

KEA

(Kubernetes Empowerer to API)

Task 5

Product description

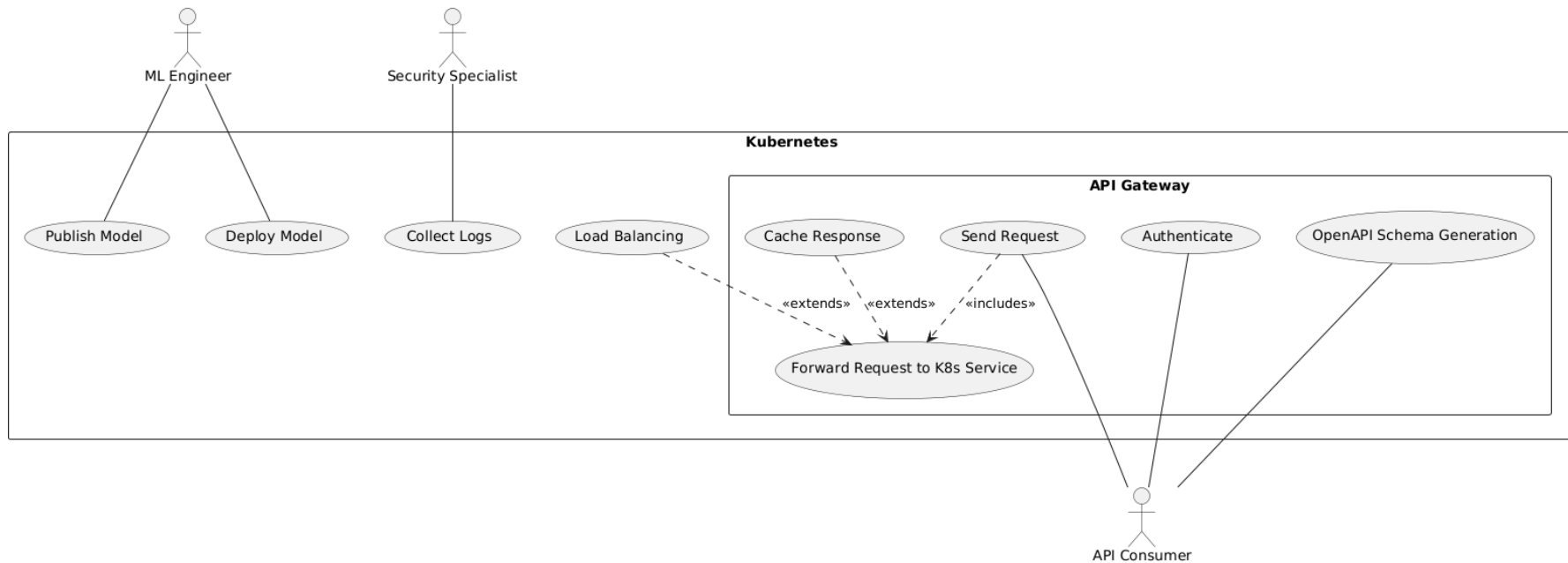
The product is a platform for deploying, managing, and scaling machine learning models in production. It offers a secure, flexible environment for automating ML tasks like model versioning, routing, and monitoring. With Kubernetes integration and containerization support, it's designed for developers,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

Team K8C: Tsurkan Daniel; Dandamaev Gadji; Tsaturyan Konstantin; Smolkin Mikhail

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



Class candidates (1/2)

| Candidate | Criteria | Stored information | Operations |
|--------------------------------|----------|---|---|
| Request Router | SIAOUT | Routing rules, target services, request states | <ul style="list-style-type: none">- Handle request forwarding- Add new route- Get current routes |
| Load Balancer | SIAOUT | Service instances, traffic distribution rules | <ul style="list-style-type: none">- Distribute traffic- Monitor instance health- Adjust weights dynamically |
| Request Validator | SIAOUT | Validation rules, OpenAPI schema, error-handling config | <ul style="list-style-type: none">- 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) | <ul style="list-style-type: none">- 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 | <ul style="list-style-type: none">- Put responses in cache- Retrieve cached responses- Invalidate cache- Update cache entries |
| System Logger | SIAOUT | Request logs, system events, user activity logs | <ul style="list-style-type: none">- Log traffic- Archive logs- Track API errors and security issues |
| OpenAPI Generator | OUT | Generated API documentation, schema, endpoints | <ul style="list-style-type: none">- Generate OpenAPI schema- Parse source code for schema generation- Provide API documentation |
| Service Deployer | SIAOUT | Service configurations, versioning data, deployment status | <ul style="list-style-type: none">- Deploy services- Manage service lifecycle- Monitor deployment status |
| Model Containerizer | SIAOUT | Container configurations, Docker images, deployment settings | <ul style="list-style-type: none">- Containerize models- Deploy containerized services- Manage Docker images |

Domain model diagram

