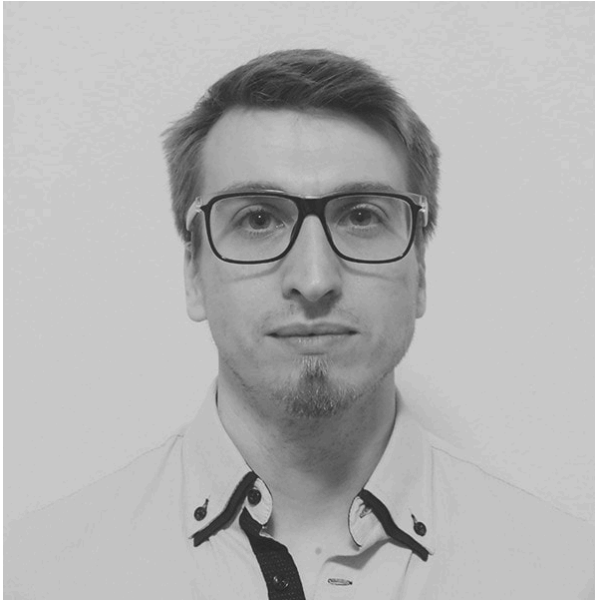


Black Magic: Micro Frontends without Web Components

WeAreDevelopers Congress Vienna 2019

Day 1 – W2

Who are we?



Lead Web Developer,
Frontend Architect and
Scrum Master

Father of BAWAG P.S.K.s'
Micro Frontend Architecture



Full Stack Developer

Agenda

10:45 – 12:45

1. Definition & Purpose of Micro Frontends

2. BAWAG P.S.K. Approach

3. Explanation of Hands-on

4. Hands-on

till 12:30

5. Q&A

last 15 min

"An architectural style where independently deliverable frontend applications are composed into a greater whole"

<https://martinfowler.com/articles/micro-frontends.html>

"It extends the concepts of micro services to the frontend world."

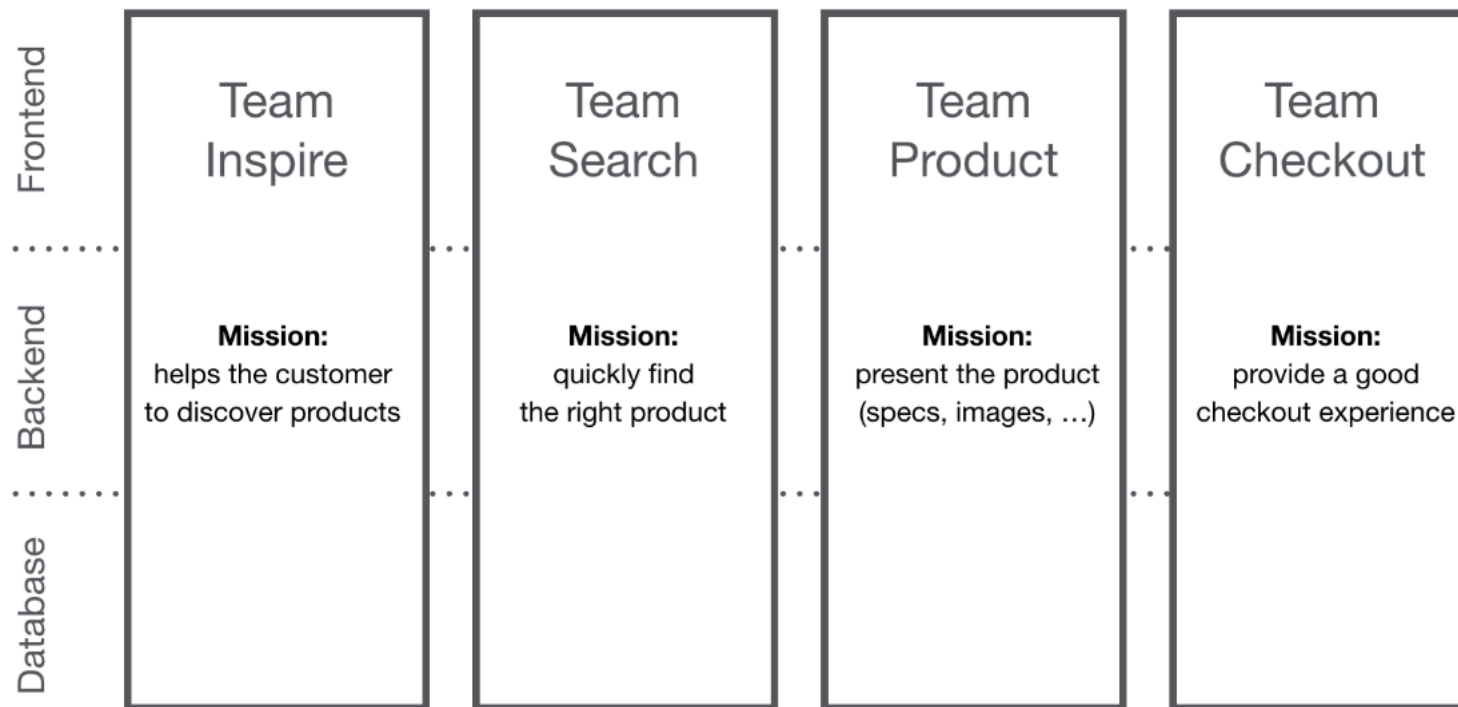
- Michael Geers

<https://micro-frontends.org>

Purpose

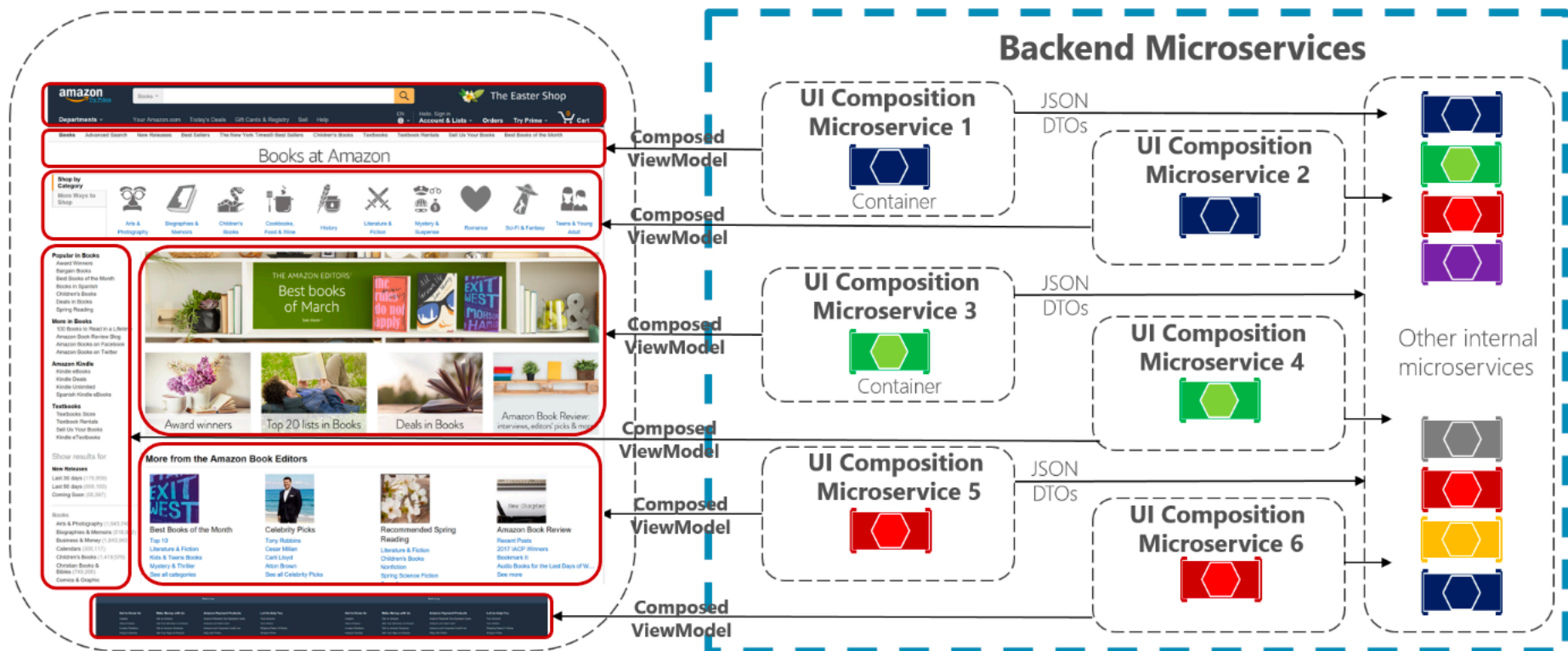
Organizational Scaling & Structural Decomposition

- Enable vertical teams (E2E delivery of features – autonomy/ownership)
- Organizational scaling (n teams - 1 product)



<https://micro-frontends.org/>

Micro Frontends & Micro Services



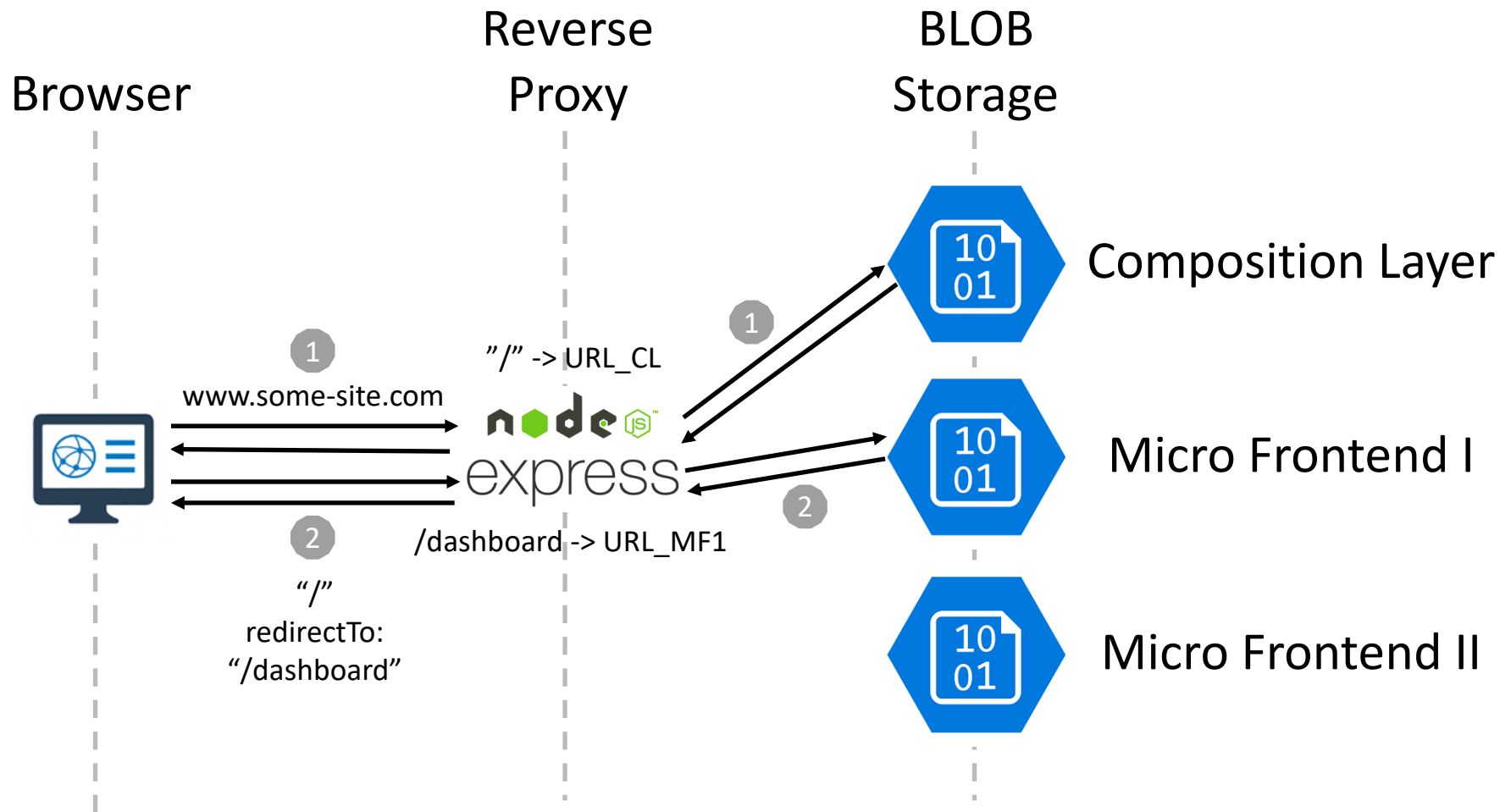
<https://altkomsoftware.pl/en/blog/ui-in-microservices-world/>

BAWAG P.S.K. Approach

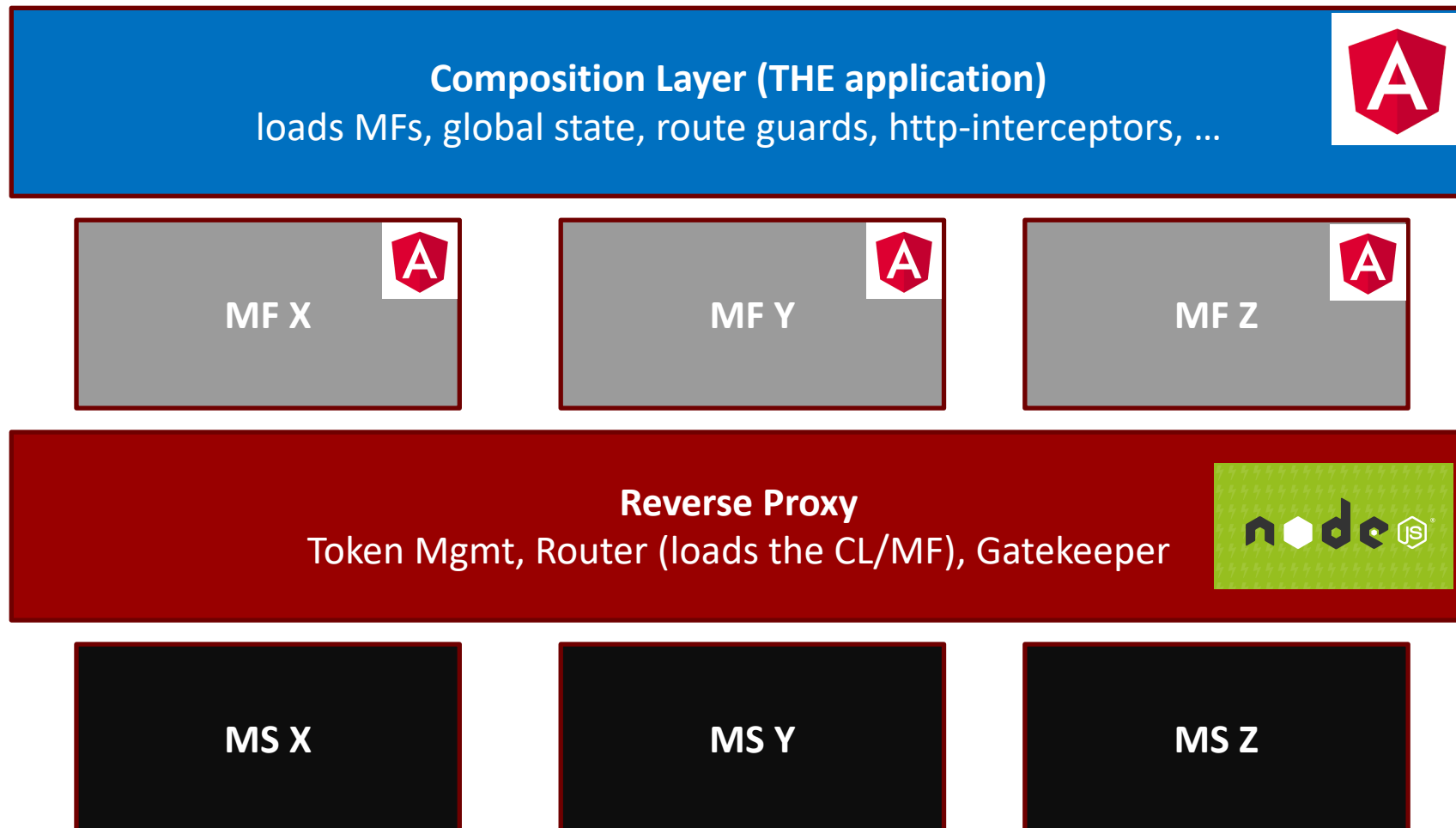
Angular + Runtime Composition

- **100% Angular** (AOT compiled) + extra webpack-config
- Custom webpack loader (<https://github.com/MrFrankel/share-loader>)
 - load major libs (ng, clarity,...) only once
- **Runtime composition**
- **NGXS** – emitter extension for state mgmt. (<https://github.com/ngxs-labs/emitter>)
- Communication (FE)
 - DOM-Events (e.g. custom events) or
 - Private event-bus (shared-library)
- (Stateless) **reverse proxy as glue** between Micro Frontends and Micro Services
 - Only reverse proxy is exposed (public)

The FLOW

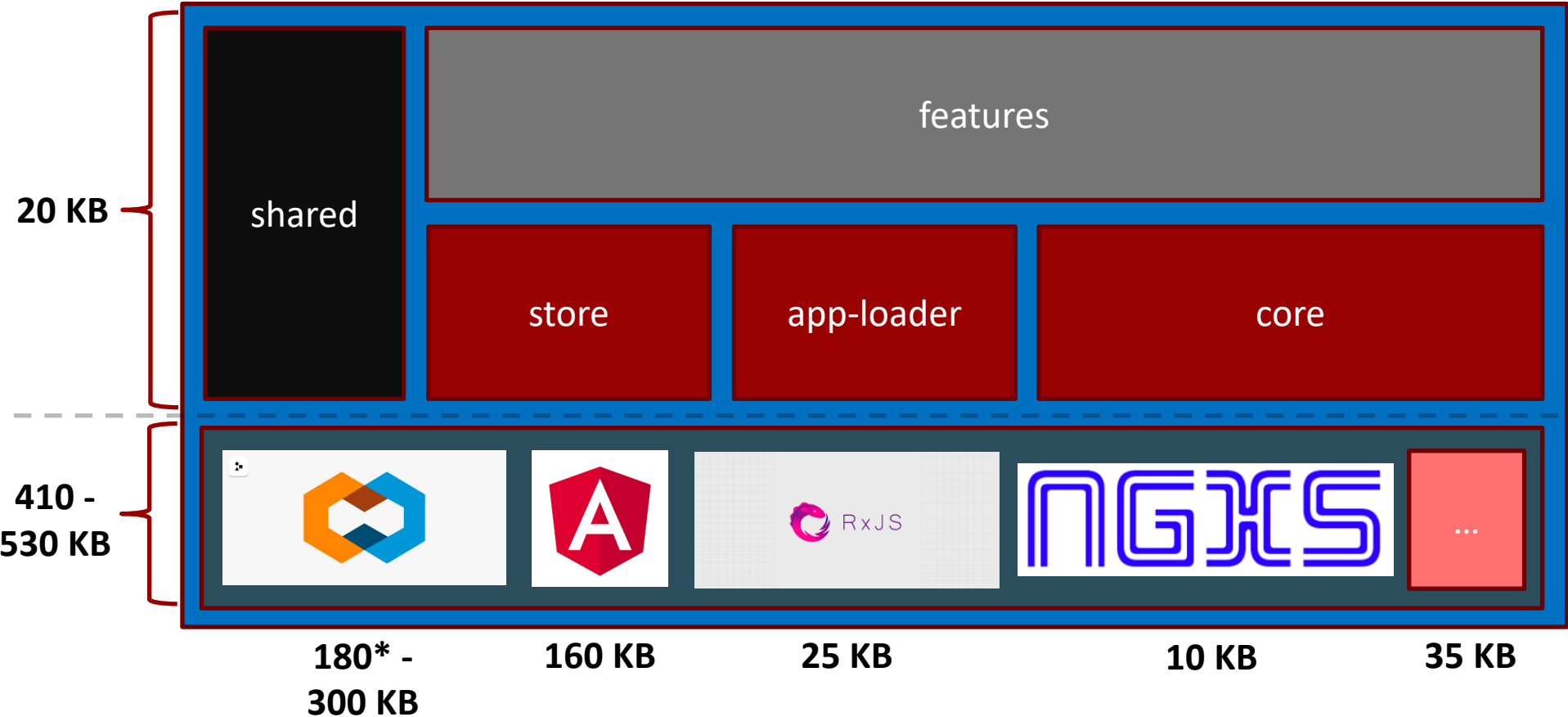


Architecture Overview



Architecture

Building Block View - CL

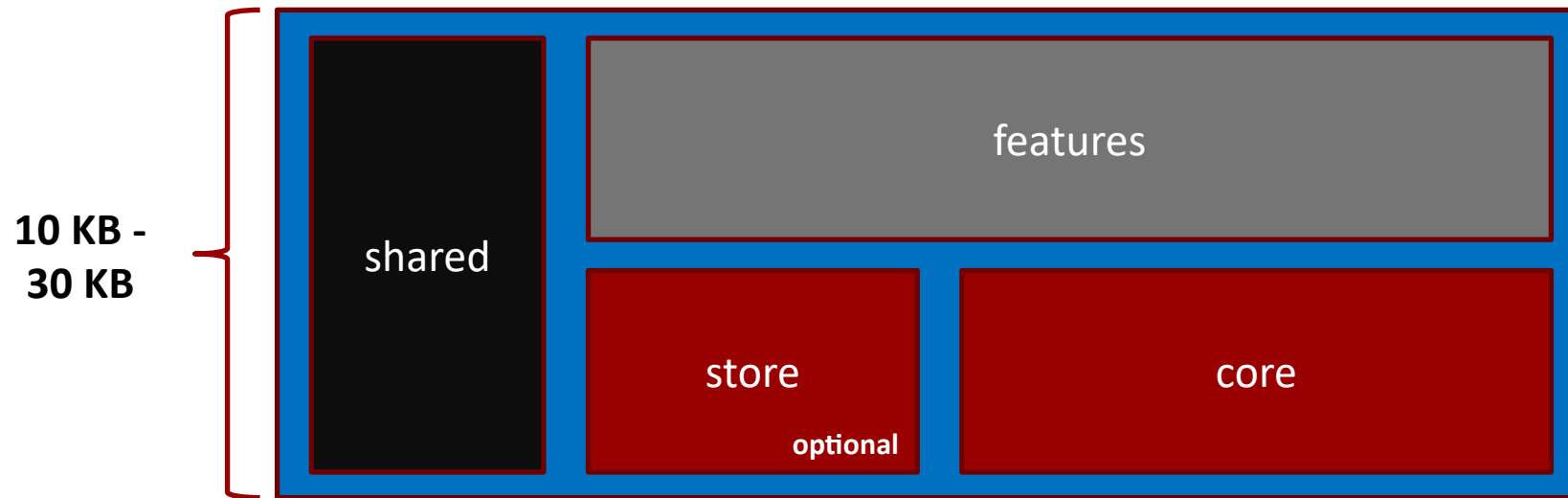


* w/o icons

Overall size: 430 - 550 KB

Architecture

Building Block View - MF



Can also contain 3rd party libraries
e.g. ng-select, file-saver,...

Development

The 2 worlds

A solid green rectangular box with the word "standalone" in white, lowercase, sans-serif font centered inside.

standalone

Primary Development Mode

Micro Frontend has:

- index.html
- Root Module (BrowserModule)

A solid red rectangular box with the text "in composition" in white, lowercase, sans-serif font centered inside.

in composition

As part of the composition layer

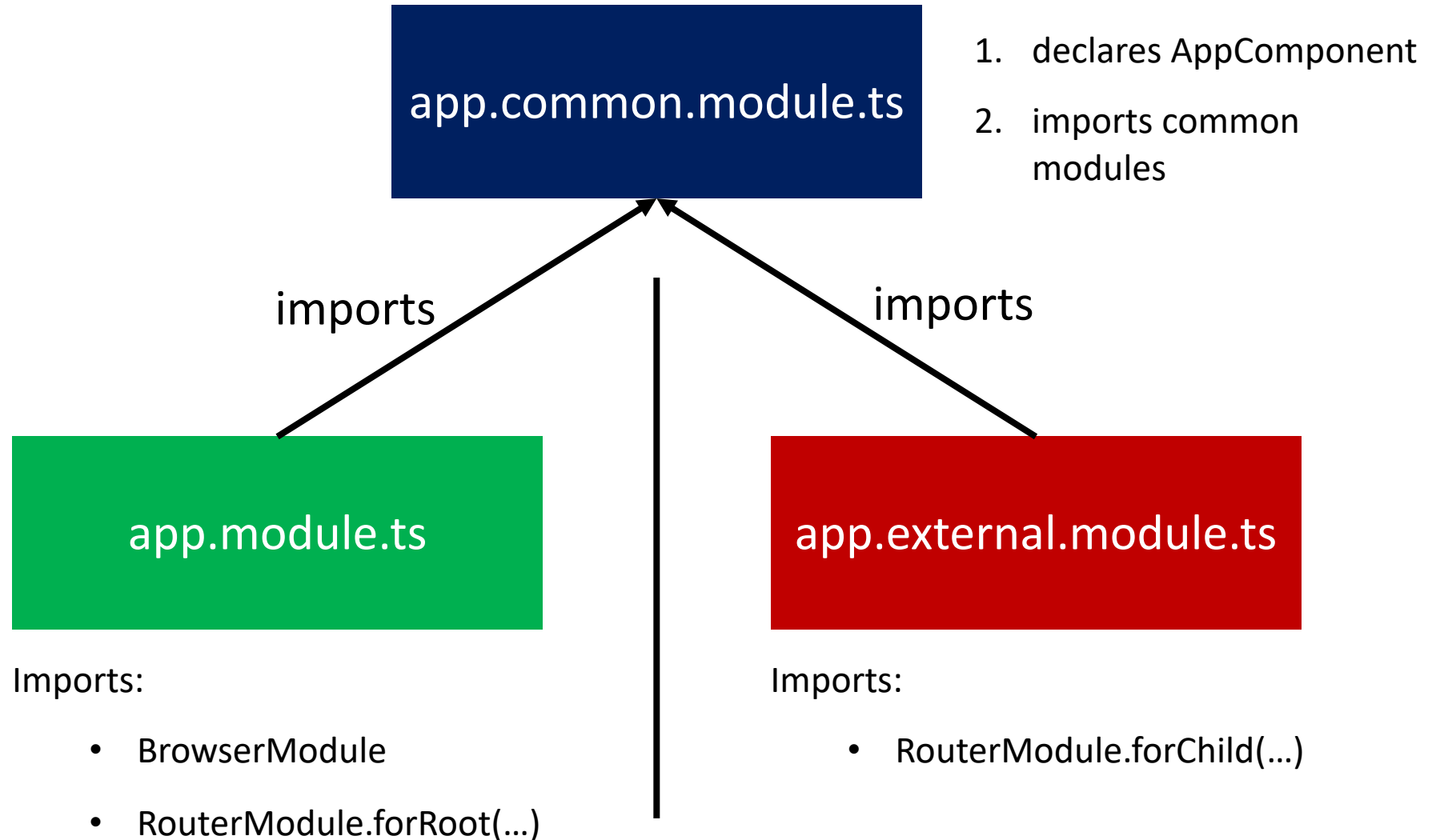
Micro Frontend has:

- Feature Module

Relies on external dependencies

Development

The 2 worlds



Pitfalls

- Dependencies in composition mode
 - Everything that a MF needs must be provided in CL
 - Present in the window object when child loads
- Same Angular version

Hands-on instructions



Who wants to code?



alone

team

5 Micro Frontends
waiting for you

Explanation of Hands-on

What?

Create an application together!

Complete 5 Micro Frontends and deploy to them Azure!

1. **Login:** form + use shared private event-bus
2. **Quiz:** complete + add backend service
3. **Tic Tac Toe:** provide dark theme
4. **Statistics:** visualize data with charts
5. **Profile:** form + resource management + local storage

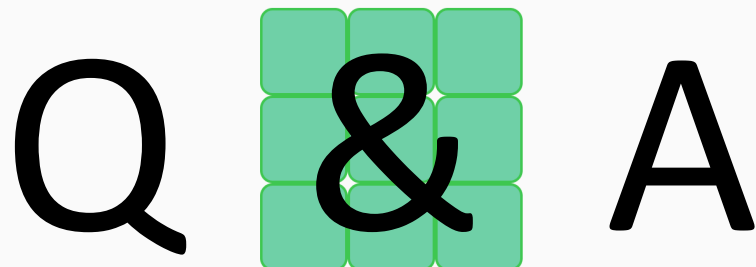
Provided: Composition Layer + Proxy + Azure Blob Storage

Explanation of Hands-on

How?

1. <https://github.com/BAWAG-PSK/wrd-bawag-mfa>
2. **npm run bootstrap** (install node_modules for each project)
3. Open **README.md of your project** for further instructions
4. Have fun ;-)
5. Make sure azure-cli is installed (needed for deployment)

X:0 0:0



RESET GAME

Themes LIGHT DARK



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Angular Elements

Reasons for using them

Why publish angular components as custom elements?

5 Reasons:

- 1: Embedding Angular Components Into Non-Angular Applications
- 2: Embedding Angular Components Into Content Sites
- 3: Implementing Dynamic Angular Applications (“Dashboard”/CMS)
- 4: Upgrading from AngularJS to Angular
- 5: Independent Deployment

<https://blog.nrw1.io/5-reasons-to-use-angular-elements-390c9a629f89>

Manfred Steyer

- <https://www.softwarearchitekt.at/aktuelles/🌿📦A-web-components-with-angular-ivy-in-6-steps/>

Micro Frontend Architecture (Monorepo approach)

- <https://www.softwarearchitekt.at/aktuelles/6-steps-to-your-angular-based-microfrontend-shell/>

Web Components

Why I don't use Web Components

- <https://dev.to/richharris/why-i-don-t-use-web-components-2cia>

VS

Why I use Web Components

- <https://gist.github.com/WebReflection/71aed0c811e2e88e3cd3c647213f0e6c>