Web Design & Programming

Images, Audio and Video

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Image Formats

- Bitmap
  - “Array of bytes”
  - File formats: JPEG, PNG, GIF, WebP
- Vector
  - “Lines and curves”
  - File format: SVG

JPEG

- Joint Photographic Experts Group (1992)
- 24-bit colors
- Compression (destructive)
- Ideal for photographs

PNG

- Portable Network Graphics (1996)
- 8-bit indexed colors; 24-bit colors
- Compression (lossless), transparency (alpha)
- Ideal for almost everything, except photographs

GIF

- Graphics Interchange Format (1987)
- 8-bit indexed colors
- Compression (lossless), transparency (binary), animation
- Ideal for flat color images, logos

WebP

- Developed by Google, open format (2010)
- Combine almost all characteristics of other formats (transparency, compression, animation, …)

SVG

- Scalable Vector Graphics (2001)
- XML based
- Resolution independent
- Ideal for logos, technical drawings

Favicon

- A favicon is an image used to identify a web site in a title bar, tab bar or shortcut.
- The favicon.ico file should be located the web site root.
- Multiple formats can be used for different web browsers/platforms , with different sizes and quality levels.
- `<link rel="shortcut icon" href="favicon.ico" type="image/x-icon">`
  (in the head of the HTML document)

Audio and Video Formats

- Audio and video files are containers, they contains one or multiple media in different formats.
- Medias are encoded with a codec.

Audio Format and Codecs

- WAV: uncompressed, .wav
- MP3: compressed, .mp3
- Ogg-Vorbis: compressed, .ogg
- MPEG-4 with ACC audio codec, compressed, .m4a

Video Formats and Codecs

- MPEG-4 + H.264 + AAC (.mp4)
- WebM + VP8 + Vorbis (.webm)
- WebM + VP9 + Opus (.webm)
- Ogg + Theora + Vorbis (.ogv)

Audio and Video HTML Elements

- `<audio src="file.mp3"></audio>`
- `<video src="file.mp4"></video>`
- Various attributes are available.

Audio Element Example

```
<audio autoplay loop controls>
  <source src="file.mp3" type="audio/mpeg">
  <source src="file.ogg" type="audio/ogg">
  Sorry, your web browser doesn’t support
audio playback.
</audio>
```

Video Element Example

```
<video controls width="400" height="300"
poster="image.jpg">
  <source src="file.mp4" type="video/mp4">
  <source src="file.ogv" type="video/ogg">
  Sorry, your web browser doesn’t support
video playback.
</video>
```

Subtitles

- You can add subtitles by using the track element inside an audio or video element.
- The track element will reference a Web Video Text Tracks Format (WebVTT) file that contains the subtitles for each of the cues that are defined.
- Different WebVTT files can be used for different languages.

Intellectual Property / Licensing

- You must have a proper authorization for any audio, video or graphical asset used in your web site.
  - Using your own media files
  - Using public, royalty-free resources
  - Acquire a license from the original source
- This apply to all resources used on your website, regardless of the source (hosted on the same server or from a third party).