

# KEA

(Kubernetes Empowerer to API)

## Task 5

# Product description

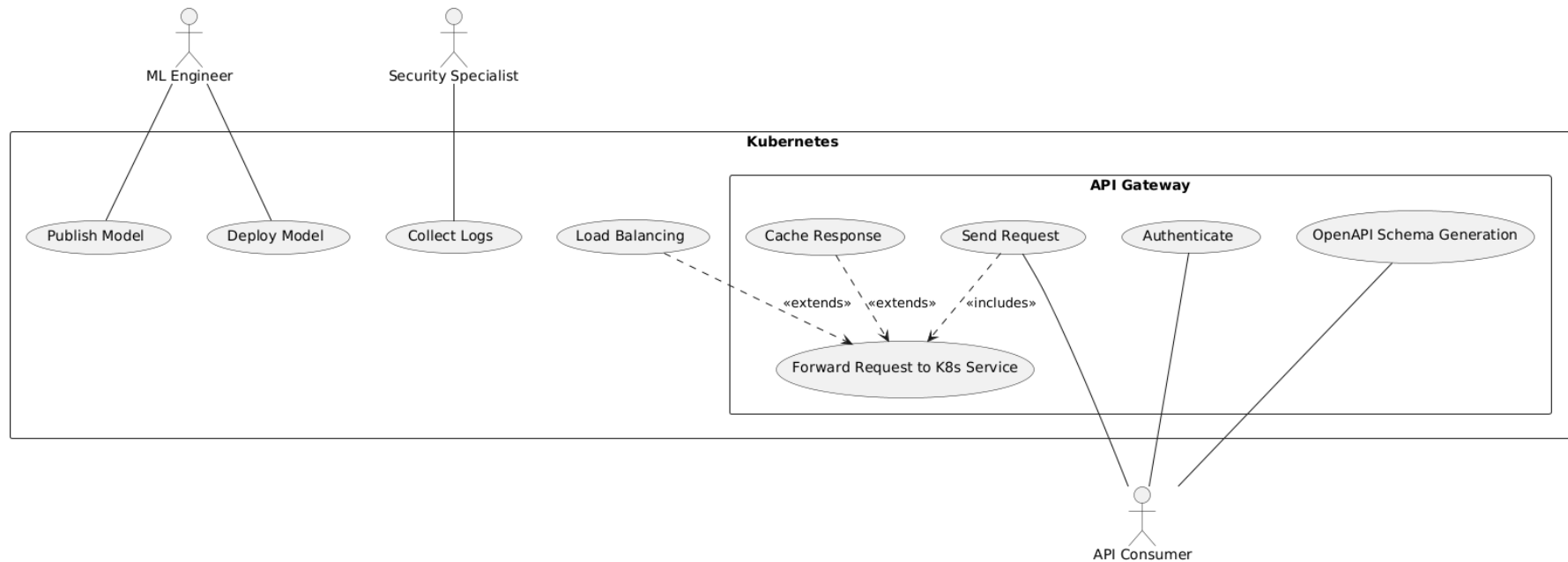
The product is a platform for deploying, managing, and scaling machine learning models in production. It offers a secure, flexible environment for automating ML tasks like model versioning, routing, and monitoring. With Kubernetes integration and containerization support, it's designed for developers, 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](https://github.com/fanglores/Advanced-Software-Design/blob/master/Practice%20Tasks/Task5/K8C_DomainModeling_Task5.pdf)

# Use case diagram



# Class candidates (1/2)

Candidate	Criteria	Stored information	Operations
Request Router	SIAOUT	Routing rules, target services, request states	<ul style="list-style-type: none"><li>- Handle request forwarding</li><li>- Add new route</li><li>- Get current routes</li></ul>
Load Balancer	SIAOUT	Service instances, traffic distribution rules	<ul style="list-style-type: none"><li>- Distribute traffic</li><li>- Monitor instance health</li><li>- Adjust weights dynamically</li></ul>
Request Validator	SIAOUT	Validation rules, OpenAPI schema, error-handling config	<ul style="list-style-type: none"><li>- Validate requests via rules and OpenAPI schema</li><li>- Generate error reports</li><li>- Upload new validation rules</li></ul>
Authentication Provider	SIAOUT	Authentication tokens, session details, expiration policies, authentication policies (RBAC)	<ul style="list-style-type: none"><li>- Validate tokens</li><li>- Authenticate users</li><li>- Invalidate stored tokens</li><li>- Update session information- Authenticate via SSO</li><li>- Handle token management and validation</li></ul>

# Class candidates (2/2)

Candidate	Criteria	Stored information	Operations
Response Cacher	SIAOUT	Cached responses, expiration policies, caching rules	<ul style="list-style-type: none"><li>- Put responses in cache</li><li>- Retrieve cached responses</li><li>- Invalidate cache</li><li>- Update cache entries</li></ul>
System Logger	SIAOUT	Request logs, system events, user activity logs	<ul style="list-style-type: none"><li>- Log traffic</li><li>- Archive logs</li><li>- Track API errors and security issues</li></ul>
OpenAPI Generator	OUT	Generated API documentation, schema, endpoints	<ul style="list-style-type: none"><li>- Generate OpenAPI schema</li><li>- Parse source code for schema generation</li><li>- Provide API documentation</li></ul>
Service Deployer	SIAOUT	Service configurations, versioning data, deployment status	<ul style="list-style-type: none"><li>- Deploy services</li><li>- Manage service lifecycle</li><li>- Monitor deployment status</li></ul>
Model Containerizer	SIAOUT	Container configurations, Docker images, deployment settings	<ul style="list-style-type: none"><li>- Containerize models</li><li>- Deploy containerized services</li><li>- Manage Docker images</li></ul>

# 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