Single Page Applications without REST API

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About me

1972

1995 — COBOL — SBB CFF FFS

2000 — Java

2007 — Bern University of Applied Sciences

2009 — 72

2011 — JSR-352 Java Batch

2012 — JAVA USER GROUP CH

2013 — JSR-354 Money/Currency


vaadin

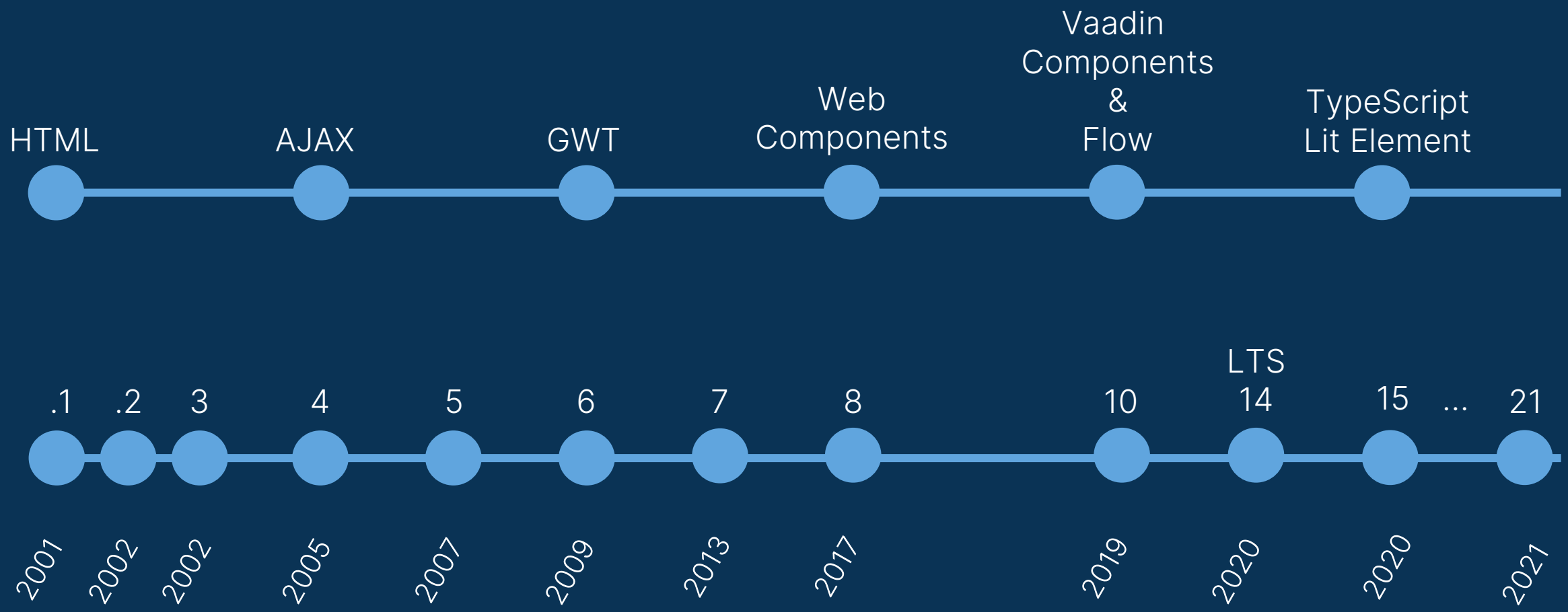
Why Vaadin?

- **A great fit for data-centric business applications**
- Has a **rich component model**
- Brings everything you need for this type of application
  - **Grids with paging, sorting and filtering**
  - **Forms with validation and conversion**

Vaadin as we know it

```
@Route
public class HelloView extends VerticalLayout {

    public HelloView() {
        TextField textField = new TextField("Your Name");
        Label label = new Label();

        Button button = new Button("Greet",
                        e -> label.setText("Hello, " + textField.getValue()));

        add(textField, label, button);
    }

}
```

History


HTML
AJAX
GWT
Web Components
Vaadin Components & Flow
TypeScript Lit Element
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LTS 14
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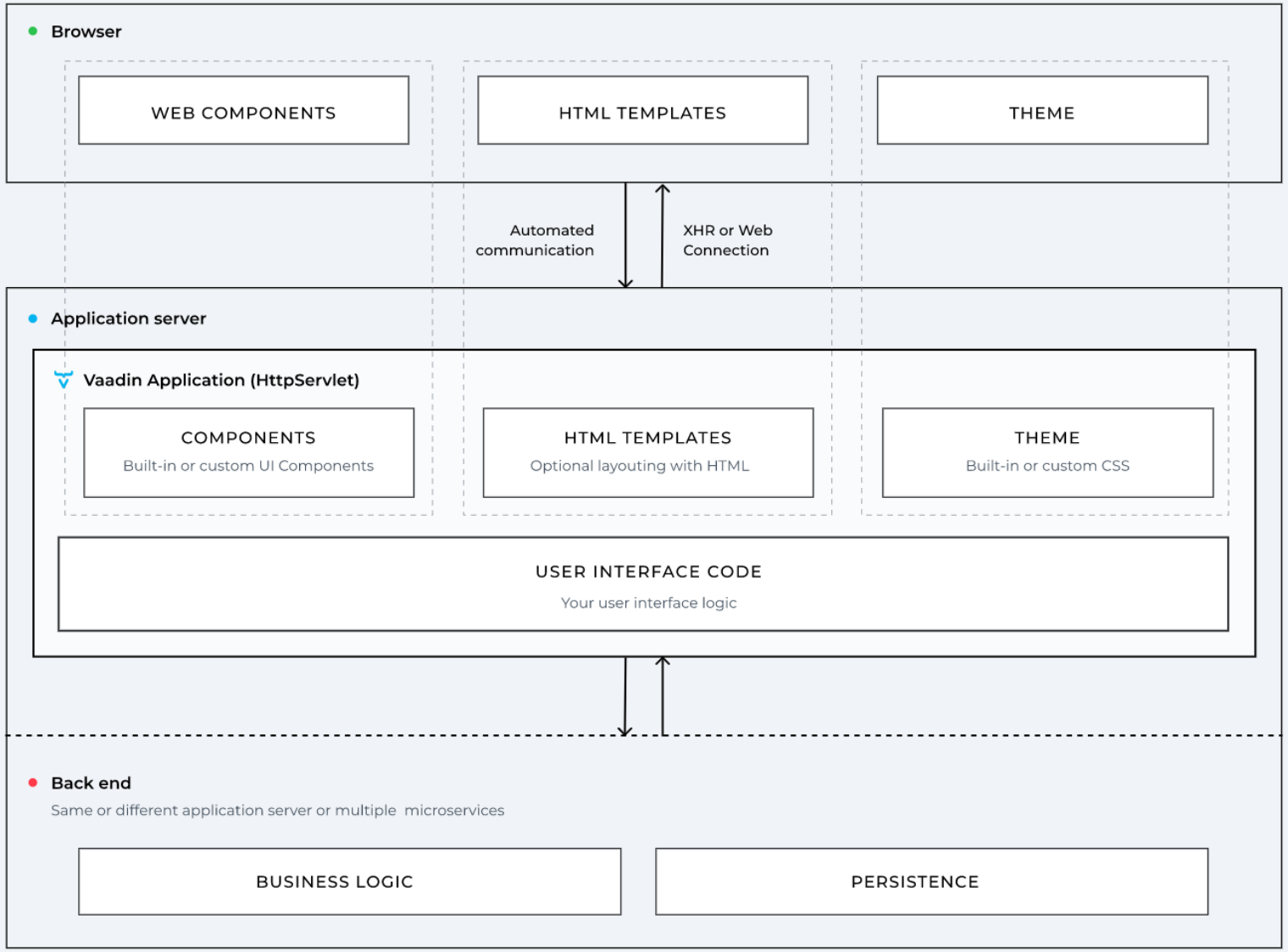
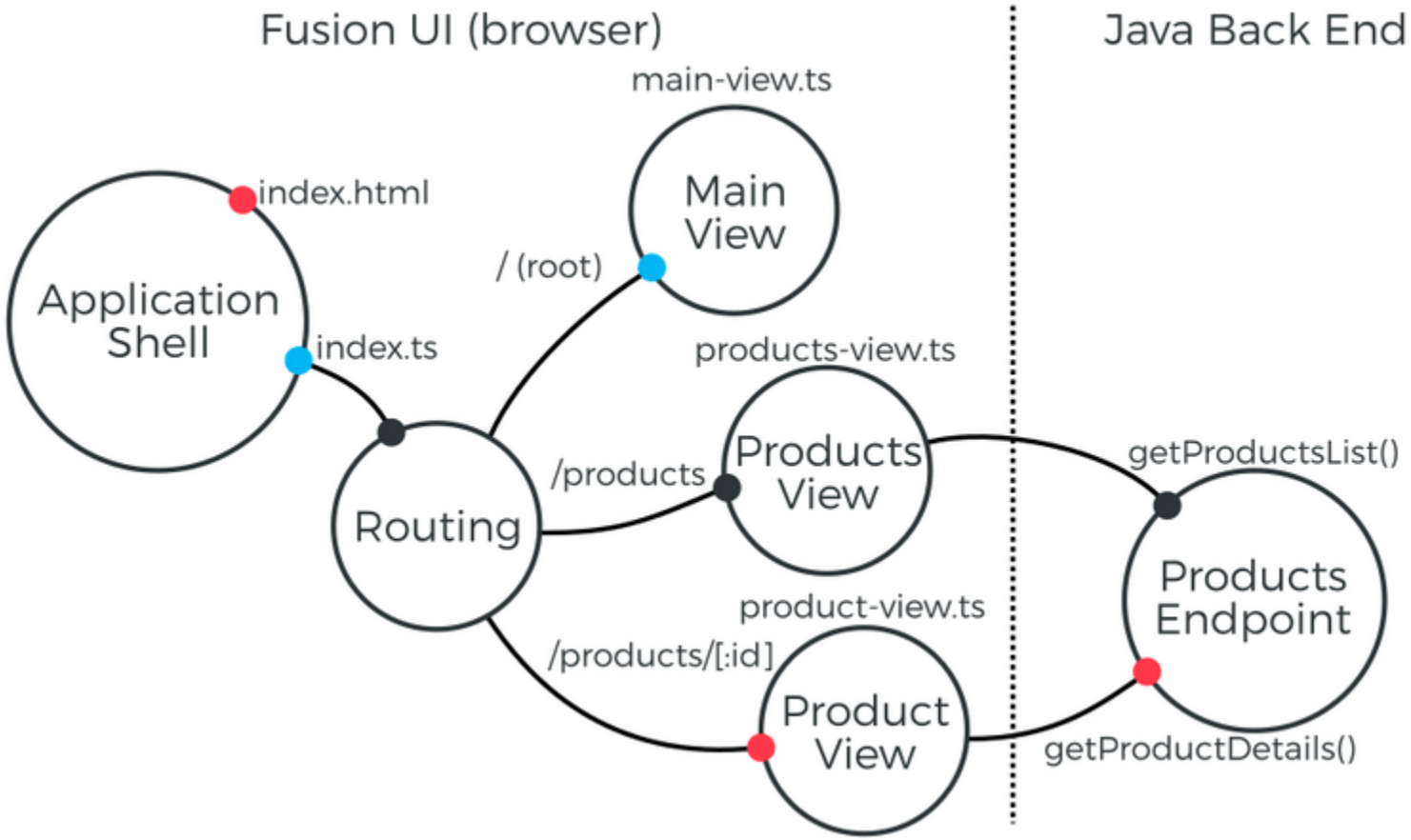
Vaadin FLOW Architecture



Vaadin FLOW

- Type-safe **Java-UI-Component-API** on the server side
- Uses **Web Components**
- **No REST API necessary**
  - Direct acces from UI code to services and repositories
- **Bi-directional Data Binding**
  - If the user interface changes on the client or the server, the changes are automatically applied to the other side

Vaadin FUSION Architecture



Vaadin FUSION

- **Integrates** a Spring Boot **Java backend** with a reactive **TypeScript frontend**
  - Build UIs from web components
  - Use a reactive programming model for updating the UI
  - Use routing to display views and resources
- **No REST-API necessary**
  - REST API and client code are generated
  - Manage security on the server-side
- **Fully stateless**
  - TypeScript views can be loaded without creating a server session

What is Lit?

- Lit is a **simple library for building fast, lightweight web components**
- At Lit's core is a boilerplate-killing component base class that provides **reactive** state, scoped styles, and a **declarative template system** that's tiny, fast and expressive

- https://lit.dev/

Frontend Example

```
@customElement('hello-world-view')
export class HelloWorldView extends View {
  name = '';

  render() {
    return html`
      <vaadin-text-field label="Your name" @value-changed=${this.nameChanged}>
      </vaadin-text-field>
      <vaadin-button @click=${this.sayHello}>Say hello</vaadin-button>
    `;
  }
  nameChanged(e: CustomEvent) {
    this.name = e.detail.value;
  }
  sayHello() {
    showNotification(`Hello ${this.name}`);
  }
}
```

Endpoints are secure by default

```java
@Endpoint
public class MyEndpoint {

  @PermitAll
  public void permittedToAllMethod() {
    // Any authenticated user can access
  }

  @RolesAllowed("ROLE_ADMIN")
  public void permittedToRoleMethod() {
    // Only users with admin role can access
  }
}
```

Flow or Fusion

- Vaadin **Flow** for **full-stack development with Java**
- Vaadin **Fusion** if you want **to avoid server state**

Let's see some code

https://start.vaadin.com

Conclusion

- With Vaadin Fusion you **don’t** have to **care about client-server communication**
- You can **concentrate on building the application** because the build just works
- You get a **single deployment** which is in many cases very convenient

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Thank you!