

WEB COMPONENTS INTRODUCTION

A QUICK GUIDE ON HOW TO CREATE AND USE WEB COMPONENTS

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YOU DON'T NEED TO TAKE PICTURES OF THE SLIDES!



Michael Sohn / AP

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

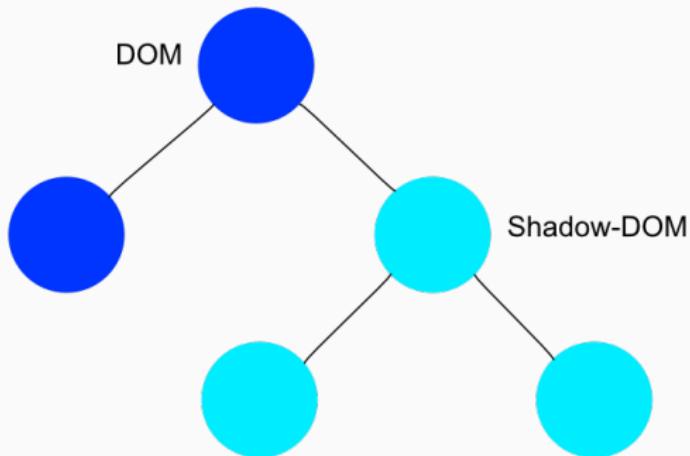
TEMPLATES

- 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 />
```

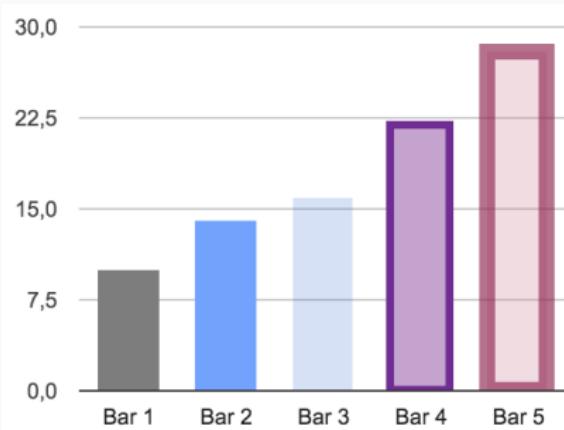


Start a Hangout

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

The screenshot shows a web browser window titled "Server Dashboard" at the URL "localhost:8080". The dashboard displays nine planetary nodes arranged in two rows of four and one row of three. Each node is represented by a circular image of a planet and a corresponding label below it. To the right of each label is a set of four horizontal bars representing system resources: IP, CPU, Memory, and Disk.

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

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

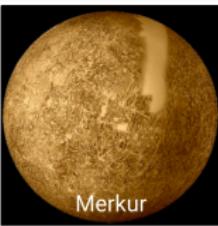
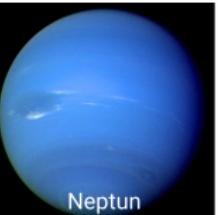
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Venus	192.168.192.102	Green	Green	Green
Erde	192.168.192.103	Green	Green	Green
Mars	192.168.192.104	Green	Green	Green
Jupiter	192.168.192.105	Green	Green	Green
Uranus	192.168.192.106	Green	Green	Green
Neptun	192.168.192.107	Green	Green	Green

COMPONENTS OF DEMO APPLICATION

Server Dashboard Marcus Fritton

localhost:8080

Server Dashboard

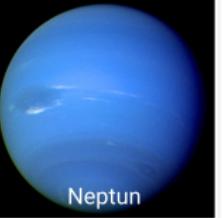
 Merkur IP: 192.168.192.101 CPU: <div style="width: 100%; height: 10px; background-color: green;"></div> Memory: <div style="width: 100%; height: 10px; background-color: green;"></div> Disk: <div style="width: 100%; height: 10px; background-color: green;"></div>	 Venus IP: 192.168.192.102 CPU: <div style="width: 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

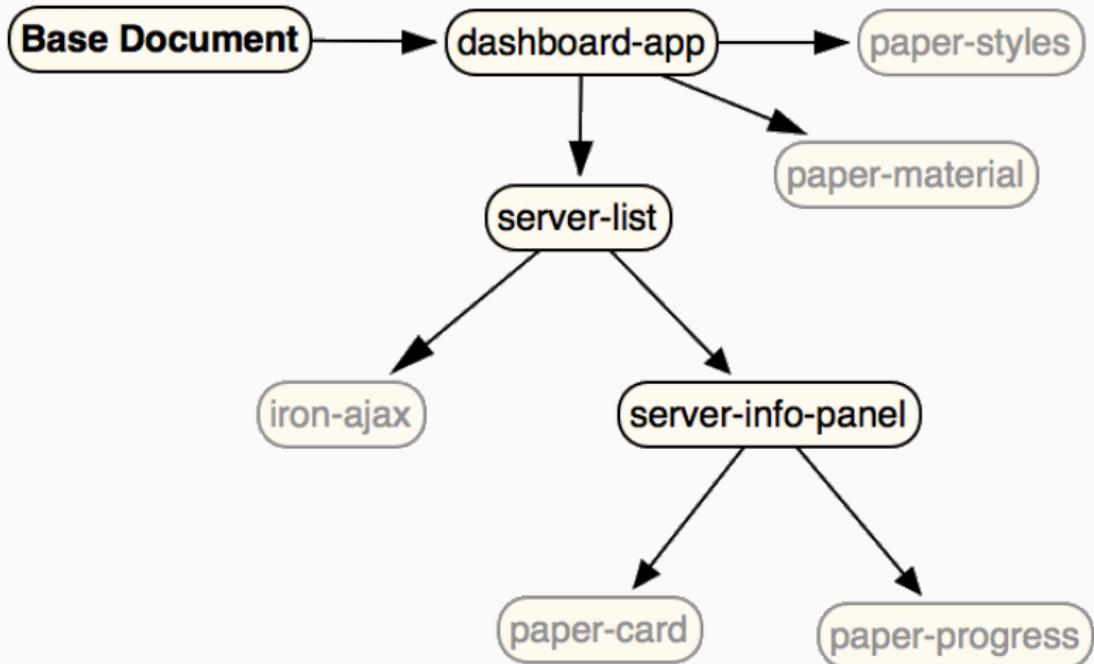
Server Dashboard Marcus Fritton

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: red;"></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: red;"></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: red;"></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: red;"></div> Disk: <div style="width: 100%; height: 10px; background-color: green;"></div>
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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>