

# EzMail Microservices Project Documentation

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## Introduction

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EzMail is a microservices-based email delivery system designed to provide scalable, efficient, and secure email communication. With the increasing demand for reliable email services, businesses face challenges in handling authentication, rate limiting, tracking, and deployment. EzMail leverages modern microservices architecture to ensure seamless email processing while maintaining security, efficiency, and flexibility.

## Problem Statement

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Traditional monolithic email services suffer from scalability issues, security vulnerabilities, and inefficient tracking mechanisms. Businesses need a modular, scalable solution that can:

- Handle high volumes of email requests efficiently.
- Ensure secure authentication and prevent unauthorized access.
- Provide detailed logging and monitoring for email tracking.
- Implement rate limiting to enforce fair usage policies.
- Support seamless deployment and maintenance with minimal downtime.

## Objectives

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The primary objectives of the EzMail project are:

- **Scalability:** Design a modular microservices architecture to handle increasing email requests.
- **Security:** Implement JWT-based authentication for secure API access.
- **Rate Limiting:** Prevent excessive API usage to ensure fair access to resources.
- **Tracking & Logging:** Provide comprehensive logs for monitoring email delivery and user activity.

- **Deployment Efficiency:** Utilize containerization for easy deployment and scalability.
- **User Management:** Support subscription-based plans with automated billing and quota enforcement.

## Scope of the Project

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### In Scope

The following components and features are included in the project:

- Microservices for user authentication, email processing, billing, and API gateway.
- Service discovery using Eureka for efficient communication between microservices.
- A web-based dashboard for users to monitor email logs and usage statistics.
- Implementation of rate limiting and subscription-based email quotas.
- Containerized deployment using Docker.

### Out of Scope

The following features and components are not included in the project:

- Advanced AI-based spam filtering.
- Complex email template design tools.
- Integration with third-party CRM or marketing automation tools.

## Technologies Used

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The project utilizes the following technologies and tools:

- **Backend:** Spring Boot (Java)
- **Service Discovery:** Eureka
- **API Gateway:** Spring Cloud Gateway
- **Authentication:** JWT (JSON Web Token)
- **Database:** MySQL/PostgreSQL
- **Containerization:** Docker
- **Frontend Dashboard:** React/Angular
- **Email Delivery:** SMTP

# Expected Outcome

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By implementing the EzMail microservices architecture, the project aims to deliver:

- A fully functional, scalable, and containerized email service.
- Secure authentication and access control through JWT.
- Reliable email logging and tracking.
- A user-friendly dashboard for monitoring email usage and API statistics.
- Optimized API performance with efficient database queries.

## Additional Information

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This document provides crucial details necessary for understanding, utilizing, and maintaining the EzMail microservices project. Developers and stakeholders can refer to this document for deployment guidelines, architectural decisions, and system capabilities.