

Vaadin Workshop

JavaLand 2025
Simon Martinelli



About Me

- 30 years of Software Engineering
- Java for 25 years
- Self-employed since 2009
- University teacher for 18 years
- JUG Switzerland, Location Bern



Java™
Champions



vaadin}>
Champion



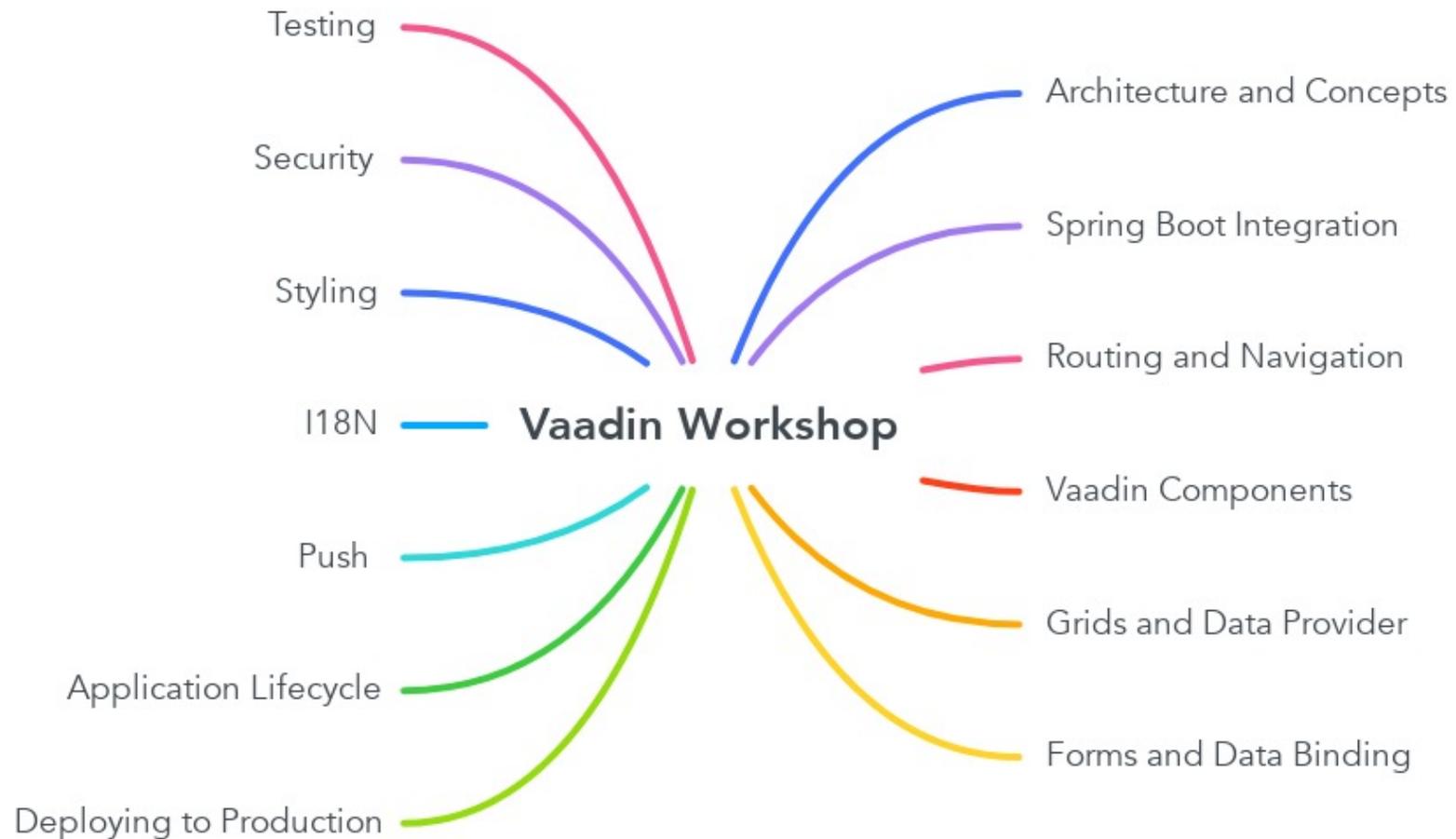
Oracle ACE
Pro

About You



- Are you a front-end, back-end, or full-stack developer?
- Did you ever use Vaadin?
- What are your expectations?

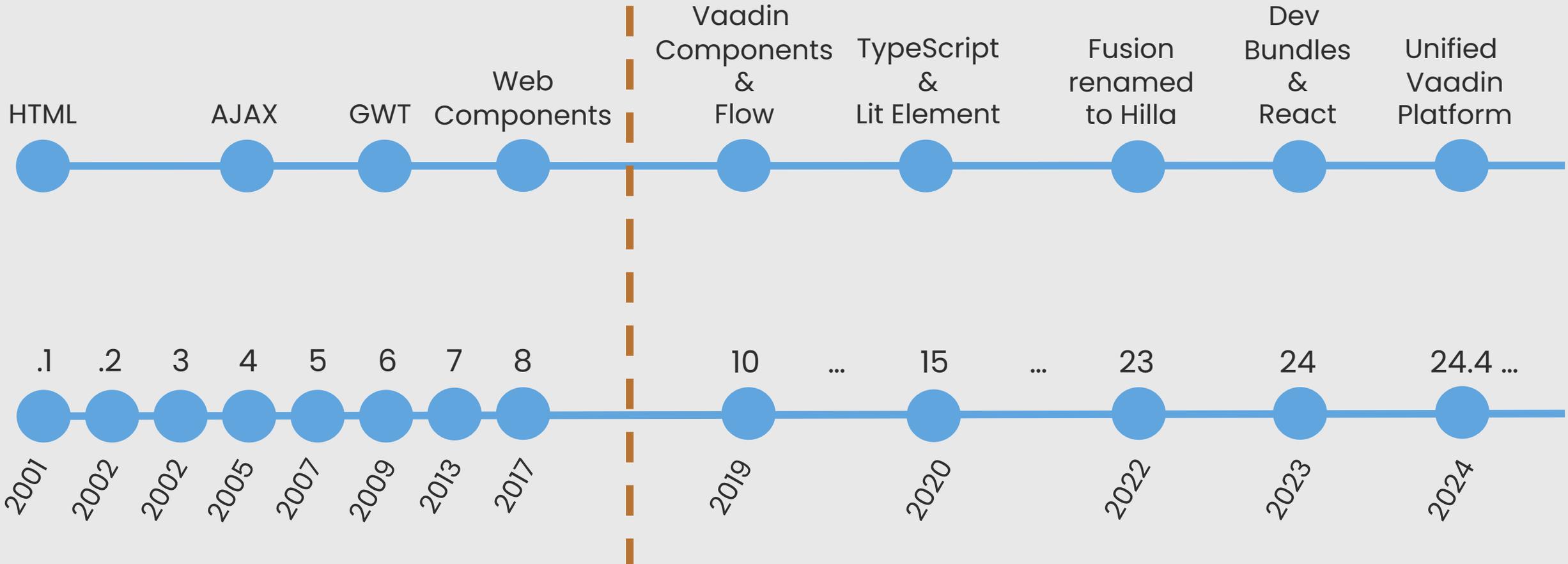
Workshop Topics



Helpful Resources

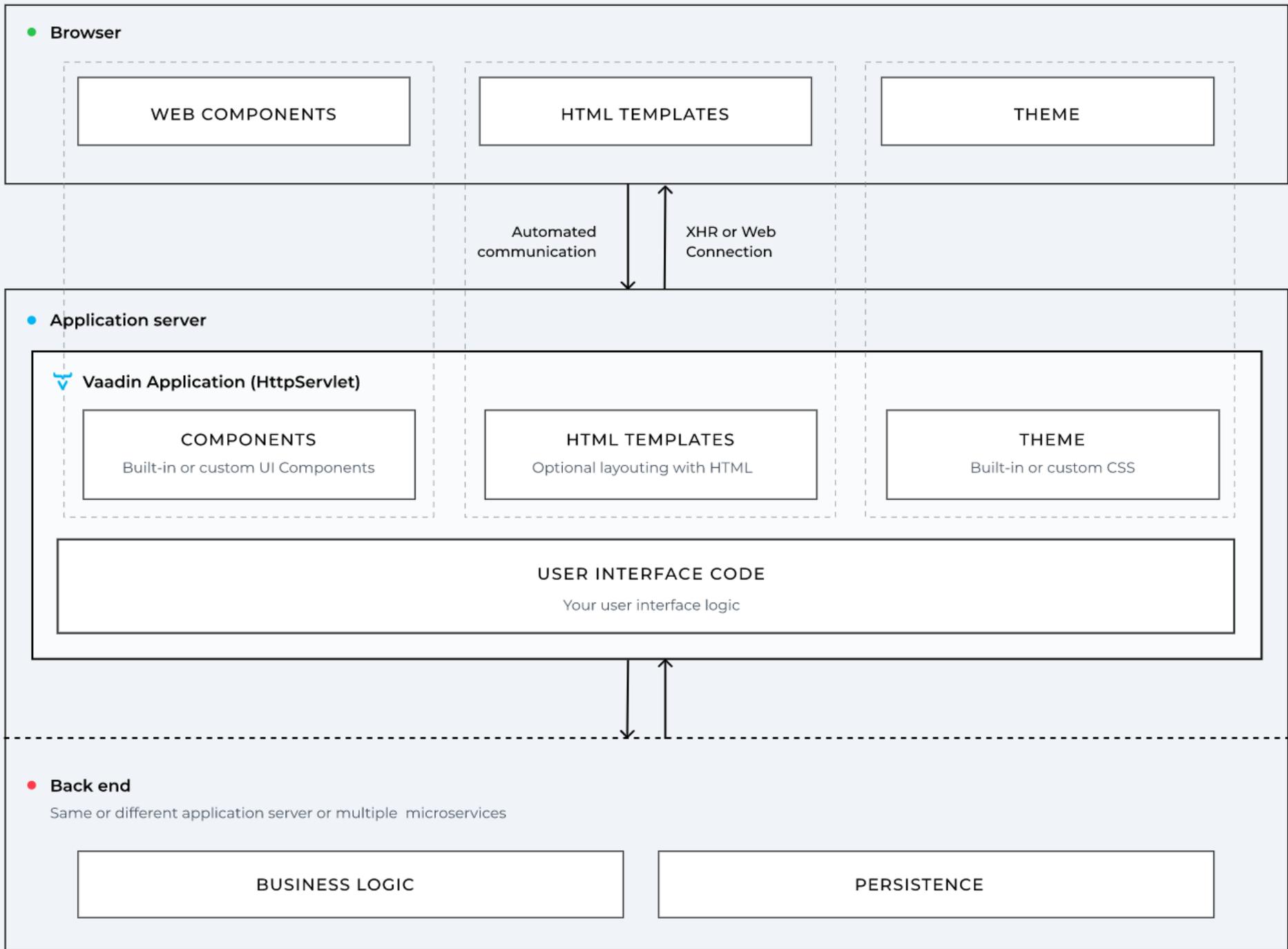
1. <https://vaadin.com/>
2. <https://vaadin.com/forum>
3. <https://stackoverflow.com/>
4. Ask AI 😊

History



Architecture and Concepts





Getting Started



Build



- Maven
 - Default
- Gradle
 - <https://vaadin.com/docs/latest/guide/start/gradle>

Integrations



- Spring/Spring Boot
- Quarkus
- CDI (Jakarta EE)
- OSGi
- Portlet (commercial)

Spring Integration

- Scopes
 - <https://vaadin.com/docs/latest/integrations/spring/scopes>
- Routing and Dependency Injection
 - <https://vaadin.com/docs/latest/integrations/spring/routing>
- Configuration
 - <https://vaadin.com/docs/latest/integrations/spring/configuration>

How to Start?



- <https://start.vaadin.com>
- <https://start.spring.io>



Exercise: Getting Started

1. Optional: Register for a Vaadin account
2. Go to <https://start.vaadin.com>
3. Add a Flow Hello World View
4. Download the application
5. Unzip and import the project into your IDE
6. Install the IntelliJ Vaadin Plugin
7. Run the app
 - Either with the IDE or
`./mvnw spring-boot:run`

Export "My App" ×

Artifact ID ?

Group ID ?

Platform Version

Java Version

Main Layout

Frontend Build Tool

Database

Additional Options

- Git Repository
- Docker Config
- Kubernetes Config
- Control Center
- Launch on random port

Project



<https://github.com/martinellich/vaadin-workshop>

Workshop Manager

MENU SUCHE KONTAKT

CH Open
Source | Business | Community

Dienstag, 06. September 2022 (9:00 – 17:00 Uhr)

Titel	Thema	Referenten	Status
ATDD mit Spring Boot & Karate	Softwareentwicklung mit Open Source	Thorben Stangenberg	
IoT Embedded Programmierung mit Zephyr OS	Mobile und IoT	Thomas Amberg	CANCELLED
Securing your Microservices with Spring Security, OAuth 2 and OpenID Connect (OIDC)	Softwareentwicklung mit Open Source	Patrick Baumgartner	
Java Full-Stack Entwicklung mit Vaadin	Softwareentwicklung mit Open Source	Simon Martinelli	
Ansible Basics	Open Source Systeme und Applikationen	Jérôme Witt	
Mob Programming: Erlebe Kollaborations- und Kreativitätstechniken hautnah	Methodik & Soft Skills	Danilo Biella Barbara Dravec	
Functional Programming Idioms and Practices	Softwareentwicklung mit Open Source	Venkat Subramaniam	AUSGEBUCHT!



Requirements



- Create an application to manage workshops and participants
- A workshop has many participants, and a participant can attend one workshop
- The list of workshops is public
- To manage workshops and participants, the user must log in

Routing and Navigation

<https://vaadin.com/docs/latest/routing>

Route



```
@Route("")
public class HelloWorldView extends Div {

    public HelloWorldView() {
        setText("Hello world");
    }
}
```

Navigation

- Programmatically

```
UI.getCurrent().navigate>HelloWorldView.class);
```

- RouterLink

```
new RouterLink("Home", HomeView.class);
```

Exercise: Routing and Navigation



1. Create views according to the requirements
2. Programmatically navigate from one view to another view
3. Implement `BeforeEnterObserver` and display the current timestamp
4. Bonus: Try out Route Templates

Vaadin Components



<https://vaadin.com/docs/latest/components>



Exercise: Components

1. Get familiar with the Vaadin Components
2. Add one of the basic layouts (Horizontal or Vertical)
3. Try out
 1. Alignment
 2. Spacing
 3. Padding
 4. Expanding
4. Bonus: Checkout the 3rd party components

Grids and Data Providers



<https://vaadin.com/docs/latest/binding-data/data-provider>

Combo box

List item x v

- ✓ List item
- List item
- List item
- List item

Combo Box
Latest v6.0.1

✓ List item

List item

List item

List item

List item

List Box
Latest v2.0.0

CLOSED STATE

Dropdown menu

List item x v

OPENED STATE

- ✓ List item
- List item
- List item
- List item
- List item

Select
Latest v3.0.0

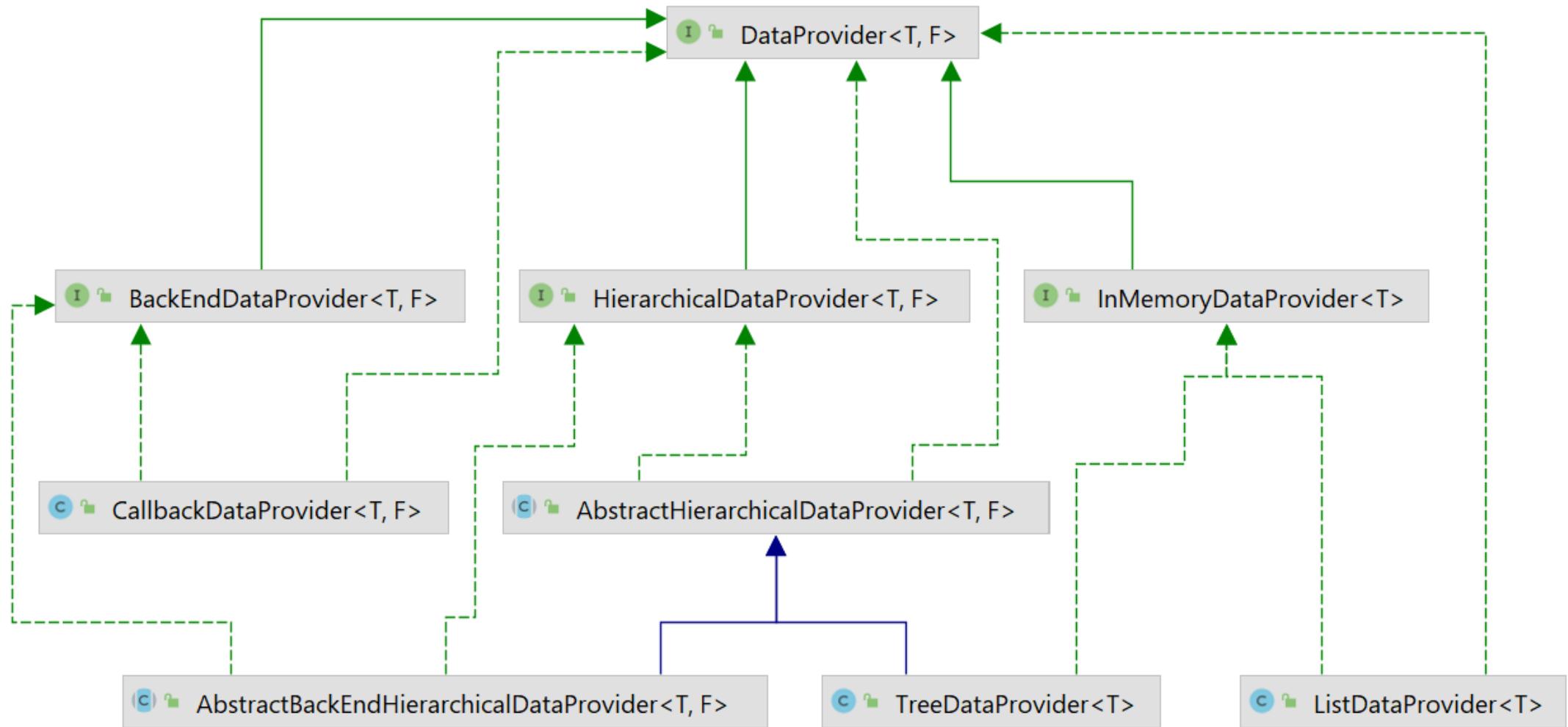
First Name	Last Name	Email
Henry	Carter	henry.carter@example.com
✓ Liam	Perez	liam.perez@example.com
Justin	Garcia	justin.garcia@example.com
Jordan	Howard	jordan.howard@example.com
Jacob	Riviera	jacob.riviera@example.com
Robert	Williams	robert.williams@example.com
Maya	Sullivan	maya.sullivan@example.com
Andrew	Robinson	andrew.robinson@example.com
Samantha	Collins	samantha.collins@example.com
Asad	Park	asad.park@example.com

Grid
Latest v6.0.2

Expense category	Code
> Insurance	e7c4
> Job expenses	e7cb
✓ Leisure	e7cf
Books	e7d0
Magazines	e7d1
Movie theater	e7d2
Video rental / Pay per view	e7d3
Sporting events	e7d4

TreeGrid
Latest v6.0.2





DataProvider Variations



- <https://github.com/72services/vaadin-database-performance>

Exercise: Grids and Data Providers



1. Add grids on the two views to display Workshops and Participants
 2. The grids must be sortable
Hint: Checkout VaadinSpringDataHelpers
-
1. Bonus: Make the grids filterable
 2. Bonus: Save the sort order of the columns

Forms and Data Binding



<https://vaadin.com/docs/latest/binding-data/components-binder>

Binder



- The Binder class allows you to define **how the values** in a business object **are bound to fields** in the UI
- Binder **reads** the values in the business object and **converts** them from the format expected by the business object to the format expected by the field.
- It **also handles the reverse process**, converting values from UI fields to the format expected by the business object
- Binder can only bind components that implement the **HasValue** interface, for example, TextField and ComboBox.
- It is also possible to **validate** user input and present the validation status to the user in different ways.

Binder Types



- Binder
- **BeanValidationBinder**
 - Must use property name!

```
.bind("name");
```

Loading From and Saving to Business Objects

- Reading and Writing **Automatically**
 - setBean
- Reading and Writing **Manually**
 - readBean
 - writeBean
 - writeBeanIfValid



Exercise: Forms and DataBinding

1. Add Bean Validation constraints to Workshop and Participant
2. Add a FormLayout to the workshop and participants view
3. Add input fields and a save button
4. Workshop status and topic must be Select fields
5. Participant workshop must be a ComboBox
6. Use the BeanValidationBinder
7. Populate the form when the users selects an item in the Grid

Testing



Karibu Testing



- Testing without browser (Browserless)
- Runs Vaadin in a mock environment
- <https://github.com/mvysny/karibu-testing>

Testbench



- E2E
 - End-to-end testing with browser
 - Based on Selenium
- Browserless
 - Inspired by Karibu Testing
- <https://vaadin.com/docs/latest/testing>

E2E with Playwright

- <https://playwright.dev/>
- Why Playwright over Selenium?
<https://vaadin.com/blog/testing-vaadin-applications-and-add-ons-using-playwright>
- Mopo - a helper library for testing Vaadin apps with Playwright
<https://github.com/viritin/mopo>



Exercise: Testing

1. Add at least one Karibu test for a View
2. Add at least one TestBench test for a View

Security



<https://vaadin.com/docs/latest/flow/security>

Spring Security Integration

- Extend from `VaadinWebSecurity`
- Enables annotation-based security on views



Exercise: Security

1. Add a dependency
`org.springframework.boot:spring-boot-starter-security`
2. Extend `VaadinWebSecurity`
3. Add a `LoginView`
4. The public workshop view should be anonymous allowed
5. Workshop and participant view are protected (Role USER)

Hint: The default username is "user" and the password will be logged to the console

Styling



<https://vaadin.com/docs/latest/styling>

Theming

- Base on default Lumo theme

```
@Theme("my-theme")
```

- Folder structure
 - frontend
 - themes
 - my-theme
 - components
 - styles.css



Exercise: Theming

1. Change the primary color and the default font
2. Add a light-yellow background to all TextFields

Localization



<https://vaadin.com/docs/latest/advanced/i18n-localization>

I18N



- Implement `I18NProvider`
- Usage:
`Component.getTranslation()` or
`I18NProvider.translate()`
- `BeanValidationBinder`
 - You must use `ValidationMessages.properties`
 - or <https://martinelli.ch/vaadin-beanvalidationbinder-with-custom-resource-bundle/>



Exercise: I18N

1. Implement I18NProvider
2. Add a resource bundle for German and English
3. Use `getTranslation()` in the views

Push



<https://vaadin.com/docs/latest/advanced/server-push>

Use Cases



- PDF generation takes long
 - Display a progress indicator
 - Display a notification with a download link when finished
- Notify other users when the data has been changed

Push



- Activate with @Push
- Uses Atmosphere
- Asynchronous UI update

```
ui.access(() -> label.setText(text));
```



Exercise: Push

1. Notify the users that are on the public workshop view when a new workshop has been added
- Example
 - <https://github.com/simasch/vaadin-spring-events>

Component Events



<https://vaadin.com/docs/latest/flow/create-ui/creating-components/events>

<https://cookbook.vaadin.com/ui-eventbus>

Application Lifecycle



<https://vaadin.com/docs/latest/advanced/application-lifecycle>

UI



- When a browser first accesses a URL mapped to the servlet of a particular UI class, the Vaadin servlet generates a loader page. The page loads the client-side engine, which in turn loads the UI in a separate request to the Vaadin servlet
- A UI instance is created when the client-side engine makes its first request
- UI instances are cleaned up if no communication is received from them after a certain time

Deploying to Production

<https://vaadin.com/docs/latest/flow/production>

Production Build



```
mvn package -Pproduction
```

- Builds a JAR or WAR file with all the dependencies and transpiled front-end resources, ready to be deployed.

Exercise: Deploying to Production



1. Create a production build
2. Run the executable JAR

Thank you!

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