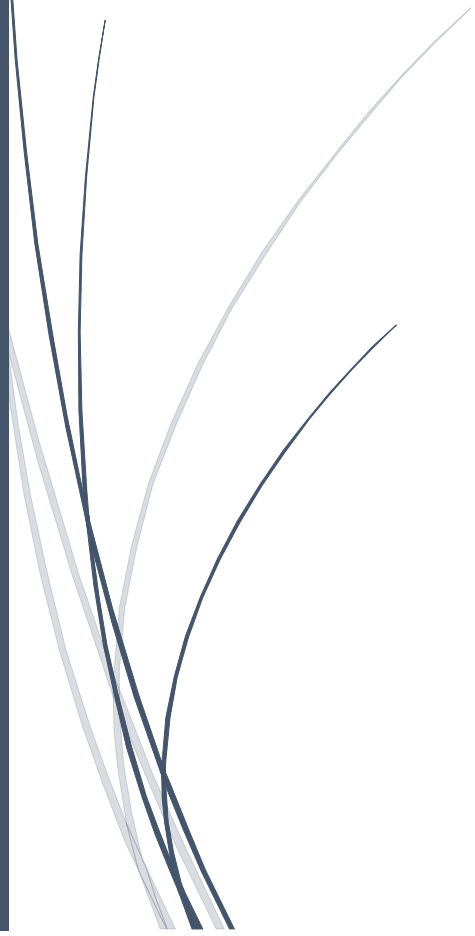
1/13/2022

Design Document

belongs to project: Margarita



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Class: S3-CB-01

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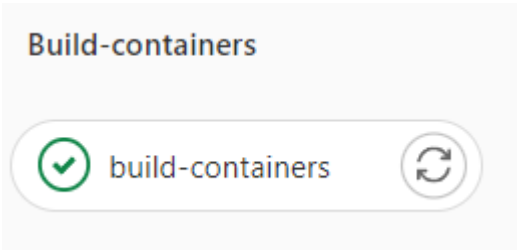
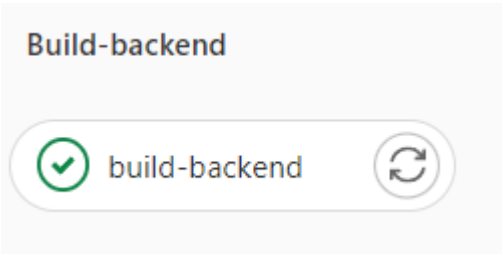
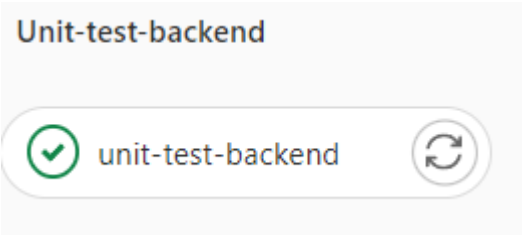
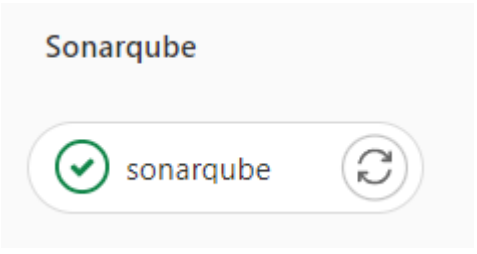
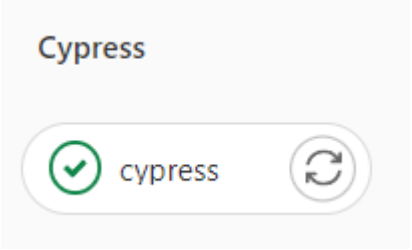
CI/CD Pipeline

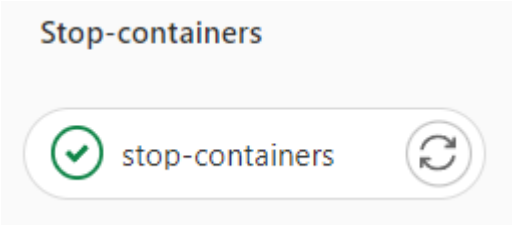








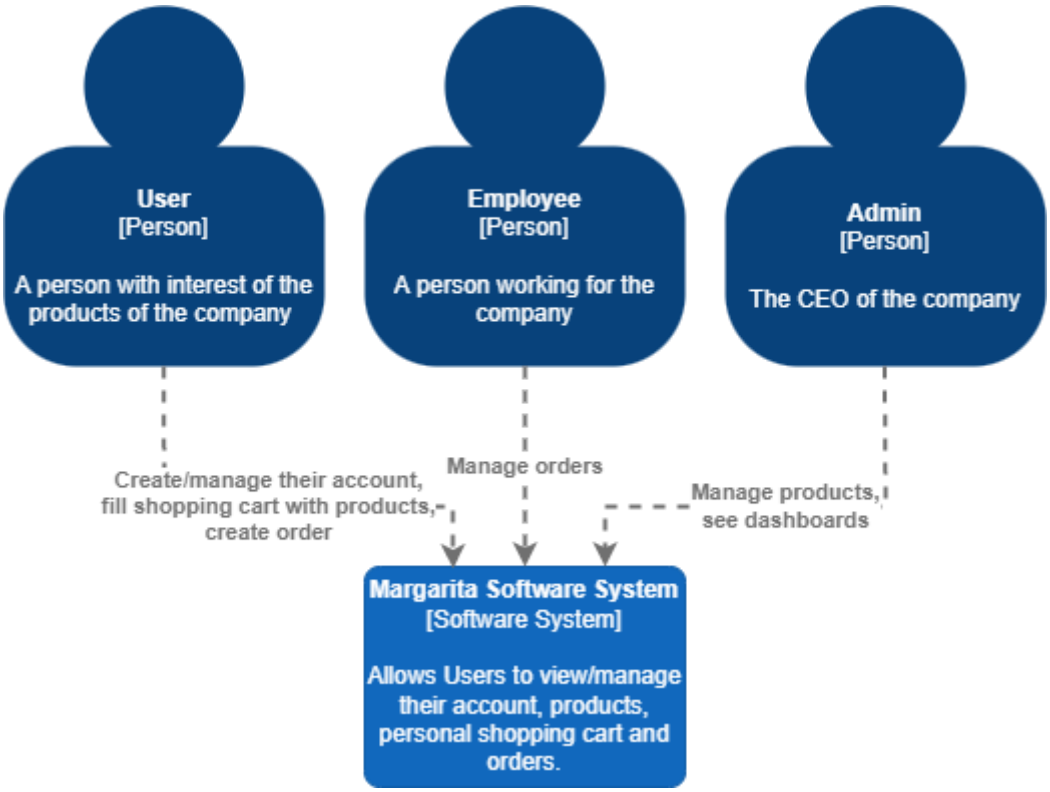




- Start containers
  1. Frontend
  2. Backend
  3. Database
- Test Building the backend
- Test run the backend unit tests
- Test run backend software quality
- Test run front end and E2E tests
- Stop the containers

C4 Model

C1:



➢ In this project, there are 3 different roles.

- User

  The user can create account, view products filtered by category, add them to his shopping cart, and order them.

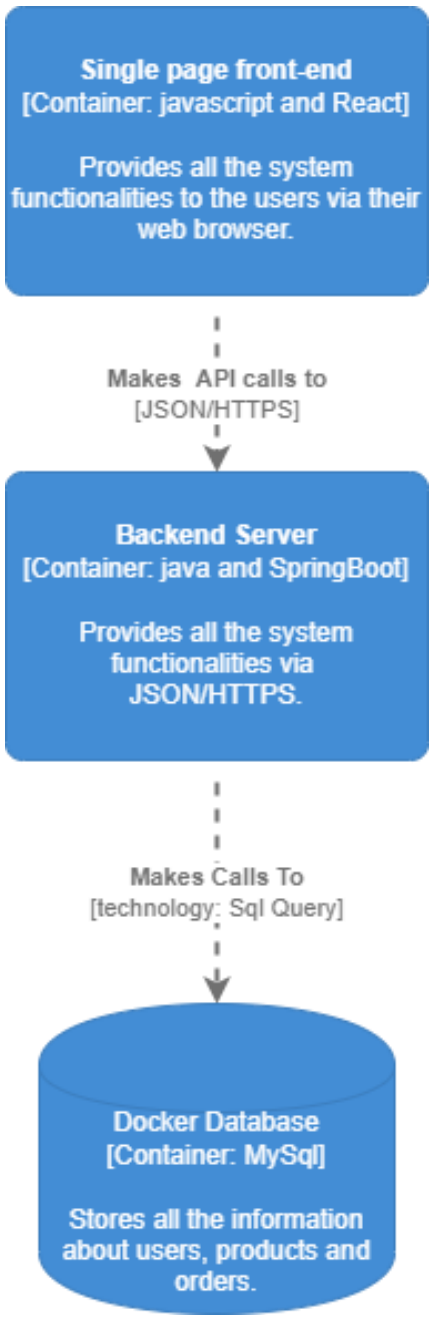
- Employee

  The employee's only extra functionality is to see a table with all new orders. Next to every order, he will see a button for confirmation. When he clicks it the order's status is changed to shipped.

- Admin

  The admin has full control over all functionalities in the software. He can see dashboards with live information related to products and orders. He is managing the products.

C2:


Single page front-end
[Container: javascript and React]
Provides all the system functionalities to the users via their web browser.
Makes API calls to
[JSON/HTTPS]
Backend Server
[Container: java and SpringBoot]
Provides all the system functionalities via JSON/HTTPS.
Makes Calls To
[technology: Sql Query]
Docker Database
[Container: MySql]
Stores all the information about users, products and orders.

Frontend

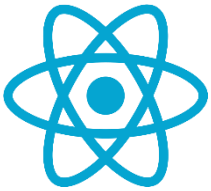
1. JavaScript

a. Why

Because we want the application to be dynamic. With JavaScript, we can choose from a variety of frameworks and libraries to create this project.

2. React

a. What is



React.js is an open-source JavaScript library that is used for building user interfaces specifically for single-page applications. It's used for handling the view layer for web and mobile apps. React also allows us to create reusable UI components. React allows developers to create large web applications that can change data, without reloading the page. The main purpose of React is to be fast, scalable, and simple. It works only on user interfaces in the application.

b. Why

JavaScript has a lot of frameworks/libraries to choose from. The most popular ones are Angular and React. In my research, I found that React is more suitable for this project with its easier learning curve. Also React is a fast and reliable library with a great component base layout.

3. Extras:

a. Nivo

- What is:

Nivo is a data visualization library built for React.js and makes use of the data visualization library D3.js. The library uses functionality from D3.js to create components of various charts like bar charts, line charts, radar charts, scatter plots, and heat maps that are ready to use.

- Why:

There are many chart libraries for React.js available, like Recharts.js, Victory, and React-chartjs-2. After research, I found that Nivo is well maintained and has excellent documentation that allows a developer to quickly become acquainted with the various features of the library.

For this software, we will need a simple bar chart and Nivo is the perfect
option with its easy to lean documentation.

b. Cypress

This is a powerful tool for testing. You can find more information about it in the Test plan.

Backend

4. Java

a. Why

Because it has many inbuilt security features like advanced authentication, cryptography, and access control which makes it highly useful for this project. Using these features, we can use its comprehensive API including secure login mechanisms, digital signatures, ciphers, creating a custom security policy, and more.

5. SpringBoot

a. What is

It is a tool that makes developing web applications and microservices with Spring Framework faster and easier through three core capabilities – autoconfiguration, an opinionated approach to configuration, the ability to create standalone applications. These features work together to provide you with a tool that allows you to set up a Spring-based application with minimal configuration and setup.

b. Why

One of the most used Java frameworks is SpringBoot. It is easy to learn and use, very efficient with a variety of useful tools such as data JPA and Spring Security. Another reason why I chose SpringBoot is that it provides several utilities and annotations which help with testing the application.

6. Extras:

a. JPA

What is

Spring Boot JPA is a Java specification for managing relational data in Java applications. It allows us to access and persist data between Java object/ class and relational database.

Why

It will save time and effort building the data access layer.

b. Spring Security

What is

Spring Security is a framework that focuses on providing both authentication and authorization to Java applications.
Spring Security is the primary choice for implementing application-level security in Spring applications. Generally, its purpose is to offer you a highly customizable way of implementing authentication, authorization, and protection against common attacks.

Why

This framework will help with securing the application. We will also use JWT /JSON Web Token/for authentication and authorization.

c. SonarQube

This is a powerful tool for testing. You can find more information about it in the Test plan.

C3:

The focus here is on the design. Every layer of this design is made in such a way that its access is limited only to a point that it is efficient and secured at the same time.

1. Controller
    a. The controller handles incoming browser requests, retrieves necessary model data, and returns appropriate responses. The returned response in our case is DTO object/s. They contain only the necessary data.
2. Service/Repository Interface
    a. The purpose of the interfaces here is to hide implementation details of classes from each other
3. Service
    a. The Service layer's single responsibility is to do any logic required with the data received by the Controller.
4. Repository
    a. The repository's single responsibility is to query the database.