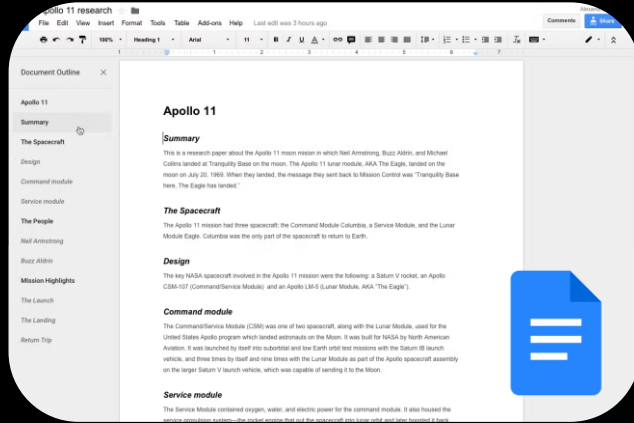# NoteSpace

Multi-platform Web Application for Real-Time Document
Collaboration & Sharing

Guilherme Ferreira 49472 | Ricardo Costa 49511

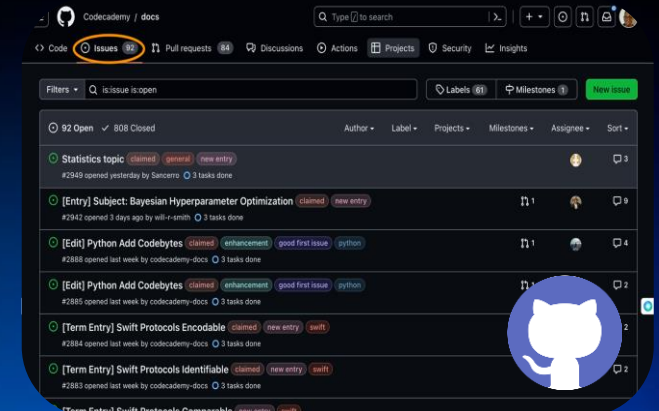Supervisors: Paulo Pereira

March 2024

Introduction

Google Docs

✔️Real-time Document Editing
✔️Rich Text Editor
✔️Collaborative Features

✖️Explicit Version Control
✖️Offline Support
✖️Platform for Sharing Documents
✖️Project Management

GitHub

✔️Version Control
✔️Project Management
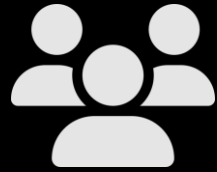✔️Repositories for Code Sharing
✔️Markdown Support

✖️Synchronous Editing
✖️Live Collaboration Features

Goals

Markdown-Supported Editor

Live Collaboration Features

Workspace Management

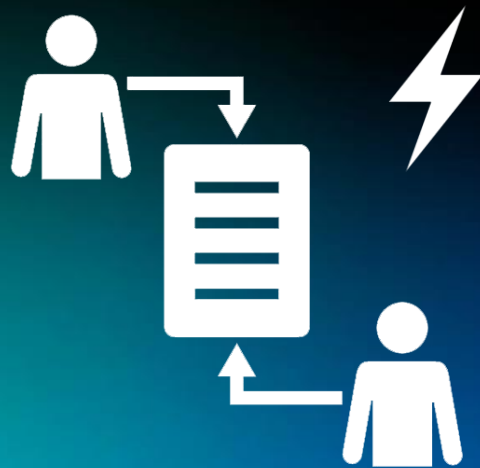Sharing Platform

Multi-platform (PWA)

Offline Support

Version Control

Research - Conflict Resolution Algorithm

- **Operational Transformation (OT)**:
  - Operations are transformed when a conflict is detected.

- **Conflict-Free Replicated Data Type (CRDT):**
  - Operations must be commutative and idempotent, so that the same state is always reached for all clients.
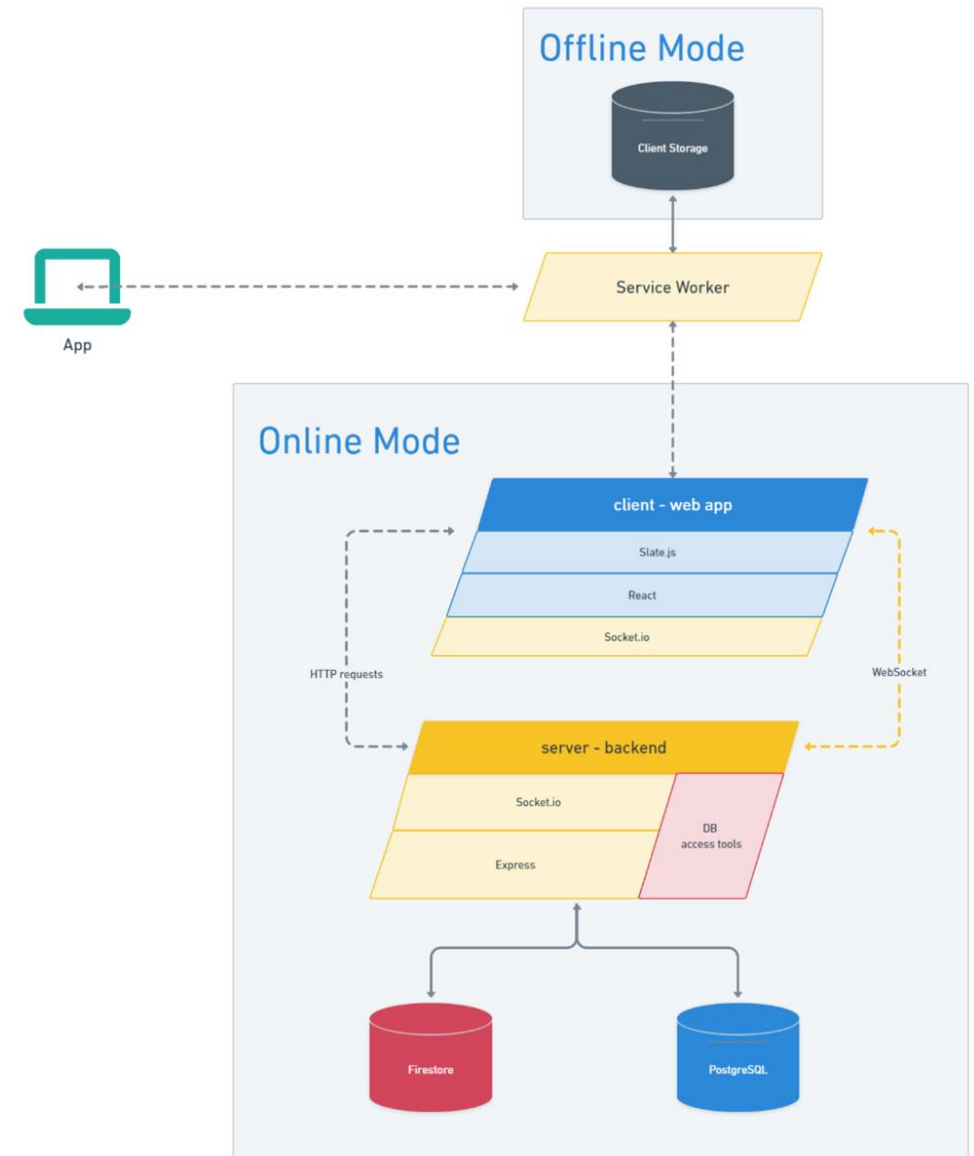
Architecture

Frontend

Backend

Optionals

- Load Balancing
- Content Caching
- Redis Adapter

Challenges

Concurrent Editing
- Conflict Resolution
- State Consistency
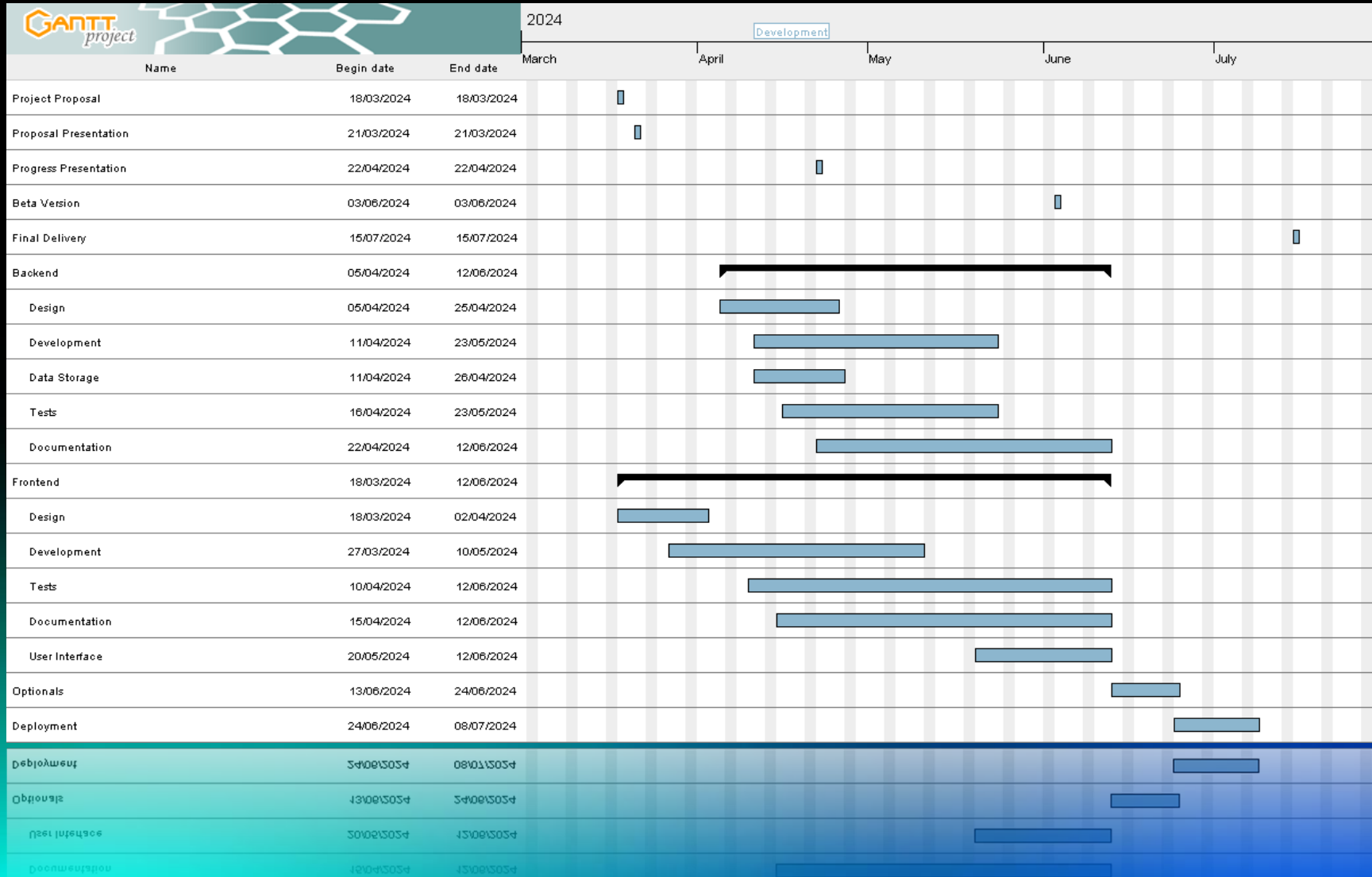- No Data Loss

Offline Support
- Read and Write Documents Offline

Version Control
- Revision
- Rollback
- Fork & Merge

Scalable Architecture
- Fast Content Access
- Elastic Scaling

Project Plan

Questions?

"We are trying to prove ourselves wrong as quickly as possible, because only in that way can we find progress."
Richard P. Feynman