BITBY

Software Architecture Document
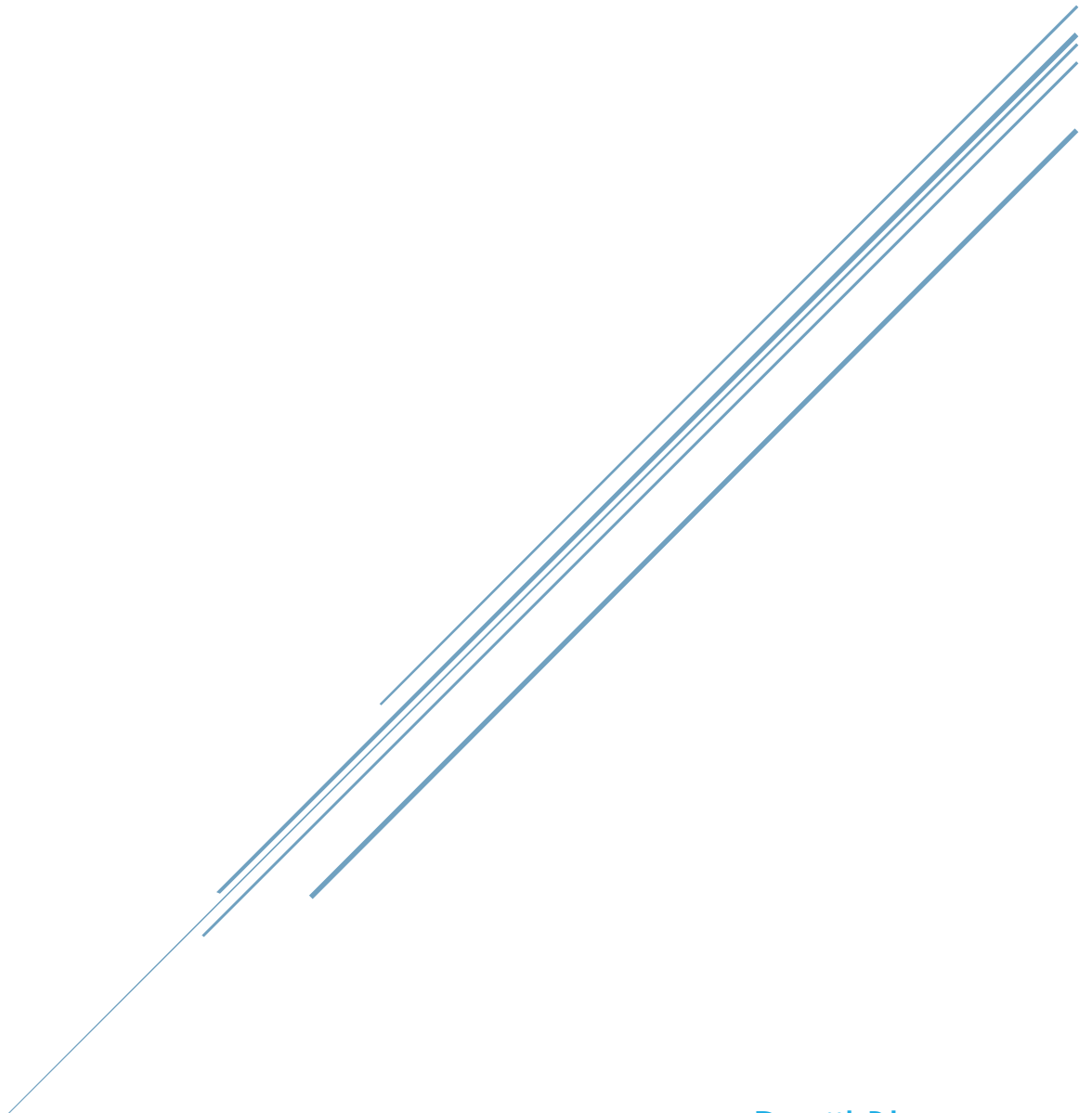
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Software Engineering Semester 3

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Introduction

BitBy is a crypto exchange software system which gives traders the possibility to manage their positions in a real-time market and to keep track of their performance through statistics. The second user of the app are the admins, who have the role of an overseer more than anything. The exchange uses 2 external systems which are TradingView and Binance- TradingView to acquire the real-time chart from and Binance for the real-time price of Bitcoin.
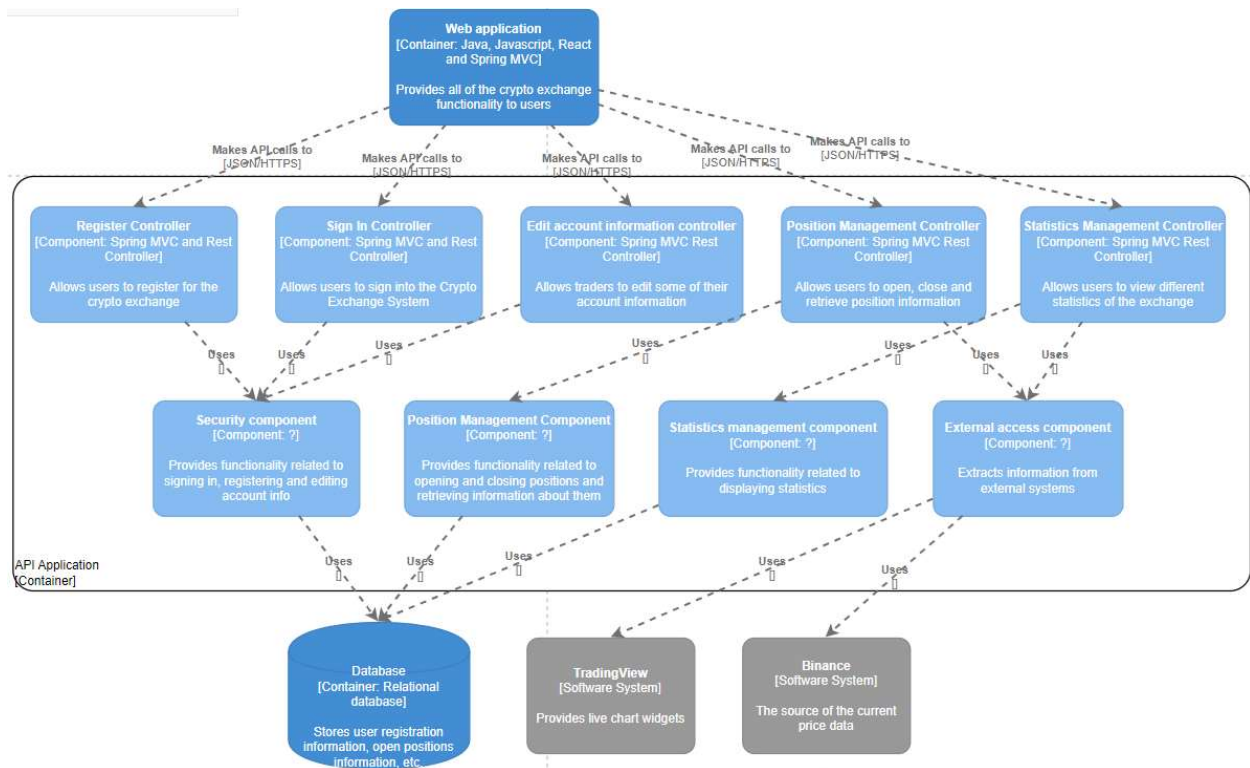
System context (C1)
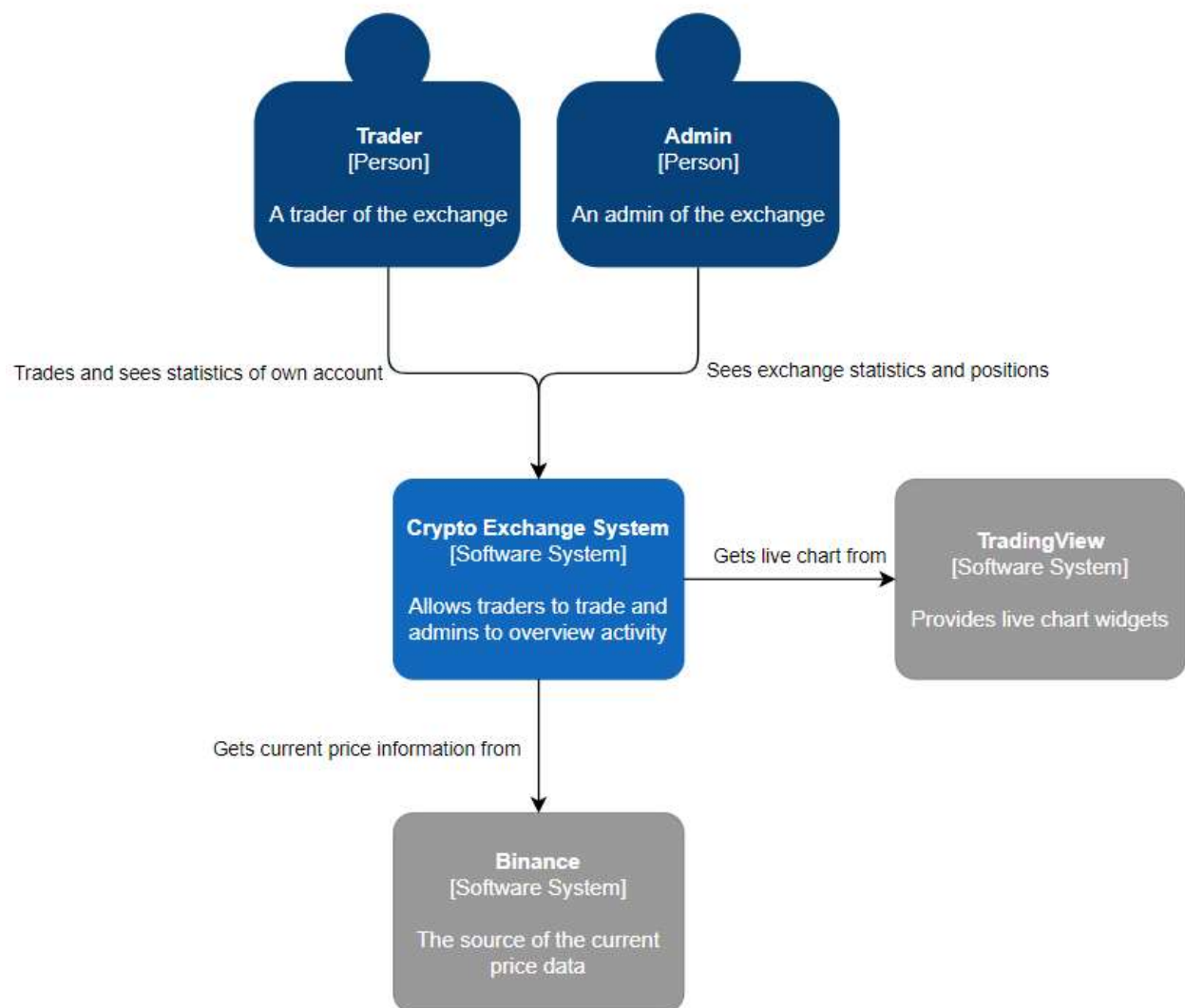
Containers (C2)

In the C2 we have the trader and admin get access to the exchange's functionalities through the web application, which is connected to the API application. The API application communicates with TradingView in order to get the live chart and with Binance in order to get the real-time Bitcoin price.
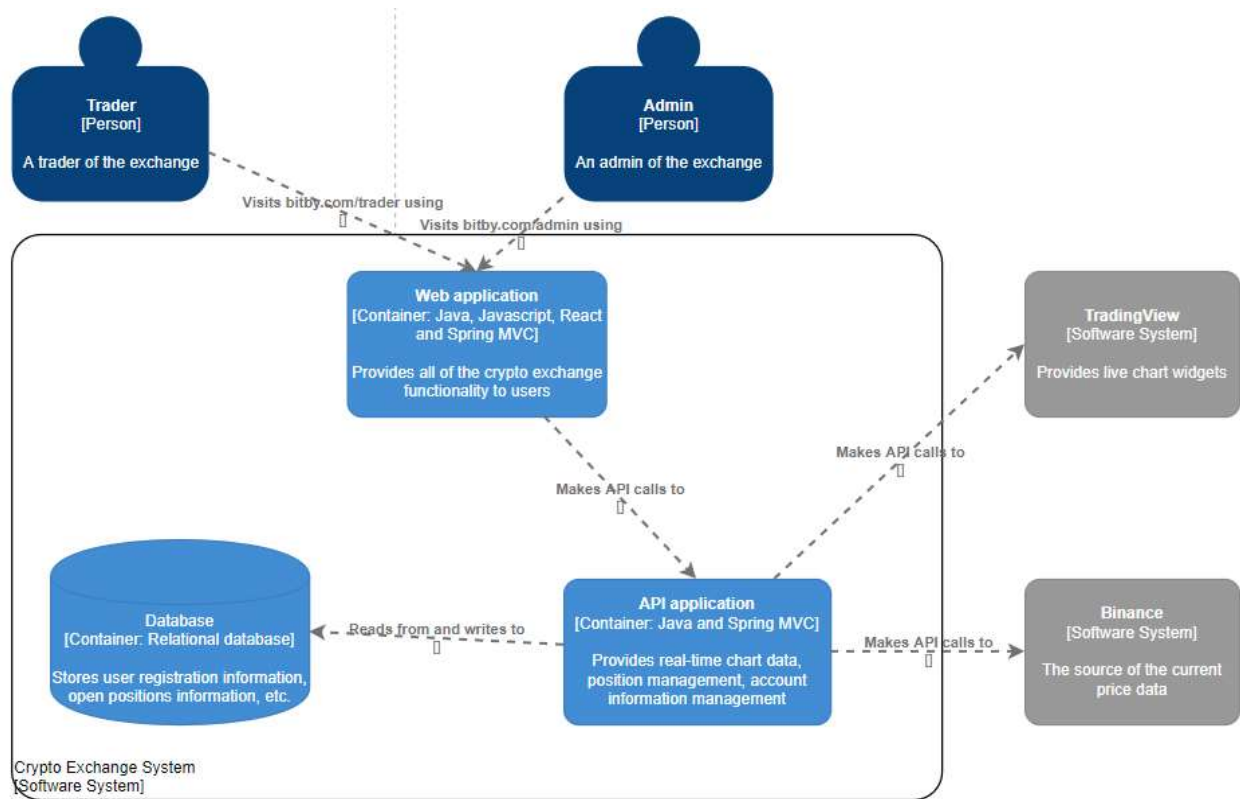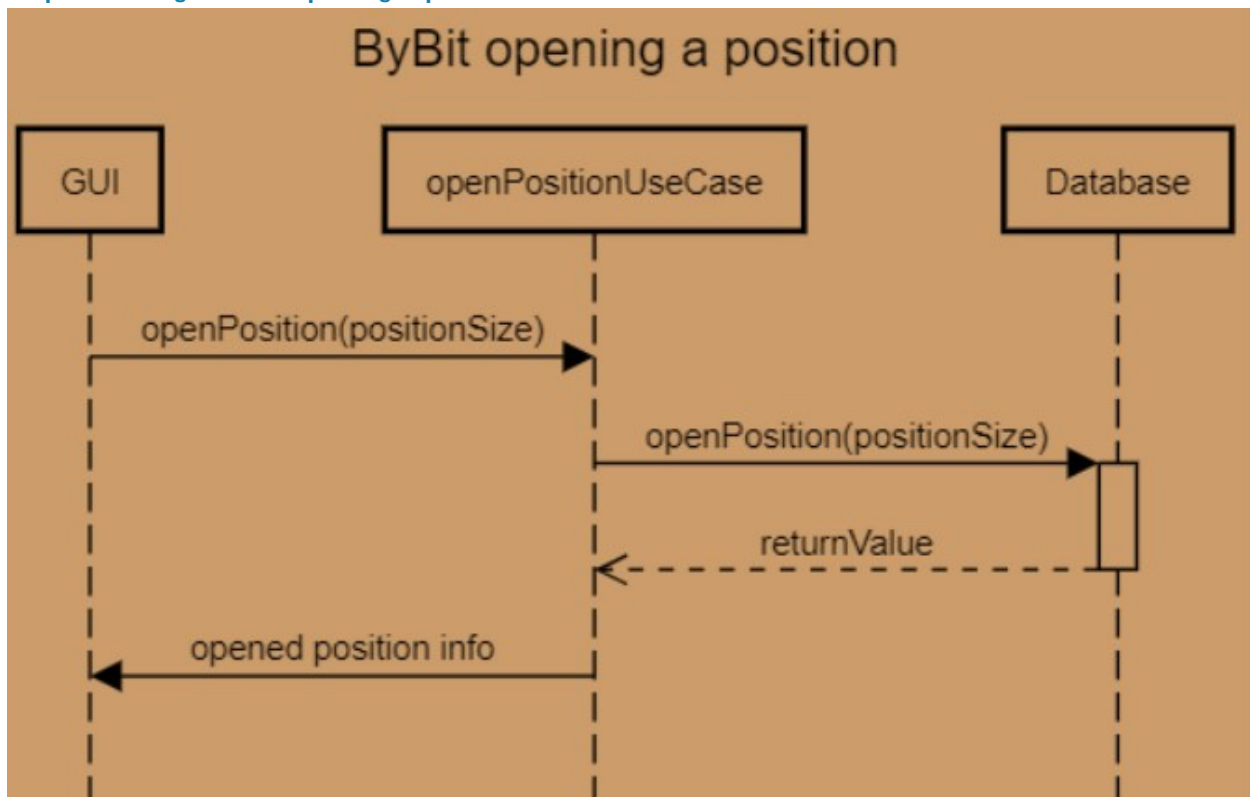
Components (C3)

In C3 we have the controllers communicating with the appropriate for them component. All of the components are required to be communicating with the database in order to fulfill their functionalities, except the external access component. That one is used to retrieve information from the external systems used in the project.

Sequence diagram for opening a position

ByBit opening a position

GUI   openPositionUseCase   Database

openPosition(positionSize)

openPosition(positionSize)

returnValue

opened position info

Interaction between layers

Controllers

(PositionController) (TraderController) (TickerPriceController) (UserController)

Business

(Interface)

(Implementation)

Persistence

(Interface) —— (JPA)
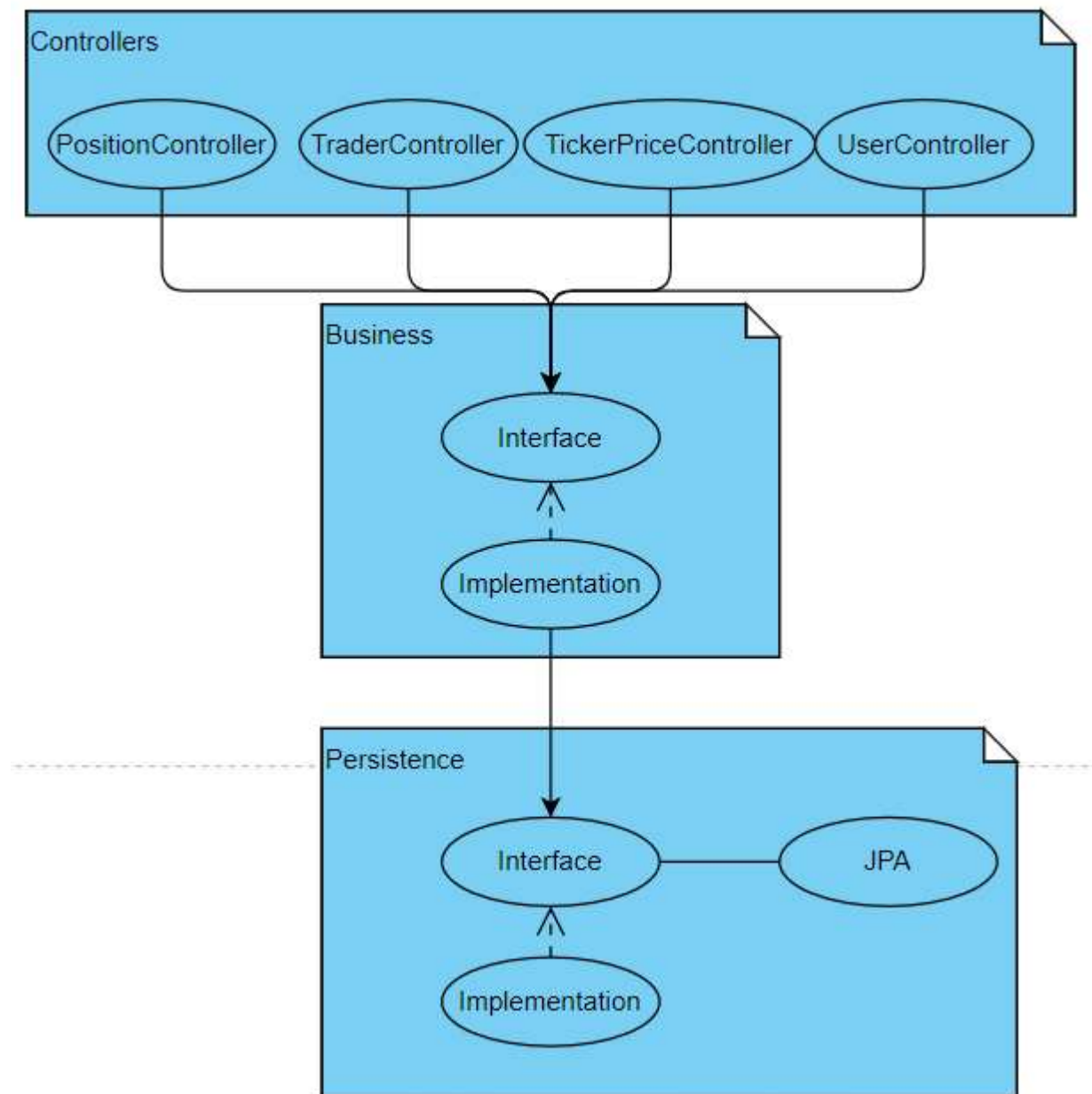
(Implementation)

This is how the layers in the application interact with each-other. Dependency inversion is guaranteed through the use of interfaces. The controllers are talking to the interfaces from the business layer, which the business implementations are dependent on. The implementations are talking to the persistence interfaces, which the persistence implementations are dependent on. The persistence interfaces also implement JPA classes.

CI pipeline setup diagram
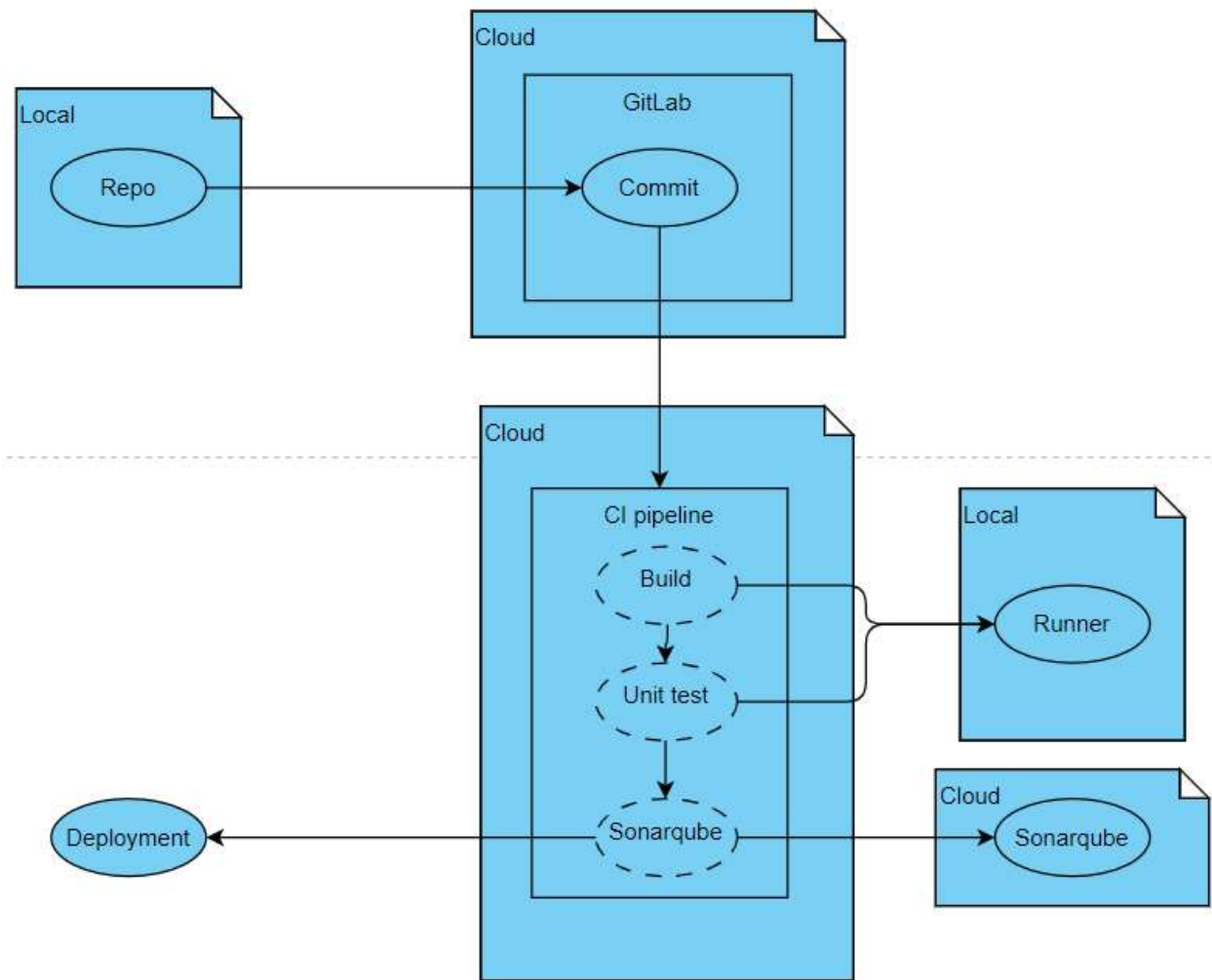
Security

BitBy will mainly be secured by JWT. Once the user is logged in, each subsequent request will include the JWT, allowing the user to access routes, services, and resources that are permitted with that token.

Reasoning behind system choices

- TradingView
    - I have chosen to use TradingView because it is the most widely spread charting tool and it is extremely convenient to implement into a React-based front-end through the widgets provided on their website.
- Binance
    - I have chosen to use Binance as a provider for Bitcoin's current price due to it being the biggest and most used exchange. Also, because we pretty much have the code for it already from a past assignment.
- Relational database

- o I have chosen to use a relational database for this project firstly due to the fact that I have experience in using them and secondly because of their highly organized structure combined with flexibility offered by the relations between tables.
- Java, JavaScript and React
    - o Those are used mainly because they are required for this project.