

WEB COMPONENTS INTRODUCTION

A QUICK GUIDE ON HOW TO CREATE AND USE WEB COMPONENTS

Marcus Fihlon

June 23, 2016

Scrum Master | Software Engineer | Lecturer | Speaker

DISCLAIMER

The following presentation has been approved for open audiences only. Hypersensitivity to occasional profanity requires covering ears.

All logos, photos etc. used in this presentation are the property of their respective copyright owners and are used here for educational purposes only. Any and all marks used throughout this presentation are trademarks of their respective owners.

The presenter is not acting on behalf of CSS Insurance, either as an official agent or representative. The views expressed are those solely of the presenter.

Marcus Fihlon and CSS Insurance disclaims all responsibility for any loss or damage which any person may suffer from reliance on this information or any opinion, conclusion or recommendation in this presentation whether the loss or damage is caused by any fault or negligence on the part of presenter or otherwise.

NOTES AND PHOTOS

You can take notes and photos if you want.
Or you can focus on the presentation and live coding.
All my slides and source files are available online.
A link and a QR code are on the last slide.

ABOUT ME

- **Scrum Master**

CSS Insurance

- **Software Engineer**

CSS Insurance / Open Source Software

- **Lecturer**

TEKO Swiss Technical College

- **Speaker**

Conferences / User Groups / Meetups



www.fihlon.ch | github.com/McPringle | hackergarten.net

AGENDA

Intro

Specifications

Goodies

Status

Live Coding

Wrap-up

INTRO

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

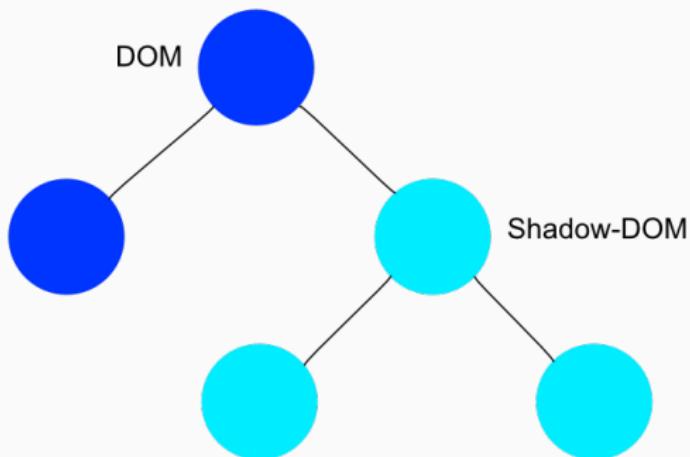
TEMPLATES

- 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 />
```

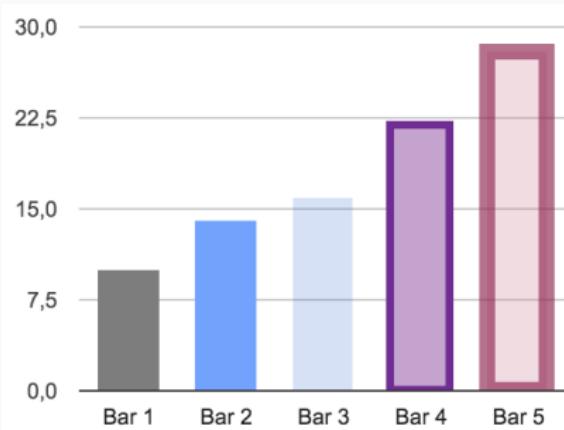


Start a Hangout

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

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

STATUS

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

Polyfills

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

Libraries

- Polymer
- X-Tag
- Bosonic

LIVE CODING

SCREENSHOT OF DEMO APPLICATION

Server Dashboard Marcus Fritton

localhost:8080

Server Dashboard



Merkur

IP: 192.168.192.101
CPU:
Memory:
Disk:



Venus

IP: 192.168.192.102
CPU:
Memory:
Disk:



Erde

IP: 192.168.192.103
CPU:
Memory:
Disk:



Mars

IP: 192.168.192.104
CPU:
Memory:
Disk:



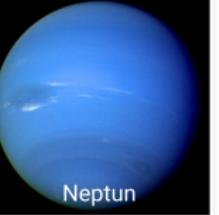
Jupiter

IP: 192.168.192.105
CPU:
Memory:
Disk:



Uranus

IP: 192.168.192.106
CPU:
Memory:
Disk:



Neptun

IP: 192.168.192.107
CPU:
Memory:
Disk:

COMPONENTS OF DEMO APPLICATION

Server Dashboard

Planet	IP	CPU	Memory	Disk
Merkur	192.168.192.101	Green	Green	Green
Venus	192.168.192.102	Green	Green	Green
Erde	192.168.192.103	Green	Green	Green
Mars	192.168.192.104	Green	Green	Green
Jupiter	192.168.192.105	Green	Green	Green
Uranus	192.168.192.106	Green	Green	Green
Neptun	192.168.192.107	Green	Green	Green

COMPONENTS OF DEMO APPLICATION

Server Dashboard

The screenshot displays a "Server Dashboard" interface with a red border, showing seven planetary nodes (Merkur, Venus, Erde, Mars, Jupiter, Uranus, Neptun) and their corresponding IP addresses and resource usage metrics.

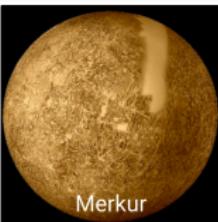
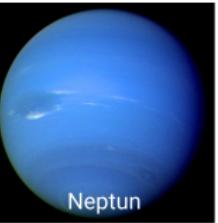
Node	IP Address	CPU	Memory	Disk
Merkur	192.168.192.101	Green	Green	Green
Venus	192.168.192.102	Green	Green	Green
Erde	192.168.192.103	Green	Green	Green
Mars	192.168.192.104	Green	Green	Green
Jupiter	192.168.192.105	Green	Green	Green
Uranus	192.168.192.106	Green	Green	Green
Neptun	192.168.192.107	Green	Green	Green

COMPONENTS OF DEMO APPLICATION

Server Dashboard Marcus Fritton

localhost:8080

Server Dashboard

 Merkur IP: 192.168.192.101 CPU: <div style="width: 100%; height: 10px; background-color: green;"></div> Memory: <div style="width: 100%; height: 10px; background-color: green;"></div> Disk: <div style="width: 100%; height: 10px; background-color: green;"></div>	 Venus IP: 192.168.192.102 CPU: <div style="width: 100%; height: 10px; background-color: green;"></div> Memory: <div style="width: 100%; height: 10px; background-color: green;"></div> Disk: <div style="width: 100%; height: 10px; background-color: green;"></div>	 Erde IP: 192.168.192.103 CPU: <div style="width: 100%; height: 10px; background-color: green;"></div> Memory: <div style="width: 100%; height: 10px; background-color: green;"></div> Disk: <div style="width: 100%; height: 10px; background-color: green;"></div>	 Mars IP: 192.168.192.104 CPU: <div style="width: 100%; height: 10px; background-color: green;"></div> Memory: <div style="width: 100%; height: 10px; background-color: green;"></div> Disk: <div style="width: 100%; height: 10px; background-color: green;"></div>
 Jupiter IP: 192.168.192.105 CPU: <div style="width: 100%; height: 10px; background-color: green;"></div> Memory: <div style="width: 100%; height: 10px; background-color: green;"></div> Disk: <div style="width: 100%; height: 10px; background-color: green;"></div>	 Uranus IP: 192.168.192.106 CPU: <div style="width: 100%; height: 10px; background-color: green;"></div> Memory: <div style="width: 100%; height: 10px; background-color: green;"></div> Disk: <div style="width: 100%; height: 10px; background-color: green;"></div>	 Neptun IP: 192.168.192.107 CPU: <div style="width: 100%; height: 10px; background-color: green;"></div> Memory: <div style="width: 100%; height: 10px; background-color: green;"></div> Disk: <div style="width: 100%; height: 10px; background-color: green;"></div>	

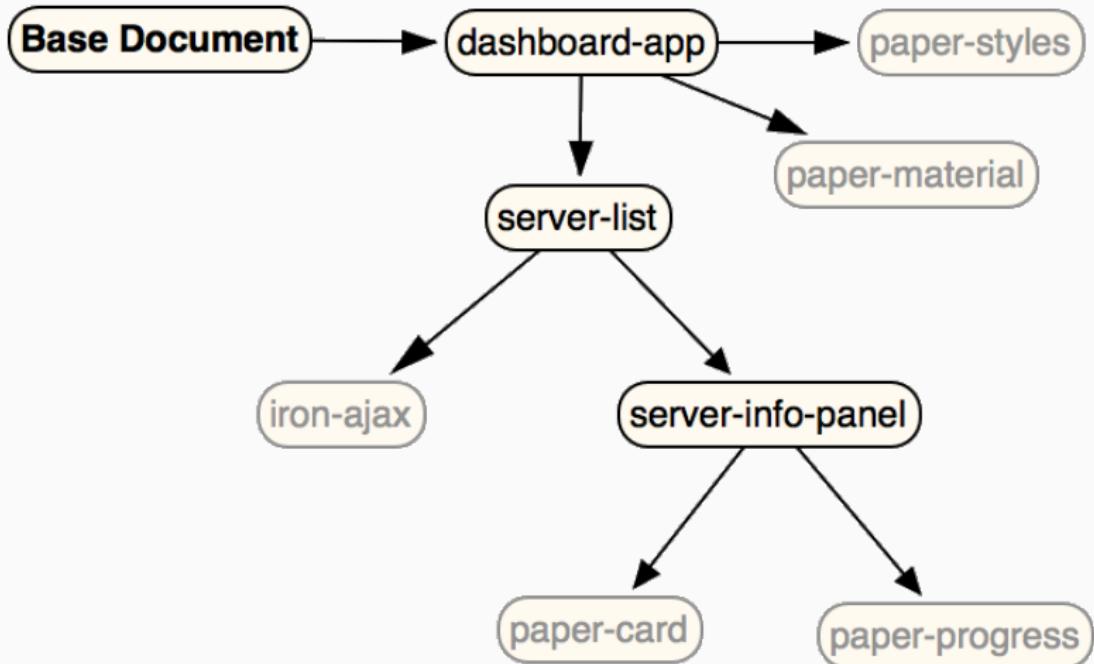
COMPONENTS OF DEMO APPLICATION

Server Dashboard

The screenshot shows a web browser window titled "Server Dashboard" with the URL "localhost:8080". The dashboard displays seven cards, each representing a planet and showing its image, name, IP address, and performance metrics (CPU, Memory, Disk). The first card for Merkur has its CPU, Memory, and Disk metrics highlighted with red boxes.

Planet	IP:	CPU:	Memory:	Disk:
Merkur	192.168.192.101	Green	Red (highlighted)	Green
Venus	192.168.192.102	Green	Green	Green
Erde	192.168.192.103	Green	Green	Green
Mars	192.168.192.104	Green	Green	Green
Jupiter	192.168.192.105	Green	Green	Green
Uranus	192.168.192.106	Green	Green	Green
Neptun	192.168.192.107	Green	Green	Green

COMPONENT STRUCTURE OF DEMO APPLICATION



WRAP-UP

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>