

Analyzing-and-Designing-Complex-systems-using-graphql

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Problem Statement

Bank of America wants to enhance their shared services layer to produce robust data visualization, quality control, and access control. To enhance decision-making and security, the next phase of the project will integrate new tools, develop key features, and strengthen data management.

Background

Bank of America is looking to create a shared services layer to centralize and standardize the way the data is served up to the business. In the first phase of this project, the foundation was established. A dashboard was developed integrated with SQL databases using tools such as Hasura, Denodo, GraphQL, and Python. The second phase of this project aims to integrate more tools, develop more features, and inject more security into this application.

Specifically issues that need to be addressed are:

- A lack of data visualization- Visualization capabilities is an issue as a lack of avenues with which employees can interact with the data.
- Quality control- Data quality issues surrounding costly data leaks.
- Access control- Data security issues surrounding data access and privacy.

Proposed Solution

Our proposed solutions to these problems are:

1. Optimization of the piping from the database structure to the front-facing system
 - a. Look and solve for any data leaks and optimize the process for a large volume of calls/queries.
 - b. Implement a database monitoring tool
1. Introduce the ability to run the Hasura API in outside visualization platforms with security
 - a. Utilize a data visualization tool with Auth0 security to ensure data governance.
 - b. Test Scalability with large-scale data implementations, live data storage, and multi-user API calls
1. Use a variety of database types implement into our Hasura system
 - a. An additional goal given time is to create a postgres and mysql database along with a flat file to show flexibility
 - b. Given leftover time, alongside Airbnb Listings data, we will implement a customers database to show complex relationships between the two.

Potential Issues

Data Visualization Technology

- Possibility of switching from Talebau to alternate data visualization source based on available capabilities of Hasura.

Data Quality Control

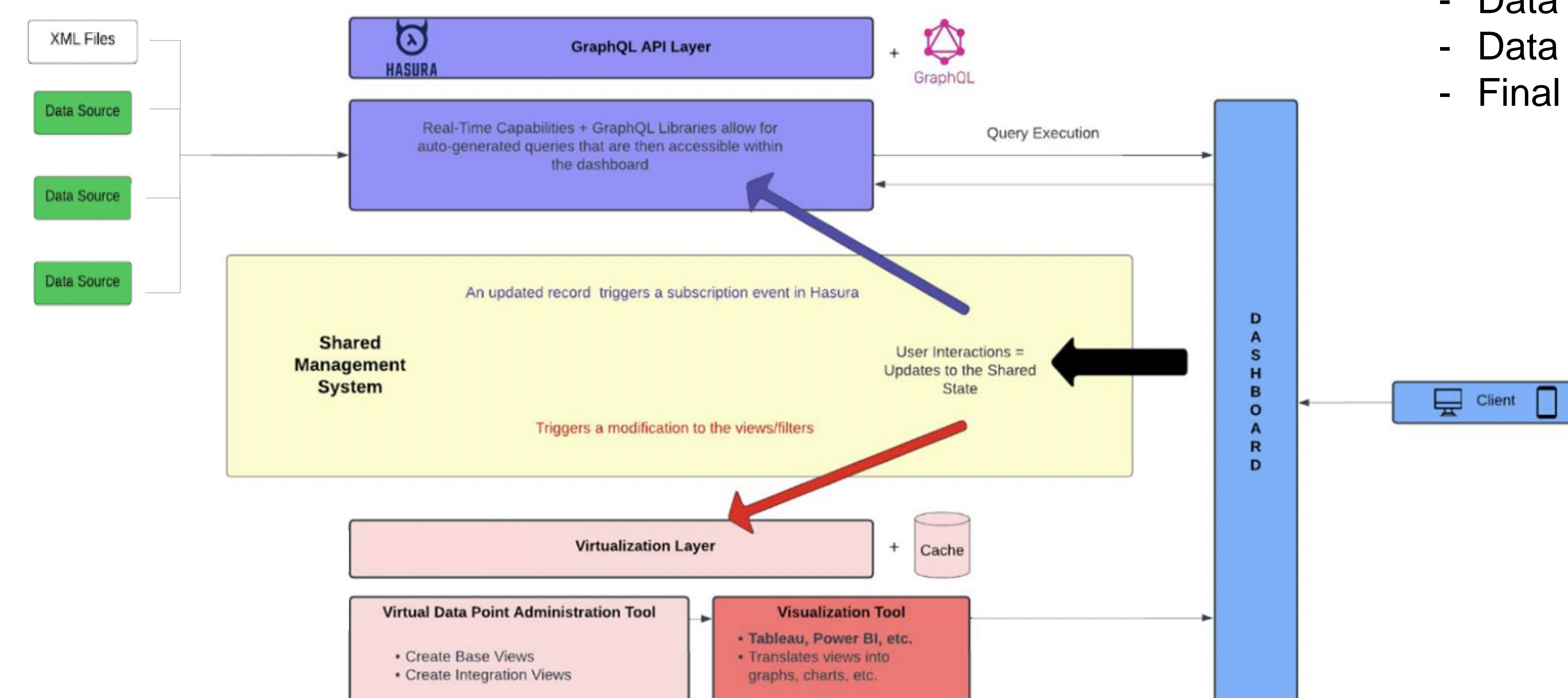
- Difficulty getting accurate transfer times on data movement through the application.

Individual Authentication Issues

- Possibility of issues when using Auth0 as authentication source for later data governance rules.

Deliverables

- Preliminary Design Report
- Project Design Report
- Updated Base System
- Data Connection to Tableau
- Data Governance and Quality Assurance
- Data Quality Tests
- Data Visualisation Dashboard
- Final Presentation and Capstone Expo



Anil, A., Gandhi, M., Goyal, N., Johnson, G. (2023). Capstone 24-314 Architecture Diagram [Modified].



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