

The background image shows a serene lake scene. On the left, a large, leafy tree stands on a grassy bank. In the middle ground, several small boats are docked along the shore, each covered with a blue or green protective tarp. The water is calm, reflecting the sky and the surrounding greenery. In the background, a large, modern building with a prominent red-brown facade and many windows is visible. The sky is a pale blue with some light clouds. A white swan is swimming in the water in the lower right foreground.

Challenge Task

Distributed Systems & Blockchain (DS1), FS 2021

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Agenda

- Goal
- Software Design
- Implementation
- Fulfillment of requirements
- Demonstration

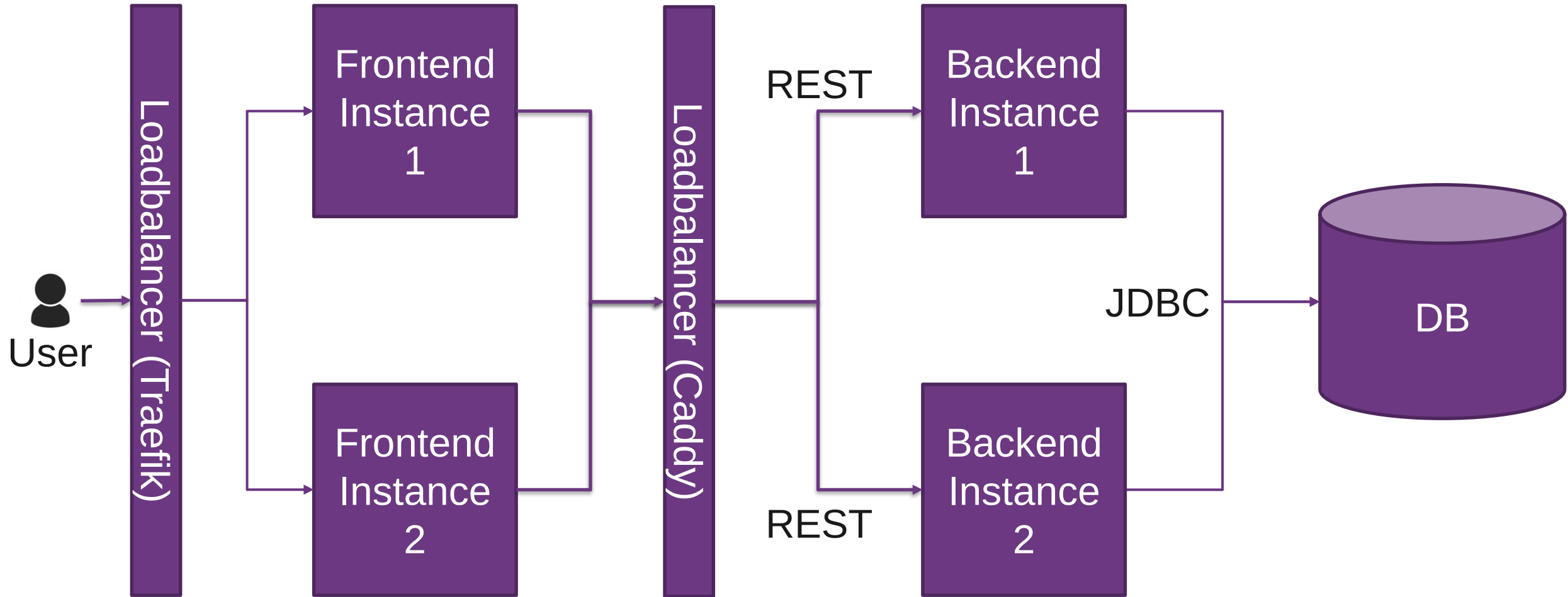
Goal

- “A todo list application which has a distributed architecture, i.e. a todo list application which uses load balancing to distribute the load over two instances of our service.”

Software Design

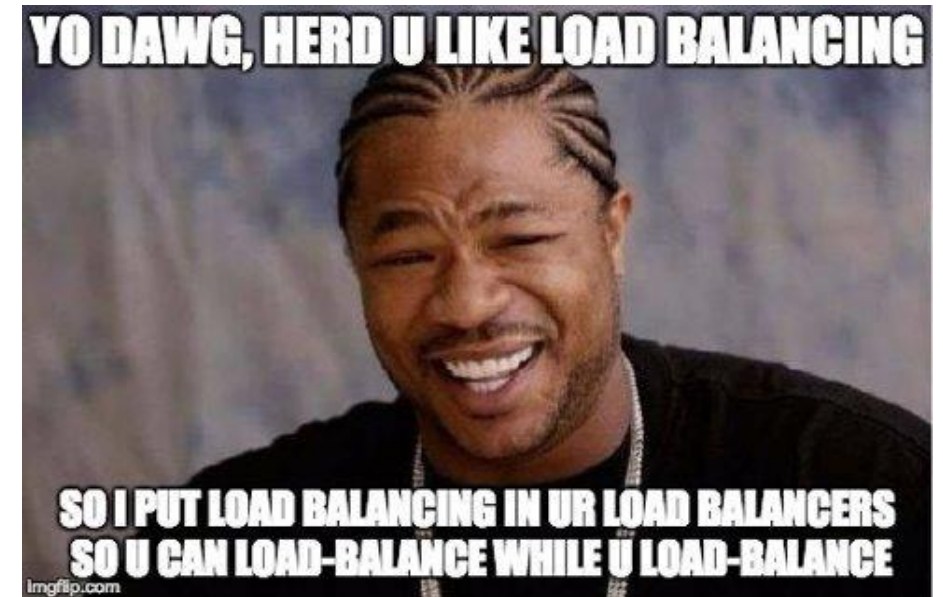
- Simple distributed client server design
 - 2x Frontend, 2x Backend, Database
- Scalable through Docker
 - All deliverables are docker images
- 2x Loadbalancer
 - Loadbalancer (Traefik) balances traffic between Frontend1 and Frontend2
 - Loadbalancer (Caddy) balances traffic between Backend1 and Backend2
- JWT authentication
 - The services are only accessible to authenticated users

System Diagramm



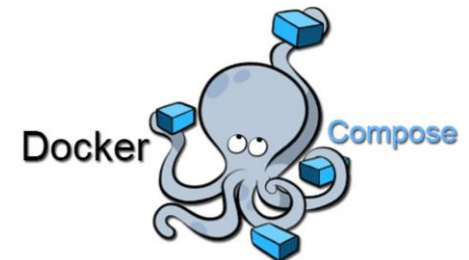
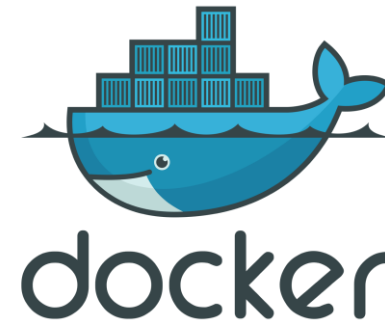
Load Balancers

- Implementation of Traefik
- Need arises for Dockerization of frontend
- Dockerization achieved by using Caddie
- Caddie can be configured as load balancer aswell



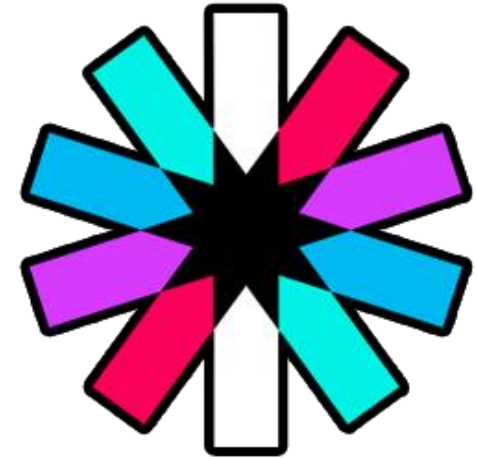
Dockerization

- Frontend Dockerization was done by using caddie
 - Backend with jdk on alpine
 - Database is postgres running on alpine
 - And Traefik can be as docker container on it's own
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- The amount of frontend and backend services can be increased easily
 - Only thing needed is change of load balancer config

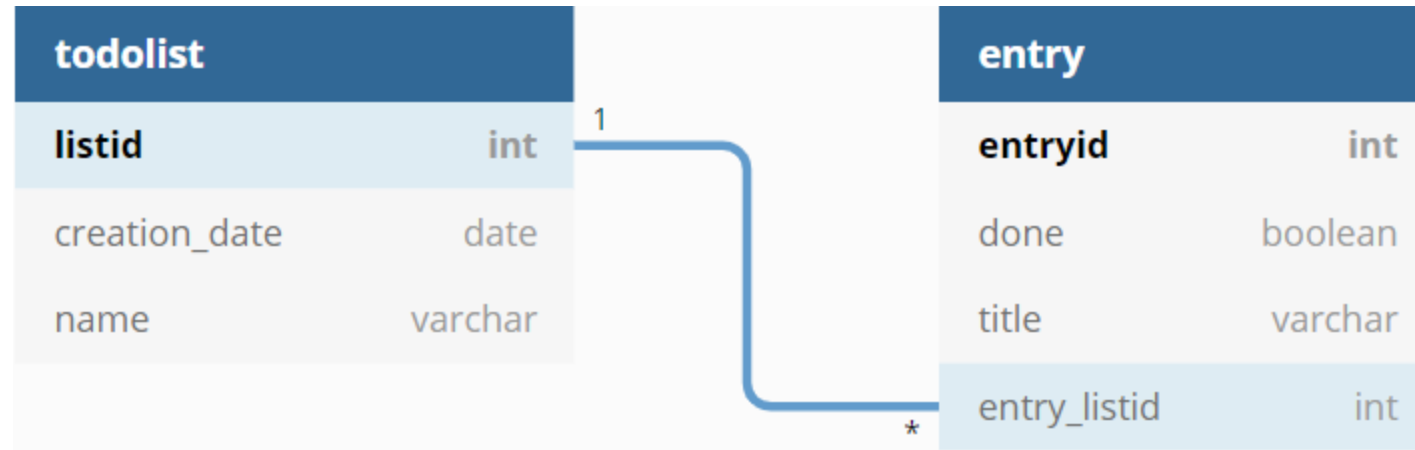


JWT

- Users are currently stored in the application
- User can only access login page with no token
- Upon login, token is generated and sent back to client
- Token can be reused until it expires



Database



Implementation

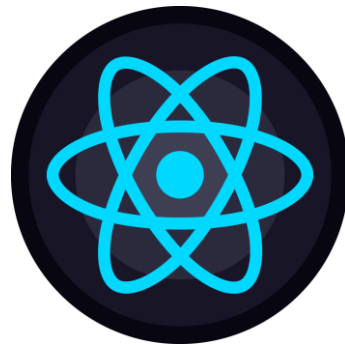
Loadbalancing

- Traefik
- Caddy



React

- React
- Redux

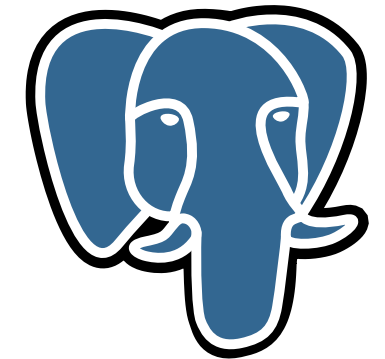


Spring Boot

- Data JPA
- Web
- Security
- JWT



PostgreSQL



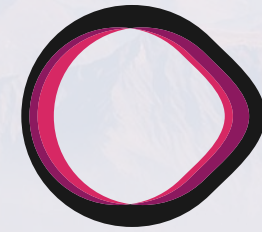
Fulfillment of Requirements

Requirement

- Load balancing
- Scalable Service
- JWT authentication
- Dockerized
- Use latest stable releases of chosen libraries and frameworks

Fulfillment

- ✓ Traefik/Caddy (2/3 – exceeded expectations)
- ✓ We got that (via Docker Compose)
- ✓ We got that (via Spring Boot Security)
- ✓ We got that
- ✓ We got that



OST
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Demonstration