Microservice with Kubernetes

Overview

Microservice Architecture (MSA) develops business applications using small services. It allows rapid development, easy distribution of changes, convenient maintenance, and minimizes system failure impact.

Viettel IDC offers services such as Viettel Open Kubernetes Service, Viettel Database Service, Viettel API Gateway, and Viettel CloudWatch for MSA-based cloud-native application development to address fast-changing business and technology needs.

Architecture Diagram

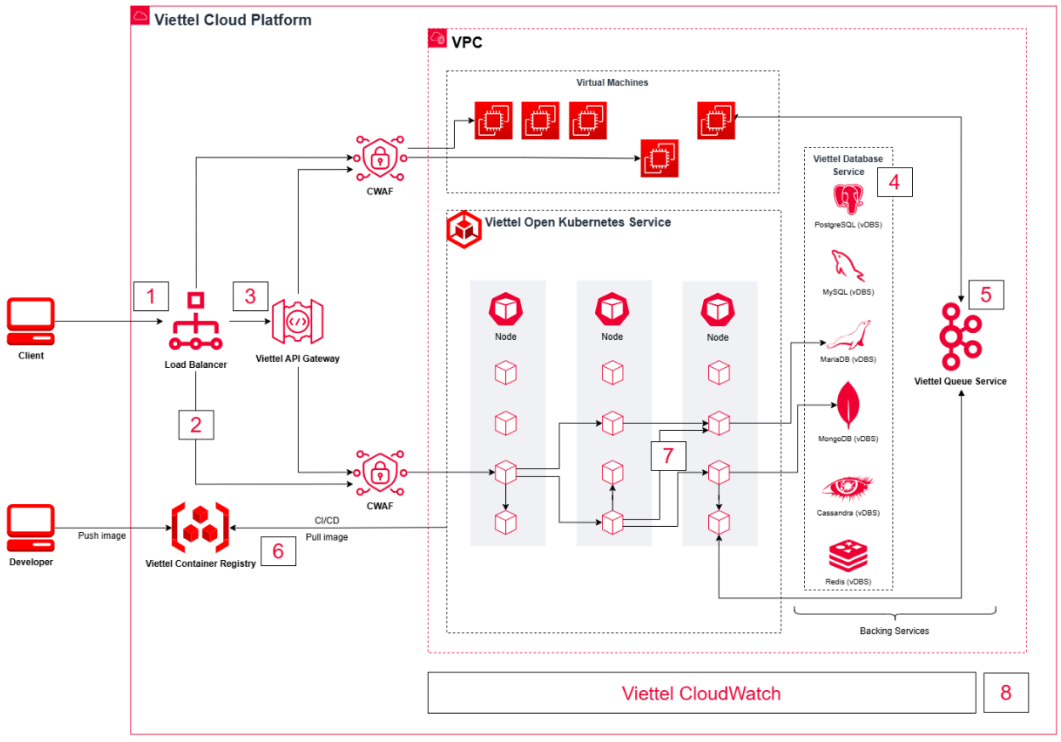

Figure 1: Microservice with Kubernetes

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1. Client requests are routed to VM/container workloads and **Viettel API Gateway** service through the **Load Balancer**.
2. Non-API client requests are delivered to the ingress provided by **Viettel Open Kubernetes Service (vOKS)**. The **vOKS** performs route processing for these requests, directing them to the appropriate service pod.
3. For API client requests, **Viettel API Gateway** is positioned at the forefront, handling authentication and service routing for all external API calls.
4. The Microservice Architecture incorporates a separate database within each structured service unit utilizing **Viettel Database Service (vDBS)**.
5. Backing Services are backend services accessed by microservices through the network. This includes DBMS services like **PostgreSQL (vDBS)**, in-memory cache services such as **Redis (vDBS)**, and **Viettel Queue Service** for asynchronous message processing within microservices.
6. DevOps-based CI/CD services provide seamless support for the development and operation of microservices applications.
7. Service Mesh manages and controls the network interactions among microservice components, overseeing network configuration and data flows between various applications.
8. In a Microservice Architecture (MSA), numerous microservices operate in a distributed environment, necessitating service status monitoring. **Viettel CloudWatch** handles monitoring, logging, and tracing, configuring the environment for monitoring services and addressing issues from individual services.

Use case

A. Microservices in logistics system.

We have deployed container-based MSA when developing new applications to create a more flexible, lightweight and available response architecture.

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The education system includes container-based subsystems such as the online lesson system, exam registration system and exam system. Viettel IDC provides easy and fast deployment, independent execution environment, scalability and resilience of Microservices in a container-based environment using Viettel Open Kubernetes Service.

B. Global manufacturer's development platform

The platform that supports application development of global manufacturers provides API Gateway, DevOps, and Kubernetes-based container services for Microservice based application development.

Through this, we support DevOps-based canary deployment for individual services and increase service reusability by cataloging individual service APIs through API Gateway.

In the future, we plan to gain flow control and visibility for Microservices through the Service mesh function.

Limitation

Some functions, such as Viettel Queue Service & Service Mesh are scheduled to be provided later.

Related Products

- Viettel Virtual Private Cloud (Virtual Machines, VPC)
- Viettel Open Kubernetes Service
- Viettel Container Registry
- Viettel Database Service (PostgreSQL, MySQL, MariaDB, Redis, MongoDB, Cassandra)
- Viettel API Gateway
- Viettel Cloud Watch
- Viettel CWAF
- Viettel Queue Service (Coming soon)
- Service Mesh (Coming soon)

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