DMS Enterprise

Formal Technical Report – Senior / Staff Level System Design Submission

1. Executive Summary

DMS Enterprise is a production-style document governance platform implementing approval-based workflows, RBAC authorization, transactional consistency, and scalable file storage. The system is designed with modular monolith architecture to enable future microservice evolution.

2. System Architecture

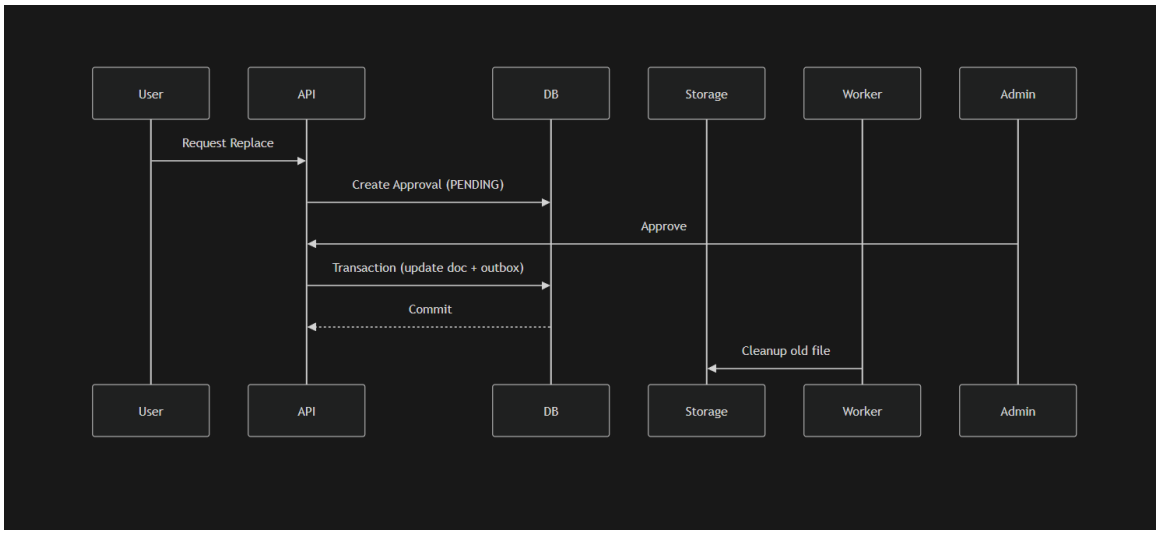
The system follows a layered architecture separating frontend, backend API, database, and file storage. The backend enforces approval workflow and ensures transactional safety.

3. Approval Workflow Design

Sensitive operations such as document replacement and deletion require administrative approval. The workflow ensures governance and prevents unauthorized destructive actions.

4. Failure Mode & Reliability Strategy

To prevent data corruption during replace operations, the system commits database updates before deleting old files. Cleanup is performed asynchronously, ensuring crash safety and idempotent execution.



Gambar Failure Mode

Upload New File

DB Transaction (update fileKey + version)

Commit

Async Cleanup Old File (Safe)

5. Scalability & Evolution

The architecture is horizontally scalable via stateless API design. Object storage offloads heavy file operations. The system is microservice-ready with clear domain boundaries and supports outbox-based event processing.

6. Governance & Compliance

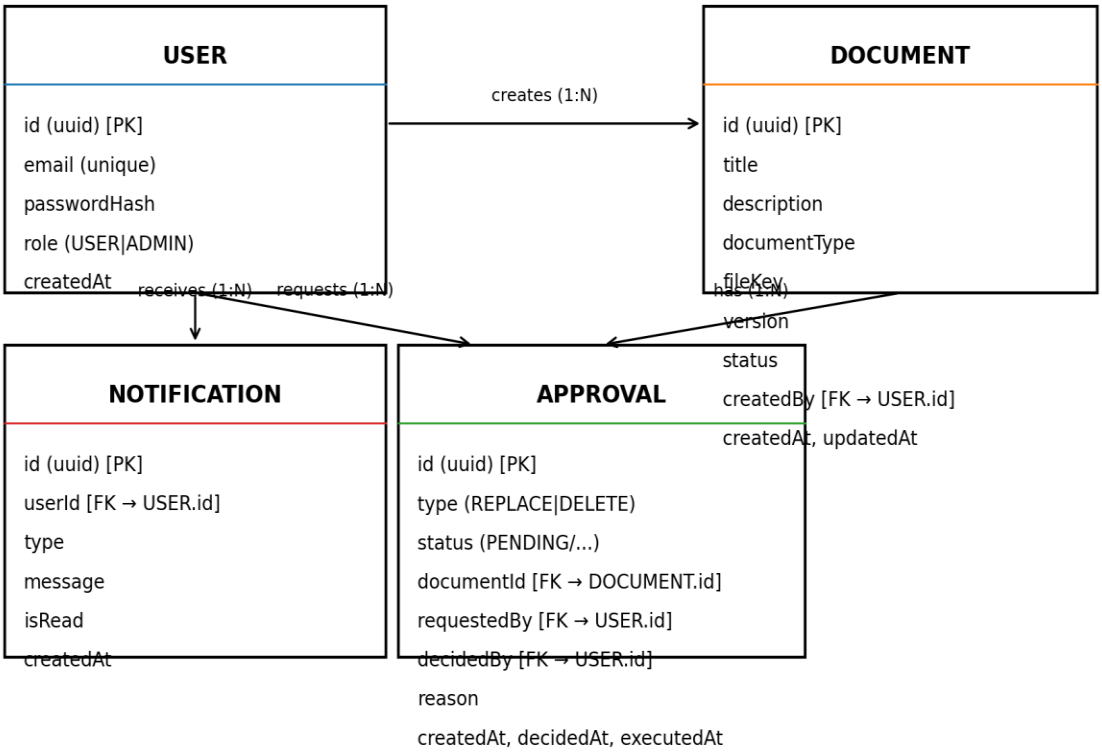
The system implements RBAC, audit logging, soft delete with retention policy, encryption in transit and at rest, and is aligned toward ISO 27001 / SOC2 compliance direction.

7. Conclusion

DMS Enterprise demonstrates senior-level architectural thinking with strong emphasis on reliability, scalability, governance, and maintainability.

8. Data Model (ERD)

The ERD below summarizes the core entities and relationships used to support authentication, document lifecycle management, approval workflows, and in-app notifications.



Notes:
- One USER can create many DOCUMENT records.
- One DOCUMENT can have many APPROVAL records (historical trail).
- One USER can request many APPROVAL records.
- One USER can receive many NOTIFICATION records.