

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

Claim 1	Amazon Prime Video
[Preamble] A method of rendering digital content comprising:	Amazon systems and services identified below (e.g., Prime Video) infringe at least claim 1 (and its asserted dependent claims) of U.S. Patent No. 9,319,720 (“the ’720 patent”) literally and/or under the doctrine of equivalents. Amazon uses, sells, offers for sale, imports, and/or markets several Amazon services and related functionality, including but not limited to, the Amazon service that streams video content (including on-demand video, live video, and other video content) and all related apps, platforms, components, devices, developer kits, SDKs, application programming interfaces (APIs), settings or customization options, and functionality (“Prime Video”). By way of specific, non-limiting example, accused Prime Video includes services and related functionality to serve and synchronize digital content across multiple devices using bookmarks, time offsets, or other means, including via functionality described in response to Audio Pod’s Interrogatory No. 2. By way of specific, non-limiting example, Prime Video also include testing Amazon has conducted on additional or future versions of the above-listed products and functionality (described in these charts) that might be used in additional or future products or services. Not all devices, functions, or systems are presented in this chart. However, on information and belief, source code will demonstrate that Prime Video meets the claim elements. Audio Pod provides this disclosure based upon a diligent inquiry and upon information and belief related to how the accused functionality operates (e.g., operation handled by proprietary and unavailable source code). Audio Pod reserves the right to modify or clarify this position based upon discovery, non-infringement contentions disclosed by Amazon, or claim construction. Unless otherwise noted, all limitations are literally present in Prime Video. Amazon is the direct infringer. Amazon (i) makes, uses, sells, offers to sell, sells access to, offers to sell to access to, imports, and/or markets Prime Video; (ii) makes, uses, sells, offers to sell, sells access to, offers to sell to access to, imports, and/or markets services/products which use Prime Video; (iii) performs the accused methods; and/or (iv)

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provides developer kits, SDKs, or other settings or customization options (individually and collectively, “Customization”). To the extent Amazon asserts that any method step is not performed or attributable to Amazon, it is also performed or controlled by either (1) users operating Prime Video (“end-users”) or (2) other persons developing Customization (“developers”) (individually and collectively, “users”). The role of such users is to access, use, customize, communicate with, share information associated with, or operate (individually, and collectively, “use”) Prime Video, such that each method step is performed or that each limitation becomes present. The role of those developing Customizations is to operate Prime Video with the addition of functionality provided by Customizations. Each of the foregoing users operate or modify Prime Video as intended by Amazon based upon manuals provided by Amazon, other information provided by Amazon (e.g., SDKs or APIs) and pursuant to license agreements associated with Prime Video.

Prime Video provides a method of rendering digital content comprising several method steps.

What is Amazon Prime Video?

Prime Video is a streaming video service by Amazon. Prime Video benefits are included with an Amazon Prime membership and if Amazon Prime isn't available in your country/region, you can [join Prime Video](#) to watch. With your membership, you can watch hundreds of TV shows and movies on your favorite devices. To get started, go to [PrimeVideo.com](#), or download the Prime Video app on your mobile device.

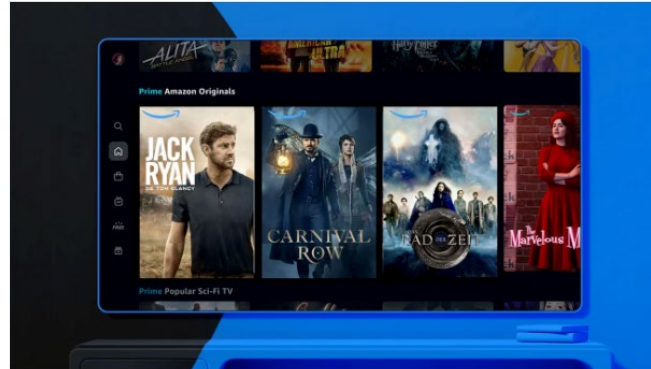
See https://www.primevideo.com/region/na/splash/getTheApp/ref=atv_hp_cnt.

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Prime Video offers a massive library of movies, series, and sports.

[*Read this article in Spanish.*](#)

[Prime Video](#) is home to more content than you might realize. If you're ready to stream blockbuster movies, hit shows, award-winning Amazon Originals, premium channels, and sports, read on for everything you need to know about Prime Video.



See <https://www.aboutamazon.com/news/entertainment/what-you-need-to-know-about-prime-video>.

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Prime Video System Requirements for Computers

Prime Video is available via a web browser on a computer running Windows, macOS, Chrome OS, or Linux.

Note: Not all Prime Video titles support all features.

To access Prime Video, please ensure that you're running the latest version of one of these web browsers:

- Google Chrome
- Mozilla Firefox
- Microsoft Edge
- Safari
- Opera

Prime Video playback is supported on these web browsers. If you're running an operating system other than Windows or macOS, playback is restricted to standard definition.

See <https://www.amazon.com/gp/help/customer/display.html?nodeId=GUVGB3QMORYRERYW>.

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providing a media player having access to at least one server via a network, the at least one server having stored thereon a descriptor file and a plurality of media streams derived from a same originating written work, each media stream including a plurality of digital data files, the descriptor file including information allowing a simultaneous synchronized rendering of the plurality of media streams that provides a literary experience of the originating written work, the information including time

Prime Video provides a method for rendering digital content comprising providing a media player having access to at least one server via a network (**e.g., the Prime Video player is accessed by a client device and accesses the Prime Video backend servers**), the at least one server having stored thereon a descriptor file and a plurality of media streams (**e.g. Amazon Prime Video contains the video component and the audio component (plurality of streams)**) derived from a same originating written work (**e.g., Prime Video uses MPEG-DASH for adaptive streaming, which can include, e.g., video streams, audio streams, and subtitle streams corresponding to a written artistic work (e.g., a script upon which a movie is based)**), each media stream including a plurality of digital data files (e.g. each media stream is broken down into fragments (**e.g., a plurality of digital data files**)), the descriptor file including information allowing a simultaneous synchronized rendering of the plurality of media streams (**e.g., Prime Video (using, e.g., MPEG-DASH) synchronizes video, audio, and subtitles (media streams)**) that provides a literary experience of the originating written work (**e.g., a storyline experience in the form of a movie that is based on a script**).

Amazon Prime Video: Delivering the Amazing Video Experience (CTD203-R1) - AWS re:Invent 2018

Nov 29, 2018 • 4 likes • 12,604 views



Amazon Web Services

Follow

In this session, hear engineers from Amazon Prime Video and Amazon CloudFront discuss how they have architected and optimized their video delivery for scaled global audiences. Topics include optimizing the application and video pipeline for use with content delivery networks (CDN), optimizations in the CDN for efficient and performant video delivery, measuring quality, and effectively managing multi-CDN performance and policy. Learn how CloudFront delivers the performance that Prime Video demands, and hear best practices and lessons learned through scaling this fast-growing service.

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information for each digital data file in each media stream, the time information for synchronizing the plurality of media streams and determined relative to a timeline of the originating written work;

Amazon CloudFront global footprint

150 Points of Presence (POP)

- 139 Edge locations
- 11 Regional Edge Caches
- In 65 cities across 29 countries

CloudFront Edge locations:

- Close to the viewers
- Connection termination

CloudFront Regional Edge Cache:

- Have larger cache width than any individual Edge location
- Mid-tier cache between your origin server and globally distributed Edge locations



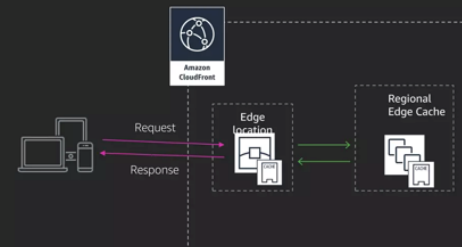
aws
re:invent

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CloudFront traffic management

Inside a POP

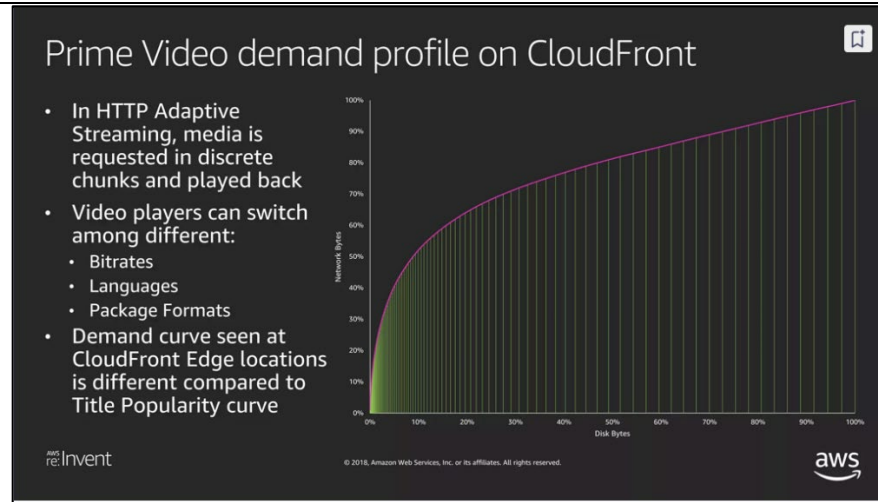
- Load balancing
- TLS Encryption and HTTPS
- HTTP/2
- Persistent connections
- Full and Partial object requests
- Collapsed Forwarding
- Throttling



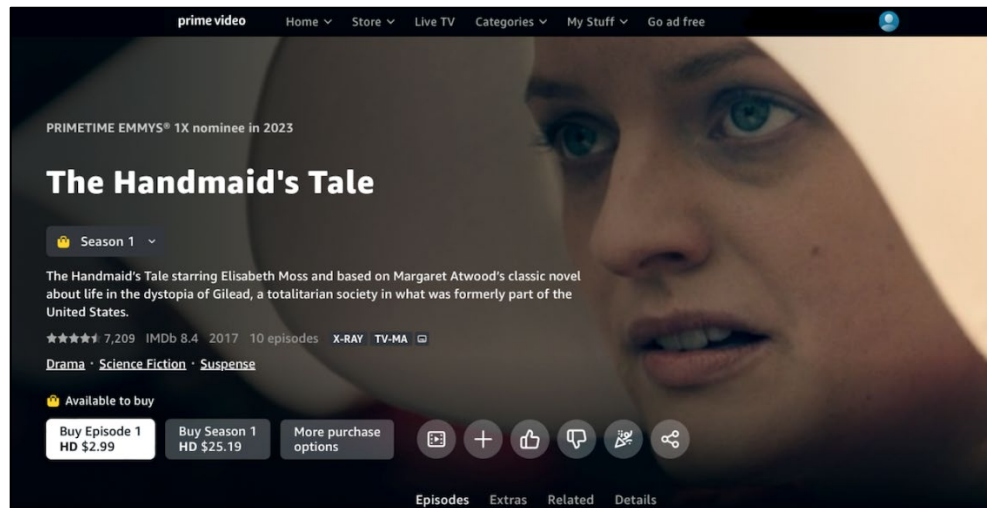
aws
re:invent

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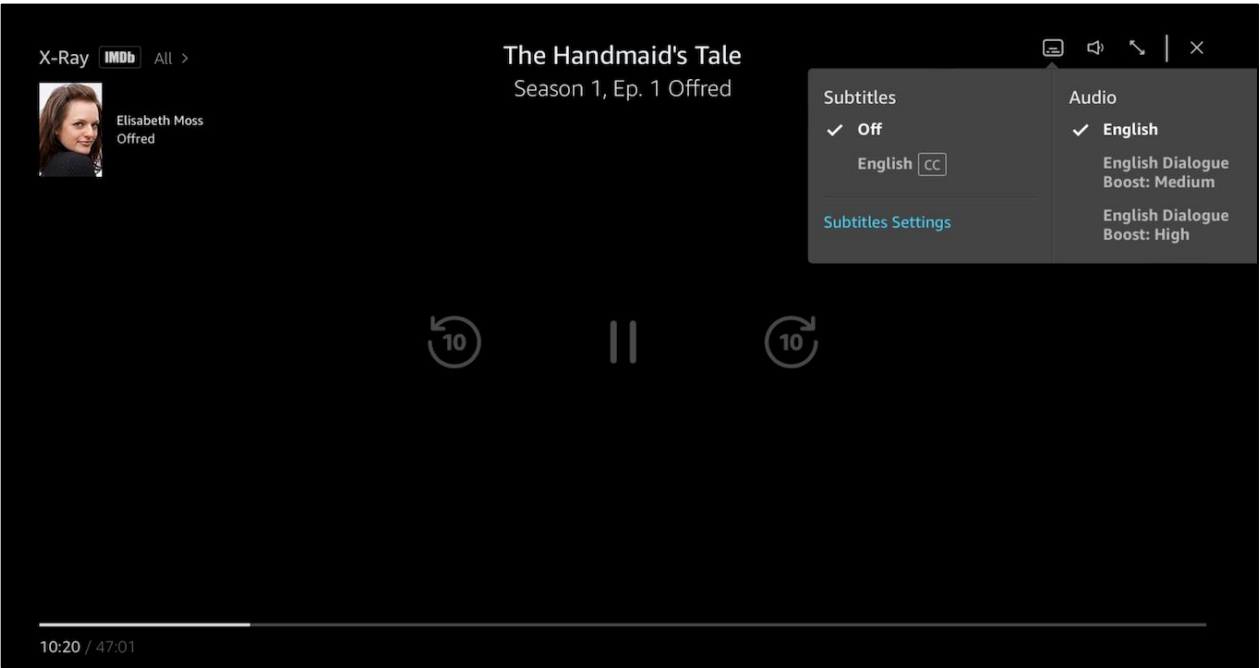


See <https://www.slideshare.net/AmazonWebServices/amazon-prime-video-delivering-the-amazing-video-experience-ctd203r1-aws-reinvent-2018#19>.



See screenshot of Prime Video.

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See screenshot of Prime Video.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video**4.1 System description**

Dynamic Adaptive Streaming over HTTP (DASH) specifies XML and binary formats that enable delivery of media content from standard HTTP servers to HTTP clients and enable caching of content by standard HTTP caches.

This part of ISO/IEC 23009 primarily defines two formats:

- The Media Presentation Description (MPD) describes a *Media Presentation*, i.e. a bounded or unbounded presentation of media content. In particular, it defines formats to announce resource identifiers for *Segments* and to provide the context for these identified resources within a Media Presentation. These resource identifiers are HTTP-URLs possibly combined with a byte range.
- The Segment formats specify the formats of the entity body of the HTTP response to an HTTP GET request or a partial HTTP GET with the indicated byte range using HTTP/1.1 as defined in RFC 2616 to a resource identified in the MPD. Segments typically contain efficiently coded media data and metadata conforming to or at least closely aligned with common media formats.

See Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats (5th ed. 2022) (Document available at <https://www.iso.org/standard/83314.html>).

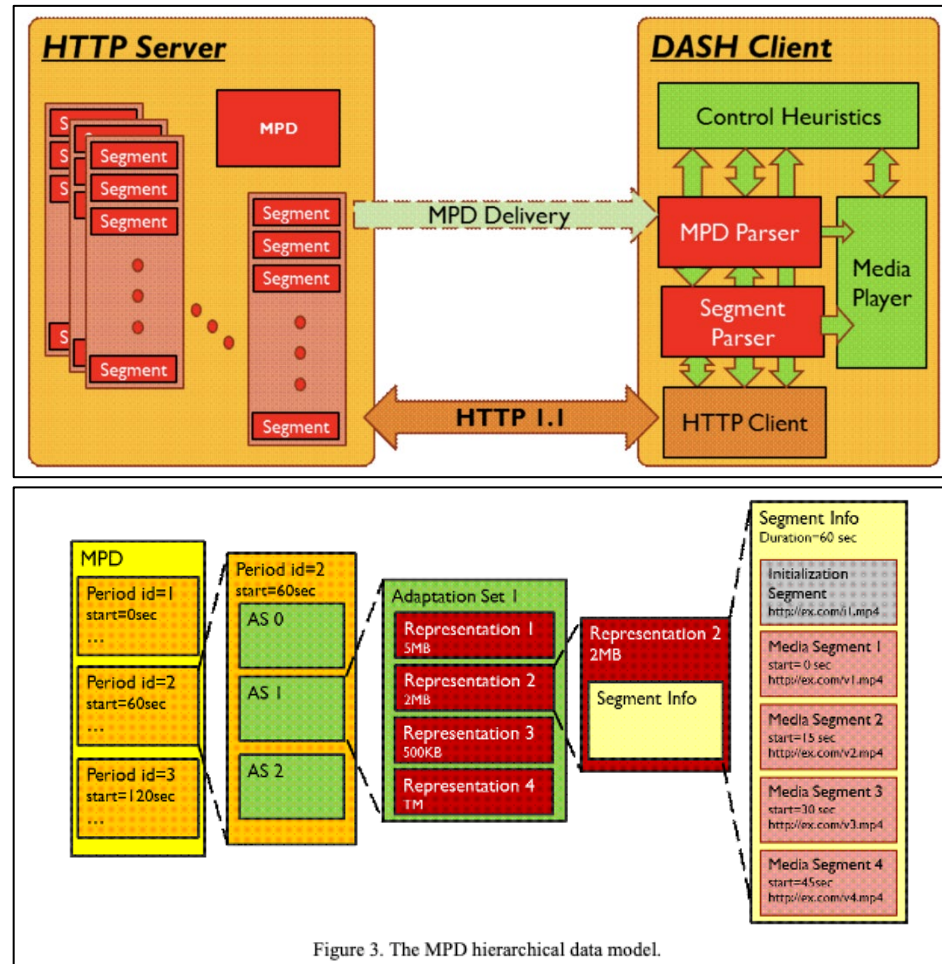
4.3 DASH data model overview

DASH is intended to support a media-streaming model for delivery of continuous media content in which control lies primarily with the client. Clients may request data using the HTTP protocol from standard web servers that have no DASH-specific capabilities. Consequently, this document focuses not on client or server procedures but on the data formats used to provide a DASH Media Presentation.

The collection of encoded and deliverable versions of continuous media content and the appropriate description of these form a Media Presentation. Media content is composed of a single or multiple contiguous media content **periods** in time. Content in different media content periods may be completely independent or certain periods of a Media Presentation may belong to the same Asset, for example a Media Presentation is a collection of main program composed of multiple periods, each assigned to the same Asset, and interleaved with inserted advertisement periods. Each media content period is composed of one or multiple **media content components**, for example audio components in various languages, different video components providing different views of the same program, subtitles in different languages, etc. Each media content component has an assigned **media content component type**, for example audio or video.

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See Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats (5th ed. 2022) (Document available at <https://www.iso.org/standard/83314.html>).



See https://tele1.dee.fct.unl.pt/sar_2023_2024/files/w13533-MPEG-DASH-Overview.doc.

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7.2.1 Media Presentation timeline

One of the key features in DASH is that encoded versions of different media components share a common timeline. The presentation time of access unit within the media content is mapped to the global common presentation timeline for synchronization of different media components and to enable seamless switching of different coded versions of the same media components.

See Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats (5th ed. 2022) (Document available at <https://www.iso.org/standard/83314.html>).

NOTE This is not strictly true, since the MPD can also include a byte range with the URL, meaning that the Segment is contained in the provided byte range of some larger resource. An intelligent client can in principle construct a single request for multiple Segments, but this is not the typical case.

DASH defines different timelines. One of the key features in DASH is that encoded versions of different media content components share a common timeline. The presentation time of each access unit within the media content is mapped to the global common presentation timeline for synchronization of different media components and to enable seamless switching of different coded versions of the same media components. This timeline is referred as Media Presentation timeline. The Media Segments themselves contain accurate Media Presentation timing information enabling synchronization of components and seamless switching.

See Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats (5th ed. 2022) (Document available at <https://www.iso.org/standard/83314.html>).

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14.5.3. Descriptive Audio

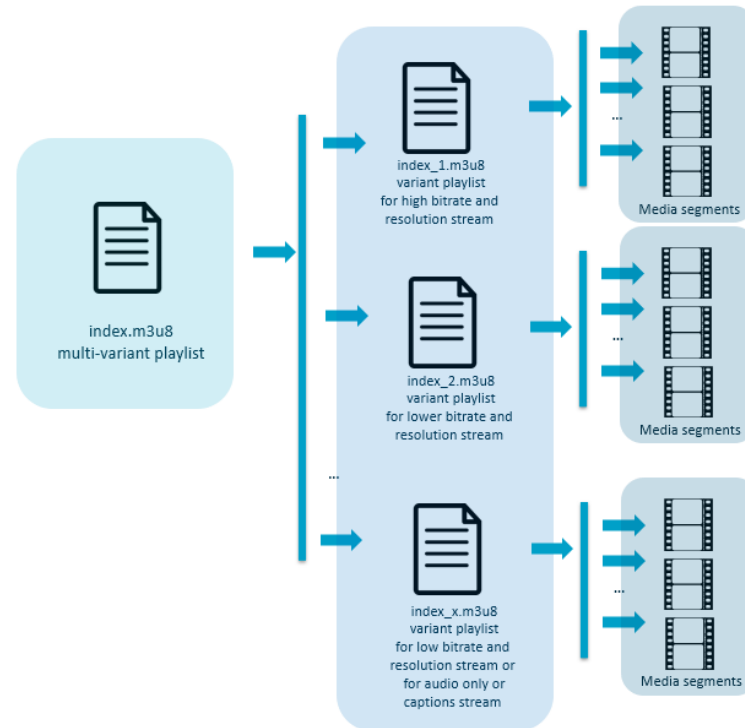
In an effort to further support blind and visually impaired customers, Prime Video fully supports descriptive audio or “Narration”. Descriptive audio consists of a narrator talking through the presentation, describing what is happening on the screen or stage during the natural pauses in the audio, and sometimes during dialogue if deemed necessary. In order to deliver descriptive audio, partners will need to follow the below instructions, depending on delivery method.

See https://m.media-amazon.com/images/G/01/CooperWebsite/dvp/downloads/Prime_Video-GlobalContentGuide-v5.2.2.pdf at 56.

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Media segments can be in transport streams or mp4 containers. The previous example uses transport stream (.ts). The consuming device or player uses the referenced files, requesting specific segments, while determining which version of the segments (higher or lower bitrates) can be supported with detected network speed. Another convenient aspect of HLS playlists is they remain reasonably human readable. You can establish things like how many variants there are and certain attributes about those variants, such as bitrate, resolution, codec, audio language, etc.

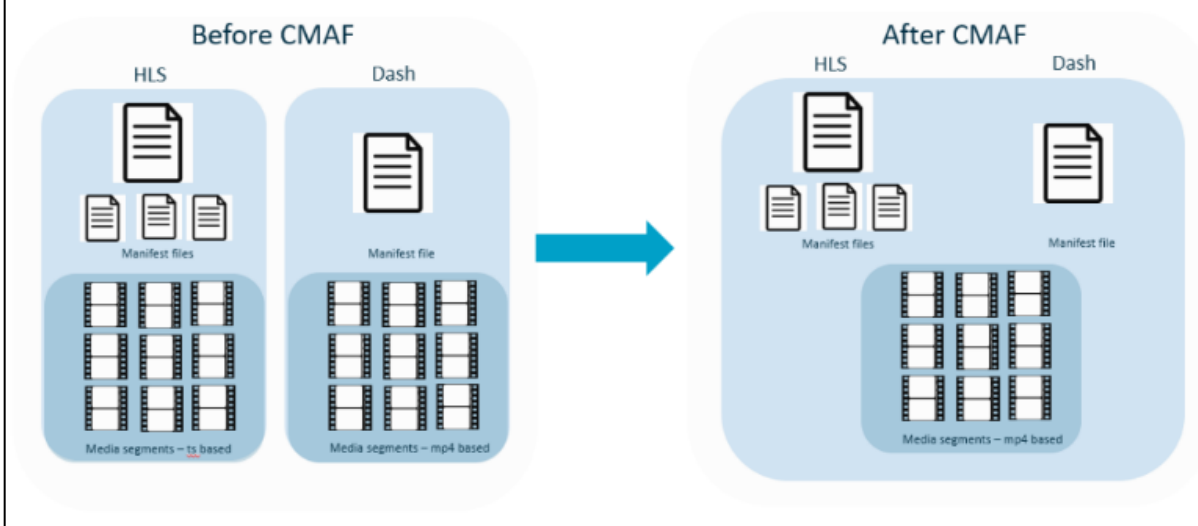
Playlists may also contain other types of information, such as locations for advertisements, captions, and language track options.



See <https://aws.amazon.com/blogs/media/back-to-basics-http-video-streaming/>.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video**Common Media Application Format (CMAF)**

The Common Media Application Format (CMAF) standard has quickly gained adoption across media technologies and playback devices. It was proposed by MPEG in 2016. Very much simplified, CMAF can be described as a hybrid solution of DASH and HLS. By enabling a single file format to store, process, and deliver video streams to both HLS and DASH clients using fMP4 segments, CMAF allows to increase efficiency and limit complexity by reducing processing, storage and delivery cost for live and on-demand video workflows.



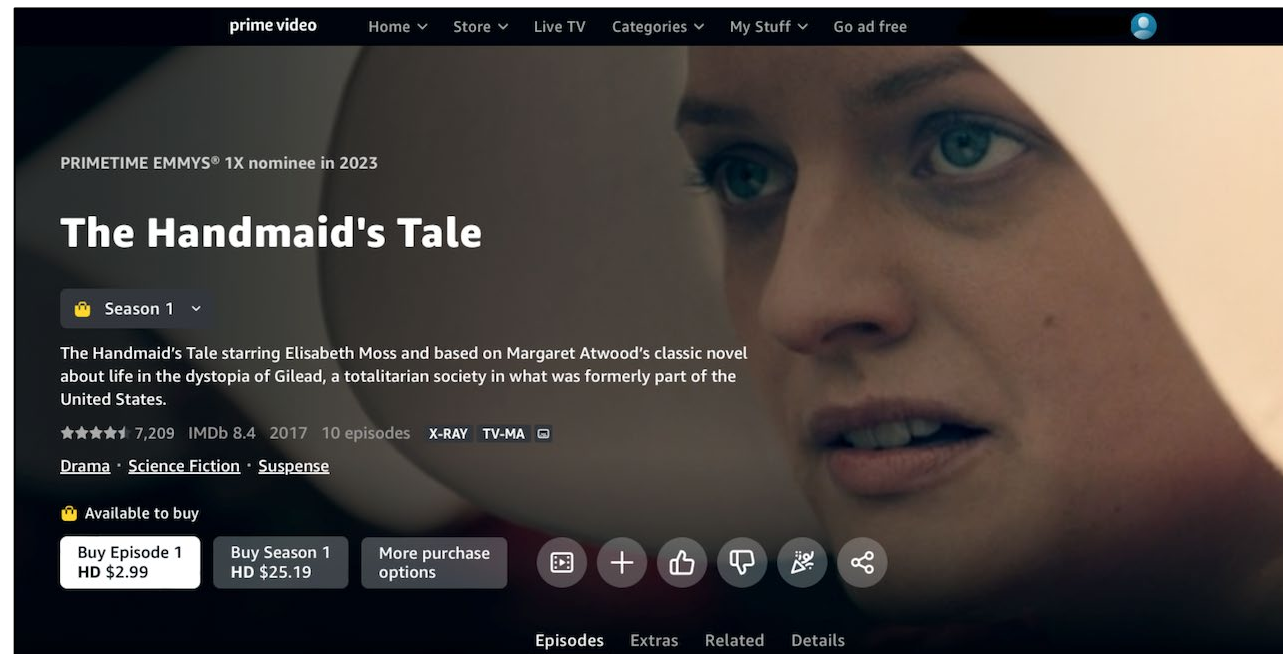
See <https://aws.amazon.com/blogs/media/back-to-basics-http-video-streaming/>

On information and belief, additional support can be found in Defendants' source code and non-public documents.

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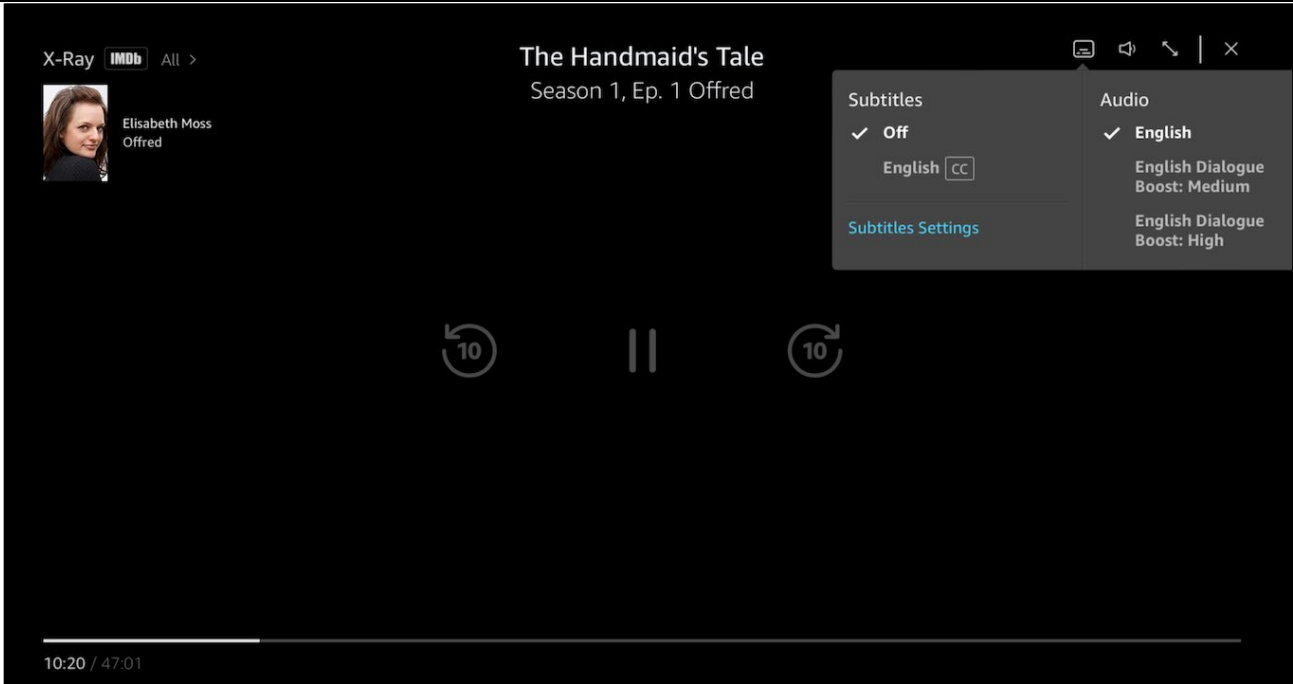
determining a first digital data file from the plurality of digital data files in a first media stream from the plurality of media streams, the first digital data file having digital content to be rendered with the media player, and determined using the time information in the descriptor file and a predetermined time offset, the predetermined time offset external to the descriptor file and determined relative to the timeline of the audio recording;

Prime Video provide a method for rendering digital content comprising determining a first digital data file from the plurality of digital data files in a first media stream from the plurality of media streams (**e.g. when the user taps the play button, the player determines the correct encoded alternative based on the current network conditions (determining) to download the segment (digital data file) of the requested video content (e.g., first video stream)),** the first digital data file having digital content to be rendered with the media player, and determined using the time information in the descriptor file and a predetermined time offset, the predetermined time offset external to the descriptor file and determined relative to the timeline of the audio recording (**e.g. when the user taps the play button, the video continues to play from where the user left off).**

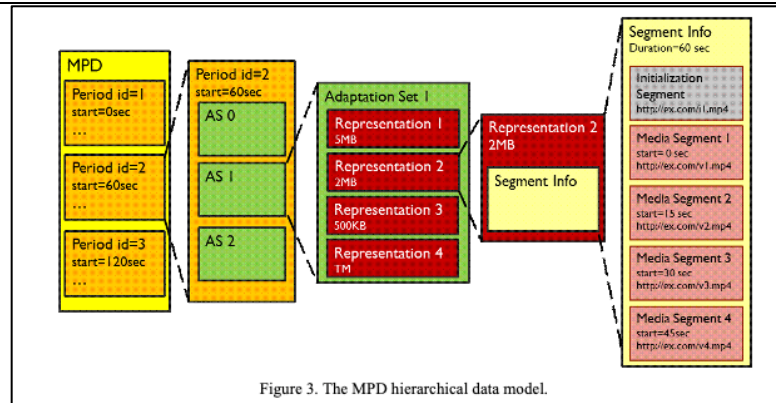


See screenshot of Prime Video.

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See screenshot of Prime Video.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

In order to play the content, the DASH client first obtains the MPD. The MPD can be delivered using HTTP, email, thumb drive, [broadcast](#) or other transports. By parsing the MPD, the DASH client learns about the timing of the program, the availability of media content, the media types, resolutions, minimum and maximum [bandwidths](#) and the existence of various encoded alternatives of multimedia components, the accessibility features and the required digital right management (DRM), the location of each media component on the network and other characteristic of the content. Using this information, the DASH client selects the appropriate encoded alternative and starts streaming of the content by fetching the segments using HTTP GET requests.

See https://tele1.dee.fct.unl.pt/sar_2023_2024/files/w13533-MPEG-DASH-Overview.doc.

NOTE This is not strictly true, since the MPD can also include a byte range with the URL, meaning that the Segment is contained in the provided byte range of some larger resource. An intelligent client can in principle construct a single request for multiple Segments, but this is not the typical case.

DASH defines different timelines. One of the key features in DASH is that encoded versions of different media content components share a common timeline. The presentation time of each access unit within the media content is mapped to the global common presentation timeline for synchronization of different media components and to enable seamless switching of different coded versions of the same media components. This timeline is referred as Media Presentation timeline. The Media Segments themselves contain accurate Media Presentation timing information enabling synchronization of components and seamless switching.

See *Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats* (5th ed. 2022) (Document available at <https://www.iso.org/standard/83314.html>).

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video**4.5.2 Media stream access points**

To be able to access a Representation, each of the media streams that are contained in the Representation requires Media Stream Access Points (SAPs). SAPs in the context of this part of ISO/IEC 23009 refer to the SAP definition in ISO/IEC 14496-12 Annex I. ISO/IEC 14496-12 Annex I.3 defines different types of SAPs that provide a relationship between the position where a stream can be accessed, relative to the start of a Segment or Subsegment, its presentation time and the presentation times and position of other access unit in the stream. The same SAP type definitions shall apply for this part of ISO/IEC 23009.

A SAP is a position in a Representation that enables playback of a media stream to be started using only the information contained in Representation data starting from that position onwards (preceded by initializing data in the Initialization Segment, if any).

7.2.1 Media Presentation timeline

One of the key features in DASH is that encoded versions of different media components share a common timeline. The presentation time of access unit within the media content is mapped to the global common presentation timeline for synchronization of different media components and to enable seamless switching of different coded versions of the same media components.

See Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats (5th ed. 2022) (Document available at <https://www.iso.org/standard/83314.html>).

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video**HTTP live streaming (HLS)**

Support for the HLS protocol is widespread in media players, web browsers, mobile devices, and streaming media servers. It is the most popular streaming format.

HLS uses a two layer playlist structure, combined with media segments. The very first file a player needs to start a stream is called the multi-variant playlist. HLS playlists can be identified by the file suffix ".m3u8". The multi-variant playlist contains references to all the variant playlists files available to the player, and additional information about what those variant playlists contain. In most cases, there are different variants to cater to various network speeds or available bandwidth (high, medium, and low, with potentially intermediate steps). There may also be additional audio and/or caption/subtitle streams available. An example of a multi-variant playlist file follows:

```
#EXTM3U
#EXT-X-VERSION:3
#EXT-X-INDEPENDENT-SEGMENTS
#EXT-X-STREAM-INF:BANDWIDTH=500000,RESOLUTION=640x360,CODECS="avc1.42e00a,mp4a.40.2"
http://example.com/low/index.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=1500000,RESOLUTION=854x480,CODECS="avc1.42e00a,mp4a.40.2"
http://example.com/mid/index.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=2500000,RESOLUTION=1280x720,CODECS="avc1.42e00a,mp4a.40.2"
http://example.com/high/index.m3u8
```

See <https://aws.amazon.com/blogs/media/back-to-basics-http-video-streaming/>.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video**Example**

This code is an example of a Video on Demand playlist:

```
#EXTM3U
#EXT-X-PLAYLIST-TYPE:VOD
#EXT-X-TARGETDURATION:10
#EXT-X-VERSION:4
#EXT-X-MEDIA-SEQUENCE:0
#EXTINF:10.0,
http://example.com/movie1/fileSequenceA.ts
#EXTINF:10.0,
http://example.com/movie1/fileSequenceB.ts
#EXTINF:10.0,
http://example.com/movie1/fileSequenceC.ts
#EXTINF:9.0,
http://example.com/movie1/fileSequenceD.ts
#EXT-X-ENDLIST
```

These are the tags used in the Video on Demand playlist example:

EXTM3U: Indicates that the playlist is an extended M3U file. This type of file is distinguished from a basic M3U file by changing the tag on the first line to EXTM3U. All HLS playlists must start with this tag.

EXT-X-PLAYLIST-TYPE: Provides mutability information that applies to the entire playlist file. This tag may contain a value of either EVENT or VOD. If the tag is present and has a value of EVENT, the server must not change or delete any part of the playlist file (although it may append lines to it). If the tag is present and has a value of VOD, the playlist file must not change.

EXT-X-TARGETDURATION: Specifies the maximum media-file duration.

EXT-X-VERSION: Indicates the compatibility version of the playlist file. The playlist media and its server must comply with all provisions of the most recent version of the IETF Internet-Draft of the HTTP Live Streaming specification that defines that protocol version.

EXT-X-MEDIA-SEQUENCE: Indicates the sequence number of the first URL that appears in a playlist file. Each media file URL in a playlist has a unique integer sequence number. The sequence number of a URL is higher by 1 than the sequence number of the URL that preceded it. The media sequence numbers have no relation to the names of the files.

EXTINF: A record marker that describes the media file identified by the URL that follows it. Each media file URL must be preceded by an EXTINF tag. This tag contains a duration attribute that's an integer or floating-point number in decimal positional notation that specifies the duration of the media segment in seconds. This value must be less than or equal to the target duration.

See <https://developer.apple.com/documentation/http-live-streaming/video-on-demand-playlist-construction>.

On information and belief, additional support can be found in Defendants' source code and non-public documents.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video**[1c]**

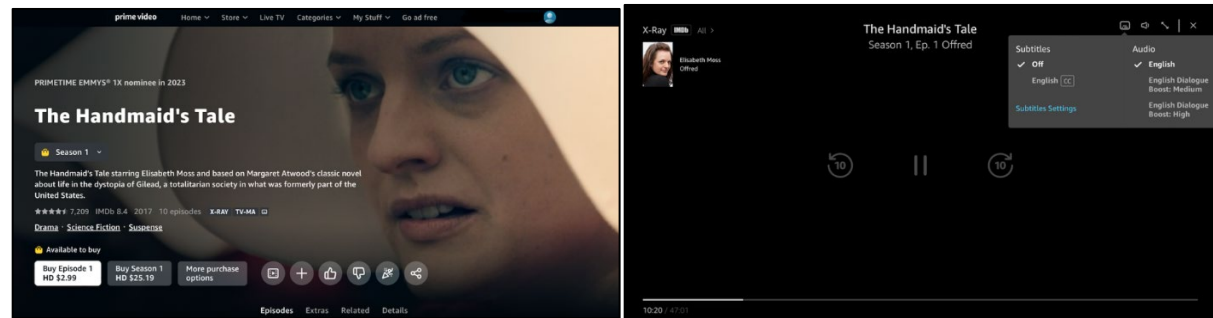
downloading the first digital data file or a digital data segment contained in the first digital data file and determined using the time information in the descriptor file from the at least one server so that the digital content is resident with the media player; and

Prime Video provides a method for rendering digital content comprising downloading the first digital data file or a digital data segment contained in the first digital data file and determined using the time information in the descriptor file from the at least one server so that the digital content is resident with the media player (**e.g. when the user taps on the play button, the player downloads and buffers the stream from where the user left off**).

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See Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats (5th ed. 2022) (Document available at <https://www.iso.org/standard/83314.html>).



See screenshot of Prime Video.

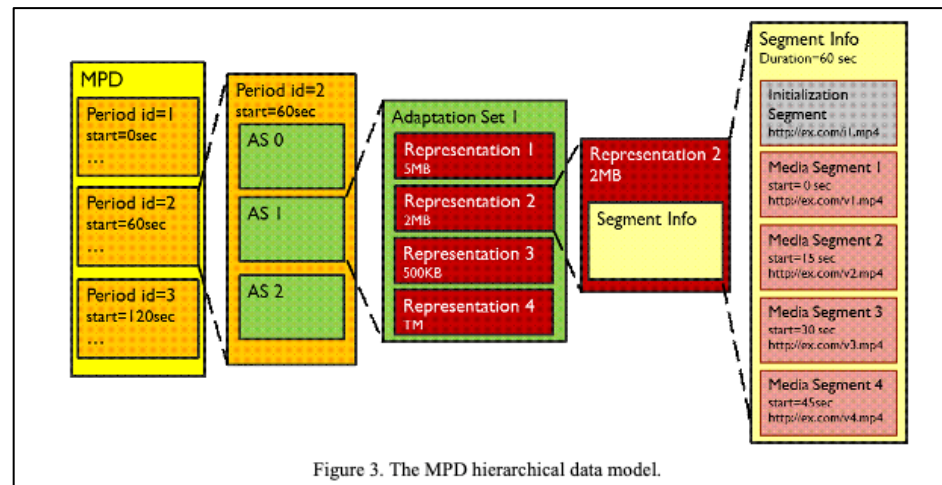
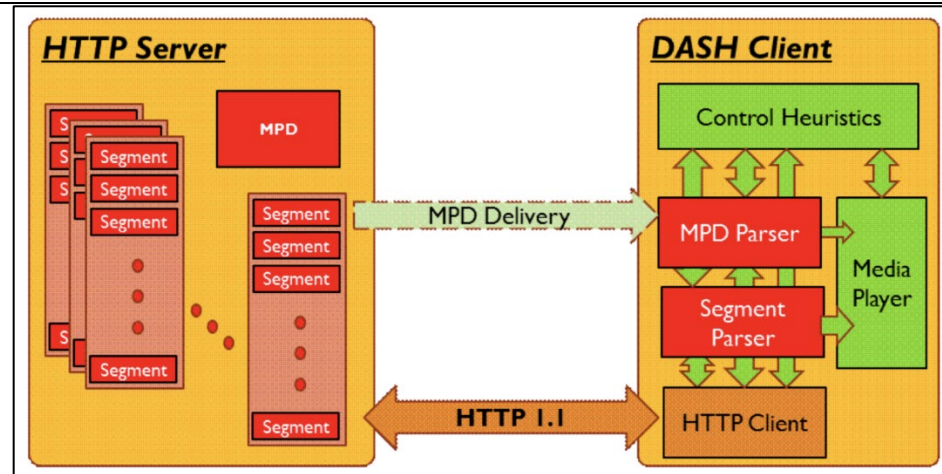
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Figure 3. The MPD hierarchical data model.

See https://tele1.dee.fct.unl.pt/sar_2023_2024/files/w13533-MPEG-DASH-Overview.doc.

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HTTP live streaming (HLS)

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```
#EXTM3U
#EXT-X-VERSION:3
#EXT-X-INDEPENDENT-SEGMENTS
#EXT-X-STREAM-INF:BANDWIDTH=500000,RESOLUTION=640x360,CODECS="avc1.42e00a,mp4a.40.2"
http://example.com/low/index.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=1500000,RESOLUTION=854x480,CODECS="avc1.42e00a,mp4a.40.2"
http://example.com/mid/index.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=2500000,RESOLUTION=1280x720,CODECS="avc1.42e00a,mp4a.40.2"
http://example.com/high/index.m3u8
```

See <https://aws.amazon.com/blogs/media/back-to-basics-http-video-streaming/>.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video**Example**

This code is an example of a Video on Demand playlist:

```
#EXTM3U
#EXT-X-PLAYLIST-TYPE:VOD
#EXT-X-TARGETDURATION:10
#EXT-X-VERSION:4
#EXT-X-MEDIA-SEQUENCE:0
#EXTINF:10.0,
http://example.com/movie1/fileSequenceA.ts
#EXTINF:10.0,
http://example.com/movie1/fileSequenceB.ts
#EXTINF:10.0,
http://example.com/movie1/fileSequenceC.ts
#EXTINF:9.0,
http://example.com/movie1/fileSequenceD.ts
#EXT-X-ENDLIST
```

These are the tags used in the Video on Demand playlist example:

EXTM3U: Indicates that the playlist is an extended M3U file. This type of file is distinguished from a basic M3U file by changing the tag on the first line to EXTM3U. All HLS playlists must start with this tag.

EXT-X-PLAYLIST-TYPE: Provides mutability information that applies to the entire playlist file. This tag may contain a value of either EVENT or VOD. If the tag is present and has a value of EVENT, the server must not change or delete any part of the playlist file (although it may append lines to it). If the tag is present and has a value of VOD, the playlist file must not change.

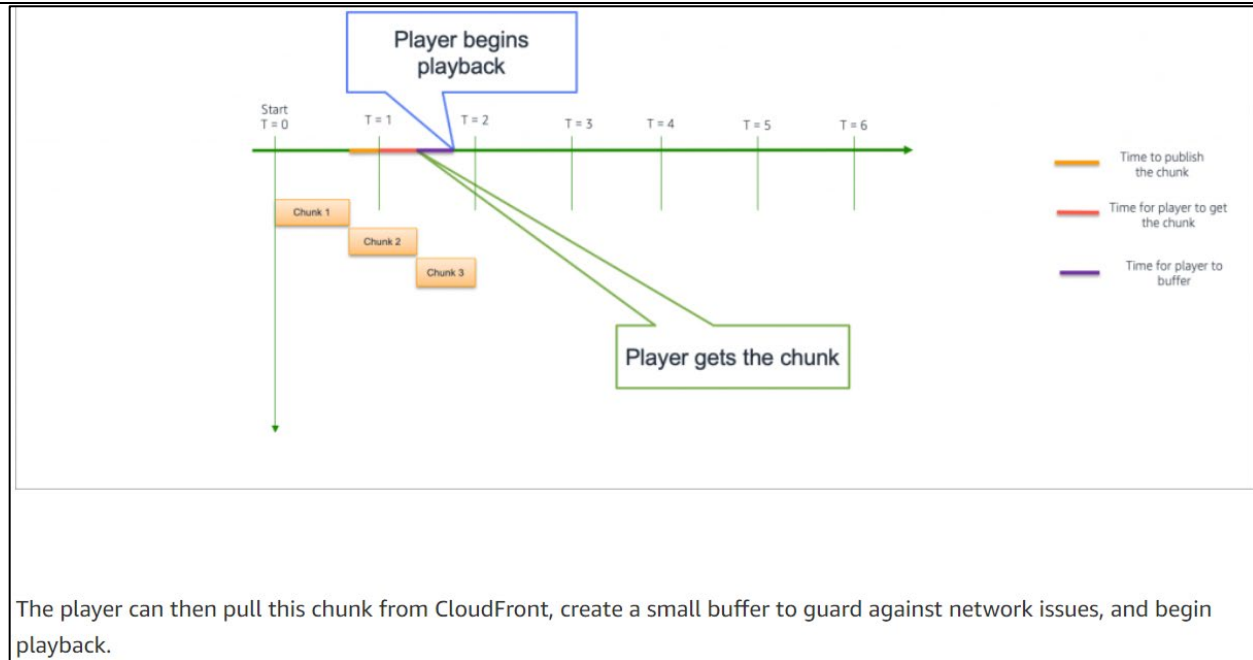
EXT-X-TARGETDURATION: Specifies the maximum media-file duration.

EXT-X-VERSION: Indicates the compatibility version of the playlist file. The playlist media and its server must comply with all provisions of the most recent version of the IETF Internet-Draft of the HTTP Live Streaming specification that defines that protocol version.

EXT-X-MEDIA-SEQUENCE: Indicates the sequence number of the first URL that appears in a playlist file. Each media file URL in a playlist has a unique integer sequence number. The sequence number of a URL is higher by 1 than the sequence number of the URL that preceded it. The media sequence numbers have no relation to the names of the files.

EXTINF: A record marker that describes the media file identified by the URL that follows it. Each media file URL must be preceded by an EXTINF tag. This tag contains a duration attribute that's an integer or floating-point number in decimal positional notation that specifies the duration of the media segment in seconds. This value must be less than or equal to the target duration.

See <https://developer.apple.com/documentation/http-live-streaming/video-on-demand-playlist-construction>.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

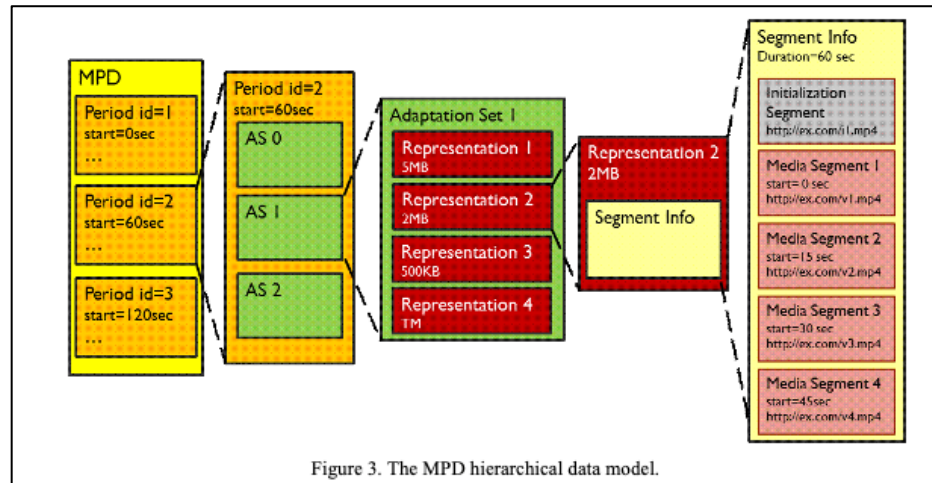
See <https://aws.amazon.com/blogs/media/lower-latency-with-aws-elemental-mediastore-chunked-object-transfer/>

On information and belief, additional support can be found in Defendants' source code and non-public documents.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video**[1d]**

rendering the digital content using the media player at an arbitrary point determined using the predetermined time offset.

Prime Video provides a method for rendering the digital content using the media player at an arbitrary point determined using the predetermined time offset (e.g., **segment timing information**).



See https://tele1.dee.fct.unl.pt/sar_2023_2024/files/w13533-MPEG-DASH-Overview.doc.

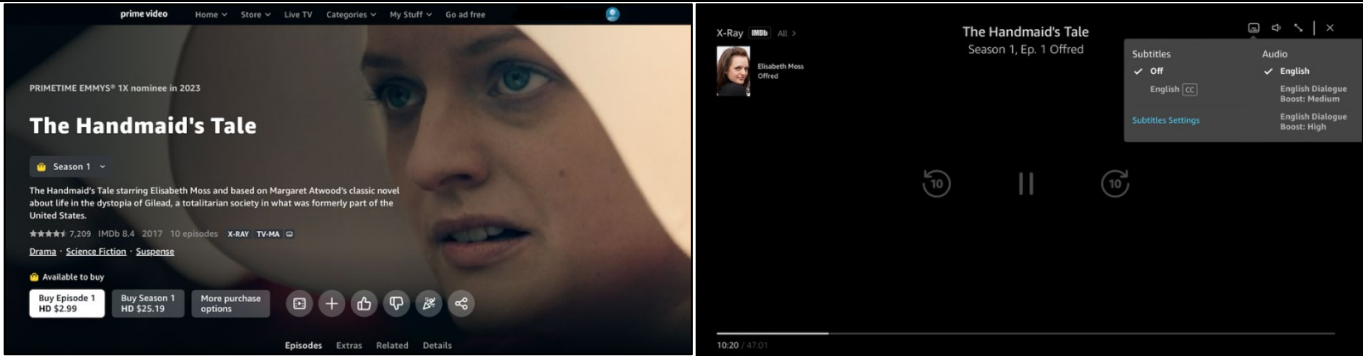
Watch anywhere, anytime

Watch movies and TV shows on the web at [Amazon.com/primevideo](https://www.amazon.com/primevideo) or with the Prime Video app on your iOS and Android phone, tablet, or select Smart TVs. To learn more, go to [How to Watch a Prime Video Title](#) and [Devices Compatible with Prime Video](#).

See

https://www.amazon.com/gp/video/splash/t/getTheApp/ref=atv_dl_rdr#:~:text=After%20you%20download%20the%20a pp,from%20the%20video%20detail%20page.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video



See screenshot of Prime Video.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

Digital Services and Device Support › Fire TV Support › Device Features on Fire TV ›

How Does the Continue Watching Row Work?

The **Continue Watching** row on your home screen helps you find your recently watched shows from Prime Video, Freevee, and supported third-party apps.

The **Continue Watching** row syncs across your compatible Fire TV devices and reflects the viewing activity of the profile you're using. Compatibility varies across Fire TV devices.

Note: This feature isn't available on Kids profiles.

When you open a supported app, a message appears on-screen about personalizing your Fire TV. To turn on this feature for all supported apps, select **Accept**. You can also turn on this feature by going to **Manage Sharing from Apps** in your Fire TV's **Privacy Settings**.

Tip: You can manage your privacy settings at any time by following the steps in [Manage Sharing of Viewing Information from Apps on Fire TV](#).

While this feature is on, supported third-party apps share your viewing and content information with Amazon. Shared information includes:

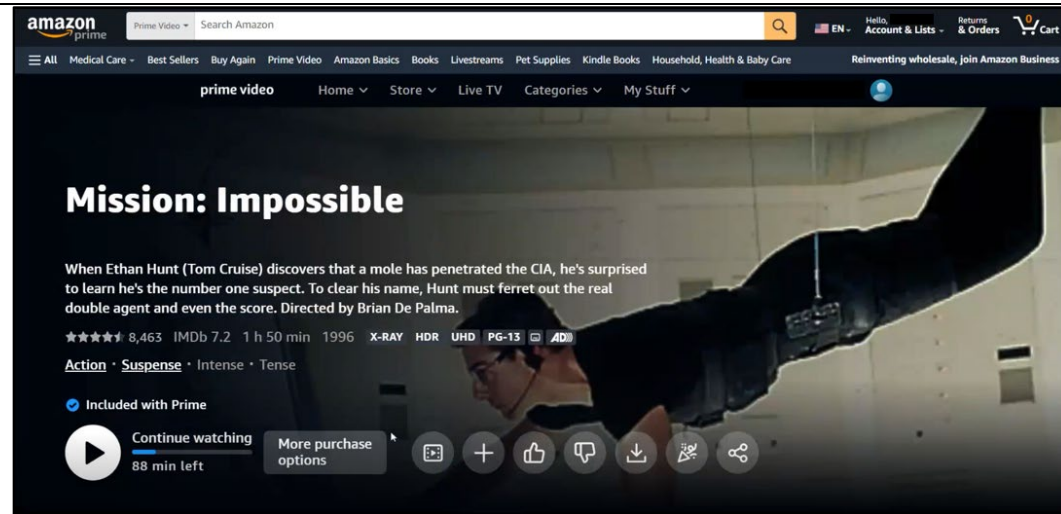
- Watching activity
- Watchlist
- Recordings
- Purchases

See <https://www.amazon.com/gp/help/customer/display.html?nodeId=TEIq4vikEIpvh49FW1>

7. Multi-Device Sync: Amazon Prime Video offers multi-device syncing, allowing you to start watching a TV show or movie on one device and continue on another. For example, if you start streaming on your smartphone, you can pause and resume playback seamlessly on your smart TV or tablet using the same Amazon account.

See <https://citizenside.com/entertainment/how-to-watch-tv-with-amazon-prime/>

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

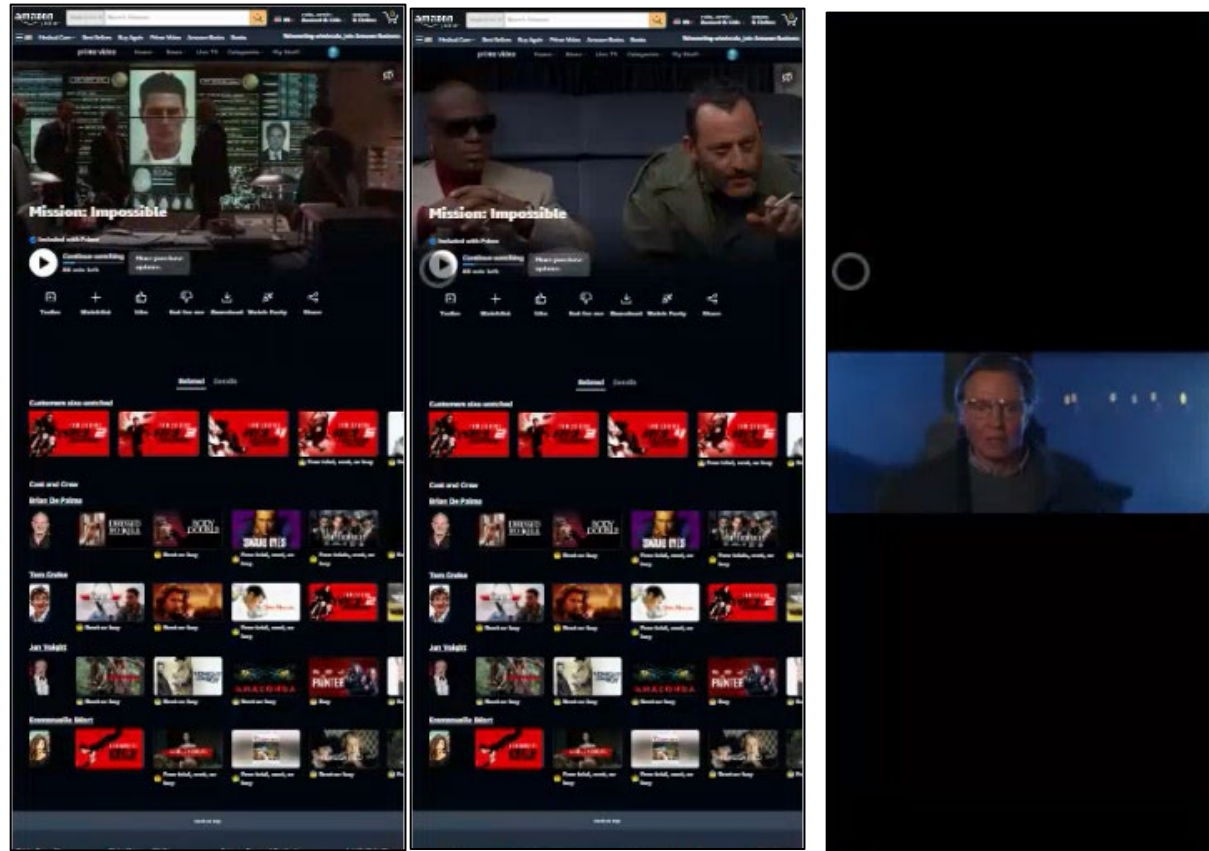


See screenshot of Prime Video.

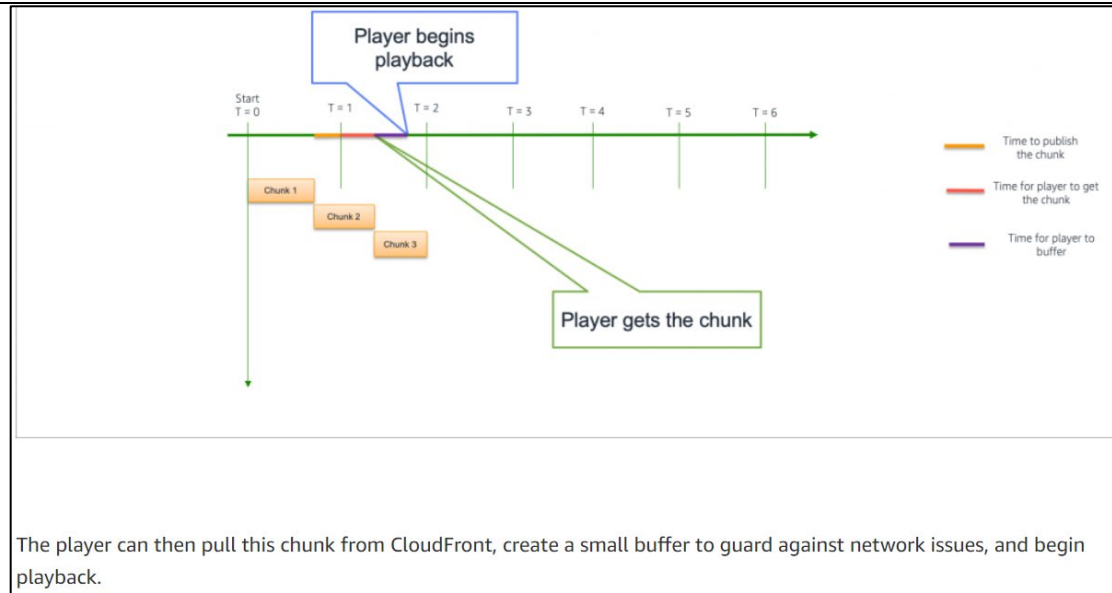


See screenshot of Prime Video.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video



See screenshot of Prime Video.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

See <https://aws.amazon.com/blogs/media/lower-latency-with-aws-elemental-mediastore-chunked-object-transfer/>

7.2.1 Media Presentation timeline

One of the key features in DASH is that encoded versions of different media components share a common timeline. The presentation time of access unit within the media content is mapped to the global common presentation timeline for synchronization of different media components and to enable seamless switching of different coded versions of the same media components.

See *Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats* (5th ed. 2022) (Document available at <https://www.iso.org/standard/83314.html>).

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video**4.3.2.2.9. Synchronized Playout and Seamless Switching**

In order to achieve synchronized playout across different Representations, typically from different Adaptation Sets, the different Representations are synchronized according to the presentation time in the Period. Specifically, the earliest presentation time of each Segment according to section 4.3.2.2.6 determines the playout of the Segment in the Period and therefore enables synchronized playout of different media components as well as seamless switching within one media component.

4.5.2 Media stream access points

To be able to access a Representation, each of the media streams that are contained in the Representation requires Media Stream Access Points (SAPs). SAPs in the context of this part of ISO/IEC 23009 refer to the SAP definition in ISO/IEC 14496-12 Annex I. ISO/IEC 14496-12 Annex I.3 defines different types of SAPs that provide a relationship between the position where a stream can be accessed, relative to the start of a Segment or Subsegment, its presentation time and the presentation times and position of other access unit in the stream. The same SAP type definitions shall apply for this part of ISO/IEC 23009.

A SAP is a position in a Representation that enables playback of a media stream to be started using only the information contained in Representation data starting from that position onwards (preceded by initializing data in the Initialization Segment, if any).

5.3.13 Resynchronization**5.3.13.1 Overview**

In DASH context, in typical cases Segments are treated as a single unit for download, random access to Media Presentations, and they are also addressed by a single URL. However, Segments may have internal

See Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats (5th ed. 2022) (Document available at <https://www.iso.org/standard/83314.html>).

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

Element or Attribute Name	Use	Description
@subsegmentStartsWit hSAP	OD default: 0	when greater than 0, specifies that each Subsegment with SAP_type greater than 0 starts with a SAP of type less than or equal to the value of @subsegmentStartsWithSAP. A Subsegment starts with SAP when the Subsegment contains a SAP, and for the first SAP, I _{SAU} is the index of the first access unit that follows I _{SAP} , and I _{SAP} is contained in the Subsegment. The semantics of @subsegmentStartsWithSAP equal to 0 are unspecified.

See Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats (5th ed. 2022) (Document available at <https://www.iso.org/standard/83314.html>).

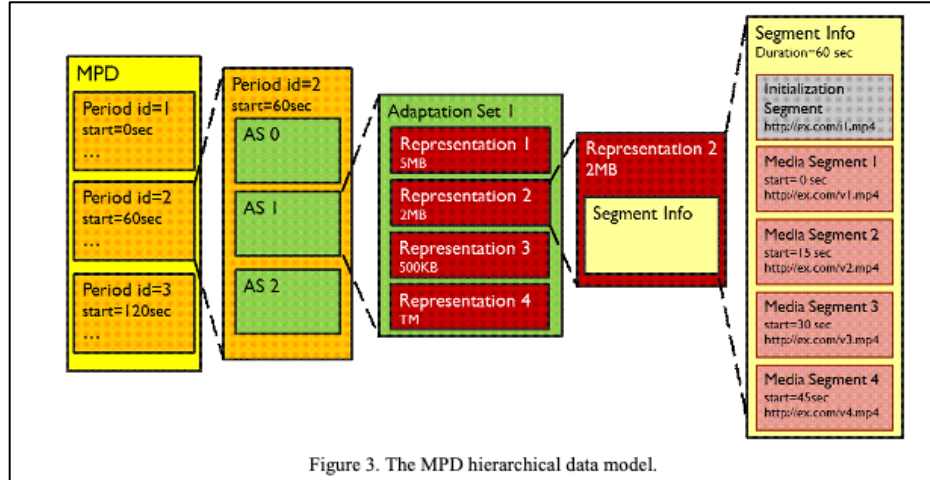
On information and belief, additional support can be found in Defendants' source code and non-public documents.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

Claim 2	Prime Video
A method of rendering digital content according to claim 1, wherein the plurality of media streams comprises an audio stream including a plurality of digital audio files, the plurality of digital audio files created by segmenting the audio recording in dependence upon natural language gaps so that when the plurality of digital audio files are rendered sequentially using the media player an experience of a contiguous audio stream is reproduced for a user without reassembling sequential digital audio files, and wherein the	Prime Video provides a method of rendering digital content wherein the plurality of media streams comprises an audio stream (e.g., audio media content component) including a plurality of digital audio files (e.g., segments and or “chunks”), the plurality of digital audio files created by segmenting the audio recording in dependence upon natural language gaps so that when the plurality of digital audio files are rendered sequentially using the media player an experience of a contiguous audio stream is reproduced for a user without reassembling sequential digital audio files, and wherein the first digital data file is a first digital audio file from the plurality of digital audio files in the audio stream (e.g., seamless playback of segments and/or “chunks”). 4.3 DASH data model overview DASH is intended to support a media-streaming model for delivery of continuous media content in which control lies primarily with the client. Clients may request data using the HTTP protocol from standard web servers that have no DASH-specific capabilities. Consequently, this document focuses not on client or server procedures but on the data formats used to provide a DASH Media Presentation. The collection of encoded and deliverable versions of continuous media content and the appropriate description of these form a Media Presentation. Media content is composed of a single or multiple contiguous media content periods in time. Content in different media content periods may be completely independent or certain periods of a Media Presentation may belong to the same Asset, for example a Media Presentation is a collection of main program composed of multiple periods, each assigned to the same Asset, and interleaved with inserted advertisement periods. Each media content period is composed of one or multiple media content components, for example audio components in various languages, different video components providing different views of the same program, subtitles in different languages, etc. Each media content component has an assigned media content component type, for example audio or video. <i>See Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats (5th ed. 2022) (Document available at https://www.iso.org/standard/83314.html).</i>

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

first digital data file is a first digital audio file from the plurality of digital audio files in the audio stream.



See https://tele1.dee.fct.unl.pt/sar_2023_2024/files/w13533-MPEG-DASH-Overview.doc.

Example playlists for HTTP Live Streaming

View and compare playlists for different HLS applications.

Overview

HTTP Live Streaming sends audio and video as a series of small files, typically of about 6 seconds duration, called *media segment files*. An index file, or playlist, provides an ordered list of the URLs of the media segment files. Index files for HTTP Live Streaming are saved as M3U8 playlists, an extension of the M3U format used for MP3 playlists. The URL of the index file is accessed by clients, which then request the indexed files in sequence.

See <https://developer.apple.com/documentation/http-live-streaming/example-playlists-for-http-live-streaming>.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video**Example**

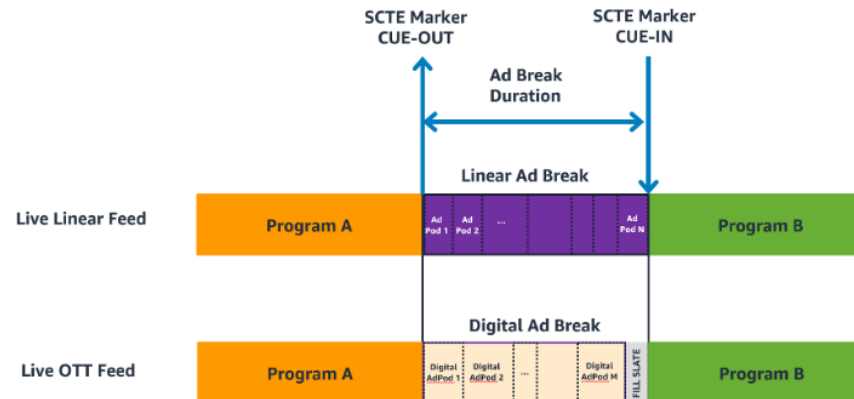
The following example shows a stream that uses the EXT-X-DISCONTINUITY tag to play movies that are preceded by an 18-second ad (segments ad0.ts and ad1.ts):

```
#EXTM3U
#EXT-X-TARGETDURATION:10
#EXT-X-VERSION:4
#EXT-X-MEDIA-SEQUENCE:0
#EXTINF:10.0,
ad0.ts
#EXTINF:8.0,
ad1.ts
#EXT-X-DISCONTINUITY
#EXTINF:10.0,
movieA.ts
#EXTINF:10.0,
movieB.ts
```

See <https://developer.apple.com/documentation/http-live-streaming/incorporating-ads-into-a-playlist>.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

The following illustration summarizes what a live ad replacement system should do to switch ads from a live linear feed to digital ads:



NOTE: For OTT distribution, it is challenging to replace the whole ad break with digital ads of the same duration. The purpose of the video slate is to fill video until the end of a digital ad break.

In a traditional broadcast setup, ad markers are inserted at a specific frame to indicate the beginning and the duration of an ad break (this is usually done at the playout level). The duration of an ad break can vary depending on the broadcaster and/or the event. There is no limit on AWS Elemental MediaTailor with respect to ad breaks duration. Multiple ad pods or ad creatives can be displayed during the ad break.

Using DAI makes it possible to replace an ad break in full or in only one specific ad pod. The markers used during the ad breaks are usually Society of Cable Telecommunications Engineers (SCTE) markers ([SCTE-104](#) for uncompressed video feeds and [SCTE-35](#) for compressed feeds). AWS Elemental offers broad flexibility to handle SCTE markers; you can find out more information on how [AWS Elemental MediaLive](#)—a broadcast-grade live video processing service—processes SCTE messages [here](#).

<https://aws.amazon.com/blogs/media/how-to-implement-reliable-dynamic-ad-insertion-using-aws-media-services/>

On information and belief, additional support can be found in Defendants' source code and non-public documents.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

Claim 3	Prime Video
A method of rendering digital content according to claim 2, wherein the time information includes at least one of a start time, an end time, and a duration of each digital audio file in the plurality of digital audio files, the start and end times of each digital audio file determined relative to the beginning of the audio recording.	Prime Video provides a method of rendering digital content wherein the time information includes at least one of a start time, an end time, and a duration of each digital audio file (e.g., segment timing information) in the plurality of digital audio files, the start and end times of each digital audio file determined relative to the beginning of the audio recording. Figure 3. The MPD hierarchical data model. See https://www.slideshare.net/AmazonWebServices/amazon-prime-video-delivering-the-amazing-video-experience-ctd203r1-aws-reinvent-2018#19, slide 18 and https://www.bogotobogo.com/VideoStreaming/images/mpeg_dash/DASH-IEEE-multimedia-preprint.pdf at 4. 7.2.1 Media Presentation timeline One of the key features in DASH is that encoded versions of different media components share a common timeline. The presentation time of access unit within the media content is mapped to the global common presentation timeline for synchronization of different media components and to enable seamless switching of different coded versions of the same media components. See <i>Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats</i> (5th ed. 2022) (Document available at https://www.iso.org/standard/83314.html).

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video**Example**

This code is an example of a Video on Demand playlist:

```
#EXTM3U
#EXT-X-PLAYLIST-TYPE:VOD
#EXT-X-TARGETDURATION:10
#EXT-X-VERSION:4
#EXT-X-MEDIA-SEQUENCE:0
#EXTINF:10.0,
http://example.com/movie1/fileSequenceA.ts
#EXTINF:10.0,
http://example.com/movie1/fileSequenceB.ts
#EXTINF:10.0,
http://example.com/movie1/fileSequenceC.ts
#EXTINF:9.0,
http://example.com/movie1/fileSequenceD.ts
#EXT-X-ENDLIST
```

These are the tags used in the Video on Demand playlist example:

EXTM3U: Indicates that the playlist is an extended M3U file. This type of file is distinguished from a basic M3U file by changing the tag on the first line to EXTM3U. All HLS playlists must start with this tag.

EXT-X-PLAYLIST-TYPE: Provides mutability information that applies to the entire playlist file. This tag may contain a value of either EVENT or VOD. If the tag is present and has a value of EVENT, the server must not change or delete any part of the playlist file (although it may append lines to it). If the tag is present and has a value of VOD, the playlist file must not change.

EXT-X-TARGETDURATION: Specifies the maximum media-file duration.

EXT-X-VERSION: Indicates the compatibility version of the playlist file. The playlist media and its server must comply with all provisions of the most recent version of the IETF Internet-Draft of the HTTP Live Streaming specification that defines that protocol version.

EXT-X-MEDIA-SEQUENCE: Indicates the sequence number of the first URL that appears in a playlist file. Each media file URL in a playlist has a unique integer sequence number. The sequence number of a URL is higher by 1 than the sequence number of the URL that preceded it. The media sequence numbers have no relation to the names of the files.

EXTINF: A record marker that describes the media file identified by the URL that follows it. Each media file URL must be preceded by an EXTINF tag. This tag contains a duration attribute that's an integer or floating-point number in decimal positional notation that specifies the duration of the media segment in seconds. This value must be less than or equal to the target duration.

See <https://developer.apple.com/documentation/http-live-streaming/video-on-demand-playlist-construction>.

On information and belief, additional support can be found in Defendants' source code and non-public documents.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

Claim 4	Prime Video
A method of rendering digital content according to claim 3, wherein determining the first digital data file comprises comparing the predetermined time offset to the at least one of a start time, an end time, and a duration of each digital audio file in the plurality of digital audio files to find a first digital audio file that includes digital audio data from a point in the audio stream corresponding to the predetermined time offset.	Prime Video provides a method of rendering digital content wherein determining the first digital data file comprises comparing the predetermined time offset to the at least one of a start time, an end time, and a duration of each digital audio file (e.g., segment timing information) in the plurality of digital audio files to find a first digital audio file (e.g., audio segment or “chunk”) that includes digital audio data from a point in the audio stream corresponding to the predetermined time offset. Figure 3. The MPD hierarchical data model. See https://tele1.dee.fct.unl.pt/sar_2023_2024/files/w13533-MPEG-DASH-Overview.doc. 7.2.1 Media Presentation timeline One of the key features in DASH is that encoded versions of different media components share a common timeline. The presentation time of access unit within the media content is mapped to the global common presentation timeline for synchronization of different media components and to enable seamless switching of different coded versions of the same media components. See <i>Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats</i> (5th ed. 2022) (Document available at https://www.iso.org/standard/83314.html).

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video**Example**

This code is an example of a Video on Demand playlist:

```
#EXTM3U
#EXT-X-PLAYLIST-TYPE:VOD
#EXT-X-TARGETDURATION:10
#EXT-X-VERSION:4
#EXT-X-MEDIA-SEQUENCE:0
#EXTINF:10.0,
http://example.com/movie1/fileSequenceA.ts
#EXTINF:10.0,
http://example.com/movie1/fileSequenceB.ts
#EXTINF:10.0,
http://example.com/movie1/fileSequenceC.ts
#EXTINF:9.0,
http://example.com/movie1/fileSequenceD.ts
#EXT-X-ENDLIST
```

These are the tags used in the Video on Demand playlist example:

EXTM3U: Indicates that the playlist is an extended M3U file. This type of file is distinguished from a basic M3U file by changing the tag on the first line to EXTM3U. All HLS playlists must start with this tag.

EXT-X-PLAYLIST-TYPE: Provides mutability information that applies to the entire playlist file. This tag may contain a value of either EVENT or VOD. If the tag is present and has a value of EVENT, the server must not change or delete any part of the playlist file (although it may append lines to it). If the tag is present and has a value of VOD, the playlist file must not change.

EXT-X-TARGETDURATION: Specifies the maximum media-file duration.

EXT-X-VERSION: Indicates the compatibility version of the playlist file. The playlist media and its server must comply with all provisions of the most recent version of the IETF Internet-Draft of the HTTP Live Streaming specification that defines that protocol version.

EXT-X-MEDIA-SEQUENCE: Indicates the sequence number of the first URL that appears in a playlist file. Each media file URL in a playlist has a unique integer sequence number. The sequence number of a URL is higher by 1 than the sequence number of the URL that preceded it. The media sequence numbers have no relation to the names of the files.

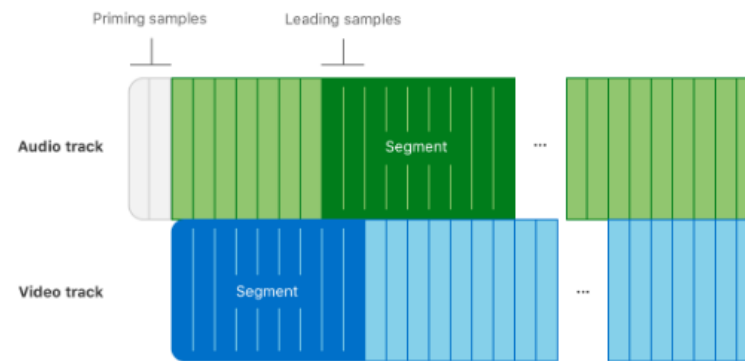
EXTINF: A record marker that describes the media file identified by the URL that follows it. Each media file URL must be preceded by an EXTINF tag. This tag contains a duration attribute that's an integer or floating-point number in decimal positional notation that specifies the duration of the media segment in seconds. This value must be less than or equal to the target duration.

See <https://developer.apple.com/documentation/http-live-streaming/video-on-demand-playlist-construction>.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video**Overview**

Producing media for HTTP Live Streaming (HLS) requires special considerations if you're encoding audio using the Advanced Audio Coding (AAC) family of formats.

AAC audio processing requires a small amount of leading "throw-away" audio to prime the encoder and initialize internal tables. This small amount of audio results from *encoder delay* which happens during encoding to produce properly formed, encoded audio packets, and its duration is commonly referred to as the *priming duration*. This audio needs to occur before the first frame of video; otherwise, there will be no audio for the first few frames of video.



The audio sample rates are normally 44.1 kHz or 48 kHz. For more information, see the [HTTP Live Streaming Specification](#) and the [HTTP Live Streaming \(HLS\) authoring specification for Apple devices](#).

See <https://developer.apple.com/documentation/http-live-streaming/preparing-audio-for-http-live-streaming>.

On information and belief, additional support can be found in Defendants' source code and non-public documents.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

Claim 5	Prime Video
A method of rendering digital content according to claim 4, wherein downloading the first digital data file or the digital data segment contained in the first digital data file and determined using the time information in the descriptor file comprises downloading the first digital audio file from the at least one server so that the first digital audio file is resident with the media player, and wherein rendering the digital content using the media player comprises rendering the first digital audio file using the media player while simultaneously downloading subsequent digital audio files from the at least one server (e.g., buffering chunks ahead of playback).	Prime Video provides a method of rendering digital content wherein downloading the first digital data file or the digital data segment contained in the first digital data file and determined using the time information in the descriptor file (e.g., segment timing information) comprises downloading the first digital audio file from the at least one server so that the first digital audio file is resident with the media player (e.g., received for playback), and wherein rendering the digital content using the media player comprises rendering the first digital audio file using the media player while simultaneously downloading subsequent digital audio files from the at least one server (e.g., buffering chunks ahead of playback). Figure 3. The MPD hierarchical data model. See https://tele1.dee.fct.unl.pt/sar_2023_2024/files/w13533-MPEG-DASH-Overview.doc. 7.2.1 Media Presentation timeline One of the key features in DASH is that encoded versions of different media components share a common timeline. The presentation time of access unit within the media content is mapped to the global common presentation timeline for synchronization of different media components and to enable seamless switching of different coded versions of the same media components. See <i>Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats</i> (5th ed. 2022) (Document available at https://www.iso.org/standard/83314.html).

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

subsequent digital audio files from the at least one server.

Example

This code is an example of a Video on Demand playlist:

```
#EXTM3U
#EXT-X-PLAYLIST-TYPE:VOD
#EXT-X-TARGETDURATION:10
#EXT-X-VERSION:4
#EXT-X-MEDIA-SEQUENCE:0
#EXTINF:10.0,
http://example.com/movie1/fileSequenceA.ts
#EXTINF:10.0,
http://example.com/movie1/fileSequenceB.ts
#EXTINF:10.0,
http://example.com/movie1/fileSequenceC.ts
#EXTINF:9.0,
http://example.com/movie1/fileSequenceD.ts
#EXT-X-ENDLIST
```

These are the tags used in the Video on Demand playlist example:

EXTM3U: Indicates that the playlist is an extended M3U file. This type of file is distinguished from a basic M3U file by changing the tag on the first line to EXTM3U. All HLS playlists must start with this tag.

EXT-X-PLAYLIST-TYPE: Provides mutability information that applies to the entire playlist file. This tag may contain a value of either EVENT or VOD. If the tag is present and has a value of EVENT, the server must not change or delete any part of the playlist file (although it may append lines to it). If the tag is present and has a value of VOD, the playlist file must not change.

EXT-X-TARGETDURATION: Specifies the maximum media-file duration.

EXT-X-VERSION: Indicates the compatibility version of the playlist file. The playlist media and its server must comply with all provisions of the most recent version of the IETF Internet-Draft of the HTTP Live Streaming specification that defines that protocol version.

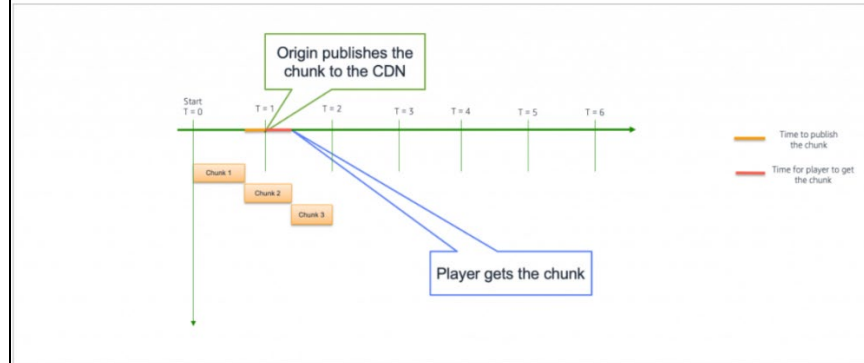
EXT-X-MEDIA-SEQUENCE: Indicates the sequence number of the first URL that appears in a playlist file. Each media file URL in a playlist has a unique integer sequence number. The sequence number of a URL is higher by 1 than the sequence number of the URL that preceded it. The media sequence numbers have no relation to the names of the files.

EXTINF: A record marker that describes the media file identified by the URL that follows it. Each media file URL must be preceded by an EXTINF tag. This tag contains a duration attribute that's an integer or floating-point number in decimal positional notation that specifies the duration of the media segment in seconds. This value must be less than or equal to the target duration.

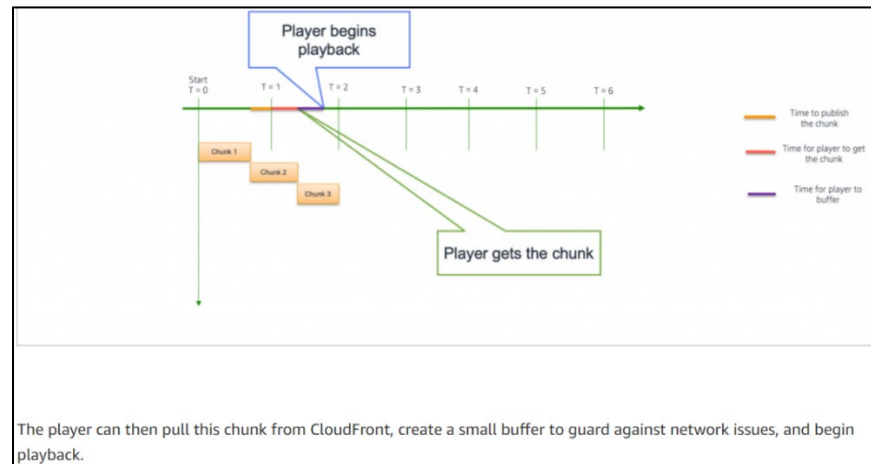
See <https://developer.apple.com/documentation/http-live-streaming/video-on-demand-playlist-construction>.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

Once the chunk is pushed to MediaStore, it is available for delivery via a CDN like CloudFront. CloudFront will now be able to pull this chunk, and collapse all corresponding requests for this chunk.



See <https://aws.amazon.com/blogs/media/lower-latency-with-aws-elemental-mediastore-chunked-object-transfer/>.



See <https://aws.amazon.com/blogs/media/lower-latency-with-aws-elemental-mediastore-chunked-object-transfer/>.

On information and belief, additional support can be found in Defendants' source code and non-public documents.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

Claim 6	Prime Video
A method of rendering digital content according to claim 4, wherein the plurality of media streams further comprises a text stream including a plurality of electronic text files created by segmenting an electronic text of the originating written work, and wherein the time information further includes at least one of a start time, an end time, and a duration of each electronic text file in the plurality of electronic text files, the start and end times of each electronic text file determined relative to the beginning of the audio recording.	Prime Video provides a method of rendering digital content wherein the plurality of media streams further comprises a text stream (e.g., subtitle media content component) including a plurality of electronic text files created by segmenting an electronic text of the originating written work, and wherein the time information further includes at least one of a start time, an end time, and a duration (e.g., segment timing information) of each electronic text file in the plurality of electronic text files, the start and end times of each electronic text file determined relative to the beginning of the audio recording (e.g., timing information from the Media Presentation timeline). The collection of encoded and deliverable versions of media content and the appropriate description of these form a Media Presentation. Media content is composed of a single or multiple contiguous media content periods in time. Content in different media content periods may be completely independent or certain periods of a Media Presentation may belong to the same Asset, for example a Media Presentation is a collection of main program composed of multiple periods, each assigned to the same Asset, and interleaved with inserted advertisement periods. Each media content period is composed of one or multiple media content components, for example audio components in various languages, different video components providing different views of the same program, subtitles in different language, etc.. Each media content component has an assigned media content component type, for example audio or video. 4.3 DASH data model overview DASH is intended to support a media-streaming model for delivery of continuous media content in which control lies primarily with the client. Clients may request data using the HTTP protocol from standard web servers that have no DASH-specific capabilities. Consequently, this document focuses not on client or server procedures but on the data formats used to provide a DASH Media Presentation. The collection of encoded and deliverable versions of continuous media content and the appropriate description of these form a Media Presentation. Media content is composed of a single or multiple contiguous media content periods in time. Content in different media content periods may be completely independent or certain periods of a Media Presentation may belong to the same Asset, for example a Media Presentation is a collection of main program composed of multiple periods, each assigned to the same Asset, and interleaved with inserted advertisement periods. Each media content period is composed of one or multiple media content components, for example audio components in various languages, different video components providing different views of the same program, subtitles in different languages, etc. Each media content component has an assigned media content component type, for example audio or video. <i>See Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats (5th ed. 2022) (Document available at https://www.iso.org/standard/83314.html).</i>

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video**7.2.1 Media Presentation timeline**

One of the key features in DASH is that encoded versions of different media components share a common timeline. The presentation time of access unit within the media content is mapped to the global common presentation timeline for synchronization of different media components and to enable seamless switching of different coded versions of the same media components.

See *Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats* (5th ed. 2022) (Document available at <https://www.iso.org/standard/83314.html>).

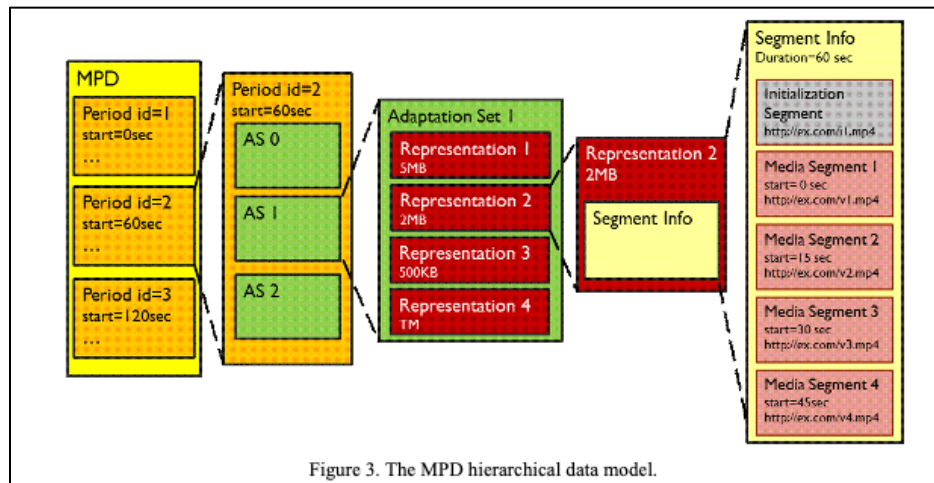


Figure 3. The MPD hierarchical data model.

See https://tele1.dee.fct.unl.pt/sar_2023_2024/files/w13533-MPEG-DASH-Overview.doc.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video**HTTP live streaming (HLS)**

Support for the HLS protocol is widespread in media players, web browsers, mobile devices, and streaming media servers. It is the most popular streaming format.

HLS uses a two layer playlist structure, combined with media segments. The very first file a player needs to start a stream is called the multi-variant playlist. HLS playlists can be identified by the file suffix ".m3u8". The multi-variant playlist contains references to all the variant playlists files available to the player, and additional information about what those variant playlists contain. In most cases, there are different variants to cater to various network speeds or available bandwidth (high, medium, and low, with potentially intermediate steps). There may also be additional audio and/or caption/subtitle streams available. An example of a multi-variant playlist file follows:

```
#EXTM3U
#EXT-X-VERSION:3
#EXT-X-INDEPENDENT-SEGMENTS
#EXT-X-STREAM-INF:BANDWIDTH=500000,RESOLUTION=640x360,CODECS="avc1.42e00a,mp4a.40.2"
http://example.com/low/index.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=1500000,RESOLUTION=854x480,CODECS="avc1.42e00a,mp4a.40.2"
http://example.com/mid/index.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=2500000,RESOLUTION=1280x720,CODECS="avc1.42e00a,mp4a.40.2"
http://example.com/high/index.m3u8
```

See <https://aws.amazon.com/blogs/media/back-to-basics-http-video-streaming/>.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video**Example**

This code is an example of a Video on Demand playlist:

```
#EXTM3U
#EXT-X-PLAYLIST-TYPE:VOD
#EXT-X-TARGETDURATION:10
#EXT-X-VERSION:4
#EXT-X-MEDIA-SEQUENCE:0
#EXTINF:10.0,
http://example.com/movie1/fileSequenceA.ts
#EXTINF:10.0,
http://example.com/movie1/fileSequenceB.ts
#EXTINF:10.0,
http://example.com/movie1/fileSequenceC.ts
#EXTINF:9.0,
http://example.com/movie1/fileSequenceD.ts
#EXT-X-ENDLIST
```

These are the tags used in the Video on Demand playlist example:

EXTM3U: Indicates that the playlist is an extended M3U file. This type of file is distinguished from a basic M3U file by changing the tag on the first line to EXTM3U. All HLS playlists must start with this tag.

EXT-X-PLAYLIST-TYPE: Provides mutability information that applies to the entire playlist file. This tag may contain a value of either EVENT or VOD. If the tag is present and has a value of EVENT, the server must not change or delete any part of the playlist file (although it may append lines to it). If the tag is present and has a value of VOD, the playlist file must not change.

EXT-X-TARGETDURATION: Specifies the maximum media-file duration.

EXT-X-VERSION: Indicates the compatibility version of the playlist file. The playlist media and its server must comply with all provisions of the most recent version of the IETF Internet-Draft of the HTTP Live Streaming specification that defines that protocol version.

EXT-X-MEDIA-SEQUENCE: Indicates the sequence number of the first URL that appears in a playlist file. Each media file URL in a playlist has a unique integer sequence number. The sequence number of a URL is higher by 1 than the sequence number of the URL that preceded it. The media sequence numbers have no relation to the names of the files.

EXTINF: A record marker that describes the media file identified by the URL that follows it. Each media file URL must be preceded by an EXTINF tag. This tag contains a duration attribute that's an integer or floating-point number in decimal positional notation that specifies the duration of the media segment in seconds. This value must be less than or equal to the target duration.

See <https://developer.apple.com/documentation/http-live-streaming/video-on-demand-playlist-construction>.

On information and belief, additional support can be found in Defendants' source code and non-public documents.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

Claim 7	Prime Video
A method of rendering digital content according to claim 6, wherein the method further comprises determining a first electronic text file from the plurality of electronic text files in the text stream by comparing the predetermined time offset to the at least one of a start time, an end time, and a duration of each electronic text file in the plurality of electronic text files to find a first electronic text file having a point therein corresponding to the predetermined time offset, and downloading the first electronic text file from the at least one server	Prime Video provides a method of rendering digital content wherein the method further comprises determining a first electronic text file (e.g., subtitle and/or lyric segments and/or “chunks”) from the plurality of electronic text files in the text stream by comparing the predetermined time offset to the at least one of a start time, an end time, and a duration of each electronic text file in the plurality of electronic text files to find a first electronic text file having a point therein corresponding to the predetermined time offset (e.g., timing information from the Media Presentation timeline), and downloading the first electronic text file from the at least one server so that the electronic text file is resident with the media player (e.g., available for playback). The collection of encoded and deliverable versions of media content and the appropriate description of these form a Media Presentation. Media content is composed of a single or multiple contiguous media content periods in time. Content in different media content periods may be completely independent or certain periods of a Media Presentation may belong to the same Asset, for example a Media Presentation is a collection of main program composed of multiple periods, each assigned to the same Asset, and interleaved with inserted advertisement periods. Each media content period is composed of one or multiple media content components, for example audio components in various languages, different video components providing different views of the same program, subtitles in different language, etc.. Each media content component has an assigned media content component type, for example audio or video. Figure 3. The MPD hierarchical data model. See https://tele1.dee.fct.unl.pt/sar_2023_2024/files/w13533-MPEG-DASH-Overview.doc.

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so that the electronic text file is resident with the media player.

HTTP live streaming (HLS)

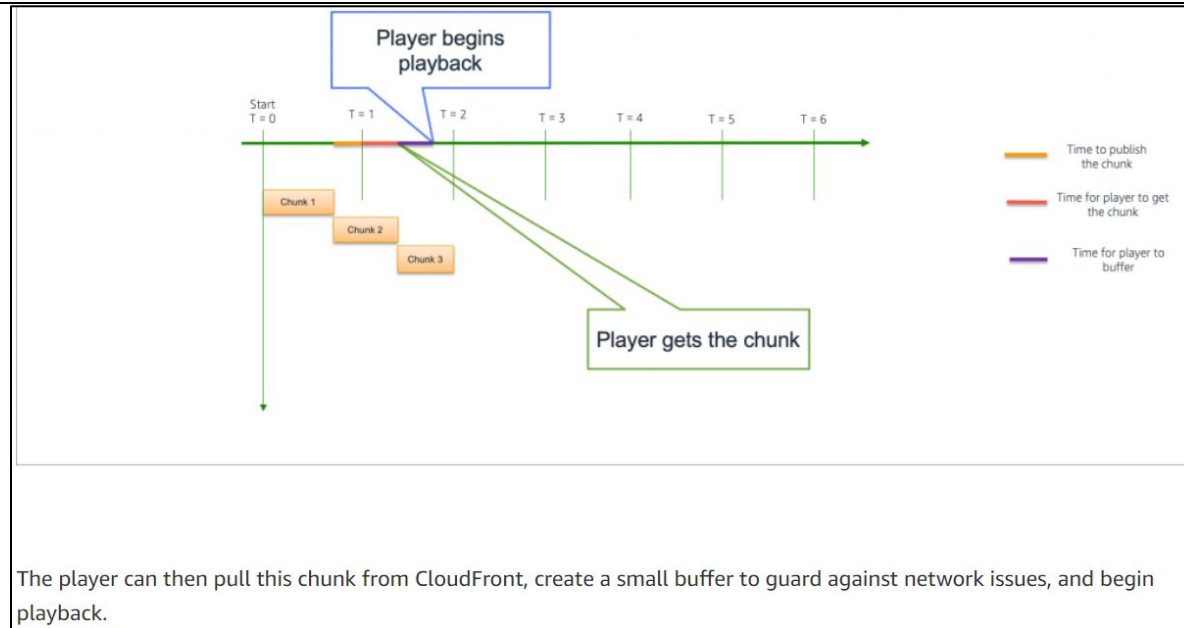
Support for the HLS protocol is widespread in media players, web browsers, mobile devices, and streaming media servers. It is the most popular streaming format.

HLS uses a two layer playlist structure, combined with media segments. The very first file a player needs to start a stream is called the multi-variant playlist. HLS playlists can be identified by the file suffix ".m3u8". The multi-variant playlist contains references to all the variant playlists files available to the player, and additional information about what those variant playlists contain. In most cases, there are different variants to cater to various network speeds or available bandwidth (high, medium, and low, with potentially intermediate steps). There may also be additional audio and/or caption/subtitle streams available. An example of a multi-variant playlist file follows:

```
#EXTM3U
#EXT-X-VERSION:3
#EXT-X-INDEPENDENT-SEGMENTS
#EXT-X-STREAM-INF:BANDWIDTH=500000,RESOLUTION=640x360,CODECS="avc1.42e00a,mp4a.40.2"
http://example.com/low/index.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=1500000,RESOLUTION=854x480,CODECS="avc1.42e00a,mp4a.40.2"
http://example.com/mid/index.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=2500000,RESOLUTION=1280x720,CODECS="avc1.42e00a,mp4a.40.2"
http://example.com/high/index.m3u8
```

See <https://aws.amazon.com/blogs/media/back-to-basics-http-video-streaming/>

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See <https://aws.amazon.com/blogs/media/lower-latency-with-aws-elemental-mediastore-chunked-object-transfer/>

On information and belief, additional support can be found in Defendants' source code and non-public documents.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

Claim 8	Prime Video
A method of rendering digital content according to claim 7, wherein rendering the digital content using the media player comprises rendering the first digital audio file using the media player while simultaneously rendering the first electronic text file using the media player starting from a point in the first electronic text file calculated to correspond to the predetermined time offset.	Prime Video provides a method of rendering digital content wherein rendering the digital content using the media player comprises rendering the first digital audio file using the media player while simultaneously rendering the first electronic text file using the media player starting from a point in the first electronic text file calculated to correspond to the predetermined time offset (e.g., playback in dependence on the process of mapping and synchronizing media components). 7.2.1 Media Presentation timeline One of the key features in DASH is that encoded versions of different media components share a common timeline. The presentation time of access unit within the media content is mapped to the global common presentation timeline for synchronization of different media components and to enable seamless switching of different coded versions of the same media components. See <i>Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats</i> (5th ed. 2022) (Document available at https://www.iso.org/standard/83314.html). Figure 3. The MPD hierarchical data model. See https://tele1.dee.fct.unl.pt/sar_2023_2024/files/w13533-MPEG-DASH-Overview.doc.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video**HTTP live streaming (HLS)**

Support for the HLS protocol is widespread in media players, web browsers, mobile devices, and streaming media servers. It is the most popular streaming format.

HLS uses a two layer playlist structure, combined with media segments. The very first file a player needs to start a stream is called the multi-variant playlist. HLS playlists can be identified by the file suffix ".m3u8". The multi-variant playlist contains references to all the variant playlists files available to the player, and additional information about what those variant playlists contain. In most cases, there are different variants to cater to various network speeds or available bandwidth (high, medium, and low, with potentially intermediate steps). There may also be additional audio and/or caption/subtitle streams available. An example of a multi-variant playlist file follows:

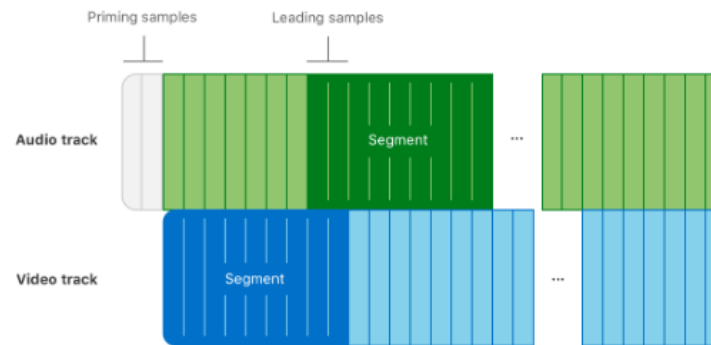
```
#EXTM3U
#EXT-X-VERSION:3
#EXT-X-INDEPENDENT-SEGMENTS
#EXT-X-STREAM-INF:BANDWIDTH=500000,RESOLUTION=640x360,CODECS="avc1.42e00a,mp4a.40.2"
http://example.com/low/index.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=1500000,RESOLUTION=854x480,CODECS="avc1.42e00a,mp4a.40.2"
http://example.com/mid/index.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=2500000,RESOLUTION=1280x720,CODECS="avc1.42e00a,mp4a.40.2"
http://example.com/high/index.m3u8
```

See <https://aws.amazon.com/blogs/media/back-to-basics-http-video-streaming/>.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video**Overview**

Producing media for HTTP Live Streaming (HLS) requires special considerations if you're encoding audio using the Advanced Audio Coding (AAC) family of formats.

AAC audio processing requires a small amount of leading "throw-away" audio to prime the encoder and initialize internal tables. This small amount of audio results from *encoder delay* which happens during encoding to produce properly formed, encoded audio packets, and its duration is commonly referred to as the *priming duration*. This audio needs to occur before the first frame of video; otherwise, there will be no audio for the first few frames of video.



The audio sample rates are normally 44.1 kHz or 48 kHz. For more information, see the [HTTP Live Streaming Specification](#) and the [HTTP Live Streaming \(HLS\) authoring specification for Apple devices](#).

See <https://developer.apple.com/documentation/http-live-streaming/preparing-audio-for-http-live-streaming>.

On information and belief, additional support can be found in Defendants' source code and non-public documents.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

Claim 9	Amazon Prime Video
A method of rendering digital content according to claim 1, wherein the plurality of media streams comprises a text stream including a plurality of electronic text files created by segmenting an electronic text of the originating written work, and wherein the time information includes at least one of a start time, an end time, and a duration of each electronic text file in the plurality of electronic text files, the start and end times of each electronic text file determined relative to the beginning of the audio recording, and wherein the first digital data file is a first	Prime Video provides a method of rendering digital content wherein the plurality of media streams comprises a text stream (e.g., subtitles and/or lyrics) including a plurality of electronic text files created by segmenting an electronic text of the originating written work, and wherein the time information includes at least one of a start time, an end time, and a duration (e.g., segment timing information) of each electronic text file in the plurality of electronic text files, the start and end times of each electronic text file determined relative to the beginning of the audio recording (e.g., timing information from the Media Presentation timeline), and wherein the first digital data file is a first electronic text file from the plurality of electronic text files in the text stream. Figure 3. The MPD hierarchical data model. See https://tele1.dee.fct.unl.pt/sar_2023_2024/files/w13533-MPEG-DASH-Overview.doc. 4.3 DASH data model overview

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electronic text file from the plurality of electronic text files in the text stream.

The collection of encoded and deliverable versions of media content and the appropriate description of these form a Media Presentation. Media content is composed of a single or multiple contiguous media content **periods** in time. Content in different media content periods may be completely independent or certain periods of a Media Presentation may belong to the same Asset, for example a Media Presentation is a collection of main program composed of multiple periods, each assigned to the same Asset, and interleaved with inserted advertisement periods. Each media content period is composed of one or multiple **media content components**, for example audio components in various languages, different video components providing different views of the same program, subtitles in different language, etc.. Each media content component has an assigned **media content component type**, for example audio or video.

DASH is based on a hierarchical data model aligned with the presentation in Figure 3. A DASH Media Presentation is described by a **Media Presentation Description** document. This describes the sequence of **Periods** (see 5.3.2) in time that make up the Media Presentation. A Period typically represents a media content period during which a consistent set of encoded versions of the media content is available i.e. the set of available bitrates, languages, captions, subtitles etc. does not change during a Period.

Within a Period, material is arranged into **Adaptation Sets** (see 5.3.3). An Adaptation Set represents a set of interchangeable encoded versions of one or several media content components (see 5.3.4). For example there may be one Adaptation Set for the main video component and a separate one for the main audio component. If there is other material available, for example captions or audio descriptions, then these may each have a separate Adaptation Set. Material may also be provided in multiplexed form, in which case interchangeable versions of the *multiplex* may be described as a single Adaptation Set, for example an Adaptation Set containing both the main audio and main video for a Period. Each of the multiplexed components may be described individually by a media content component description.

A second timeline is used to signal to clients the availability time of Segments at the specified HTTP-URLs. These times are referred to as **Segment availability times** and are provided in wall-clock time. Clients typically compare the wall-clock time to Segment availability times before accessing the Segments at the specified HTTP-URLs in order to avoid erroneous HTTP request responses. For static Media Presentations, the availability times of all Segments are identical. For dynamic Media Presentations, the availability times of segments depend on the position of the Segment in the Media Presentation timeline, i.e. the Segments get available over time. Whereas static Media Presentations are suitable to offer On-Demand content, dynamic Media Presentations are mostly suitable to offer live services.

See Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats (5th ed. 2022) (Document available at <https://www.iso.org/standard/83314.html>).

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video**7.2.1 Media Presentation timeline**

One of the key features in DASH is that encoded versions of different media components share a common timeline. The presentation time of access unit within the media content is mapped to the global common presentation timeline for synchronization of different media components and to enable seamless switching of different coded versions of the same media components.

See Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats (5th ed. 2022) (Document available at <https://www.iso.org/standard/83314.html>).

HTTP live streaming (HLS)

Support for the HLS protocol is widespread in media players, web browsers, mobile devices, and streaming media servers. It is the most popular streaming format.

HLS uses a two layer playlist structure, combined with media segments. The very first file a player needs to start a stream is called the multi-variant playlist. HLS playlists can be identified by the file suffix ".m3u8". The multi-variant playlist contains references to all the variant playlists files available to the player, and additional information about what those variant playlists contain. In most cases, there are different variants to cater to various network speeds or available bandwidth (high, medium, and low, with potentially intermediate steps). There may also be additional audio and/or caption/subtitle streams available. An example of a multi-variant playlist file follows:

```
#EXTM3U
#EXT-X-VERSION:3
#EXT-X-INDEPENDENT-SEGMENTS
#EXT-X-STREAM-INF:BANDWIDTH=500000,RESOLUTION=640x360,CODECS="avc1.42e00a,mp4a.40.2"
http://example.com/low/index.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=1500000,RESOLUTION=854x480,CODECS="avc1.42e00a,mp4a.40.2"
http://example.com/mid/index.m3u8
#EXT-X-STREAM-INF:BANDWIDTH=2500000,RESOLUTION=1280x720,CODECS="avc1.42e00a,mp4a.40.2"
http://example.com/high/index.m3u8
```

See <https://aws.amazon.com/blogs/media/back-to-basics-http-video-streaming/>

On information and belief, additional support can be found in Defendants' source code and non-public documents.

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Claim 10	Prime Video
A method of rendering digital content according to claim 9, wherein determining the first digital data file comprises comparing the predetermined time offset to the at least one of a start time, an end time, and a duration of each electronic text file in the plurality of electronic text files to find a first electronic text file having a point therein corresponding to the predetermined time offset.	Prime Video provides a method of rendering digital content wherein determining the first digital data file comprises comparing the predetermined time offset to the at least one of a start time, an end time, and a duration of each electronic text file in the plurality of electronic text files to find a first electronic text file having a point therein corresponding to the predetermined time offset (e.g., the process of mapping and synchronizing media components). 4.5.2 Media stream access points To be able to access a Representation, each of the media streams that are contained in the Representation requires Media Stream Access Points (SAPs). SAPs in the context of this part of ISO/IEC 23009 refer to the SAP definition in ISO/IEC 14496-12 Annex I. ISO/IEC 14496-12 Annex I.3 defines different types of SAPs that provide a relationship between the position where a stream can be accessed, relative to the start of a Segment or Subsegment, its presentation time and the presentation times and position of other access unit in the stream. The same SAP type definitions shall apply for this part of ISO/IEC 23009. A SAP is a position in a Representation that enables playback of a media stream to be started using only the information contained in Representation data starting from that position onwards (preceded by initializing data in the Initialization Segment, if any). <i>See Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats</i> (5th ed. 2022) (Document available at https://www.iso.org/standard/83314.html). 7.2.1 Media Presentation timeline One of the key features in DASH is that encoded versions of different media components share a common timeline. The presentation time of access unit within the media content is mapped to the global common presentation timeline for synchronization of different media components and to enable seamless switching of different coded versions of the same media components. <i>See Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats</i> (5th ed. 2022) (Document available at https://www.iso.org/standard/83314.html).

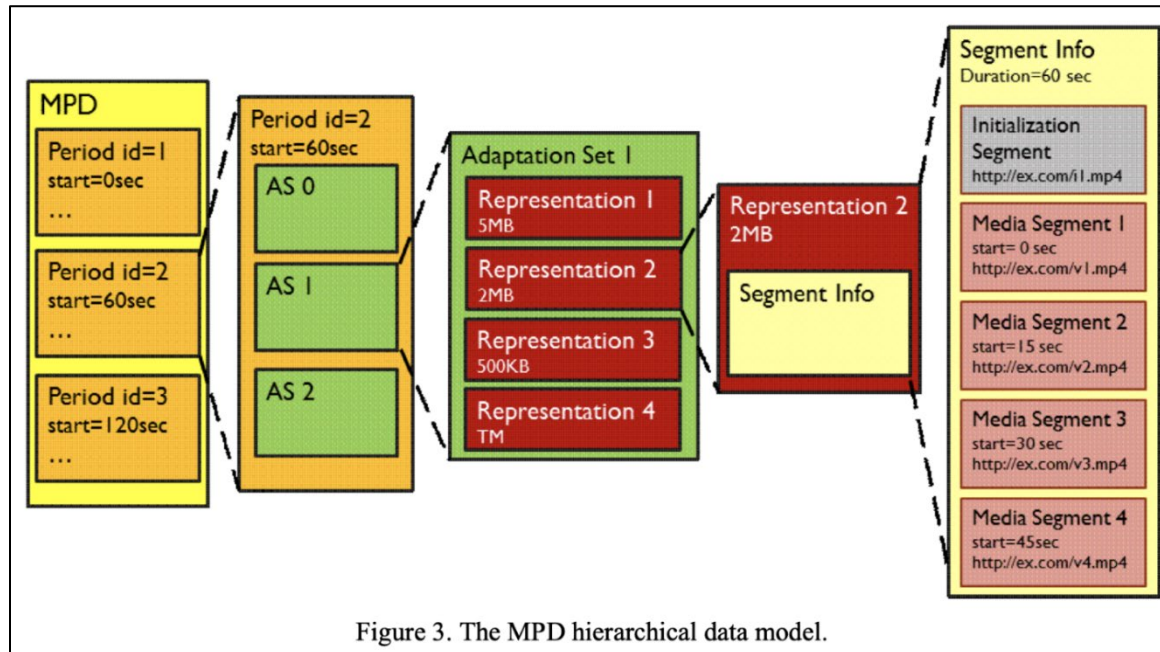
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Figure 3. The MPD hierarchical data model.

See https://tele1.dee.fct.unl.pt/sar_2023_2024/files/w13533-MPEG-DASH-Overview.doc.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video**Example**

This code is an example of a Video on Demand playlist:

```
#EXTM3U
#EXT-X-PLAYLIST-TYPE:VOD
#EXT-X-TARGETDURATION:10
#EXT-X-VERSION:4
#EXT-X-MEDIA-SEQUENCE:0
#EXTINF:10.0,
http://example.com/movie1/fileSequenceA.ts
#EXTINF:10.0,
http://example.com/movie1/fileSequenceB.ts
#EXTINF:10.0,
http://example.com/movie1/fileSequenceC.ts
#EXTINF:9.0,
http://example.com/movie1/fileSequenceD.ts
#EXT-X-ENDLIST
```

These are the tags used in the Video on Demand playlist example:

EXTM3U: Indicates that the playlist is an extended M3U file. This type of file is distinguished from a basic M3U file by changing the tag on the first line to EXTM3U. All HLS playlists must start with this tag.

EXT-X-PLAYLIST-TYPE: Provides mutability information that applies to the entire playlist file. This tag may contain a value of either EVENT or VOD. If the tag is present and has a value of EVENT, the server must not change or delete any part of the playlist file (although it may append lines to it). If the tag is present and has a value of VOD, the playlist file must not change.

EXT-X-TARGETDURATION: Specifies the maximum media-file duration.

EXT-X-VERSION: Indicates the compatibility version of the playlist file. The playlist media and its server must comply with all provisions of the most recent version of the IETF Internet-Draft of the HTTP Live Streaming specification that defines that protocol version.

EXT-X-MEDIA-SEQUENCE: Indicates the sequence number of the first URL that appears in a playlist file. Each media file URL in a playlist has a unique integer sequence number. The sequence number of a URL is higher by 1 than the sequence number of the URL that preceded it. The media sequence numbers have no relation to the names of the files.

EXTINF: A record marker that describes the media file identified by the URL that follows it. Each media file URL must be preceded by an EXTINF tag. This tag contains a duration attribute that's an integer or floating-point number in decimal positional notation that specifies the duration of the media segment in seconds. This value must be less than or equal to the target duration.

See <https://developer.apple.com/documentation/http-live-streaming/video-on-demand-playlist-construction>.

On information and belief, additional support can be found in Defendants' source code and non-public documents.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

Claim 11	Prime Video
A method of rendering digital content according to claim 10, wherein downloading the first digital data file or the digital data segment contained in the first digital data file and determined using the time information in the descriptor file comprises downloading the first electronic text file from the at least one server, loading the first electronic text file into a formatted memory structure, and loading a plurality of hard time tags from the descriptor file into the formatted memory structure.	Prime Video provides a method of rendering digital content wherein downloading the first digital data file or the digital data segment contained in the first digital data file and determined using the time information in the descriptor file comprises downloading the first electronic text file (e.g. segment or chunk) from the at least one server, loading the first electronic text file into a formatted memory structure (e.g., computer memory), and loading a plurality of hard time tags from the descriptor file into the formatted memory structure (e.g., playback). 4.3 DASH data model overview The collection of encoded and deliverable versions of media content and the appropriate description of these form a Media Presentation. Media content is composed of a single or multiple contiguous media content periods in time. Content in different media content periods may be completely independent or certain periods of a Media Presentation may belong to the same Asset, for example a Media Presentation is a collection of main program composed of multiple periods, each assigned to the same Asset, and interleaved with inserted advertisement periods. Each media content period is composed of one or multiple media content components, for example audio components in various languages, different video components providing different views of the same program, subtitles in different language, etc.. Each media content component has an assigned media content component type, for example audio or video. DASH is based on a hierarchical data model aligned with the presentation in Figure 3. A DASH Media Presentation is described by a Media Presentation Description document. This describes the sequence of Periods (see 5.3.2) in time that make up the Media Presentation. A Period typically represents a media content period during which a consistent set of encoded versions of the media content is available i.e. the set of available bitrates, languages, captions, subtitles etc. does not change during a Period. Within a Period, material is arranged into Adaptation Sets (see 5.3.3). An Adaptation Set represents a set of interchangeable encoded versions of one or several media content components (see 5.3.4). For example there may be one Adaptation Set for the main video component and a separate one for the main audio component. If there is other material available, for example captions or audio descriptions, then these may each have a separate Adaptation Set. Material may also be provided in multiplexed form, in which case interchangeable versions of the <i>multiplex</i> may be described as a single Adaptation Set, for example an Adaptation Set containing both the main audio and main video for a Period. Each of the multiplexed components may be described individually by a media content component description.

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A second timeline is used to signal to clients the availability time of Segments at the specified HTTP-URLs. These times are referred to as **Segment availability times** and are provided in wall-clock time. Clients typically compare the wall-clock time to Segment availability times before accessing the Segments at the specified HTTP-URLs in order to avoid erroneous HTTP request responses. For static Media Presentations, the availability times of all Segments are identical. For dynamic Media Presentations, the availability times of segments depend on the position of the Segment in the Media Presentation timeline, i.e. the Segments get available over time. Whereas static Media Presentations are suitable to offer On-Demand content, dynamic Media Presentations are mostly suitable to offer live services.

4.5.2 Media stream access points

To be able to access a Representation, each of the media streams that are contained in the Representation requires Media Stream Access Points (SAPs). SAPs in the context of this part of ISO/IEC 23009 refer to the SAP definition in ISO/IEC 14496-12 Annex I. ISO/IEC 14496-12 Annex I.3 defines different types of SAPs that provide a relationship between the position where a stream can be accessed, relative to the start of a Segment or Subsegment, its presentation time and the presentation times and position of other access unit in the stream. The same SAP type definitions shall apply for this part of ISO/IEC 23009.

A SAP is a position in a Representation that enables playback of a media stream to be started using only the information contained in Representation data starting from that position onwards (preceded by initializing data in the Initialization Segment, if any).

7.2.1 Media Presentation timeline

One of the key features in DASH is that encoded versions of different media components share a common timeline. The presentation time of access unit within the media content is mapped to the global common presentation timeline for synchronization of different media components and to enable seamless switching of different coded versions of the same media components.

See Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats (5th ed. 2022) (Document available at <https://www.iso.org/standard/83314.html>).

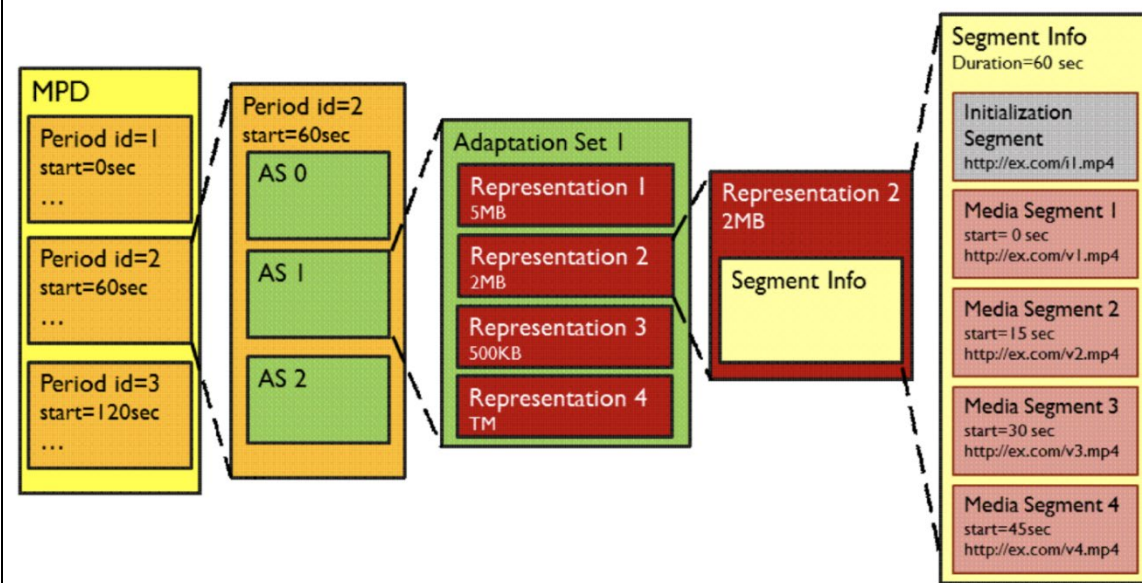
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Figure 3. The MPD hierarchical data model.

See https://tele1.dee.fct.unl.pt/sar_2023_2024/files/w13533-MPEG-DASH-Overview.doc.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video**Example**

This code is an example of a Video on Demand playlist:

```
#EXTM3U
#EXT-X-PLAYLIST-TYPE:VOD
#EXT-X-TARGETDURATION:10
#EXT-X-VERSION:4
#EXT-X-MEDIA-SEQUENCE:0
#EXTINF:10.0,
http://example.com/movie1/fileSequenceA.ts
#EXTINF:10.0,
http://example.com/movie1/fileSequenceB.ts
#EXTINF:10.0,
http://example.com/movie1/fileSequenceC.ts
#EXTINF:9.0,
http://example.com/movie1/fileSequenceD.ts
#EXT-X-ENDLIST
```

These are the tags used in the Video on Demand playlist example:

EXTM3U: Indicates that the playlist is an extended M3U file. This type of file is distinguished from a basic M3U file by changing the tag on the first line to EXTM3U. All HLS playlists must start with this tag.

EXT-X-PLAYLIST-TYPE: Provides mutability information that applies to the entire playlist file. This tag may contain a value of either EVENT or VOD. If the tag is present and has a value of EVENT, the server must not change or delete any part of the playlist file (although it may append lines to it). If the tag is present and has a value of VOD, the playlist file must not change.

EXT-X-TARGETDURATION: Specifies the maximum media-file duration.

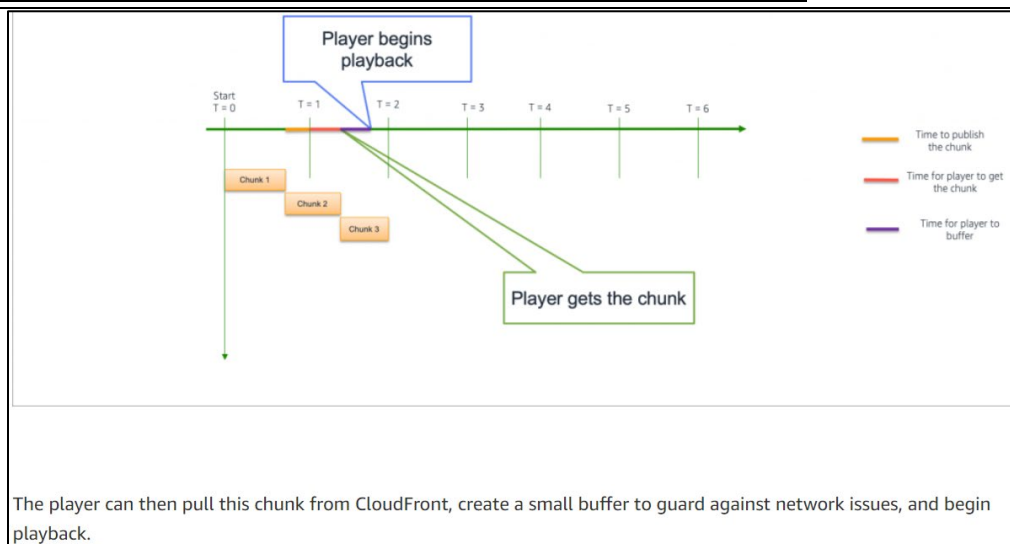
EXT-X-VERSION: Indicates the compatibility version of the playlist file. The playlist media and its server must comply with all provisions of the most recent version of the IETF Internet-Draft of the HTTP Live Streaming specification that defines that protocol version.

EXT-X-MEDIA-SEQUENCE: Indicates the sequence number of the first URL that appears in a playlist file. Each media file URL in a playlist has a unique integer sequence number. The sequence number of a URL is higher by 1 than the sequence number of the URL that preceded it. The media sequence numbers have no relation to the names of the files.

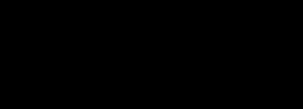
EXTINF: A record marker that describes the media file identified by the URL that follows it. Each media file URL must be preceded by an EXTINF tag. This tag contains a duration attribute that's an integer or floating-point number in decimal positional notation that specifies the duration of the media segment in seconds. This value must be less than or equal to the target duration.

See <https://developer.apple.com/documentation/http-live-streaming/video-on-demand-playlist-construction>.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video



See <https://aws.amazon.com/blogs/media/lower-latency-with-aws-elemental-mediastore-chunked-object-transfer/>



Access-Control-Allow-Methods:	GET
Access-Control-Allow-Origin:	*
Access-Control-Max-Age:	3000
Age:	5579390
Content-Length:	216876
Content-Range:	bytes 66331827-66548702/303787648
Content-Type:	video/mp4
Date:	Fri, 08 Nov 2024 13:41:11 GMT
Etag:	"b35c15085f87a6a9e1ed6318c1fd94fe-58"
Last-Modified:	Sun, 29 Oct 2023 06:51:38 GMT
Server:	AmazonS3
Vary:	Access-Control-Request-Headers,Access-Control-Request-Method
Via:	1.1 ca507725b9397f917364c90d2f75496.cloudfront.net (CloudFront)
X-Amz-Cf-Id:	zX-1IOQnpk-AhM_Fa59z3YpCD8lRKDxwatZ1hXuYzKuPmEmUkJcEQJ=
X-Amz-Cf-Pop:	ORD58-P5

See Screenshot of Prime Video.

On information and belief, additional support can be found in Defendants' source code and non-public documents.

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Claim 12	Prime Video
A method of rendering digital content according to claim 11, wherein rendering the digital content using the media player comprises determining at least one of a start time and an end time of a plurality of paragraphs in the loaded first electronic text file using the plurality of hard time tags, the start and end times of each paragraph determined relative to one of the beginning of the audio recording and a beginning of the first electronic text file (e.g., using the Media Presentation timeline and/or segment timing information).	Prime Video provides a method of rendering digital content wherein rendering the digital content using the media player comprises determining at least one of a start time and an end time of a plurality of paragraphs in the loaded first electronic text file using the plurality of hard time tags, the start and end times of each paragraph determined relative to one of the beginning of the audio recording and a beginning of the first electronic text file (e.g., using the Media Presentation timeline and/or segment timing information). Figure 3. The MPD hierarchical data model. See https://tele1.dee.fct.unl.pt/sar_2023_2024/files/w13533-MPEG-DASH-Overview.doc. 4.3 DASH data model overview

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

The collection of encoded and deliverable versions of media content and the appropriate description of these form a Media Presentation. Media content is composed of a single or multiple contiguous media content **periods** in time. Content in different media content periods may be completely independent or certain periods of a Media Presentation may belong to the same Asset, for example a Media Presentation is a collection of main program composed of multiple periods, each assigned to the same Asset, and interleaved with inserted advertisement periods. Each media content period is composed of one or multiple **media content components**, for example audio components in various languages, different video components providing different views of the same program, subtitles in different language, etc.. Each media content component has an assigned **media content component type**, for example audio or video.

DASH is based on a hierarchical data model aligned with the presentation in Figure 3. A DASH Media Presentation is described by a **Media Presentation Description** document. This describes the sequence of **Periods** (see 5.3.2) in time that make up the Media Presentation. A Period typically represents a media content period during which a consistent set of encoded versions of the media content is available i.e. the set of available bitrates, languages, captions, subtitles etc. does not change during a Period.

Within a Period, material is arranged into **Adaptation Sets** (see 5.3.3). An Adaptation Set represents a set of interchangeable encoded versions of one or several media content components (see 5.3.4). For example there may be one Adaptation Set for the main video component and a separate one for the main audio component. If there is other material available, for example captions or audio descriptions, then these may each have a separate Adaptation Set. Material may also be provided in multiplexed form, in which case interchangeable versions of the *multiplex* may be described as a single Adaptation Set, for example an Adaptation Set containing both the main audio and main video for a Period. Each of the multiplexed components may be described individually by a media content component description.

A second timeline is used to signal to clients the availability time of Segments at the specified HTTP-URLs. These times are referred to as **Segment availability times** and are provided in wall-clock time. Clients typically compare the wall-clock time to Segment availability times before accessing the Segments at the specified HTTP-URLs in order to avoid erroneous HTTP request responses. For static Media Presentations, the availability times of all Segments are identical. For dynamic Media Presentations, the availability times of segments depend on the position of the Segment in the Media Presentation timeline, i.e. the Segments get available over time. Whereas static Media Presentations are suitable to offer On-Demand content, dynamic Media Presentations are mostly suitable to offer live services.

See Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats (5th ed. 2022) (Document available at <https://www.iso.org/standard/83314.html>).

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video**7.2.1 Media Presentation timeline**

One of the key features in DASH is that encoded versions of different media components share a common timeline. The presentation time of access unit within the media content is mapped to the global common presentation timeline for synchronization of different media components and to enable seamless switching of different coded versions of the same media components.

The presentation times within each Period are relative to the *PeriodStart* time of the Period minus the value of the @presentationTimeOffset, T_0 , of the containing Representation. This means for an access unit with a presentation time T_P signalled in the media stream, the Media Presentation time relative to the *PeriodStart* is $T_M = T_P - T_0$.

A Representation should cover all presentation times T_P that are greater than and equal to the value of the @presentationTimeOffset, T_0 . If smaller values are present, i.e. the value of the @eptDelta is negative, then presentation of the Media Segment is expected to only take place for presentation times greater than or equal to T_0 .

In case the @duration attribute is used for the signalling of the duration of Segments, then the MPD start times as defined in subclause 5.3.9.5.3 should provide an approximation of the Media Presentation time T_M within the Period. Specifically, the difference between MPD start time and presentation time T_P shall not exceed 50% of value of @duration divided by the value of the @timescale attribute. In case the Segment Timeline is used for the signalling of the duration of Segments, then the MPD start times as defined in subclause 5.3.9.5.3 shall provide exactly the Media Presentation time T_M within the Period, i.e. the MPD start time is the earliest presentation time of the Segment.

See https://github.com/liwf616/awesome-live-stream/blob/master/Ebook/ISO_IEC_23009-1_2014.pdf

On information and belief, additional support can be found in Defendants' source code and non-public documents.

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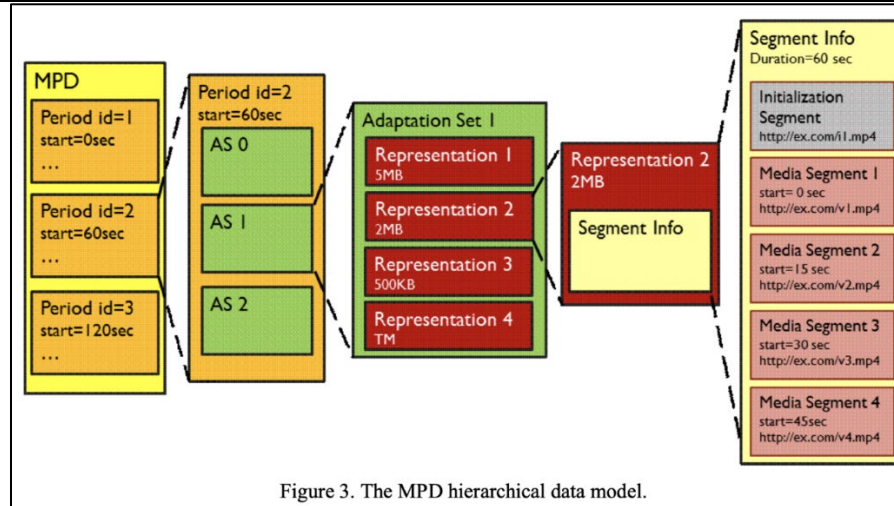
Claim 13	Prime Video
A method of rendering digital content according to claim 11, wherein rendering the digital content using the media player comprises extrapolating time values for a plurality of characters in the loaded first electronic text file, the time values extrapolated from the at least one of a start time, an end time, and a duration of the first electronic text file and the plurality of hard time tags.	Prime Video provides a method of rendering digital content wherein rendering the digital content using the media player comprises extrapolating time values for a plurality of characters in the loaded first electronic text file, the time values extrapolated from the at least one of a start time, an end time, and a duration of the first electronic text file and the plurality of hard time tags (e.g., mapping and synchronization of media components using the Media Presentation timeline). 7.2.1 Media Presentation timeline One of the key features in DASH is that encoded versions of different media components share a common timeline. The presentation time of access unit within the media content is mapped to the global common presentation timeline for synchronization of different media components and to enable seamless switching of different coded versions of the same media components. The presentation times within each Period are relative to the <i>PeriodStart</i> time of the Period minus the value of the @presentationTimeOffset, T_0, of the containing Representation. This means for an access unit with a presentation time T_P signalled in the media stream, the Media Presentation time relative to the <i>PeriodStart</i> is $T_M = T_P - T_0$. A Representation should cover all presentation times T_P that are greater than and equal to the value of the @presentationTimeOffset, T_0. If smaller values are present, i.e. the value of the @eptDelta is negative, then presentation of the Media Segment is expected to only take place for presentation times greater than or equal to T_0. In case the @duration attribute is used for the signalling of the duration of Segments, then the MPD start times as defined in subclause 5.3.9.5.3 should provide an approximation of the Media Presentation time T_M within the Period. Specifically, the difference between MPD start time and presentation time T_P shall not exceed 50% of value of @duration divided by the value of the @timescale attribute. In case the Segment Timeline is used for the signalling of the duration of Segments, then the MPD start times as defined in subclause 5.3.9.5.3 shall provide exactly the Media Presentation time T_M within the Period, i.e. the MPD start time is the earliest presentation time of the Segment. <i>See Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats (5th ed. 2022) (Document available at https://www.iso.org/standard/83314.html).</i>

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

Within a Period, material is arranged into **Adaptation Sets** (see 5.3.3). An Adaptation Set represents a set of interchangeable encoded versions of one or several media content components (see 5.3.4). For example there may be one Adaptation Set for the main video component and a separate one for the main audio component. If there is other material available, for example captions or audio descriptions, then these may each have a separate Adaptation Set. Material may also be provided in multiplexed form, in which case interchangeable versions of the *multiplex* may be described as a single Adaptation Set, for example an Adaptation Set containing both the main audio and main video for a Period. Each of the multiplexed components may be described individually by a media content component description.

A second timeline is used to signal to clients the availability time of Segments at the specified HTTP-URLs. These times are referred to as **Segment availability times** and are provided in wall-clock time. Clients typically compare the wall-clock time to Segment availability times before accessing the Segments at the specified HTTP-URLs in order to avoid erroneous HTTP request responses. For static Media Presentations, the availability times of all Segments are identical. For dynamic Media Presentations, the availability times of segments depend on the position of the Segment in the Media Presentation timeline, i.e. the Segments get available over time. Whereas static Media Presentations are suitable to offer On-Demand content, dynamic Media Presentations are mostly suitable to offer live services.

See Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats (5th ed. 2022) (Document available at <https://www.iso.org/standard/83314.html>).

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See https://tele1.dee.fct.unl.pt/sar_2023_2024/files/w13533-MPEG-DASH-Overview.doc.

On information and belief, additional support can be found in Defendants' source code and non-public documents.

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Claim 14	Prime Video
A method of rendering digital content according to claim 10, wherein rendering the digital content using the media player comprises determining a current time offset using at least one of a discrete and a timed event.	Prime Video provides a method of rendering digital content wherein rendering the digital content using the media player comprises determining a current time offset using at least one of a discrete and a timed event (e.g., the “Skip Intro” feature). See Screenshot of Prime Video.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video**7.2.1 Media Presentation timeline**

One of the key features in DASH is that encoded versions of different media components share a common timeline. The presentation time of access unit within the media content is mapped to the global common presentation timeline for synchronization of different media components and to enable seamless switching of different coded versions of the same media components.

The presentation times within each Period are relative to the *PeriodStart* time of the Period minus the value of the `@presentationTimeOffset`, T_0 , of the containing Representation. This means for an access unit with a presentation time T_P signalled in the media stream, the Media Presentation time relative to the *PeriodStart* is $T_M = T_P - T_0$.

A Representation should cover all presentation times T_P that are greater than and equal to the value of the `@presentationTimeOffset`, T_0 . If smaller values are present, i.e. the value of the `@ptDelta` is negative, then presentation of the Media Segment is expected to only take place for presentation times greater than or equal to T_0 .

In case the `@duration` attribute is used for the signalling of the duration of Segments, then the MPD start times as defined in subclause 5.3.9.5.3 should provide an approximation of the Media Presentation time T_M within the Period. Specifically, the difference between MPD start time and presentation time T_P shall not exceed 50% of value of `@duration` divided by the value of the `@timescale` attribute. In case the Segment Timeline is used for the signalling of the duration of Segments, then the MPD start times as defined in subclause 5.3.9.5.3 shall provide exactly the Media Presentation time T_M within the Period, i.e. the MPD start time is the earliest presentation time of the Segment.

See https://github.com/liwf616/awesome-live-stream/blob/master/Ebook/ISO_IEC_23009-1_2014.pdf

On information and belief, additional support can be found in Defendants' source code and non-public documents.

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Claim 15	Prime Video
A method of rendering digital content according to claim 14, wherein the plurality of media streams further comprises an audio stream including a plurality of digital audio files created by segmenting the audio recording, and wherein rendering the digital content using the media player further comprises simultaneously rendering a digital audio file from a point in the audio stream corresponding to the predetermined time offset and the first electronic text file (e.g., captions and/or lyrics) from a point in the text stream corresponding to the predetermined time offset (e.g., using the Media Presentation timeline).	Prime Video provides a method of rendering digital content wherein the plurality of media streams further comprises an audio stream (e.g., the audio media component) including a plurality of digital audio files (e.g., “Chunks”) created by segmenting the audio recording, and wherein rendering the digital content using the media player further comprises simultaneously rendering a digital audio file from a point in the audio stream corresponding to the predetermined time offset and the first electronic text file (e.g., captions and/or lyrics) from a point in the text stream corresponding to the predetermined time offset (e.g., using the Media Presentation timeline). Figure 3. The MPD hierarchical data model. See https://tele1.dee.fct.unl.pt/sar_2023_2024/files/w13533-MPEG-DASH-Overview.doc.

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to the predetermined time offset.

4.3 DASH data model overview

The collection of encoded and deliverable versions of media content and the appropriate description of these form a Media Presentation. Media content is composed of a single or multiple contiguous media content **periods** in time. Content in different media content periods may be completely independent or certain periods of a Media Presentation may belong to the same Asset, for example a Media Presentation is a collection of main program composed of multiple periods, each assigned to the same Asset, and interleaved with inserted advertisement periods. Each media content period is composed of one or multiple **media content components**, for example audio components in various languages, different video components providing different views of the same program, subtitles in different language, etc.. Each media content component has an assigned **media content component type**, for example audio or video.

DASH is based on a hierarchical data model aligned with the presentation in Figure 3. A DASH Media Presentation is described by a **Media Presentation Description** document. This describes the sequence of **Periods** (see 5.3.2) in time that make up the Media Presentation. A Period typically represents a media content period during which a consistent set of encoded versions of the media content is available i.e. the set of available bitrates, languages, captions, subtitles etc. does not change during a Period.

Within a Period, material is arranged into **Adaptation Sets** (see 5.3.3). An Adaptation Set represents a set of interchangeable encoded versions of one or several media content components (see 5.3.4). For example there may be one Adaptation Set for the main video component and a separate one for the main audio component. If there is other material available, for example captions or audio descriptions, then these may each have a separate Adaptation Set. Material may also be provided in multiplexed form, in which case interchangeable versions of the *multiplex* may be described as a single Adaptation Set, for example an Adaptation Set containing both the main audio and main video for a Period. Each of the multiplexed components may be described individually by a media content component description.

A second timeline is used to signal to clients the availability time of Segments at the specified HTTP-URLs. These times are referred to as **Segment availability times** and are provided in wall-clock time. Clients typically compare the wall-clock time to Segment availability times before accessing the Segments at the specified HTTP-URLs in order to avoid erroneous HTTP request responses. For static Media Presentations, the availability times of all Segments are identical. For dynamic Media Presentations, the availability times of segments depend on the position of the Segment in the Media Presentation timeline, i.e. the Segments get available over time. Whereas static Media Presentations are suitable to offer On-Demand content, dynamic Media Presentations are mostly suitable to offer live services.

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See Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats (5th ed. 2022) (Document available at <https://www.iso.org/standard/83314.html>).

7.2.1 Media Presentation timeline

One of the key features in DASH is that encoded versions of different media components share a common timeline. The presentation time of access unit within the media content is mapped to the global common presentation timeline for synchronization of different media components and to enable seamless switching of different coded versions of the same media components.

See Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats (5th ed. 2022) (Document available at <https://www.iso.org/standard/83314.html>).

On information and belief, additional support can be found in Defendants' source code and non-public documents.

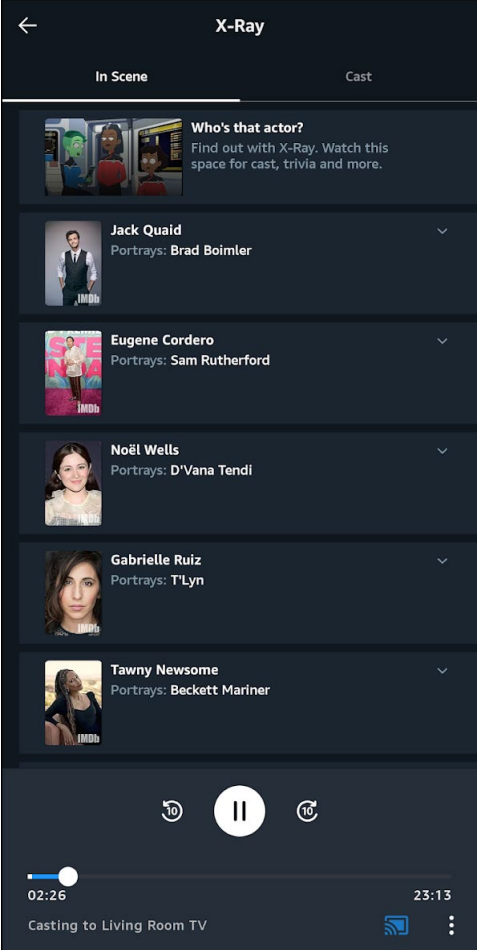
Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

Claim 17	Prime Video
A method of rendering digital content according to claim 1, wherein the plurality of media streams comprises an ancillary content stream including a plurality of ancillary files, and wherein the time information includes at least one of a start time, an end time, and a duration of each ancillary file in the plurality of ancillary files, the start and end times of each ancillary file determined relative to the beginning of the audio recording, the ancillary content stream including at least one of a plurality of graphic files, a plurality of advertising files, and a plurality of user generated ancillary files	Prime Video provides a method of rendering digital content wherein the plurality of media streams comprises an ancillary content stream including a plurality of ancillary files, and wherein the time information includes at least one of a start time, an end time, and a duration of each ancillary file in the plurality of ancillary files, the start and end times of each ancillary file determined relative to the beginning of the audio recording, the ancillary content stream including at least one of a plurality of graphic files, a plurality of advertising files, and a plurality of user generated ancillary files (e.g. the process and playback of dynamically inserted advertisements). See Screenshot of Prime Video.

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files, and a plurality of user generated ancillary files.

See Screenshot of Prime Video.



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A synchronized second-screen experience enables shoppers to seamlessly shop products on their TV from their mobile device.

See <https://advertising.amazon.com/library/news/amazon-live-groupm-shoppable-content-partnership>.

7.2.1 Media Presentation timeline

One of the key features in DASH is that encoded versions of different media components share a common timeline. The presentation time of access unit within the media content is mapped to the global common presentation timeline for synchronization of different media components and to enable seamless switching of different coded versions of the same media components.

See *Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats* (5th ed. 2022) (Document available at <https://www.iso.org/standard/83314.html>).

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The collection of encoded and deliverable versions of media content and the appropriate description of these form a Media Presentation. Media content is composed of a single or multiple contiguous media content **periods** in time. Content in different media content periods may be completely independent or certain periods of a Media Presentation may belong to the same Asset, for example a Media Presentation is a collection of main program composed of multiple periods, each assigned to the same Asset, and interleaved with inserted advertisement periods. Each media content period is composed of one or multiple **media content components**, for example audio components in various languages, different video components providing different views of the same program, subtitles in different language, etc.. Each media content component has an assigned **media content component type**, for example audio or video.

See Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats (5th ed. 2022) (Document available at <https://www.iso.org/standard/83314.html>).

Example playlists for HTTP Live Streaming

View and compare playlists for different HLS applications.

Overview

HTTP Live Streaming sends audio and video as a series of small files, typically of about 6 seconds duration, called *media segment files*. An index file, or playlist, provides an ordered list of the URLs of the media segment files. Index files for HTTP Live Streaming are saved as M3U8 playlists, an extension of the M3U format used for MP3 playlists. The URL of the index file is accessed by clients, which then request the indexed files in sequence.

See <https://developer.apple.com/documentation/http-live-streaming/example-playlists-for-http-live-streaming>.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video**Example**

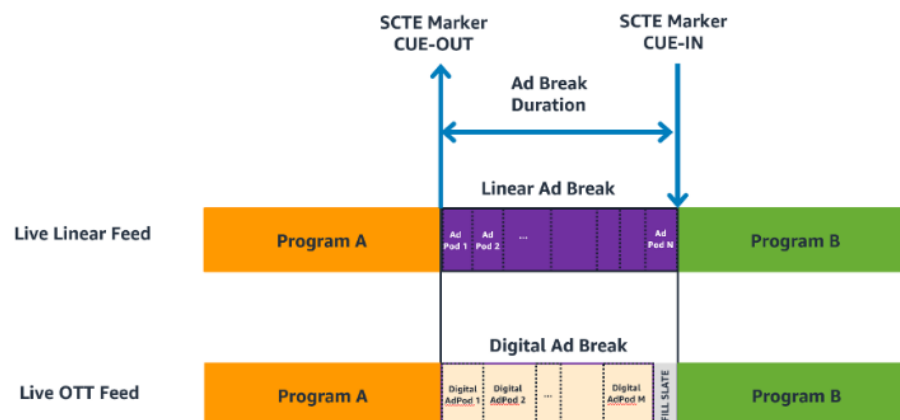
The following example shows a stream that uses the EXT-X-DISCONTINUITY tag to play movies that are preceded by an 18-second ad (segments ad0.ts and ad1.ts):

```
#EXTM3U
#EXT-X-TARGETDURATION:10
#EXT-X-VERSION:4
#EXT-X-MEDIA-SEQUENCE:0
#EXTINF:10.0,
ad0.ts
#EXTINF:8.0,
ad1.ts
#EXT-X-DISCONTINUITY
#EXTINF:10.0,
movieA.ts
#EXTINF:10.0,
movieB.ts
```

See <https://developer.apple.com/documentation/http-live-streaming/incorporating-ads-into-a-playlist>.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

The following illustration summarizes what a live ad replacement system should do to switch ads from a live linear feed to digital ads:



NOTE: For OTT distribution, it is challenging to replace the whole ad break with digital ads of the same duration. The purpose of the video slate is to fill video until the end of a digital ad break.

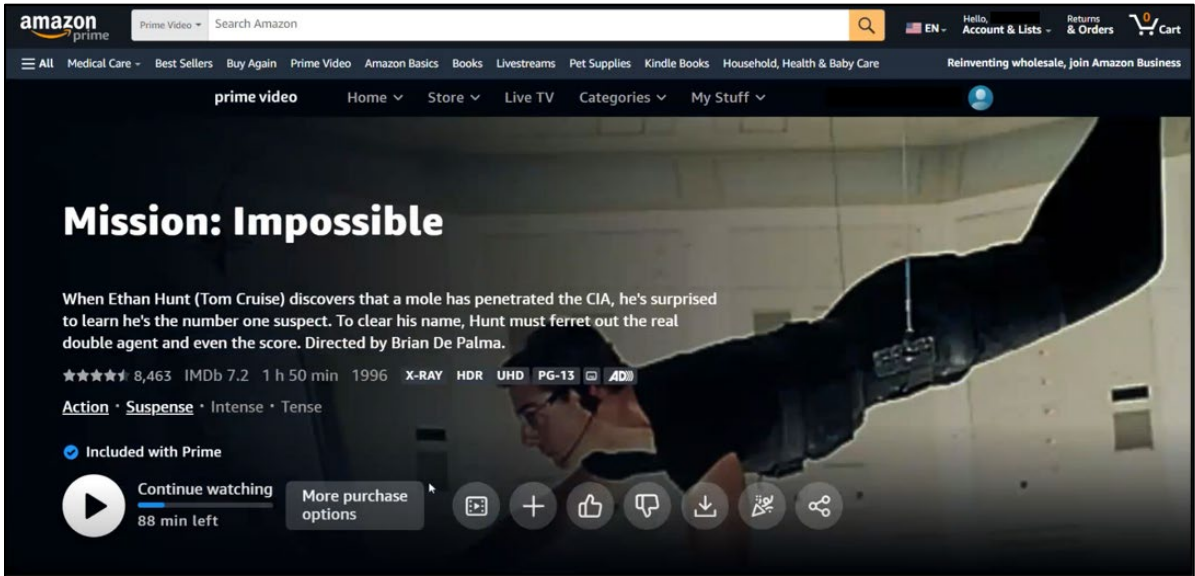
In a traditional broadcast setup, ad markers are inserted at a specific frame to indicate the beginning and the duration of an ad break (this is usually done at the playout level). The duration of an ad break can vary depending on the broadcaster and/or the event. There is no limit on AWS Elemental MediaTailor with respect to ad breaks duration. Multiple ad pods or ad creatives can be displayed during the ad break.

Using DAI makes it possible to replace an ad break in full or in only one specific ad pod. The markers used during the ad breaks are usually Society of Cable Telecommunications Engineers (SCTE) markers ([SCTE-104](#) for uncompressed video feeds and [SCTE-35](#) for compressed feeds). AWS Elemental offers broad flexibility to handle SCTE markers; you can find out more information on how [AWS Elemental MediaLive](#)—a broadcast-grade live video processing service—processes SCTE messages [here](#).

<https://aws.amazon.com/blogs/media/how-to-implement-reliable-dynamic-ad-insertion-using-aws-media-services/>

On information and belief, additional support can be found in Defendants' source code and non-public documents.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

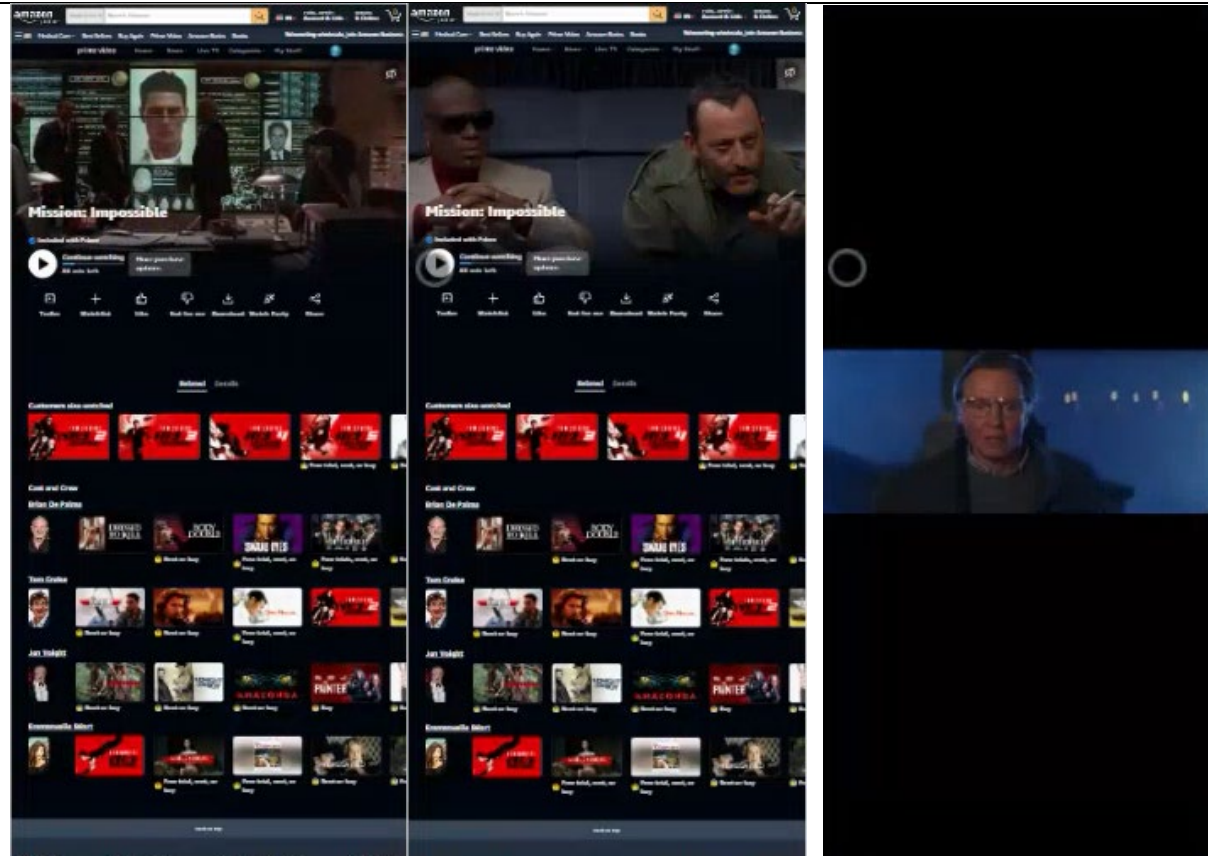
Claim 18	Prime Video
A method of rendering digital content according to claim 1, wherein the predetermined time offset is provided by one of a bookmark, a search result, a table of contents, an index, a list of tables, a list of figures, footnotes, quotations, a list of illustrations, a fast-forward request, and a rewind request.	Prime Video provides a method of rendering digital content wherein the predetermined time offset is provided by one of a bookmark (e.g., through Multi-Device Sync or the “Skip Intro” feature), a search result, a table of contents, an index, a list of tables, a list of figures, footnotes, quotations, a list of illustrations, a fast-forward request, and a rewind request. 7. Multi-Device Sync: Amazon Prime Video offers multi-device syncing, allowing you to start watching a TV show or movie on one device and continue on another. For example, if you start streaming on your smartphone, you can pause and resume playback seamlessly on your smart TV or tablet using the same Amazon account. See https://citizenside.com/entertainment/how-to-watch-tv-with-amazon-prime/  The screenshot shows the Amazon Prime Video website. At the top is the Amazon logo and a search bar. Below the navigation bar, the movie 'Mission: Impossible' is featured. The title is in large white text. Below it is a synopsis: 'When Ethan Hunt (Tom Cruise) discovers that a mole has penetrated the CIA, he's surprised to learn he's the number one suspect. To clear his name, Hunt must ferret out the real double agent and even the score. Directed by Brian De Palma.' Below the synopsis are ratings (8,463 stars, IMDb 7.2), runtime (1 h 50 min), year (1996), and technical specifications (X-RAY, HDR, UHD, PG-13, AD). There are also genre tags: Action, Suspense, Intense, Tense. A blue checkmark indicates 'Included with Prime'. At the bottom, there is a play button icon, a 'Continue watching' button with '88 min left', and a 'More purchase options' button. A row of icons for various features (subtitles, audio, etc.) is at the very bottom. See screenshot of Prime Video.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video



See screenshot of Prime Video.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video



See screenshot of Prime Video.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video



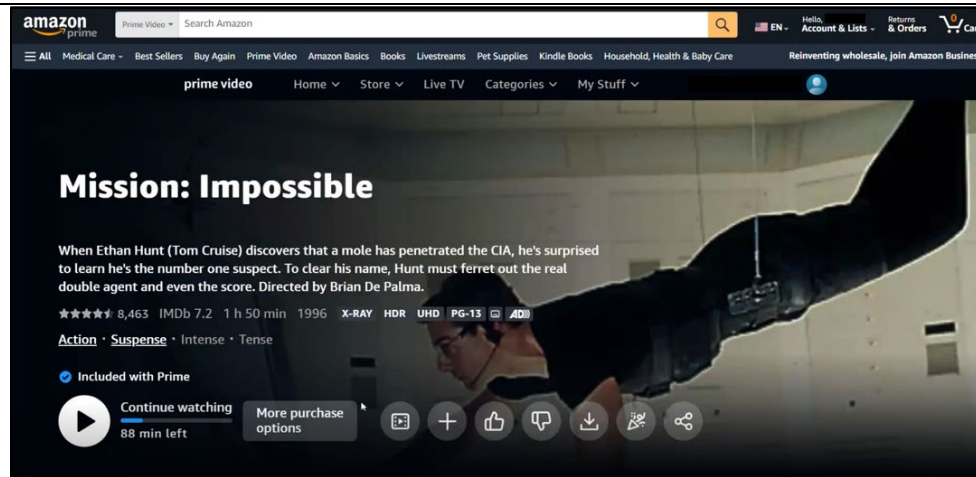
See Screenshot of Prime Video.

On information and belief, additional support can be found in Defendants' source code and non-public documents.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

Claim 19	Prime Video
A method of rendering digital content according to claim 1, wherein the predetermined time offset is provided by a bookmark, the bookmark including information to identify the descriptor file.	Prime Video provides a method of rendering digital content wherein the predetermined time offset is provided by a bookmark, the bookmark including information to identify the descriptor file (e.g., through Multi-Device Sync and/or the Continue Watching feature). Digital Services and Device Support › Fire TV Support › Device Features on Fire TV › How Does the Continue Watching Row Work? The Continue Watching row on your home screen helps you find your recently watched shows from Prime Video, Freevee, and supported third-party apps. The Continue Watching row syncs across your compatible Fire TV devices and reflects the viewing activity of the profile you're using. Compatibility varies across Fire TV devices. Note: This feature isn't available on Kids profiles. When you open a supported app, a message appears on-screen about personalizing your Fire TV. To turn on this feature for all supported apps, select Accept. You can also turn on this feature by going to Manage Sharing from Apps in your Fire TV's Privacy Settings. Tip: You can manage your privacy settings at any time by following the steps in Manage Sharing of Viewing Information from Apps on Fire TV. While this feature is on, supported third-party apps share your viewing and content information with Amazon. Shared information includes: • Watching activity • Watchlist • Recordings • Purchases See https://www.amazon.com/gp/help/customer/display.html?nodeId=TEIq4vikEIpvh49FW1 7. Multi-Device Sync: Amazon Prime Video offers multi-device syncing, allowing you to start watching a TV show or movie on one device and continue on another. For example, if you start streaming on your smartphone, you can pause and resume playback seamlessly on your smart TV or tablet using the same Amazon account. See https://citizenside.com/entertainment/how-to-watch-tv-with-amazon-prime/

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

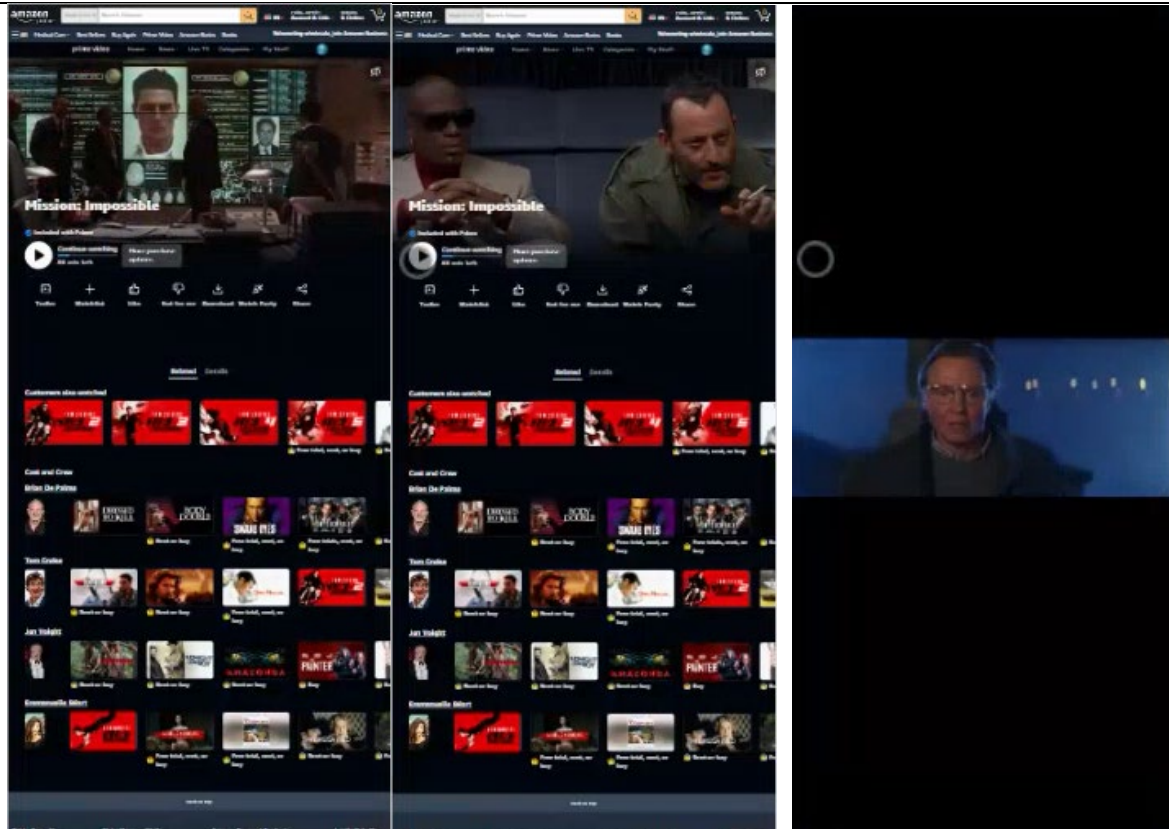


See screenshot of Prime Video.



See screenshot of Prime Video.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video



See screenshot of Prime Video.

On information and belief, additional support can be found in Defendants' source code and non-public documents.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

Claim 21	Prime Video
A method of rendering digital content according to claim 10, wherein the predetermined time offset is provided from a text search result.	Prime Video provides a method of rendering digital content wherein the predetermined time offset is provided from a text search result (e.g., a searchable link may be created for any timestamp). See https://www.reddit.com/r/amazonprime/comments/153zazr/is there a way to share a amazon prime video/. On information and belief, additional support can be found in Defendants' source code and non-public documents.

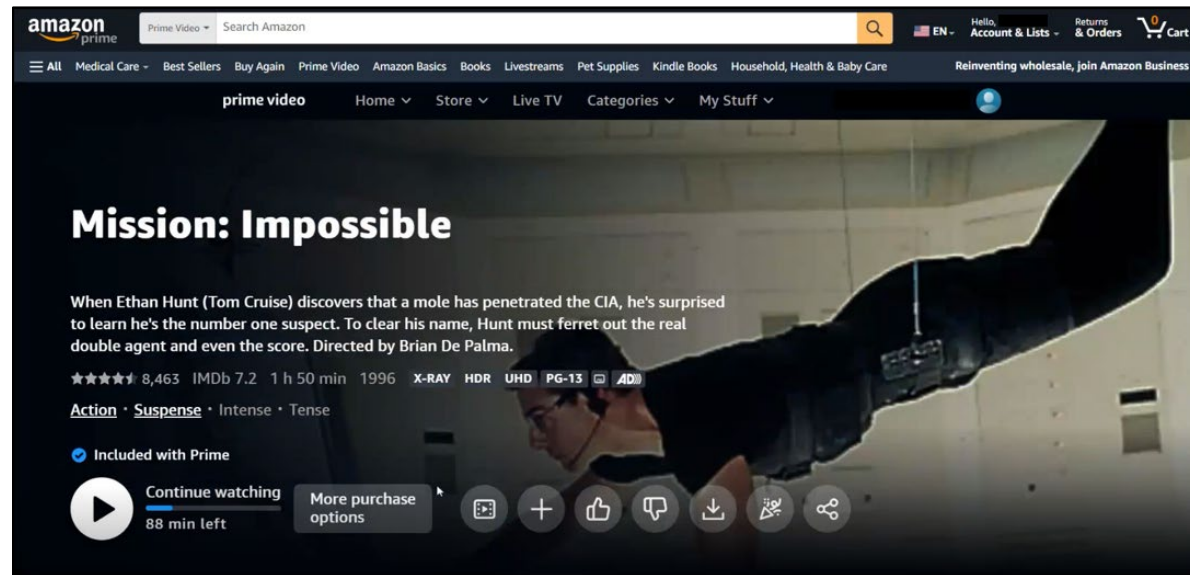
Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

Claim 22	Prime Video
A method of rendering digital content according to claim 14, further comprising creating a bookmark for a selected point in the digital content, the bookmark including the current time offset, the current time offset determined relative to the timeline of the audio recording.	Prime Video provides a method of rendering digital content further comprising creating a bookmark for a selected point in the digital content, the bookmark including the current time offset, the current time offset determined relative to the timeline of the audio recording (e.g., through Multi-Device Sync and/or the Continue Watching feature). Digital Services and Device Support › Fire TV Support › Device Features on Fire TV › How Does the Continue Watching Row Work? The Continue Watching row on your home screen helps you find your recently watched shows from Prime Video, Freevee, and supported third-party apps. The Continue Watching row syncs across your compatible Fire TV devices and reflects the viewing activity of the profile you're using. Compatibility varies across Fire TV devices. Note: This feature isn't available on Kids profiles. When you open a supported app, a message appears on-screen about personalizing your Fire TV. To turn on this feature for all supported apps, select Accept. You can also turn on this feature by going to Manage Sharing from Apps in your Fire TV's Privacy Settings. Tip: You can manage your privacy settings at any time by following the steps in Manage Sharing of Viewing Information from Apps on Fire TV. While this feature is on, supported third-party apps share your viewing and content information with Amazon. Shared information includes: • Watching activity • Watchlist • Recordings • Purchases See https://www.amazon.com/gp/help/customer/display.html?nodeId=TEIq4vikEIpvh49FW1

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

7. Multi-Device Sync: Amazon Prime Video offers multi-device syncing, allowing you to start watching a TV show or movie on one device and continue on another. For example, if you start streaming on your smartphone, you can pause and resume playback seamlessly on your smart TV or tablet using the same Amazon account.

See <https://citizenside.com/entertainment/how-to-watch-tv-with-amazon-prime/>



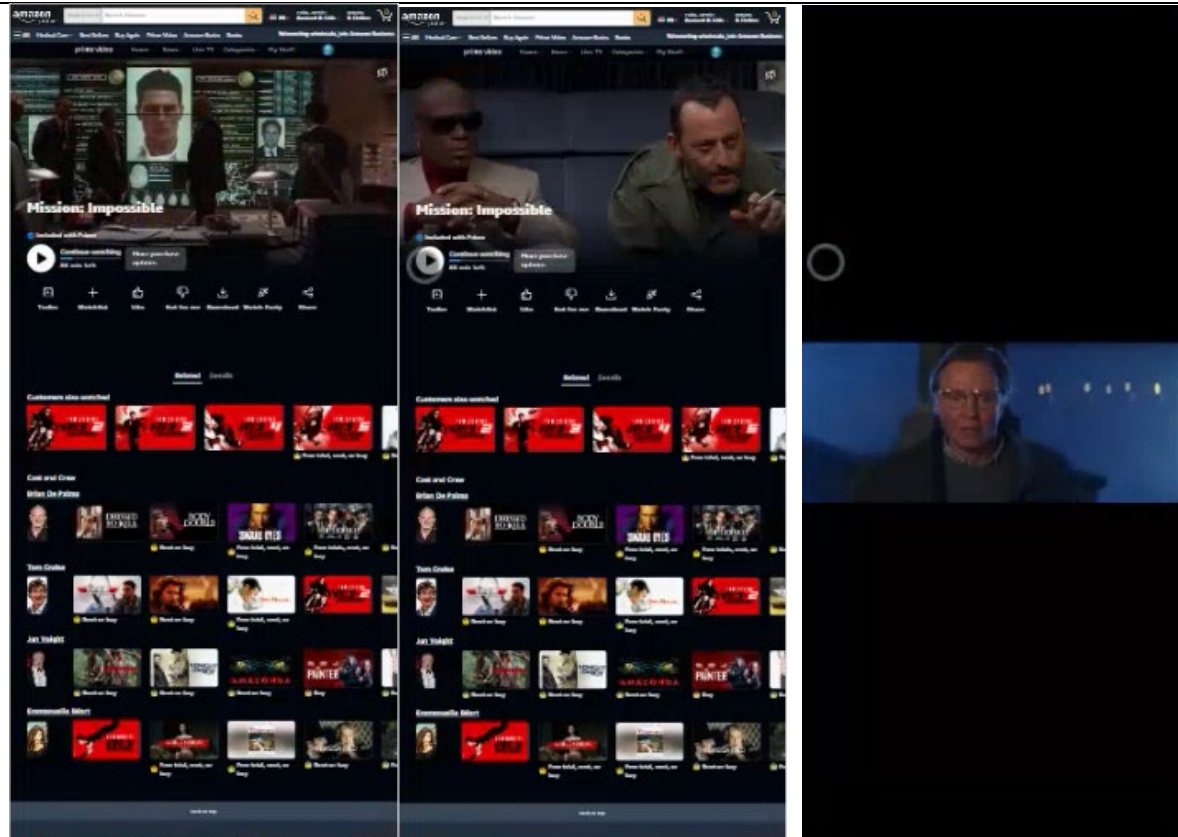
See screenshot of Prime Video.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video



See screenshot of Prime Video.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video



See screenshot of Prime Video.

On information and belief, additional support can be found in Defendants' source code and non-public documents.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

Claim 23	Prime Video
[23a] A method of rendering digital content according to claim 1, further comprising: determining a current time offset while rendering the digital content; and	Prime Video provides a method of rendering digital content further comprising: determining a current time offset (e.g., tracking progress during playback) while rendering the digital content.  See screenshot of Prime Video. On information and belief, additional support can be found in Defendants' source code and non-public documents.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video**[23b]**

creating a bookmark for a selected point in the rendered digital content, the bookmark an electronic file including the current time offset and an identification of the descriptor file, the current time offset being a time difference from a beginning of the audio recording to a selected point in the audio recording, the selected point in the audio recording corresponding to the selected point in the digital content.

Prime Video provides a method for rendering digital content further comprising: creating a bookmark for a selected point in the rendered digital content the bookmark an electronic file including the current time offset and an identification of the descriptor file, the current time offset being a time difference from a beginning of the audio recording to a selected point in the audio recording, the selected point in the audio recording corresponding to the selected point in the digital content (e.g., through **Multi-Device Sync** and/or the **Continue Watching** feature).

Digital Services and Device Support › Fire TV Support › Device Features on Fire TV ›

How Does the Continue Watching Row Work?

The **Continue Watching** row on your home screen helps you find your recently watched shows from Prime Video, Freevee, and supported third-party apps.

The **Continue Watching** row syncs across your compatible Fire TV devices and reflects the viewing activity of the profile you're using. Compatibility varies across Fire TV devices.

Note: This feature isn't available on Kids profiles.

When you open a supported app, a message appears on-screen about personalizing your Fire TV. To turn on this feature for all supported apps, select **Accept**. You can also turn on this feature by going to **Manage Sharing from Apps** in your Fire TV's **Privacy Settings**.

Tip: You can manage your privacy settings at any time by following the steps in [Manage Sharing of Viewing Information from Apps on Fire TV](#).

While this feature is on, supported third-party apps share your viewing and content information with Amazon. Shared information includes:

- Watching activity
- Watchlist
- Recordings
- Purchases

See <https://www.amazon.com/gp/help/customer/display.html?nodeId=TEIq4vikEIpvh49FW1>

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

7. Multi-Device Sync: Amazon Prime Video offers multi-device syncing, allowing you to start watching a TV show or movie on one device and continue on another. For example, if you start streaming on your smartphone, you can pause and resume playback seamlessly on your smart TV or tablet using the same Amazon account.

See <https://citizenside.com/entertainment/how-to-watch-tv-with-amazon-prime/>

7.2.1 Media Presentation timeline

One of the key features in DASH is that encoded versions of different media components share a common timeline. The presentation time of access unit within the media content is mapped to the global common presentation timeline for synchronization of different media components and to enable seamless switching of different coded versions of the same media components.

The presentation times within each Period are relative to the *PeriodStart* time of the Period minus the value of the `@presentationTimeOffset`, T_O , of the containing Representation. This means for an access unit with a presentation time T_P signalled in the media stream, the Media Presentation time relative to the *PeriodStart* is $T_M = T_P - T_O$.

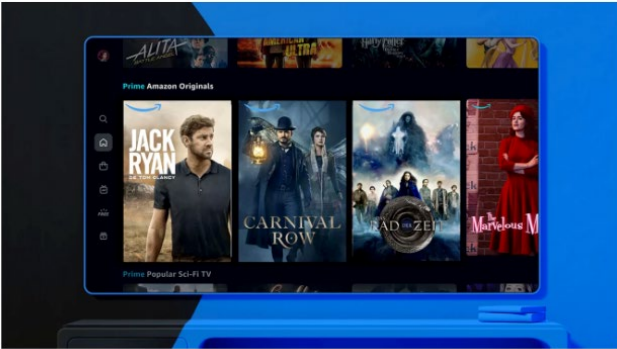
A Representation should cover all presentation times T_P that are greater than and equal to the value of the `@presentationTimeOffset`, T_O . If smaller values are present, i.e. the value of the `@ptDelta` is negative, then presentation of the Media Segment is expected to only take place for presentation times greater than or equal to T_O .

In case the `@duration` attribute is used for the signalling of the duration of Segments, then the MPD start times as defined in subclause 5.3.9.5.3 should provide an approximation of the Media Presentation time T_M within the Period. Specifically, the difference between MPD start time and presentation time T_P shall not exceed 50% of value of `@duration` divided by the value of the `@timescale` attribute. In case the Segment Timeline is used for the signalling of the duration of Segments, then the MPD start times as defined in subclause 5.3.9.5.3 shall provide exactly the Media Presentation time T_M within the Period, i.e. the MPD start time is the earliest presentation time of the Segment.

See *Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats* (5th ed. 2022) (Document available at <https://www.iso.org/standard/83314.html>).

On information and belief, additional support can be found in Defendants' source code and non-public documents.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

Claim 25	Prime Video
[Preamble] A system for rendering digital content comprising:	Prime Video provides a system for rendering digital content. What is Amazon Prime Video? Prime Video is a streaming video service by Amazon. Prime Video benefits are included with an Amazon Prime membership and if Amazon Prime isn't available in your country/region, you can join Prime Video to watch. With your membership, you can watch hundreds of TV shows and movies on your favorite devices. To get started, go to PrimeVideo.com, or download the Prime Video app on your mobile device. See https://www.primevideo.com/region/na/splash/getTheApp/ref=atv_hp_cnt. Prime Video offers a massive library of movies, series, and sports. Read this article in Spanish. Prime Video is home to more content than you might realize. If you're ready to stream blockbuster movies, hit shows, award-winning Amazon Originals, premium channels, and sports, read on for everything you need to know about Prime Video.  See https://www.aboutamazon.com/news/entertainment/what-you-need-to-know-about-prime-video.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

Prime Video System Requirements for Computers

Prime Video is available via a web browser on a computer running Windows, macOS, Chrome OS, or Linux.

Note: Not all Prime Video titles support all features.

To access Prime Video, please ensure that you're running the latest version of one of these web browsers:

- Google Chrome
- Mozilla Firefox
- Microsoft Edge
- Safari
- Opera

Prime Video playback is supported on these web browsers. If you're running an operating system other than Windows or macOS, playback is restricted to standard definition.

See <https://www.amazon.com/gp/help/customer/display.html?nodeId=GUVGB3QMORYRERYW>.

On information and belief, additional support can be found in Defendants' source code and non-public documents.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

[25a] at least one server having stored thereon a descriptor file and a plurality of media streams derived from a same originating written work, each media stream including a plurality of digital data files, the descriptor file including information allowing a simultaneous synchronized rendering of the plurality of media streams that provides a literary experience of the originating written work, the information including time information for each digital data file in each media stream, the time information for synchronizing the plurality of media streams and determined relative to a timeline of an audio recording of the originating written work.	Prime Video provides a system comprising at least one server having stored thereon a descriptor file and a plurality of media streams derived from a same originating written work, each media stream including a plurality of digital data files, the descriptor file including information allowing a simultaneous synchronized rendering of the plurality of media streams that provides a literary experience of the originating written work, the information including time information for each digital data file in each media stream, the time information for synchronizing the plurality of media streams and determined relative to a timeline of an audio recording of the originating written work. <i>See claim element [1a].</i> On information and belief, additional support can be found in Defendants' source code and non-public documents.
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Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

synchronizing the plurality of media streams and determined relative to a timeline of an audio recording of the originating written work;	
[25b] a client including computer readable code for: determining a first digital data file from the plurality of digital data files in a first media stream from the plurality of media streams, the first digital data file having digital content to be rendered with the media player and determined using the time information in the descriptor file and a predetermined time offset external to the descriptor file and determined relative to the timeline of the audio recording;	Prime Video provides a system comprising a client including computer readable code for: determining a first digital data file from the plurality of digital data files in a first media stream from the plurality of media streams, the first digital data file having digital content to be rendered with the media player and determined using the time information in the descriptor file and a predetermined time offset, the predetermined time offset external to the descriptor file and determined relative to the timeline of the audio recording; <i>See claim element [1b]</i> On information and belief, additional support can be found in Defendants' source code and non-public documents.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

predetermined time offset, the predetermined time offset external to the descriptor file and determined relative to the timeline of the audio recording;	
[25c] downloading the first digital data file or a digital data segment contained in the first digital data file and determined using the time information in the descriptor file from the at least one server so that the digital content is resident with the client; and	Prime Video provides a system for downloading the first digital data file or a digital data segment contained in the first digital data file and determined using the time information in the descriptor file from the at least one server so that the digital content is resident with the client. <i>See claim element [1c].</i> On information and belief, additional support can be found in Defendants' source code and non-public documents.
[25d] rendering the digital content at an arbitrary	Prime Video provides a system for rendering the digital content at an arbitrary point determined using the predetermined time offset. <i>See claim element [1d].</i>

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

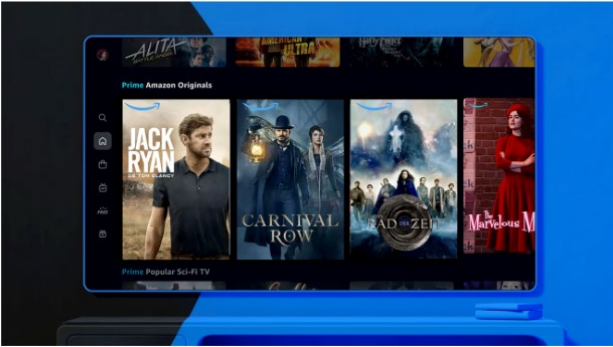
point determined using the predetermined time offset; and	On information and belief, additional support can be found in Defendants' source code and non-public documents.
[25e] a network for connecting the at least one server and the client.	Prime Video provides a system comprising a network for connecting the at least one server and the client (e.g., connecting to any one of the edge locations). The infographic titled "Amazon CloudFront global footprint" displays a world map with numerous colored dots representing POPs. A legend indicates: Blue dot for Edge location, Purple dot for Regional Edge Cache, and Yellow dot for POP. Text on the left lists: 150 Points of Presence (POP), 139 Edge locations, 11 Regional Edge Caches, and 65 cities across 29 countries. It also describes CloudFront Edge locations as being close to viewers and where connection termination occurs. For Regional Edge Caches, it notes they have a larger cache width than individual edge locations and act as mid-tier caches between origin servers and globally distributed edge locations. Logos for AWS re:Invent, Amazon CloudFront, and AWS are present, along with a copyright notice for 2018.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

See <https://www.slideshare.net/AmazonWebServices/amazon-prime-video-delivering-the-amazing-video-experience-ctd203r1-aws-reinvent-2018#19>.

On information and belief, additional support can be found in Defendants' source code and non-public documents.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

Claim 26	Prime Video
[Preamble] A non-transitory computer readable storage medium including computer readable code, which when executed by a computer, causes said computer to:	Prime Video provides a non-transitory computer readable storage medium including computer readable code, which when executed by a computer, causes said computer to perform the claimed processes. What is Amazon Prime Video? Prime Video is a streaming video service by Amazon. Prime Video benefits are included with an Amazon Prime membership and if Amazon Prime isn't available in your country/region, you can join Prime Video to watch. With your membership, you can watch hundreds of TV shows and movies on your favorite devices. To get started, go to PrimeVideo.com, or download the Prime Video app on your mobile device. See https://www.primevideo.com/region/na/splash/getTheApp/ref=atv_hp_cnt. Prime Video offers a massive library of movies, series, and sports. Read this article in Spanish. Prime Video is home to more content than you might realize. If you're ready to stream blockbuster movies, hit shows, award-winning Amazon Originals, premium channels, and sports, read on for everything you need to know about Prime Video.  See https://www.aboutamazon.com/news/entertainment/what-you-need-to-know-about-prime-video.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

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To access Prime Video, please ensure that you're running the latest version of one of these web browsers:

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- Microsoft Edge
- Safari
- Opera

Prime Video playback is supported on these web browsers. If you're running an operating system other than Windows or macOS, playback is restricted to standard definition.

See <https://www.amazon.com/gp/help/customer/display.html?nodeId=GUVGB3QMQRERYW>.

On information and belief, additional support can be found in Defendants' source code and non-public documents.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

[26a] access at least one server via a network, the at least one server having stored thereon a descriptor file and a plurality of media streams derived from a same originating written work, each media stream including a plurality of digital data files, the descriptor file including information allowing a simultaneous synchronized rendering of the plurality of media streams that provides a literary experience of the originating written work, the information including time information for each digital data file in each	Prime Video provides a non-transitory computer readable storage medium to access at least one server via a network, the at least one server having stored thereon a descriptor file and a plurality of media streams derived from <i>See claim element [1a].</i> On information and belief, additional support can be found in Defendants' source code and non-public documents.
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Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

media stream, the time information for synchronizing the plurality of media streams and determined relative to a timeline of an audio recording of the originating written work;	
[26b] determine a first digital data file from the plurality of digital data files in a first media stream from the plurality of media streams, the first digital data file having digital content to be rendered with the media player and determined using the time information in the descriptor file and a predetermined time	Prime Video provides a non-transitory computer readable storage medium to determine a first digital data file from the plurality of digital data files in a first media stream from the plurality of media streams, the first digital data file having digital content to be rendered with the media player and determined using the time information in the descriptor file and a predetermined time offset, the predetermined time offset external to the descriptor file and determined relative to the timeline of the audio recording. <i>See claim element [1b].</i> On information and belief, additional support can be found in Defendants' source code and non-public documents.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

offset, the predetermined time offset external to the descriptor file and determined relative to the timeline of the audio recording;	
[26c] download the first digital data file or a digital data segment contained in the first digital data file and determined using the time information in the descriptor file from the at least one server so that the digital content is resident with the computer: and	Prime Video provides a non-transitory computer readable storage medium to download the first digital data file or a digital data segment contained in the first digital data file and determined using the time information in the descriptor file from the at least one server so that the digital content is resident with the computer. <i>See claim element [1c].</i> On information and belief, additional support can be found in Defendants' source code and non-public documents.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

[26d] render the digital content at an arbitrary point determined using the predetermined time offset.	Prime Video provides a non-transitory computer readable storage medium to render the digital content at an arbitrary point determined using the predetermined time offset. <i>See claim element [1d].</i> On information and belief, additional support can be found in Defendants' source code and non-public documents.
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Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

Claim 27	Prime Video
[27a] A non-transitory computer readable storage medium according to claim 26, which when executed by a computer, further causes said computer to: determine a current time offset while rendering the digital content; and	Prime Video provides a non-transitory computer readable storage medium which when executed by a computer, further causes said computer to: determine a current time offset (e.g., the position on the progress bar corresponding to timing) while rendering the digital content.  See screenshot of Prime Video. On information and belief, additional support can be found in Defendants' source code and non-public documents.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video**[27b]**

create a bookmark for a selected point in the rendered digital content, the bookmark an electronic file including the current time offset and an identification of the descriptor file, the current time offset being a time difference from a beginning of the audio recording to a selected point in the audio recording, the selected point in the audio recording corresponding to the selected point in the digital content.

Prime Video provides a non-transitory computer readable storage medium to create a bookmark for a selected point in the rendered digital content, the bookmark an electronic file including the current time offset and an identification of the descriptor file, the current time offset being a time difference from a beginning of the audio recording to a selected point in the audio recording, the selected point in the audio recording corresponding to the selected point in the digital content (e.g., through **Multi-Device Sync** and/or the **Continue Watching** feature).

[Digital Services and Device Support](#) › [Fire TV Support](#) › [Device Features on Fire TV](#) ›

How Does the Continue Watching Row Work?

The **Continue Watching** row on your home screen helps you find your recently watched shows from Prime Video, Freevee, and supported third-party apps.

The **Continue Watching** row syncs across your compatible Fire TV devices and reflects the viewing activity of the profile you're using. Compatibility varies across Fire TV devices.

Note: This feature isn't available on Kids profiles.

When you open a supported app, a message appears on-screen about personalizing your Fire TV. To turn on this feature for all supported apps, select **Accept**. You can also turn on this feature by going to **Manage Sharing from Apps** in your Fire TV's **Privacy Settings**.

Tip: You can manage your privacy settings at any time by following the steps in [Manage Sharing of Viewing Information from Apps on Fire TV](#).

While this feature is on, supported third-party apps share your viewing and content information with Amazon. Shared information includes:

- Watching activity
- Watchlist
- Recordings
- Purchases

See <https://www.amazon.com/gp/help/customer/display.html?nodeId=TEIq4vikEIpvh49FW1>

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

7. Multi-Device Sync: Amazon Prime Video offers multi-device syncing, allowing you to start watching a TV show or movie on one device and continue on another. For example, if you start streaming on your smartphone, you can pause and resume playback seamlessly on your smart TV or tablet using the same Amazon account.

See <https://citizenside.com/entertainment/how-to-watch-tv-with-amazon-prime/>

7.2.1 Media Presentation timeline

One of the key features in DASH is that encoded versions of different media components share a common timeline. The presentation time of access unit within the media content is mapped to the global common presentation timeline for synchronization of different media components and to enable seamless switching of different coded versions of the same media components.

The presentation times within each Period are relative to the *PeriodStart* time of the Period minus the value of the `@presentationTimeOffset`, T_0 , of the containing Representation. This means for an access unit with a presentation time T_P signalled in the media stream, the Media Presentation time relative to the *PeriodStart* is $T_M = T_P - T_0$.

A Representation should cover all presentation times T_P that are greater than and equal to the value of the `@presentationTimeOffset`, T_0 . If smaller values are present, i.e. the value of the `@ptDelta` is negative, then presentation of the Media Segment is expected to only take place for presentation times greater than or equal to T_0 .

In case the `@duration` attribute is used for the signalling of the duration of Segments, then the MPD start times as defined in subclause 5.3.9.5.3 should provide an approximation of the Media Presentation time T_M within the Period. Specifically, the difference between MPD start time and presentation time T_P shall not exceed 50% of value of `@duration` divided by the value of the `@timescale` attribute. In case the Segment Timeline is used for the signalling of the duration of Segments, then the MPD start times as defined in subclause 5.3.9.5.3 shall provide exactly the Media Presentation time T_M within the Period, i.e. the MPD start time is the earliest presentation time of the Segment.

See *Information technology — Dynamic adaptive streaming over HTTP (DASH) — Part 1: Media presentation description and segment formats* (5th ed. 2022) (Document available at <https://www.iso.org/standard/83314.html>).

On information and belief, additional support can be found in Defendants' source code and non-public documents.

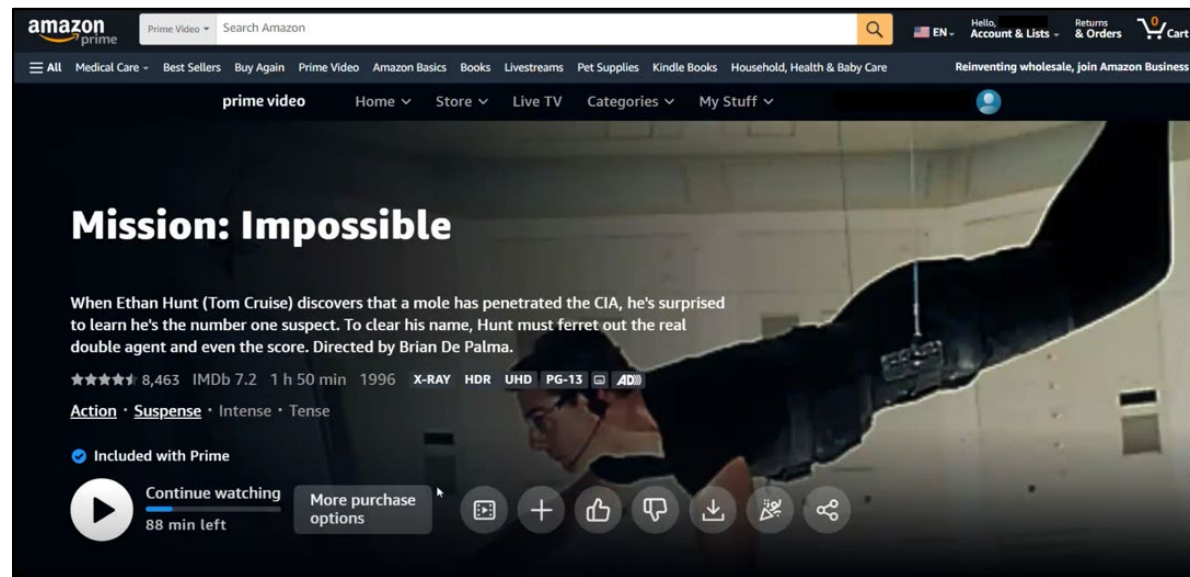
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Claim 28	Prime Video
A non-transitory computer readable storage medium according to claim 27, which when executed by a computer, further causes said computer to electronically transfer the bookmark to another computer.	Prime Video provides a non-transitory computer readable storage medium which when executed by a computer, further causes said computer to electronically transfer the bookmark to another computer (e.g., through Multi-Device Sync and/or the Continue Watching feature). Digital Services and Device Support › Fire TV Support › Device Features on Fire TV › How Does the Continue Watching Row Work? The Continue Watching row on your home screen helps you find your recently watched shows from Prime Video, Freevee, and supported third-party apps. The Continue Watching row syncs across your compatible Fire TV devices and reflects the viewing activity of the profile you're using. Compatibility varies across Fire TV devices. Note: This feature isn't available on Kids profiles. When you open a supported app, a message appears on-screen about personalizing your Fire TV. To turn on this feature for all supported apps, select Accept. You can also turn on this feature by going to Manage Sharing from Apps in your Fire TV's Privacy Settings. Tip: You can manage your privacy settings at any time by following the steps in Manage Sharing of Viewing Information from Apps on Fire TV. While this feature is on, supported third-party apps share your viewing and content information with Amazon. Shared information includes: • Watching activity • Watchlist • Recordings • Purchases See https://www.amazon.com/gp/help/customer/display.html?nodeId=TEIq4vikEIpvh49FW1

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See <https://citizenside.com/entertainment/how-to-watch-tv-with-amazon-prime/>



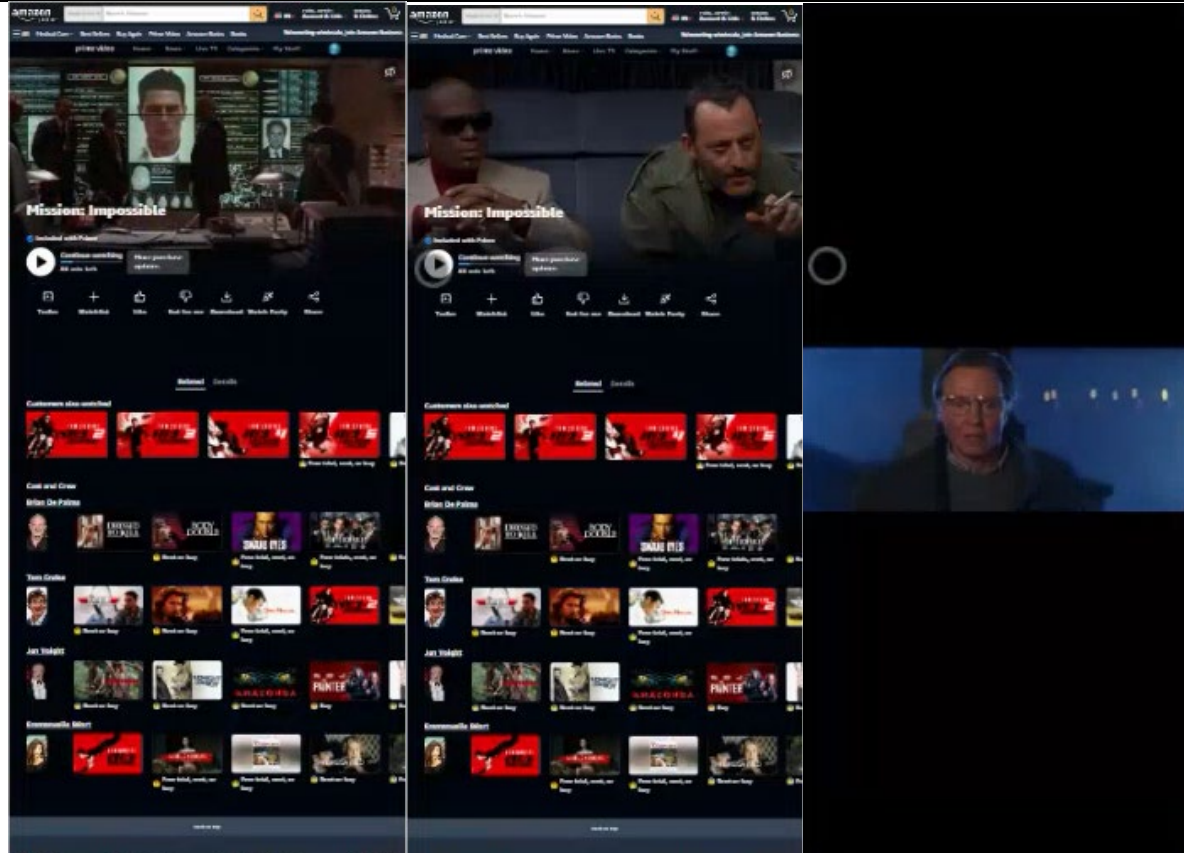
See screenshot of Prime Video.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video



See screenshot of Prime Video.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video



See screenshot of Prime Video.

On information and belief, additional support can be found in Defendants' source code and non-public documents.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

Claim 29	Prime Video
A non-transitory computer readable storage medium according to claim 27, which when executed by a computer, further causes said computer to transfer one of the bookmark and a shortcut to the bookmark to one of a desktop, a window other than the window used for rendering the digital content, and an application other than the application used for rendering the digital content.	Prime Video provides a non-transitory computer readable storage medium which when executed by a computer, further causes said computer to transfer one of the bookmark and a shortcut to the bookmark to one of a desktop, a window other than the window used for rendering the digital content, and an application other than the application used for rendering the digital content. The screenshot shows a Reddit post in the subreddit r/amazonprime. The post title is "Is there a way to share a Amazon Prime Video movie/tv series(episode) link with timestamp?". Below the title are 2 upvotes, 2 comments, and a share button. A comment by user jdohndoe13, posted 10 months ago, provides a detailed answer. It lists steps: "Go to the series' page.", "Right-click the episode preview.", "Select 'Open in new tab' from pop-up menu.", "Copy the link from the address bar.", and "Add 't=350' parameter to it (or modify existing 't' parameter) where '350' is number of seconds to skip from the episode's beginning." It also provides an example URL: <code>https://www.primevideo.com/region/eu/detail/0MB0TP05LJKDJSI2T242J1UA3N/ref=atv_dp_btf_el_prime_sd_tv_play_t1ADAAAAA0wg0?autoplay=1&t=350</code>. See https://www.reddit.com/r/amazonprime/comments/153zazr/is_there_a_way_to_share_a_amazon_prime_video/.

Infringement of U.S. Patent No. 9,319,720 by Amazon Prime Video

Making a Desktop shortcut to a specific site AND have it open in a new window

SUPPORT

This is because it took me to long to figure it out/find valid and useful info on how to do this. So ill be making a step by step on how I found to do it.

BTW this is my first instructional post so I may go into to much detail... or not enough, let me know but don't be an ass.

Assuming windows 11

If you ONLY want a desktop icon and don't care if its in a new window

1. go to the desired website and copy the URL
2. got to desktop and right-click > new > shortcut
3. paste URL into the available field and click next
4. rename shortcut to desired name and click finish

This will get you a shortcut to open the website in your default browser in a new TAB if you have a copy of said browser already open.

See https://www.reddit.com/r/OperaGX/comments/14plp48/making_a_desktop_shortcut_to_a_specific_site_and/.

On information and belief, additional support can be found in Defendants' source code and non-public documents.