# Requirement Background

The i-Scanned Image Migration Service is a Spring Boot-based microservice designed to handle scanned images stored in an Oracle database by migrating them to AWS S3 and providing CRUD operations via REST APIs. This service will ensure efficient storage, retrieval, and management of images while leveraging cloud scalability and high availability.

## Business Need

- Scalability & Performance: Move image storage to AWS S3 to optimize database performance and reduce storage costs.

- Data Accessibility: Provide an API to upload, retrieve, update, and delete images efficiently.

- Security & Compliance: Ensure encryption, access control, and logging for image transactions.

- Automation: Automate the migration of existing images from Oracle BLOB storage to AWS S3.

## Functional Requirements

### Image Fetching & Migration

- Retrieve images stored as BLOBs in Oracle.

- Migrate images to AWS S3 using AWS SDK.

- Store metadata (e.g., S3 URL, upload status) back in Oracle.

### REST API for CRUD Operations

- Create: Upload new images with metadata to S3.

- Read: Fetch images via S3 URL or direct streaming.

- Update: Modify image metadata and replace images in S3.

- Delete: Remove images from S3 and update Oracle.

### Batch Processing & Monitoring

- Scheduled migration for bulk image transfers.

- Enable logging and monitoring via Spring Boot Actuator.

### Security & Compliance

- Authentication & Authorization using JWT/Spring Security.

- Encryption for images in transit and at rest.

- Logging & Auditing with SLF4J and Actuator.

## Technical Stack & Dependencies

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| --- | --- | --- | --- |
| Component | Technology / Library | Version | Purpose |
| Backend Framework | Spring Boot | 3.2.0 | Core microservice framework |
| Database | Oracle | - | Source of scanned images |
| Storage | AWS S3 | - | Cloud storage for images |
| Persistence | Spring Data JPA | 3.2.0 | ORM for database interactions |
| JDBC Driver | Oracle JDBC | 23.3.0.22.09 | Connection to Oracle DB |
| Cloud SDK | AWS SDK (Java v2) | 2.23.10 | AWS S3 operations |
| Security | Spring Security | 3.2.0 | API authentication |
| Serialization | Jackson Databind | 2.16.0 | JSON processing |
| Logging | SLF4J + Logback | 2.0.9 | Log management |
| Testing | JUnit 5, Mockito | 5.10.1, 5.5.0 | Unit testing framework |

## System Architecture

- Spring Boot Application

- Database (Oracle)

- Cloud Storage (AWS S3)

- Security & Compliance