

The



State Of HTML5 Video

Mark Robertson - Founder & Publisher, ReelSEO

Sam Dutton - Developer Advocate, Google Chrome

Jeroen Wijering - Founder & Creator, JW Player

A white Twitter bird icon is positioned in the bottom right corner, partially obscured by a light gray circular gradient.

[@markrrobertson](https://twitter.com/markrrobertson)

[@sw12](https://twitter.com/sw12)

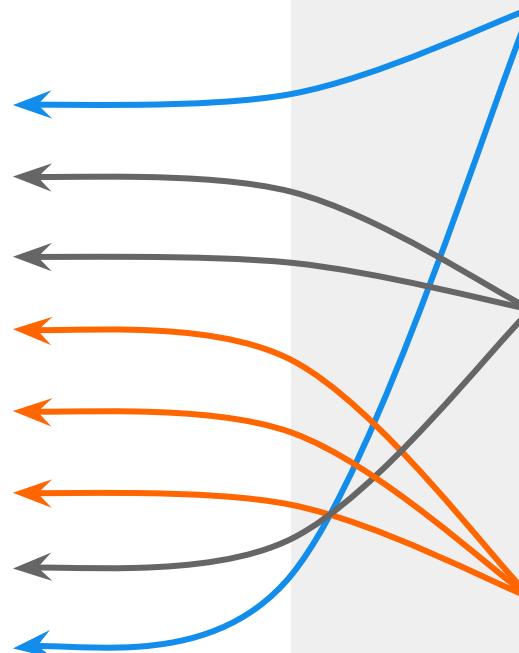
[@jeroenw](https://twitter.com/jeroenw)

April 16, 2014



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- Why HTML5 Video?
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Mark



Jeroen



Sam

About Mark Robertson | ReelSEO.com



- Founder & Publisher of ReelSEO.com
- Online Video Trainer (YouTube Certified)
- Digital Video and SEO Consultant

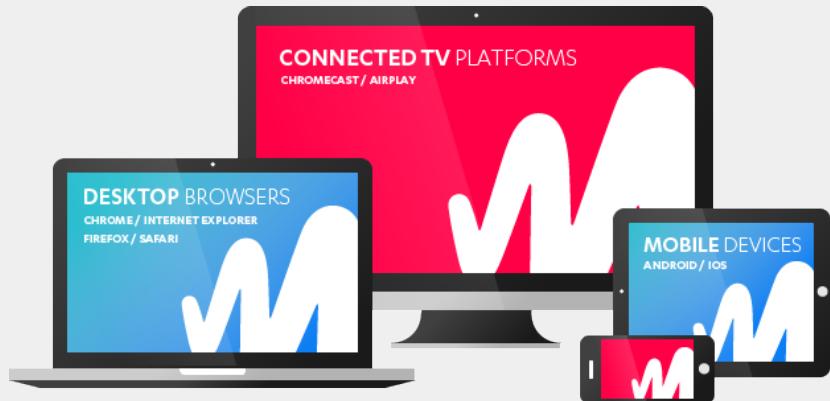
The screenshot shows the ReelSEO.com homepage with a navigation bar at the top. Below the header, there's a main article titled "Adobe Creative Cloud: New Features for Premiere Pro" with a thumbnail image of the Premiere Pro CC logo. To the right of the article, there's a sidebar featuring social sharing icons (Twitter, Facebook, LinkedIn, YouTube) and a section for "OVER 20 MILLION ROYALTY FREE CONTENT" from 123RF.

- [ReelSEO](#) - The Video Marketing Guide
- [ReelSummit](#) - July 24th/25th - San Francisco

About Jeroen Wijering | JWPlayer.com



"To help content owners publish and monetize their video across any device."



- Created in 2005
- Used on 2 million sites
- W3C, IAB & DASH-IF member
- Plays Everywhere

About Sam Dutton | Google Chrome



- Developer Advocate, Google Chrome
- Writes and presents about [media APIs](#)
- Author of several [WebRTC resources](#)
- Maintains [simpl.info](#)



Get a fast, free web browser

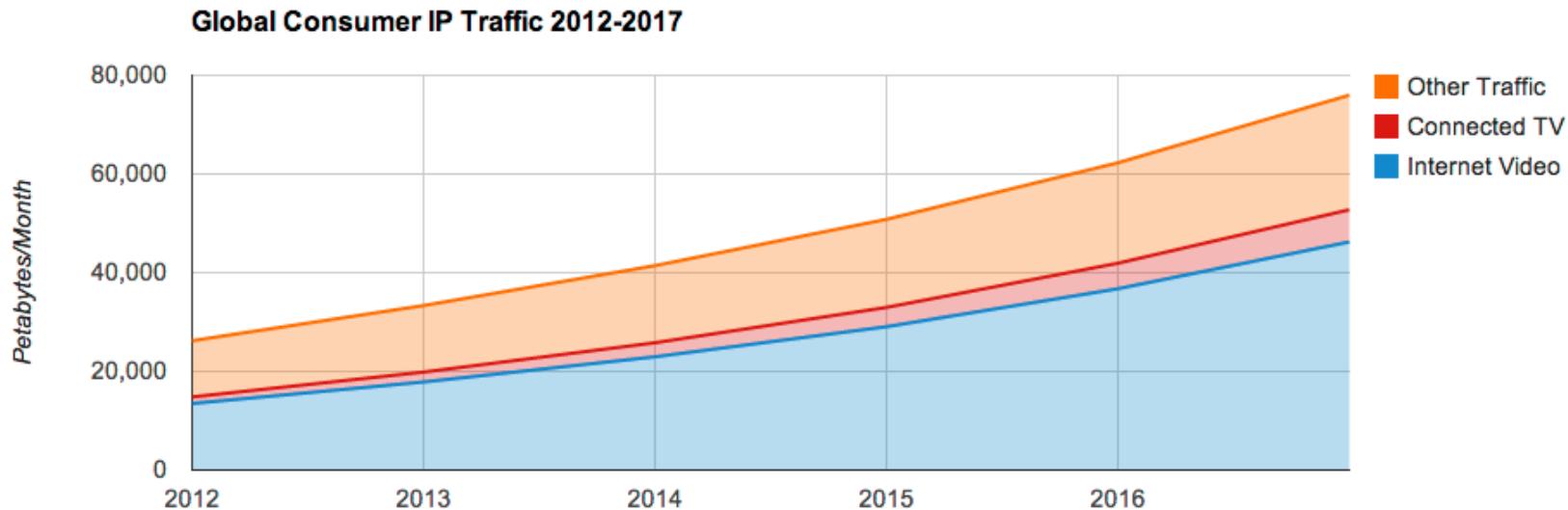
One browser for your computer, phone and tablet



Why HTML5 Video?



The Rise of Video

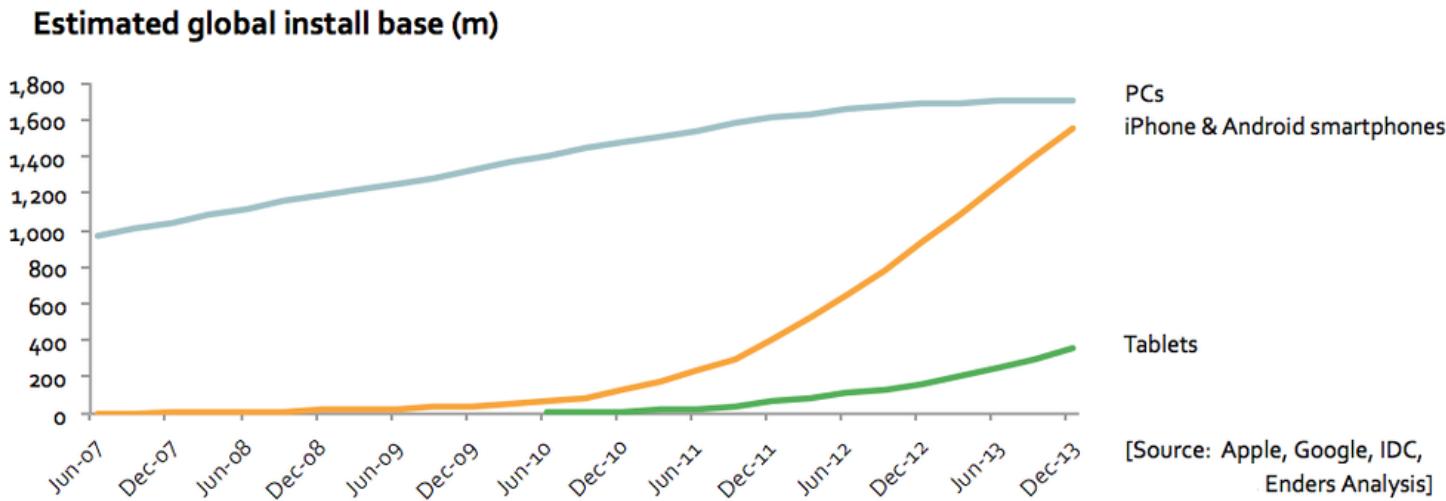


"Video traffic will be 69 percent of all consumer Internet traffic in 2017, up from 57 percent in 2012"

Source: [Cisco Visual Networking Index: Forecast and Methodology, 2012-2017](#)



The Rise of Mobile



"If the number of smartphones on earth has not yet passed the number of PCs, it will do so any day now."

Source: [Benedict Evans, Andreessen Horowitz - January 2014](#)



Moving to Standards

- No plugins on mobile (iOS/Android)
 - ◆ not performant, non-standard
- Ease of use for developers
 - ◆ As easy as inserting an image
 - ◆ Existing tools (CSS, JavaScript)
- Video as “First Class Citizen”
 - ◆ Part of browser DOM and rendering
 - ◆ Accessible (for humans and robots)
 - ◆ Scalable, secure and interoperable





Browser Support

On **desktop**, all big browsers play HTML5 video:



Chrome



Internet Explorer (9+)



Firefox



Safari



Opera

Same on **mobile**, but beware of proxy browsers:



Safari



Chrome



Android Browser



Internet Explorer



Opera Mini



Evolution of Web Video



1995-2004

Separate applications



2004-2013

Browser plugins



2013+

Web standard



The <video> Tag



The <video> Tag

```
<video  
    src="myVideo.mp4"  
    poster="myPreview.jpg"  
    width="640"  
    height="360"  
    controls  
    autoplay  
    loop  
    muted>  
  
<p>Sorry! No video element support.</p>  
</video>
```

- Location of the video to play
- Location of preview image
- Width of the video player
- Height of the video player
- Display the built-in controlbar
- Automatically start playback
- Automatically repeat playback
- Suppress audio volume

demo.jwplayer.com/video-tag



Scripting API

Use JavaScript to manage items like:

- Media loading / errors
- Metadata (dimensions / duration)
- Play / pause / stop
- Media ended
- Playback rate
- Seeking
- Time updates
- Audio volume

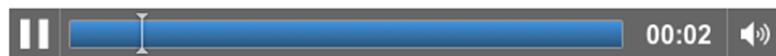
Internet Explorer



Firefox



Chrome



Safari



Custom UI: demo.jwplayer.com/user-experience



Fun with <video>

```
<style>  
  video {  
    position:fixed; left:0; bottom:0;  
    width:100%; height: auto; z-index: -100;  
    background: url(myImage.jpg);  
  }  
</style>  
  
<video src="myVideo.mp4" autoplay loop muted>  
</video>
```

demo.jwplayer.com/background-video

```
<video src="myVideo.mp4" controls></video>  
  
<button>Slow Down</button>  
  
<script>  
  var v = document.querySelector("video");  
  var b = document.querySelector("button");  
  b.addEventListener("click",function(){  
    v.playbackRate = 0.25;  
  });  
</script>
```

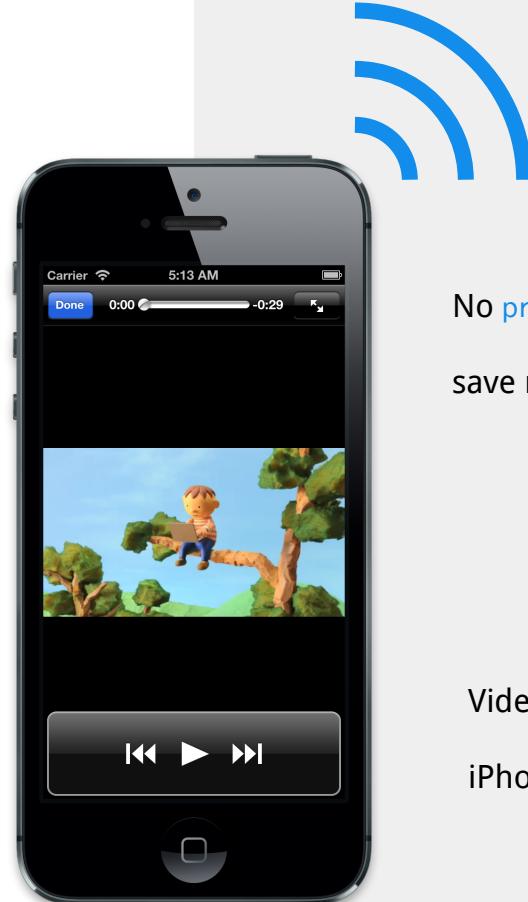
demo.jwplayer.com/playback-rate



Mobile Gotcha's

A video's [volume](#) cannot be programmatically controlled.

No [autoplay](#) support, saving both battery and bandwidth.



No [preload](#) of video content, to save mobile bandwidth.

Video only plays in [fullscreen](#) on iPhone (n/a for iPad/Android).



Video Codecs



Format support

- Two formats cover all modern browsers:
 - ◆ MP4
 - ◆ WebM
- Use the source element...
 - ◆ Efficient and clear: browser chooses
- ...add a *type* attribute
 - ◆ No 'sniffing'!
 - ◆ Less network activity
- ...and a fallback
- Use canPlayType('video/webm') to check

```
<video>  
  
  <source src="chrome.webm" type="video/webm" />  
  
  <source src="chrome.mp4" type="video/mp4" />  
  
  <p>Sorry! No video element support.</p>  
  
</video>
```



New codecs!

- VP9
 - ◆ Developed by the WebM project
 - ◆ Increasing hardware support
 - ◆ Over 200M YouTube playbacks per day
- HEVC, aka H.265
 - ◆ Developed by MPEG and VCEG
 - ◆ Up to Double data compression of H.264
 - ◆ ... or better quality at same bit rate
- Daala
 - ◆ Developed by Xiph.Org, patent free



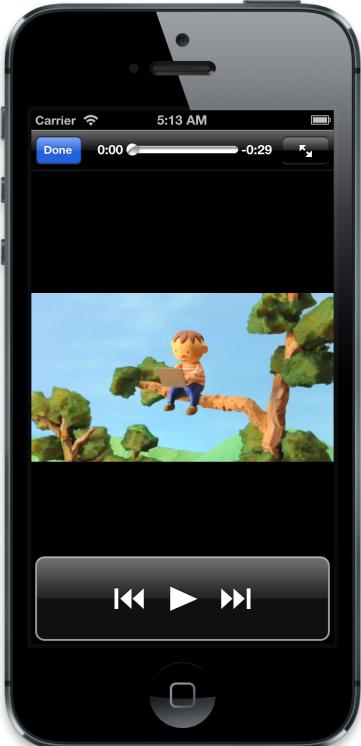
VP9

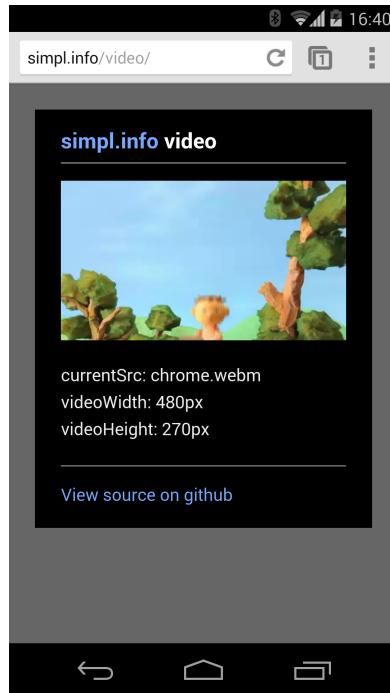
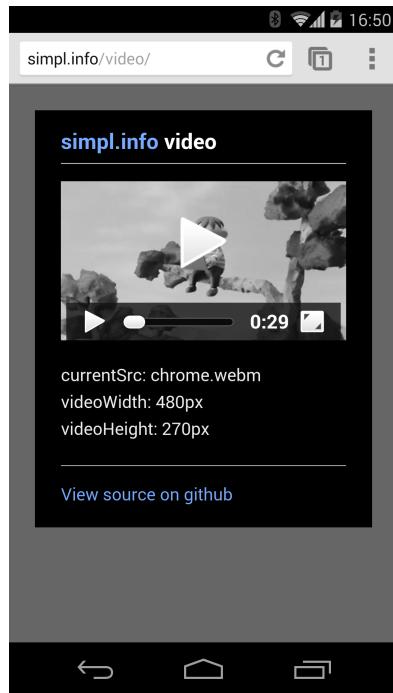
HEVC

H.265 - HIGH EFFICIENCY VIDEO CODING



Fullscreen API







localhost/simpl/video/



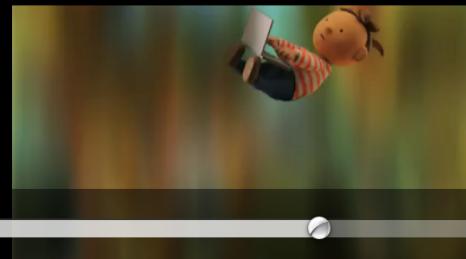
Search

x

The video element

+

simpl.info video



currentSrc: chrome.mp4
videoWidth: 480px
videoHeight: 270px

[View source on github](#)



The Full Screen API

- Widely supported by modern browsers:
 - ◆ caniuse.com/fullscreen
- Scripting:
 - ◆ `video.requestFullScreen()`
- Events and properties:
 - ◆ `fullscreenchange`, `displayingFullScreen`
- CSS:
 - ◆ `:full-screen`
- Demo:
 - ◆ simpl.info/fullscreen/video

simpl.info Fullscreen video



Click or tap a thumbnail image to display video fullscreen.

[View source on github](#)

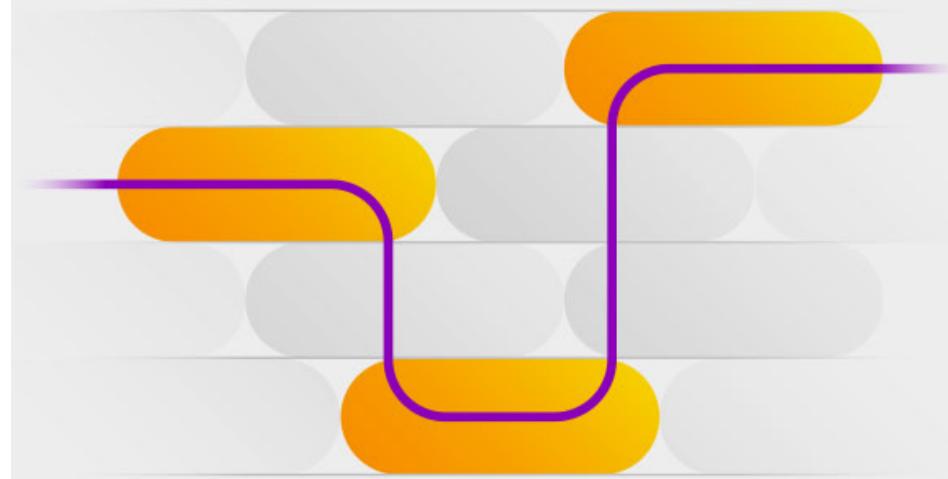


Streaming & Protection



Adaptive Streaming

- Streaming vs Download:
 - ◆ buffer control
 - ◆ fast seeking
 - ◆ live streaming
 - ◆ quality adjustments
- HTTP Live Streaming
 - ◆ Streaming protocol from Apple
 - ◆ Built-in on iOS and Android

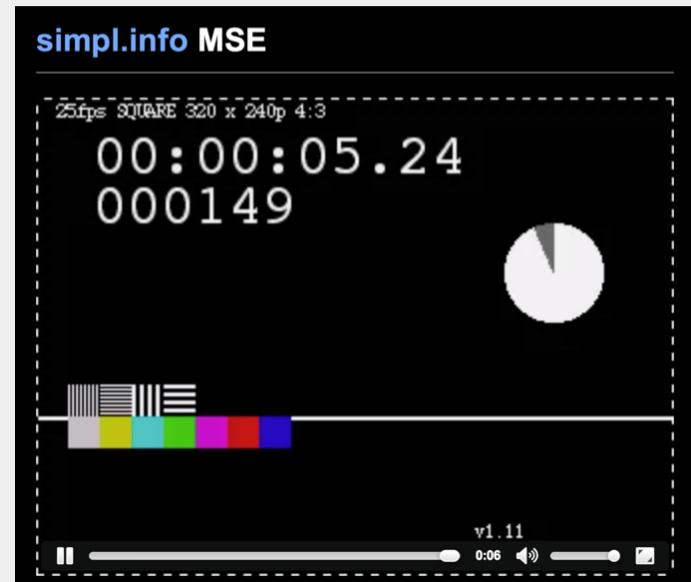


demo.jwplayer.com/adaptive-streaming



MSE

- Media Source Extensions
- Enables JavaScript to construct video streams
- Enables client-side adaptive streaming
- Techniques such as DASH
- W3C [Candidate Recommendation](#)
- Gaining support
- Demo: simpl.info/mse





EME

- Encrypted Media Extensions
- Enables playback of protected content
- Allows web apps to interact with DRM systems
- Clear-Key encryption or DRM modules:
 - ◆ Widevine
 - ◆ PlayReady
- More information on HTML5 Rocks:
 - ◆ [EME WTF?](#)
- [W3C Working draft](#)





Text Tracks



The <track> Element

- A brand new HTML5 element!
- Supported in IE, Chrome, Safari, Opera
 - ◆ Firefox soon... ([ticket](#))
- Focus on accessibility:
 - ◆ Captions
 - ◆ Subtitles
 - ◆ Chapters
 - ◆ Descriptions
 - ◆ Metadata

```
<video controls>  
  <source src="chrome.webm" type="video/webm" />  
  <source src="chrome.mp4" type="video/mp4" />  
  <track kind="captions" src="sintel.vtt" />  
  <p>Sorry! No video element support.</p>  
</video>  
  
demo.jwplayer.com/closed-captions
```



The WebVTT Format

- Basic file format for text tracks.
- Collection of cues
 - ◆ identifier (for CSS)
 - ◆ start & end times
 - ◆ text (1 or more lines)
- Styling options ([MDN](#))
 - ◆ Inline (bold, italic, voices, ruby)
 - ◆ CSS rules (`::cue`)

WEBVTT

`00:00:01.000 --> 00:00:10.000`

`This first line of text displays from 1 to 10 s.`

`00:00:12.000 --> 00:00:18.000`

`And the second line of text
separated over two lines.`

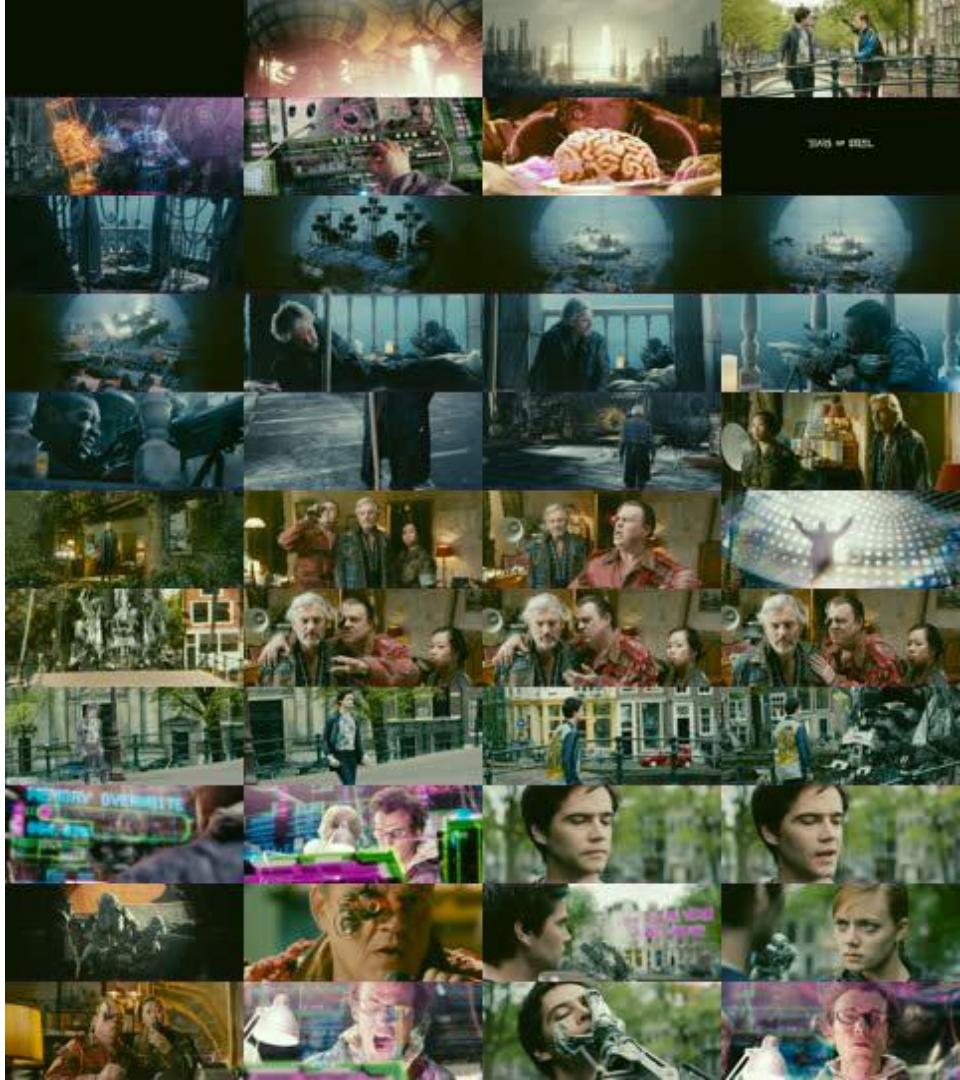
`00:00:20.000 --> 00:00:26.000`

`This line <i>has</i> some <u>styling</u>.`

Beyond Captions...

Many cool applications of text tracks:

- [Interactive Transcripts](#)
- [Tooltip Thumbnails](#)
- [Video Chapters](#)
- [Audio Descriptions](#)
- [In-Video Search](#)
- [Slide Syncing](#)
- [GPS Tracking](#)
- ...





Q&A Session

Would you like to know more?

www.html5rocks.com

www.jwplayer.com/html5

[@markrrobertson](https://twitter.com/markrrobertson)

[@sw12](https://twitter.com/sw12)

[@jeroenw](https://twitter.com/jeroenw)