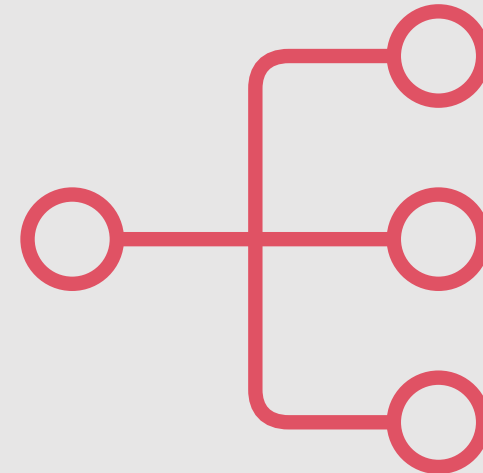# Objectives

After this session, you should be able to:

- Understand the technology stack of the NUM mobile backend

- Get a first overview of the functionality of the NUM mobile backend
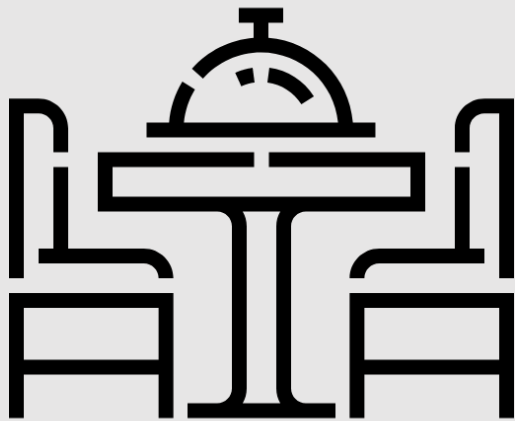
Agenda

- Components

- Introduction Backend Development

- Technology Stack Overview

- Initial Introduction to NUM Mobile
  Backend

- Outlook on Backend Contributor Track

- Q&A

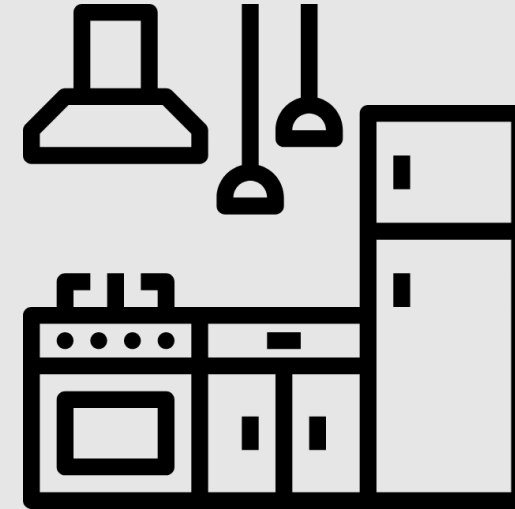# Introduction Backend Development

What is a Backend?

Frontend   Requests   Backend

Technology Stack Overview

Node.js

JavaScript runtime designed for developing server-side and networking applications

Node.js = Runtime Environment + JavaScript Library

Features:

- Asynchronous and Event Driven

- Very Fast

- Single Threaded but Highly Scalable

- No Buffering

- Open source

TypeScript

Typed JavaScript

Features:

- Open source
- Code validation
- Type-checking
- Supports JavaScript

```
const user = {
  firstName: "Angela",
  lastName: "Davis",
  role: "Professor"
}

console.log(user.name)
```
Property 'name' does not exist on type '{ firstName: string; lastName: string; role: string; }'.

```
interface User {
  id: number
  firstName: string
  lastName: string
  role: string
}

function updateUser(id: number, update: Partial<User>) {
  const user = getUser(id)
  const newUser = {...user, ...update}
  saveUser(id, newUser)
}
```

Express

Web framework for Node.js

Features:

- Open source
- Lightweight
- Flexibility
- Enhances Node.js
- Support for JavaScript

```javascript
const express = require('express')
const app = express()
const port = 3000

app.get('/', (req, res) => {
  res.send('Hello World!')
})


app.listen(port, () => {
  console.log(`Example app listening at http://localhost:${port}`)
})
```

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

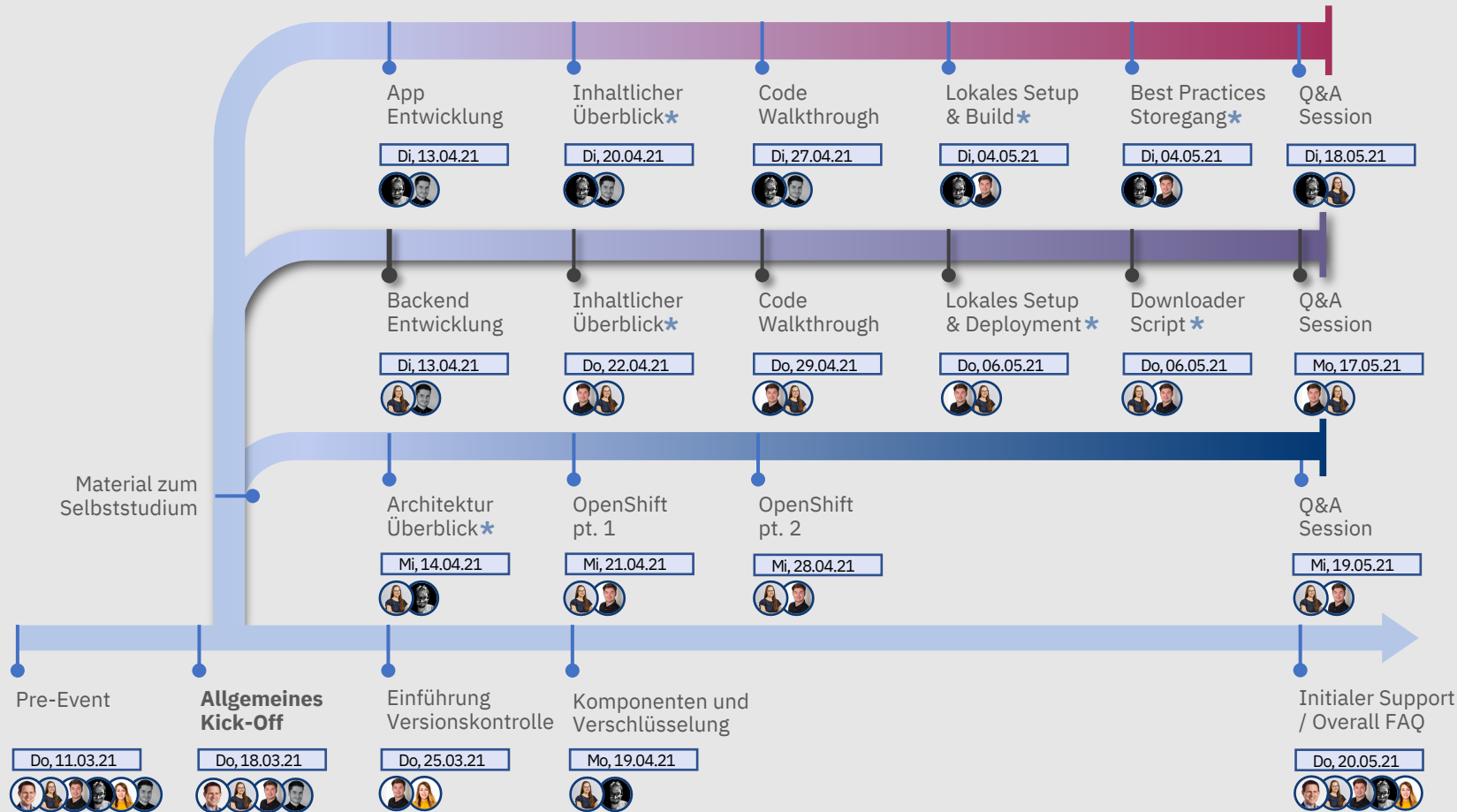#### Run the back end locally

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

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Outlook on Backend Contributor Track

Backend Contributor Track

App Entwicklung	Inhaltlicher Überblick*	Code Walkthrough	Lokales Setup & Build *	Best Practices Storegang *	Q&A Session
Di, 13.04.21	Di, 20.04.21	Di, 27.04.21	Di, 04.05.21	Di, 04.05.21	Di, 18.05.21

Backend Entwicklung	Inhaltlicher Überblick*	Code Walkthrough	Lokales Setup & Deployment *	Downloader Script *	Q&A Session
Di, 13.04.21	Do, 22.04.21	Do, 29.04.21	Do, 06.05.21	Do, 06.05.21	Mo, 17.05.21

Material zum Selbststudium

Architektur Überblick*	OpenShift pt. 1	OpenShift pt. 2	Q&A Session
Mi, 14.04.21	Mi, 21.04.21	Mi, 28.04.21	Mi, 19.05.21

Pre-Event	**Allgemeines Kick-Off**	Einführung Versionskontrolle	Komponenten und Verschlüsselung	Initialer Support / Overall FAQ
Do, 11.03.21	Do, 18.03.21	Do, 25.03.21	Mo, 19.04.21	Do, 20.05.21

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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?*