Tencent Kubernetes Engine Distributed Cloud Center

Product Introduction

Product Documentation

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Product Introduction
Product Overview

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Overview

Tencent Kubernetes Engine Distributed Cloud Center is an application management platform for multi-cloud and multi-cluster scenarios. Users can expand the cloud-native applications to distributed cloud, and manage and operate the distributed cloud resources in a unified way from a global respective.

Tencent Kubernetes Engine Distributed Cloud Center interconnects public cloud, private cloud and edge cloud, delivers public cloud products and services including mature clusters, networks, storage, microservices and operations to locations that are closer to users. It ensures unified control plane under different cloud infrastructures, and provides reliability and conformance guarantees to meet the requirements of enterprises for multi-cloud management, application governance and high-availability disaster recovery.

Source code of core features in Tencent Kubernetes Engine Distributed Cloud Center have been provided for public use. Vendors and customers can use the source code to build their own container application platforms.

- Clusternet multi-cluster application governance project
- TKEStack open-source TKE platform

Features

Infrastructure management

You can easily manage massive Kubernetes clusters. No matter they are running on public cloud, private cloud, hybrid cloud or edge cloud, you can manage and access them just like they are running locally, and centrally deploy and coordinate multi-cluster applications and services through standard APIs.

Distributed application management

Tencent Kubernetes Engine Distributed Cloud Center uses a distributed application management model based on cloud-native design. It expands native K8s resources to multiple cloud and multiple

clusters, supports distributing various resources to different clusters, including Kubernetes native Deployment/StatefulSet/ConfigMap/Secret, custom CRDs and third-party CRD resources.

Global application scheduling and orchestration

Tencent Kubernetes Engine Distributed Cloud Center provides multidimensional scheduling and orchestration capabilities to improve application services scheduling from single-cluster scheduling to multi-cluster scheduling and from node scheduling to cluster scheduling based on Tencent Cloud's mature and reliable application scheduling and orchestration capabilities. It helps users to rationally plan resources from a global perspective, realize multi-cluster level awareness, proportional distribution, auto scaling, load balancing and other features, and complete tedious operations automatically.

Traffic governance

Tencent Kubernetes Engine Distributed Cloud Center works in conjunction with Services, Ingress controllers, and Service meshes of multiple clusters, providing features such as multi-cluster Service discovery, multi-cluster Ingress/Gateway, and multi-cluster NetworkPolicy to achieve traffic load balancing and service routing across multiple clusters. More over, through multi-cluster Mesh Istio, Pod-to-Pod connections across cluster boundaries are realized, and communication between services running on different clusters can be managed through Mesh.

Application marketplace

Users can manage multiple cloud-native products and services (Helm Chart) through cloud-native applications marketplace. Also, users can manage and distribute applications to clusters in multiple regions and owned by different cloud vendors.

Ops center

Tencent Kubernetes Engine Distributed Cloud Center provides complete log management, audit management, event management, health check, monitoring and alarming features based on public cloud service.

Security and compliance

Tencent Kubernetes Engine Distributed Cloud Center provides multiple security policies and tools, and enables users to manage security policies for multi-cloud and multi-cluster scenarios and applications in one place to meet the requirements of rules and regulations in different regions and countries.

Automation tools

Tencent Kubernetes Engine Distributed Cloud Center provides a variety of multi-cloud automation tools to deal with the scenarios such as multi-cloud migration of applications, cluster backup

recovery, multi-site active-active disaster recovery, and multi-cloud image transfer.

Clusternet

Tencent Cloud has provided the core features of Tencent Kubernetes Engine Distributed Cloud Center to the open-source multi-cluster application governance project Clusternet. Any vendor and customer who is willing to build a container application platform can quickly realize multi-cluster management and application governance capabilities by integrating Clusternet.

Clusternet is designed for hybrid cloud, distributed cloud and edge computing scenarios, supports integration and management of massive clusters. Its flexible cluster registration capabilities can adapt to cluster management requirements under various complex network conditions. It is compatible with cloud-native Kubernetes APIs to reduce users' management and Ops costs, and to accelerate the transformation of cloud-native applications.
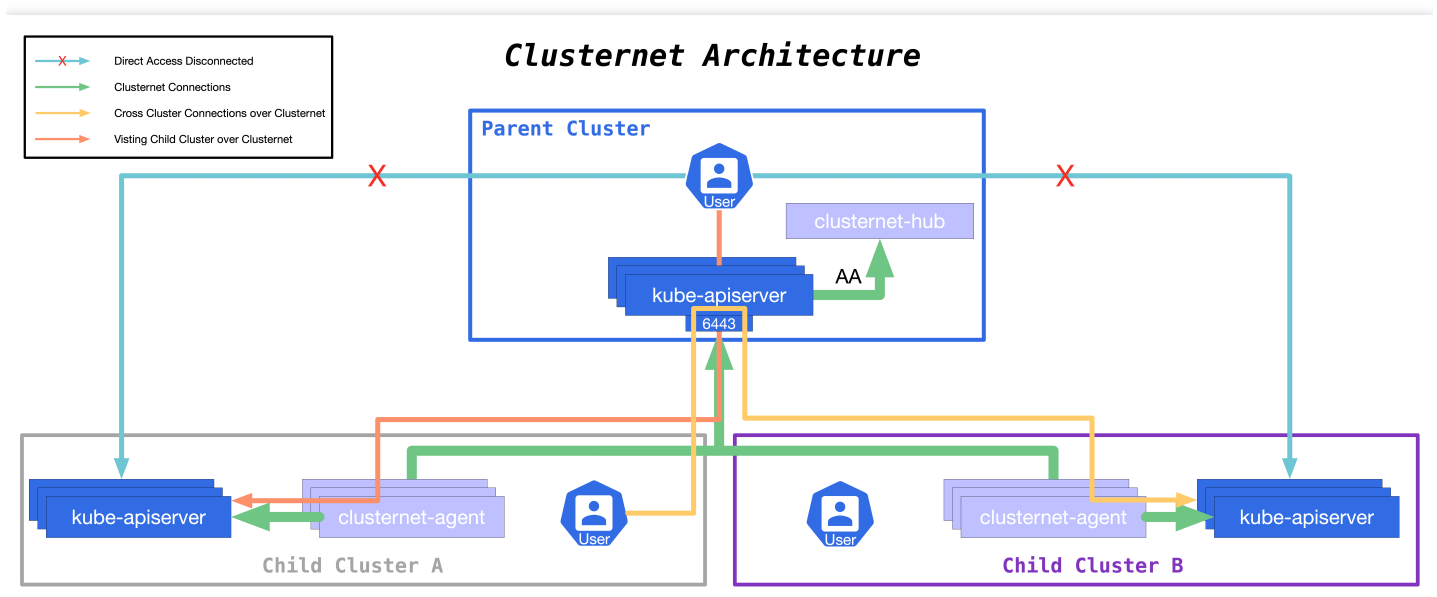
Clusternet provides the users with the following services:

Managing various Kubernetes clusters in one place

Clusternet supports managing clusters in "Pull" mode and "Push" mode. Clusternet can establish network tunnels to connect and manage the target clusters even when these clusters are running within a VPC, at the edge, or behind a firewall.

Supports cross-cluster service discovery and service mutual access

It provides cross-cluster access routing even in the absence of a dedicated network channel.

Fully compatible with native Kubernetes APIs

It is fully compatible with standard Kubernetes APIs, such as Deployment, StatefulSet and

DaemonSet, as well as custom CRDs. Users only need to do simple configurations to upgrade from a single-cluster application to a multi-cluster application, without the need to learn complex multi-cluster APIs.

Supports deployment of Helm Chart, native Kubernetes applications and custom CRDs

It supports Helm Chart applications, including distribution, localization configuration, status aggregation of Chart. The capabilities are consistent with the native Kubernetes APIs.

Rich and flexible configuration management

It provides various types of configuration policies. Users can flexibly use these configurations to implement complex application scenarios, such as multi-cluster canary release.

Simple architecture with add-ons

It adopts the method of Aggregated ApiServer and does not rely on additional storage. The simple architecture is easy to deploy, and greatly reduces the complexity of operations.

Easy to integrate

Clusternet provides complete capabilities for integration, supports kubectl plugin and client-go, facilitates one-click integration of applications, and has the ability to manage multiple clusters.

Concepts

Container

By containerization, all applications and their dependencies are packaged into an image, and then use the image to generate a resource-isolated environment to run the applications. This allows the applications to run independently in a consistent environment in a simple and efficient manner.

Container is a lightweight virtualization technology at the operating system level for isolating and controlling system resources, making global resources only usable in the container processes.

Kubernetes

Kubernetes is an open-source Container Orchestration Engine (COE) inspired by a Google project called Borg. It is one of the most important components of the Cloud Native Computing Foundation (CNCF). Kubernetes provides production-level capabilities such as application orchestration, container scheduling, service discovery, and autoscaling. For more information, see Kubernetes Documentation.

Additional Services

Tencent Kubernetes Engine Distributed Cloud Center can provide solutions in combination with other Tencent Cloud products.

If you want to use Kubernetes container management service, it is recommended to choose TKE.

Product Strengths

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Manage Cloud Everywhere

You can integrate and manage clusters, servers, hosts and smart devices through Kubernetes, without the need to build and operate anything. No matter they are running on public, private or edge cloud, they have a unified control plane to implement cloud-network integration and cloud-edge collaboration.

Focus on Application

Tencent Kubernetes Engine Distributed Cloud Center. integrates the resources of application images, traffic and storage with the applications as the focus, and covers the full lifecycle of applications from delivery, management, scheduling, disaster recovery to Ops. With rich cloud services and products, It helps users expand applications to the distributed cloud, and manage them in a unified way from a global respective.

All in Cloud Native

Tencent Kubernetes Engine Distributed Cloud Center. is fully compatible with cloud native standards. All kinds of native Kubernetes resources can be distributed and managed through Tencent Kubernetes Engine Distributed Cloud Center.. Systems such as DevOps CI/CD, AI/big data computing, microservice and IoT edge computing that are based on K8s cloud native standards can be managed in a unified way through Tencent Kubernetes Engine Distributed Cloud Center. to minimize the multi-cloud operation costs.

Automated Multi-cloud Operations

Tencent Kubernetes Engine Distributed Cloud Center. provides multiple-cloud one-click automation tools to help users implement multi-cloud deployment, high-availability disaster recovery, security and compliance inspection, and cross-cloud image migration of applications.

Reliable Service

With cloud-native container technologies, Tencent Kubernetes Engine Distributed Cloud Center. delivers proven and stable Tencent Cloud services to locations closer to users and data, ensuring long-term operation, governance, update and evolution of platforms and providing guarantees for reliability, security and compliance.

Use Cases

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Multi-cloud Management

Tencent Kubernetes Engine Distributed Cloud Center can integrate with all kinds of computing resources of your enterprise and manage them. It distributes Tencent Cloud services to different physical locations to reduce delay and improve service quality. The operation, governance, update and evolution of Tencent Kubernetes Engine Distributed Cloud Center are performed by Tencent Cloud in a unified way. Using container technologies as the service base of distributed environment, Tencent Kubernetes Engine Distributed Cloud Center delivers containerized applications and cloud services with cloud-native standards to provide you with lightweight, efficient, flexible and reliable open-source services.

You can manage resources on and off the cloud through External Node Management, Elastic Scaling with EKS for IDC-Based Cluster and Edge Cluster Service.
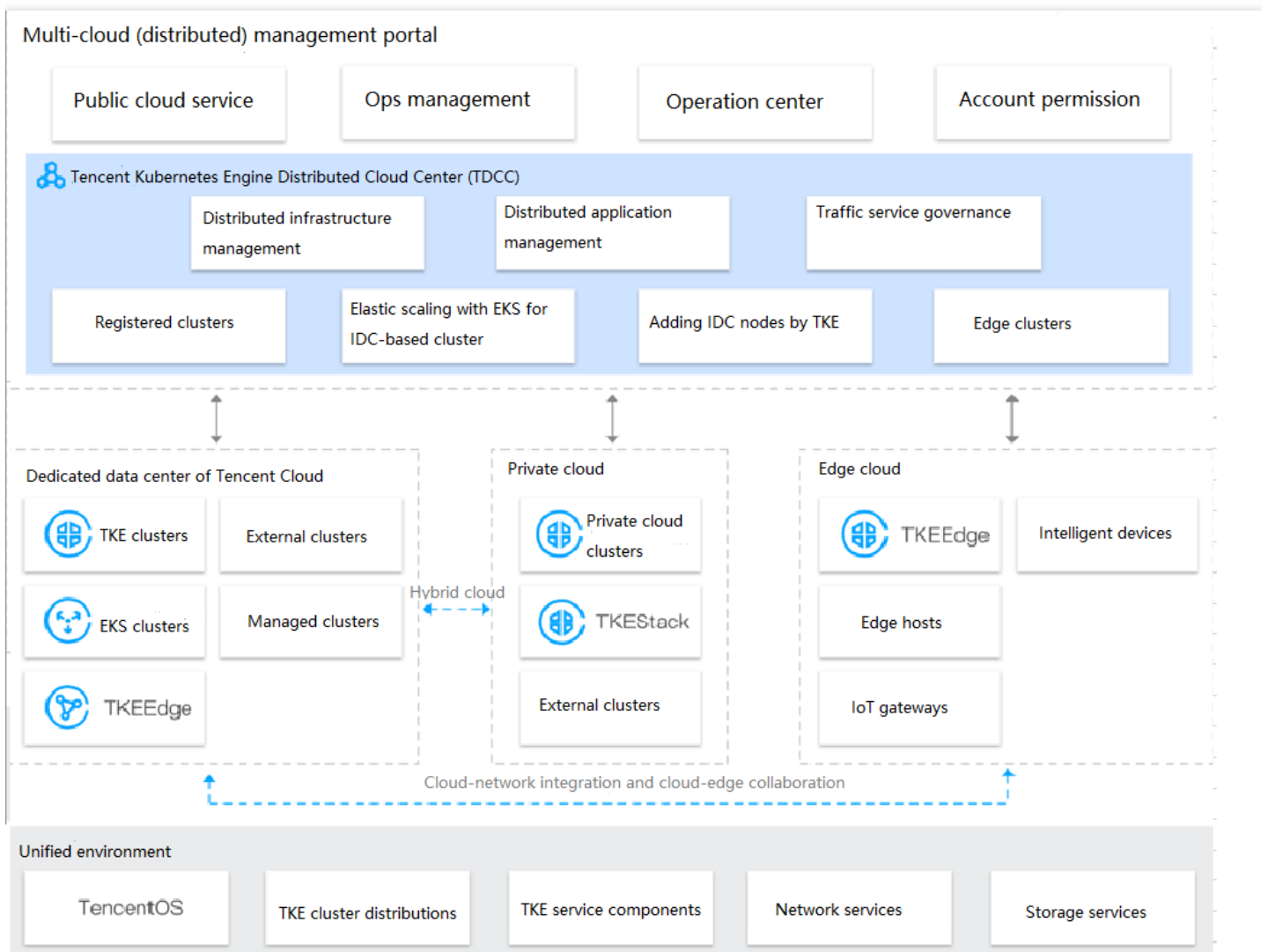
Application Governance

Cloud-native applications run on multiple cloud services, and their deployment and management are performed through the same APIs and operational processes. Tencent Kubernetes Engine Distributed Cloud Center provides a uniform operation environment across multiple heterogeneous cloud infrastructures based on Kubernetes standards. You can expand Kubernetes applications from one cluster to clusters owned by different cloud vendors in multiple regions with the minimum costs. Also, you can configure dedicated policies and application configurations for public cloud clusters,

local clusters and edge clusters through Tencent Kubernetes Engine Distributed Cloud Center.
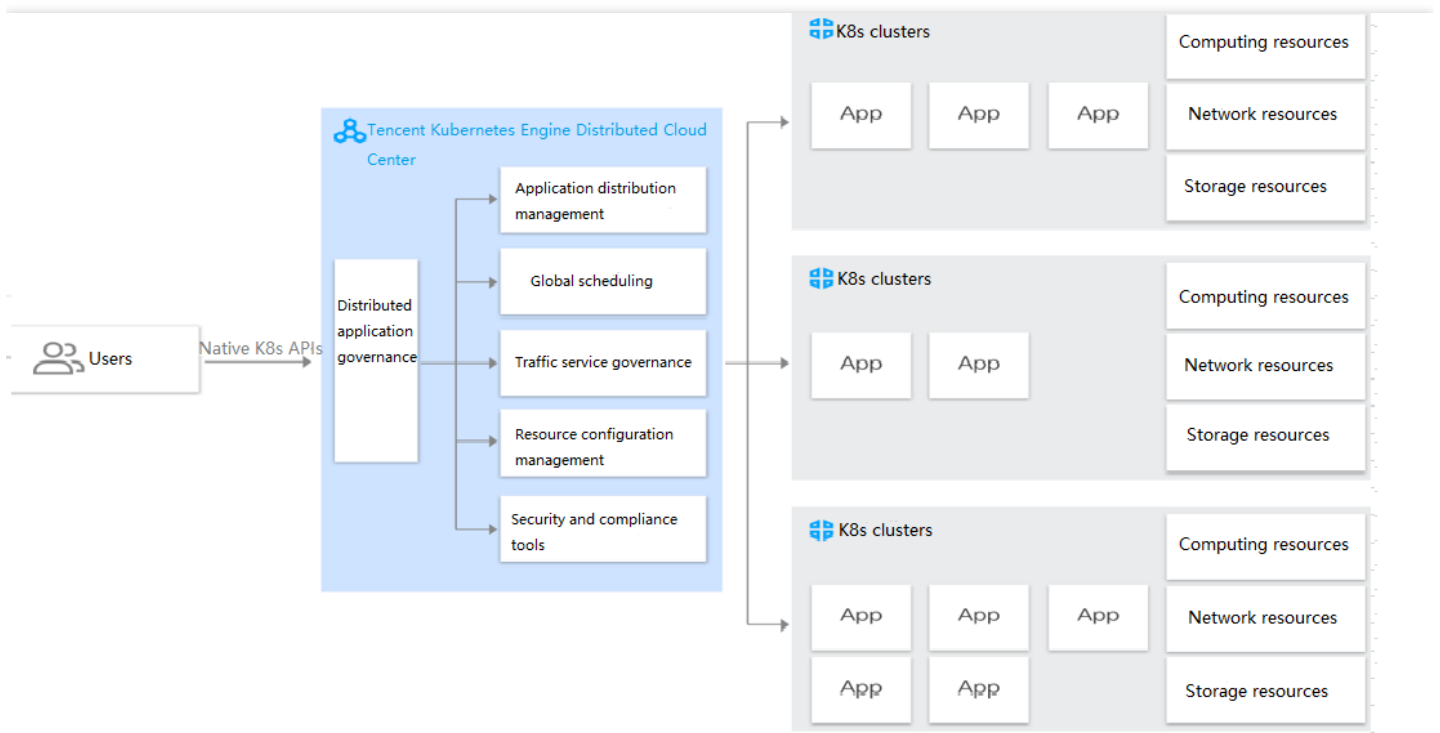
High-Availability Disaster Recovery

High availability is available for applications in a single Kubernetes cluster, allowing the applications to continue running in case of some hardware or software failures. However, due to the distance between master nodes in the cluster, the protection for disaster events is limited. You can implement high-availability disaster recovery across the whole site or region by unified governance of

applications, traffic and storage in multiple clusters.
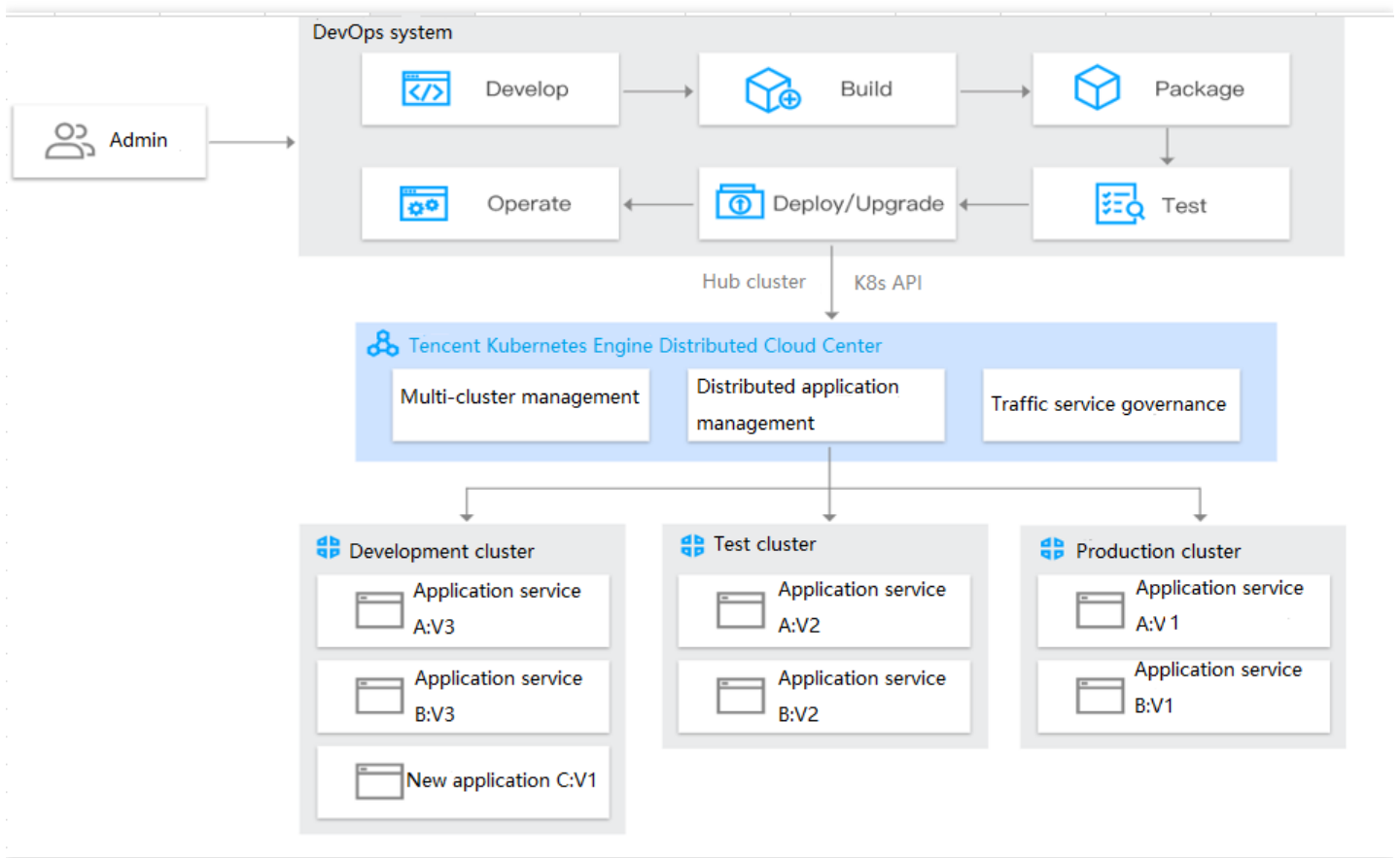
Automatic Release

You can manage the release, canary release and lifecycle of applications in multiple clusters on multiple cloud with the minimum costs by integrating your DevOps systems to the hub cluster in Tencent Kubernetes Engine Distributed Cloud Center. In this way, you can associate the application release logic with the underlying cluster loose coupling to expand and manage the application release, without the need to configure and initialize the clusters for development, test and

production.
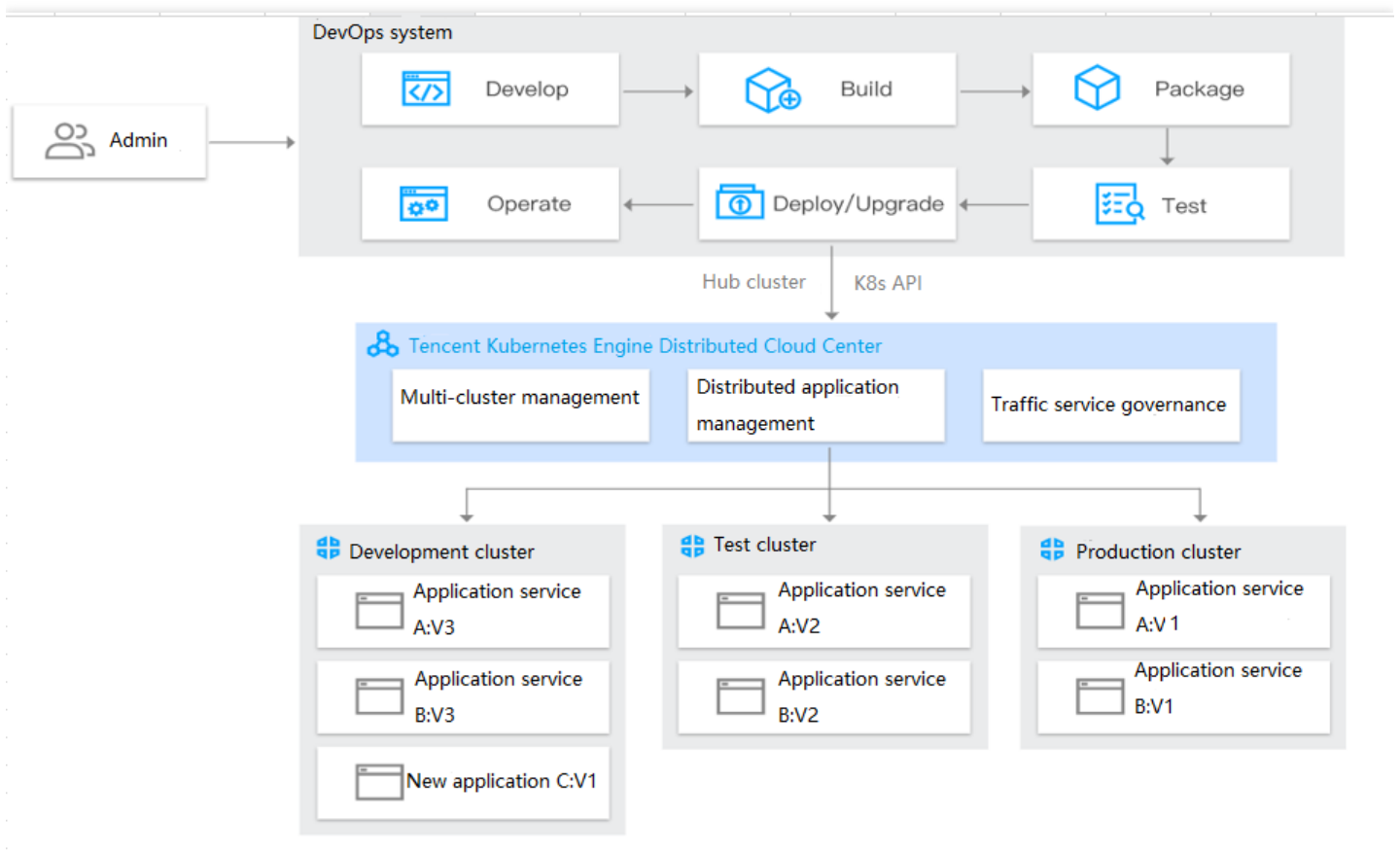
Cloud-Edge Collaboration

Tencent Kubernetes Engine Distributed Cloud Center's distributed cloud platform based on the cloud-native technologies can be adapted to all types of edge terminals. Tencent Kubernetes Engine Distributed Cloud Center provides a unified technology stack for lightweight edge access facilities, edge data centers, edge gateways and smart devices, enabling you to manage private cloud, industry cloud, region cloud and cloud operated by different ISPs in a unified way.

The mature cloud services and products on the public cloud, such as AI/big data, database/middleware, CloudBase/low-code platform and IoT edge computing, can be integrated or

expanded to the edge terminals seamlessly based on the cloud-native standards.

Control on cloud

Tencent Cloud

IoT development platform	AI development platform	Low-code development platform	Application/algorithm/data marketplace

Tencent Kubernetes Engine Distributed Cloud Center

Multi-cluster management	Distributed application management	Traffic service governance

Edge access

Data center
- TKE clusters
- Auto Scaling

Edge data center
- Edge clusters

Local data center
- External clusters

Device site

Edge hosts	IoT gateways	Intelligent terminals	SCADA