CommunityGrid

1. MOTIVATION

CommunityGrid aims to solve the problem of shared energy capacity congestion in low voltage networks. Specifically, this project aims to manage and **optimize** electric vehicle charging by using **prioritization**, **scheduling**, and **prediction**.

Optimizing energy consumption is useful as the demand for energy use is increasing, while the energy available is stagnating, especially in Europe. Since there is a bottleneck in the number of electric vehicle (EV) chargers, it is becoming crucial to manage the shared use of the ones that exist, rather than adding more.

2. SAFETY ////////////

Scheduling Considerations

Our application considers the minimum charge required for a user to reach their destination, ensuring they will reach their destination.

QR Code Scams

Some competitor products on the market reported that fake QR codes were being placed on chargers, leading users to malicious websites demanding payment for no actual charge. On CommunityGrid, community administrators can automatically generate charger-specific QR codes that direct the user to a dedicated charger page on CommunityGrid with accurate information about the charger's charging schedule, address, image, and community information. This builds trust in the user, since they may validate the information personally, ensuring their safety when using our application.
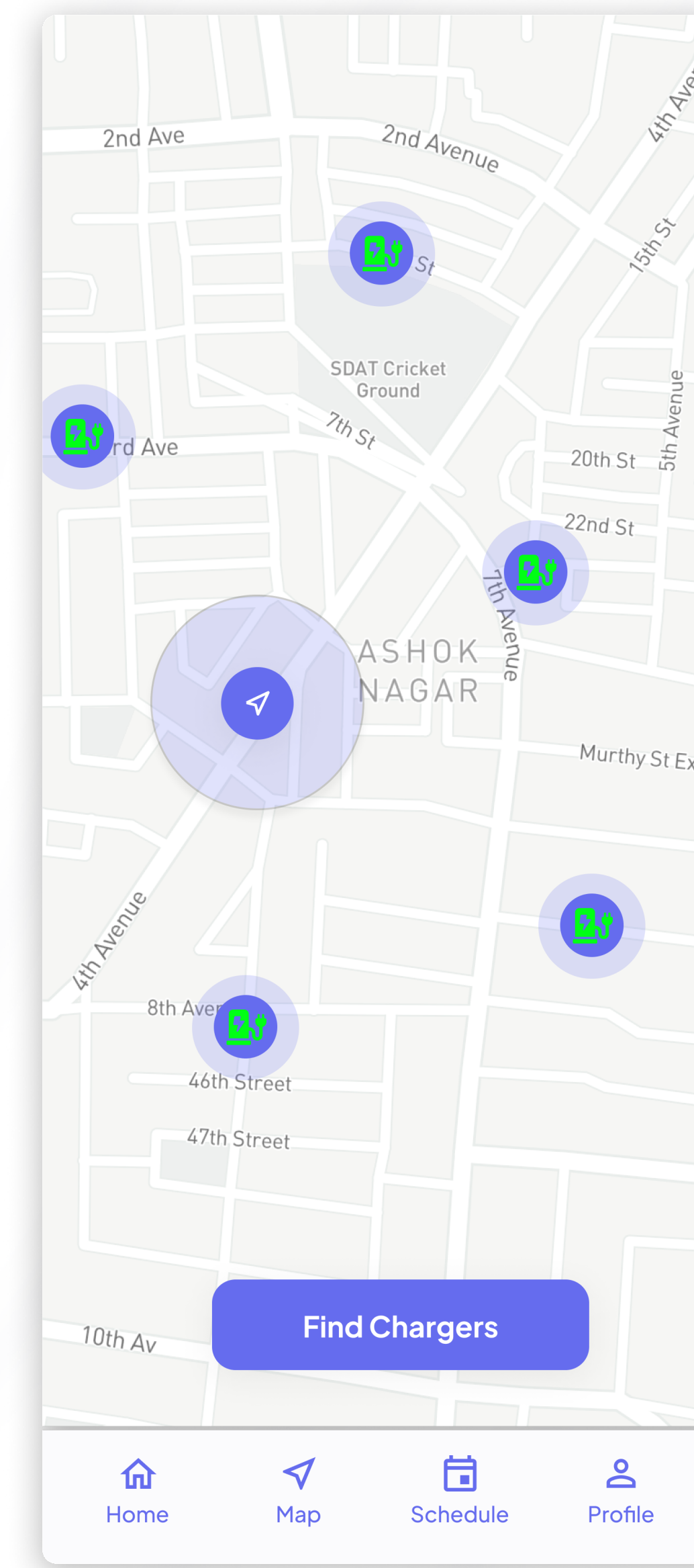
3. LESSONS LEARNED

⚡ Prototype different stacks before deciding on one
⚡ Dedicate more time for requirement gathering and grooming
⚡ Have one source of truth for database management
⚡ Ask for help early on in development
⚡ Find dedicated testers since stakeholders are very busy
⚡ Discuss technical external dependencies early on in the project

4. PRIVACY ////////////

CommunityGrid views **privacy** as a core value, and we prioritize the **protection** of sensitive information such as credit card details. To ensure the privacy of our users, we have integrated **Stripe** for handling payments. Stripe is PCI (Payment Card Industry Data Security Standard) compliant and utilizes **encryption** and **tokenization**. With Stripe, we do not store any credit card information within our system, thereby maintaining the highest standards of privacy and security for our community members.

5. ENVIRONMENT

Our application aims to minimize peak energy load via **congestion control**. This avoids grid reinforcement, an expensive process in terms of cost and environmental impact, which increases the maximum load of the grid. By centering our application on EVs and EV charging, we strive to promote the use of renewable energy applications, especially in the EU, where sustainable energy practices are crucial.

ARCHITECTURE
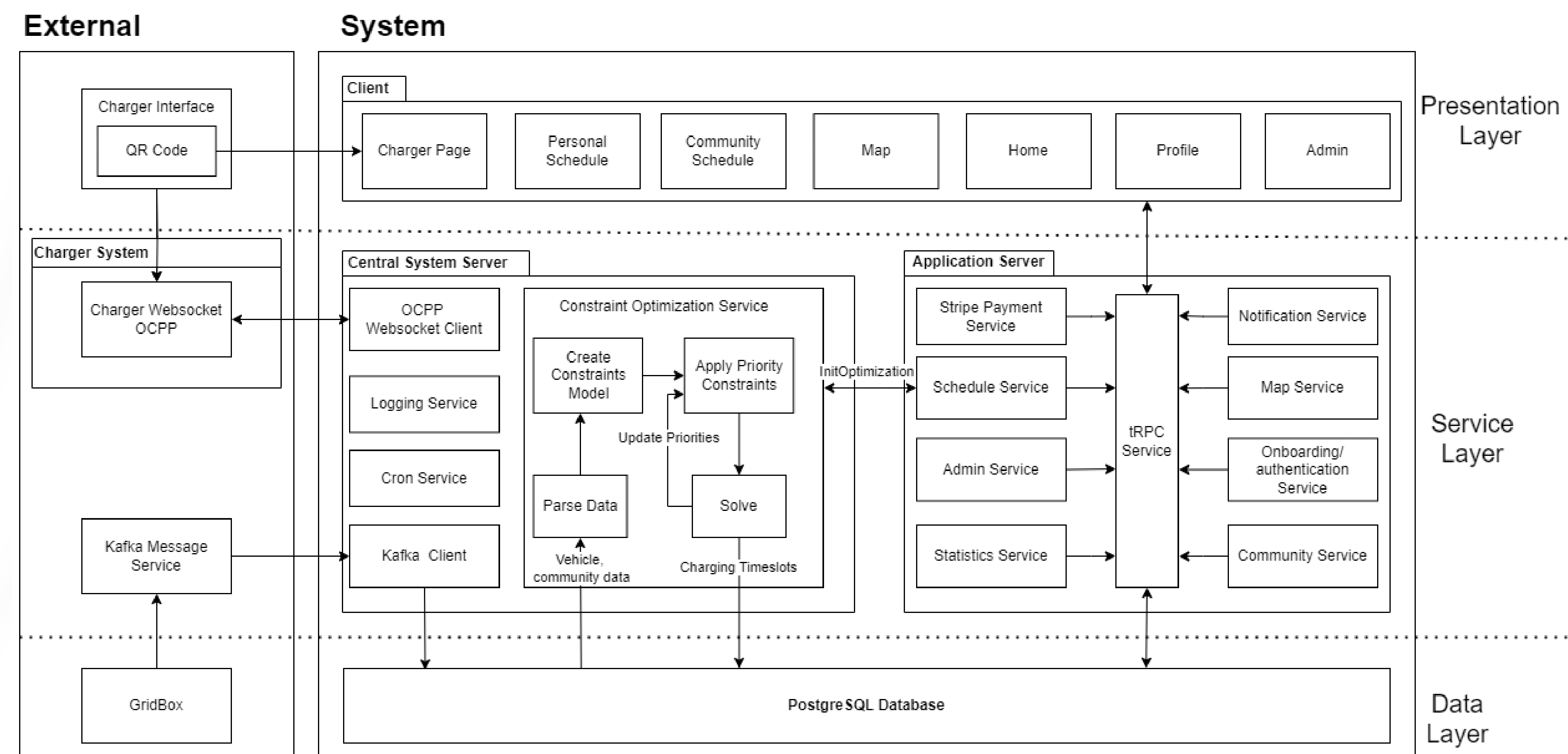
STACK DIAGRAM
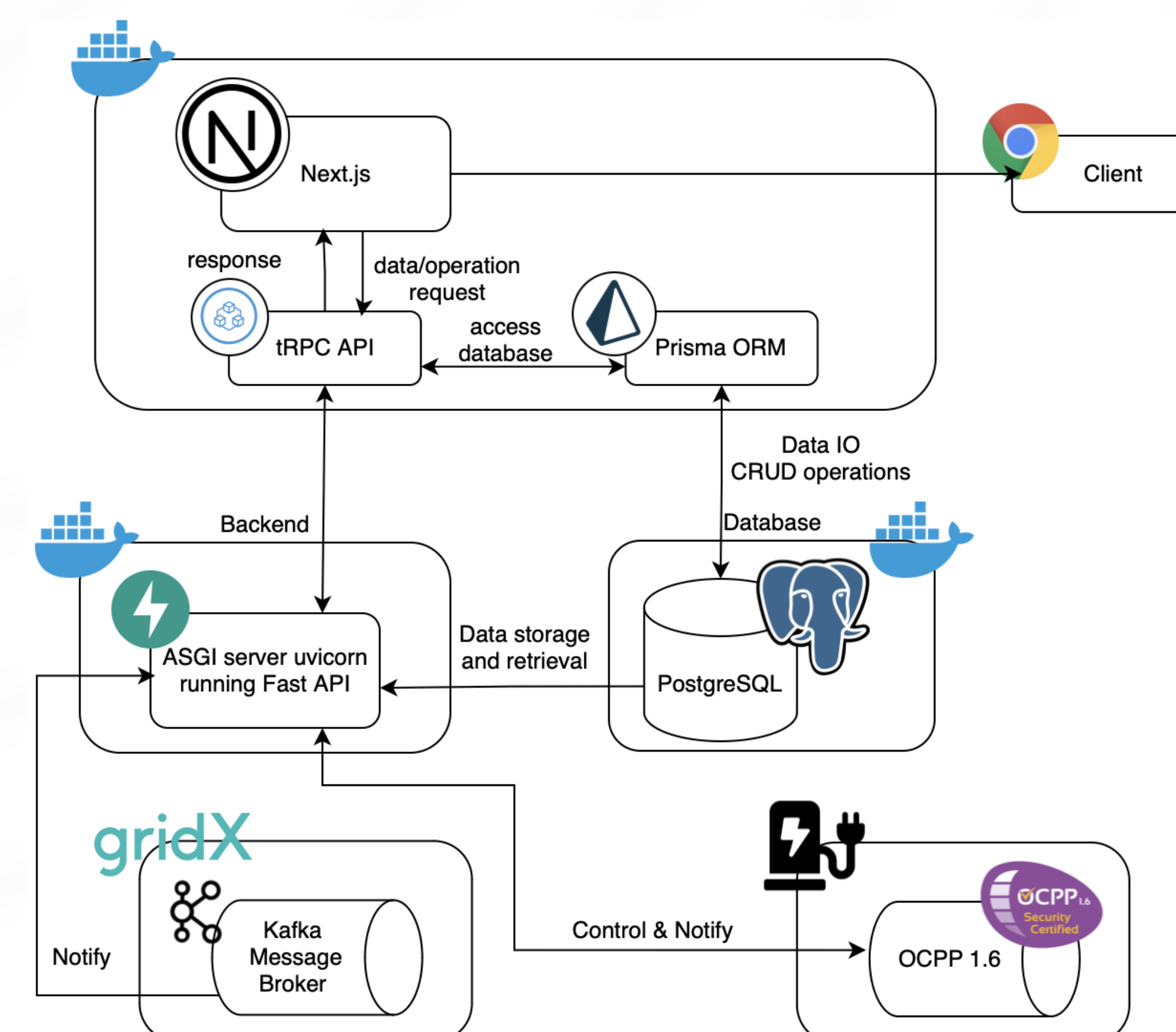
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WITH CREDITS TO

LABORATORY OF
ENERGY POLICY