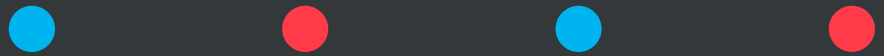
QUICK RECAP

A reminder of what we have done during Lecture 08



LAST TIME...

- Declarative UI
  - What is it?
- Vaadin Declarative Syntax
  - How to declare and use designs?
  - What are the advantages and drawbacks?
- Vaadin Designer
  - Do I need it?

WEB COMPONENTS AND VAADIN ELEMENTS

Development of Modern Web Applications (with Vaadin)

Lecture 09

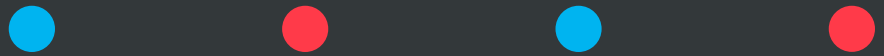
vaadin}>

OVERVIEW

- Web Components
- Building blocks
- Vaadin Elements

WEB COMPONENTS

Component-based web development



WEB COMPONENTS

A set of features currently being added (...) to the HTML and DOM specifications 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.

Says wiki.

CORE FEATURES

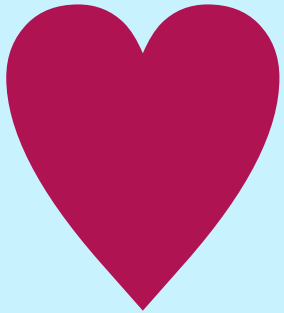
- Custom Elements
  - API to define and use new HTML elements
- Shadow DOM
  - Encapsulating DOM and styling
  - Allowing composition
- HTML Imports
  - Importing HTML documents into other documents
- HTML Templates
  - Reusing parts of DOM

BROWSER COMPATIBILITY

	Chrome	Edge	Firefox	Opera	Safari
HTML Templates					
Shadom DOM					
Custom Elements					
HTML Imports					

POLYFILLS

	Chrome	Edge	Firefox	Opera	Safari
HTML Templates					
Shadom DOM					
Custom Elements					
HTML Imports					

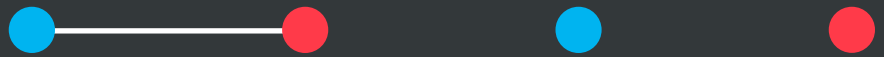


POLYFILLS?

- JS library
  - http://webcomponents.org/polyfills
- Ensures all features for all browsers
  - "Evergreen" browsers
  - 117KB minified
- Detects features natively supported
  - Size will decrease in the future
- Lite version available
  - Custom Elements and HTML Import only
  - Custom versions possible through manual build
- Use like any other JS
  - `<script src="path_to/webcomponents.js"></script>`
  - Recommended to be the first script in the document's `<head>`

COMPONENTS OF WEB COMPONENTS

The building blocks



CUSTOM ELEMENTS

2016-10-02

- All-lowercase tag name
- Must contain a hyphen
- Must not be reserved
  - SVG and MathML have a total of 8 tags with hyphens
- Spec adds custom attributes for existing elements
  - All-lowercase
  - Starts with `data-`

HTML IMPORTS

2016-10-02

- A way to include HTML documents in HTML documents
- `<link rel="import" href="/path/to/file.html">`
- A linked document may include other documents

HTML TEMPLATES

- Part of HTML standard
- Declares fragments to clone
  - Does nothing by itself
  - Left for scripts to handle

SHADOW DOM

2016-10-02

- Method of combining multiple DOM trees
  - Shadow host and shadow root
  - Host is not rendered
    - Root is, instead
- Hides the details of an element
  - Exposes only the relevant parts

POLYMER

Web Components for modern web

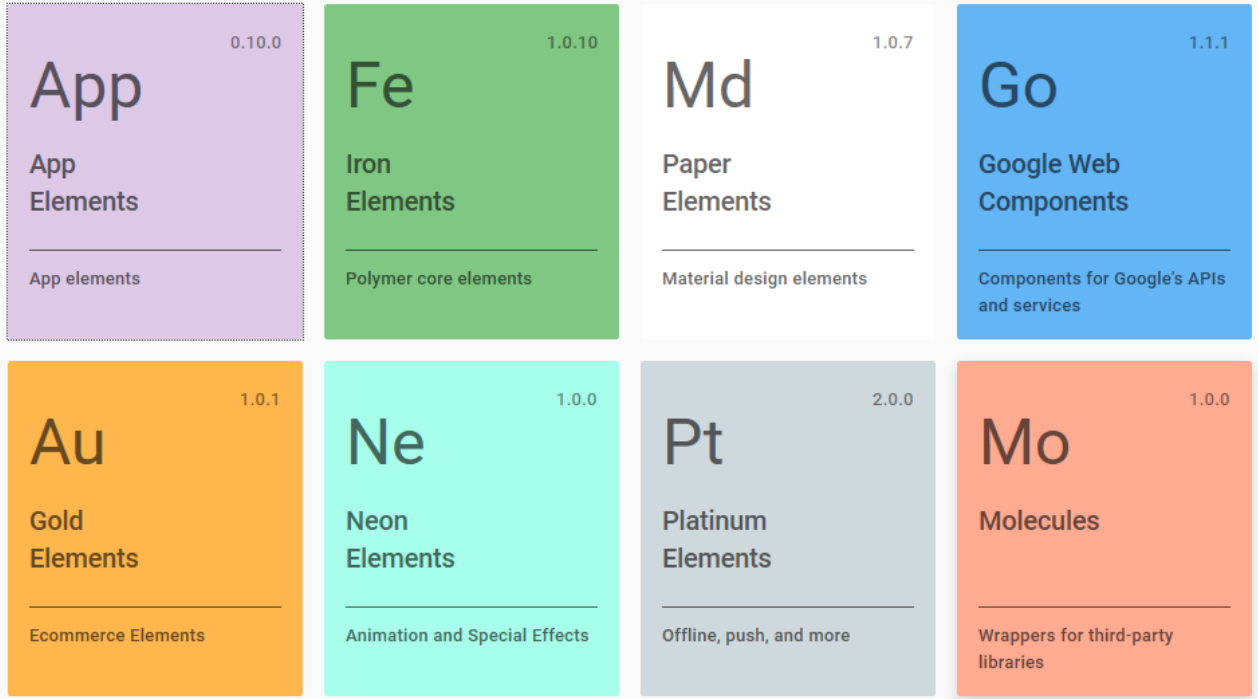
vaadin}>

WHAT IS IT?

v1.7.0 → 2016-09-29

- A library for building custom elements
- A collection of a variety of custom elements
- Built on top of Web Components technology
  - http://polymer-project.org
  - Requires polyfills to be cross-browser
- App Toolbox available for Progressive Web Apps

POLYMER OVERVIEW



VAADIN ELEMENTS

Web Components the Vaadin Way

OVERVIEW

Core Elements

- Apache 2.0 licensed
- 6 different components
  - Not found in Polymer
  - Work with Polymer
    - Also Angular 2 support
    - Bind with others

Charts

- Commercial
- Based on Highcharts

<VAADIN-GRID>

- Shows tabular data
- High performance component
  - Data source is irrelevant
- Lots of features
  - Sorting, filtering, cell rendering…

<VAADIN-COMBO-BOX>

- Filterable drop-down select
- Supports keyboard navigation
- Compatible with Polymer's `<iron-form>`
- Optimised for large data
  - Data source is irrelevant

<VAADIN-UPLOAD>

- Multiple file upload
  - With drag-and-drop support
- Gazillion events to listen to

<VAADIN-DATE-PICKER>

- Drop-down selection for dates
  - Scrollable calendar
- Customisable
  - To some degree

<VAADIN-SPLIT-LAYOUT>

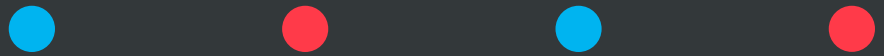
- Partition the layout into resizable areas
  - Horizontal and vertical
  - Can be nested
- Support for mobile devices
  - Enhanced touch areas
- Most recent Vaadin Element
  - Still in (early) development

VAADIN ICONS

- 530 unique icons
- Designed for web applications
  - Simple
  - Favour sharp corners
    - Whatever that means ☺
- Used through `<iron-icon>`

OTHER FRAMEWORKS

Web Components are client side



OVERVIEW

- Web Components are done as client side code
- Many frameworks operate on server side
  - Vaadin
  - Ruby on Rails / Sinatra
  - Django
  - PHP
- Binding can be done through events and AJAX

(SEVERELY OUT-OF-DATE) EXAMPLE

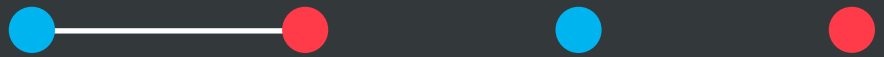
- Ruby/Sinatra bindings to Vaadin Elements
  - https://github.com/vaadin-miki/vaadin-elements
    - Self-advertising ☺
- View helpers to render HTML elements
  - With relevant imports on client side
- All events are callbacks to server
  - Generated JS code
  - All server responses update the resulting HTML
    - Painting new content
    - Parsing JSON in the browser

DEMO?

- Web Components are evolving fast
  - Polymer has new releases almost every month
- Last time I updated my code was in May 2016
- Since then, pre-release of Elements 2.0 is available
  - I started when 1.0.beta was a thing!
- Amazingly, this still works! ☺
  - http://github.com/vaadin-miki/vaadin-elements-demo

SUMMARY

What did we do today



LESSONS OF TODAY (HOPEFULLY)

- Web Components
  - What is the technology about?
  - What are the possibilities?
- Vaadin Elements
  - What are they?
  - How they can be used?
- Other frameworks
  - Can Web Components be connected with server-side?

COMING UP NEXT

- Quality, debugging and testing
- Progressive Web Applications

THE END

SUGGESTIONS?
QUESTIONS?

miki@vaadin.com
t: @mikiolsz

vaadin}>