POLYTECHNIC OF CRETE

ECE DEPARTMENT

COURSE: PLH 513 - CLOUD & SERVICES

Project Report

Name: Nikolaos Papoutsakis
Student ID: 2019030206

Title:

Full Stack E-commerce Application

Introduction:

This report describes the development of the full-stack application project. In this project, we used frameworks like React JS for the frontend and Express JS for the backend. Also, we implemented a user registration system with Keycloak, providing user authentication and registration, and Apache-Kafka, a publish-subscribe model for backend server interaction. The application has two backend servers, one dedicated to orders and the other to products, each seamlessly connected to PostgreSQL databases.

Frontend Development:

React's component-based architecture makes it easy to create modular and reusable UI components, contributing to an easily maintainable application. In this project, two main routes are rendered, one for customers and one for sellers. Each role has its own set of sub-routes that can only be accessed by authorized users, improving the security of the application.

Backend Development:

ExpressJS is the backbone of the application backend. RESTful APIs are created to handle product and order-related functionality. The separation of backend servers for orders and products supports a microservices architecture, increasing modularity and scalability.

Apache-Kafka:

KafkaJS is integrated to establish a publish-subscribe model for communication between the order and product backend servers. This asynchronous processing of messages improves the overall performance and responsiveness of the application.

Keycloak:

The Keycloak service was implemented to manage user registration, login and logout, and to provide an authentication layer for the application. It also gave us the ability to handle the access token at login and verify the endpoints that the user can access. On the front end, PrivateRoute components are rendered to ensure that the user cannot access pages without permission. The backend, on the other hand, was enhanced by adding custom middleware to ensure that the user is authenticated and can receive appropriate information from the databases.

Google Cloud Platform:

After successful development, the full-stack e-commerce application was deployed on a VM instance within Google Cloud Platform (GCP). You can interact with the application hosted at

http://34.118.108.175:3000/

Finally, I must mention that all the specified tasks outlined in the assignment have been successfully completed.