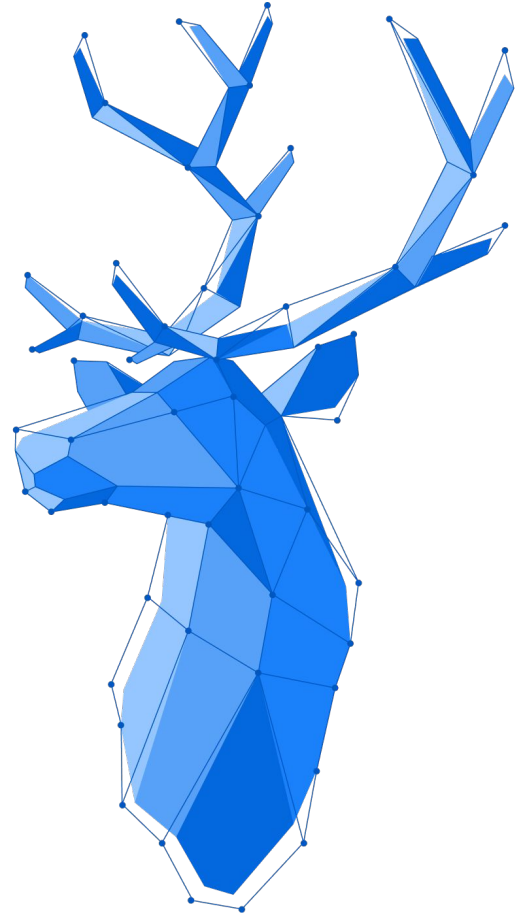




Introduction to Vaadin Flow

What is Vaadin good for?



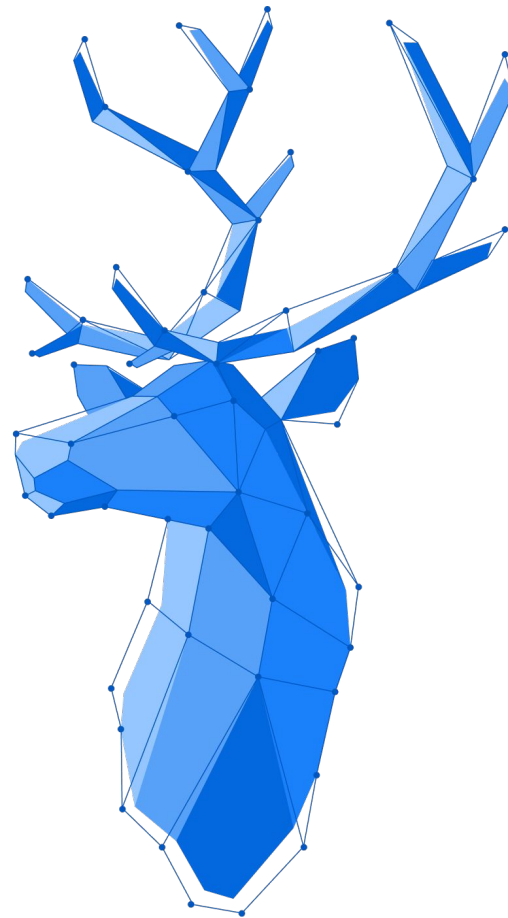
Vaadin training set

Vaadin Foundation

- **Introduction**
- Layouting
- Creating Forms
- Data Lists with Grid
- Routing and Navigation
- Theming and Styling Applications

Agenda

- What is Vaadin?
- Developing in Java
- Components
- Exercise



What is Vaadin?

Vaadin

Finnish word meaning
“female reindeer”



Vaadin

A company creating Open Source web development tools and components



What is Vaadin Flow?

Vaadin Flow is a web framework for Java. It comes with a suite of components and tools for building web applications.

What is Hilla?

Hilla is another web framework developed by Vaadin. Hilla focuses on **TypeScript** development with a **Spring Boot** backend. In this training, we'll focus on Flow.



How is Vaadin Flow different?

Flow is a framework focused on building **Progressive Web Applications** with **Java**

Typesafe and **secure** end-to-end integration gives unparalleled developer experience

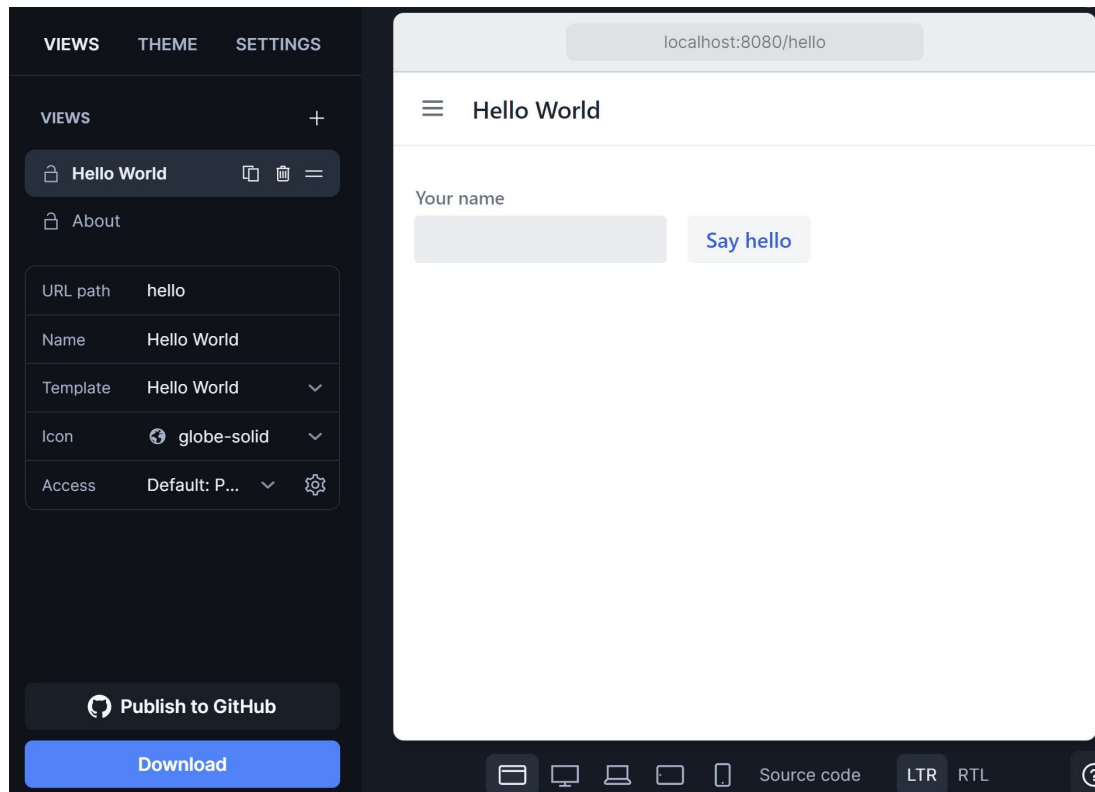
Vendor-backed open source is a **stable** foundation to build on

Best-in-class **component** set makes building highly **usable** and **accessible** applications easy

Developing in Java

<https://start.vaadin.com/>

Getting started



Project structure

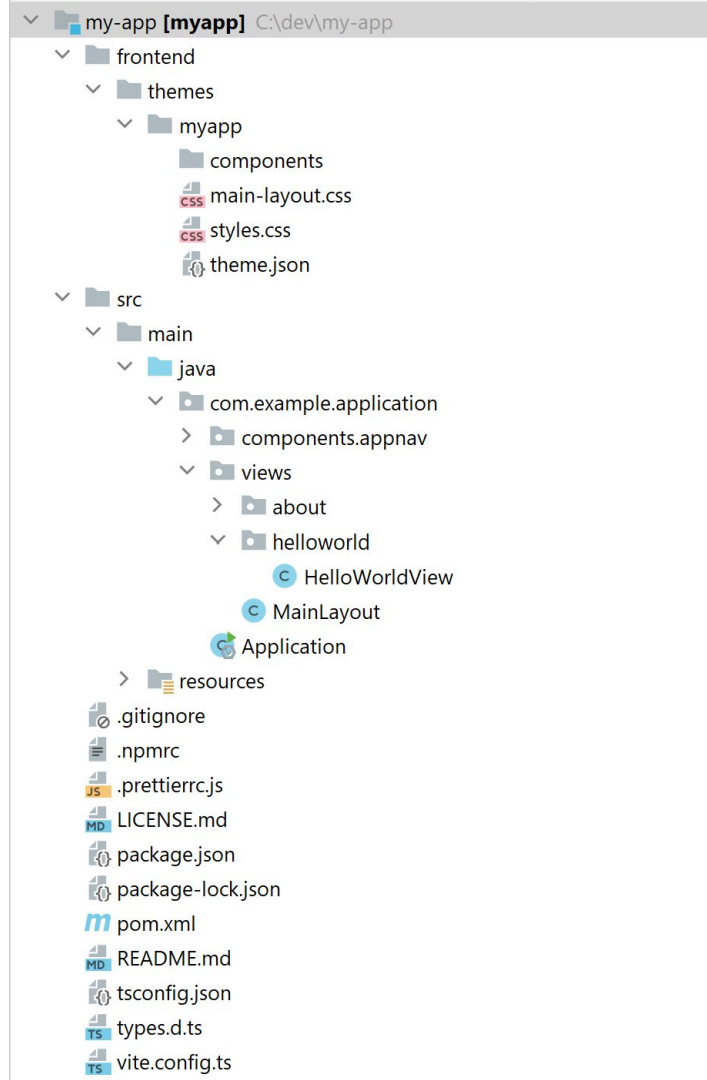
src/main/java for Java sources

pom.xml Maven project configuration

frontend for client side resources, e.g. js, HTML, CSS files

node_modules, package.json, package-lock.json for npm

vite.config.ts auto generated file for Vite, frontend build tooling



Java UI

Hello World!

```
@Route(value = "")
public class HelloWorldView extends VerticalLayout {
    public HelloWorldView() {
        Button sayHello = new Button("Say hello");
        sayHello.addClickListener(e -> {
            Notification.show("Hello world!");
        });
        add(sayHello);
    }
}
```

Java UI with a backend service

Hello World!

```
@Route(value = "")
public class HelloWorldView extends VerticalLayout {

    private MessageBean messageBean = new MessageBean();

    public HelloWorldView() {
        Button sayHello = new Button("Say hello", (e ->
            Notification.show("Hello " + messageBean.getMessage())
        ));
        add(sayHello);
    }
}
```

How to run the application?

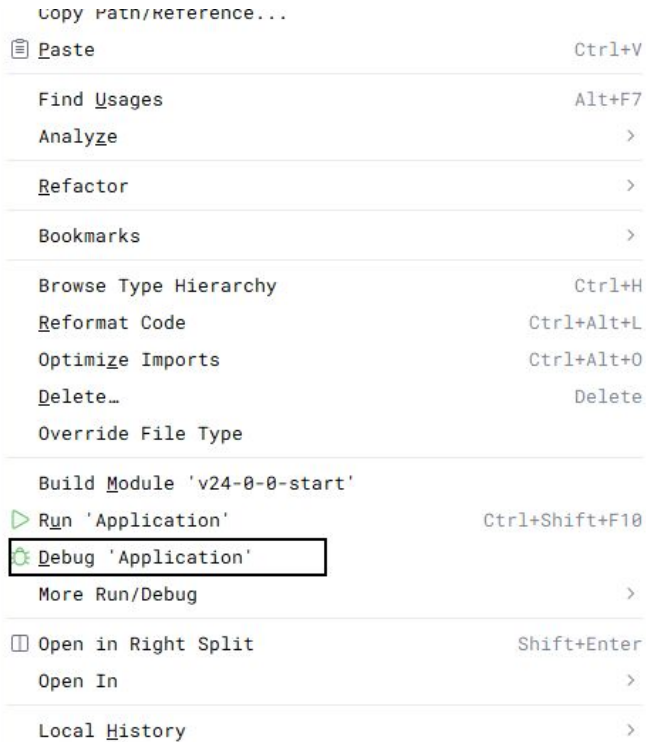
1. Run the main method of Application.java
2. Wait for the application to start
3. Open <http://localhost:8080> in a browser to view the application

Alternatively:

1. Run the `spring-boot:run` Maven goal
2. Wait for the application to start
3. Open `http://localhost:8080` in a browser to view the application

Debug (IntelliJ)

- Find Application.java
- Right-click and choose “Debug ‘Application’”

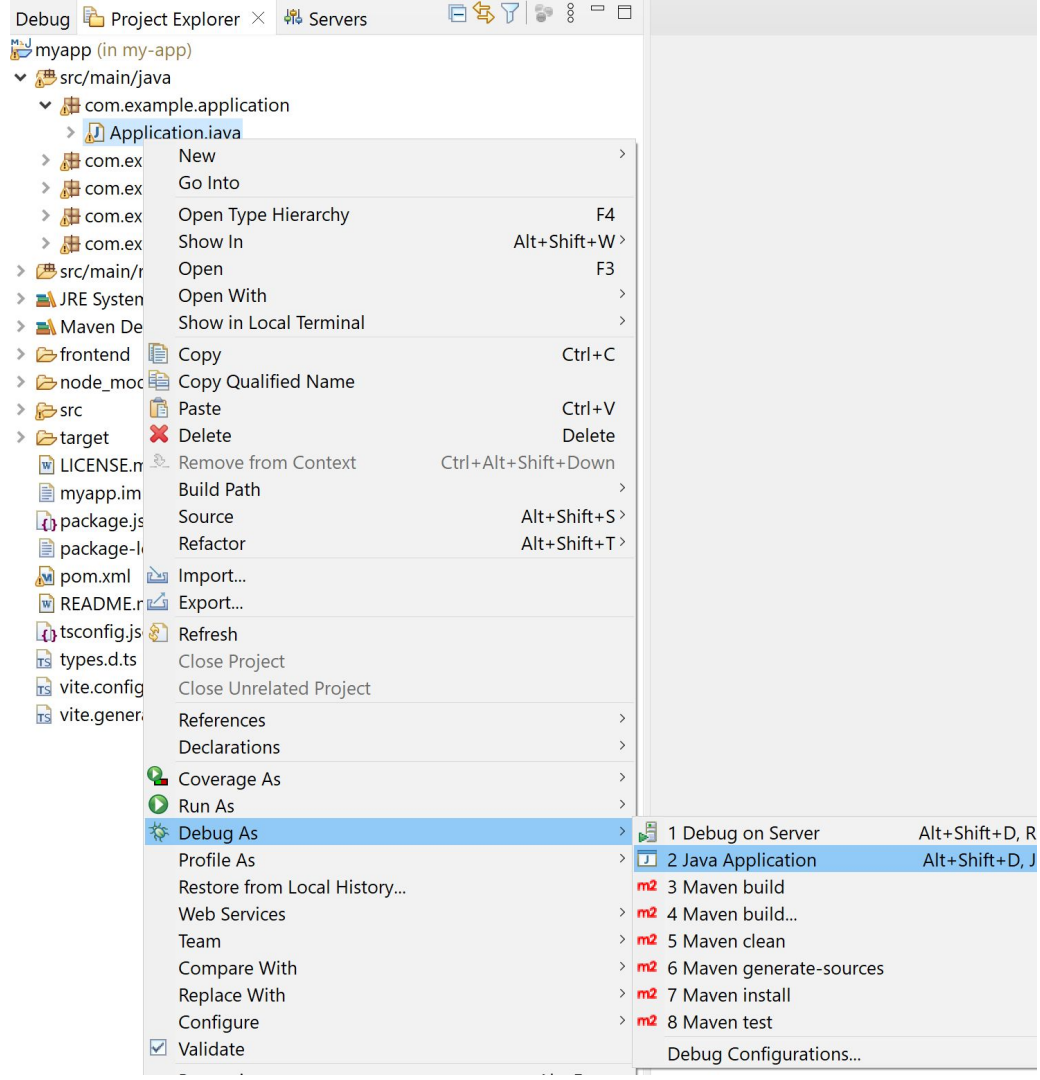


Debug (Eclipse)

- Find Application.java
- Right-click and choose “Debug As” → “Java Application”

Note: if you’re running plain Eclipse, you’ll need to continue past a `SilentExitException`.

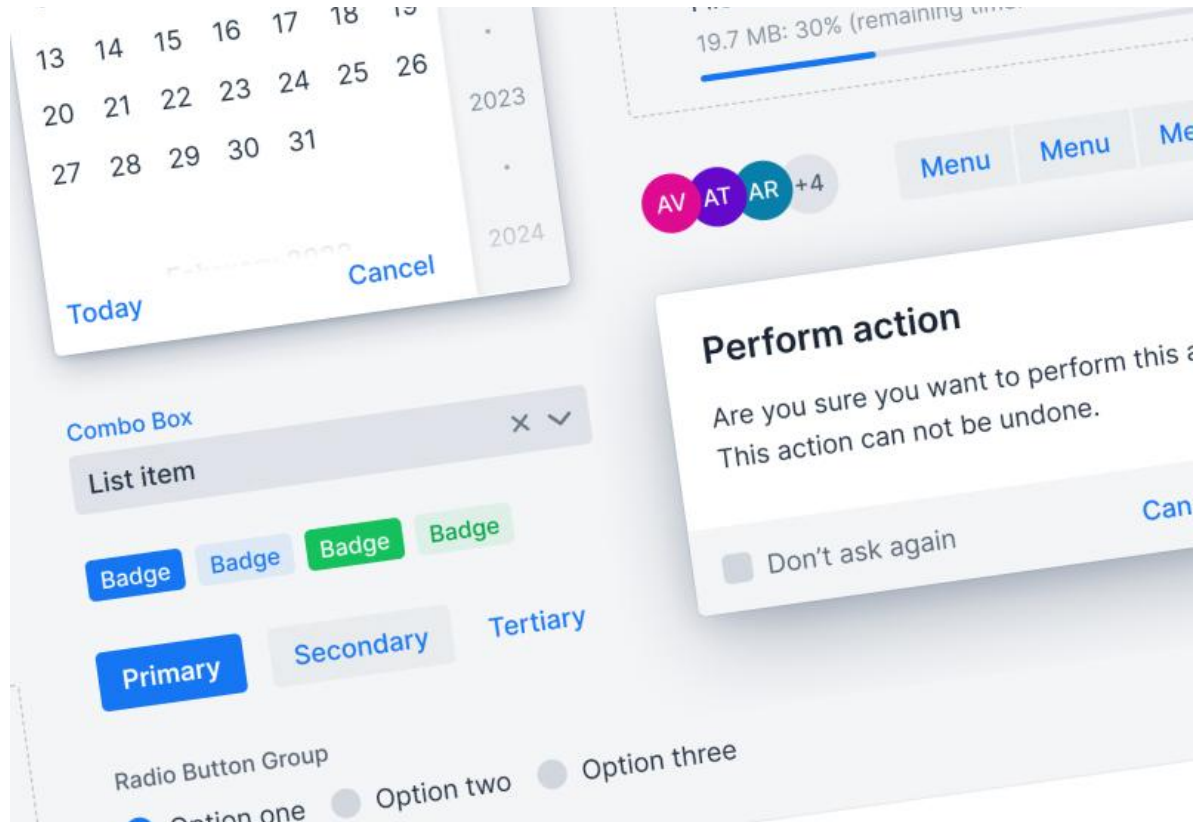
You can install the Spring Tools 4 Plugin from Eclipse Marketplace to work around this issue



Components

Components

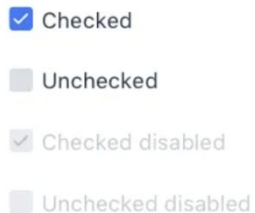
- Built-in components
- Architecture
- Web components



Built-in components

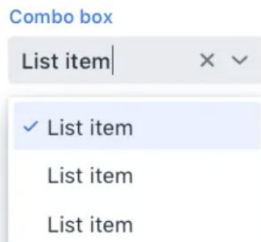
- Form inputs
- Visualization and interaction
- Layouts
- HTML components

Form inputs



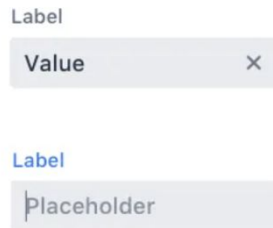
Checkbox

Checkbox is an input field representing a binary choice.



Combo Box

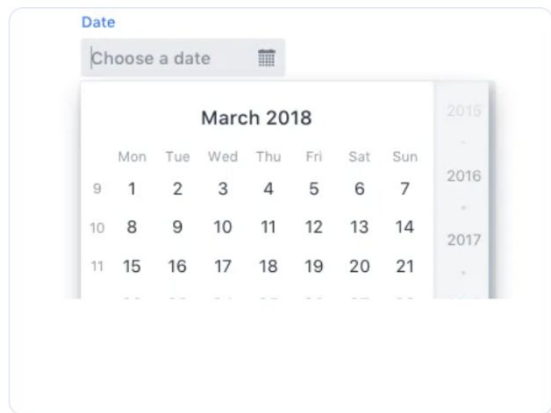
Combo Box allows the user to choose a value from a filterable list of options presented in an overlay.



Text Field

Text Field allows the user to input and edit text.

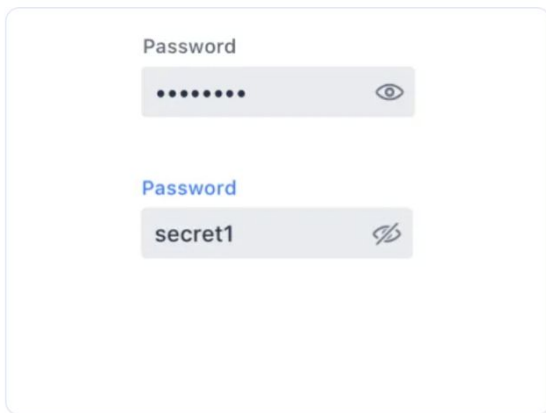
More form inputs



The Date Picker component consists of a text input field with the placeholder text "Choose a date" and a calendar icon. When the calendar icon is clicked, a calendar overlay is displayed. The calendar shows the month of March 2018, with days of the week (Mon, Tue, Wed, Thu, Fri, Sat, Sun) and dates (1-31). The year 2018 is highlighted, and the month of March is selected.

Date Picker

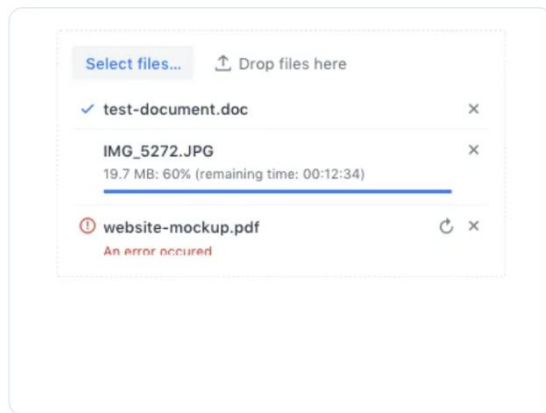
Date Picker is an input field that allows the user to enter a date by typing or by selecting from a calendar overlay.



The Password Field component consists of a text input field with the placeholder text "Password". The input field is masked with dots. To the right of the input field is an eye icon, which is used to toggle the visibility of the password. Below the input field, the word "Password" is displayed in blue text, and the password "secret1" is shown in a grey box with a lock icon.

Password Field

Password Field is an input field for entering passwords.



The Upload component consists of a text input field with the placeholder text "Select files..." and a "Drop files here" button. Below the input field, there is a list of uploaded files. Each file entry includes a checkmark, the file name, the file size, and the remaining time. The files listed are "test-document.doc", "IMG_5272.JPG", and "website-mockup.pdf". The "website-mockup.pdf" file has a red error icon and the text "An error occurred".

Upload

Upload is a component for uploading one or more files.

Even more form inputs

Price

234.95 EUR ▼

Datetime •

Jan 1st 12:34

Credit card number

Custom Field

Meeting date and time

Date Time Picker

Email

team@vaadin.com ✕

Email Field

✓ List item

List item

List item

List item

List item

List Box

Label

— 42 +

Number Field

Multi-Select Combo Box

1 Helium ✕ ▼

✓ Hydrogen

✓ Helium

Lithium

Barium

Multi-Select Combo Box

Vaadin Rich Text Editor

- Easy Java and Web Component API
- Text formatting, images and content blocks

Rich Text Editor

CLOSED STATE

Dropdown menu

List item ✕ ▼

OPENED STATE

✓ List item

List item

List item

List item

List item

Select

Description

Write here...

Text Area

Arrival hour (hh:mm)

01:00

00:00

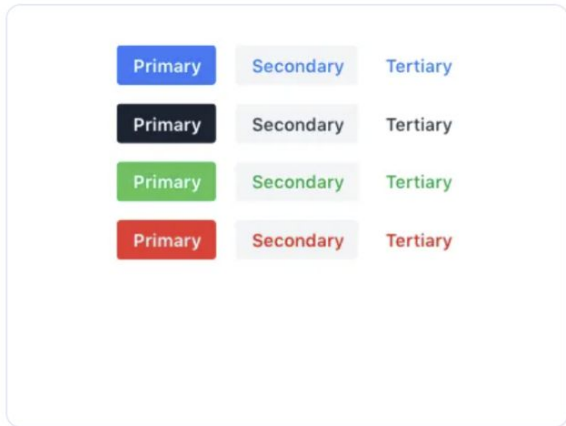
✓ 01:00

02:00

03:00

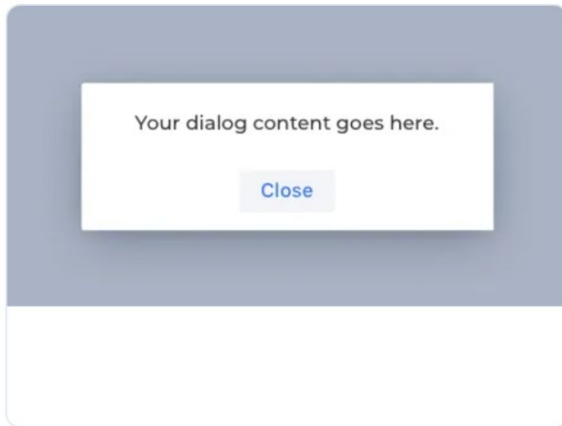
Time Picker

Visualization & interaction



Button

The Button component allows users to perform actions.



Dialog

Dialog is a small window that can be used to present information and user interface elements in an overlay.

<input type="checkbox"/>	Henry	Carter	henry.carter@example.com
<input checked="" type="checkbox"/>	Liam	Perez	liam.perez@example.com
<input type="checkbox"/>	Justin	Garcia	justin.garcia@example.com
<input type="checkbox"/>	Jordan	Howard	jordan.howard@example.com
<input type="checkbox"/>	Jacob	Riviera	jacob.riviera@example.com
<input type="checkbox"/>	Robert	Williams	robert.williams@example.com
<input type="checkbox"/>	Maya	Sullivan	maya.sullivan@example.com
<input type="checkbox"/>	Andrew	Robinson	andrew.robinson@example.com

Grid

Grid is a component for showing tabular data.

More visualization & interaction



Icons

Over 600 built-in icons for business applications.



Progress Bar

Progress Bar shows the completion status of a task or process.

Tab name Tab name Tab name

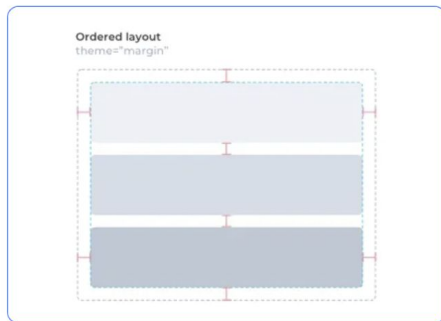
Tabs

Tabs are used to organize and group content into sections that the user can navigate between.

The image displays a collection of 14 small UI component examples arranged in a grid. Each example is labeled with its name below it. The components include:

- Accordion:** A vertical list of three sections, with the first section expanded.
- Avatar:** Three circular avatars, one of which is labeled 'AB'.
- Badge:** Four rectangular badges with labels: 'Pending', 'Confirmed', 'Denied', and 'On hold'.
- Charts:** A bar chart with multiple bars of different colors (blue, yellow, red) and a line graph overlaid.
- Confirm Dialog:** A modal dialog box titled 'Unsaved changes' asking if the user wants to save or discard changes.
- Context Menu:** A right-click context menu with three items: 'List item', 'List item', and 'List item'.
- Cookie Consent:** A dark modal dialog box with a message about cookies and a 'Get it!' button.
- CRUD:** A table with columns for 'First', 'Last', 'Phone', 'Email', 'Address', and 'Age', containing several rows of data.
- Details:** A vertical list of details, with the first item expanded to show more information.
- Grid Pro:** A grid of four items, each with a label and a status indicator.
- Map:** A world map showing continents and oceans.
- Menu Bar:** A horizontal menu bar with items like 'Project', 'Account', 'Sign Out', 'Users', 'Billing', 'Invoices', and 'Balance Events'.
- Message List:** A vertical list of messages, each with a profile picture, name, and text.
- Notification:** A notification box with a message and a 'Close' button.

Layouts



Basic Layouts

New order

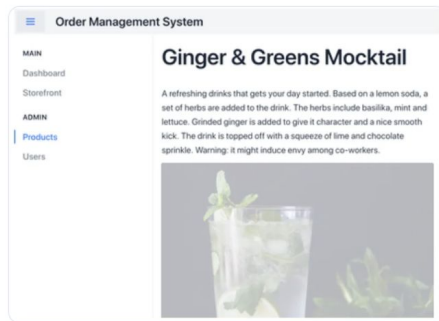
Due • Time •
Choose date Choose Time

Customer • Additional details •
Choose

Product •
Choose product

Cancel Save

Form Layout



App Layout

Log in

Username •

Password •

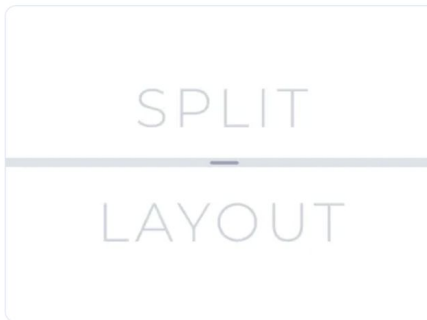
Log in

Forgot password

Login



Board



Split Layout

HTML components

Anchor	H1
Article	H2
Aside	H3
Description	H4
List	H5
Div	H6
Emphasis	Hr

Header
Footer
IFrame
Input
Label
ListItem
Main

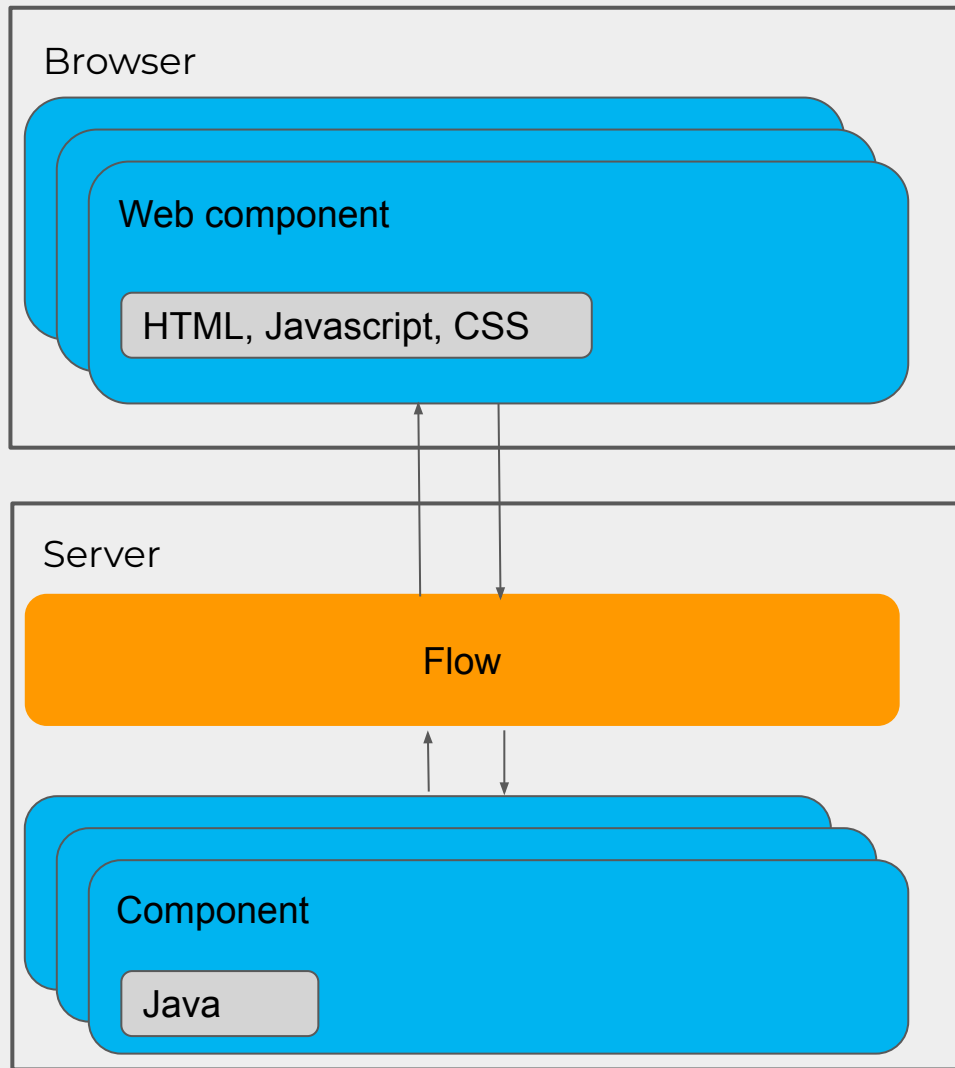
NativeButton
Nav
OrderedList
Paragraph
Section
Span
UnorderedList

Architecture

Client side: Web Components

Server side: Java

Communication: Flow



Web components?

Custom web components build on existing web standards that work across modern browsers

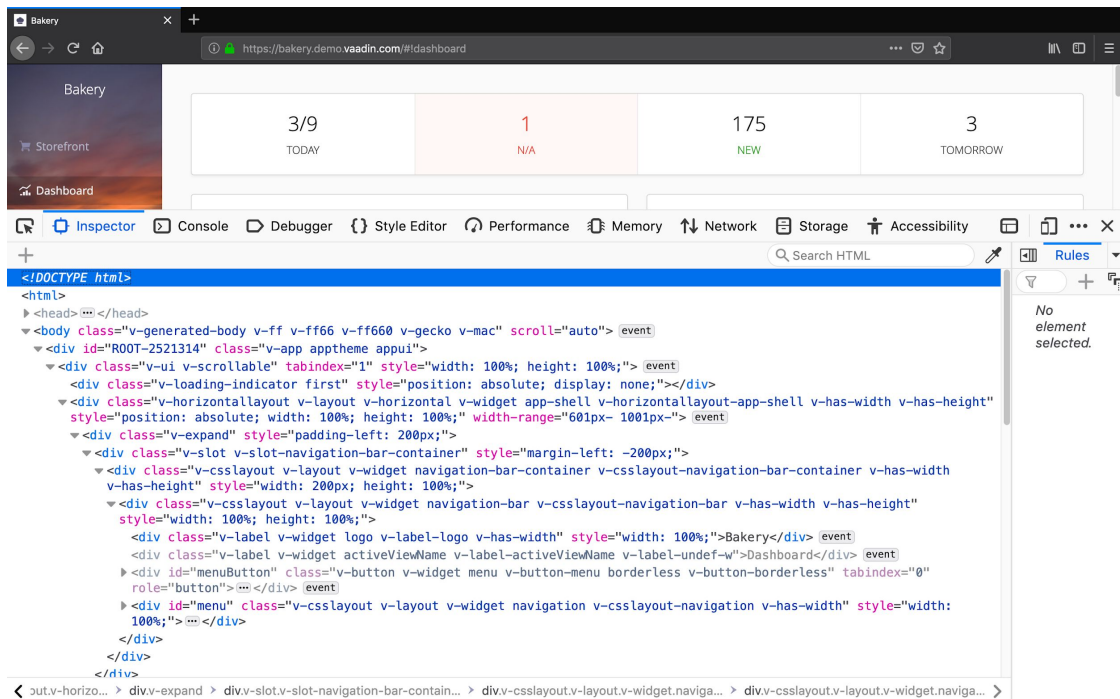
The standards allow easily extending HTML with new tags with encapsulated styling and custom behavior



Semantics

Before:

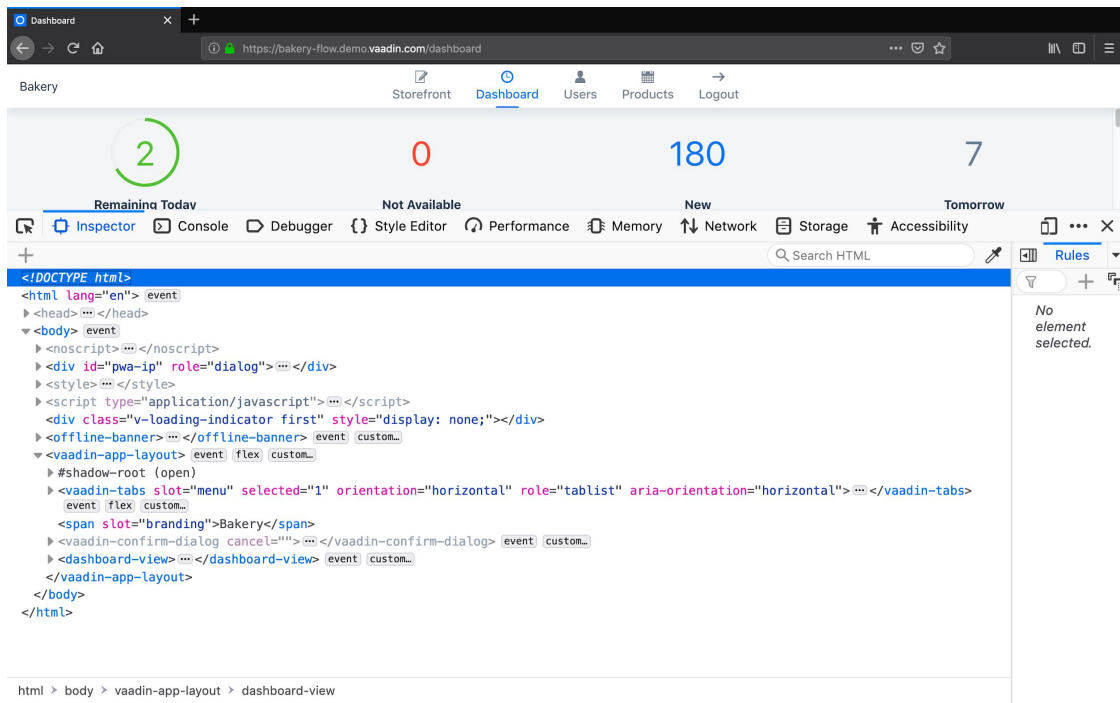
- `<div>` soup



Semantics

Now:

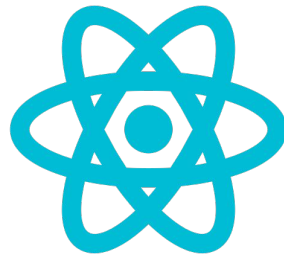
- New tags for your browser
- Client-side component model to match server-side components



Reusability

Web components

- Based on properties and DOM events
- Framework agnostic



Stability

Web components

- Based on standards
- Web standards live long



Exercise

Tools

Tools

TestBench

Designer

Multiplatform Runtime

Collaboration Kit

Design System Publisher

Observability Kit

Azure Cloud Kit

SSO Kit

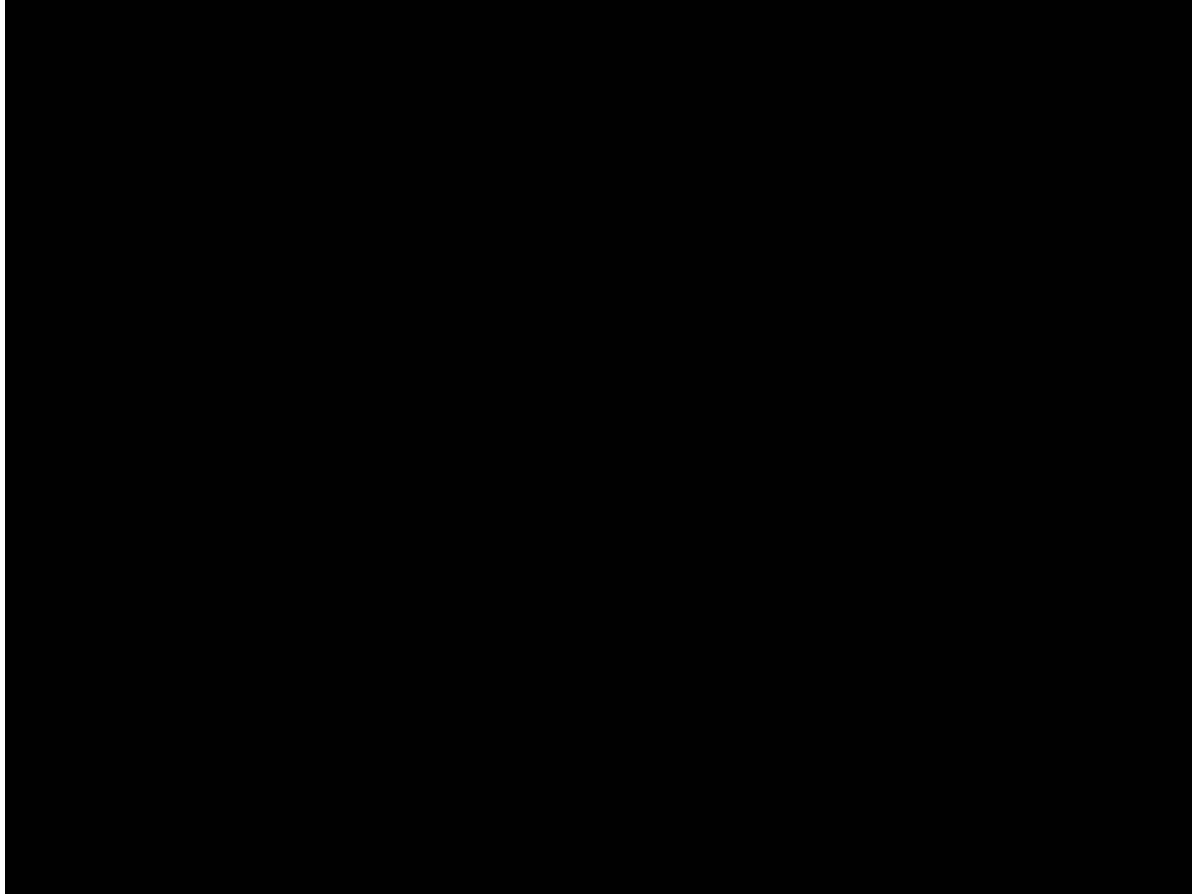
Swing Kit



TestBench

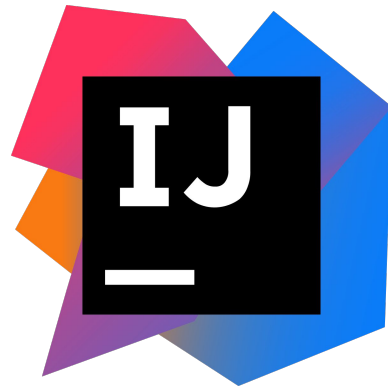
- Vaadin TestBench is a tool for creating and running browser-based integration tests for your Vaadin application
- The UI unit testing feature also allows browser-less and container-less testing directly in the JVM

TestBench in action



Vaadin Designer

IDE plugin for Eclipse and IntelliJ Idea for building Vaadin applications with Drag&Drop



Drag and drop to canvas

Drop elements here to start

Form layout with vaadin ele...
Signup Form

Components

VAADIN TEXT FIELD

- Icon Text Field
- Prefixed Text Field
- Required Text Field
- RTL Text Field
- Suffix TextField
- Vaadin Text Area
- Vaadin Text Field

Parts

WEB COMPONENTS

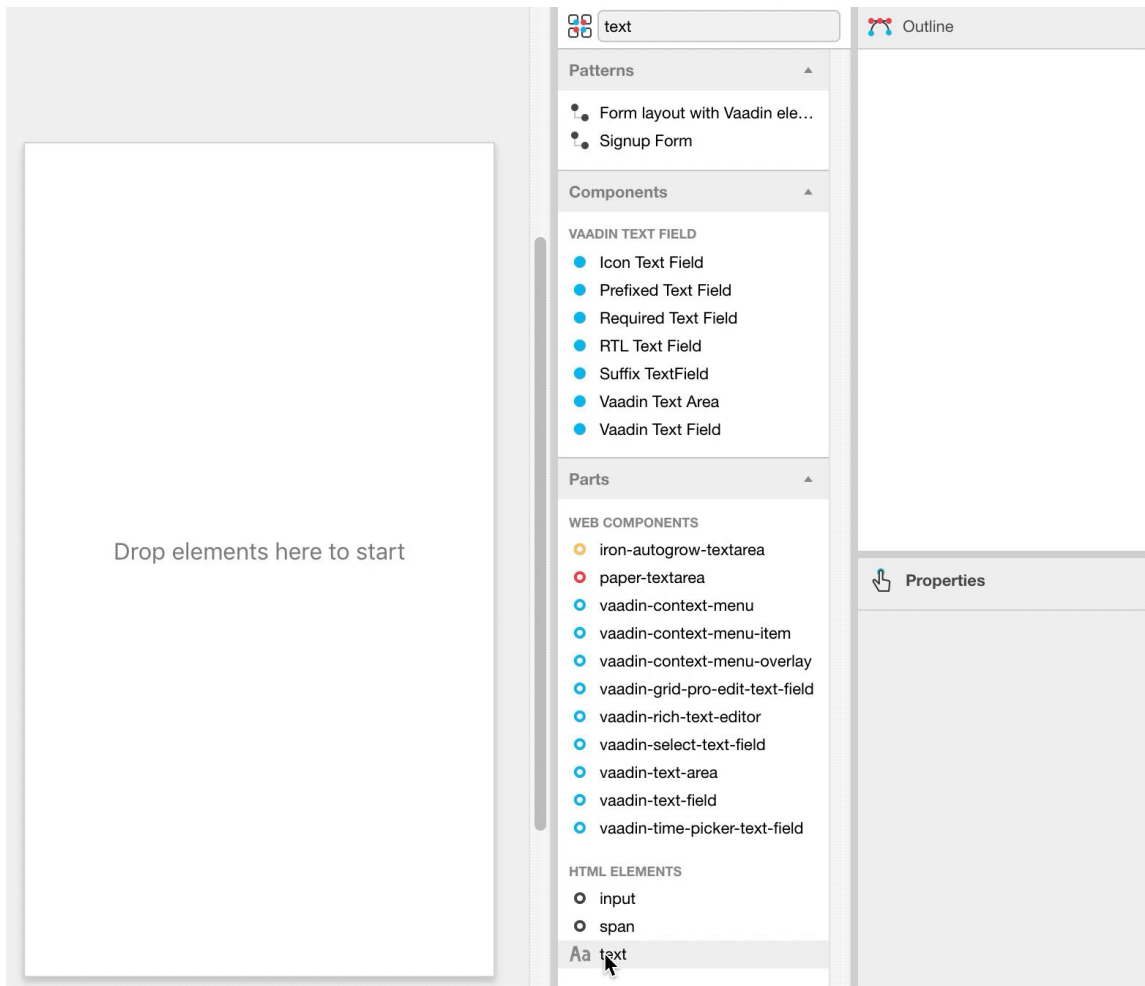
- iron-autogrow-textarea
- paper-textarea
- vaadin-context-menu
- vaadin-context-menu-item
- vaadin-context-menu-overlay
- vaadin-grid-pro-edit-text-field
- vaadin-rich-text-editor
- vaadin-select-text-field
- vaadin-text-area
- vaadin-text-field
- vaadin-time-picker-text-field

HTML ELEMENTS

- input
- span

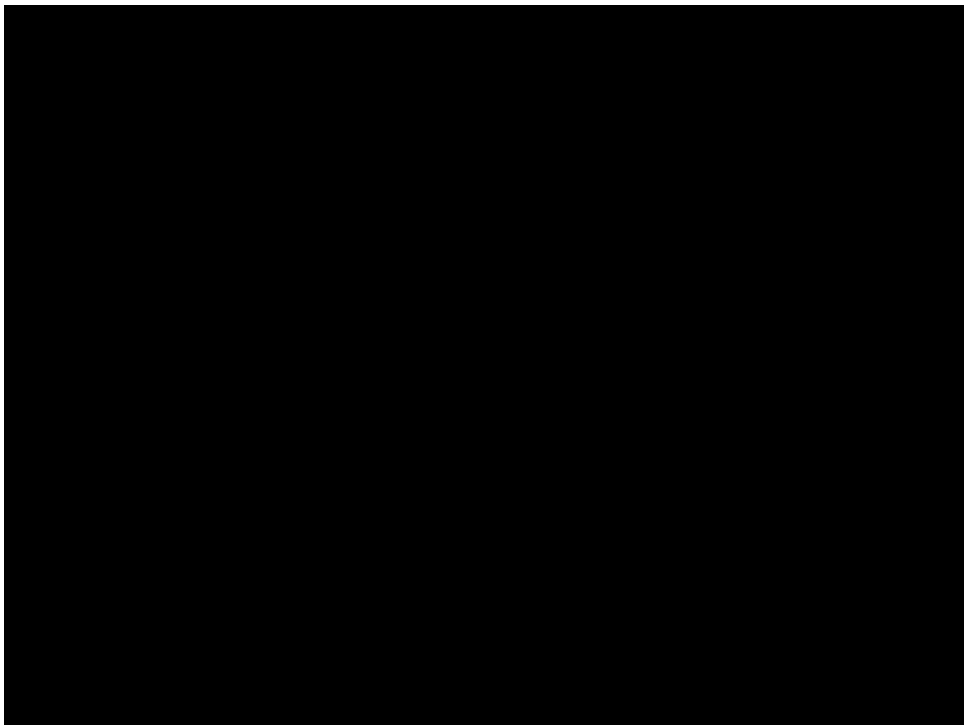
Aa text

Drag and drop to outline



Progressive Web Apps

Web apps with native-like experiences



PWA How

- Web App Manifest
- Service Worker
- Icons
- Offline Support
- Header information
- Installation prompt

```
...return pC...  
...height: o...  
...width: o...  
...margin: m...  
...offsetLeft...  
...offsetTop...  
...function...  
...if (c.m...  
...d=n(e)...  
...a=t(o)...  
...f+=a.b...  
...borderTopWidth...  
...split...  
...var u=...  
...return 'BODY'===i||...  
...arguments[5]:0;if(-1===e.indexOf('auto'),left:{width:t.left...  
...height:p.bottom-t.bottom},a=d.filter(function(e){va...  
...return 1+(f?'-'+f:''))function x(e,t,o){var i=d(t...  
...i=parseFloat(t.marginLeft)+parseFloat(t.margin...  
...om:'top',top:'bottom'};return e.replace(/left|rig...  
...L(s)],n}function T(e,t){return Array.prototype...  
...sole.warn('`modifier.function` is deprecated, use...  
...sets.reference,o=i(o,t)}},o}function k...  
...ndariesElement,this.state,this.popper,this.r...  
...sition='absolute',e=N(this...  
...ction(e){var...  
...i-t=...
```

Create PWA with Vaadin

Just by adding @PWA, a Vaadin application becomes a PWA

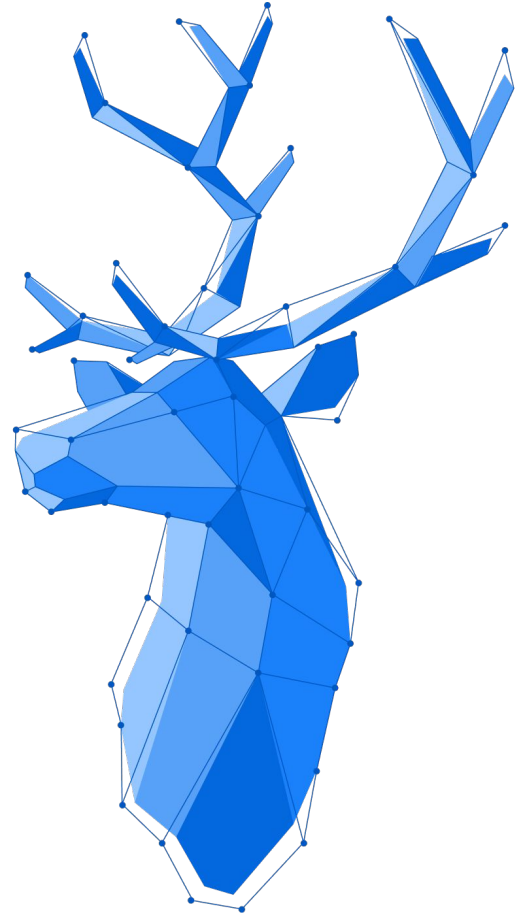
@Route

@PWA(name = "My Progressive Web Application", shortName = "MyPWA")

```
public class MainView extends VerticalLayout {  
    public MainView() {  
        Button button = new Button("Click me",  
            e -> Notification.show("Hello Worlld!"));  
        add(button);  
    }  
}
```

Summary

- What is Vaadin
- Java
- Components
- Tools
- Progressive Web Application



Thank you!

