HTML5 Media

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Topics

- What is and Why HTML5 Audio/Video support?
- Video containers and Codec's
- <video> element
- <track> sub-element (of <video> element)
- JavaScript control of <video>
- Advanced features
- Future features
- Libraries and frameworks

Acknowledgment

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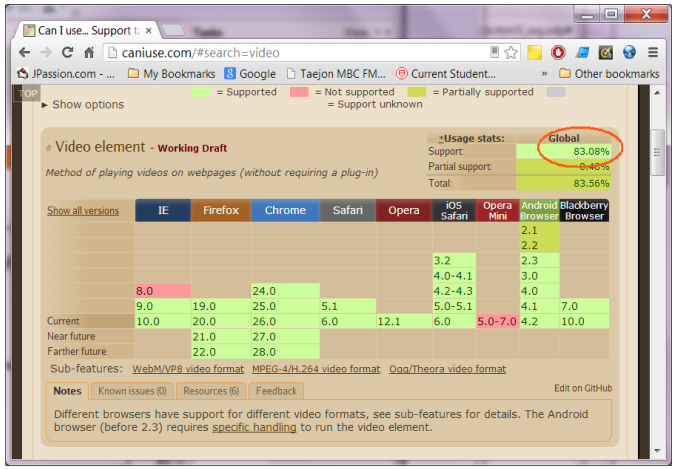
What is & Why HTML5 Audio/Video Support?

History of Video Support in Browsers

- ~2000
  - Browsers have to install multiple plug-in's: RealPlayer, Quicktime, Windows Media player
- ~2004 – 2008
  - Flash becomes the dominant video plug-in
- ~2009
  - HTML5 enables native video support in the browser
- ~2013
  - HTML5 has ~80% user support
  - http://caniuse.com/#search=video



Why HTML5 Video?

- Runs native in the browser
  - No external plug-in required
- Simpler coding
  - No need to have different coding for different formats and for different browsers
- Can be manipulated just like any other DOM element
  - Transformation (moving, resizing) & styling can be performed
- It is the standard
  - Future proof
  - No vendor lock-in
  - Wide-adoption
- iOS devices do not support flash

<audio>/<video>

- HTML5 defines new elements which specify a standard way to embed an audio/video file on a web page
  - <audio>
  - <video>

Video Containers & Codec's

Video Containers

- An video file is “container” file, which contains
  - Video stream
  - Audio stream
  - Meta data
- The video and audio streams are combined to play video
- The meta data includes
  - title, subtitle, cover art, captioning info., etc

Video Container File Formats

- MP4 (video_file.mp4)
  - H.264 (video codec format) + AAC (audio codec format)
- Ogg (video_file.org or video_file.ogg)
  - Theora (video codec format) + Vorbis (audio codec format)
- WebM (video_file.webm)
  - VP8 (video codec format) + Vorbis (audio codec format)
- ...

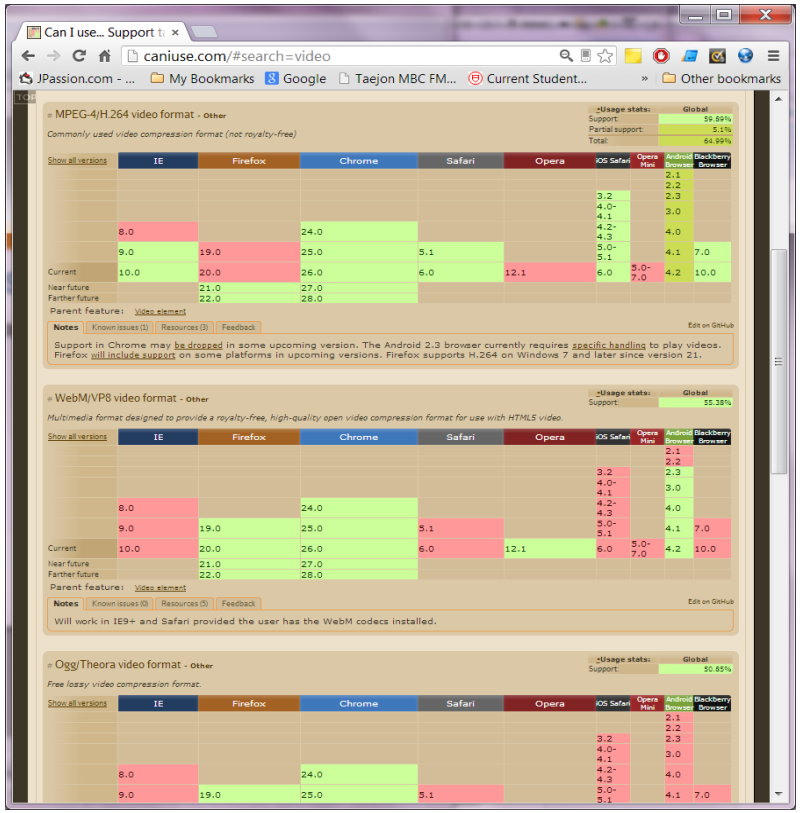
What is and Why Video/Audio Codec?

- What are codecs?
  - Codecs (Coders/Decoders) are algorithms used to encode and decode a particular video/audio stream so that they can played back
- Why codecs?
  - Raw media files too big to transmit over the internet
- Example video codecs
  - H.264, VP8, Ogg Theora
- Example audio codecs
  - AAC, MPEC-3, Orgg Vorbis

Video Codecs and Browser Support

- There is NOT a single Codec that is being supported by all browsers at this point :-(

- MP4/H.264
  - > Chrome, Safari, IE9, Firefox*
  - > Potential royalty payment issue
- WebM
  - > Chrome, Firefox, Opera, IE9
  - > Open source
- Ogg Theora
  - > Chrome, Firefox, Opera
  - > Open source



Fallback Options

- However, you can use multiple sources in your videos which will fall back to one another
- You can even fall back all the way to Flash for older browsers

Encoding and Transcoding Tools

- Firefogg
  - Video and audio encoding for Firefox
  - http://firefogg.org/
- Handbrake.fr
  - An open source multiplatform video transcoder
  - http://handbrake.fr/
- Zencoder
  - API-based online video encoding service
  - http://zencoder.com
- Microvideo Converter
  - Video converter
  - http://www.mirovideoconverter.com/

Lab:

Exercise 1: Browser Support Test

1230_html5_media.zip

<video> element

<video ...>

- With a single source

```
<video src="movie.webm" controls>
   Your browser does not support HTML5 video.
<video>
```

- With multiple sources

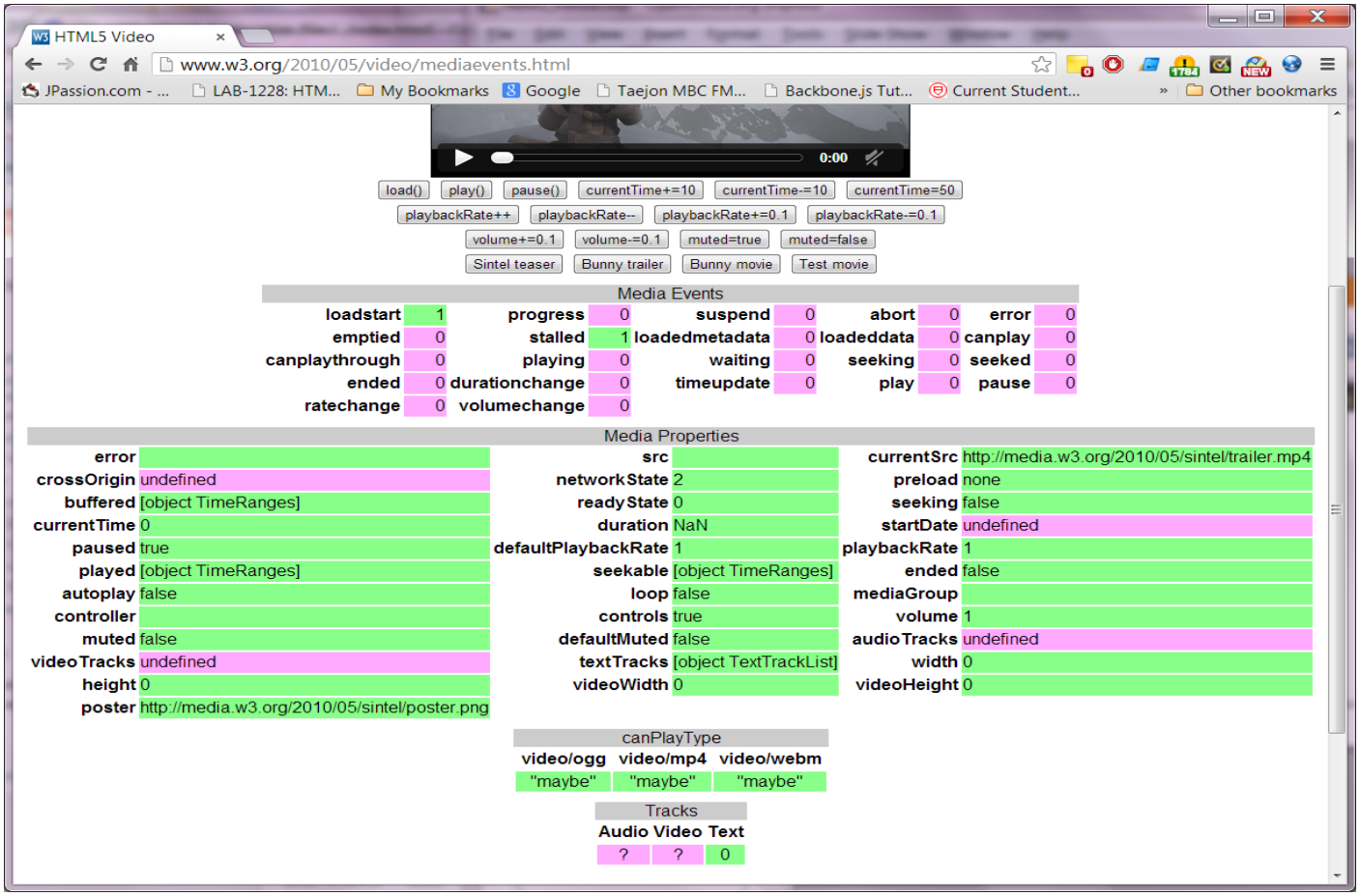
```
<video width="320" height="240" controls>
  <source src="movie.mp4" type="video/mp4">
  <source src="movie.ogg" type="video/ogg">
  <source src="movie.webm" type="video/webm">
  <object data="movie.mp4" width="320" height="240">
    <embed src="movie.swf" width="320" height="240">
  </object>
</video>
```

<video> element Attributes

- controls
- autoplay
- poster
- loop
- preload
- width/height

<video> element Attributes & Methods

- http://www.w3.org/2010/05/video/mediaevents.html



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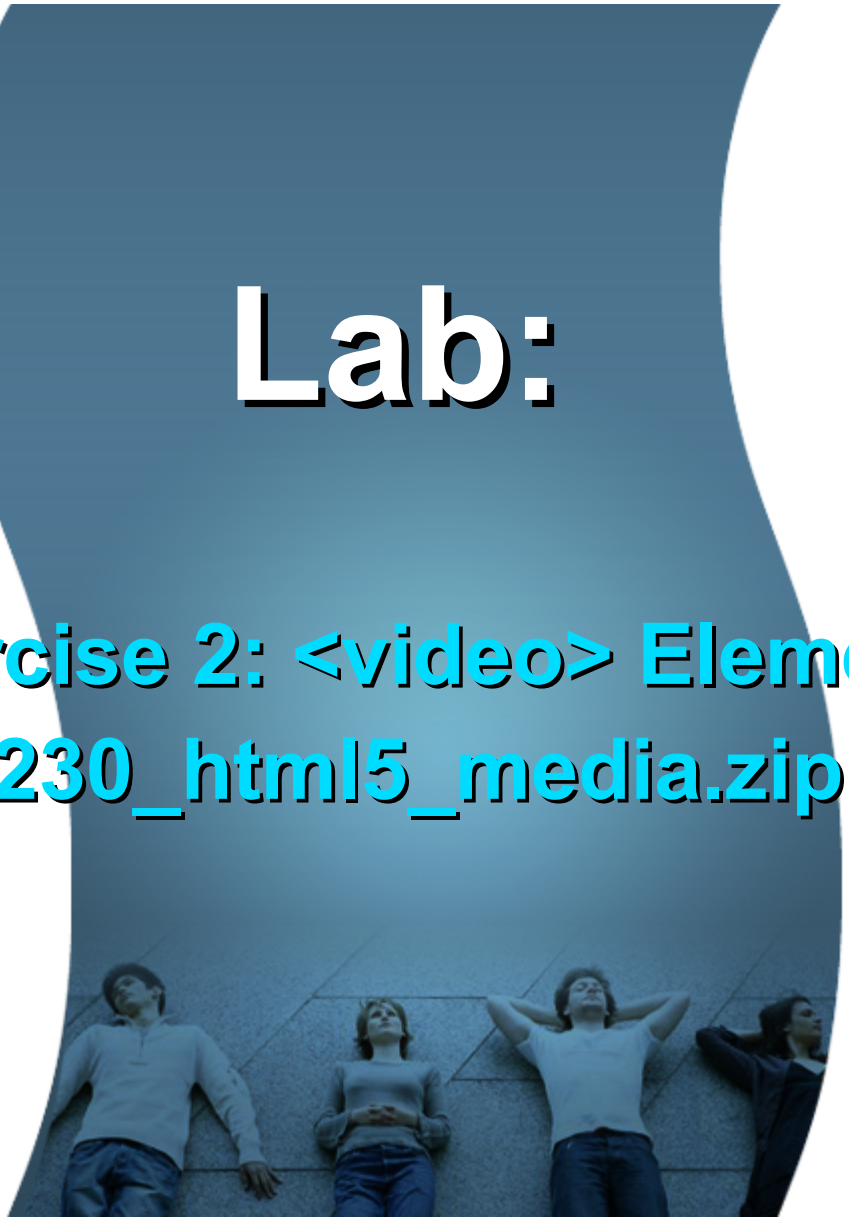
Exercise 2: <video> Element

1230_html5_media.zip



<track> sub-element (of <video> element)

<track> sub-element

- Used for providing time triggered text to the viewer
- 5 Types of tracks
  - Subtitles - Translations of the dialogue in the video
  - Captions - Transcription of the dialogue, sound effects, musical cues, and other audio information
  - Chapters - Used to create navigation within the video, Typically they're in the form of a list of chapters that the viewer can click on to go to a specific chapter.
  - Descriptions (not supported yet) - Text descriptions of what's happening in the video
  - Metadata (not supported yet) - Tracks that have data meant for javascript to parse and do something with. These aren't shown to the user
- WebVTT format

<track> attributes

- kind
  - One of the five track types. Kind defaults to “subtitles” if no kind is included.
- src
  - URL of the track file
- srclang
  - The two-letter code (valid BCP 47 language tag) for the language of the text track, for example "en" for English
- label
  - The label for the track that will be shown to the user, for example in a menu that list the different languages available for subtitles
- default
  - Default selection

<track> sub-element with attributes

- A video with two subtitle tracks - “English” subtitle is the default.

```
<video width="320" height="240" controls>
  <source src="forrest_gump.mp4" type="video/mp4">
  <source src="forrest_gump.ogg" type="video/ogg">
  <track kind="subtitles" src="subtitles_en.vtt"  srclang="en"
         label="English" default>
  <track kind="subtitles" src="subtitles_ko.vtt"  srclang="ko"
         label="Korean">
</video>
```

Tools

- HTML5 Video caption maker
  - Helps you to create simple video caption file
  - http://ie.microsoft.com/testdrive/Graphics/CaptionMaker/

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Exercise 3: Tracks

1230_html5_media.zip

JavaScript control of Video

Control Functions

- load()
- play()
- pause()
- canPlayType(type)

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Exercise 4: JavaScript control of Video 1230_html5_media.zip

<audio> tag

<audio ...>

- With a single source

```
<audio src="horse.mp3" autoplay controls loop preload=”auto” >
  Your browser does not support the audio element.
</audio>
```

- With multiple sources

```
<audio controls>
  <source src="horse.mp3" type="audio/mpeg">
  <source src="horse.ogg" type="audio/ogg">
  Your browser does not support HTML5 audio.
</audio>
```

<audio ...> attributes

- autoplay
- controls
- loop
- muted
- preload
- src

Audio Formats

- Currently, there are 3 supported file formats for the <audio> element
  - MP3 (audio/mpeg)
  - Wav (audio/wav)
  - Ogg (audio/ogg)

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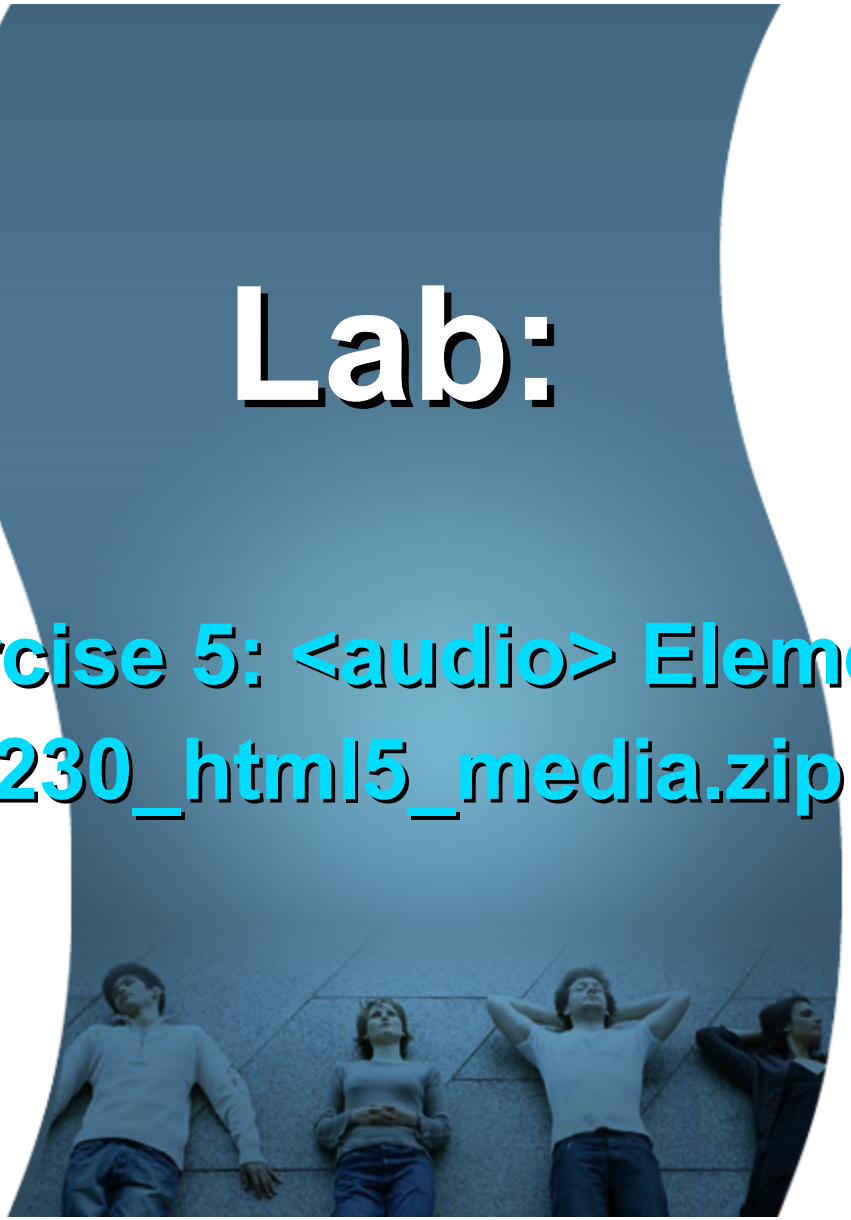
Exercise 5: <audio> Element

1230_html5_media.zip



Advanced Manipulation of Video

Advanced Features

- Usage of <video> with Canvas
- Transformation of <video> with CSS transformation
- Cross-domain access

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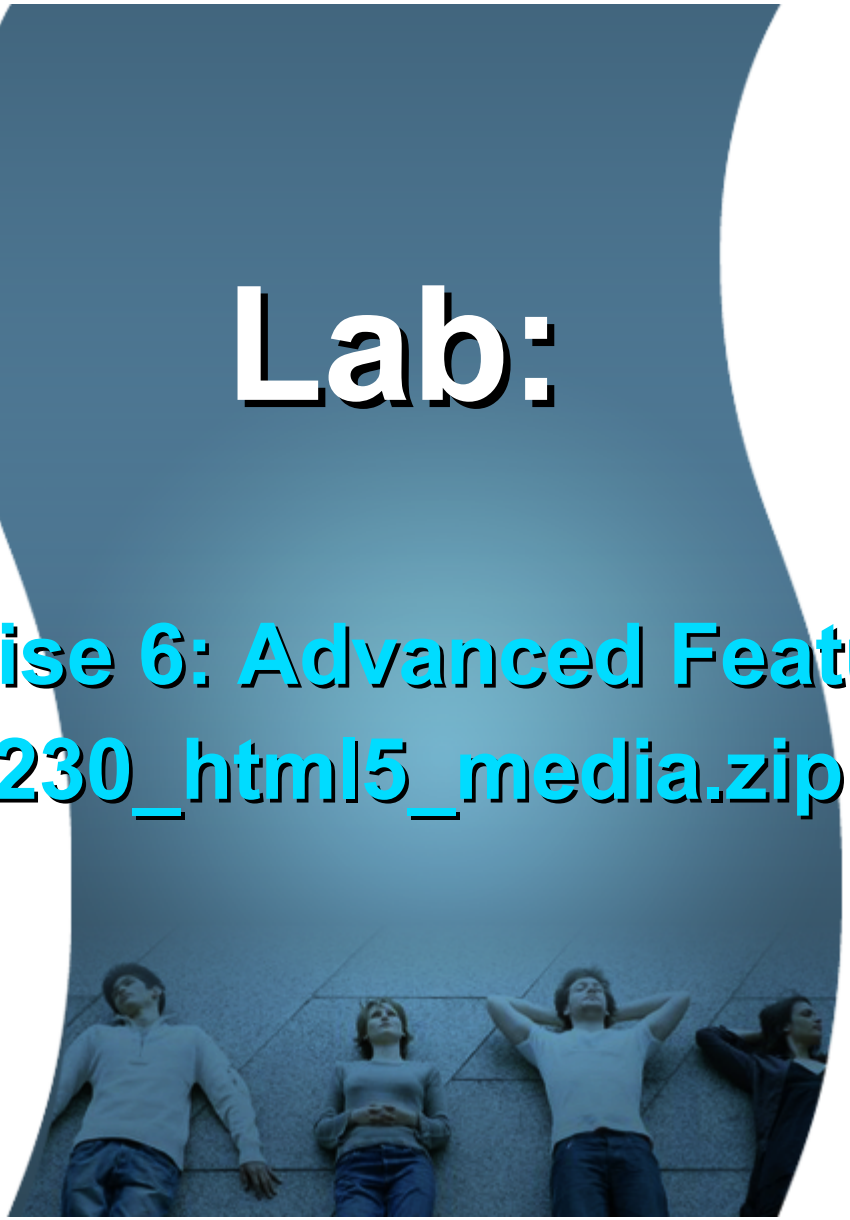
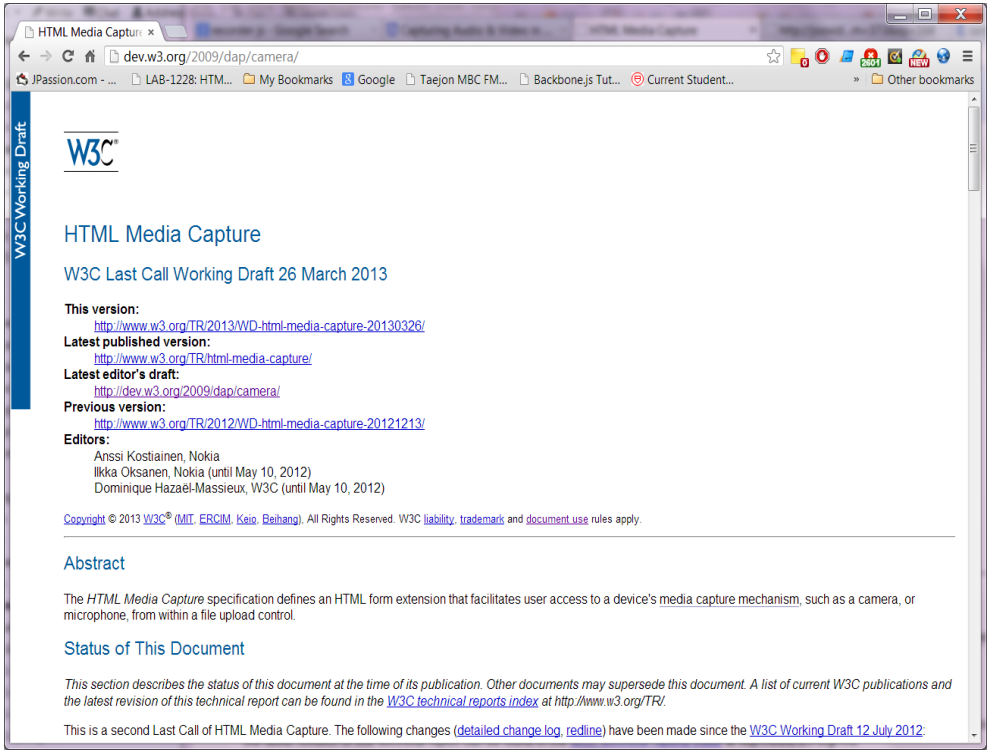
Exercise 6: Advanced Features
1230_html5_media.zip



Future Features

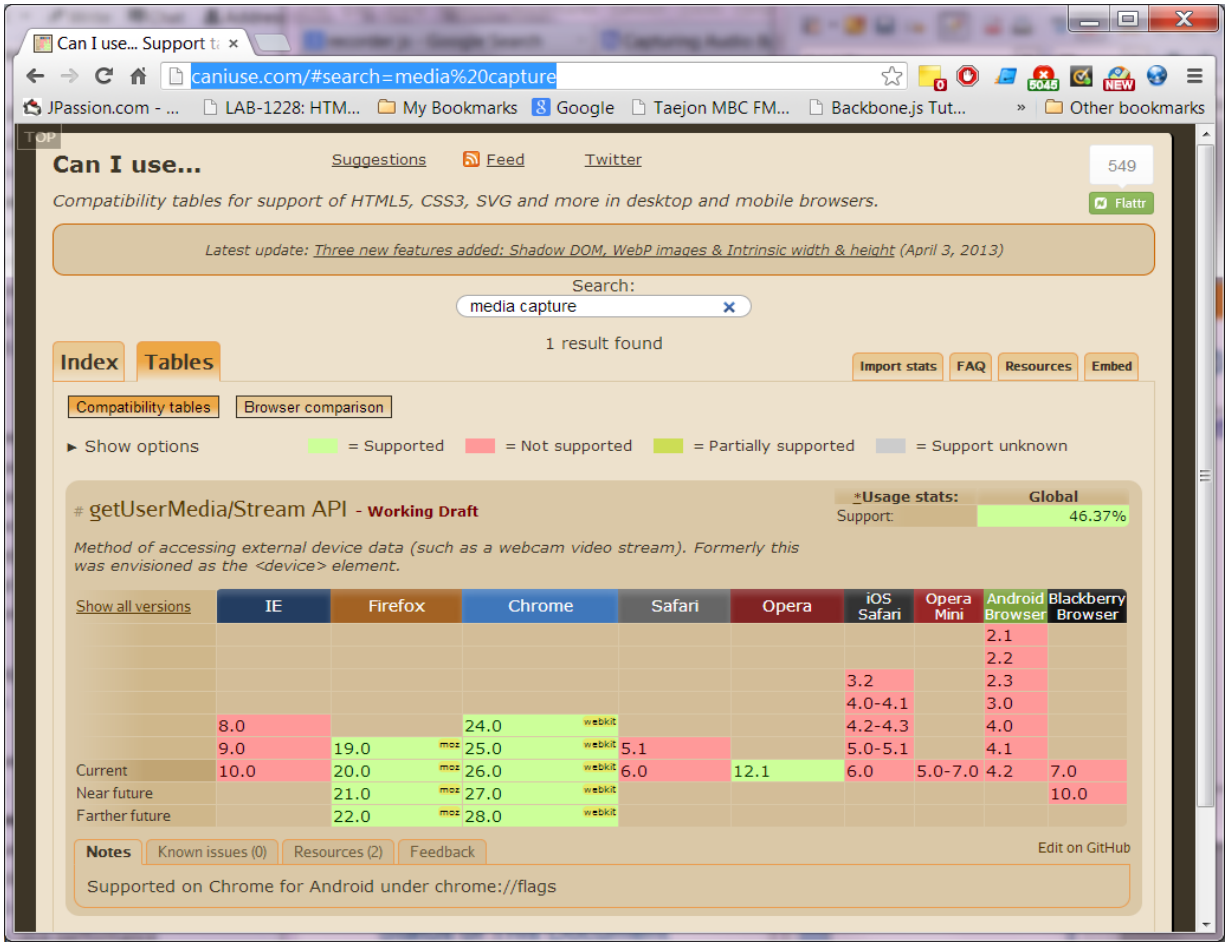
W3C HTML Media Capture

- http://dev.w3.org/2009/dap/camera/
- Facilitates user access to a device's media capture mechanism, such as a camera, or microphone,



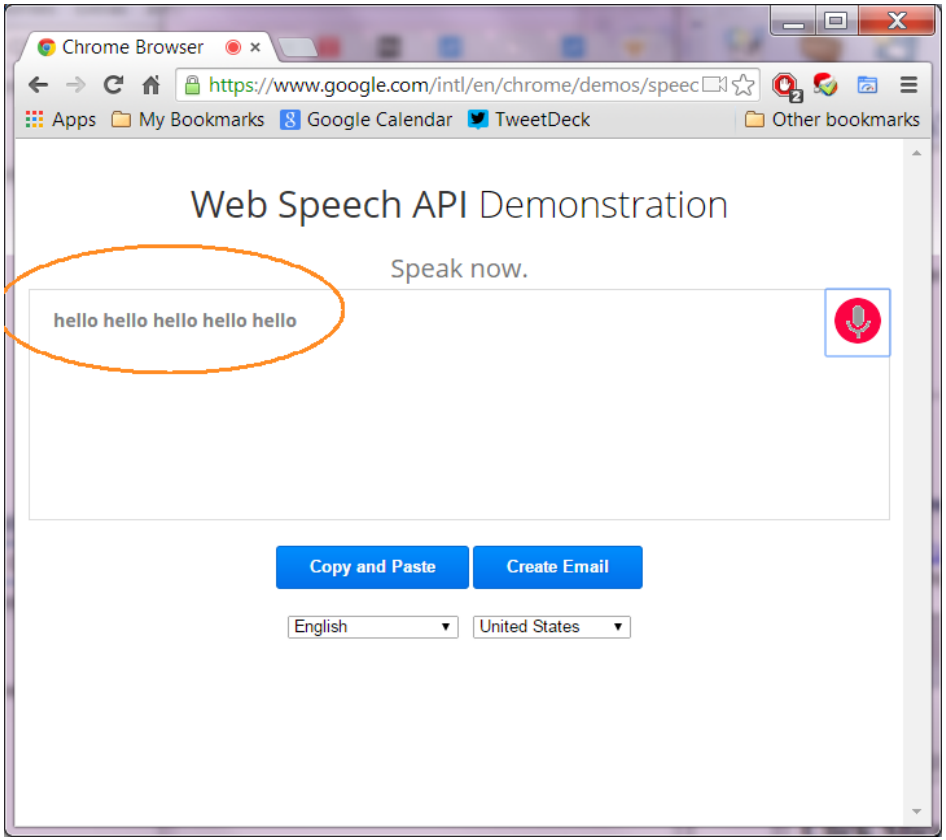
W3C HTML Media Capture Browser Support

- http://caniuse.com/#search=media%20capture



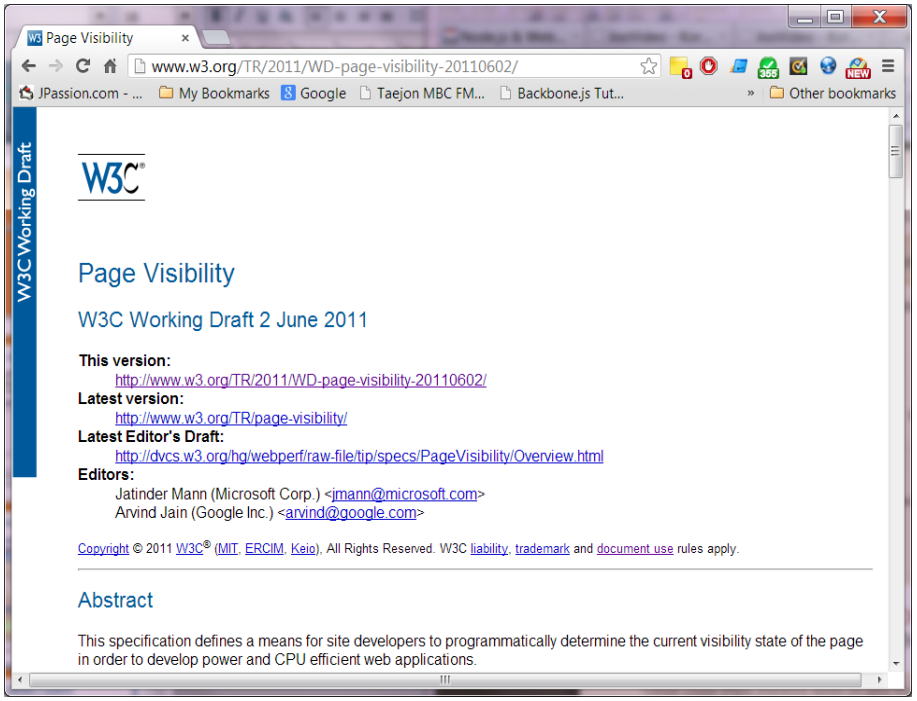
Speech Recognition API for Webkit-enabled Browsers

- var recognition = new webkitSpeechRecognition();



Page Visibility

- http://www.w3.org/TR/2011/WD-page-visibility-20110602/
- Defines a means for site developers to programmatically determine the current visibility state of the page in order to develop power and CPU efficient web applications.



Lab:

Exercise 7: Future Features

1230_html5_media.zip

Libraries & Frameworks

Libraries

- Video.js
  - Fixed many cross browser HTML5 bugs or inconsistencies
  - Added new features that haven't been implemented by all browsers (like fullscreen and subtitles)
  - Provides consistent JavaScript API for both HTML5, Flash, and other playback technologies
  - http://videojs.com/
- MediaElement.js

HTML5 Media Frameworks

- Popcorn.js (open source)
  - HTML5 media framework written in JavaScript for filmmakers, web developers, and anyone who wants to create time-based interactive media on the web
  - Part of Mozilla's Popcorn project
  - http://popcornjs.org/
- Popcorn maker
  - Popcorn Maker makes it easy to enhance, remix and share web video. Use your web browser to combine video and audio with content from the rest of the web — from text, links and maps to pictures and live feeds.
  - https://popcorn.webmaker.org/

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