KEA

(Kubernetes Empowerer to API)

Task 5

Product description

The product is a platform for deploying, managing, and scaling machine learning models in production. It offers a secure, flexible environment for automating ML tasks like model versioning, routing, and monitoring. With Kubernetes integration and containerization support, it's designed for developers, ML engineers, and enterprises needing scalable, resilient ML infrastructure.

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Project repo: https://github.com/fanglores/Advanced-Software-Design

This report: https://github.com/fanglores/Advanced-Software-Design
/blob/master/Practice%20Tasks/Task5/K8C_DomainModeling_Task5.pdf

Use case diagram

Identify actors and use cases and develop a use case diagram from prior business requirements

Rule of thumb: user/job story = function / user level use case

Actors - user groups and/or external systems that have similar interaction goals (use cases)

Class candidates (1/2)

Candidate	Criteria	Stored information	Operations
Request Router	SIAOUT	Routing rules, target services, request states	- Handle request forwarding - Add new route - Get current routes
Load Balancer	SIAOUT	Service instances, traffic distribution rules	- Distribute traffic - Monitor instance health - Adjust weights dynamically
Request Validator	SIAOUT	Validation rules, OpenAPI schema, error-handling config	- Validate requests via rules and OpenAPI schema - Generate error reports - Upload new validation rules
Authentication Provider	SIAOUT	Authentication tokens, session details, expiration policies, authentication policies (RBAC)	- Validate tokens - Authenticate users - Invalidate stored tokens - Update session information- Authenticate via SSO - Handle token management and validation

Class candidates (2/2)

Candidate	Criteria	Stored information	Operations
Response Cacher	SIAOUT	Cached responses, expiration policies, caching rules	- Put responses in cache - Retrieve cached responses - Invalidate cache - Update cache entries
System Logger	SIAOUT	Request logs, system events, user activity logs	- Log traffic - Archive logs - Track API errors and security issues
OpenAPI Generator	OUT	Generated API documentation, schema, endpoints	- Generate OpenAPI schema - Parse source code for schema generation - Provide API documentation
Service Deployer	SIAOUT	Service configurations, versioning data, deployment status	- Deploy services - Manage service lifecycle - Monitor deployment status
Model Containerizer	SIAOUT	Container configurations, Docker images, deployment settings	- Containerize models - Deploy containerized services - Manage Docker images

Domain model diagram

Draw a class diagram or ER+DFD diagram

Show candidate classes, relations, attributes. If class diagram - show operations at classes. If ER then add a DFD connecting processes to entities.

Add DDD stereotypes