

W09 - HTML5 APIs

HTML5 brings together a number of related technologies including javascript and CSS.

HTML5 - Improved development rates.

- create modules to allow features to be developed at different rates.

<http://canIUse.com/> - check specific feature availability

The data- Attribute - embed data in a web page using custom attributes that the browser ignores. Private to the page

Format:

- Start with data-
- contain only lowercase letters, numbers, hyphens, dots, colons or underscores.
- Include an optional string value.

data-powers = 'flight superSpeed'

data-rating = '5'

data-dropdown ← identify elements with dropdown menus

data-user = 'DAZ'

data-max.length = '32'

Information contained in the attribute can be used to identify particular elements.

dataset property accesses data- attributes

```
<div id='hero' data-powers='flight superSpeed'>  
  Superman  
</div>
```

```
const superman = document.getElementById('hero');
```

```
const powers = superman.dataset.powers;
```

data- prefix gets dropped. hyphens are replace with camelCase notation

data-max-length ⇒ dataset.maxLength

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HTML5 APIs - APIs allow access to hardware - cameras, batteries, geolocation, graphics card.

As hardware evolves quickly APIs are introduced to provide access and control

HTML5 Web Storage - key-value store on client's computer similar to cookies:

- More storage
- Fewer restrictions
- EASIER TO USE

Differences compared to cookies

- Information stored isn't shared with server on every request.
- Available to multiple windows of the browser if same domain
- Capacity is far greater than cookies 4 kb limit
- Doesn't automatically expire

localStorage - native object with number of properties
- saved in key-value pairs

sessionStorage works in same way but data is only saved for the session

GEOLOCATION - obtain geographical position of the device.

- link users to nearby places or measure the user's speed.
- privacy concerns require the user's permission

property of the Navigator object.

getCurrentPosition() provides a position object to a specified call back function

Position object properties

coords, latitude coords, longitude used in geolocation sample

position, speed - returns ground speed measured in meters per second

position, altitude - returns an estimate of the devices altitude in meters above WGS84's ellipsoid - standard measure for center of earth.

position, heading - returns direction device is heading

position, timestamp - returns time position was calculated

Accuracy property returns how accurate the position parameters are

watchPosition() will call a call back every time the position updates if it has changed.

clearWatch()

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Web workers allow processes to run in the background, adding support for concurrency in JavaScript

Worker() constructor . takes name of another JavaScript file as parameter

```
const worker = new Worker('task.js');
```

self keyword is used to refer to the worker

```
worker.postMessage('Hello');
```

to post message from the worker

```
self.postMessage('Finished'); ← fires message event
```

using a listener to know when events take place

```
worker.addEventListener('message', (event) => { console.log(event.data); }, false);
```

when task is complete, it can be stopped using terminate()

```
worker.terminate();
```

Shared Web Workers - can create a shared worker that can be used by lots of different scripts on the same domain.

Service Workers - Service Worker API will work in background and be able to intercept network requests, taking alternative actions if the network is offline.

- Push notifications and background syncing
- Require HTTPS

<https://serviceworkers.rs> ← The ServiceWorker Cookbook

Web Sockets - allows two-way communication (push messaging)
See example text message send/response

connection variable is created as a new WebSocket connected to the url.

An event listener fires when a connection is created
Another listener for sending a message that is submitted

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connection object events also include:

close - fires when the connection is closed
- can be achieved using close() method.

error - fires when any sort of error occurs
- information about the error is accessed through error.data

```
connection.addEventListener('close', () => {  
  output('DISCONNECTED');  
}, false);
```

```
connection.addEventListener('error', (event) => {  
  output('<span style= "color: red;" > ERROR: {event.data}</span>');  
}, false);
```

Notifications - show messages using the system's notifications.

1. get permission using requestPermission() method of a Notification global object

```
if (window.Notification) {  
  Notification.requestPermission();  
}
```

Some Notifications close automatically after a short time.
can close programmatically using close() method.

events = 'click' 'show' 'close'

```
notification.addEventListener('click', () => {  
  window.open('https://s.tepoint.com');  
}, false);
```

Multimedia - <audio> & <video>

```
<audio src = '/song.mp3' controls>  
Your browser does not support the audio element.  
</audio>
```

```
<video src = 'http://movie.mp4' controls>  
Your browser does not support the video element.  
</video>
```

Content between tags will only display if not supported

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DOM Methods for audio/video

```
const video = document.getElementsByTagName('video')[0];  
video.play();           video.muted = true;  
video.pause();          video.currentTime += 10; // Jump 10 seconds  
video.volume = 0.9;     video.playbackRate = 8; // Fast forward 8x as fast  
                        video.loop = true;  
video.duration; // ← returns length of clip
```

Events of video/audio

play event, pause event, volumechange event,
loadedmetadata event.

```
video.addEventListener('pause', () => {  
  console.log('The video has been paused'); }, false);
```

Other APIs - constant increase in APIs made available.

Shims and Polyfills

Shim - code that adds some missing functionality

polyfill - a shim that also uses API commands that would be used if the feature was supported natively