🚀 Open Labs Share

A Collaborative Learning Platform

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Agenda

- **Problem Statement:** The Theory-Practice Gap
- **Target Audience:** Experts & Learners
- **Our Solution:** The Open Labs Share Platform
- **Key Features:** What We Offer
- **Live Demo:** Platform in Action
- **Technology Stack:** Under the Hood
- **Challenges & Lessons Learned:** Our Journey
- **Team Contributions:** Who We Are

The Problem: A Gap Between Theory and Practice

In today's tech landscape, there is a significant disconnect:

- **Academic learning** often focuses heavily on theory, leaving students without practical, hands-on experience.
- **Industry demands** professionals who can build, deploy, and maintain real-world software systems from day one.
- **Aspiring developers** struggle to find high-quality, practical projects and mentorship to build a strong portfolio.

This gap makes it difficult for learners to enter the workforce and for experts to share their valuable, practical knowledge effectively.

Our Solution: Bridging the Gap

Open Labs Share is a peer-to-peer educational platform designed to connect experts and learners through hands-on, practical learning experiences.

We solve the problem by providing:

- A structured environment for **subject-matter experts** to create and share high-quality lab assignments.
- A rich catalog of **real-world projects** for learners to build practical skills.
- An integrated **peer-review and feedback system** to foster a collaborative learning community.

Target Audience

Our platform is designed for two key groups:

Experts 🎓

(e.g., Senior Developers, Tech Leads, Educators)

- **Motivations:** Share their expertise, mentor the next generation of developers, and build a professional reputation.
- **Platform Value:** Tools for creating structured, in-depth lab materials and a channel to engage with motivated learners.

Learners 📚

(e.g., Students, Junior Developers, Career Changers)

- **Motivations:** Gain practical skills, build a strong project portfolio, and connect with industry professionals.

Key Features

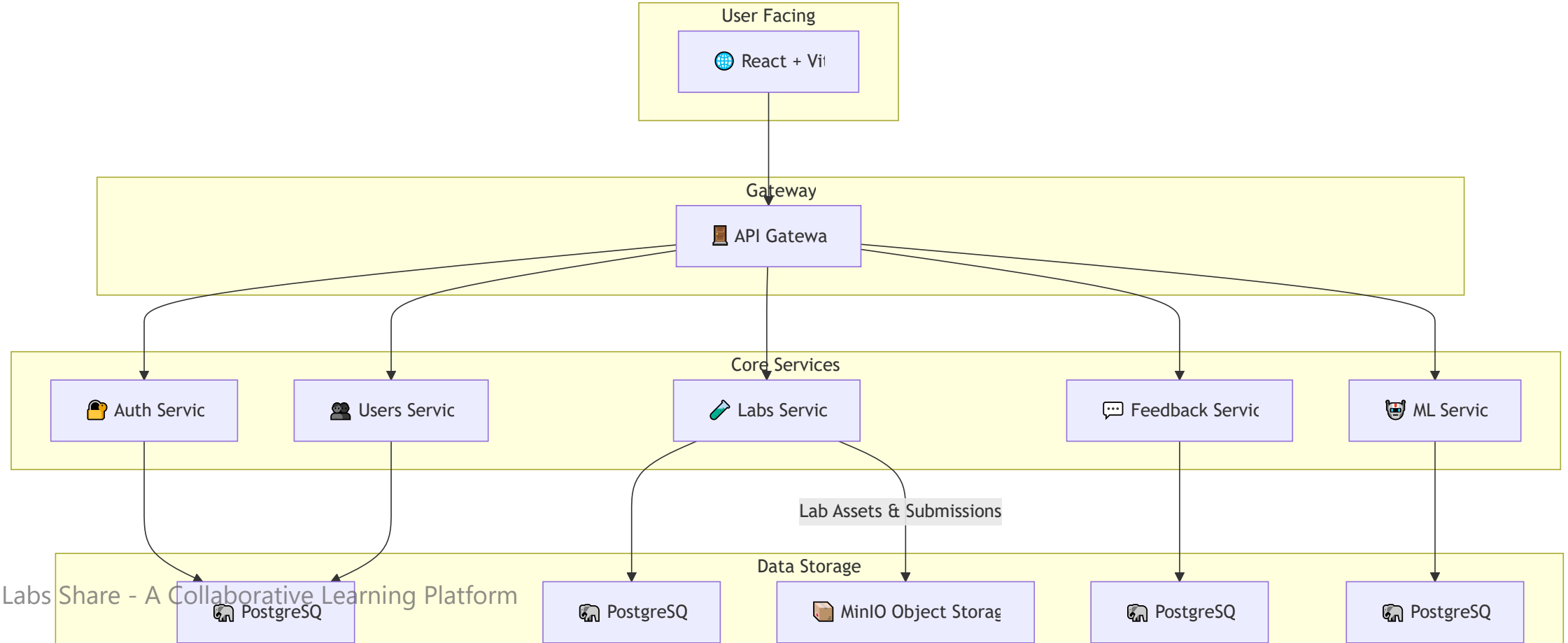
- **Expert-Created Labs:** Step-by-step practical exercises designed by industry experts.
- **Hands-On Learning:** A focus on real-world applications and problem-solving.
- **Community Feedback:** An integrated peer-review system for submitting work and receiving constructive evaluations.
- **Knowledge Sharing:** A collaborative environment for exchanging practical knowledge and expertise.
- **AI Assistance:** An ML-powered assistant to help learners with lab-related questions.

Live Demo Flow

1. **Quick Registration:** Demonstrate the simple onboarding process for new users.
2. **Lab Discovery:** Browse the lab catalog and select an assignment.
3. **Lab Submission:** Complete a lab and submit the work for feedback.
4. **Feedback Discovery:** Review peer feedback on a submitted assignment.
5. **User Dashboard:** Showcase the personal account page with progress and activity.

Technology Stack: Architecture Overview

Our platform is built on a robust microservices architecture, ensuring scalability and maintainability.



Technology Stack: Communication & Data Flow

We use a combination of REST and gRPC for efficient and reliable communication between services.

```
Error 400: SyntaxError: Parse error on line 11:
...uth[🔐 Auth Service (REST)];       ML[
----------------------^
Expecting 'SQE', 'DOUBLECIRCLEEND', 'PE', '-)', 'STADIUMEND', 'SUBROUTINEEND', 'PIPE', 'CYLINDEREND', 'DIAMOND_STOP', 'TAGEND', 'TRAPEND', 'INVTRAPEND', 'UNICOD...
Error: Syntax error in graph
    at Worker.convert (file:///usr/local/kroki/src/worker.js:44:15)
    at async file:///usr/local/kroki/src/index.js:31:28
```

- **REST API:** Used for client-facing communication from the frontend to the API Gateway.
- **gRPC:** Used for high-performance, low-latency internal communication between the API Gateway and core backend services.

Technology Stack: Service Details

Service	Language/Framework	Database	Role
API Gateway	Go	-	Central routing and authentication point
Auth Service	Java (Spring)	PostgreSQL	Manages users and JWT tokens
Users Service	Java (Spring)	PostgreSQL	Manages user profiles and data
Labs Service	Java (Spring)	PostgreSQL, MinIO	Manages lab content and submissions
Feedback Service	Java (Spring)	PostgreSQL	Powers the peer review system

Challenges & Lessons Learned

1. Complex Microservices Communication

- **Challenge:** Ensuring efficient and reliable communication between multiple Java, Go, and Python services.
- **Lesson:** We adopted **gRPC** for internal traffic, which provided strongly-typed contracts, high performance, and reduced network latency compared to a pure REST approach.

2. Consistent Development Environments

- **Challenge:** Onboarding new developers and ensuring a consistent setup across different machines was time-consuming.
- **Lesson:** We embraced **Docker and Docker Compose** to define our entire stack as code. This allows for a one-command setup (`docker-compose up`) and guarantees a

Team Contributions

Our platform was built by a dedicated team of student developers:

- **Alesiya Turushkina**
- **Kirill Efimovich**
- **Nikita Maksimenko**
- **Timur Salakhov**
- **Ravil Kazeev**
- **Mikhail Trifonov**
- **Kirill Shumskiy**

🙏 Thank You!

Questions & Discussion