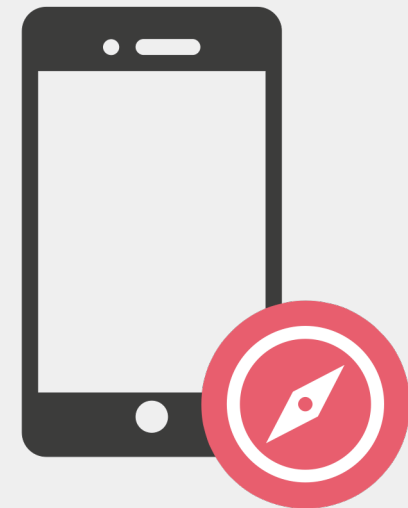


The Backend Code Walkthrough

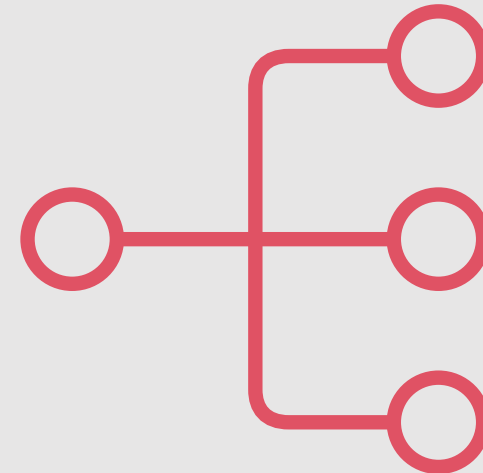
COMPASS NUM-APP

29.04.2021



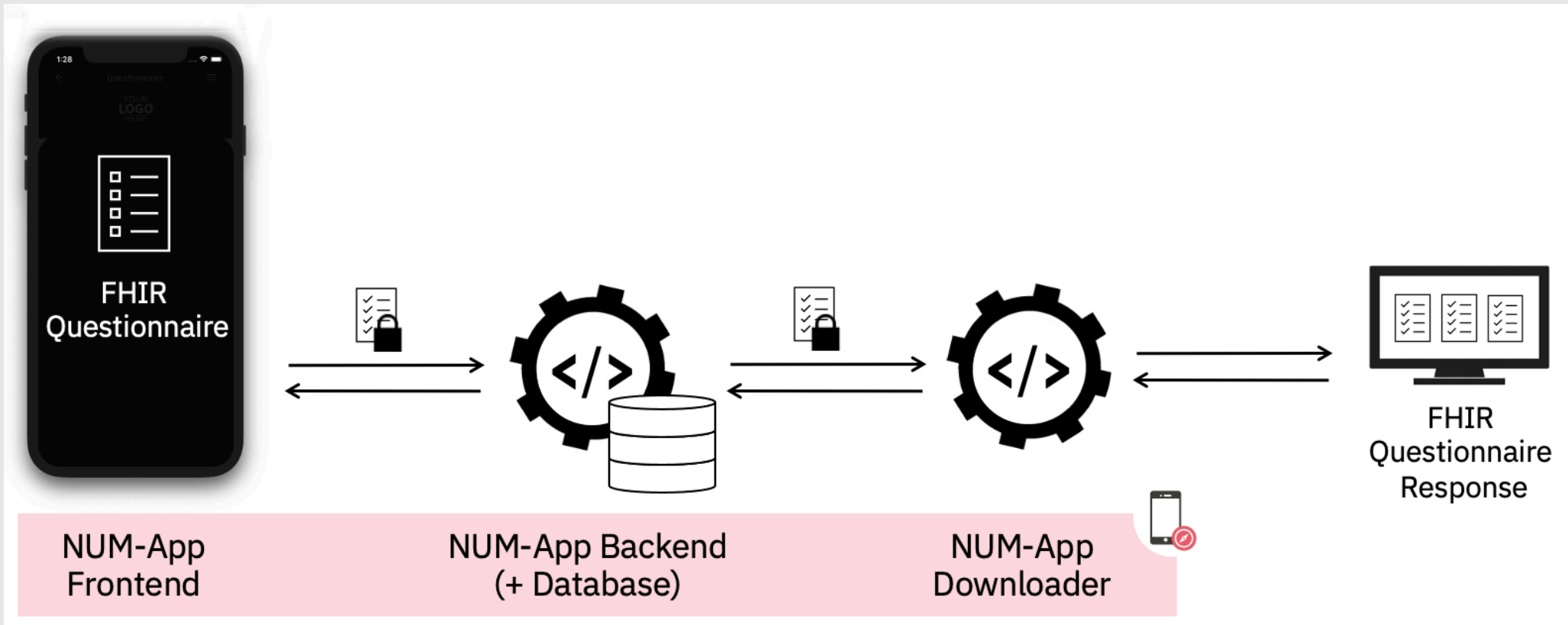
Agenda

- Recap Backend Development
- Tooling
- Code Show
- Outlook on Backend Contributor Track
- Q&A



Recap Backend Development

Num Components



Functionality of Mobile Backend



Login



Provisioning of
FHIR questionnaire



Signing of FHIR
questionnaire response



Storage of FHIR
questionnaire response

☰ README.adoc ✎

NUM-App Mobile Back End

[Main Repository](#) | [Back End Documentation](#)

Welcome

This repository provides the source code for the mobile back end of the [Compass NUM-App Project](#). This project provides a set of open source components meant for the digital conduct of questionnaire based studies. The mobile back end itself is a part of [COMPASS](#) (Coordination On Mobile Pandemic Apps best practice and Solution Sharing).

The mobile back end provides study data for the NUM-App in form of [FHIR Questionnaires](#). It also stores the study data that is uploaded from the mobile app. Additionally it makes the collected data accessible for other parties.

Development

Local Setup

- Make sure you have a recent version (LTS recommended) of [Node.js](#) installed and run the following commands to download and prepare this repository:

```
git clone https://github.com/NUMde/compass-numapp-backend.git
npm install
```

- In case you use VSCode as your editor, install the recommended extensions

Run the back end locally

Create .env file

Some configuration values need to be present as environment variables during runtime. The application loads a file with the name `.env` during startup, if it is present.

To get started copy the file `.env.sample` to `.env` and add your values.

Generating RSA key pair

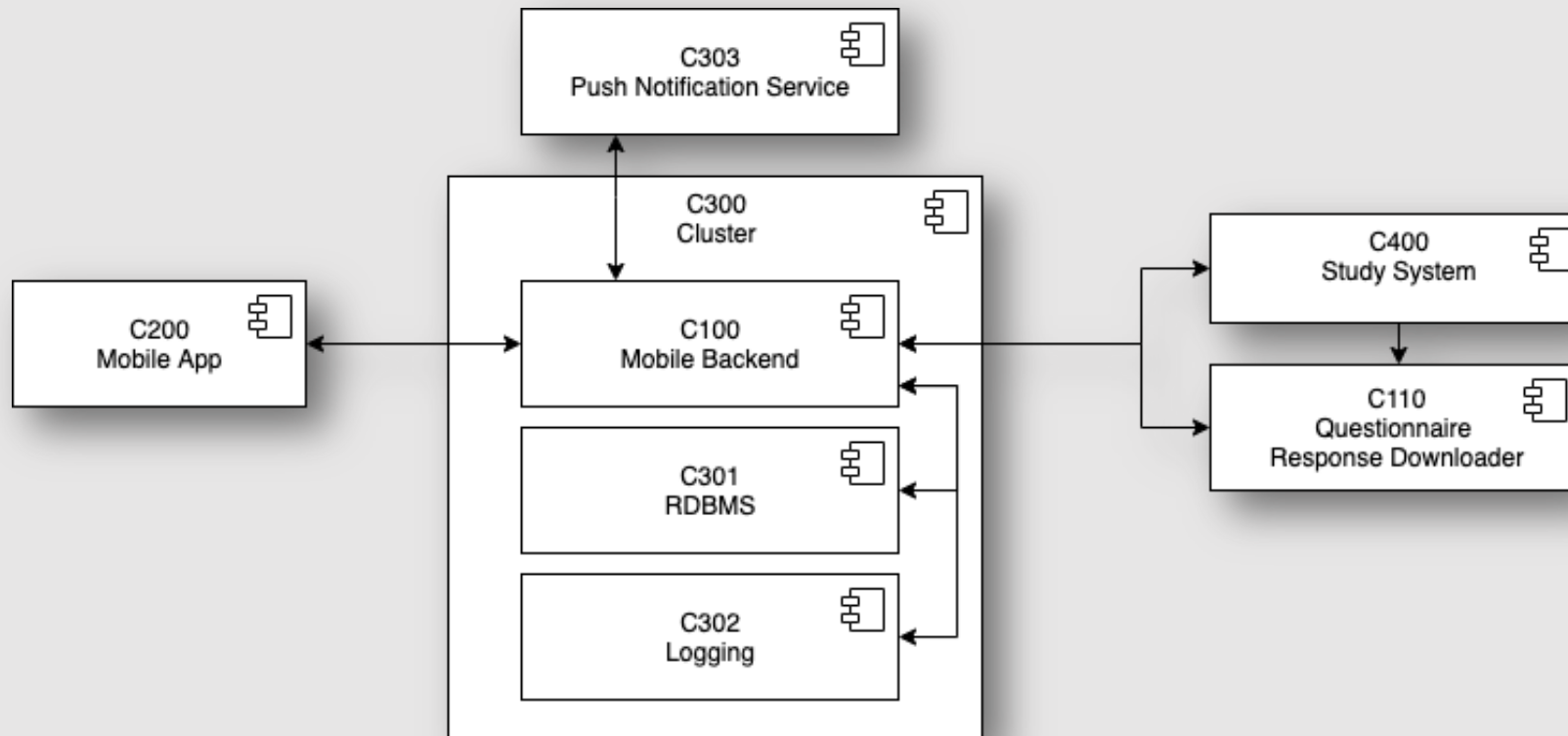
Component Overview

C1xx - Backend Components

C2xx - Frontend Components

C3xx - Technical Components (Middleware)

C4xx - University Hospital Specific Components



Code Structure

assets

- Resource files need during runtime

Config

- Classes with configuration from environment or defaults

Controllers

- Classes for the REST API

Models

- Database access classes

Server

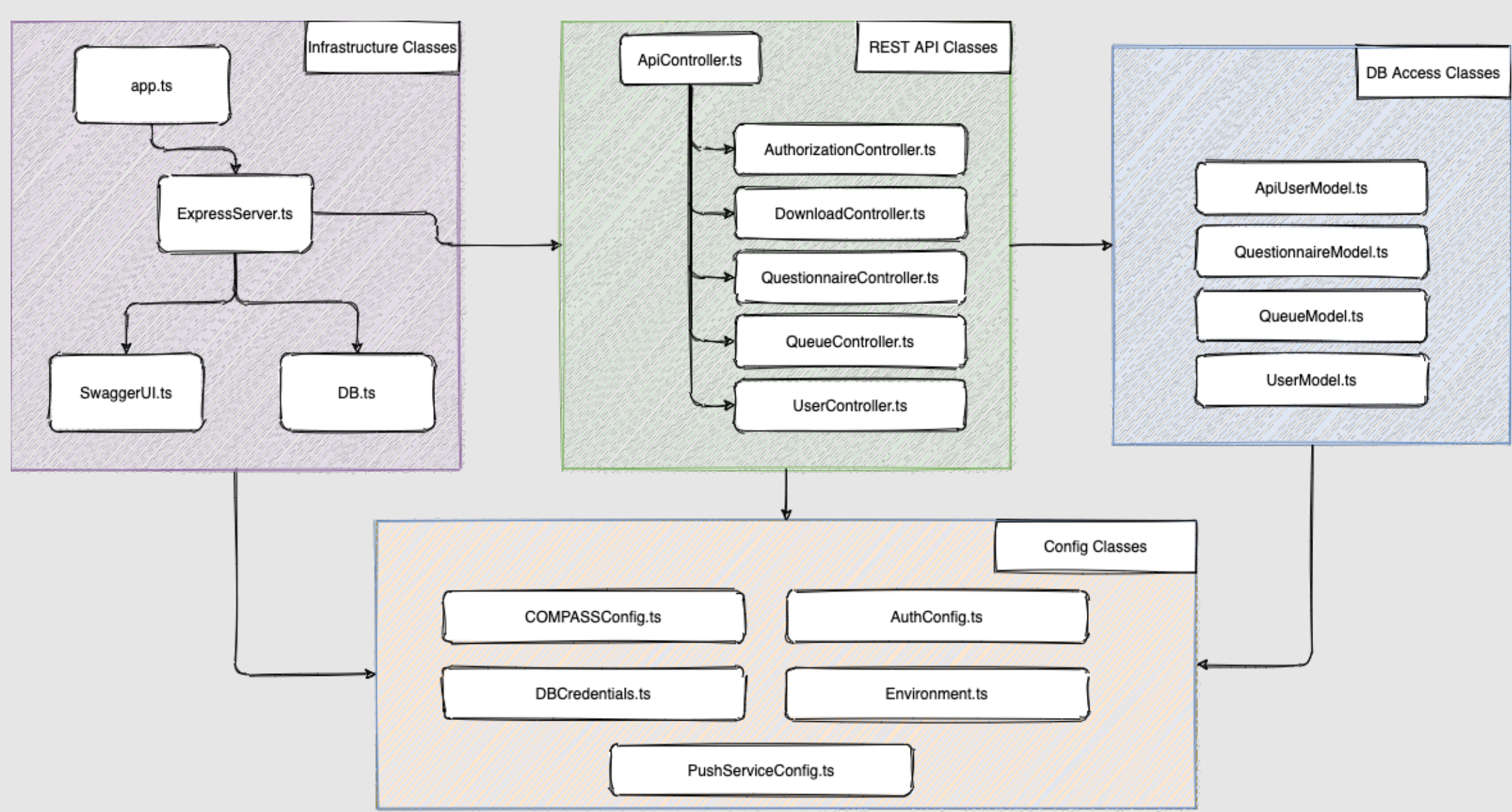
- Technical functions (e.g. Express config)

Services

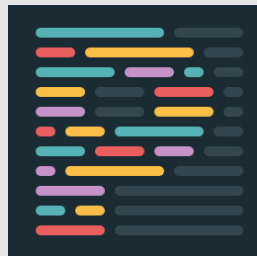
- Classes with cross cutting functions (e.g. logging)

Types

- Interfaces with type definitions

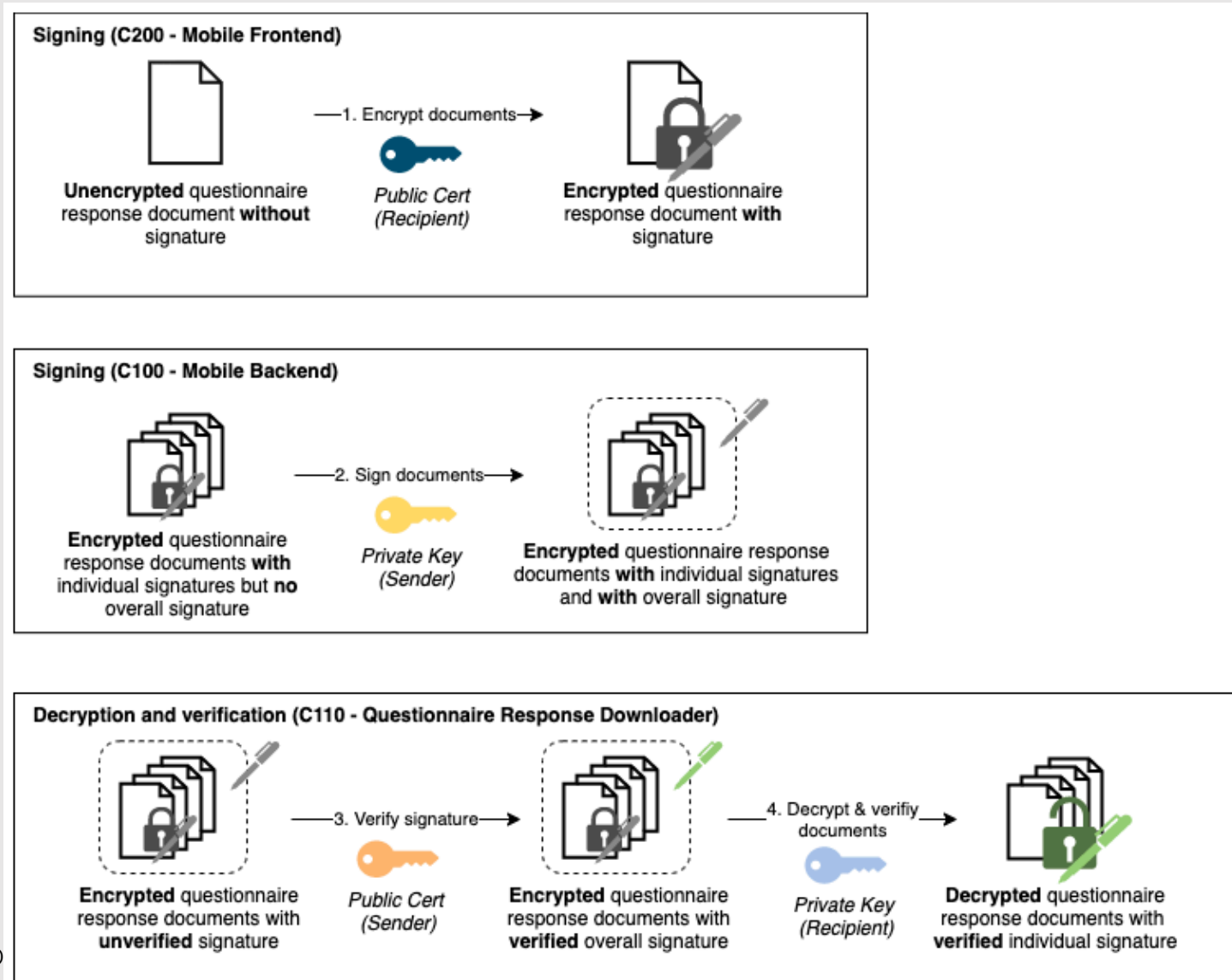


Supporting Tools



Husky - Modern native git hooks made easy

Encryption Certificates



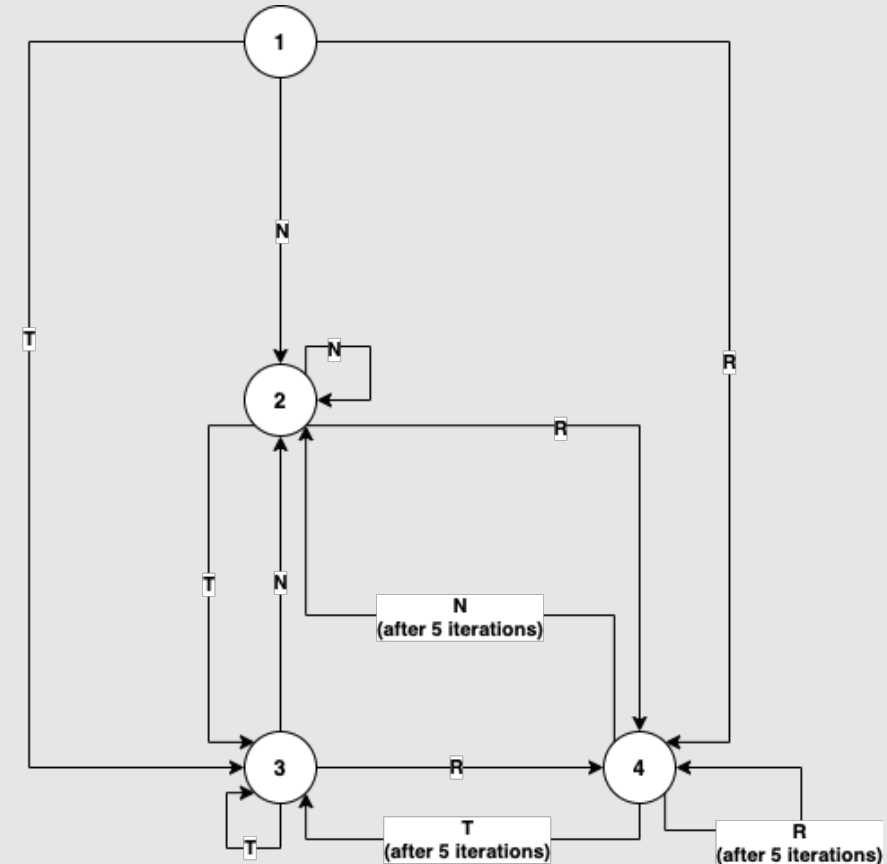
The App Flow

App Flow Updating the User (server side)

This graph displays how the backend determines **what questionnaire the user will receive next**.

- 1 Questionnaire 1, Starting Point, will be sent out once per user
- 2 Questionnaire 2, default, 7 days interval
- 3 Questionnaire 3, after hitting a Trigger, 2 days interval
- 4 Questionnaire 4, after sending out a report, 2 days interval at 5 iterations

N	Neutral (no Trigger activated, next questionnaire: 2)
T	Trigger (trigger was activated, next questionnaire: 3)
R	Report (report was sent out, next questionnaire: 4; for 5 iterations, after that: reassessment)



Database

ER Model

studyuser	
ABC study_id	NOT NULL
🕒 last_action	
ABC current_questionnaire_id	
🕒 start_date	
🕒 due_date	
ABC current_instance_id	
123 current_interval	
123 additional_iterations_left	

questionnaires	
ABC id	NOT NULL
📄 body	NOT NULL

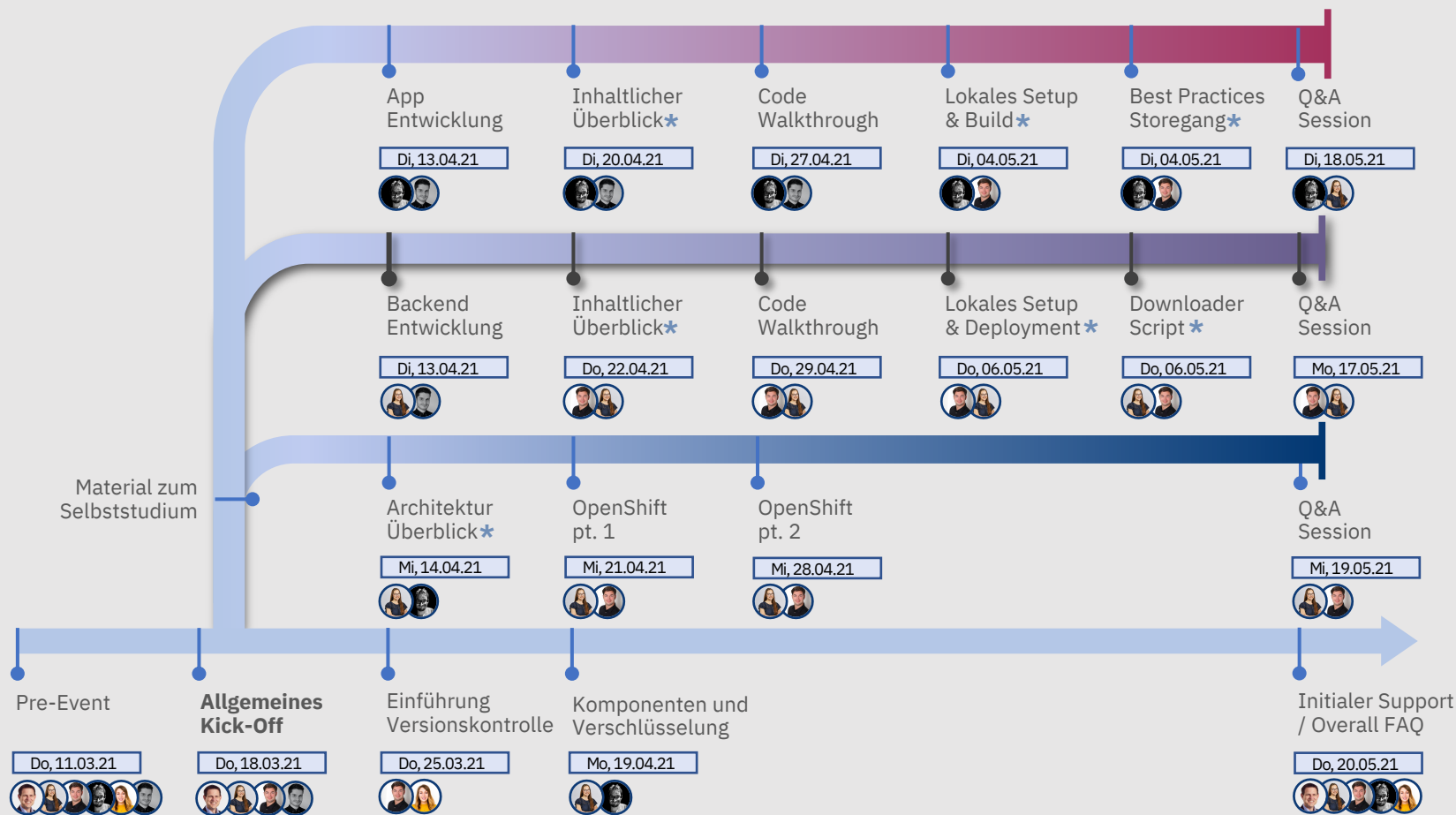
apiuser	
ABC api_id	NOT NULL
ABC api_key	NOT NULL
ABC api_key_salt	NOT NULL

questionnairehistory	
ABC id	NOT NULL
ABC study_id	NOT NULL
ABC questionnaire_id	NOT NULL
🕒 date_received	NOT NULL
🕒 date_sent	
ABC instance_id	

queue	
ABC id	NOT NULL
ABC study_id	NOT NULL
ABC encrypted_resp	NOT NULL
🕒 date_sent	NOT NULL
🕒 date_received	NOT NULL

Outlook on Backend Contributor Track

Backend Contributor Track





Links

Links

Node.js

- <https://nodejs.org/en/about/>

Express

- <https://expressjs.com/de/>

JavaScript / TypeScript

- <https://www.typescriptlang.org/>
- https://www.tutorialspoint.com/typescript/typescript_quick_guide.htm
- <https://blog.logrocket.com/typescript-with-node-js-and-express/>
- <https://www.w3schools.com/js/DEFAULT.asp>



Q&A

Q&A

*What questions
do you have?*

