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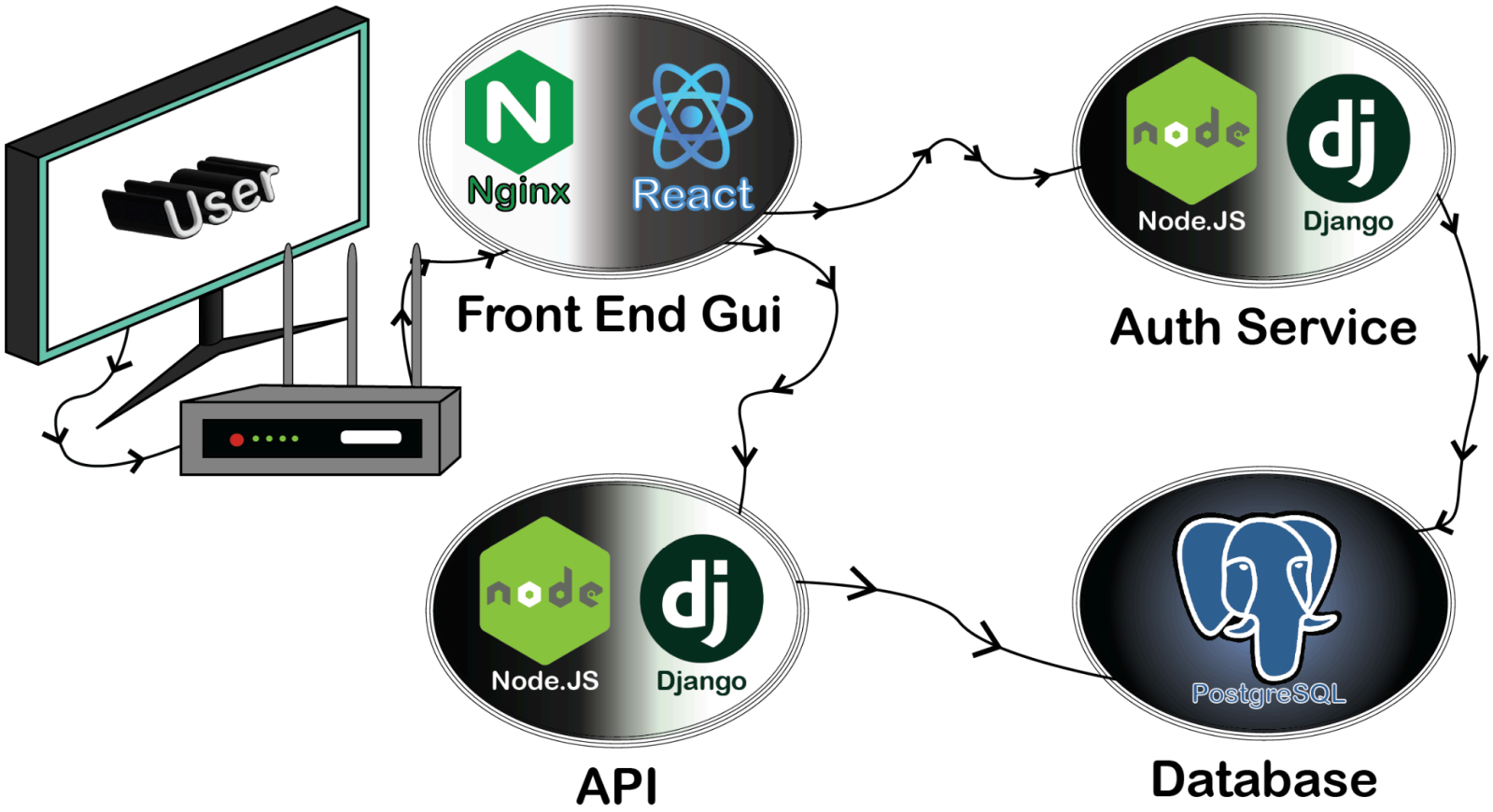
Chapter 1

Though the era of Telnet-accessible forums is long behind us, we at Strata Labs felt that the current browser-based forum space was either too feature-rich, too unmoderated, or too specialized. The likes of Reddit, 4chan, and Stack Overflow all offer unique end-user experiences, but they all come with their own downsides. Going forward with our project, we want to create a simple forum space that allows for posts and threads to be created, where users post replies to the post itself or to other users' post-replies. This will create a dynamic, communicative experience for our users to share messages, news, or information.

Users will be able to create an account with a username and a password in order to access the forum. Posts and replies created by the user will be stored in a database and can be accessed at any moment by the user. User authentication will be required in order to access the user's account on the forum and to view the internal forum posts to prevent crawling. Out of other forum platforms we wanted something that is simpler and moderated, an alternative to the average complicated forum page.

There are four main components in the architecture. A **front-end GUI**, an **API service**, a **user authentication protocol**, and a **database**. The front-end GUI will make calls to the user authentication protocol, and it will make calls to our API service for database read/writes; posting to the forum in all manners will be facilitated with the API service. User authentication will handle the user registration, logins, and session management. The database will store user profiles, user posts, user replies, and users' encrypted login credentials. The database can only be accessed via the API and user authentication services, but the user will be limited in which API calls they can make.



Chapter 2

We propose the following in order to implement our vision: our front-end web GUI will be built with React in conjunction with Nginx on Linux; our authentication service, built with Node.JS and Django, will process requests between the front-end and the database regarding user security, and it will be running on a Linux image; our database will be built using PostgreSQL and an official Docker image; finally, our API service, which will handle the majority of traffic- posts and replies- will be built using Node.JS and Django. All of these will be containerized Docker images, and they will be hosted on CloudLab.

Nooh will build our front-end web GUI, Demetrius will be responsible for the API service, Evan will implement our authentication service, and Jay will construct the database. We expect to have the individual components finished by Week 7, 3 March. We will have the entire project finished by Week 15, 28 April.

Chapter 3

The entire app can be launched beginning with our docker-compose.yml file. This file declares three services will run: our frontend, our API, and our database.

Beginning with our frontend, it begins with a Dockerfile. We first pull a nginx image. Next we copy three files: index.html, forum.js, and nginx.conf. We then expose port 80.

Next, for our API, we first prepared a Dockerfile located in the /api directory. This image is built using a node image. We then had to ‘npm install’ a few packages locally on our machines before then copying package.json and package-lock.json to the image using the COPY command in the Dockerfile. After that, the image runs ‘npm install’ so that all dependencies are installed (note that we are NOT copying the ‘node_modules’ directory to the image). After this, we copy the server.js file, expose port 3000, and node server.js.

Finally, we do not have a Dockerfile for our database, but we do use the docker-compose.yml file to streamline the containerization of the mongodb image offered by Dockerhub. We use the docker-compose.yml file to expose port 27017 and copy our database’s data to the image’s database location.

Jhan Vazquez-Barreto

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EDUCATION

West Chester University of Pennsylvania, West Chester, PA
Bachelor Degree in Computer Science

- GPA: 3.5

Millersville University, Millersville, PA
Major: Computer Science, August 2022 – May 2023

Delaware County Community College, Media, PA
Associate degree in Liberal Arts, August 2020 –
August 2022

Course Experience

CSC 240, Computer Science III - Java. Fall 2024

- Specialized in Object-Oriented programming involving complex programs.
- Initialized a circular linked list data structure to store data for a hotel managing system.
- Implemented a text processing program that collected and formatted data from *The Red Record* by Ida B. Wells.

CSC 231, Computer Systems. Fall 2024

- Acquired skills in understanding components of CPUs, memory, storage, networking, and operating systems.

- Reversed engineered in assembly language back to C language.

CSC 220, Foundations of Computer Science. Spring 2024

- Developed algorithmic thinking in computational logic.
- Initialized complex finite-state machines.

CSC 142, Computer Science II. Spring 2024

- Implemented core logical thinking for problem solving.
- Studied primitive types and strings inside an array.
- Initialized sorting and searching in an array.
- Introduced to objects and classes.

CSC 301, Computer Security & Ethics. Fall 2024

- Developed skill in creating secure systems.
- Developed understanding of cyber attack methods and defenses.

Personal Project

Database Structure, December 2024

- Implemented a complex singly linked list data structure that allows for large amounts of data to be stored.

Technical Profile

Languages: Java, Python, C, Racket, some assembly

Software Tools: Visual Studio Code, Eclipse IDE

Operating Systems: Linux, Windows

Relevant Courses: Discrete Structures, Calculus 1, Calculus 2, Intro to Statistics

Work Experience

Giant Food Company, Kennett Square, Pa

Replenish associate, July/2021 – Present

- Replenish stock and complete tasks in a timely manner
- Specializes in leading team work
- High drive in customer experience
- Prospers in communication skills

Lowe's Companies Inc., Avondale, Pa

Seasonal Garden Associate, May/2021 – July/2021

- Provided aid towards difficult tasks involving customers, and coworkers with care
- Sufficed in one-to-one customer service
- Drove department sales
- Collaborated successfully with other store departments