Web Components Introduction

A quick guide on how to create and use Web Components

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About Me

- **Agile Coach**
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Agenda

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Goodies

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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

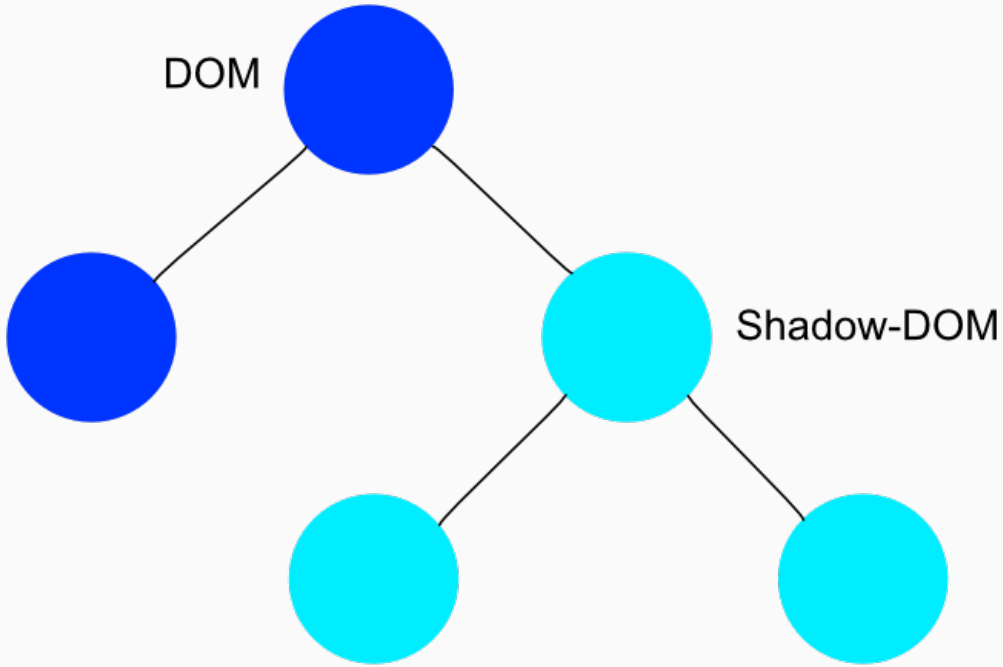
Templates

- 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         <img src="ok.png" width="20" height="20" />
4     </div>
5 </template>
```

Shadow DOM

- Create an independent sub-DOM
- Not accessable 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

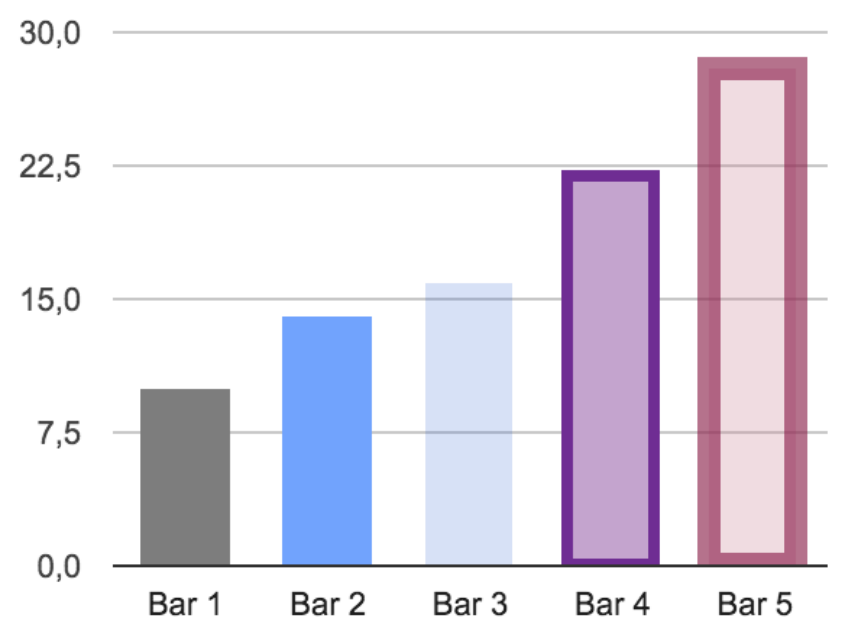
- Connect template and shadow DOM
- Define reusable components
- Create own tags to produce readable HTML
  → own tags need to include a hyphen
- Apply styles inside of the custom element
- Use JavaScript for interaction
- Throws lifecycle events:
  → created, ready, attached, detached, attributeChanged

```
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

CSS Variables

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

CSS Mixins

```
:root {
    --form-styles: {
        border: 1px dotted grey;
        font-size: 0.8em;
        margin: 1.2em;
    }
}

form {
    @apply(--form-styles);
}
```

Status

Status

	Chrome	Opera	Firfox	Safari	Edge
Templates	✔	✔	✔	✔	✔
Imports	✔	✔	✘	✘	✘
Custom Elements	✔	✔	▲	▲	✘
Shadow DOM	✔	✔	▲	✔	✘

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.

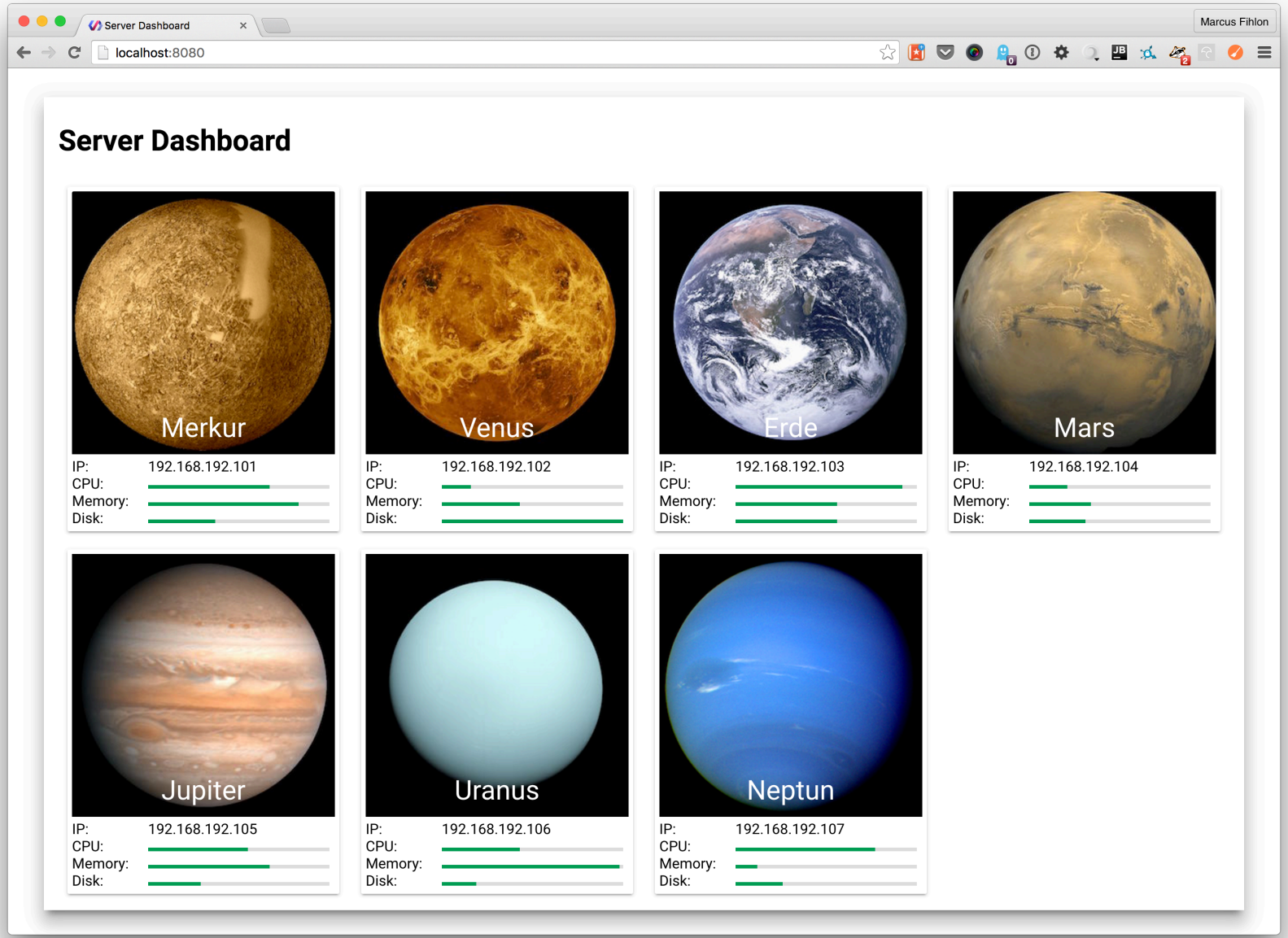
- ## X-Tag with Brick
  X-Tag is a small JavaScript library, initially created by Mozilla and now supported by Microsoft, that brings Web Components Custom Element capabilities to all modern browsers.

- ## 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.

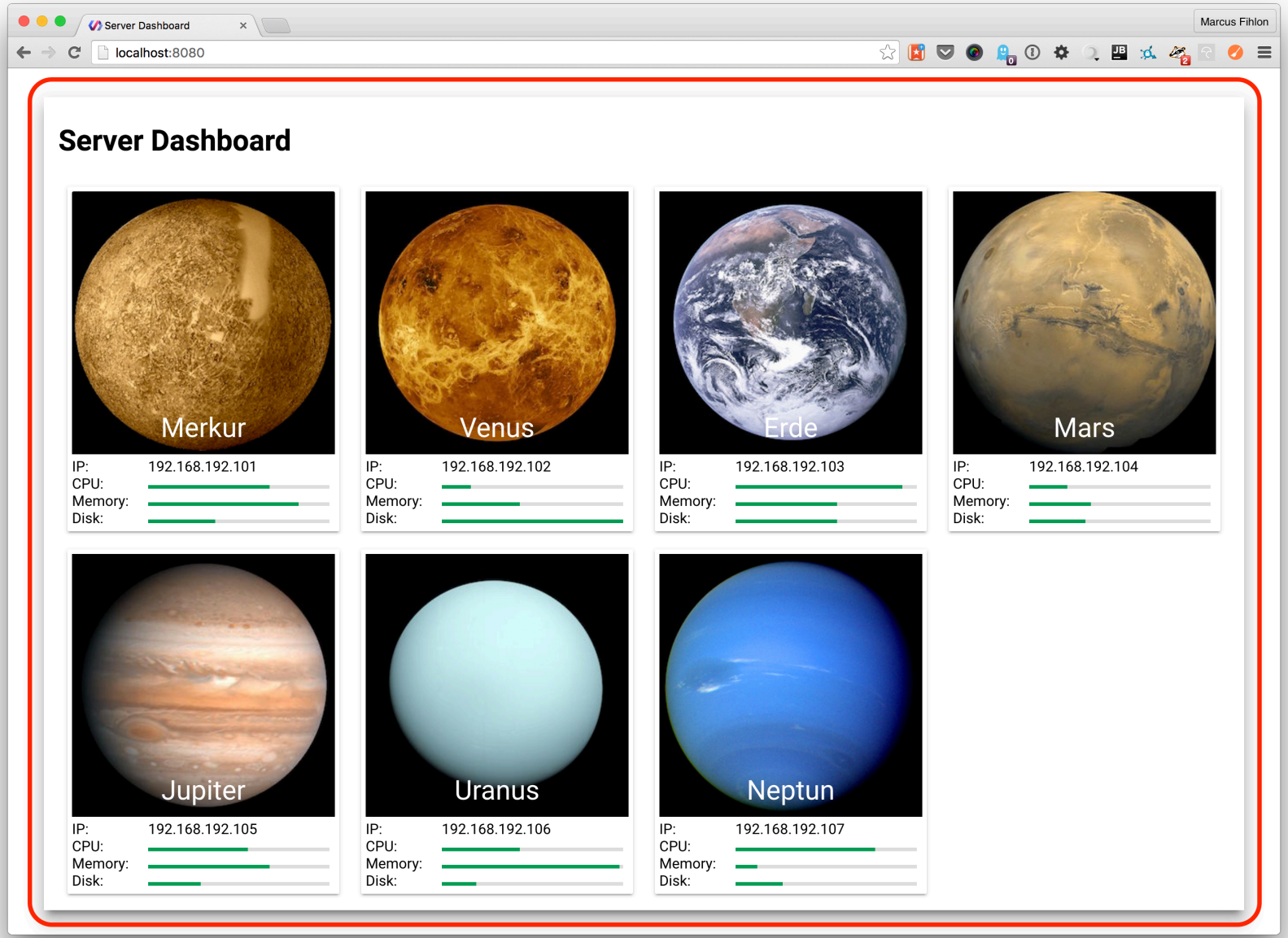
- ## SkateJS
  SkateJS is a superset of the web component specs, with a very small footprint, that enables you to write performant web components using a functional rendering pipeline.

Live Coding

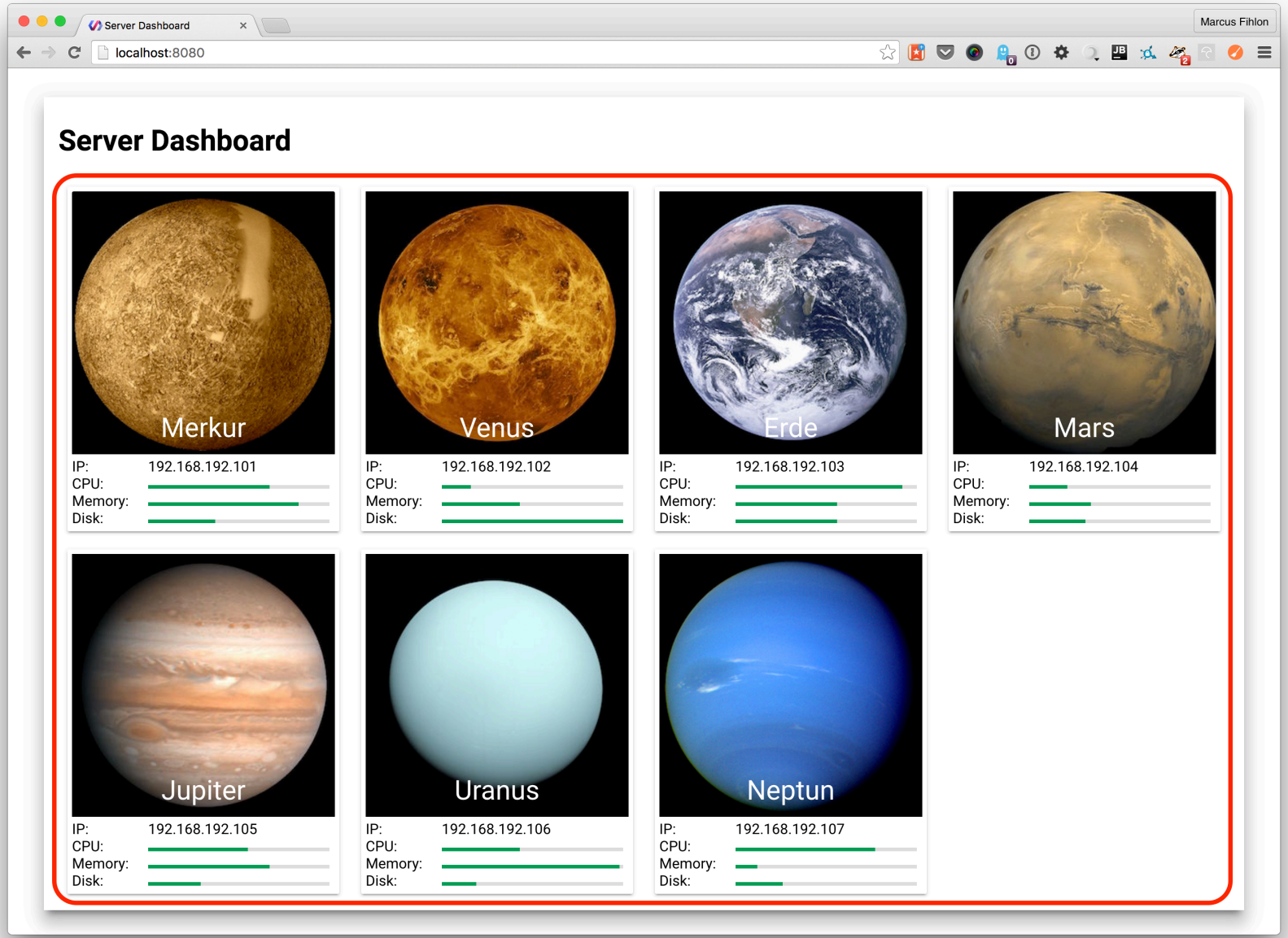
Screenshot of Demo Application



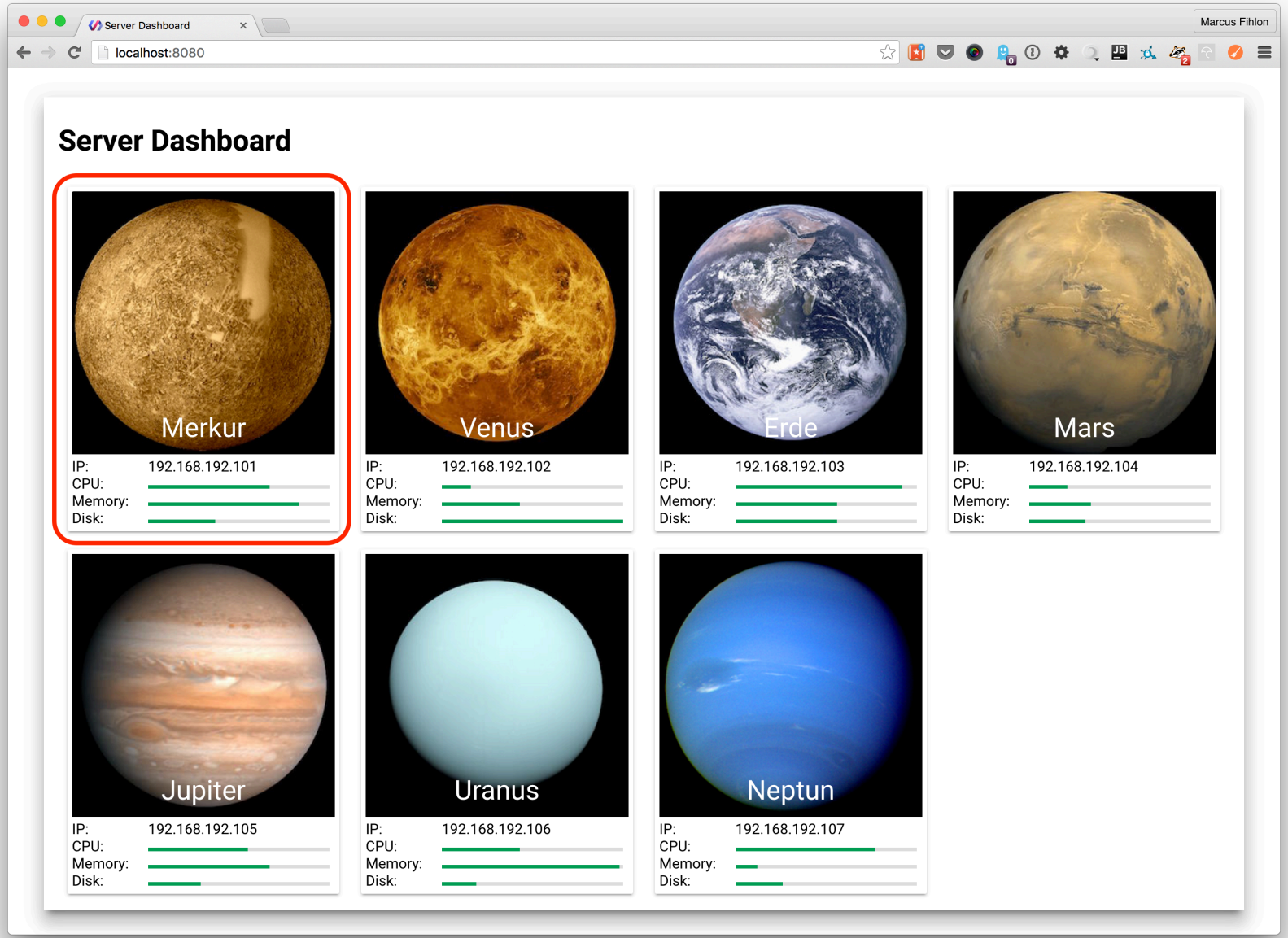
Components of Demo Application



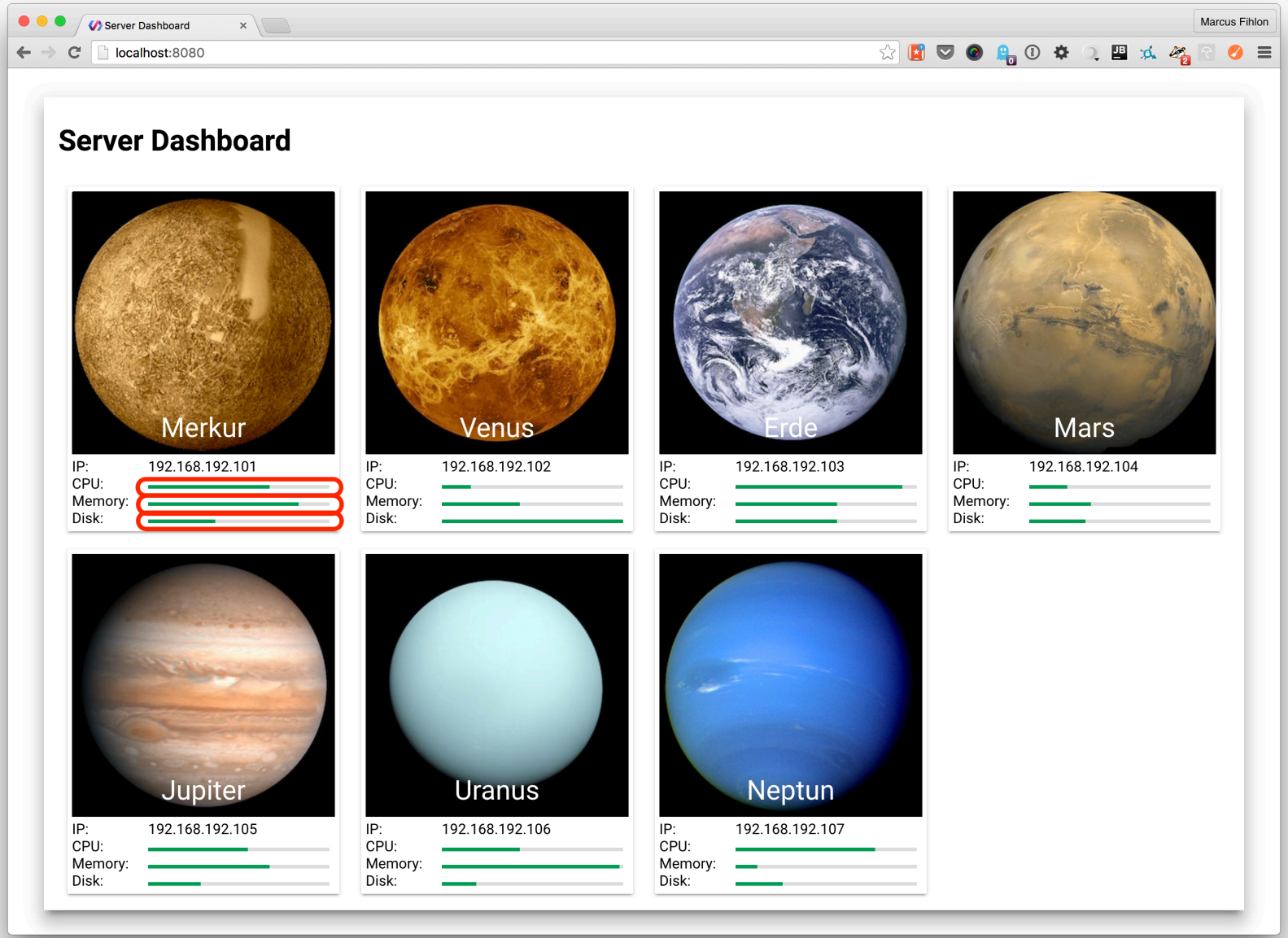
Components of Demo Application



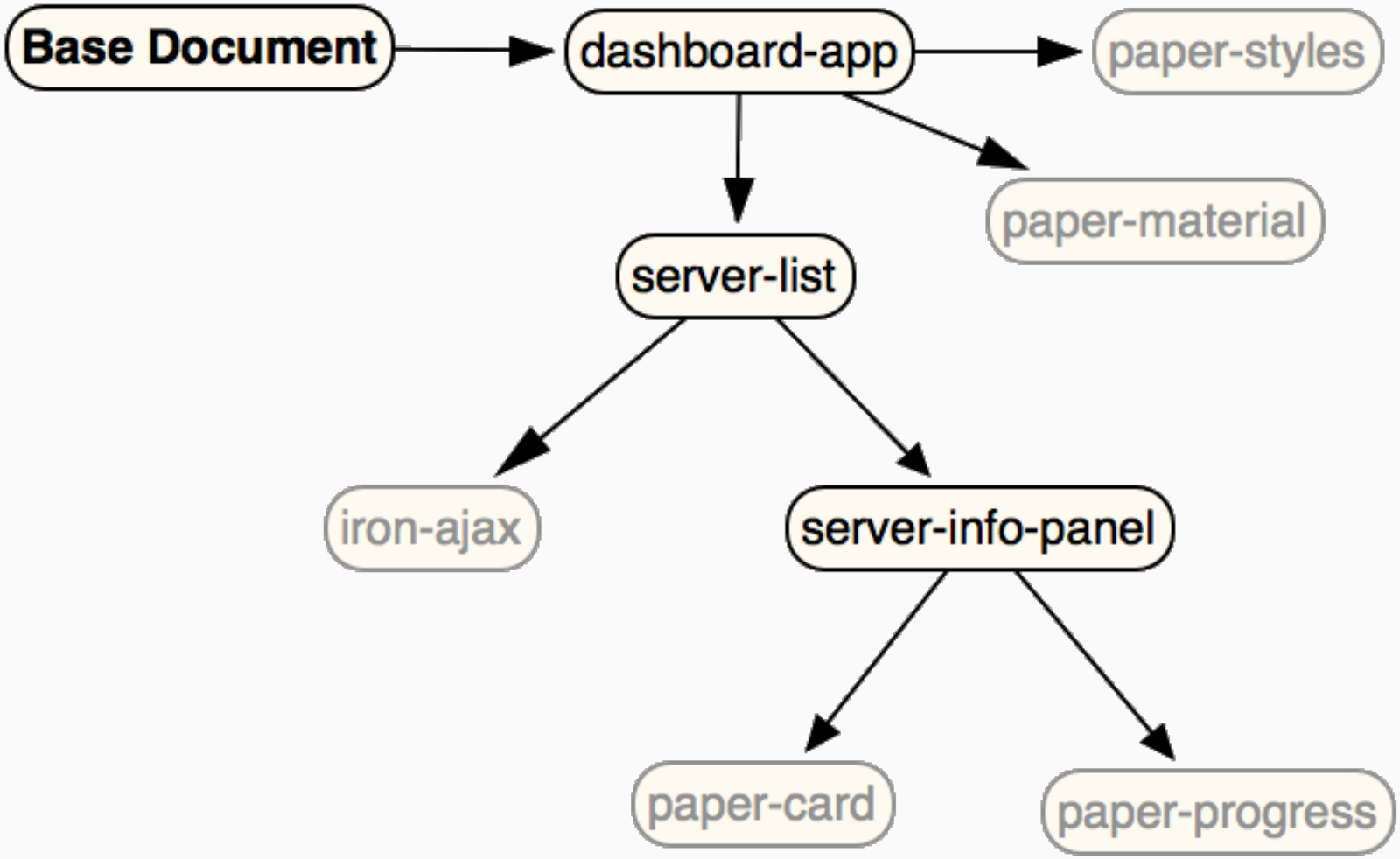
Components of Demo Application



Components of Demo Application



Component Structure of Demo Application



Wrap-up

Conclusion

Web Components…

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

Commands

- Install the Polymer command line client

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

- Initialize a Polymer project

```
polymer init
```

- Serve a Polymer project

```
polymer serve
```

- Build a Polymer project

```
polymer build
```

- Test a Polymer project

```
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`

Thank You! Questions?

http://bit.ly/html-wc