION=1280x720,AUDIO="audio-3",CLOSED-CAPTIONS=NONE

https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/d2a5e81c-b340-4a45-b5c4-ebac17a18abe/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfNjRlN2JhNDI2YzQ3NTlmMjZlN2I1YjZjZmNiMmRiNGM2NWVhMmI1MGRhZDRhN2Y5NTQxZTAwYTQyNDgwNTY1Yg%3D%3D

#EXT-X-I-FRAME-STREAM-INF:PROGRAM-ID=0,BANDWIDTH=2406800,CODECS="mp4a.40.2,avc1.4d001f",RESOLUTION=1280x720,URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/d2a5e81c-b340-4a45-b5c4-ebac17a18abe/iframe.m3u8?fastly_token=NmEyZGRhMjZfNmRINTI3MDM0MTVmYjk4Yzg4MDM5NWYzYjI0ZDM1ZTI3OGU1NTg4OTA5MDc5Mjc2YWQyYmRhYjNmODlmYTU5OA%3D%3D"

#EXT-X-STREAM-INF:PROGRAM-ID=0,BANDWIDTH=4052400,CODECS="mp4a.40.2,avc1.640028",RESOLUTION=1920x1080,AUDIO="audio-3",CLOSED-CAPTIONS=NONE

https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/6a2634e2-4237-4e5a-a3ce-fb07a3b2d1a3/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfZjExYTlkODI1ZWY3M2E5YTY3YjRkNWJhZDNmMjRmZTBjNjZmNWRhMDEzMzYzMmQ3YmVmN2NkZjMxNGRiMGYwNw%3D%3D

#EXT-X-I-FRAME-STREAM-INF:PROGRAM-ID=0,BANDWIDTH=4052400,CODECS="mp4a.40.2,avc1.640028",RESOLUTION=1920x1080,URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/6a2634e2-4237-4e5a-a3ce-fb07a3b2d1a3/iframe.m3u8?fastly_token=NmEyZGRhMjZfYzdiYzE4MTMyYzYwM2Y4ZjQx"

Exemplary Infringement Chart for U.S. Patent No. 8,868,772

M2EzNjc0NDA4Njc2ZTE2NDhmZjE2YjhiZGNIN2FmODAyODUzNTQ0ZDkzOTViNQ%3D%3D"

File path: **master.m3u8**

The Master Manifest shows at least three bandwidth versions, or variant streams, of the video at the following bandwidths:

- 563200 (referred to herein as the “563200 Bandwidth”) having a resolution of 480x270
- 1128600 (referred to herein as the “1128600 Bandwidth”) having a resolution of 640x360
- 2406800 (referred to herein as the “2406800 Bandwidth”) having a resolution of 1280x720

For each of these bandwidth versions, the Master Manifest provides a link to a playlist for the specified version of the selected video at a particular bandwidth and resolution. Each variant stream or bandwidth version playlist is defined by the token associated with the stream file path. For example:

Bandwidth	Token ⁷
563200 Bandwidth	/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/10s/rendition.m3u8?...
1128600 Bandwidth	/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/10s/rendition.m3u8?...
2406800 Bandwidth	/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/d2a5e81c-b340-4a45-b5c4-ebac17a18abe/10s/rendition.m3u8?...

Each of the variant stream playlists includes segments, or streamlets, that encode the same portion of the video at various resolutions. For example, the **563200 Bandwidth** version can be considered a low-quality stream, the **1128600 Bandwidth** version can be considered a medium-quality stream, and the **2406800 Bandwidth** version can be considered a high-quality stream.

A client device accessing the Gaia Site through a web browser uses HTTP GET requests to retrieve the segments, or streamlets, of the encoded video specified in the file above from the one or more servers hosting Gaia content.

The Media Playlist for each of the variant streams identifies a group of streamlets associated with each of the different copies, as the exemplary Media Playlist shown below

⁷ URL path abbreviated for readability throughout.

Exemplary Infringement Chart for U.S. Patent No. 8,868,772

illustrates. *See* RFC 8216 at 38 (“The server must create a Media Playlist file (Section 4) that contains a URI for each Media Segment that the server wishes to make available, in the order in which they are to be played.”); *see also* RFC 8216 at 4 (“A multimedia presentation is specified by a Uniform Resource Identifier (URI) [RFC3986] to a Playlist.”); RFC 8216 at 4 (“A Media Playlist contains a series of Media Segments that make up the overall presentation. A Media Segment is specified by a URI and optionally a byte range.”).

As shown in the test data, the client device accessing the Gaia Site selects the **1128600 Bandwidth** version of the stream and makes a request for the corresponding playlist pursuant to the instructions received from the Gaia Site. The Gaia Server(s) returns the playlist file with the contents below.

```

8#EXTM3U

#EXT-X-VERSION:7

#EXT-X-KEY:METHOD=AES-
128,URI="https://manifest.prod.boltdns.net/license/v1/aes128/1324209225001/19c86d36-aafd-
43f9-90f8-a8d20b6a3b2d/e957634b-6a80-40e6-b19d-
e7217ac25931?fastly_token=NmEyZGRhMjZfNDY2MDg3NmQ3NmFjYmNjYTQ5MGlyMzk
2ZjA2MmVmYmJjYThiYzY5OWUyM2JjYTdkMmYzMDVmMWNjY2Q2Zjk1MA%3D%3D"
,Iv=0xdb9d69d96ec08a7de38bbd163f8200e4

#EXT-X-
MAP:URI="https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-
aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-
b19d-e7217ac25931/init.m4f"

#EXT-X-PLAYLIST-TYPE:VOD

#EXT-X-MEDIA-SEQUENCE:0

#EXT-X-TARGETDURATION:10

#EXTINF:10.010,

https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-
90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-
e7217ac25931/5x/segment0.m4f

#EXTINF:10.010,

```

⁸ Any highlighting presented throughout this chart is intended to exemplify certain elements of Gaia’s operation and is not intended to limit DISH’s position with respect to how Gaia practices any element of the claims.

- YELLOW = variant streams
- BLUE = media segment

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<https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment1.m4f>

#EXTINF:10.010,

<https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment2.m4f>

#EXTINF:10.010,

<https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment3.m4f>

#EXTINF:10.010,

<https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment4.m4f>

#EXTINF:10.010,

<https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment5.m4f>

[***]

The variant playlist file is an HLS playlist. Each line in the file path “/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/10s/rendition.m3u8?...” that begins with “#EXTINF” specifies the length of the segments in seconds. The line below the #EXTINF file is the location of the video file. Most of the streamlets, with a few exceptions, are 10.010 seconds long and return sequential segments of the video.

Similarly shown in the test data, when the client device accessing the Gaia Site selects the **563200 Bandwidth** version of the stream, it makes a request for the corresponding playlist. The Gaia Server(s) returns the playlist file for the **563200 Bandwidth** with the contents below.

#EXTM3U

#EXT-X-VERSION:7

#EXT-X-KEY:METHOD=AES-

128,URI="https://manifest.prod.boltdns.net/license/v1/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/e957634b-6a80-40e6-b19d-

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e7217ac25931?fastly_token=NmEyZGRhNDhfZDZlOWNmYjMxOWQ3MGM0YzUzODU2O
DJmOThjMjQ3MjA0ZWZyZDhlODA3MTdkOTBhZTc3NjAzM2ZmYmUzZGNmNA%3D%3
D",IV=0xdb9d69d96ec08a7de38bbd163f8200e4

#EXT-X-

MAP:URI="https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-
aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-
b19d-e7217ac25931/init.m4f"

#EXT-X-PLAYLIST-TYPE:VOD

#EXT-X-MEDIA-SEQUENCE:0

#EXT-X-TARGETDURATION:10

#EXTINF:10.010,

https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-
90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-
e7217ac25931/5x/segment0.m4f

#EXTINF:10.010,

https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-
90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-
e7217ac25931/5x/segment1.m4f

#EXTINF:10.010,

https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-
90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-
e7217ac25931/5x/segment2.m4f

#EXTINF:10.010,

https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-
90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-
e7217ac25931/5x/segment3.m4f

#EXTINF:10.010,

https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-
90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-
e7217ac25931/5x/segment4.m4f

#EXTINF:10.010,

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<https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment5.m4f>

[***]

As with the variant playlist file for the **1128600 Bandwidth** version, the variant playlist file for the **563200 Bandwidth** version is an HLS playlist. Each line in the file path “/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/10s/rendition.m3u8?...” that begins with “#EXTINF” specifies the length of the segments in seconds. The line below the #EXTINF file is the location of the video file. Most of the streamlets, with few exceptions, are 10.010 seconds long and return sequential segments of the video. Discussed further below, the number of streamlets in each variant playlist for the test video is the same. Similarly, the segments of each streamlet (identified by “segment[#].m4f”) are the same duration across variant playlists. For example, the streamlet beginning “segment2.m4f” in the **1128600 Bandwidth** variant playlist and the streamlet beginning “segment2.m4f” in the **563200 Bandwidth** variant playlist each has a duration of 10.010 seconds and is equally distant in time from the first streamlet.

Thus, the limitations for this claim element are met. Gaia videos are stored on one or more servers associated with Gaia as multiple different copies, each of which comprises individually-requestable segments encoded at one of multiple bitrates.

To the extent Gaia contends that the Accused Services do not literally satisfy this limitation, Gaia infringes under the doctrine of equivalents because the Accused Services perform substantially the same function, in substantially the same way, to achieve the same result.

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

As shown above in elements 1[pre]-[b], which are incorporated fully herein, the limitations of this claim are met. *See* §§ A.1[pre]-[b].

As mentioned above, Gaia videos are encoded at a plurality of different bitrates to create a plurality of streams including at least low, medium, and high quality streams. Each of the low, medium, and high quality streams has a streamlet that encodes the same portion of the video at a different one of the plurality of different bitrates. The streamlets comprising the low-, medium-, and high-quality streams are stored in variant playlists, each comprising a group of streamlets at a respective bitrate.

In the instant test of a video titled “The 900-Year Secret of the Knights Templar - Part 1,” a personal computer accessing the Gaia Site through a web browser made an HTTP GET request to **manifest.prod.boltdns.net** for the **Master Manifest**, which returned the contents below.

Exemplary Infringement Chart for U.S. Patent No. 8,868,772

⁹#EXTM3U

#EXT-X-VERSION:7

#EXT-X-MEDIA:TYPE=AUDIO,GROUP-ID="audio-0",NAME="en (Main)",DEFAULT=YES,AUTOSELECT=YES,LANGUAGE="en",CHANNELS="2",URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/287c1657-b0f2-4bed-b9dd-0fb1b8d0cf99/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfMjNmYjY0MDRiYjhjMmZkNGEyZTY0MDMyNGJkYTQzMTBmMTAyYtIjNDFjZGI5OGFjMjVkbGUxNjk4Y2IzMjdiOA%3D%3D"

#EXT-X-STREAM-INF:PROGRAM-

ID=0,BANDWIDTH=872300,CODECS="mp4a.40.2,avc1.42001e",RESOLUTION=640x360,AUDIO="audio-0",CLOSED-CAPTIONS=NONE

https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/d519f960-099b-443c-838a-6eedf24b6b1/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfNGI1ZGY2MzE5MzA1ZDUxYWZlNTVlYWRjZjM2MmY2YjczNjJjMjc5MzI3YWZlMjZkM2JiN2RhODM2ZTNhNzFhYg%3D%3D

#EXT-X-I-FRAME-STREAM-INF:PROGRAM-

ID=0,BANDWIDTH=872300,CODECS="mp4a.40.2,avc1.42001e",RESOLUTION=640x360,URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/d519f960-099b-443c-838a-6eedf24b6b1/iframe.m3u8?fastly_token=NmEyZGRhMjZfZDMxYjEwMDY1MDQ5OTdmMGI0YWVjYmY4MGFkYzdhNGVjYzBhNjJkxMTRjZDNkOWYwZmJjNGNhN2RiMjgxmVg%3D%3D"

#EXT-X-MEDIA:TYPE=AUDIO,GROUP-ID="audio-1",NAME="en

(Main)",DEFAULT=YES,AUTOSELECT=YES,LANGUAGE="en",CHANNELS="2",URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/f29b42ce-293f-4ef2-9298-8de77bdceb77/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfMDc5YTE3MzIzZWU5OTY2ODk0NjYyNzQxN2Y5N2I3YWZlYmRkODVjYjEzNTNiOWJhYzhkMzQ2NDQwYTc1ZDIwZA%3D%3D"

⁹ Any highlighting presented throughout this chart is intended to exemplify certain elements of Gaia's operation and is not intended to limit DISH's position with respect to how Gaia practices any element of the claims.

- YELLOW = variant streams
- RED = bitrates of variant streams

Exemplary Infringement Chart for U.S. Patent No. 8,868,772

#EXT-X-STREAM-INF:PROGRAM-

ID=0,BANDWIDTH=563200,CODECS="mp4a.40.2,avc1.420015",RESOLUTION=480x270,AUDIO="audio-1",CLOSED-CAPTIONS=NONE

https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfNjk0MGRlOGY5ZWl0NjE5NjAyMzUwYzM4ZTk5MGIxNDk3NmVkYmFkZGY4OTIzZWExMzFhZTU1OWUwZWVjZQ%3D%3D

#EXT-X-I-FRAME-STREAM-INF:PROGRAM-

ID=0,BANDWIDTH=563200,CODECS="mp4a.40.2,avc1.420015",RESOLUTION=480x270,URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/iframe.m3u8?fastly_token=NmEyZGRhMjZfNjg0MzA4ZmYwYWI1M2U4NWUwNDM2MDliOGI0ZGVhMDY2MjhhYzE3NWQ4ODY5YjEwNzQ2NTQ5MDBmN2Q3MDU4OQ%3D%3D"

#EXT-X-MEDIA:TYPE=AUDIO,GROUP-ID="audio-2",NAME="en

(Main)",DEFAULT=YES,AUTOSELECT=YES,LANGUAGE="en",CHANNELS="2",URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/49f40932-1740-41c3-897d-f4c40bb9b5e0/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfMDJhMjZfZWY2ZGM5OGRI0NDUwZGFhY2IwNDM0N2M0OGRkMzUzM2Q2MjA5NGNlMDg5MDBiMzQyYzhjMjRjYzlmZg%3D%3D"

#EXT-X-STREAM-INF:PROGRAM-

ID=0,BANDWIDTH=1128600,CODECS="mp4a.40.2,avc1.4d001e",RESOLUTION=640x360,AUDIO="audio-2",CLOSED-CAPTIONS=NONE

https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfY2YzZWJlNDM5Y2VhNzY1OGM3ODA1YWE5ZjE5YjQ4Zjk0YmU5OGU0NzVhYmUxZjhjNDgzZTgxMWQxOTEyZmY2MA%3D%3D

#EXT-X-I-FRAME-STREAM-INF:PROGRAM-

ID=0,BANDWIDTH=1128600,CODECS="mp4a.40.2,avc1.4d001e",RESOLUTION=640x360,URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/iframe.m3u8?fastly_token=NmEyZGRhMjZfNzg0NGY1Njg5ZDIwZTUxNmViNTJmM2ZmYWlyY2ZmYWI5ZmRlMGM0Yjk0NDI1OTQzNTg3YjFmMmI3NGE5NGEyNw%3D%3D"

#EXT-X-MEDIA:TYPE=AUDIO,GROUP-ID="audio-3",NAME="en

(Main)",DEFAULT=YES,AUTOSELECT=YES,LANGUAGE="en",CHANNELS="2",URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-

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43f9-90f8-a8d20b6a3b2d/e5579988-5223-4aa2-b00b-0cad5e0cdeb6/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfMDZhOTBjOTY0NDViZjE4YWYwMjc3YzYzMGFhMjQ2MjQwNDYzYTZhNGJkZWU2OGVINWEwNThkNmVjYmE1ZDAwNg%3D%3D"

#EXT-X-STREAM-INF:PROGRAM-

ID=0,BANDWIDTH=1525700,CODECS="mp4a.40.2,avc1.4d001f",RESOLUTION=960x540,AUDIO="audio-3",CLOSED-CAPTIONS=NONE

https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/e2ebaf05-f22c-492d-8245-356a09c84824/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfZjMxMTFmMjYyYTI5ODhkZWJkMTM1MzkyODRkMTQ2OTU0M2FIZWFjYjRlODI0MjRlODQ3ODczMTU5YjYwMTkyMQ%3D%3D

#EXT-X-I-FRAME-STREAM-INF:PROGRAM-

ID=0,BANDWIDTH=1525700,CODECS="mp4a.40.2,avc1.4d001f",RESOLUTION=960x540,URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/e2ebaf05-f22c-492d-8245-356a09c84824/iframe.m3u8?fastly_token=NmEyZGRhMjZfMTc3NTIwMDU0N2M0YjU4ZGU2OWI0ZTZkMDBkZjA5ZDRkN2Q0YjM1NDkzMmE3Y2EyZjZmMmJiNDdkNDBmMGFhZA%3D%3D"

#EXT-X-STREAM-INF:PROGRAM-

ID=0,BANDWIDTH=2076800,CODECS="mp4a.40.2,avc1.4d001f",RESOLUTION=960x540,AUDIO="audio-3",CLOSED-CAPTIONS=NONE

https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/160979c7-2a99-40f0-9667-4c0980356790/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfZDdiNmFhZTBmYjkwNzk1Njg2Y2U2Y2NmNGQ1M2NhODJiYzYzM3YzczM2EwMjYwNjIwM2NIYjYzMDI1MWJINDI2ZA%3D%3D

#EXT-X-I-FRAME-STREAM-INF:PROGRAM-

ID=0,BANDWIDTH=2076800,CODECS="mp4a.40.2,avc1.4d001f",RESOLUTION=960x540,URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/160979c7-2a99-40f0-9667-4c0980356790/iframe.m3u8?fastly_token=NmEyZGRhMjZfYzI2OTk5ZGVhZmQ3MmVjMGNmNzVINmExN2QzODZkZTMxYjZkZDRjOWE5NTIwMmVINWJlYWU0NTkxOGEzMzdiOQ%3D%3D"

#EXT-X-STREAM-INF:PROGRAM-

ID=0,BANDWIDTH=2406800,CODECS="mp4a.40.2,avc1.4d001f",RESOLUTION=1280x720,AUDIO="audio-3",CLOSED-CAPTIONS=NONE

https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/d2a5e81c-b340-4a45-b5c4-ebac17a18abe/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfNjRIN2JhNDI2YzQ3NTlmM

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jZIN2I1YjZjZmNiMmRiNGM2NWVhMmI1MGRhZDRhN2Y5NTQxZTAwYTQyNDgwNTY1Yg%3D%3D

#EXT-X-I-FRAME-STREAM-INF:PROGRAM-

ID=0,BANDWIDTH=2406800,CODECS="mp4a.40.2,avc1.4d001f",RESOLUTION=1280x720,URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/d2a5e81c-b340-4a45-b5c4-ebac17a18abe/iframe.m3u8?fastly_token=NmEyZGRhMjZfNmRINTI3MDM0MTVmYjk4Yzg4MDM5NWYzYjI0ZDM1ZTI3OGU1NTg4OTA5MDc5Mjc2YWQyYmRhYjNmODlmYTU5OA%3D%3D"

#EXT-X-STREAM-INF:PROGRAM-

ID=0,BANDWIDTH=4052400,CODECS="mp4a.40.2,avc1.640028",RESOLUTION=1920x1080,AUDIO="audio-3",CLOSED-CAPTIONS=NONE

https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/6a2634e2-4237-4e5a-a3ce-fb07a3b2d1a3/10s/rendition.m3u8?fastly_token=NmEyZGRhMjZfZjExYTlkODI1ZWY3M2E5YTY3YjRkNWJhZDNmMjRmZTBjNjZmNWRhMDEzMzYzMmQ3YmVmN2NkZjMxNGRiMGYwNw%3D%3D

#EXT-X-I-FRAME-STREAM-INF:PROGRAM-

ID=0,BANDWIDTH=4052400,CODECS="mp4a.40.2,avc1.640028",RESOLUTION=1920x1080,URI="https://manifest.prod.boltdns.net/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/6a2634e2-4237-4e5a-a3ce-fb07a3b2d1a3/iframe.m3u8?fastly_token=NmEyZGRhMjZfYzdiYZE4MTMyYzYwM2Y4ZjQxM2EzNjc0NDA4Njc2ZTE2NDhmZjE2YjhiZGNIN2FmODAyODUzNTQ0ZDkzOTViNQ%3D%3D"

File path: **master.m3u8**

For each of these bandwidth versions, the Master Manifest provides a link to a playlist for the specified version of the selected video at a particular bandwidth and resolution. Each variant stream or bandwidth version playlist is defined by the token associated with the stream file path. For example:

Bandwidth	Token ¹⁰
563200 Bandwidth	/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/10s/rendition.m3u8?...
1128600 Bandwidth	/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/10s/rendition.m3u8?...

¹⁰ URL path abbreviated for readability throughout.

Exemplary Infringement Chart for U.S. Patent No. 8,868,772

2406800 Bandwidth	/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/d2a5e81c-b340-4a45-b5c4-ebac17a18abe/10s/rendition.m3u8?...
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As shown for example below, each of the **1128600 Bandwidth** and **563200 Bandwidth** version playlists contains segments, or streamlets, that encode different segments of the video. The streamlet files within each version playlist are arranged in ascending chronological order, beginning with the first segment of the video and progressing until the final segment of the video.

¹¹ Bandwidth	Streamlet
1128600 Bandwidth	#EXTM3U #EXT-X-VERSION:7 #EXT-X-KEY:METHOD=AES-128,URI="https://manifest.prod.boltdns.net/license/v1/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/e957634b-6a80-40e6-b19d-e7217ac25931?fastly_token=NmEyZGRhMjZfNDY2MDg3NmQ3NmFjYmNjYTQ5MGlyMzk2ZjA2MmVmYmJjYThiYzY5OWUyM2JjYTdkMmYzMDVmMWNjY2Q2Zjk1MA%3D%3D",IV=0xdb9d69d96ec08a7de38bbd163f8200e4 #EXT-X-MAP:URI="https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/init.m4f" #EXT-X-PLAYLIST-TYPE:VOD #EXT-X-MEDIA-SEQUENCE:0 #EXT-X-TARGETDURATION:10 #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-

¹¹ Any highlighting presented throughout this chart is intended to exemplify certain elements of Gaia's operation and is not intended to limit DISH's position with respect to how Gaia practices any element of the claims.

- BLUE = media segment
- YELLOW = variant stream

Exemplary Infringement Chart for U.S. Patent No. 8,868,772

	aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment0.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment1.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment2.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment3.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment4.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment5.m4f ***]
563200 Bandwidth	#EXTM3U #EXT-X-VERSION:7 #EXT-X-KEY:METHOD=AES-128,URI="https://manifest.prod.boltdns.net/license/v1/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/e957634b-6a80-40e6-b19d-

Exemplary Infringement Chart for U.S. Patent No. 8,868,772

	https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment4.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment5.m4f ***]
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On information and belief, playlists for the other resolution variants also include these segments, or streamlets, arranged in ascending chronological order and corresponding to the same portion of the video provided on-demand from Gaia’s server(s).

The low-quality stream, medium-quality stream, and high-quality stream each comprise a group of streamlets encoded at a respective one of the different bitrates. As set forth above, each of the variant streams “describes a different version of the same content.” RFC 8216 at 5. Thus, the variant streams are “encodings of the same presentation” at different bitrates. RFC 8216 at 42. Indeed, to allow “clients to switch between” variant streams seamlessly, HLS requires that “[e]ach variant stream MUST present the same content” on playback. RFC 8216 at 43. And, HLS provides that “[m]atching content in variant streams MUST have matching timestamps” to allow the media player embedded in the web page of the Gaia Site to synchronize the media. *Id.* Further, “[e]ach Media Segment in a Media Playlist has an integer Discontinuity Sequence Number. The Discontinuity Sequence Number can be used in addition to the timestamps within the media to synchronize Media Segments across different Renditions.” RFC 8216 at 39. Thus, “[m]atching content in variant streams MUST have matching Discontinuity Sequence Numbers.” RFC 8216 at 43.

Gaia’s video server stores the video wherein “each of the low quality stream, the medium quality stream, and the high quality stream comprising a group of streamlets.” The HLS protocol indicates that “[a] Media Playlist contains a list of Media Segments, which, when played sequentially, will play the multimedia presentation.” RFC 8216 at 4; *see also* RFC 8216 at 5 (“To play this Playlist, the client first downloads it and then downloads and plays each Media Segment declared within it. The client reloads the Playlist as described in this document to discover any added segments.”); RFC 8216 at 4 (“A Media Playlist contains a series of Media Segments that make up the overall presentation.”).

Each of the Media Segments in HLS yields a different portion of the video on playback. For example, HLS provides that “[e]ach segment in a Media Playlist has a unique integer Media Sequence Number. The Media Sequence Number of the first segment in the Media Playlist is either 0 or declared in the Playlist (Section 4.3.3.2). The Media Sequence Number of every other segment

Exemplary Infringement Chart for U.S. Patent No. 8,868,772

is equal to the Media Sequence Number of the segment that precedes it plus one.” RFC 8216 at 6. As such, “[e]ach Media Segment MUST carry the continuation of the encoded bitstream from the end of the segment with the previous Media Sequence Number, where values in a series such as timestamps and Continuity Counters MUST continue uninterrupted.” RFC 8216 at 6. Thus, each of the streamlets in a set must yield a different portion of the video on playback.

The streamlets across the different copies yield the same portions of the video on playback. As set forth above, each of the variant streams “describes a different version of the same content.” RFC 8216 at 5. Thus, the variant streams are “encodings of the same presentation” at different bitrates. RFC 8216 at 42. Indeed, to allow “clients to switch between” variant streams seamlessly, HLS requires that “[e]ach variant stream MUST present the same content” on playback. RFC 8216 at 43.

Thus, the limitations for this claim element are met. Gaia provides a method for presenting rate-adaptive streams wherein each of the multiple files yields a different portion of the video on playback.

To the extent Gaia contends that the Accused Services do not literally satisfy this limitation, Gaia infringes under the doctrine of equivalents because the Accused Services perform substantially the same function, in substantially the same way, to achieve the same result.

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

As shown above in elements 1[pre]-[c], which are incorporated fully herein, the limitations of this claim are met. *See* §§ A.1[pre]-[d].

Moreover, Gaia videos are encoded at a plurality of different bitrates to create a plurality of streams including at least low, medium, and high quality streams. Each of the low, medium, and high quality streams has a streamlet that encodes the same portion of the video at a different one of the plurality of different bitrates. The streamlets comprising the low-, medium-, and high-quality streams are stored in variant playlists, each comprising a group of streamlets at a respective bitrate.

The Master Manifest shows at least three bandwidth versions, or variant streams, of the video at the following bandwidths:

- 563200 (referred to herein as the “563200 Bandwidth”) having a resolution of 480x270
- 1128600 (referred to herein as the “1128600 Bandwidth”) having a resolution of 640x360
- 2406800 (referred to herein as the “2406800 Bandwidth”) having a resolution of 1280x720

For each of these bandwidth versions, the Master Manifest provides a link to a playlist for the specified version of the selected video at a particular bandwidth and resolution. Each variant

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stream or bandwidth version playlist is defined by the token associated with the stream file path. For example:

Bandwidth	Token¹²
563200 Bandwidth	/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/10s/rendition.m3u8?...
1128600 Bandwidth	/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/10s/rendition.m3u8?...
2406800 Bandwidth	/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/d2a5e81c-b340-4a45-b5c4-ebac17a18abe/10s/rendition.m3u8?...

As shown for example below, each of the **1128600 Bandwidth** and **563200 Bandwidth** version playlists contains segments, or streamlets, that encode different segments of the video. The streamlet files within each version playlist are arranged in ascending chronological order, beginning with the first segment of the video and progressing until the final segment of the video.

¹³ Bandwidth	Streamlet
1128600 Bandwidth	#EXTM3U #EXT-X-VERSION:7 #EXT-X-KEY:METHOD=AES-128,URI="https://manifest.prod.boltdns.net/license/v1/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/e957634b-6a80-40e6-b19d-e7217ac25931?fastly_token=NmEyZGRhMjZfNDY2MDg3NmQ3NmFjYmNjYlY2Q5MGlyMzk2ZjA2MmVmYmJjYThiYzY5OWUyM2JjYTdkMmYzMDVmMWNjY2Q2Zjk1MA%3D%3D",IV=0xdb9d69d96ec08a7de38bbd163f8200e4 #EXT-X-MAP:URI="https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/init.m4f"

¹² URL path abbreviated for readability throughout.

¹³ Any highlighting presented throughout this chart is intended to exemplify certain elements of Gaia's operation and is not intended to limit DISH's position with respect to how Gaia practices any element of the claims.

- BLUE = media segment
- YELLOW = variant stream

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	#EXT-X-PLAYLIST-TYPE:VOD #EXT-X-MEDIA-SEQUENCE:0 #EXT-X-TARGETDURATION:10 #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment0.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment1.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment2.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment3.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment4.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment5.m4f
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	***]
563200 Bandwidth	#EXTM3U #EXT-X-VERSION:7 #EXT-X-KEY:METHOD=AES-128,URI="https://manifest.prod.boltdns.net/license/v1/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/e957634b-6a80-40e6-b19d-e7217ac25931?fastly_token=NmEyZGRhNDhfZDZlOWNmYjMxOWQ3MGM0YzUzODU2ODJmOThjMjQ3MjA0ZWZyZDhlODA3MTdkOTBhZTc3NjAzM2ZmYmUzZGNmNA%3D%3D",IV=0xdb9d69d96ec08a7de38bbd163f8200e4 #EXT-X-MAP:URI="https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/init.m4f" #EXT-X-PLAYLIST-TYPE:VOD #EXT-X-MEDIA-SEQUENCE:0 #EXT-X-TARGETDURATION:10 #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment0.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment1.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment2.m4f

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	#EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment3.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment4.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment5.m4f ***
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On information and belief, playlists for the other variant streams also include these segments, or streamlets, arranged in ascending chronological order and corresponding to the same portion of the video provided on demand from server(s) associated with Gaia.

Referring to the variant stream data shown above, segment 3 (...segment2.m4f) of the medium quality stream (7062269f-d30b-4aea-ac0c-aea6eb598879) yields 10.010 seconds of the video to be viewed, here “The 900-Year Secret of the Knights Templar - Part 1,” and segment 3 (...segment2.m4f) of the low quality stream (05484b98-94b5-4240-8f26-996ab8cff02c) yields the same 10.010 seconds of the video to be viewed. Similarly, segment 4 (...segment3.m4f) of the medium quality stream (7062269f-d30b-4aea-ac0c-aea6eb598879) yields the next 10.010 seconds of the video, and segment 4 (...segment3.m4f) of the low quality stream (05484b98-94b5-4240-8f26-996ab8cff02c) yields the same next 10.010 seconds of the video. This correspondence continues for each of the streamlets in each of the variant playlists. Therefore, the respective Media Segments across different variant streams yield the same portions of the video to be viewed on playback.

For the instant test, the client device requests and receives the streamlets corresponding to the portion of the video such that the video is viewed in continuous fashion. Below is an excerpt of the DevTools Network listing showing the same alongside the status of the requests:

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¹⁴ Method	Host	Path	...	Status
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment6.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment7.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment8.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment9.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-	...	Complete

¹⁴ ¹⁴ Any highlighting presented throughout this chart is intended to exemplify certain elements of Gaia's operation and is not intended to limit DISH's position with respect to how Gaia practices any element of the claims.

- BLUE = media segment
- YELLOW = variant stream

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		a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment10.m4f		
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment11.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment12.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment13.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment14.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-	...	Complete

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		94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment15.m4f		
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment16.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment17.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment18.m4f	...	Complete

Thus, the limitations for this claim element are met. Gaia provides a method for presenting rate-adaptive streams wherein each of the multiple files yields a different portion of the video on playback.

To the extent Gaia contends that the Accused Services do not literally satisfy this limitation, Gaia infringes under the doctrine of equivalents because the Accused Services perform substantially the same function, in substantially the same way, to achieve the same result.

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

Exemplary Infringement Chart for U.S. Patent No. 8,868,772

As shown above in elements 1[pre]-[c], which are incorporated fully herein, the limitations of this claim are met. *See* §§ A.1[pre]-[d].

As explained above, Gaia videos are encoded at a plurality of different bitrates to create a plurality of streams including at least low, medium, and high quality streams. Each of the low, medium, and high quality streams has a streamlet that encodes the same portion of the video at a different one of the plurality of different bitrates. The streamlets comprising the low-, medium-, and high-quality streams are stored in variant playlists, each comprising a group of streamlets at a respective bitrate.

Each of the Media Segments in HLS yields a different portion of the video on playback. For example, HLS provides that “[e]ach segment in a Media Playlist has a unique integer Media Sequence Number. The Media Sequence Number of the first segment in the Media Playlist is either 0 or declared in the Playlist (Section 4.3.3.2). The Media Sequence Number of every other segment is equal to the Media Sequence Number of the segment that precedes it plus one.” RFC 8216 at 6. As such, “[e]ach Media Segment MUST carry the continuation of the encoded bitstream from the end of the segment with the previous Media Sequence Number, where values in a series such as timestamps and Continuity Counters MUST continue uninterrupted.” RFC 8216 at 6. Additionally, HLS provides that “[m]atching content in variant streams MUST have matching timestamps” to allow the media player embedded in the web page of the Gaia Site to synchronize the media. RFC 8216 at 43. Thus, the streamlets across the different copies yield the same portions of the video on playback.

As set forth above, each of the variant streams “describes a different version of the same content.” RFC 8216 at 5. Thus, the variant streams are “encodings of the same presentation” at different bitrates. RFC 8216 at 42. Indeed, to allow “clients to switch between” variant streams seamlessly, HLS requires that “[e]ach variant stream MUST present the same content” on playback. RFC 8216 at 43.

As shown for example below, each of the **1128600 Bandwidth** and **563200 Bandwidth** version playlists contains segments, or streamlets, that encode different segments of the video. The streamlet files within each version playlist are arranged in ascending chronological order, beginning with the first segment of the video and progressing until the final segment of the video.

¹⁵ Bandwidth	Streamlet
1128600 Bandwidth	#EXTM3U #EXT-X-VERSION:7 #EXT-X-KEY:METHOD=AES-128,URI="https://manifest.prod.boltdns.net/license/v1/aes128/132420922

¹⁵ Any highlighting presented throughout this chart is intended to exemplify certain elements of Gaia’s operation and is not intended to limit DISH’s position with respect to how Gaia practices any element of the claims.

- BLUE = media segment
- YELLOW = variant stream

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	5001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/e957634b-6a80-40e6-b19d-e7217ac25931?fastly_token=NmEyZGRhMjZfNDY2MDg3NmQ3NmFjYmNjYTQ5MGlyMzk2ZjA2MmVmYmJjYThiYzY5OWUyM2JjYTdkMmYzMDVmMWNjY2Q2Zjk1MA%3D%3D",IV=0xdb9d69d96ec08a7de38bbd163f8200e4 #EXT-X- MAP:URI="https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/init.m4f" #EXT-X-PLAYLIST-TYPE:VOD #EXT-X-MEDIA-SEQUENCE:0 #EXT-X-TARGETDURATION:10 #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment0.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment1.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment2.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment3.m4f
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Exemplary Infringement Chart for U.S. Patent No. 8,868,772

	#EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment4.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment5.m4f [***]
563200 Bandwidth	#EXTM3U #EXT-X-VERSION:7 #EXT-X-KEY:METHOD=AES-128,URI="https://manifest.prod.boltdns.net/license/v1/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/e957634b-6a80-40e6-b19d-e7217ac25931?fastly_token=NmEyZGRhNDhfZDZlOWNmYjMxOWQ3MGM0YzUzODU2ODJmOTJmMjQ3MjA0ZWZyZDhlODA3MTdkOTBhZTc3NjAzM2ZmYmUzZGNmNA%3D%3D",IV=0xdb9d69d96ec08a7de38bbd163f8200e4 #EXT-X-MAP:URI="https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/init.m4f" #EXT-X-PLAYLIST-TYPE:VOD #EXT-X-MEDIA-SEQUENCE:0 #EXT-X-TARGETDURATION:10 #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment0.m4f

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	#EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment1.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment2.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment3.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment4.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment5.m4f [***]
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On information and belief, playlists for the other variant streams also include these segments, or streamlets, arranged in ascending chronological order and corresponding to the same portion of the video provided on demand from server(s) associated with Gaia.

Referring to the variant stream data shown above, segment 3 (...segment2.m4f) of the medium quality stream (7062269f-d30b-4aea-ac0c-aea6eb598879) yields 10.010 seconds of the video to be viewed, here “The 900-Year Secret of the Knights Templar - Part 1,” and segment 3 (...segment2.m4f) of the low quality stream (05484b98-94b5-4240-8f26-996ab8cff02c) yields the same 10.010 seconds of the video to be viewed. Similarly, segment 4 (...segment3.m4f) of the

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medium quality stream (7062269f-d30b-4aea-ac0c-aea6eb598879) yields the next 10.010 seconds of the video, and segment 4 (...segment3.m4f) of the low quality stream (05484b98-94b5-4240-8f26-996ab8cff02c) yields the same next 10.010 seconds of the video. This correspondence continues for each of the streamlets in each of the variant playlists. Therefore, the respective Media Segments across different variant streams yield the same portions of the video to be viewed on playback.

Thus, the limitations for this claim element are met. Gaia provides a method for presenting rate-adaptive streams wherein each of said files has a time index such that the files whose playback is the same portion of the video for each of the different copies have the same time index in relation to the beginning of the video.

To the extent Gaia contends that the Accused Services do not literally satisfy this limitation, Gaia infringes under the doctrine of equivalents because the Accused Services perform substantially the same function, in substantially the same way, to achieve the same result. For example, the Accused Services perform substantially the same function because they request files in a sequential order that are timestamped. Additionally, the Accused Services function in substantially the same way by being requested in a sequential order based on the timestamps from the beginning of the video. Lastly, the Accused Services achieve substantially the same result because the files are requested and produced in sequential order from the beginning of the video to the end.

1[[f]] requesting by the media player a plurality of sequential ones of the files of one of the copies from the set of servers over a plurality of Transmission Control Protocol (TCP) connections based on the time indexes;

As shown above in elements 1[pre]-[e], which are incorporated fully herein, the limitations of this claim are met. *See* §§ A.1[pre]-[e].

As explained above, the client device executing the instructions from the Gaia Site requests (and is provided with) segments, or streamlets, from the one or more Gaia servers to display on the client device through the media player embedded in the web page of the Gaia Site. The streamlets are communicated to the client device accessing the Gaia Site via an internet connection pursuant to HLS. HLS requires the use of HTTP communications, which requires the use of at least one connection pursuant to at least one TCP connection. The video segments are presented in sequential ascending chronological order, based upon the previously requested and/or fulfilled streamlet, defined by time index relevant to the beginning of the video.

During streaming of the instant test video, a plurality of TCP connections is established to transmit video files from one or more servers to the client device. The client device accessing the Gaia Site requests streamlets from the one or more servers associated with Gaia via HTTP GET requests and evaluates the established TCP connections to determine whether transmissions of the files have been duplicated, delayed, lost, are out of sequence, or are otherwise deficient pursuant to certain parameters. If so, the client device accessing the Gaia Site makes requests to the server to retransmit or adjust transmission of the files. Once the client device accessing the Gaia Site determines that it has received the files such that they may be played in the appropriate order, the media files are accordingly played back on the client device in, for example, ascending

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chronological order. The server(s) associated with the host URI (**gaia.brightcovecdn.com**) for the instant test video are identifiable at the below IP addresses:

```
U:\>nslookup gaia.brightcovecdn.com
Server:  DALDC01.bakerbotts.net
Address:  10.200.254.81

Non-authoritative answer:
Name:     dualstack.brightcove.map.fastly.net
Addresses: 2a04:4e42:600::539
           2a04:4e42:200::539
           2a04:4e42::539
           2a04:4e42:400::539
           151.101.2.27
           151.101.130.27
           151.101.194.27
           151.101.66.27
Aliases:  gaia.brightcovecdn.com
```

Windows PowerShell nslookup for gaia.brightcovecdn.com (highlights added).

Additionally, HLS provides that “[m]atching content in variant streams MUST have matching timestamps” to allow the media player embedded in the web page of the Gaia Site to synchronize the media. RFC 8216 at 43. And, “[e]ach Media Segment in a Media Playlist has an integer Discontinuity Sequence Number. The Discontinuity Sequence Number can be used in addition to the timestamps within the media to synchronize Media Segments across different Renditions.” RFC 8216 at 39. Thus, “[m]atching content in variant streams MUST have matching Discontinuity Sequence Numbers.” RFC 8216 at 43.

As noted above, the variant playlist file is an HLS playlist. Each line in the file that begins with “#EXTINF” specifies the length of the segments in seconds. The line below the #EXTINF file is the location of the video file. In the present test, the End User Station uses HTTP GET requests to request and retrieve the segments of the encoded stream specified in the file above. The video files are hosted at **gaia.brightcovecdn.com**, and most of the streamlets, with a few exceptions, are 10.010 seconds long.

The received playlists at each resolution include video streamlets. Within each bandwidth playlist file, there are multiple .m4f files, each .m4f file in each respective bandwidth playlist file yielding the same segmented moments in the video.

¹⁶ Bandwidth	Streamlet
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¹⁶ Any highlighting presented throughout this chart is intended to exemplify certain elements of Gaia’s operation and is not intended to limit DISH’s position with respect to how Gaia practices any element of the claims.

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1128600 Bandwidth	<pre>#EXTM3U #EXT-X-VERSION:7 #EXT-X-KEY:METHOD=AES- 128,URI="https://manifest.prod.boltdns.net/license/v1/aes128/132420922 5001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/e957634b-6a80-40e6- b19d- e7217ac25931?fastly_token=NmEyZGRhMjZfNDY2MDg3NmQ3NmFj YmNjYlY2Q5MGlyMzk2ZjA2MmVmYmJjYThiYzY5OWUyM2JjYTdk MmYzMDVmMWNjY2Q2Zjk1MA%3D%3D",IV=0xdb9d69d96ec08a7 de38bbd163f8200e4 #EXT-X- MAP:URI="https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324 209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b- 4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d- e7217ac25931/init.m4f" #EXT-X-PLAYLIST-TYPE:VOD #EXT-X-MEDIA-SEQUENCE:0 #EXT-X-TARGETDURATION:10 #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/1 9c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c- aea6eb598879/e957634b-6a80-40e6-b19d- e7217ac25931/5x/segment0.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/1 9c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c- aea6eb598879/e957634b-6a80-40e6-b19d- e7217ac25931/5x/segment1.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/1 9c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-</pre>
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-
- BLUE = media segment
 - YELLOW = variant stream

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	aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment2.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment3.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment4.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment5.m4f ***]
563200 Bandwidth	#EXTM3U #EXT-X-VERSION:7 #EXT-X-KEY:METHOD=AES-128,URI="https://manifest.prod.boltdns.net/license/v1/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/e957634b-6a80-40e6-b19d-e7217ac25931?fastly_token=NmEyZGRhNDhfZDZlOWNmYjMxOWQ3MGM0YzUzODU2ODJmOThjMjQ3MjA0ZWZyZDhlODA3MTdkOTBhZTc3NjAzM2ZmYmUzZGNmNA%3D%3D",IV=0xdb9d69d96ec08a7de38bbd163f8200e4 #EXT-X-MAP:URI="https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/init.m4f" #EXT-X-PLAYLIST-TYPE:VOD

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	#EXT-X-MEDIA-SEQUENCE:0 #EXT-X-TARGETDURATION:10 #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment0.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment1.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment2.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment3.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment4.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment5.m4f ***]
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On information and belief, the other variant stream playlists comprise the same number of streamlets, each corresponding to the same portion of video as is respective counterpart in the streamlet files shown above.

The matching timestamps and Discontinuity Sequence Numbers for matching content across the variant streams are “in relation to the beginning of the video.” For example, HLS requires that “[e]ach Media Segment MUST carry the continuation of the encoded bitstream from the end of the segment with the previous Media Sequence Number, where values in a series such as timestamps and Continuity Counters MUST continue uninterrupted.” RFC 8216 at 6; *see also* RFC 8216 at 45 (“A client MUST NOT assume that segments with the same Media Sequence Number in different variant streams or Renditions have the same position in the presentation; Playlists MAY have independent Media Sequence Numbers. Instead, a client MUST use the relative position of each segment on the Playlist timeline and its Discontinuity Sequence Number to locate corresponding segments.”).

Indeed, to adapt playback between different bitrate variant streams, the End User Station accessing the Gaia Site “can use the EXTINF durations and the constraints in Section 6.2.4 to determine the approximate location of corresponding media. Once media from the new variant stream has been loaded, the timestamps in the Media Segments can be used to synchronize the old and new timelines precisely.” RFC 8216 at 47.

For each of the available bandwidth versions, the Master Manifest provides a link to a variant playlist for the specified version of the selected video at a particular bandwidth and resolution. Each variant or version playlist is defined by the token associated with the stream file path. For example:

Bandwidth	Token ¹⁷
563200 Bandwidth	/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/10s/rendition.m3u8?...
1128600 Bandwidth	/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/10s/rendition.m3u8?...
2406800 Bandwidth	/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/d2a5e81c-b340-4a45-b5c4-ebac17a18abe/10s/rendition.m3u8?...

As shown in the excerpt of the instant test below, the client device initially requests and receives the **1128600 Bandwidth** version of the streamlets (indicated by the **7062269f-d30b-4aea-ac0c-aea6eb598879**). At this time, the bandwidth is not restricted and the client device accessing the Gaia Site determines—pursuant to instructions received from the Gaia Site—that it can support a higher bandwidth version of the video. Once the bandwidth is restricted, the client device

¹⁷ URL path abbreviated for readability throughout.

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determines that the higher bitrate cannot be supported and subsequently switches to request and receive the **563200 Bandwidth** version of the streamlets (indicated by the **05484b98-94b5-4240-8f26-996ab8cff02c**). Upon making a successive determination that the higher bitrate can be supported again once the bandwidth restriction is removed, the client device switches to request and receive the **1128600 Bandwidth** version of the streamlets (indicated by the **7062269f-d30b-4aea-ac0c-aea6eb598879**). Below is an excerpt of the Microsoft Edge DevTools file showing downshifting from a higher to lower playback quality and subsequently upshifting back to the higher playback quality alongside the status of the requests. As shown by the DevTools Network data, partially reproduced below, the streamlet video files are hosted on a server accessible via **gaia.brightcovecdn.com**.

¹⁸ Method	Host	Path	...	Status
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment6.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment7.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment8.m4f	...	Complete

¹⁸ ¹⁸ Any highlighting presented throughout this chart is intended to exemplify certain elements of Gaia's operation and is not intended to limit DISH's position with respect to how Gaia practices any element of the claims.

- BLUE = media segment
- YELLOW = variant stream

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GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment9.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment10.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment11.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment12.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment13.m4f	...	Complete

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GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment14.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment15.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment16.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment17.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment18.m4f	...	Complete

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Thus, the limitations for this claim element are met. Gaia provides a method for presenting rate-adaptive streams including requesting by the media player a plurality of sequential ones of the files of one of the copies from the set of servers over a plurality of Transmission Control Protocol (TCP) connections based on the time indexes, including, for example, sequential files in the 1128600 Bandwidth playlist such as segment3.m4f through segment5.m4f.

To the extent Gaia contends that the Accused Services do not literally satisfy this limitation, Gaia infringes under the doctrine of equivalents because the Accused Services perform substantially the same function, in substantially the same way, to achieve the same result. The Accused Services perform substantially the same function because they request files in a sequential order that are timestamped. The Accused Services function in substantially the same way by being requested in a sequential order based on the timestamps from the beginning of the video. The Accused Services achieve substantially the same result because the files are requested and produced in sequential order from the beginning of the video to the end.

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

As shown above in elements 1[pre]-[f], which are incorporated fully herein, the limitations of this claim are met. See §§ A.1[pre]-[f].

As explained above, the video segments are requested and received over a plurality of TCP connections. Also explained above, the streamlets are presented in sequential ascending chronological order, based upon the previously requested and/or fulfilled streamlet, defined by time index relevant to the beginning of the video. The media player automatically transmits the requests, without user input for each sequential streamlet.

During streaming of the instant test video, a plurality of TCP connections is established to transmit video files from one or more servers to the client device. The client device accessing the Gaia Site requests streamlets from the one or more servers associated with Gaia via HTTP GET requests and evaluates the established TCP connections to determine whether transmissions of the files have been duplicated, delayed, lost, are out of sequence, or are otherwise deficient pursuant to certain parameters. If so, the client device accessing the Gaia Site makes requests to the server to retransmit or adjust transmission of the files. Once the client device accessing the Gaia Site determines that it has received the files such that they may be played in the appropriate order, the media files are accordingly played back on the client device in, for example, ascending chronological order. The server(s) associated with the host URI (**gaia.brightcovecdn.com**) for the instant test video are identifiable at the below IP addresses:

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```

U:\>nslookup gaia.brightcovecdn.com
Server: DALDC01.bakerbotts.net
Address: 10.200.254.81

Non-authoritative answer:
Name: dualstack.brightcove.map.fastly.net
Addresses: 2a04:4e42:600::539
           2a04:4e42:200::539
           2a04:4e42::539
           2a04:4e42:400::539
           151.101.2.27
           151.101.130.27
           151.101.194.27
           151.101.66.27
Aliases: gaia.brightcovecdn.com

```

Windows PowerShell nslookup for gaia.brightcovecdn.com (highlights added).

Moreover, each video available on the Gaia Site has associated information that contains instructions for how the client device may request, receive, and display the desired video. For example, for the instant test video, “The 900-Year Secret of the Knights Templar - Part 1,” the client device accessing the Gaia Site requested, using an HTTP GET request, and received, instructions for streaming the test video: **index.min.js** (hereinafter referred to as the “**player script**”).

The **player script** further contains code that specifies instructions for how the client device must execute the Gaia Site and present the requested Gaia video—including instructions for requesting streamlets, generating factors indicative of the network connection(s) between the client device and the server(s) associated with the Gaia Site, and making successive determinations as to which bandwidth versions of the video program to request.

For example, as shown in the below extract, the **player script** instructs the client device accessing the Gaia Site to execute the *pm* function, which iterates through the available bandwidth versions of the video program and returns the highest bandwidth version that meets certain criteria related to the client device’s network connection and any delays. An excerpt of the *pm* function is shown below:

```

let pm = function(e) {
  const {main: t, bandwidth: i, playerWidth: s, playerHeight: n, playerObjectFit: r, limitRenditionByPlayerDimensions: a, playlistController: o} = e;
  if (!t) {
    return
  }
  const l = {
    bandwidth: i,
    width: s,
    height: n,
    limitRenditionByPlayerDimensions: a
  };
};

```

On information and belief, the client device accessing the Gaia Site automatically calls the function *pm* to assess the most appropriate bandwidth version for presentation given the then-

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current network conditions. As part of this assessment, the *pm* function, among other functions called in the **player script**, generates factors indicative of, for example, connection strength, buffer health, playback rate, calculated bandwidth abilities, calculated moving averages, or other statistics.

The **player script** provided for the instant test video defines various functions that evaluate the speeds with which the client device accessing the Gaia Site evaluates the network connection, such as the following excerpted portion of the *pm* function:

```
const h = d.filter(e => e.bandwidth * R.BANDWIDTH_VARIANCE < i);
let p = h[h.length - 1];
const f = h.filter(e => e.bandwidth === p.bandwidth)[0];
if (a === false) {
  const S = f || d[0] || u[0];
  if (S && S.playlist) {
    let e = "sortedPlaylistReps";
    if (f) {
      e = "bandwidthBestRep"
    }
    if (d[0]) {
      e = "enabledPlaylistReps"
    }
    om(`choosing ${lm(S)} using ${e} with options`, 1);
    return S.playlist
  }
  om("could not choose a playlist with options", 1);
  return null
}
```

The player script also includes the following object definitions.

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```

Object.defineProperty(this, {
  selectPlaylist: {
    get() {
      return this.playlistController_.selectPlaylist
    },
    set(e) {
      this.playlistController_.selectPlaylist = e.bind(this)
    }
  },
  throughput: {
    get() {
      return this.playlistController_.mainSegmentLoader_.throughput.rate
    },
    set(e) {
      this.playlistController_.mainSegmentLoader_.throughput.rate = e;
      this.playlistController_.mainSegmentLoader_.throughput.count = 1
    }
  },
  bandwidth: {
    get() {
      let e = this.playlistController_.mainSegmentLoader_.bandwidth;
      const t = Dy.navigator.connection || Dy.navigator.mozConnection || Dy.navigator.webkitConnection;
      const i = 1e7;
      if (this.options_.useNetworkInformationApi && t) {
        const s = t.downlink * 1e3 * 1e3;
        if (s >= i && e >= i) {
          e = Math.max(e, s)
        } else {
          e = s
        }
      }
      return e
    },
    set(e) {
      this.playlistController_.mainSegmentLoader_.bandwidth = e;
      this.playlistController_.mainSegmentLoader_.throughput = {
        rate: 0,
        count: 0
      }
    }
  },
  systemBandwidth: {
    get() {
      const e = 1 / (this.bandwidth || 1);
      let t;
      if (this.throughput > 0) {
        t = 1 / this.throughput
      } else {
        t = 0
      }
      const i = Math.floor(1 / (e + t));
      return i
    },
    set() {
      C.log.error('The "systemBandwidth" property is read-only')
    }
  }
})

```

On information and belief, the above functions and others contained in the **player script** are compared to defined thresholds, whereupon the client device accessing the Gaia Site successively determines whether to switch to request higher or lower bandwidth versions of the stream.

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Further, the player script contains instructions directing the client device accessing the Gaia Site to request and present the highest-quality streamlets supportable at a given time based, at least in part, on factors indicative of the network connection.

In response to requesting the first streamlet via an HTTP GET request, as shown above, the client device receives the requested streamlet from the server via the one or more network connections. *See, e.g.*, RFC 8216 at 4 (“Using this protocol, a client can receive a continuous stream of media from a server for concurrent presentation.”); *id.* at 5 (“To play this Playlist, the client first downloads it and then downloads and plays each Media Segment declared within it. The client reloads the Playlist as described in this document to discover any added segments.”).

HLS “allows a receiver to adapt the bitrate of the media to the current network conditions in order to maintain uninterrupted playback at the best possible quality.” RFC 8216 at 4; *see also id.* (“Using this protocol, a client can receive a continuous stream of media from a server for concurrent presentation.”).

The Master Manifest shows at least three bandwidth versions, or variant streams, of the video at the following bandwidths:

- 563200 (referred to herein as the “563200 Bandwidth”) having a resolution of 480x270
- 1128600 (referred to herein as the “1128600 Bandwidth”) having a resolution of 640x360
- 2406800 (referred to herein as the “2406800 Bandwidth”) having a resolution of 1280x720

For each of these bandwidth versions, the Master Manifest provides a link to a playlist for the specified version of the selected video at a particular bandwidth and resolution. Each variant stream or bandwidth version playlist is defined by the token associated with the stream file path. For example:

Bandwidth	Token ¹⁹
563200 Bandwidth	/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/10s/rendition.m3u8?...
1128600 Bandwidth	/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/10s/rendition.m3u8?...
2406800 Bandwidth	/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/d2a5e81c-b340-4a45-b5c4-ebac17a18abe/10s/rendition.m3u8?...

¹⁹ URL path abbreviated for readability throughout.

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For the instant test below, the client device initially requests and receives the **1128600 Bandwidth** version of the streamlets (indicated by the **7062269f-d30b-4aea-ac0c-aea6eb598879**). At this time, the bandwidth is not restricted and the client device accessing the Gaia Site determines—pursuant to instructions received from the Gaia Site—that it can support a higher bandwidth version of the video. Once the bandwidth is restricted, the client device determines that the higher bitrate cannot be supported and subsequently switches to request and receive the **563200 Bandwidth** version of the streamlets (indicated by the **05484b98-94b5-4240-8f26-996ab8cff02c**). Upon making a successive determination that the higher bitrate can be supported again once the bandwidth restriction is removed, the client device switches to request and receive the **1128600 Bandwidth** version of the streamlets (indicated by the **7062269f-d30b-4aea-ac0c-aea6eb598879**). Below is an excerpt of the Microsoft Edge DevTools file showing downshifting from a higher to lower playback quality and subsequently upshifting back to the higher playback quality alongside the status of the requests. As shown by the DevTools Network data, partially reproduced below, the streamlet video files are hosted on a server accessible via **gaia.brightcovecdn.com**.

²⁰ Method	Host	Path	...	Status
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment6.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment7.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-	...	Complete

^{20 20} Any highlighting presented throughout this chart is intended to exemplify certain elements of Gaia's operation and is not intended to limit DISH's position with respect to how Gaia practices any element of the claims.

- BLUE = media segment
- YELLOW = variant stream

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		996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment8.m4f		
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment9.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment10.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment11.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment12.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-	...	Complete

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		6a80-40e6-b19d-e7217ac25931/5x/segment13.m4f		
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment14.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment15.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment16.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment17.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-	...	Complete

Exemplary Infringement Chart for U.S. Patent No. 8,868,772

		e7217ac25931/5x/segment18.m4f		
--	--	-------------------------------	--	--

Thus, the limitations for this claim element are met. Gaia provides a method for presenting rate-adaptive streams including automatically requesting by the media player from the set of servers over the plurality of TCP connections subsequent portions of the video by requesting for each such portion one of the files from one of the copies dependent upon successive determinations by the media player to shift the playback quality to a higher or lower quality one of the different copies.

To the extent Gaia contends that the Accused Services do not literally satisfy this limitation, Gaia infringes under the doctrine of equivalents because the Accused Services perform substantially the same function, in substantially the same way, to achieve the same result.

1[h] repeatedly generating a set of one or more factors indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies,

As shown above in elements 1[pre]-[g], which are incorporated fully herein, the limitations of this claim are met. *See* §§ A.1[pre]-[g].

As explained in element 1[h], the **player script** instructs the client device accessing the Gaia Site to execute the *pm* function, which iterates through the available bandwidth versions of the video program and returns the highest bandwidth version meeting criteria related to the client device's network connection and any delays. An excerpt of the *pm* function is shown below:

```
let pm = function(e) {
  const {main: t, bandwidth: i, playerWidth: s, playerHeight: n, playerObjectFit: r, limitRenditionByPlayerDimensions: a, playlistController: o} = e;
  if (!t) {
    return
  }
  const l = {
    bandwidth: i,
    width: s,
    height: n,
    limitRenditionByPlayerDimensions: a
  };
};
```

On information and belief, the client device accessing the Gaia Site automatically calls the function *pm* to assess the most appropriate bandwidth version for presentation given the then-current network conditions. As part of this assessment, the *pm* function, among other functions called in the **player script**, generates factors indicative of, for example, connection strength, buffer health, playback rate, calculated bandwidth abilities, calculated moving averages, or other statistics.

The **player script** provided for the instant test video defines various functions that evaluate the speeds with which the client device accessing the Gaia Site evaluates the network connection, such as the following excerpted portion of the *pm* function:

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```

const h = d.filter(e => e.bandwidth * R.BANDWIDTH_VARIANCE < i);
let p = h[h.length - 1];
const f = h.filter(e => e.bandwidth === p.bandwidth)[0];
if (a === false) {
  const S = f || d[0] || u[0];
  if (S && S.playlist) {
    let e = "sortedPlaylistReps";
    if (f) {
      e = "bandwidthBestRep"
    }
    if (d[0]) {
      e = "enabledPlaylistReps"
    }
    om(`choosing ${lm(S)} using ${e} with options`, 1);
    return S.playlist
  }
  om("could not choose a playlist with options", 1);
  return null
}

```

The player script also includes the following object definitions.

Exemplary Infringement Chart for U.S. Patent No. 8,868,772

```

Object.defineProperty(this, {
  selectPlaylist: {
    get() {
      return this.playlistController_.selectPlaylist
    },
    set(e) {
      this.playlistController_.selectPlaylist = e.bind(this)
    }
  },
  throughput: {
    get() {
      return this.playlistController_.mainSegmentLoader_.throughput.rate
    },
    set(e) {
      this.playlistController_.mainSegmentLoader_.throughput.rate = e;
      this.playlistController_.mainSegmentLoader_.throughput.count = 1
    }
  },
  bandwidth: {
    get() {
      let e = this.playlistController_.mainSegmentLoader_.bandwidth;
      const t = Dy.navigator.connection || Dy.navigator.mozConnection || Dy.navigator.webkitConnection;
      const i = 1e7;
      if (this.options_.useNetworkInformationApi && t) {
        const s = t.downlink * 1e3 * 1e3;
        if (s >= i && e >= i) {
          e = Math.max(e, s)
        } else {
          e = s
        }
      }
      return e
    },
    set(e) {
      this.playlistController_.mainSegmentLoader_.bandwidth = e;
      this.playlistController_.mainSegmentLoader_.throughput = {
        rate: 0,
        count: 0
      }
    }
  },
  systemBandwidth: {
    get() {
      const e = 1 / (this.bandwidth || 1);
      let t;
      if (this.throughput > 0) {
        t = 1 / this.throughput
      } else {
        t = 0
      }
      const i = Math.floor(1 / (e + t));
      return i
    },
    set() {
      C.log.error('The "systemBandwidth" property is read-only')
    }
  }
})

```

On information and belief, the above functions and others contained in the **player script** are compared to defined thresholds, whereupon the client device accessing the Gaia Site successively determines whether to switch to request higher or lower bandwidth versions of the stream.

Exemplary Infringement Chart for U.S. Patent No. 8,868,772

Further, the player script contains instructions directing the client device accessing the Gaia Site to request and present the highest-quality streamlets supportable at a given time based, at least in part, on factors indicative of the network connection.

Thus, the limitations for this claim element are met. Gaia provides a method for presenting rate-adaptive streams including repeatedly generating a set of one or more factors indicative of the current ability to sustain the streaming of the video using the files from different ones of the copies.

To the extent Gaia contends that the Accused Services do not literally satisfy this limitation, Gaia infringes under the doctrine of equivalents because the Accused Services perform substantially the same function, in substantially the same way, to achieve the same result.

1[i] wherein the set of one or more factors relate to the performance of the network; and

As shown above in elements 1[pre]-[h], which are incorporated fully herein, the limitations of this claim are met. *See* §§ A.1[pre]-[h].

As explained in element 1[h], the **player script** instructs the client device accessing the Gaia Site to execute the *pm* function, which iterates through the available bandwidth versions of the video program and returns the highest bandwidth version meeting criteria related to the client device's network connection and any delays. An excerpt of the *pm* function is shown below:

```
let pm = function(e) {
  const {main: t, bandwidth: i, playerWidth: s, playerHeight: n, playerObjectFit: r, limitRenditionByPlayerDimensions: a, playlistController: o} = e;
  if (!t) {
    return
  }
  const l = {
    bandwidth: i,
    width: s,
    height: n,
    limitRenditionByPlayerDimensions: a
  };
};
```

On information and belief, the client device accessing the Gaia Site automatically calls the function *pm* to assess the most appropriate bandwidth version for presentation given the then-current network conditions. As part of this assessment, the *pm* function, among other functions called in the **player script**, generates factors indicative of, for example, connection strength, buffer health, playback rate, calculated bandwidth abilities, calculated moving averages, or other statistics.

The **player script** provided for the instant test video defines various functions that evaluate the speeds with which the client device accessing the Gaia Site evaluates the network connection, such as the following excerpted portion of the *pm* function:

Exemplary Infringement Chart for U.S. Patent No. 8,868,772

```

const h = d.filter(e => e.bandwidth * R.BANDWIDTH_VARIANCE < i);
let p = h[h.length - 1];
const f = h.filter(e => e.bandwidth === p.bandwidth)[0];
if (a === false) {
  const S = f || d[0] || u[0];
  if (S && S.playlist) {
    let e = "sortedPlaylistReps";
    if (f) {
      e = "bandwidthBestRep"
    }
    if (d[0]) {
      e = "enabledPlaylistReps"
    }
    om(`choosing ${lm(S)} using ${e} with options`, 1);
    return S.playlist
  }
  om("could not choose a playlist with options", 1);
  return null
}

```

The player script also includes the following object definitions.

Exemplary Infringement Chart for U.S. Patent No. 8,868,772

```

Object.defineProperty(this, {
  selectPlaylist: {
    get() {
      return this.playlistController_.selectPlaylist
    },
    set(e) {
      this.playlistController_.selectPlaylist = e.bind(this)
    }
  },
  throughput: {
    get() {
      return this.playlistController_.mainSegmentLoader_.throughput.rate
    },
    set(e) {
      this.playlistController_.mainSegmentLoader_.throughput.rate = e;
      this.playlistController_.mainSegmentLoader_.throughput.count = 1
    }
  },
  bandwidth: {
    get() {
      let e = this.playlistController_.mainSegmentLoader_.bandwidth;
      const t = Dy.navigator.connection || Dy.navigator.mozConnection || Dy.navigator.webkitConnection;
      const i = 1e7;
      if (this.options_.useNetworkInformationApi && t) {
        const s = t.downlink * 1e3 * 1e3;
        if (s >= i && e >= i) {
          e = Math.max(e, s)
        } else {
          e = s
        }
      }
      return e
    },
    set(e) {
      this.playlistController_.mainSegmentLoader_.bandwidth = e;
      this.playlistController_.mainSegmentLoader_.throughput = {
        rate: 0,
        count: 0
      }
    }
  },
  systemBandwidth: {
    get() {
      const e = 1 / (this.bandwidth || 1);
      let t;
      if (this.throughput > 0) {
        t = 1 / this.throughput
      } else {
        t = 0
      }
      const i = Math.floor(1 / (e + t));
      return i
    },
    set() {
      C.log.error('The "systemBandwidth" property is read-only')
    }
  }
})

```

On information and belief, the above functions and others contained in the **player script** are compared to defined thresholds, whereupon the client device accessing the Gaia Site successively determines whether to switch to request higher or lower bandwidth versions of the stream.

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Further, the player script contains instructions directing the client device accessing the Gaia Site to request and present the highest-quality streamlets supportable at a given time based, at least in part, on factors indicative of the network connection.

Thus, the limitations for this claim element are met. Gaia provides a method for presenting rate-adaptive streams wherein the set of one or more factors relate to the performance of the network.

To the extent Gaia contends that the Accused Services do not literally satisfy this limitation, Gaia infringes under the doctrine of equivalents because the Accused Services perform substantially the same function, in substantially the same way, to achieve the same result.

<i>1[j] making the successive determinations to shift the playback quality based on at least one of the set of factors to achieve continuous playback of the video using the files of the highest quality one of the copies determined sustainable at the time; and</i>

As shown above in elements 1[pre]-[i], which are incorporated fully herein, the limitations of this claim are met. *See* §§ A.1[pre]-[i].

As explained above, the client device receives the requested streamlets via one or more network connections in accordance with determinations made based on available bandwidth. This includes upshifting in resolution when the available bandwidth can support a higher resolution of the video *and* downshifting when the available bandwidth can no longer support the then-displayed resolution of the video.

During streaming of the instant test video, a plurality of TCP connections is established to transmit video files from one or more servers to the client device. The client device accessing the Gaia Site requests streamlets from the one or more servers associated with Gaia via HTTP GET requests and evaluates the established TCP connections to determine whether transmissions of the files have been duplicated, delayed, lost, are out of sequence, or are otherwise deficient pursuant to certain parameters. If so, the client device accessing the Gaia Site makes requests to the server to retransmit or adjust transmission of the files. Once the client device accessing the Gaia Site determines that it has received the files such that they may be played in the appropriate order, the media files are accordingly played back on the client device in, for example, ascending chronological order. The server(s) associated with the host URI (**gaia.brightcovecdn.com**) for the instant test video are identifiable at the below IP addresses:

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```

U:\>nslookup gaia.brightcovecdn.com
Server:  DALDC01.bakerbotts.net
Address:  10.200.254.81

Non-authoritative answer:
Name:     dualstack.brightcove.map.fastly.net
Addresses: 2a04:4e42:600::539
           2a04:4e42:200::539
           2a04:4e42::539
           2a04:4e42:400::539
           151.101.2.27
           151.101.130.27
           151.101.194.27
           151.101.66.27
Aliases:  gaia.brightcovecdn.com

```

Windows PowerShell nslookup for gaia.brightcovecdn.com (highlights added).

Moreover, each video available on the Gaia Site has associated information that contains instructions for how the client device may request, receive, and display the desired video. For example, for the instant test video, “The 900-Year Secret of the Knights Templar - Part 1,” the client device accessing the Gaia Site requested, using an HTTP GET request, and received, the **player script**.

The **player script** further contains code that specifies instructions for how the client device must execute the Gaia Site and present the requested Gaia video—including instructions for requesting streamlets, generating factors indicative of the network connection(s) between the client device and the server(s) associated with the Gaia Site, and making successive determinations as to which bandwidth versions of the video program to request.

As explained in element 1[h], the **player script** instructs the client device accessing the Gaia Site to execute the *pm* function, which iterates through the available bandwidth versions of the video program and returns the highest bandwidth version meeting criteria related to the client device’s network connection and any delays. An excerpt of the *pm* function is shown below:

```

let pm = function(e) {
  const {main: t, bandwidth: i, playerWidth: s, playerHeight: n, playerObjectFit: r, limitRenditionByPlayerDimensions: a, playlistController: o} = e;
  if (!t) {
    return
  }
  const l = {
    bandwidth: i,
    width: s,
    height: n,
    limitRenditionByPlayerDimensions: a
  };
};

```

On information and belief, the client device accessing the Gaia Site automatically calls the function *pm* to assess the most appropriate bandwidth version for presentation given the then-current network conditions. As part of this assessment, the *pm* function, among other functions called in the **player script**, generates factors indicative of, for example, connection strength, buffer

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health, playback rate, calculated bandwidth abilities, calculated moving averages, or other statistics.

The **player script** provided for the instant test video defines various functions that evaluate the speeds with which the client device accessing the Gaia Site evaluates the network connection, such as the following excerpted portion of the *pm* function:

```
const h = d.filter(e => e.bandwidth * R.BANDWIDTH_VARIANCE < i);
let p = h[h.length - 1];
const f = h.filter(e => e.bandwidth === p.bandwidth)[0];
if (a === false) {
  const S = f || d[0] || u[0];
  if (S && S.playlist) {
    let e = "sortedPlaylistReps";
    if (f) {
      e = "bandwidthBestRep"
    }
    if (d[0]) {
      e = "enabledPlaylistReps"
    }
    om(`choosing ${lm(S)} using ${e} with options`, 1);
    return S.playlist
  }
  om("could not choose a playlist with options", 1);
  return null
}
```

The player script also includes the following object definitions.

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```

Object.defineProperty(this, {
  selectPlaylist: {
    get() {
      return this.playlistController_.selectPlaylist
    },
    set(e) {
      this.playlistController_.selectPlaylist = e.bind(this)
    }
  },
  throughput: {
    get() {
      return this.playlistController_.mainSegmentLoader_.throughput.rate
    },
    set(e) {
      this.playlistController_.mainSegmentLoader_.throughput.rate = e;
      this.playlistController_.mainSegmentLoader_.throughput.count = 1
    }
  },
  bandwidth: {
    get() {
      let e = this.playlistController_.mainSegmentLoader_.bandwidth;
      const t = Dy.navigator.connection || Dy.navigator.mozConnection || Dy.navigator.webkitConnection;
      const i = 1e7;
      if (this.options_.useNetworkInformationApi && t) {
        const s = t.downlink * 1e3 * 1e3;
        if (s >= i && e >= i) {
          e = Math.max(e, s)
        } else {
          e = s
        }
      }
      return e
    },
    set(e) {
      this.playlistController_.mainSegmentLoader_.bandwidth = e;
      this.playlistController_.mainSegmentLoader_.throughput = {
        rate: 0,
        count: 0
      }
    }
  },
  systemBandwidth: {
    get() {
      const e = 1 / (this.bandwidth || 1);
      let t;
      if (this.throughput > 0) {
        t = 1 / this.throughput
      } else {
        t = 0
      }
      const i = Math.floor(1 / (e + t));
      return i
    },
    set() {
      C.log.error('The "systemBandwidth" property is read-only')
    }
  }
})

```

On information and belief, the above functions and others contained in the **player script** are compared to defined thresholds, whereupon the client device accessing the Gaia Site successively determines whether to switch to request higher or lower bandwidth versions of the stream.

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Further, the player script contains instructions directing the client device accessing the Gaia Site to request and present the highest-quality streamlets supportable at a given time based, at least in part, on factors indicative of the network connection.

In response to requesting the first streamlet via an HTTP GET request, as shown above, the client device receives the requested streamlet from the server via the one or more network connections. *See, e.g.*, RFC 8216 at 4 (“Using this protocol, a client can receive a continuous stream of media from a server for concurrent presentation.”); *id.* at 5 (“To play this Playlist, the client first downloads it and then downloads and plays each Media Segment declared within it. The client reloads the Playlist as described in this document to discover any added segments.”).

HLS “allows a receiver to adapt the bitrate of the media to the current network conditions in order to maintain uninterrupted playback at the best possible quality.” RFC 8216 at 4; *see also id.* (“Using this protocol, a client can receive a continuous stream of media from a server for concurrent presentation.”).

The Master Manifest shows at least three bandwidth versions, or variant streams, of the video at the following bandwidths:

- 563200 (referred to herein as the “563200 Bandwidth”) having a resolution of 480x270
- 1128600 (referred to herein as the “1128600 Bandwidth”) having a resolution of 640x360
- 2406800 (referred to herein as the “2406800 Bandwidth”) having a resolution of 1280x720

For each of these bandwidth versions, the Master Manifest provides a link to a playlist for the specified version of the selected video at a particular bandwidth and resolution. Each variant stream or bandwidth version playlist is defined by the token associated with the stream file path. For example:

Bandwidth	Token ²¹
563200 Bandwidth	/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/10s/rendition.m3u8?...
1128600 Bandwidth	/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/10s/rendition.m3u8?...
2406800 Bandwidth	/manifest/v2/hls/v7/fmp4/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/d2a5e81c-b340-4a45-b5c4-ebac17a18abe/10s/rendition.m3u8?...

²¹ URL path abbreviated for readability throughout.

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For the instant test below, the client device initially requests and receives the **1128600 Bandwidth** version of the streamlets (indicated by the **7062269f-d30b-4aea-ac0c-aea6eb598879**). At this time, the bandwidth is not restricted and the client device accessing the Gaia Site determines—pursuant to instructions received from the Gaia Site—that it can support a higher bandwidth version of the video. Once the bandwidth is restricted, the client device determines that the higher bitrate cannot be supported and subsequently switches to request and receive the **563200 Bandwidth** version of the streamlets (indicated by the **05484b98-94b5-4240-8f26-996ab8cff02c**). Upon making a successive determination that the higher bitrate can be supported again once the bandwidth restriction is removed, the client device switches to request and receive the **1128600 Bandwidth** version of the streamlets (indicated by the **7062269f-d30b-4aea-ac0c-aea6eb598879**). Below is an excerpt of the Microsoft Edge DevTools file showing downshifting from a higher to lower playback quality and subsequently upshifting back to the higher playback quality alongside the status of the requests. As shown by the DevTools Network data, partially reproduced below, the streamlet video files are hosted on a server accessible via **gaia.brightcovecdn.com**.

²² Method	Host	Path	...	Status
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment6.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment7.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-	...	Complete

²² ²² Any highlighting presented throughout this chart is intended to exemplify certain elements of Gaia's operation and is not intended to limit DISH's position with respect to how Gaia practices any element of the claims.

- BLUE = media segment
- YELLOW = variant stream

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		996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment8.m4f		
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment9.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment10.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment11.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment12.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-	...	Complete

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		6a80-40e6-b19d-e7217ac25931/5x/segment13.m4f		
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment14.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment15.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment16.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment17.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-	...	Complete

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		e7217ac25931/5x/segment18.m4f		
--	--	-------------------------------	--	--

Thus, the limitations for this claim element are met. Gaia provides a method for presenting rate-adaptive streams including making the successive determinations to shift the playback quality based on at least one of the set of factors to achieve continuous playback of the video using the files of the highest quality one of the copies determined sustainable at the time.

To the extent Gaia contends that the Accused Services do not literally satisfy this limitation, Gaia infringes under the doctrine of equivalents because the Accused Services perform substantially the same function, in substantially the same way, to achieve the same result.

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

As shown above in elements 1[pre]-[j], which are incorporated fully herein, the limitations of this claim are met. *See* §§ A.1[pre]-[j].

The media player embedded in the web page of the Gaia Site plays back the requested streamlets on the end user station in order of ascending playback time.

As shown for example below, each of the **1128600 Bandwidth** and **563200 Bandwidth** version playlists contains segments, or streamlets, that encode different segments of the video. The streamlet files within each version playlist are arranged in ascending chronological order, beginning with the first segment of the video and progressing until the final segment of the video.

²³ Bandwidth	Streamlet
1128600 Bandwidth	#EXTM3U #EXT-X-VERSION:7 #EXT-X-KEY:METHOD=AES-128,URI="https://manifest.prod.boltdns.net/license/v1/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/e957634b-6a80-40e6-b19d-e7217ac25931?fastly_token=NmEyZGRhMjZfNDY2MDg3NmQ3NmFjYmNjYTQ5MGlyMzk2ZjA2MmVmYmJjYThiYzY5OWUyM2JjYTdk

²³ Any highlighting presented throughout this chart is intended to exemplify certain elements of Gaia’s operation and is not intended to limit DISH’s position with respect to how Gaia practices any element of the claims.

- BLUE = media segment
- YELLOW = variant stream
- GREEN = timestamp

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	MmYzMDVmMWNjY2Q2Zjk1MA%3D%3D",IV=0xdb9d69d96ec08a7de38bbd163f8200e4 #EXT-X- MAP:URI="https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/init.m4f" #EXT-X-PLAYLIST-TYPE:VOD #EXT-X-MEDIA-SEQUENCE:0 #EXT-X-TARGETDURATION:10 #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment0.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment1.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment2.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment3.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-
--	--

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	aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment4.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aca-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment5.m4f ***]
563200 Bandwidth	#EXTM3U #EXT-X-VERSION:7 #EXT-X-KEY:METHOD=AES-128,URI="https://manifest.prod.boltdns.net/license/v1/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/e957634b-6a80-40e6-b19d-e7217ac25931?fastly_token=NmEyZGRhNDhfZDZlOWNmYjMxOWQ3MGM0YzUzODU2ODJmOThjMjQ3MjA0ZWZyZDhlODA3MTdkOTBhZTc3NjAzM2ZmYmUzZGNmNA%3D%3D",IV=0xdb9d69d96ec08a7de38bbd163f8200e4 #EXT-X-MAP:URI="https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/init.m4f" #EXT-X-PLAYLIST-TYPE:VOD #EXT-X-MEDIA-SEQUENCE:0 #EXT-X-TARGETDURATION:10 #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment0.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-

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	996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment1.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment2.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment3.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment4.m4f #EXTINF:10.010, https://gaia.brightcovecdn.com/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment5.m4f ***]
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When the client device accessing the Gaia Site requests streaming of a video hosted on the server at **gaia.brightcovecdn.com**, the video is played back in order of ascending playback time, as indicated by the sequential playing of Media Segments, shown below.

²⁴ Metho d	Host	Path	...	Status
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-	...	Complete

²⁴ Any highlighting presented throughout this chart is intended to exemplify certain elements of Gaia's operation and is not intended to limit DISH's position with respect to how Gaia practices any element of the claims.

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²⁴ Method	Host	Path	...	Status
		aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment6.m4f		
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment7.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment8.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment9.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-	...	Complete

-
- ORANGE = one or more servers
 - BLUE = media segment
 - YELLOW = variant streams

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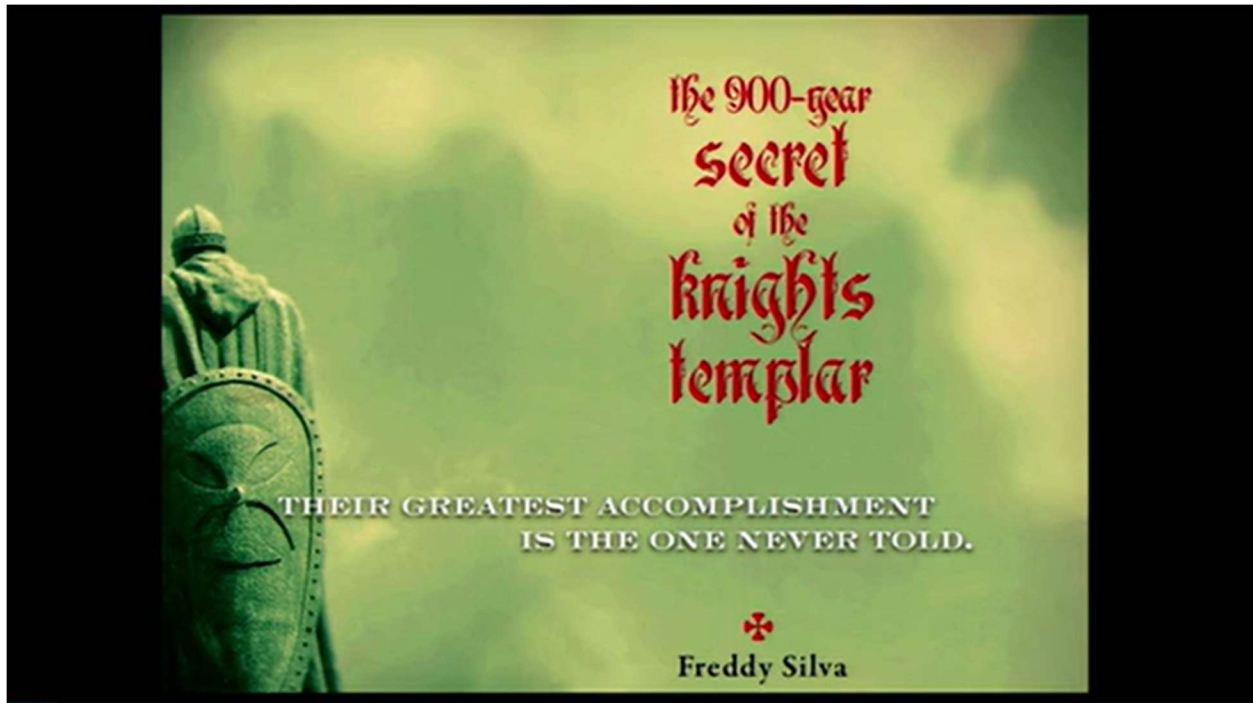
²⁴ Method	Host	Path	...	Status
		6a80-40e6-b19d-e7217ac25931/5x/segment10.m4f		
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment11.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment12.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment13.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment14.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-	...	Complete

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²⁴ Method	Host	Path	...	Status
		996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment15.m4f		
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/05484b98-94b5-4240-8f26-996ab8cff02c/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment16.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment17.m4f	...	Complete
GET	gaia.brightcovecdn.com	/media/v1/hls/v7/aes128/1324209225001/19c86d36-aafd-43f9-90f8-a8d20b6a3b2d/7062269f-d30b-4aea-ac0c-aea6eb598879/e957634b-6a80-40e6-b19d-e7217ac25931/5x/segment18.m4f	...	Complete

For example, below is a screenshot of the client device accessing the Gaia Site during playback of the instant test video:

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Thus, the limitations for this claim element are met. Gaia provides a method for presenting rate-adaptive streams including presenting the video by playing back with the media player on the end user station the requested files in order of ascending playback time.

To the extent Gaia contends that the Accused Services do not literally satisfy this limitation, Gaia infringes under the doctrine of equivalents because the Accused Services perform substantially the same function, in substantially the same way, to achieve the same result.