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Q3. Design an HLD for an Online Examination System applying SRP and OCP

The **High-Level Design (HLD)** of an Online Examination System focuses on defining the **major components, their responsibilities, and interactions** while ensuring scalability, maintainability, extensibility using **Single Responsibility Principle (SRP)** and **Open/Closed Principle (OCP)**

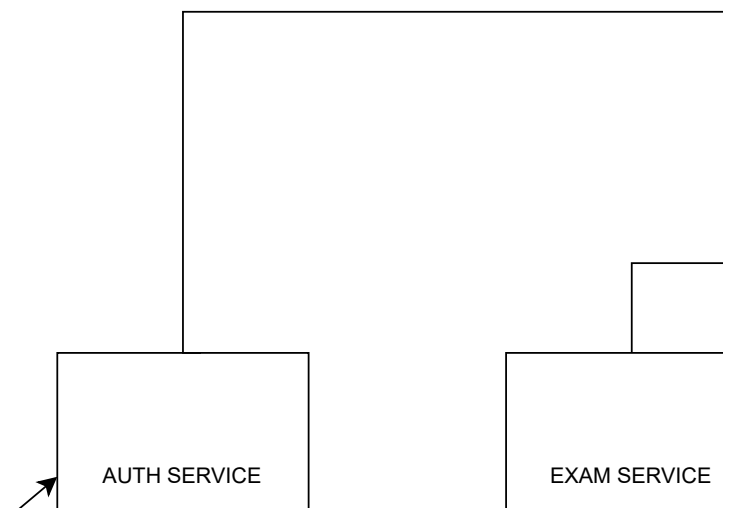
Functional Requirements

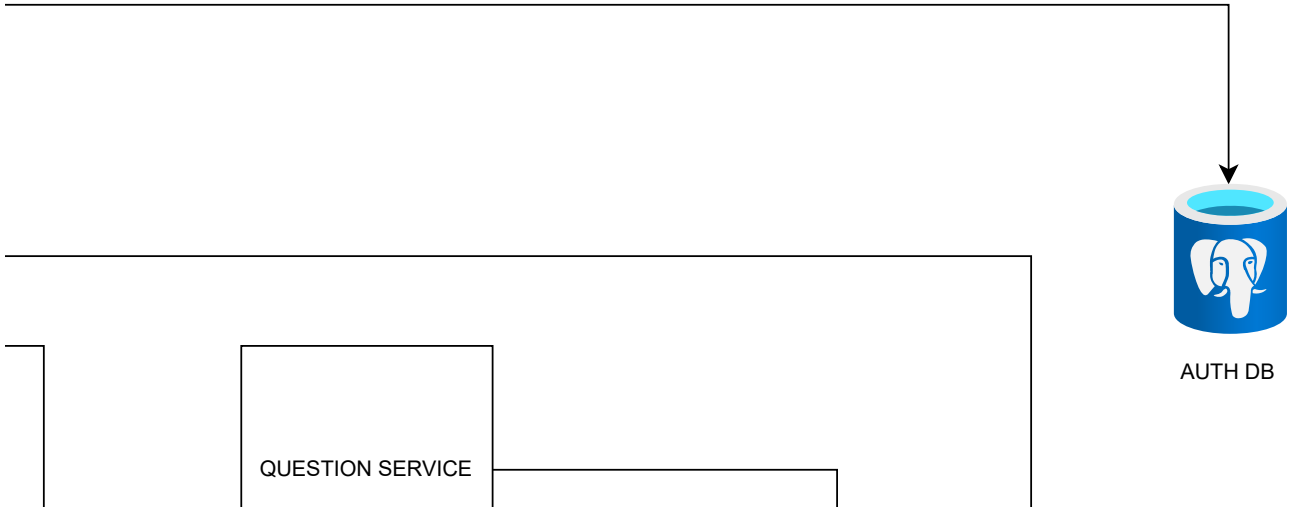
Student	Admin	System
Register/Login	<ul style="list-style-type: none">Create Exams	<ul style="list-style-type: none">Auto-evaluate answers
View available exams	<ul style="list-style-type: none">Add Questions	<ul style="list-style-type: none">Store results
Attempt exam	<ul style="list-style-type: none">Set time limits	<ul style="list-style-type: none">Send notifications
Submit answers	<ul style="list-style-type: none">Publish Results	
View results		

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Non Functional Requirements

- **Scalability** – support many users
- **Security** – authentication & data protection
- **Performance** – low response time
- **Availability** – 24/7 access
- **Reliability** – no data loss
- **Usability** – easy UI





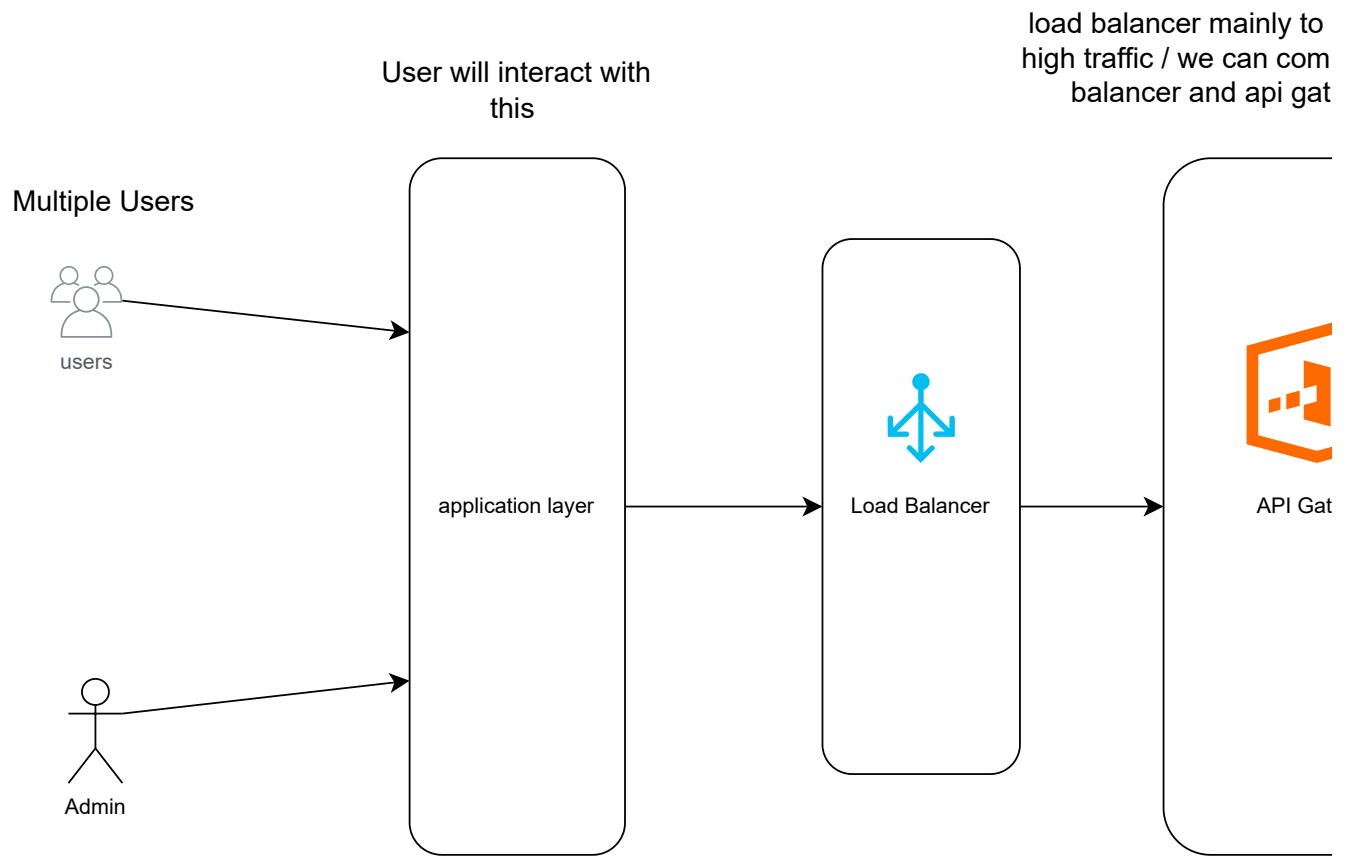
KEY POINTS:

SRP: Each service handles one responsibility

OCP: Evaluation service uses polymorphism

LB: Load Balancer for high traffic

API Gateway: Single entry point

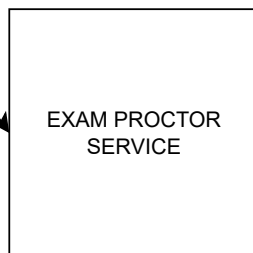
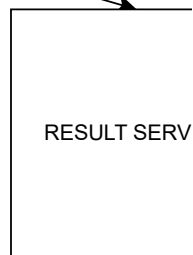
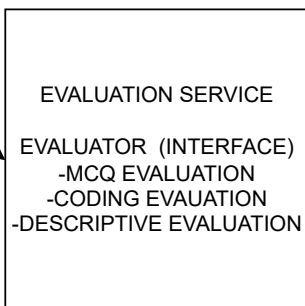


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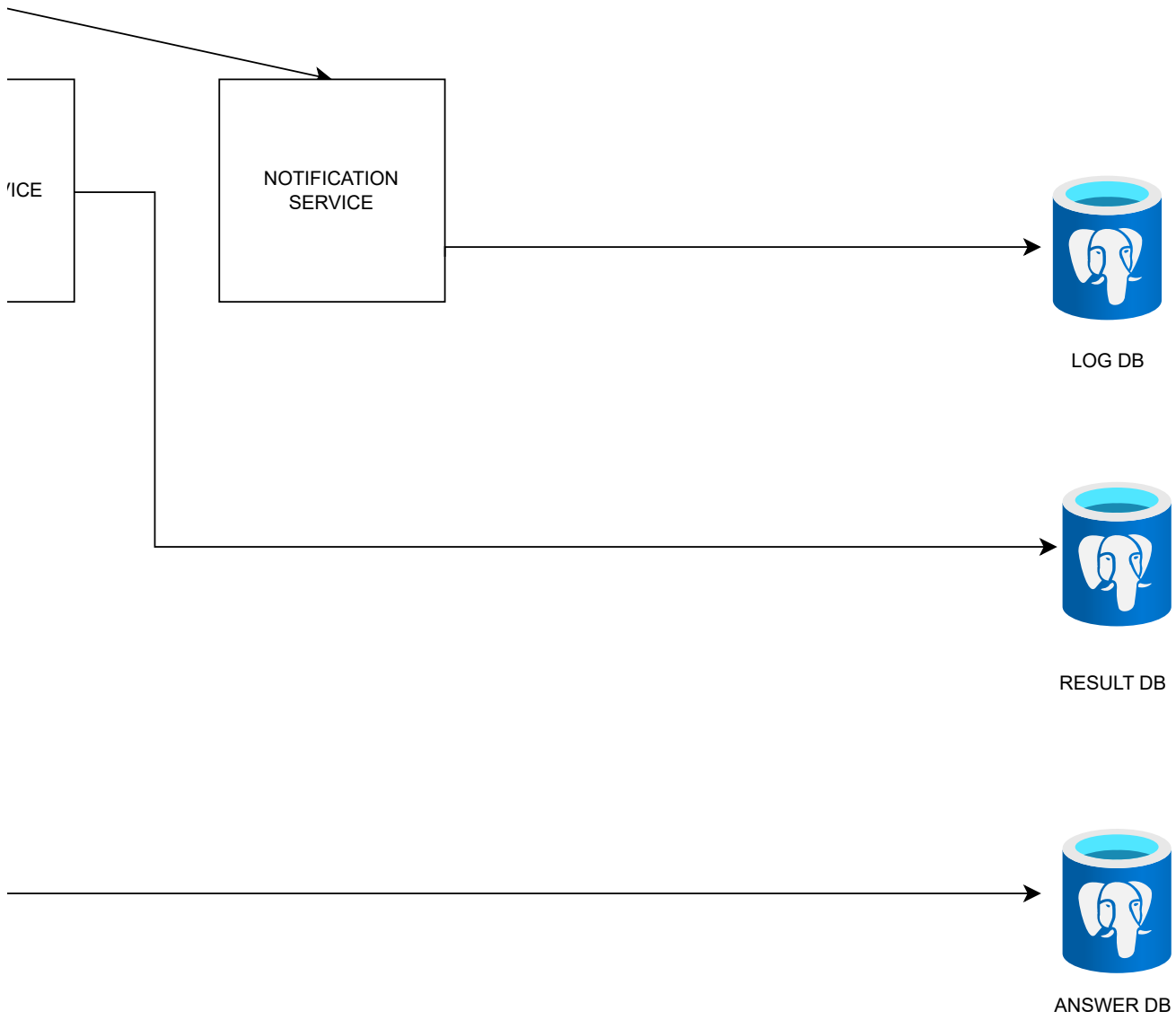
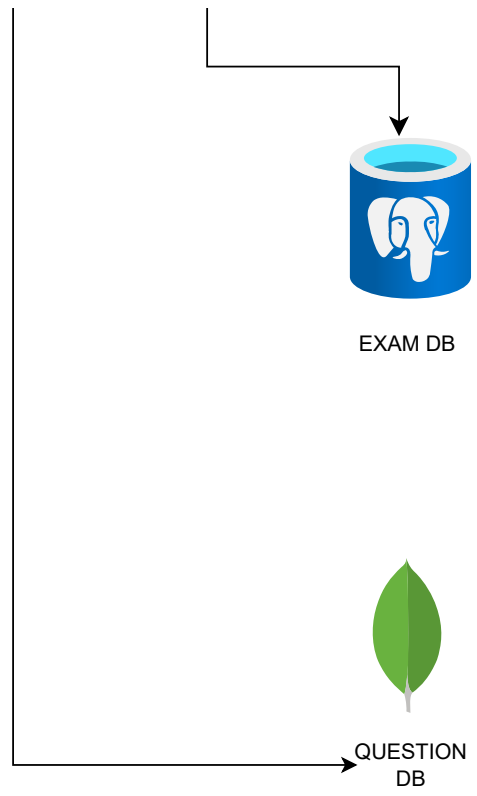
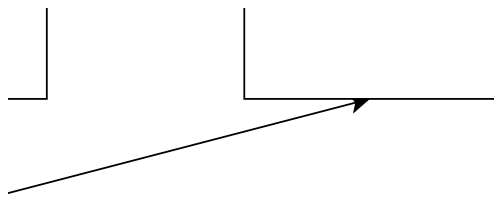
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OCP EXAMPLE



ADDITIONAL
FEATURE WE CAN
WORK ON





CLOUD INFRASTRUCTURE

- **Kubernetes Cluster**



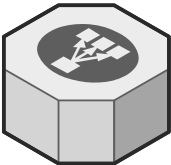
- **Auto Scaling G**



Groups

• Load Balancer (ELB / Nginx)

• Monitoring (Prometheus)



netheus / Grafana)

• Logging (ELK Stack)

• Backu



ip & Disaster Recovery