Tencent Kubernetes Engine Distributed Cloud Center Product Introduction

Product Documentation

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Product Introduction
Product Description

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Overview

TDCC (Tencent Kubernetes Engine Distributed Cloud Center, TDCC) is a Tencent's application management platform for multi-cloud and multi-cluster scenarios, enabling users to extend cloud-native applications to the distributed cloud. It provides unified management and operations for distributed cloud resources from a global perspective, allowing for easy global deployment of your business and operationality everywhere. TDCC Distributed Cloud Center bridges the gap between public clouds, private clouds, and edge clouds, delivering mature clusters, networks, storage, microservices, and operation public cloud products and services to locations closer to users and data. It ensures a consistent control plane across different cloud infrastructures and provides reliability and security compliance guarantees, meeting the needs of enterprise users for multi-cloud management, application governance, and high-availability disaster recovery.
The core features of the TDCC Distributed Cloud Center are now open source. Vendors and customers interested in building their own container application platforms can collaborate through open-source projects, ensuring technological neutrality to avoid vendor lock-in.

- Clusternet Multi-Cluster Application Governance Project
- TKEStack Open-Source Container Service Platform

Product Features

Infrastructure Management

Easily manage massive Kubernetes clusters, whether they are running on public cloud, private cloud, hybrid cloud, or edge cloud. You can manage and access them as if they are running locally and use standard interfaces to centrally deploy and coordinate multi-cluster applications and services.

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 Distribution Management

Supports multi-cluster deployment of cloud-native type applications, multi-cluster distribution strategy, differentiated strategy, and full and gray-scale updates across clusters.

Traffic Governance

Leveraging fully managed service-based TCM capabilities for cross-cluster, heterogeneous application uniform discovery management accelerates cloud-native migration. For more details, see TCM.

Application Marketplace

Provides a cloud-native application marketplace to manage various cloud-native products and services (Helm Chart), supporting the deployment and management of applications to clusters across multiple regions and different cloud service providers.

Ops Management

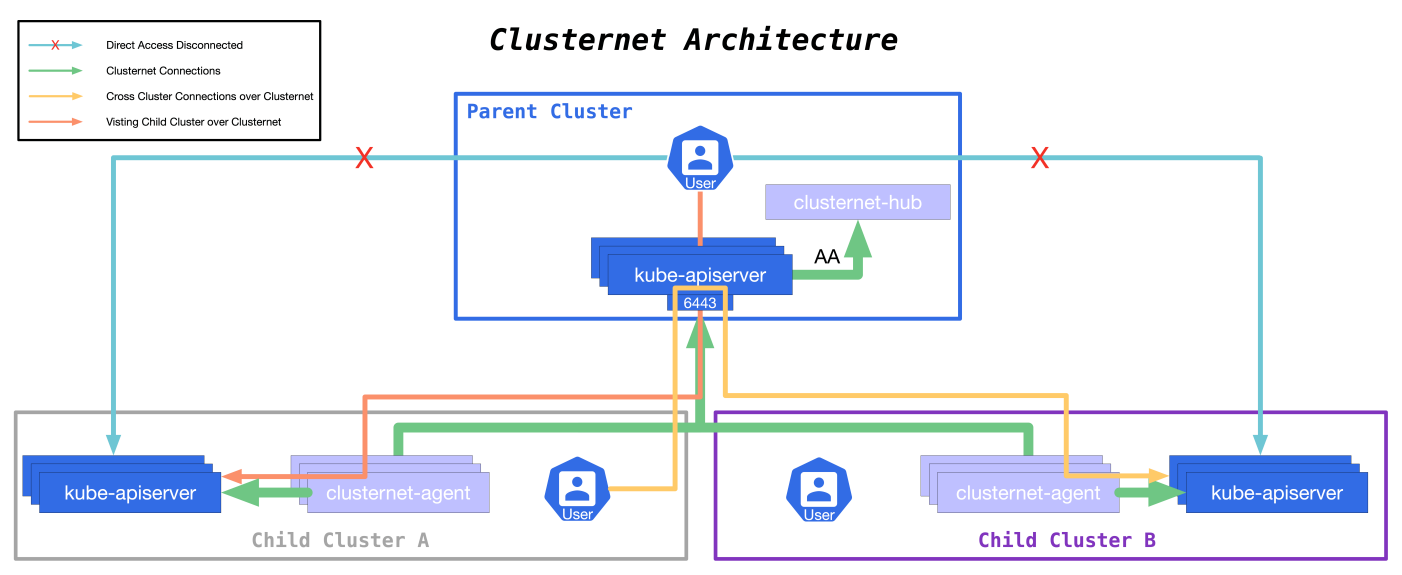
Supports comprehensive log management, audit management, event management, monitoring and alarming features using the registered cluster capabilities, based on public cloud services. It accommodates operations across various regions and cloud service providers.

Security Management

Unified authentication and authorization management for multi-clusters, centrally managing users, roles, and policies. It supports management, rotation, and revocation of users' access credentials, along with unified permission issuance and synchronization capability.

Clusternet

Tencent Cloud has contributed the core features of TDCC to the open-source Clusternet multi-cluster application governance project. Tencent Cloud contributes its mature product capabilities to the community. Any vendor and customer with the intent to build a container application platform can, by integrating Clusternet, quickly achieve multi-cluster management and application governance capabilities, ensuring technology neutrality and avoiding vendor lock-in.
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 offers users the following services:

- **One-Stop Management of Various Kubernetes Clusters:**Clusternet supports managing clusters in both Pull and Push modes. Even if a cluster operates within a VPC intranet, at the edge, or behind a firewall, Clusternet can still establish network tunnels to manage the cluster.
- **Supports Cross-Cluster Service Discovery and Intercommunication:**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, and it also encompasses user-defined CRDs. To upgrade from a single-cluster application to a multi-cluster application, users only need to make simple configurations, without learning complex multi-cluster APIs.
- **Supports the Deployment of Helm Chart, Native Kubernetes Applications, and Self-Defined CRDs:**Supports Helm chart type applications, including chart distribution, differentiated configuration, and status aggregation. The capabilities are consistent with native Kubernetes APIs.
- **Rich and Flexible Configuration Management:**It offers various types of configuration policies, allowing users to flexibly combine these configurations to achieve complex business scenarios, such as multi-cluster canary releases.
- **Addon Capability, Simple Architecture:** It adopts the Aggregated ApiServer method and does not rely on additional storage. The architecture is straightforward, easy to deploy, and significantly reduces operational complexity.
- **Convenient Access:** Clusternet provides a comprehensive docking capability, supports the kubectl plugin and client-go, facilitates one-click business integration, and is capable of managing multiple clusters.

Related Concepts

Container

A container packages an application and its dependencies into an image, and then uses the image to generate a resource-isolated environment to run the application. This allows the application 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, an open-source container orchestration and scheduling engine developed by Google based on Borg, is one of the most important components of the CNCF (Cloud Native Computing Foundation). It offers production-level application orchestration, container scheduling, service discovery, and automatic scaling capabilities. For more details, please refer to Official Kubernetes Documentation.

Related Services

The Distributed Cloud Center TDCC can provide solutions in conjunction with other Tencent Cloud products. If you need Kubernetes container management services, Tencent Kubernetes Engine (TKE) is recommended.

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 fully adheres to cloud native standards. All types of native Kubernetes resources can be distributed and managed through the Tencent Kubernetes Engine Distributed Cloud Center (TDCC). Systems based on the K8s cloud native standards, such as DevOps CI/CD, AI/big data computing, microservices, and IoT edge computing, can leverage the powerful capabilities of TDCC for consistent cloud and multicloud resource management, service, application, and user experience, minimizing the costs of multicloud operations.

Unified Operations and Maintenance

By utilizing registered cluster capabilities, you can register multiple clusters to the public cloud management platform, enabling unified management and monitoring of these clusters. The public cloud offers comprehensive log management, audit management, event management, monitoring and alerting services. It automatically collects and analyzes log, audit, event, and metric data, providing visual monitoring and alerts to help you quickly identify and resolve issues. This addresses the reliance on manual troubleshooting for cluster operations and maintenance, the lack of unified monitoring, alerts, and logs across multiple clusters, and improves operational efficiency and reliability.

Reliable Service

Deliver mature and stable cloud services through cloud-native container technology to locations closer to users and data, and ensure long-term platform operation, governance, updates, and evolution.

Use Cases

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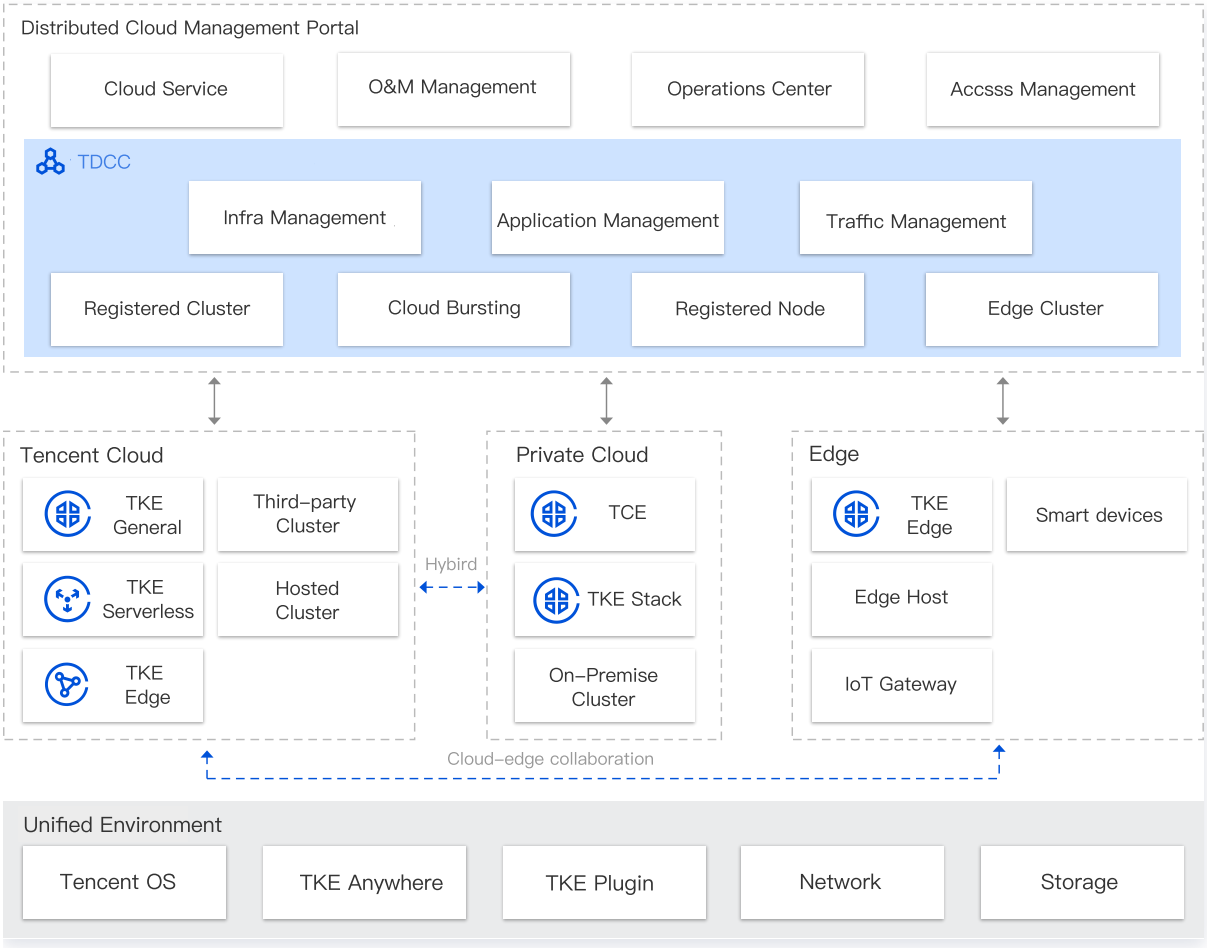
Multi-Cloud Management

It enjoys flexible access and management of various computing resources within the enterprise, distributes cloud services to different physical locations to reduce latency, improves service quality, and has the platform's operation, governance, updates, and evolution provided uniformly by the cloud service provider. By utilizing container technology as the service foundation in a distributed environment, and delivering containerized applications and cloud services based on cloud-native standards, it provides lightweight, efficient, scalable, secure, reliable, and open-source services to support rapid business growth and flexible expansion.

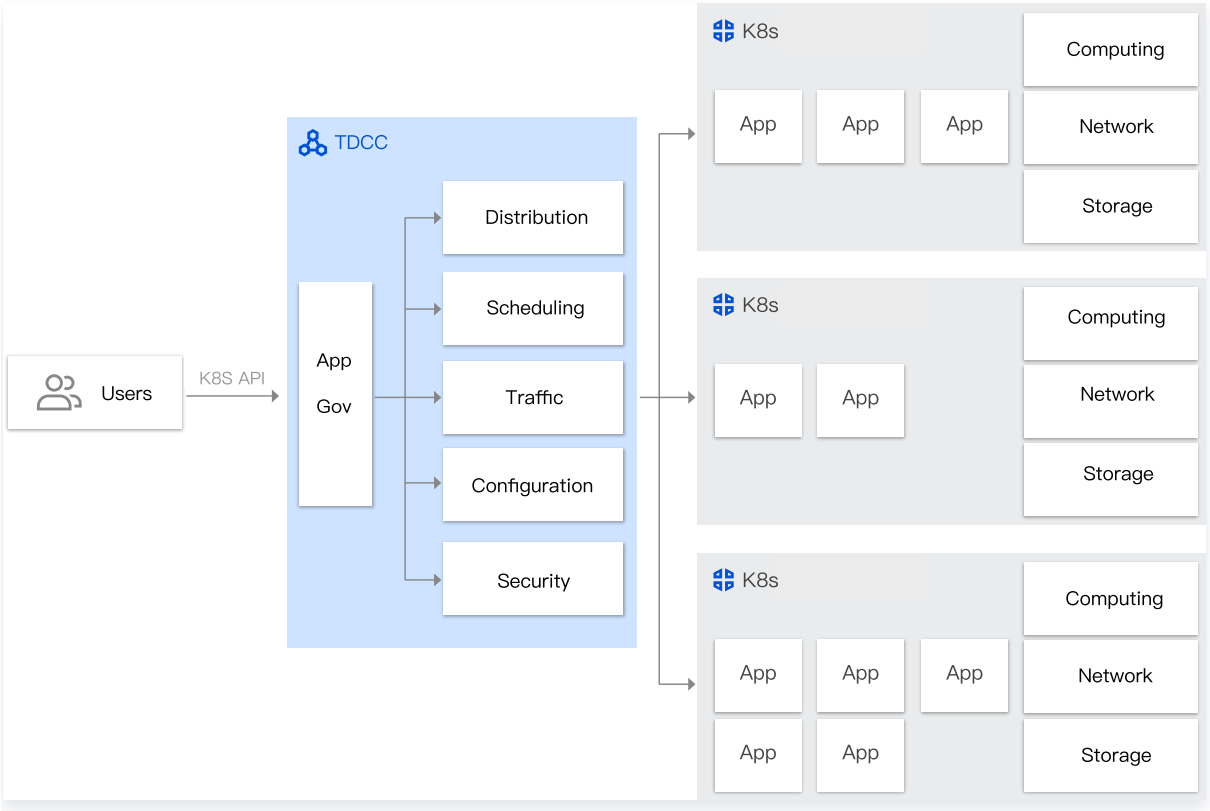
It supports managing cloud and on-premises resources through various methods, such as node registration, adding super nodes to IDC clusters for elastic scale-out, and registered cluster management.



Application Governance

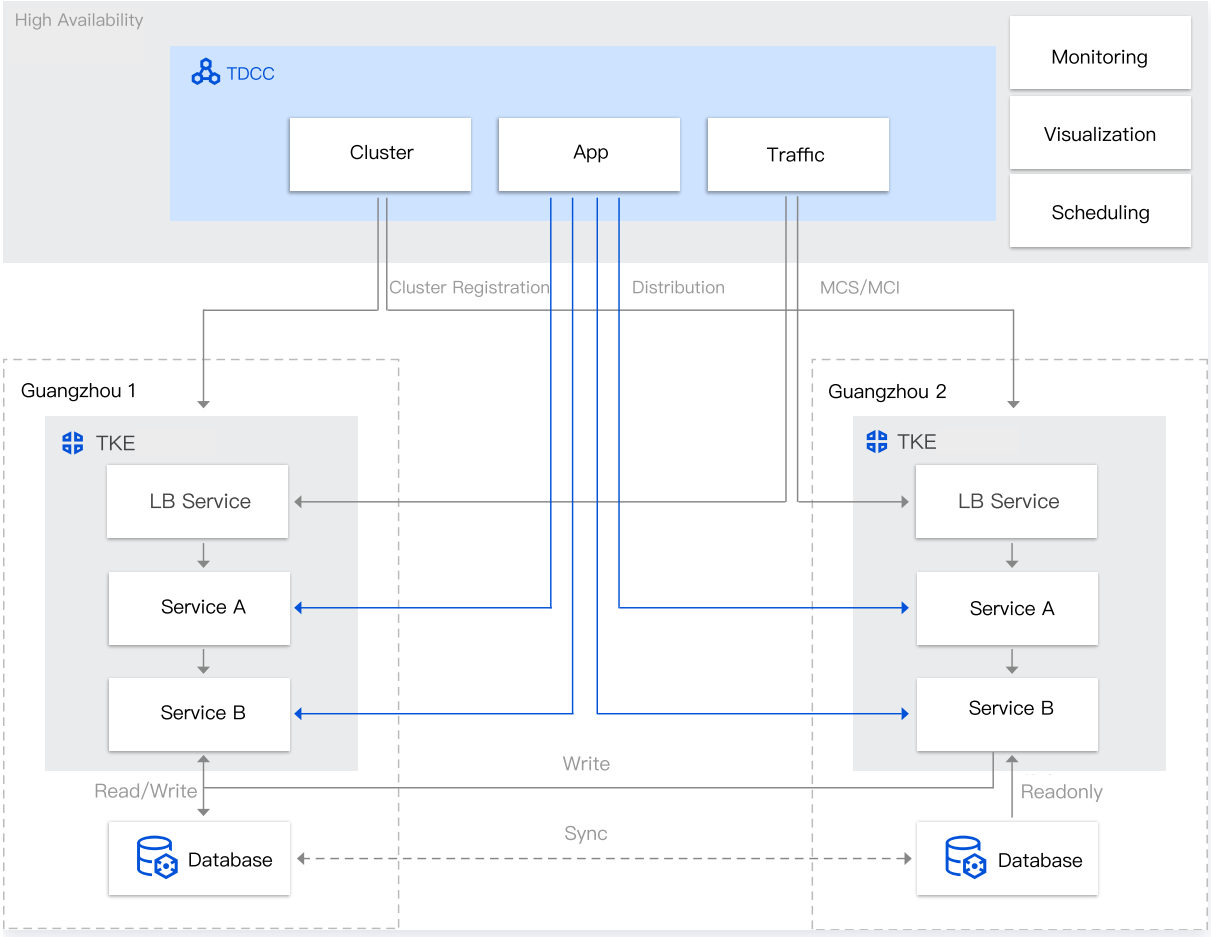
Cloud-native applications run across multiple cloud services, using the same APIs and workflows for deployment and management. By leveraging the Kubernetes standard, it provides a consistent operational

environment across multiple heterogeneous cloud infrastructures. This minimizes the switching costs and enables Kubernetes applications to scale from a single cluster to multiple regions and clusters across different cloud service providers, reducing the risk of vendor lock-in.
It provides users with a unified and consistent Kubernetes experience across multiple clouds, while also supports the definition of independent policies and application configurations for public cloud clusters, local clusters, and edge clusters. This flexible approach addresses the differences across various locations.



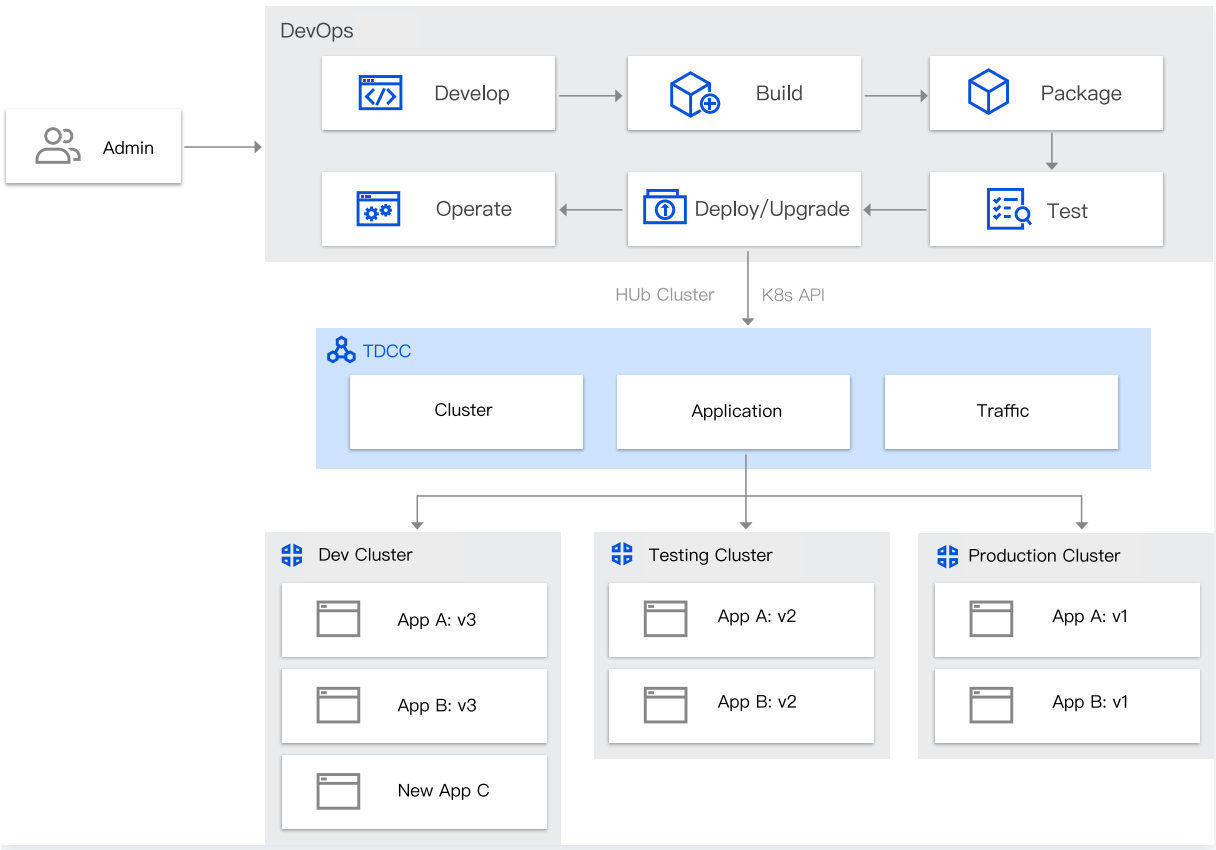
High-Availability Disaster Recovery

In a single Kubernetes cluster, application services support high availability, allowing services to continue running after partial hardware or software faults. However, the distance between cluster primary nodes limits its ability to provide protection against disaster-level events. To enable disaster recovery for entire sites or regions, unified governance of multi-cluster applications, traffic, storage, and other components can be implemented. This approach ensures high availability and disaster recovery, improving the fault resilience and reliability standards of the entire business system.



Automatic Release

Various types of DevOps systems can be integrated with TDCC's Hub Cluster to achieve multi-cloud and multi-cluster application release management, grayscale management, and application lifecycle management at minimal cost. This eliminates the need for tedious configuration and initialization of development, testing, and production environment clusters. By loosely coupling the application release logic and the underlying clusters, it allows for flexible and convenient expansion and management of business releases, accelerating product iteration and business growth.



Cloud-Edge Collaboration

The distributed cloud platform, based on cloud-native technology, is well-suited for various edge terminals. It provides a unified tech stack for lightweight edge access facilities, edge data centers, edge gateways, smart devices, and more, enabling unified management of clouds from different operators, private clouds, industry clouds, regional clouds, and others.

Mature cloud services and products on public clouds, such as AI/big data, databases/middleware, cloud development/low-code platforms, and IoT edge computing, can seamlessly be deployed and extended to the edge, following cloud-native standards.