

Appendix E-2 - Claim Chart for U.S. Patent No. 8,230,101 Against Products with HTTP Live Streaming (HLS)

Based on information presently available, Advanced Coding Technologies LLC (“ACT”) contends that Defendant Apple Inc. (“Defendant” or “Apple”) infringe Claims 1-5 and 7 (the “Asserted Claims”) of U.S. Patent No. 8,230,101 (the “’101 Patent”) through the Accused Products which are manufactured, sold, offered for sale, and/or used by Apple.

Representativeness: Each Accused Product that implements HTTP Live Streaming (HLS), including at least Apple products such as iPhone, iPod, iPod Touch, and Apple TV is representative of other Accused Products for the purposes of infringement of the ’101 Patent. Based on publicly available information, ACT believes each Accused Product shares substantially the same structure and functionality with respect to the components which are relevant to infringement given that, among other things, the listed products all purport to implement HLS.

Apple directly infringes each of the Asserted Claims by using, importing, testing, selling, and/or offering for sale the Accused Products in violation of 35 U.S.C. § 271(a).

Apple indirectly infringes the Asserted Claims in violation of 35 U.S.C. § 271(b) by inducing third parties, including its users and/or customers, to directly infringe through their operation and use of the Accused Products. Apple has knowingly and intentionally induced this direct infringement by, *inter alia*, (i) selling, importing, or otherwise providing the Accused Products to third parties with the intent that the Accused Products will be operated and used in a manner that practices the Asserted Claim; and (ii) marketing and advertising the Accused Products. Apple’s marketing and promotional materials for the Accused Products are found, for example, on Apple’s website, and in App stores of operating systems for which the Accused Products are made available. For example, Apple’s website offers customers instructions and/or manuals for the Accused Products that instruct customers to, among other things, use the accused functionality in the Accused Products. Apple’s website also offers support to customers, including instruction to, among other things, use the Accused Products. On information and belief, Apple knows that its actions will result in infringement of the Asserted Claims, or subjectively believes that there is a high probability that its actions will result in infringement of the Asserted Claims but has taken deliberate actions to avoid learning these facts.

Plaintiff contends that the Accused Products perform each step of the claimed methods. Plaintiff contends that use, testing, and qualification of the Accused Products by Apple itself, as well as use by customers and end-users of the Accused Products, perform each step of the claimed methods. On information and belief, backend servers, under the direction and control of the Accused Products, may perform certain steps of the claimed methods. Apple, its customers, and users of the Accused Products derive benefits from their infringement.

On information and belief, the charted version of Apple’s products is representative of all versions of the Accused Products, including all variants of the Accused Products made, sold, offered for sale, or used on any operating system.

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ACT does not concede that any claims of the '101 Patent that are not listed below are not infringed by the identified Accused Products. Moreover, the citations to certain documents and other information below are intended to be exemplary only and in no way foreclose ACT from citing or relying on additional documents, information, source code, and/or testimony at a later time. These contentions are preliminary in nature, and an analysis of Apple's products, internal documentation, source code, and/or testimony from relevant witnesses may more fully and accurately describe the infringing features of its Accused Products. Accordingly, ACT reserves the right to supplement, correct, modify, and/or amend these contentions once such additional information is made available to ACT. Furthermore, ACT reserves the right to supplement, correct, modify, and/or amend these contentions as discovery in this case progresses; in view of the Court's claim construction order(s); in view of any positions taken by Apple including, but not limited to, positions on claim construction, invalidity, and/or non-infringement; and in connection with the preparation and exchange of expert reports.

The contents of every below claim cell on which another claim cell depends are expressly incorporated by reference in that dependent cell, as if set forth in their entirety therein.

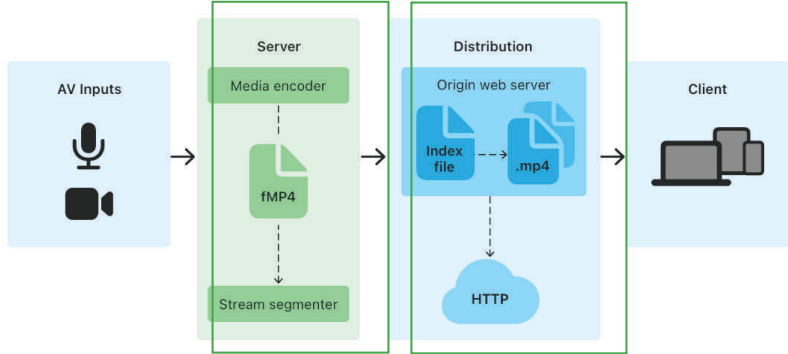
Further, to the extent this element is performed at least in part by software source code, ACT reserves the right to supplement these contentions pursuant to production of such source code and to the extent Defendant requires additional information in accordance with P.R. 3-1 and for any other reasons.

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple's Accused Products
<p>[1P] A server device for media, the server device for media comprising:</p>	<p>The Apple Accused Products are each: A server device for media, the server device for media. Apple directly infringes by using, importing, testing, selling, and/or offering for sale devices having the Apple Accused Products.</p> <p>For example, Apple Accused Products use HTTP Live Streaming technology (<i>i.e.</i>, A method for controlling a server device) to stream digital content. The content to be streamed is stored at Apple web servers (<i>i.e.</i>, a server device for media which is equipped with an internal storage device for storing digital contents) and delivered through its distribution servers that include web servers and caching infrastructure such as content delivery network (CDN).</p>

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Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple’s Accused Products
	<p>Overview</p> <p>HTTP Live Streaming (HLS) sends audio and video over HTTP from an ordinary web server for playback on iOS-based devices—including iPhone, iPad, iPod touch, and Apple TV—and on desktop computers (macOS). Using the same protocol that powers the web, HLS deploys content using ordinary web servers and content delivery networks. HLS is designed for reliability and dynamically adapts to network conditions by optimizing playback for the available speed of wired and wireless connections.</p> <p>HLS supports the following:</p> <ul style="list-style-type: none"><li>• Live broadcasts and prerecorded content (video on demand, or VOD)<li>• Multiple alternate streams at different bit rates<li>• Intelligent switching of streams in response to network bandwidth changes<li>• Media encryption and user authentication <p>“HTTP Live Streaming,” at 1 (available at https://developer.apple.com/documentation/http-live-streaming)</p>

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Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple’s Accused Products
	<p style="text-align: center;">Encode and deliver streaming media</p> <div style="border: 1px solid green; padding: 5px;"> <p>The following figure shows the three components of an HTTP Live Stream: the server component, the distribution component, and the client software.</p> </div>  <p>“HTTP Live Streaming,” at 1-2 (available at https://developer.apple.com/documentation/http-live-streaming)</p> <p>Prepare media with the server component</p> <p>The server component is responsible for taking input streams of media and encoding them digitally. It encapsulates them in a format suitable for delivery and prepares the encapsulated media for distribution.</p> <div style="border: 1px solid green; padding: 5px;"> <p>For live events, the server requires a media encoder, which can be off-the-shelf hardware, and a way to break the encoded media into segments and save them as files, which can either be software such as the media stream segmenter provided by Apple or part of an integrated third-party solution.</p> </div>

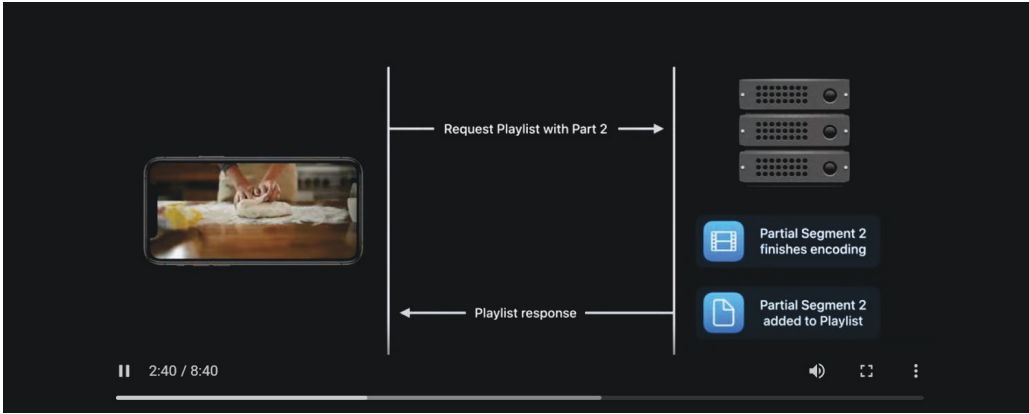
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Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple’s Accused Products
	<p align="center">“HTTP Live Streaming,” at 2 (available at https://developer.apple.com/documentation/http-live-streaming)</p> <p align="center">Deliver files with the distribution component</p> <div style="border: 1px solid green; padding: 5px;"> <p>The distribution system is a web server or a web-caching system that delivers the media files and index files to the client over HTTP. No custom server modules are required to deliver the content, and typically very little configuration is needed on the web server. To actually deploy HTTP Live Streaming, you need to create either an HTML page for browsers or a client app to act as a receiver. You also need the use of a web server and a way to encode live streams as fragmented MPEG-4 media files containing HEVC or H.264 video, and AAC or AC-3 audio.</p> </div> <p align="center">“HTTP Live Streaming,” at 2 (available at https://developer.apple.com/documentation/http-live-streaming)</p> <p>Further, to the extent this element is performed at least in part by software source code, ACT reserves the right to supplement these contentions pursuant to production of such source code and to the extent Defendant requires additional information in accordance with P.R. 3-1 and for any other reasons.</p>
<p>[1A] an internal storage device for storing digital contents, wherein the server device for media responds to a data transmission request from a network player by stream-delivering corresponding data</p>	<p>The Apple Accused Products comprise: an internal storage device for storing digital contents, wherein the server device for media responds to a data transmission request from a network player by stream-delivering corresponding data in corresponding digital contents from the internal storage device to the network player during connection to a network.</p> <p>For example, to access the media (<i>e.g.</i>, digital content), a user sends a request to the distribution server through client software. In response to the media access request, the server streams the requested media (<i>i.e.</i>, responding to a data transmission request from a network player by stream-delivering corresponding data in corresponding digital contents) through their distribution server that comprises origin web servers (<i>i.e.</i>, from the internal storage device to the network player) and caching infrastructure such as CDN.</p>

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Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple’s Accused Products
<p>in corresponding digital contents from the internal storage device to the network player during connection to a network;</p>	<p align="center">Access media through client software</p> <p>Client software is responsible for determining the appropriate media to request, downloading those resources, and then reassembling them so that the media can be presented to the user in a continuous stream. For the rules governing the interaction between an HLS player and its server, see HTTP Live Streaming 2nd Edition.</p> <p>“HTTP Live Streaming,” at 3 (available at https://developer.apple.com/documentation/http-live-streaming)</p> <p>Apple provides several frameworks that support HTTP Live Streaming, including AVKit, AVFoundation, and WebKit. Support has been available since iOS 3.0 and Safari 4.0, so there’s no need to develop your own client software.</p> <p>However, if you do develop your own client software, begin by fetching the index file using a URL that identifies the stream. The index file, in turn, specifies the location of the available media files, decryption keys, and any alternate streams available. For the selected stream, download each available media file in sequence. Each file contains a consecutive segment of the stream. Once it has a sufficient amount of data downloaded, present the reassembled stream to the user.</p> <p>“HTTP Live Streaming,” at 3 (available at https://developer.apple.com/documentation/http-live-streaming)</p>

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Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple’s Accused Products
	<p>Deliver files with the distribution component</p> <p>The distribution system is a web server or a web-caching system that delivers the media files and index files to the client over HTTP. No custom server modules are required to deliver the content, and typically very little configuration is needed on the web server. To actually deploy HTTP Live Streaming, you need to create either an HTML page for browsers or a client app to act as a receiver. You also need the use of a web server and a way to encode live streams as fragmented MPEG-4 media files containing HEVC or H.264 video, and AAC or AC-3 audio.</p> <p>“HTTP Live Streaming,” at 2 (available at https://developer.apple.com/documentation/http-live-streaming)</p>  <p>The diagram illustrates the HTTP Live Streaming (HLS) process. On the left, a video player interface shows a video of hands kneading dough. An arrow labeled "Request Playlist with Part 2" points from the player to a server rack on the right. The server rack consists of three server units. Below the server rack, two status messages are shown: "Partial Segment 2 finishes encoding" (with a filmstrip icon) and "Partial Segment 2 added to Playlist" (with a document icon). An arrow labeled "Playlist response" points from the server back to the video player. The video player interface at the bottom shows a play button, a progress bar at 2:40 / 8:40, a volume icon, a full-screen icon, and a menu icon.</p>

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	<p align="center">“Reduce latency with HLS Blocking Playlist Reload” (available at https://developer.apple.com/videos/play/wwdc2020/10231/)</p> <p>Further, to the extent this element is performed at least in part by software source code, ACT reserves the right to supplement these contentions pursuant to production of such source code and to the extent Defendant requires additional information in accordance with P.R. 3-1 and for any other reasons.</p>
<p>[1B] a transfer control unit adapted to transfer and store part of held digital contents in the internal storage device to a network storage device, wherein the network storage device is connected to the network and is capable of storing data, and wherein said transfer control unit does not transfer, from the internal storage device to the network storage device, the digital contents that cannot be recovered if a network failure occurs during the</p>	<p>The Apple Accused Products comprise: a transfer control unit adapted to transfer and store part of held digital contents in the internal storage device to a network storage device, wherein the network storage device is connected to the network and is capable of storing data, and wherein said transfer control unit does not transfer, from the internal storage device to the network storage device, the digital contents that cannot be recovered if a network failure occurs during the transferring of the digital contents from the internal storage device to the network storage device.</p> <p>For example, when a user sends a request to access the media file (<i>e.g.</i>, digital content) stored at the Apple server (<i>e.g.</i>, server device), the response streams the media file via the distribution server. The distribution server comprises of an origin web server (<i>e.g.</i>, server device) and caching infrastructure such as a Content Delivery Network (CDN) (<i>e.g.</i>, Network). Thus, when a user accesses the content stored at the Apple server, the content is delivered via caching infrastructure such as CDN, and if the content is not present at the caching infrastructure it is delivered from the origin web servers and cached at caching infrastructure such as CDN (<i>i.e.</i>, transferring and storing part of held digital contents in the internal storage device to a network storage device). In addition to this, due to certain policy restrictions, not all the content is allowed to be cached and therefore, the server device avoids transferring that non-cachable content to caching infrastructure including CDN (<i>i.e.</i>, the digital contents are not transferred from the internal storage device to the network storage device).</p>

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transferring of the digital contents from the internal storage device to the network storage device;	<p>Overview</p> <p>HTTP Live Streaming (HLS) sends audio and video over HTTP from an ordinary web server for playback on iOS-based devices—including iPhone, iPad, iPod touch, and Apple TV—and on desktop computers (macOS). Using the same protocol that powers the web, HLS deploys content using ordinary web servers and content delivery networks. HLS is designed for reliability and dynamically adapts to network conditions by optimizing playback for the available speed of wired and wireless connections.</p> <p>HLS supports the following:</p> <ul style="list-style-type: none">• Live broadcasts and prerecorded content (video on demand, or VOD)• Multiple alternate streams at different bit rates• Intelligent switching of streams in response to network bandwidth changes• Media encryption and user authentication <p>“HTTP Live Streaming,” at 1 (available at https://developer.apple.com/documentation/http-live-streaming)</p> <p>Access media through client software</p> <p>Client software is responsible for determining the appropriate media to request, downloading those resources, and then reassembling them so that the media can be presented to the user in a continuous stream. For the rules governing the interaction between an HLS player and its server, see HTTP Live Streaming 2nd Edition.</p> <p>“HTTP Live Streaming,” at 3 (available at https://developer.apple.com/documentation/http-live-streaming)</p>

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	<div style="border: 1px solid green; padding: 5px;"> <p>Expect Delivery from CDN Tune-In</p> <p>Players of Low-Latency HLS should expect delivery of low-latency streams through CDNs and other HTTP caches. To start playback at low latency, the client must first obtain a reasonably up-to-date version of the Media Playlist. Appendix C of HTTP Live Streaming 2nd Edition describes an efficient approach for obtaining an up-to-date Media Playlist served through an HTTP cache.</p> </div> <p>“Enabling Low-Latency HTTP Live Streaming (HLS),” at 5-6 (available at https://developer.apple.com/documentation/http-live-streaming/enabling-low-latency-http-live-streaming-hls)</p> <div style="border: 1px solid green; padding: 5px;"> <p>Encode and deliver streaming media</p> <p>The following figure shows the three components of an HTTP Live Stream: the server component, the distribution component, and the client software.</p> </div> <div> <pre> graph LR AV[AV Inputs] --> S[Server] subgraph S [Server] ME[Media encoder] fMP4[fMP4] SS[Stream segmenter] ME -.-> fMP4 fMP4 -.-> SS end S --> D[Distribution] subgraph D [Distribution] OWS[Origin web server] IF[Index file] MP4[.mp4] HTTP[HTTP] OWS --> IF OWS --> MP4 IF -.-> HTTP MP4 -.-> HTTP end D --> C[Client] </pre> </div>

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	<p>“HTTP Live Streaming,” at 1-2 (available at https://developer.apple.com/documentation/http-live-streaming)</p> <p>Deliver files with the distribution component</p> <p>The distribution system is a web server or a web-caching system that delivers the media files and index files to the client over HTTP. No custom server modules are required to deliver the content, and typically very little configuration is needed on the web server. To actually deploy HTTP Live Streaming, you need to create either an HTML page for browsers or a client app to act as a receiver. You also need the use of a web server and a way to encode live streams as fragmented MPEG-4 media files containing HEVC or H.264 video, and AAC or AC-3 audio.</p> <p>“HTTP Live Streaming,” at 2 (available at https://developer.apple.com/documentation/http-live-streaming)</p> <p>Country and region restrictions</p> <ul style="list-style-type: none"> <li>• Not all content is cached in all regions. <li>• iTunes downloads are not cached in Brazil, Mexico, China mainland, or Portugal. Apple Books downloads are not cached in Canada. <li>• When macOS content caching is enabled, the IP address and region of a Mac computer are registered with Apple. To cache iTunes and App Store content, the registered region of the macOS content cache must match the region of the client Apple ID accounts. <p>“Content types supported by content caching in macOS,” at 2 (available at https://support.apple.com/en-us/102860)</p>

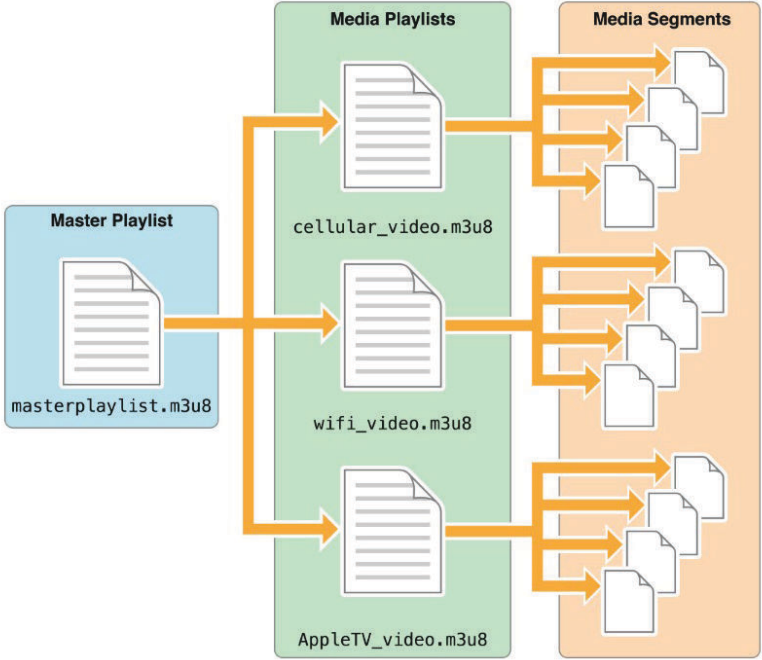
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Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple’s Accused Products
	<p>Further, to the extent this element is performed at least in part by software source code, ACT reserves the right to supplement these contentions pursuant to production of such source code and to the extent Defendant requires additional information in accordance with P.R. 3-1 and for any other reasons.</p>
<p>[1C] a list information transmission unit adapted to respond to a list presentation request for the held digital contents of the server device for media from the network player by transmitting list information to the network player, wherein the list information lists the digital contents left in the internal storage device and the digital contents transferred from the internal storage device to the network storage device and stored in the network storage device, and wherein the list information maintains a tree structure of the digital contents in the internal storage device before transferring the digital contents to the network storage device.</p>	<p>The Apple Accused Products comprise: a list information transmission unit adapted to respond to a list presentation request for the held digital contents of the server device for media from the network player by transmitting list information to the network player, wherein the list information lists the digital contents left in the internal storage device and the digital contents transferred from the internal storage device to the network storage device and stored in the network storage device, and wherein the list information maintains a tree structure of the digital contents in the internal storage device before transferring the digital contents to the network storage device.</p> <p>For example, a hardware encoder takes audio-video input, encodes it as HEVC video and AC-3 audio, and outputs a fragmented MPEG-4 file, or an MPEG-2 transport stream. A software stream segmenter then breaks the stream into a series of short media files, which are placed on a web server. The segmenter also creates and maintains an index file containing a list of the media files. The URL of the index file is published on the web server. In response to the client software’s (i.e., Network Player) request for accessing an index (i.e., responding to a list presentation request for the held digital contents of the server device for media) file the client software is provided with the index file (i.e., transmitting list information to the network player) containing a list of the media files (i.e., wherein the list information lists the digital contents left in the internal storage device and the digital contents transferred from the internal storage device to the network storage device and stored in the network storage device). Each index file (e.g., masterpalaylist.m3u8) comprises several media playlist files (e.g., cellular_video.m3u8, wifi_video.m3u8, Apple_Tv.m3u8) containing the URLs to access several media segments of the media, therefore this is a tree structure to list the digital content (i.e., wherein the list information maintains a tree structure of the digital contents in the internal storage device before transferring the digital contents to the network storage device).</p>

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<p>maintains a tree structure of the digital contents in the internal storage device before transferring the digital contents to the network storage device;</p>	<p align="center">HLS Workflow</p> <p>In a typical HLS workflow, a video encoder solution that supports HLS receives a live video feed or distribution-ready media file. The encoder creates multiple versions (known as <i>variants</i>) of the audio/video at different bit rates, resolutions, and quality levels. The encoder then segments the variants into a series of small files, called <i>media segments</i>. At the same time, the encoder creates a <i>media playlist</i> file for each variant containing a list of URLs pointing to the variant’s media segments. The encoder also creates a <i>master playlist</i> file, containing a list of the URLs to variant media playlists, and descriptive tags to control the playback behavior of the stream. While producing playlists and segments, the encoder or automated scripts upload the files to a web server or CDN.</p> <p>“About HTTP Live Streaming,” at 1 (available at https://developer.apple.com/library/archive/referencelibrary/GettingStarted/AboutHTTPLiveStreaming/about/about.html)</p> <p>In a typical configuration, a hardware encoder takes audio-video input, encodes it as HEVC video and AC-3 audio, and outputs a fragmented MPEG-4 file or an MPEG-2 transport stream. A software stream segmenter then breaks the stream into a series of short media files, which are placed on a web server. The segmenter also creates and maintains an index file containing a list of the media files. The URL of the index file is published on the web server. Client software reads the index, then requests the listed media files in order and displays them without any pauses or gaps between segments.</p> <p>“HTTP Live Streaming,” at 1-2 (available at https://developer.apple.com/documentation/http-live-streaming)</p>

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	<p>Figure 1 Playlist relationships</p>  <p>“About HTTP Live Streaming,” at 4 (available at https://developer.apple.com/library/archive/referencelibrary/GettingStarted/AboutHTTPLiveStreaming/about/about.html)</p>

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	<p>Master Playlists</p> <div style="border: 1px solid green; padding: 5px;"> <p>The master playlist provides an address for each individual media playlist in the stream. Figure 1 shows this relationship. The master playlist also provides important details such as bandwidth, resolution, and codec. The player uses that information to decide the most appropriate variant for the device and the currently measured, available bandwidth.</p> </div> <p>“About HTTP Live Streaming,” at 3-4 (available at https://developer.apple.com/library/archive/referencelibrary/GettingStarted/AboutHTTPLiveStreaming/about/about.html)</p> <p>Listing 4 A master playlist file with four available variants</p> <div style="border: 1px solid gray; padding: 10px;"> <pre> #EXTM3U #EXT-X-VERSION:6 #EXT-X-STREAM-INF:PROGRAM-ID=1,BANDWIDTH=2855600,CODECS="avc1.4d001f,mp4a.40.2",RESOLUTION=960x540 live/medium.m3u8 #EXT-X-STREAM-INF:PROGRAM-ID=1,BANDWIDTH=5605600,CODECS="avc1.640028,mp4a.40.2",RESOLUTION=1280x720 live/high.m3u8 #EXT-X-STREAM-INF:PROGRAM-ID=1,BANDWIDTH=1755600,CODECS="avc1.42001f,mp4a.40.2",RESOLUTION=640x360 live/low.m3u8 #EXT-X-STREAM-INF:PROGRAM-ID=1,BANDWIDTH=545600,CODECS="avc1.42001e,mp4a.40.2",RESOLUTION=416x234 live/cellular.m3u8 </pre> </div>

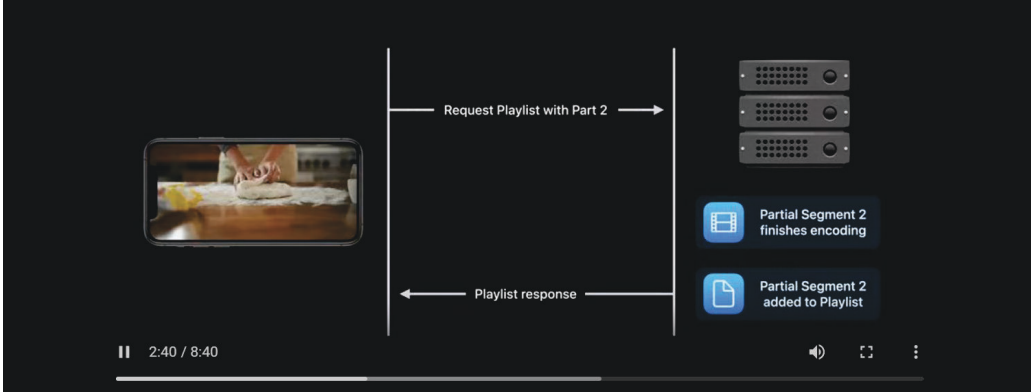
Appendix E-2 - Claim Chart for U.S. Patent No. 8,230,101 Against Products with HTTP Live Streaming (HLS)

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple’s Accused Products
	<p>“About HTTP Live Streaming,” at 3-4 (available at https://developer.apple.com/library/archive/referencelibrary/GettingStarted/AboutHTTPLiveStreaming/about/about.html)</p> <p>Media Playlist Files</p> <div style="border: 1px solid black; padding: 5px;"> <p>The encoder creates the media playlists as text files saved in the M3U format (.m3u8). The media playlists contain URLs to the media segments and other information needed for playback. The playlist type—live, event, or video on demand (VOD)—determines how the stream can be navigated.</p> <p>Live playlists let viewers perform fast forward and reverse playback within a limited time range. The range advances along the program until the end of the live presentation. Event playlists let a viewer rewind to the beginning of the stream even as it continues to stream live. VOD playlists represent a previously completed program that can be fully navigated from beginning to end.</p> </div> <p>“About HTTP Live Streaming,” at 2 (available at https://developer.apple.com/library/archive/referencelibrary/GettingStarted/AboutHTTPLiveStreaming/about/about.html)</p> <p>Listing 1 A simple live media playlist</p> <pre> #EXTM3U #EXT-X-VERSION:6 #EXT-X-TARGETDURATION:10 #EXT-X-MEDIA-SEQUENCE:26 #EXTINF:9.901, http://media.example.com/wifi/segment26.ts #EXTINF:9.901, http://media.example.com/wifi/segment27.ts #EXTINF:9.501, http://media.example.com/wifi/segment28.ts </pre>

Appendix E-2 - Claim Chart for U.S. Patent No. 8,230,101 Against Products with HTTP Live Streaming (HLS)

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple’s Accused Products
	<p>“About HTTP Live Streaming,” at 2 (available at https://developer.apple.com/library/archive/referencelibrary/GettingStarted/AboutHTTPLiveStreaming/about/about.html)</p> <p align="center">Media Segments</p> <p>An encoder creates media segments by dividing the event data into short MPEG-2 transport stream files (.ts). Typically, the files contain H.264 video or AAC audio with a duration of 5 to 10 seconds each. The encoder lets you set the encoding and duration of the media segments.</p> <p>“About HTTP Live Streaming,” at 1 (available at https://developer.apple.com/library/archive/referencelibrary/GettingStarted/AboutHTTPLiveStreaming/about/about.html)</p> <p>Further, to the extent this element is performed at least in part by software source code, ACT reserves the right to supplement these contentions pursuant to production of such source code and to the extent Defendant requires additional information in accordance with P.R. 3-1 and for any other reasons.</p>
<p>[1D] a search unit adapted to respond to a data transmission request for the held digital contents from the network player by searching for a location where the held digital contents are currently stored; and</p>	<p>The Apple Accused Products comprise: a search unit adapted to respond to a data transmission request for the held digital contents from the network player by searching for a location where the held digital contents are currently stored.</p> <p>For example, in response to a media access request from the client software (i.e., Network Player), the requested content is searched across Apple distribution server comprising of Apple origin servers and caching infrastructure including CDN. This process involves accessing an index file, such as ‘masterplaylist.m3u8’, which contains URLs to various media playlist files (e.g., ‘cellular_video.m3u8’, ‘wifi_video.m3u8’, ‘Apple_TV.m3u8’). Each of these media playlist files lists URLs for accessing specific media segments.</p>

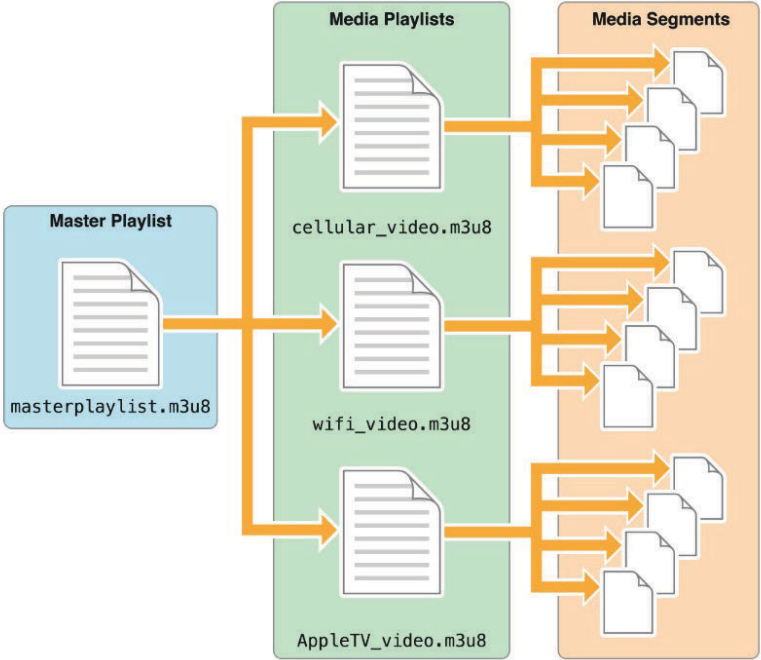
Appendix E-2 - Claim Chart for U.S. Patent No. 8,230,101 Against Products with HTTP Live Streaming (HLS)

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple’s Accused Products
	 <p>“Reduce latency with HLS Blocking Playlist Reload” (available at https://developer.apple.com/videos/play/wwdc2020/10231/)</p> <p>In a typical configuration, a hardware encoder takes audio-video input, encodes it as HEVC video and AC-3 audio, and outputs a fragmented MPEG-4 file or an MPEG-2 transport stream. A software stream segmenter then breaks the stream into a series of short media files, which are placed on a web server. The segmenter also creates and maintains an index file containing a list of the media files. The URL of the index file is published on the web server. Client software reads the index, then requests the listed media files in order and displays them without any pauses or gaps between segments.</p> <p>“HTTP Live Streaming,” at 1-2 (available at https://developer.apple.com/documentation/http-live-streaming)</p>

Appendix E-2 - Claim Chart for U.S. Patent No. 8,230,101 Against Products with HTTP Live Streaming (HLS)

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple’s Accused Products
	<p>Overview</p> <p>HTTP Live Streaming (HLS) sends audio and video over HTTP from an ordinary web server for playback on iOS-based devices—including iPhone, iPad, iPod touch, and Apple TV—and on desktop computers (macOS). Using the same protocol that powers the web, HLS deploys content using ordinary web servers and content delivery networks. HLS is designed for reliability and dynamically adapts to network conditions by optimizing playback for the available speed of wired and wireless connections.</p> <p>HLS supports the following:</p> <ul style="list-style-type: none">• Live broadcasts and prerecorded content (video on demand, or VOD)• Multiple alternate streams at different bit rates• Intelligent switching of streams in response to network bandwidth changes• Media encryption and user authentication <p>“HTTP Live Streaming,” at 1 (available at https://developer.apple.com/documentation/http-live-streaming)</p> <p>Deliver files with the distribution component</p> <p>The distribution system is a web server or a web-caching system that delivers the media files and index files to the client over HTTP. No custom server modules are required to deliver the content, and typically very little configuration is needed on the web server. To actually deploy HTTP Live Streaming, you need to create either an HTML page for browsers or a client app to act as a receiver. You also need the use of a web server and a way to encode live streams as fragmented MPEG-4 media files containing HEVC or H.264 video, and AAC or AC-3 audio.</p>

Appendix E-2 - Claim Chart for U.S. Patent No. 8,230,101 Against Products with HTTP Live Streaming (HLS)

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple’s Accused Products
	<p>“HTTP Live Streaming,” at 2 (available at https://developer.apple.com/documentation/http-live-streaming)</p> <p>Figure 1 Playlist relationships</p>  <p>“About HTTP Live Streaming,” at 4 (available at https://developer.apple.com/library/archive/referencelibrary/GettingStarted/AboutHTTPLiveStreaming/about/about.html)</p>

Appendix E-2 - Claim Chart for U.S. Patent No. 8,230,101 Against Products with HTTP Live Streaming (HLS)

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple’s Accused Products
	<p>Master Playlists</p> <div style="border: 1px solid green; padding: 5px;"> <p>The master playlist provides an address for each individual media playlist in the stream. Figure 1 shows this relationship. The master playlist also provides important details such as bandwidth, resolution, and codec. The player uses that information to decide the most appropriate variant for the device and the currently measured, available bandwidth.</p> </div> <p>“About HTTP Live Streaming,” at 3-4 (available at https://developer.apple.com/library/archive/referencelibrary/GettingStarted/AboutHTTPLiveStreaming/about/about.html)</p> <p>Listing 4 A master playlist file with four available variants</p> <div style="border: 1px solid gray; padding: 10px;"> <pre> #EXTM3U #EXT-X-VERSION:6 #EXT-X-STREAM-INF:PROGRAM-ID=1,BANDWIDTH=2855600,CODECS="avc1.4d001f,mp4a.40.2",RESOLUTION=960x540 live/medium.m3u8 #EXT-X-STREAM-INF:PROGRAM-ID=1,BANDWIDTH=5605600,CODECS="avc1.640028,mp4a.40.2",RESOLUTION=1280x720 live/high.m3u8 #EXT-X-STREAM-INF:PROGRAM-ID=1,BANDWIDTH=1755600,CODECS="avc1.42001f,mp4a.40.2",RESOLUTION=640x360 live/low.m3u8 #EXT-X-STREAM-INF:PROGRAM-ID=1,BANDWIDTH=545600,CODECS="avc1.42001e,mp4a.40.2",RESOLUTION=416x234 live/cellular.m3u8 </pre> </div>

Appendix E-2 - Claim Chart for U.S. Patent No. 8,230,101 Against Products with HTTP Live Streaming (HLS)

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple’s Accused Products
	<p>“About HTTP Live Streaming,” at 3-4 (available at https://developer.apple.com/library/archive/referencelibrary/GettingStarted/AboutHTTPLiveStreaming/about/about.html)</p> <p>Media Playlist Files</p> <p>The encoder creates the media playlists as text files saved in the M3U format (.m3u8). The media playlists contain URLs to the media segments and other information needed for playback. The playlist type—live, event, or video on demand (VOD)—determines how the stream can be navigated.</p> <p>Live playlists let viewers perform fast forward and reverse playback within a limited time range. The range advances along the program until the end of the live presentation. Event playlists let a viewer rewind to the beginning of the stream even as it continues to stream live. VOD playlists represent a previously completed program that can be fully navigated from beginning to end.</p> <p>“About HTTP Live Streaming,” at 2 (available at https://developer.apple.com/library/archive/referencelibrary/GettingStarted/AboutHTTPLiveStreaming/about/about.html)</p> <p>Listing 1 A simple live media playlist</p> <pre> #EXTM3U #EXT-X-VERSION:6 #EXT-X-TARGETDURATION:10 #EXT-X-MEDIA-SEQUENCE:26 #EXTINF:9.901, http://media.example.com/wifi/segment26.ts #EXTINF:9.901, http://media.example.com/wifi/segment27.ts #EXTINF:9.501, http://media.example.com/wifi/segment28.ts </pre>

Appendix E-2 - Claim Chart for U.S. Patent No. 8,230,101 Against Products with HTTP Live Streaming (HLS)

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple’s Accused Products
	<p>“About HTTP Live Streaming,” at 2 (available at https://developer.apple.com/library/archive/referencelibrary/GettingStarted/AboutHTTPLiveStreaming/about/about.html)</p> <p align="center">Media Segments</p> <p>An encoder creates media segments by dividing the event data into short MPEG-2 transport stream files (.ts). Typically, the files contain H.264 video or AAC audio with a duration of 5 to 10 seconds each. The encoder lets you set the encoding and duration of the media segments.</p> <p>“About HTTP Live Streaming,” at 1 (available at https://developer.apple.com/library/archive/referencelibrary/GettingStarted/AboutHTTPLiveStreaming/about/about.html)</p> <p>Further, to the extent this element is performed at least in part by software source code, ACT reserves the right to supplement these contentions pursuant to production of such source code and to the extent Defendant requires additional information in accordance with P.R. 3-1 and for any other reasons.</p>
<p>[1E] a digital contents data transmission processing unit adapted to allow the corresponding data in held digital contents to be stream-delivered from the network storage device to the network player, if the result of search</p>	<p>The Apple Accused Products comprise: a digital contents data transmission processing unit adapted to allow the corresponding data in held digital contents to be stream-delivered from the network storage device to the network player, if the result of search shows the network storage device.</p> <p>For example, in response to a media access request from the client software (i.e., Network Player), the requested content is searched across Apple’s distribution server comprising of Apple origin servers and caching infrastructure including CDN. If the requested media is available with Apple’s caching infrastructure including CDN, it is delivered (i.e., allowing the corresponding data in held digital contents to be stream-delivered) to the client software (i.e., Network Player) from Apple’s caching infrastructure including CDN (i.e., Network Storage). This process involves accessing an index file, such as ‘masterplaylist.m3u8’, which contains URLs to various media playlist files (e.g., ‘cellular_video.m3u8’, ‘wifi_video.m3u8’, ‘Apple_TV.m3u8’). Each of these media playlist files lists URLs for accessing specific media segments. The</p>

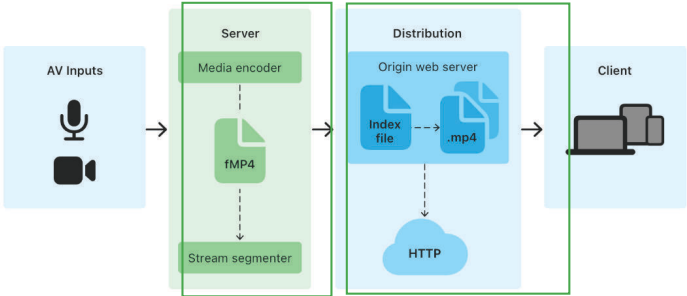
Appendix E-2 - Claim Chart for U.S. Patent No. 8,230,101 Against Products with HTTP Live Streaming (HLS)

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple’s Accused Products
shows the network storage device,	<p>media segments are then accessed through the Apple’s caching infrastructure including CDN, which is part of the Apple’s distribution server.</p> <div><p>The diagram shows a video player interface on the left with a video thumbnail and a progress bar. On the right, a server rack is depicted. An arrow labeled "Request Playlist with Part 2" points from the client to the server. Below the server, two status boxes indicate "Partial Segment 2 finishes encoding" and "Partial Segment 2 added to Playlist". An arrow labeled "Playlist response" points from the server back to the client.</p></div> <p>“Reduce latency with HLS Blocking Playlist Reload” (available at https://developer.apple.com/videos/play/wwdc2020/10231/)</p>

Appendix E-2 - Claim Chart for U.S. Patent No. 8,230,101 Against Products with HTTP Live Streaming (HLS)

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple’s Accused Products
	<p>In a typical configuration, a hardware encoder takes audio-video input, encodes it as HEVC video and AC-3 audio, and outputs a fragmented MPEG-4 file or an MPEG-2 transport stream. A software stream segmenter then breaks the stream into a series of short media files, which are placed on a web server. The segmenter also creates and maintains an index file containing a list of the media files. The URL of the index file is published on the web server. Client software reads the index, then requests the listed media files in order and displays them without any pauses or gaps between segments.</p> <p>“HTTP Live Streaming,” at 1-2 (available at https://developer.apple.com/documentation/http-live-streaming)</p> <p style="text-align: center;">Overview</p> <p>HTTP Live Streaming (HLS) sends audio and video over HTTP from an ordinary web server for playback on iOS-based devices—including iPhone, iPad, iPod touch, and Apple TV—and on desktop computers (macOS). Using the same protocol that powers the web, HLS deploys content using ordinary web servers and content delivery networks. HLS is designed for reliability and dynamically adapts to network conditions by optimizing playback for the available speed of wired and wireless connections.</p> <p>HLS supports the following:</p> <ul style="list-style-type: none"> • Live broadcasts and prerecorded content (video on demand, or VOD) • Multiple alternate streams at different bit rates • Intelligent switching of streams in response to network bandwidth changes • Media encryption and user authentication <p>“HTTP Live Streaming,” at 1 (available at https://developer.apple.com/documentation/http-live-streaming)</p>

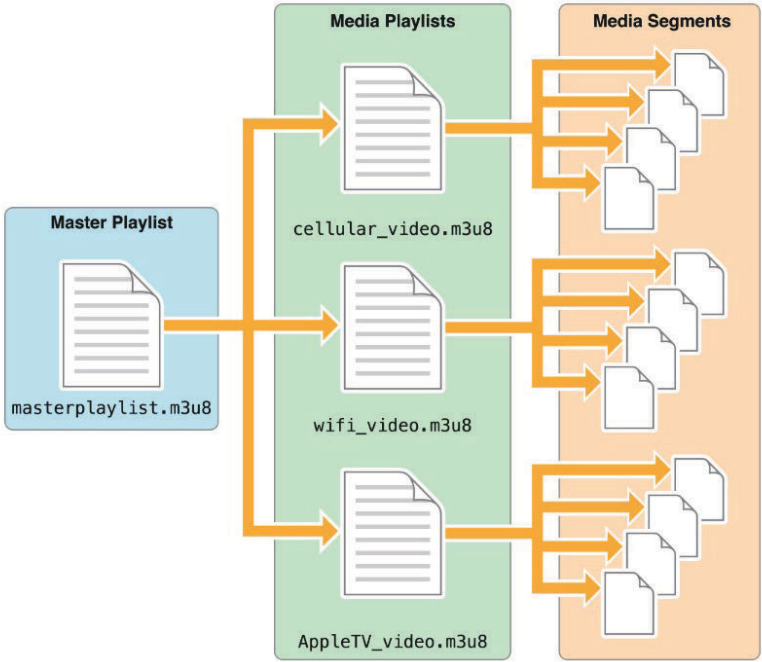
Appendix E-2 - Claim Chart for U.S. Patent No. 8,230,101 Against Products with HTTP Live Streaming (HLS)

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple’s Accused Products
	<p>Deliver files with the distribution component</p> <p>The distribution system is a web server or a web-caching system that delivers the media files and index files to the client over HTTP. No custom server modules are required to deliver the content, and typically very little configuration is needed on the web server. To actually deploy HTTP Live Streaming, you need to create either an HTML page for browsers or a client app to act as a receiver. You also need the use of a web server and a way to encode live streams as fragmented MPEG-4 media files containing HEVC or H.264 video, and AAC or AC-3 audio.</p> <p>“HTTP Live Streaming,” at 2 (available at https://developer.apple.com/documentation/http-live-streaming)</p> <p>Encode and deliver streaming media</p> <p>The following figure shows the three components of an HTTP Live Stream: the server component, the distribution component, and the client software.</p>  <p>“HTTP Live Streaming,” at 1-2 (available at https://developer.apple.com/documentation/http-live-streaming)</p>

Appendix E-2 - Claim Chart for U.S. Patent No. 8,230,101 Against Products with HTTP Live Streaming (HLS)

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple’s Accused Products
	<p>Expect Delivery from CDN Tune-In</p> <p>Players of Low-Latency HLS should expect delivery of low-latency streams through CDNs and other HTTP caches. To start playback at low latency, the client must first obtain a reasonably up-to-date version of the Media Playlist. Appendix C of HTTP Live Streaming 2nd Edition describes an efficient approach for obtaining an up-to-date Media Playlist served through an HTTP cache.</p> <p>“Enabling Low-Latency HTTP Live Streaming (HLS),” at 5-6 (available at https://developer.apple.com/documentation/http-live-streaming/enabling-low-latency-http-live-streaming-hls)</p>

Appendix E-2 - Claim Chart for U.S. Patent No. 8,230,101 Against Products with HTTP Live Streaming (HLS)

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	<p>Figure 1 Playlist relationships</p>  <p>“About HTTP Live Streaming,” at 4 (available at https://developer.apple.com/library/archive/referencelibrary/GettingStarted/AboutHTTPLiveStreaming/about/about.html)</p>

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	<p>Master Playlists</p> <p>The master playlist provides an address for each individual media playlist in the stream. Figure 1 shows this relationship. The master playlist also provides important details such as bandwidth, resolution, and codec. The player uses that information to decide the most appropriate variant for the device and the currently measured, available bandwidth.</p> <p>“About HTTP Live Streaming,” at 3-4 (available at https://developer.apple.com/library/archive/referencelibrary/GettingStarted/AboutHTTPLiveStreaming/about/about.html)</p> <p>Listing 4 A master playlist file with four available variants</p> <pre> #EXTM3U #EXT-X-VERSION:6 #EXT-X-STREAM-INF:PROGRAM-ID=1,BANDWIDTH=2855600,CODECS="avc1.4d001f,mp4a.40.2",RESOLUTION=960x540 live/medium.m3u8 #EXT-X-STREAM-INF:PROGRAM-ID=1,BANDWIDTH=5605600,CODECS="avc1.640028,mp4a.40.2",RESOLUTION=1280x720 live/high.m3u8 #EXT-X-STREAM-INF:PROGRAM-ID=1,BANDWIDTH=1755600,CODECS="avc1.42001f,mp4a.40.2",RESOLUTION=640x360 live/low.m3u8 #EXT-X-STREAM-INF:PROGRAM-ID=1,BANDWIDTH=545600,CODECS="avc1.42001e,mp4a.40.2",RESOLUTION=416x234 live/cellular.m3u8 </pre>

Appendix E-2 - Claim Chart for U.S. Patent No. 8,230,101 Against Products with HTTP Live Streaming (HLS)

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<p>[1F] wherein the server device for media is a media player.</p>	<p>The Apple Accused Products comprise: wherein the server device for media is a media player.</p> <p>For example, the media content at Apple’s servers can be played/streamed using various client software (<i>e.g.</i>, AVKit, AVFoundation, WebKit, AppleTV, etc.) developed by Apple. The Apple servers (<i>i.e.</i>, server device for media) in integration with client software play/stream the media files, therefore, Apple servers act as a media player.</p>

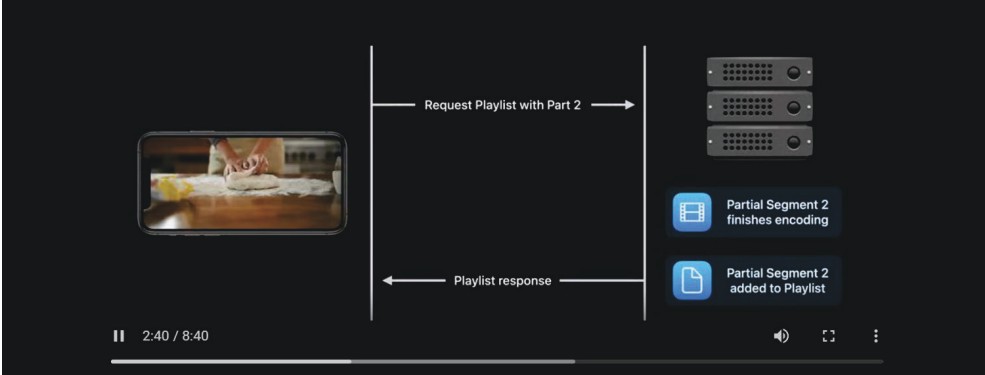
Appendix E-2 - Claim Chart for U.S. Patent No. 8,230,101 Against Products with HTTP Live Streaming (HLS)

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple’s Accused Products
	<p>Access media through client software</p> <p>Client software is responsible for determining the appropriate media to request, downloading those resources, and then reassembling them so that the media can be presented to the user in a continuous stream. For the rules governing the interaction between an HLS player and its server, see HTTP Live Streaming 2nd Edition.</p> <p>“HTTP Live Streaming,” at 3 (available at https://developer.apple.com/documentation/http-live-streaming)</p> <p>Apple provides several frameworks that support HTTP Live Streaming, including AVKit, AVFoundation, and WebKit. Support has been available since iOS 3.0 and Safari 4.0, so there’s no need to develop your own client software.</p> <p>“HTTP Live Streaming,” at 3 (available at https://developer.apple.com/documentation/http-live-streaming)</p> <p>However, if you do develop your own client software, begin by fetching the index file using a URL that identifies the stream. The index file, in turn, specifies the location of the available media files, decryption keys, and any alternate streams available. For the selected stream, download each available media file in sequence. Each file contains a consecutive segment of the stream. Once it has a sufficient amount of data downloaded, present the reassembled stream to the user.</p> <p>“HTTP Live Streaming,” at 3 (available at https://developer.apple.com/documentation/http-live-streaming)</p>

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	<p>Overview</p> <p>HTTP Live Streaming (HLS) sends audio and video over HTTP from an ordinary web server for playback on iOS-based devices—including iPhone, iPad, iPod touch, and Apple TV—and on desktop computers (macOS). Using the same protocol that powers the web, HLS deploys content using ordinary web servers and content delivery networks. HLS is designed for reliability and dynamically adapts to network conditions by optimizing playback for the available speed of wired and wireless connections.</p> <p>HLS supports the following:</p> <ul style="list-style-type: none">• Live broadcasts and prerecorded content (video on demand, or VOD)• Multiple alternate streams at different bit rates• Intelligent switching of streams in response to network bandwidth changes• Media encryption and user authentication <p>“HTTP Live Streaming,” at 1 (available at https://developer.apple.com/documentation/http-live-streaming)</p>

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Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple’s Accused Products
	 <p>“Reduce latency with HLS Blocking Playlist Reload,” at 2:40 (available at https://developer.apple.com/videos/play/wwdc2020/10231/)</p> <p>Further, to the extent this element is performed at least in part by software source code, ACT reserves the right to supplement these contentions pursuant to production of such source code and to the extent Defendant requires additional information in accordance with P.R. 3-1 and for any other reasons.</p>
<p>[2] The server device for media according to claim 1, wherein said digital contents data transmission processing unit causes the network storage device to transmit the corresponding data</p>	<p>The Apple Accused Products comprise: The server device for media according to claim 1, wherein said digital contents data transmission processing unit causes the network storage device to transmit the corresponding data to the server device for media, and then transmits the corresponding data received from the network storage device from the server device for media to the network player.</p> <p><i>See Claim [1E].</i> As shown below, the digital contents data transmission processing unit causes the network cache (<i>i.e.</i>, HLS using CDNs) to transmit the data to the Apple web server for the ultimate transmission to the client device/app for playing.</p>

Appendix E-2 - Claim Chart for U.S. Patent No. 8,230,101 Against Products with HTTP Live Streaming (HLS)

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple’s Accused Products
<p>to the server device for media, and then transmits the corresponding data received from the network storage device from the server device for media to the network player.</p>	<p align="center">Deliver files with the distribution component</p> <p>The distribution system is a web server or a web-caching system that delivers the media files and index files to the client over HTTP. No custom server modules are required to deliver the content, and typically very little configuration is needed on the web server. To actually deploy HTTP Live Streaming, you need to create either an HTML page for browsers or a client app to act as a receiver. You also need the use of a web server and a way to encode live streams as fragmented MPEG-4 media files containing HEVC or H.264 video, and AAC or AC-3 audio.</p> <p>“HTTP Live Streaming,” at 2 (available at https://developer.apple.com/documentation/http-live-streaming)</p> <p>Further, to the extent this element is performed at least in part by software source code, ACT reserves the right to supplement these contentions pursuant to production of such source code and to the extent Defendant requires additional information in accordance with P.R. 3-1 and for any other reasons.</p>
<p>[3] The server device for media according to claim 1, wherein said digital contents data transmission processing unit transmits the corresponding data and information for identifying the network storage device to the</p>	<p>The Apple Accused Products comprise: The server device for media according to claim 1, wherein said digital contents data transmission processing unit transmits the corresponding data and information for identifying the network storage device to the network player, and causes the network storage device to directly transmit the corresponding data to the network player.</p> <p><i>See Claim [1E]. As shown below, the digital contents data transmission processing unit transmits corresponding data and information for identification of the network storage device because “[t]o start playback at low latency, the client [i.e., network player] must first obtain an up-to-date version of the Media Playlist served through an [identified] HTTP cache.”</i></p>

Appendix E-2 - Claim Chart for U.S. Patent No. 8,230,101 Against Products with HTTP Live Streaming (HLS)

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple’s Accused Products
<p>network player, and causes the network storage device to directly transmit the corresponding data to the network player.</p>	<p align="center">Expect Delivery from CDN Tune-In</p> <p>Players of Low-Latency HLS should expect delivery of low-latency streams through CDNs and other HTTP caches. To start playback at low latency, the client must first obtain a reasonably up-to-date version of the Media Playlist. Appendix C of HTTP Live Streaming 2nd Edition describes an efficient approach for obtaining an up-to-date Media Playlist served through an HTTP cache.</p> <p>“Enabling Low-Latency HTTP Live Streaming (HLS),” at 5-6 (available at https://developer.apple.com/documentation/http-live-streaming/enabling-low-latency-http-live-streaming-hls)</p> <p>Further, to the extent this element is performed at least in part by software source code, ACT reserves the right to supplement these contentions pursuant to production of such source code and to the extent Defendant requires additional information in accordance with P.R. 3-1 and for any other reasons.</p>
<p>[4] The server device for media according to claim 1, further comprising a return control unit adapted to cause the digital contents corresponding to a predetermined condition among the digital contents which have been</p>	<p>The Apple Accused Products comprise: The server device for media according to claim 1, further comprising a return control unit adapted to cause the digital contents corresponding to a predetermined condition among the digital contents which have been transferred to the network storage device to be returned from the network storage device to the internal storage device.</p> <p>For example, digital contents that meet a certain predetermined condition, such as being requested on an iOS-based device, may be returned from the network storage device to an internal storage device (ordinary web server).</p>

Appendix E-2 - Claim Chart for U.S. Patent No. 8,230,101 Against Products with HTTP Live Streaming (HLS)

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple’s Accused Products
<p>transferred to the network storage device to be returned from the network storage device to the internal storage device.</p>	<p>Overview</p> <p>HTTP Live Streaming (HLS) sends audio and video over HTTP from an ordinary web server for playback on iOS-based devices—including iPhone, iPad, iPod touch, and Apple TV—and on desktop computers (macOS). Using the same protocol that powers the web, HLS deploys content using ordinary web servers and content delivery networks. HLS is designed for reliability and dynamically adapts to network conditions by optimizing playback for the available speed of wired and wireless connections.</p> <p>HLS supports the following:</p> <ul style="list-style-type: none"> • Live broadcasts and prerecorded content (video on demand, or VOD) • Multiple alternate streams at different bit rates • Intelligent switching of streams in response to network bandwidth changes • Media encryption and user authentication <p>“HTTP Live Streaming,” at 1 (available at https://developer.apple.com/documentation/http-live-streaming)</p> <p>Further, to the extent this element is performed at least in part by software source code, ACT reserves the right to supplement these contentions pursuant to production of such source code and to the extent Defendant requires additional information in accordance with P.R. 3-1 and for any other reasons.</p>
<p>[5] The server device for media according to claim 1, wherein said list information transmission unit makes the list information to be</p>	<p>The Apple Accused Products comprise: The server device for media according to claim 1, wherein said list information transmission unit makes the list information to be transmitted to the network player include information for identifying whether each digital content is currently stored in the internal storage device or the network storage device in the display list of the network player.</p> <p>For example, as shown below, the list information transmission unit lists information identifying the source of the digital content because “[t]he URL of the index file is published on the web server” and “[c]lient software reads the index.”</p>

Appendix E-2 - Claim Chart for U.S. Patent No. 8,230,101 Against Products with HTTP Live Streaming (HLS)

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple’s Accused Products
<p>transmitted to the network player include information for identifying whether each digital content is currently stored in the internal storage device or the network storage device in the display list of the network player.</p>	<p>In a typical configuration, a hardware encoder takes audio-video input, encodes it as HEVC video and AC-3 audio, and outputs a fragmented MPEG-4 file or an MPEG-2 transport stream. A software stream segmenter then breaks the stream into a series of short media files, which are placed on a web server. The segmenter also creates and maintains an index file containing a list of the media files. The URL of the index file is published on the web server. Client software reads the index, then requests the listed media files in order and displays them without any pauses or gaps between segments.</p> <p>“HTTP Live Streaming,” at 1-2 (available at https://developer.apple.com/documentation/http-live-streaming)</p> <p>Further, to the extent this element is performed at least in part by software source code, ACT reserves the right to supplement these contentions pursuant to production of such source code and to the extent Defendant requires additional information in accordance with P.R. 3-1 and for any other reasons.</p>
<p>[7P] A method for controlling a server device for media which is equipped with an internal storage device for storing digital contents, the method comprising the steps of:</p>	<p>Users of the Apple Accused Products perform a method for controlling a server device for media which is equipped with an internal storage device for storing digital contents. Apple directly infringes and induces infringement by causing a user to perform the claimed method on the Apple Accused Products. Users of the Apple Accused Products directly infringe by using the Apple Accused Products. Apple induces infringement by users by supplying the Apple Accused Products and instructing and encouraging users to use the Apple Accused Products in an infringing manner.</p> <p><i>See Claim [1P].</i></p>
<p>[7A] responding to a data transmission request from a network player by</p>	<p>Users of the Apple Accused Products perform responding to a data transmission request from a network player by stream-delivering corresponding data in corresponding digital contents from the internal storage device to the network player during connection to a network.</p>

Appendix E-2 - Claim Chart for U.S. Patent No. 8,230,101 Against Products with HTTP Live Streaming (HLS)

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple’s Accused Products
<p>stream-delivering corresponding data in corresponding digital contents from the internal storage device to the network player during connection to a network;</p>	<p><i>See Claim [1A].</i></p>
<p>[7B] transferring and storing part of held digital contents in the internal storage device to a network storage device, wherein the network storage device is connected to the network and is capable of storing data, and wherein the digital contents that cannot be recovered if a network failure occurs during the transferring of the digital contents are not transferred from the internal storage device to the</p>	<p>Users of the Apple Accused Products perform transferring and storing part of held digital contents in the internal storage device to a network storage device, wherein the network storage device is connected to the network and is capable of storing data, and wherein the digital contents that cannot be recovered if a network failure occurs during the transferring of the digital contents are not transferred from the internal storage device to the network storage device.</p> <p><i>See Claim [1B].</i></p>

Appendix E-2 - Claim Chart for U.S. Patent No. 8,230,101 Against Products with HTTP Live Streaming (HLS)

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple’s Accused Products
<p>network storage device;</p> <p>[7C] responding to a list presentation request for the held digital contents of the server device for media from the network player by transmitting list information to the network player, wherein the list information lists the digital contents left in the internal storage device and the digital contents transferred from the internal storage device to the network storage device and stored in the network storage device, and wherein the list information maintains a tree structure of the digital contents in the internal storage device before transferring the</p>	<p>Users of the Apple Accused Products perform responding to a list presentation request for the held digital contents of the server device for media from the network player by transmitting list information to the network player, wherein the list information lists the digital contents left in the internal storage device and the digital contents transferred from the internal storage device to the network storage device and stored in the network storage device, and wherein the list information maintains a tree structure of the digital contents in the internal storage device before transferring the digital contents to the network storage device.</p> <p><i>See Claim [1C].</i></p>

Appendix E-2 - Claim Chart for U.S. Patent No. 8,230,101 Against Products with HTTP Live Streaming (HLS)

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Apple’s Accused Products
digital contents to the network storage device;	
[7D] responding to a data transmission request for the held digital contents from the network player by searching for a location where the held digital contents are currently stored; and	<p>Users of the Apple Accused Products perform responding to a data transmission request for the held digital contents from the network player by searching for a location where the held digital contents are currently stored.</p> <p><i>See Claim [1D].</i></p>
[7E] allowing the corresponding data in held digital contents to be stream-delivered from the network storage device to the network player, if the result of search shows the network storage device,	<p>Users of the Apple Accused Products perform allowing the corresponding data in held digital contents to be stream-delivered from the network storage device to the network player, if the result of search shows the network storage device.</p> <p><i>See Claim [1E].</i></p>
[7F] wherein the service device for media is a media player.	<p>Users of the Apple Accused Products perform the claimed method wherein the service device for media is a media player.</p> <p><i>See Claim [1F].</i></p>