

# Gate Pass System - UML Documentation

## 1. Introduction

The Gate Pass System is a Next.js + Node.js application designed to:

- Digitally manage gate passes for employees.
- Handle multi-level approvals (Department Head to Finance to GM).
- Ensure security verification before item removal.
- Cache non-returnable files for efficiency.
- Store non-returnable files in ZIP format in Persistent Storage (PS).
- Invalidate cached files when a gate pass is deleted or updated.

### Core Features:

- Gate Pass Request Submission
- Multi-Level Approval Workflow
- Security Check for Exit & Return
- Non-Returnable File Caching & Storage
- Automatic Cache Invalidation
- Notifications for Approvals & Status Updates

## 2. UML Diagrams

### 2.1 Use Case Diagram

This diagram shows how different users interact with the system, including Employees, Approvers, and Security Officers.

### 2.2 Class Diagram

The Class Diagram defines the database structure & entity relationships, covering Users, GatePass, Approval processes, and Security Verifications.

### 2.3 Sequence Diagram

The Sequence Diagram describes the workflow of a gate pass request, including request submission, approval workflow, and cache management.

## **2.4 Activity Diagram**

The Activity Diagram provides a step-by-step process overview, including approval, security verification, and storage handling.

## **2.5 Deployment Diagram**

The Deployment Diagram represents how system components interact in production, including frontend, backend, caching, storage, and external services.

## **3. Conclusion**

- Comprehensive UML Documentation for the Gate Pass System.
- Scalable and Secure Architecture.
- Efficient Caching and Storage Strategy.
- Modular & Maintainable Code Structure.