# Project Description

***for CENG 415 and CENG 416 Senior Design Project & Seminar I-II***

**Title**

Implementing Role-Centric Attribute-Based Access Control (RABAC) in Microservice Environment

**Members**

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Our project is being supported by Delta Akıllı Teknolojiler A.Ş.

**Project Summary**

The adoption of microservices architecture has grown significantly in recent years, offering scalability, flexibility, and maintainability benefits. However, ensuring robust access control across microservices can be a challenge. The motivation for this project is to address this challenge by implementing a dedicated RABAC service.

This project aims to develop a microservice infrastructure consisting of 3-5 services, with a dedicated Role-Centric Attribute-Based Access Control (RABAC) service. The primary goal is to design and implement the RABAC service and seamlessly integrate it into the microservice environment to enhance access control mechanisms.

This project offers enhanced security with fine-grained RABAC access control, enabling organizations to define role and attribute-based access policies and ensure authorized resource access. Additionally, RABAC implementation in a microservice environment strengthens governance and compliance through auditable and maintainable access control policies.

**The key features of this project include:**

RABAC Service: The design and development of a dedicated RABAC service capable of managing access control for the microservices.

API Endpoints: Implementation of API endpoints to enable interaction with the RABAC service, allowing microservices to query and enforce access control policies.

Access Control Policies: The project will define and implement access control policies based on roles and attributes, ensuring that only authorized users can perform specific actions.

Integration: Seamless integration of the RABAC service with the microservice architecture to ensure proper communication and functionality.

The project's technology stack includes HTML5 and React for dynamic front-end interfaces, CSS3 for styling, JavaScript for client-side interactions, Material UI for improved user experiences. On the backend, Java and Spring Boot power microservices, with Kubernetes for scalable container orchestration. Data is stored and managed using MySQL, ensuring robust data capabilities.

In conclusion, the successful implementation of the RABAC service in the microservice environment will contribute to the security and governance capabilities of the system. This project not only addresses a critical need in modern software architectures but also provides valuable experience in working with cutting-edge technologies and methodologies.

Note: As a group we made an effort on projects’ design concerns such as database design, object modeling, user interfaces and protocol implementations, ensuring that all elements of the system are well-considered and optimized for functionality and efficiency.