“Das Frontend ist ja dann trivial” - Microservices und Web-Frontends
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› I build stuff for the Internet

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Microservices?!

Microservices und Web-Frontends - Matthias Reuter & Michael Bruns
Why Microservices?

› Abstract problem split into small solutions

› Monolith would simply be too hard to handle

› Large portions of the application don’t need to know about the rest of the application

› Load peaks on small parts of the application are expected
Why Microservices?

› Independent deployment

› Different people with different backgrounds and skills

› Polyglott development

› Most important: We, i.e. the whole team, wanted to do it!
That’s it. Microservices are great. You can go home now, the frontend is easy. Or isn’t it?!
Every Service has its own Frontend
Every Service has its own Frontend

NPM package for common code

- web-commons
  - css/
  - js/
  - assets/
    - fonts/
    - images/
  - templates/
Every Service has its own Frontend
Add NPM package to dependencies via git tag

"dependencies": {
   "web-commons":
      "git+ssh://git@git.example.net/bs/web-commons.git#v1.7.3"
}
Every Service has its own Frontend

✅ Scalability
✅ Independent deployment

- Code duplication
- Bad for caching
- Pages with content from several services
- Generalists vs. specialists
Single Page Application!
Single Page Application

- Self-care
- Registration
- Auth

REST API
Single Page Application

API changes - Backend solution

› Backend supports old and new API
  › in parallel
  › for a while

Via Path:
  https://auth.waipu.tv/api/v3/login

Via Header:
  Accept: application/vnd.waipu.auth-v3+json
Single Page Application
API changes - Frontend solution

```javascript
login()
  .then(function (res) {
    userName = res.userName;
  });
```
Single Page Application

API changes - Frontend solution

```javascript
login()
  .then(function (res) {
    userName = res.user.name;
  });
```
login()

  .then(function (res) {
    return res.user ? res : {
      user: { name: res.userName }
    };
  })

  .then(function (res) {
    userName = res.user.name;
  });
Single Page Application

✔ Scalability
✔ Code duplication
✔ Good for caching
✔ Pages with content from several services
✔ Generalists vs. specialists

—is Independent Deployment
—is Initial page load time
—is Dependency on JS
—is Sequence of requests
Single Page Application

Sequence of requests
Backend for Frontend

Sequence of requests
Backend for Frontend

Reusable concept
Backend for Frontend

- Scalability
- All the benefits of an SPA
- Sequence of requests
- Server-side rendering!
  - Initial page load time
  - Dependency on JS

- Independent Deployment
- API changes
Server-side Includes

- User
- Subscription
- Recording
Server-side Includes

Example: nginx

http {
    server {
        location / {
            root /some/path;
            ssi on;
        }
    }
}
Server-side Includes

Example: nginx

```
<html>
<body>
  <!--#include file="user-agent.html" -->
</body>
</html>
```

```
user-agent.html:
<p>Hey, you've got a nice user agent:</p>
<p>!---#echo var="HTTP_USER_AGENT" --></p>
```
Server-side Includes

- Scalability
- Independent deployment
- Code duplication
- Good for caching
- Pages with content from several services

- Generalists vs. specialists
- Backend logic needed to assemble page
- Bundled CSS/JS
- Global Styles/Scripts
Web-Components

Custom Elements

```html
<waipu-rec-self-care user-id="08154711" />
```

HTML-Imports

```html
<link rel="import" href="https://recording.waipu.tv/comp/self-care" />
```

Shadow-DOM

- DOM hidden from outside
- Styles kept inside
Web-Components

- Recording
- Subscription
- User
Web-Components

✔ Scalability
✔ Independent deployment
✔ Good for caching
✔ Pages with content from several services
✔ Generalists vs. specialists
✔ Bundled CSS/JS

- Code duplication
- Depends on JavaScript
And now for something completely different...
Monorepo
One to rule them all

- ✔ Scalability
- ✔ Independent deployment
- ✔ No code duplication
- ✔ No integration overhead
- ✔ Easy code sharing

- ✔ Version management
- ✔ Code once, break everywhere
Testability

End-to-end Tests

- Every Service has its own Frontend
  ✔ Single Page Application
  ✔ Backend for Frontend
  - Server-side Includes
  - Web-Components
  ✔ Monorepo
One final note...

Both lines have the same length?

Don’t believe anything just because it’s written on a slide!
Vielen Dank

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