

# **Web Components Introduction**

A quick guide on how to create and use Web Components

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# About Me

- **Agile Coach**

CSS Insurance

- **Software Engineer**

CSS Insurance, Open Source Software

- **Lecturer**

TEKO Swiss Technical College

- **Speaker**

Conferences, User Groups, Meetups



[www.fihlon.ch](http://www.fihlon.ch) | [github.com/McPringle](https://github.com/McPringle) | [hackergarten.net](http://hackergarten.net)

# Agenda

Intro

Specifications

Goodies

Status

Live Coding

Wrap-up

# Intro

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## Intro

“Web Components are a set of standards currently being produced by Google engineers as a W3C specification that allow for the creation of reusable widgets or components in web documents and web applications. The intention behind them is to bring component-based software engineering to the World Wide Web. The components model allows for encapsulation and interoperability of individual HTML elements.”

Wikipedia

# Intro

- New W3C Standard
- Allows reuse of components
- The standard is divided into four specifications:
  - Templates
  - Shadow DOM
  - Custom Elements
  - Imports
- A Web Component uses well-known technologies:
  - HTML
  - CSS
  - JavaScript
- No need of a framework or library
  - Except an optional polyfill to support older browsers

## Specifications

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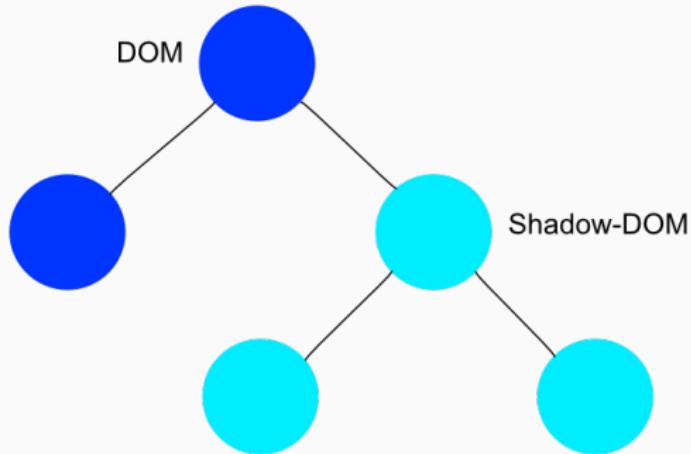
# Templates

- Defines HTML parts to be reused any number of times
- Define reusable parts directly inside of HTML documents
- Is defined by the new <template> tag
- Can be added to the DOM using JavaScript
- Unlimited number of templates possible

```
1 <template id="my-template">
2     <div>
3         
4     </div>
5 </template>
```

# Shadow DOM

- Create an independent sub-DOM
- Not accessible from “outside” of the sub-DOM
- Avoids DOM collisions between components
- No side-effects of CSS or JavaScript between components
- Can be added to the DOM using JavaScript
- Unlimited number of Shadow DOMs possible



# Custom Elements

- Connect template and shadow DOM
- Define reusable components
- Create own tags to produce readable HTML
  - own tags need to include a hyphen
- Apply styles inside of the custom element
- Use JavaScript for interaction
- Throws lifecycle events:
  - created, ready, attached, detached, attributeChanged

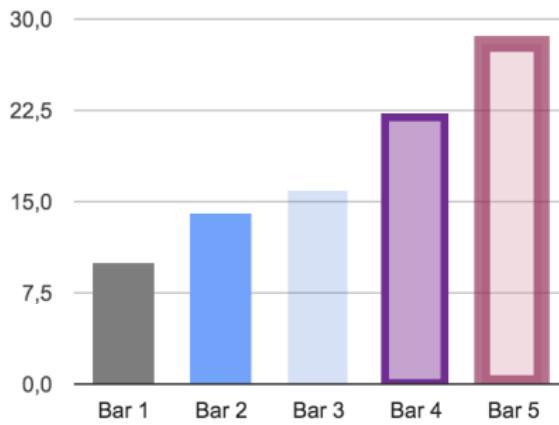
```
1 <google-hangout-button />
```



# Imports

- Outsourcing of HTML parts
- Create own HTML files for components (higher reusability)
- Add components to HTML documents using imports

```
1 <link rel="import" href="google-chart.html">
2 <google-chart type="column" data="chart.json" />
```



## Goodies

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# CSS Variables

```
1  :root {  
2      --main-text-color: grey;  
3  }  
4  
5  p {  
6      color: var(--main-text-color, black);  
7  }
```

# CSS Mixins

```
1 :root {  
2     --form-styles: {  
3         border: 1px dotted grey;  
4         font-size: 0.8em;  
5         margin: 1.2em;  
6     }  
7 }  
8  
9 form {  
10     @apply(--form-styles);  
11 }
```

## Status

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# Browser Support

	Chrome	Opera	Firfox	Safari	IE/Edge
Templates	✓	✓	✓	✓	✓
Shadow DOM	✓	✓	▲	✓	✗
Custom Elements	✓	✓	▲	▲	✗
Imports	✓	✓	▲	✗	✗

## Polyfills

```
1 bower install webcomponentsjs  
2 npm install webcomponents.js
```

# Libraries

- **Polymer**

Polymer is a new type of library for the web, built on top of Web Components, and designed to leverage the evolving web platform on modern browsers.

- **X-Tag with Brick**

X-Tag is a small JavaScript library, initially created by Mozilla and now supported by Microsoft, that brings Web Components Custom Element capabilities to all modern browsers.

- **Bosonic**

Bosonic is a set of tools that enable you to build Web Components as the spec currently describes, and supporting not-so-modern browsers like IE9.

- **SkateJS**

SkateJS is a superset of the web component specs, with a very small footprint, that enables you to write performant web components using a functional rendering pipeline.

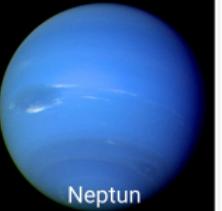
## Live Coding

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# Screenshot of Demo Application

Server Dashboard    localhost:8080    Marcus Fritsch

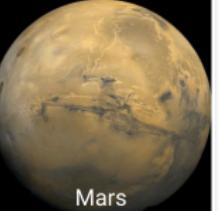
## Server Dashboard

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# Components of Demo Application

Server Dashboard    localhost:8080    Marcus Fritsch

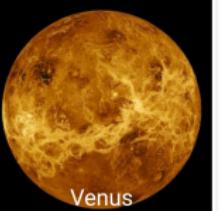
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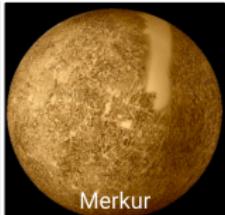
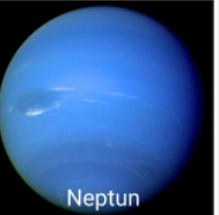
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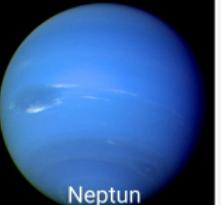
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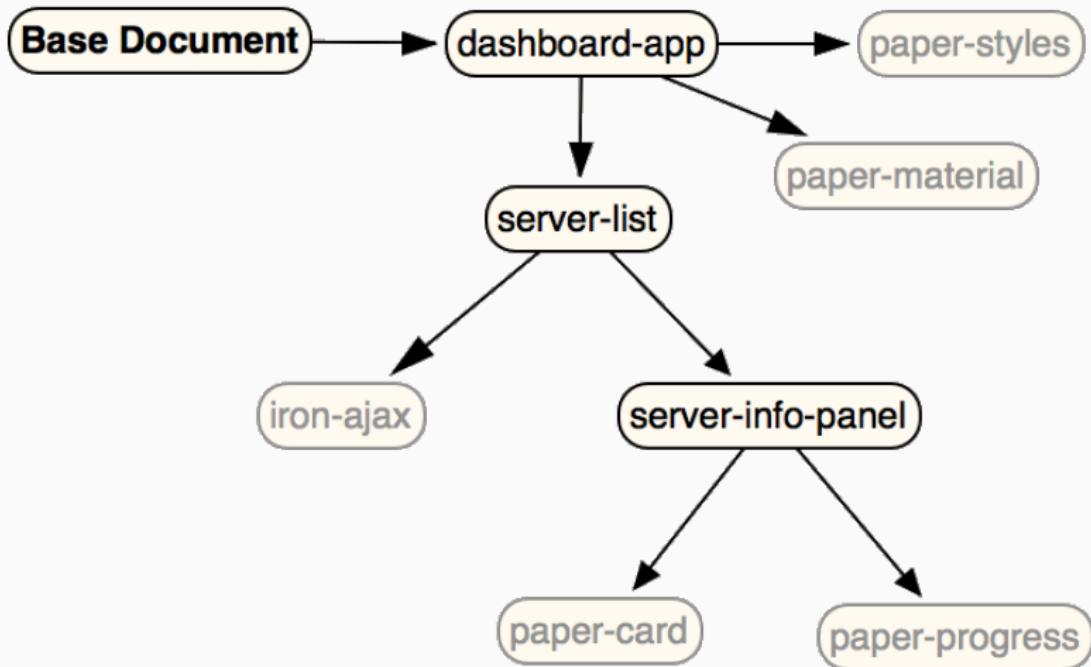
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## Component Structure of Demo Application



## Wrap-up

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# Conclusion

Web Components...

- are **declarative** and **reuseable**
- are **combinable** and **extensible**
- are **interoperational** – DOM = common denominator
- allow **encapsulation** – scoping
- increase **productivity** and **accessibility**
- are **standard**
- support **thinking in components**

# Commands

- Install the Polymer command line client

```
1 npm install -g polymer-cli
```

- Initialize a Polymer project

```
1 polymer init
```

- Serve a Polymer project

```
1 polymer serve
```

- Build a Polymer project

```
1 polymer build
```

- Test a Polymer project

```
1 polymer test
```

## Links

- W3C Web Components Specification  
<https://w3.org/standards/techs/components>
- W3C Introduction to Web Components  
<http://w3.org/TR/components-intro/>
- Informations about Web Components  
<http://webcomponents.org>
- Directory of custom elements  
<https://customelements.io>
- Polymer Project  
<https://www.polymer-project.org>

The End

Thank You! Questions?



<http://bit.ly/html-wc>