Intelligent EdgeCloud

Service Overview

Issue 01

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HUAWEI CLOUD COMPUTING TECHNOLOGIES CO., LTD.

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1 What Is Intelligent EdgeCloud?

Edge Computing

5th generation mobile networks (5G) and artificial intelligence (AI) make innovative services, such as augmented reality (AR), virtual reality (VR), interactive live streaming, automated driving, and smart manufacturing, a reality for the world. These services demand for low latency and high bandwidth. Centralized cloud computing is generally far away from devices and has the following disadvantages:

- High network latency: Centralized cloud computing cannot process and analyze data in a timely manner, resulting in slow application response and poor user experience.
- High bandwidth cost: Data generated by applications needs to be transmitted to the cloud, which consumes large bandwidth. As a result, service providers need to pay a large amount of money on bandwidth.
- Data compliance: Data generated by applications is stored on the cloud, whereas enterprises want sensitive data to be stored on premises to meet the requirement for data compliance.

Edge computing can resolve the preceding problems and becomes a good choice for these new services. Edge computing brings computation and data storage closer to where they are needed to improve response speed, save bandwidth, and ensure data compliance.

Figure 1-1 shows the differences between cloud computing and edge computing.

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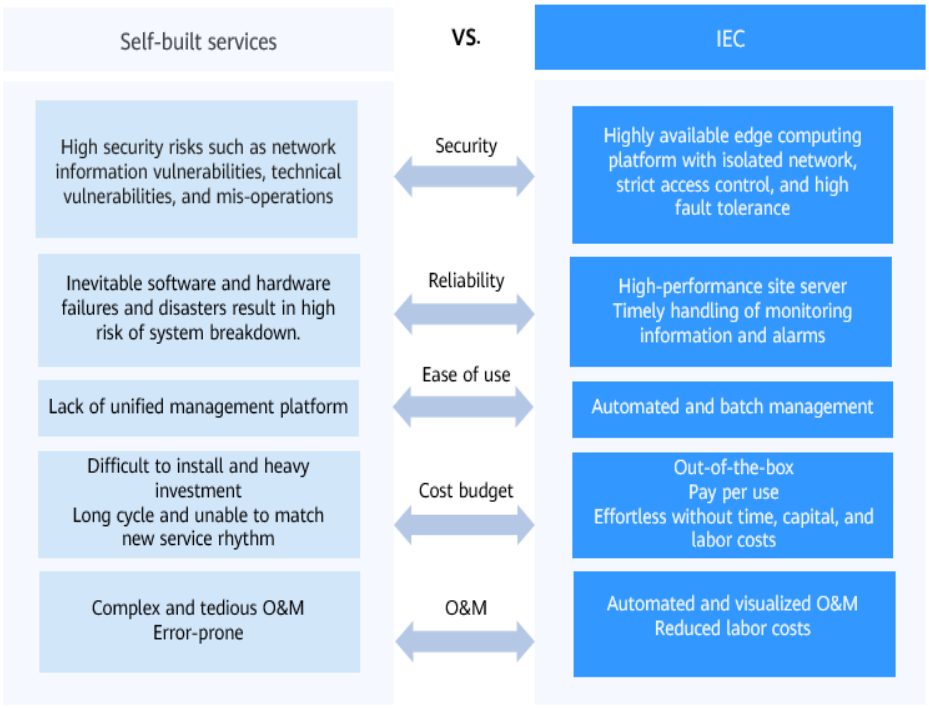
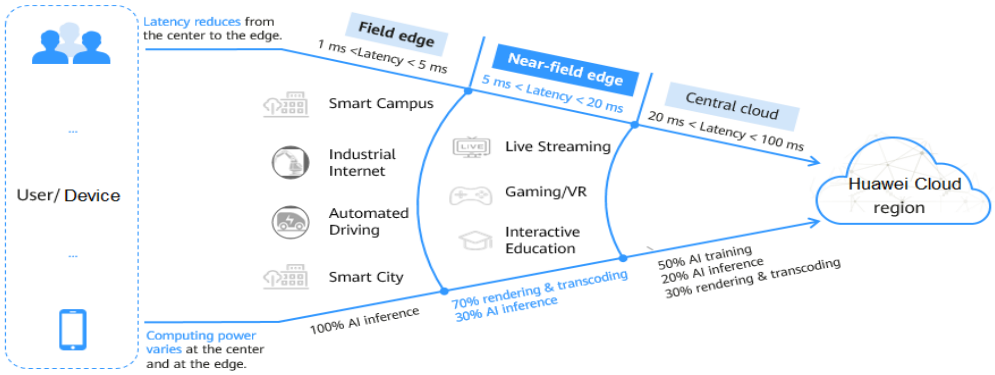
Figure 1-1 Cloud computing and edge computing



Edge computing can be seen as the extension of cloud computing to the edge of the network, and the two are mutually complementary. To fit into the requirements in different scenarios, you need to leverage both cloud computing and edge computing to form an edge-cloud synergy.

Figure 1-2 illustrates the scope of edge computing.

Figure 1-2 Scope of edge computing



There are three rough categories of network latency, each defined by their distance from end users. From closest to farthest, these ranges are the field edge, the near-field edge, and the cloud.

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- Field edge: The network latency ranges from 1 ms to 5 ms, and computing power is primarily used for AI inference. Real-time services, such as autonomous driving and industrial Internet perform well at the field edge.
- Near-field edge: The network latency ranges from 5 ms to 20 ms. 70% of the computing power is used for rendering, and the rest for AI inference. Video services are positioned to run at the near-field edge.
- Cloud (or central cloud): The network latency is between 20 ms and 100 ms, and workloads that are not delegated to the edge, such as massive data storage, data mining, and training, are generally deployed on the central cloud.

For field edge and near-field edge scenarios, Huawei Cloud has launched Intelligent EdgeCloud (IEC) and **CloudPond**.

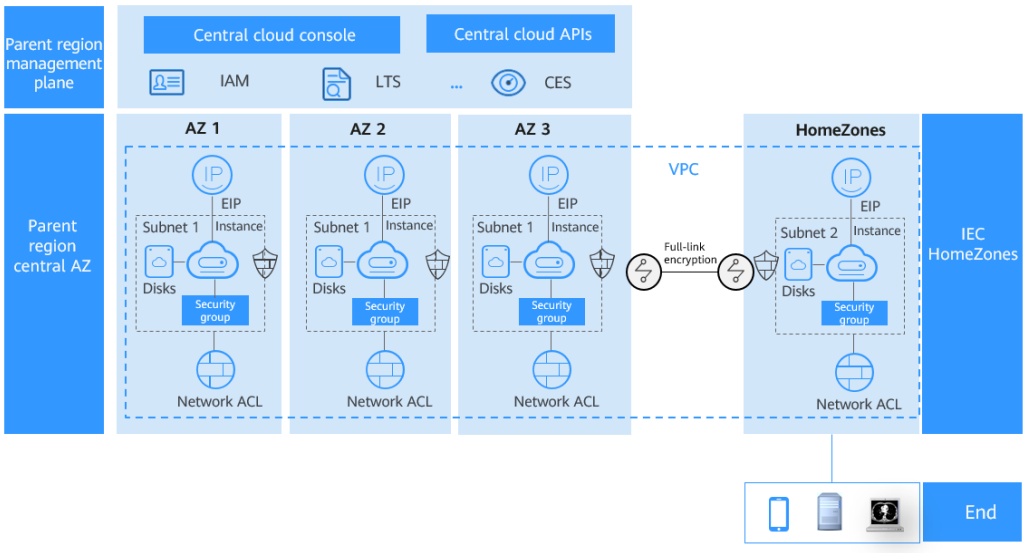
- IEC provides a distributed edge cloud with wide coverage for customers to flexibly deploy services nearby.
- **CloudPond** provides a solution that integrates software and hardware in a rack that can be deployed in your on-premises data center.

IEC

IEC is deployed closer to enterprises and areas with a large number of active users and provides the same experience as the central cloud. It provides a latency of less than 10 ms for latency-sensitive services such as interactive entertainment, online education, and media creation, as well as local data storage for services with compliance requirements, such as finance, healthcare, manufacturing, and scientific research.

Figure 1-3 shows the IEC product architecture.

Figure 1-3 IEC product architecture



- IEC management plane is deployed in the central region where IEC belongs. The management plane shares the console and APIs with the central region. There is no independent console for IEC. You can access the Huawei unified

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management console to purchase, manage, and monitor cloud resources such as compute, network, and storage required by edge services.

- IEC uses Huawei Cloud Identity and Access Management (IAM) for account authentication, and Image Management Service (IMS) of Huawei Cloud to provide private images required for creating edge instances.
- IEC uses Huawei Cloud Virtual Private Cloud (VPC), Elastic IP (EIP), instances, subnets, security groups, network Access Control Lists (ACLs), and Elastic Cloud Servers (ECSs). Elastic Volume Service (EVS).
- IEC HomeZones is physically isolated from the central AZ of the parent region. You can create a cross-AZ VPC to enable communication between IEC HomeZones and the Huawei Cloud AZ over the VPC.
- After IEC HomeZones is enabled, you can select the HomeZones in the region where IEC is located to create compute and storage resources and cloud services in the HomeZones for low latency and local data storage.

Why IEC?

Self-built services cost more and have higher security risks than IEC, and cannot meet the high requirements of new services. **Figure 1-4** shows comparison between self-built services and IEC.

Figure 1-4 Comparison between self-built services and IEC

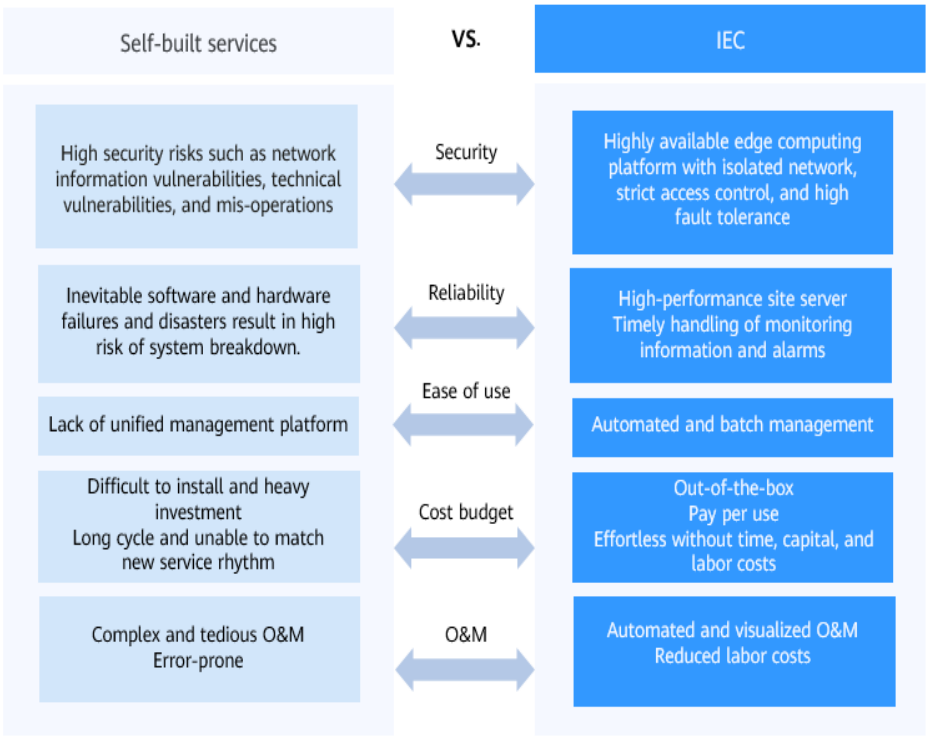

Figure 1-5 helps you further understand the IEC advantages in reducing network latency during edge service processing when compared with the traditional centralized public cloud.

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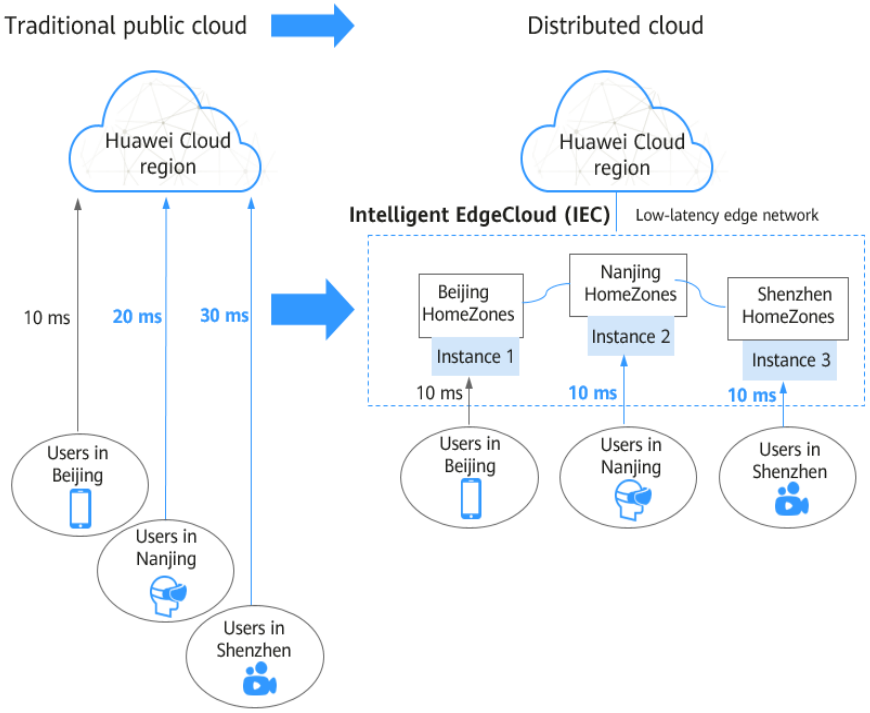
Figure 1-5 Comparison between IEC and traditional public cloud



For details about IEC advantages, see **1.2IEC Advantages**.

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2 IEC Advantages

- Low latency: IEC services are deployed on high-quality nodes covering major provinces, cities, and mainstream carriers in the Chinese mainland. You can deploy latency-sensitive services nearby to ensure deterministic latency and improve service experience.
- Local data storage: For data-sensitive industries such as healthcare, manufacturing, and scientific research, you can store data in the city or country where IEC is located to ensure data compliance.
- Multi-architecture computing power: IEC provides multi-architecture computing power suitable for various edge service scenarios. You can select the proper computing power based on service requirements.
- Diverse advanced services: In addition to basic cloud services such as compute, storage, and network services, local sites built based on the new IEC technical architecture can provide advanced services such as databases, data governance, edge applications, and security services in multi-tenant mode.
- Edge-cloud synergy: IEC HomeZones can communicate with the AZ of the central region over a VPC and share all cloud services of the central region. This allows you to build scenario-oriented distributed cloud solutions.

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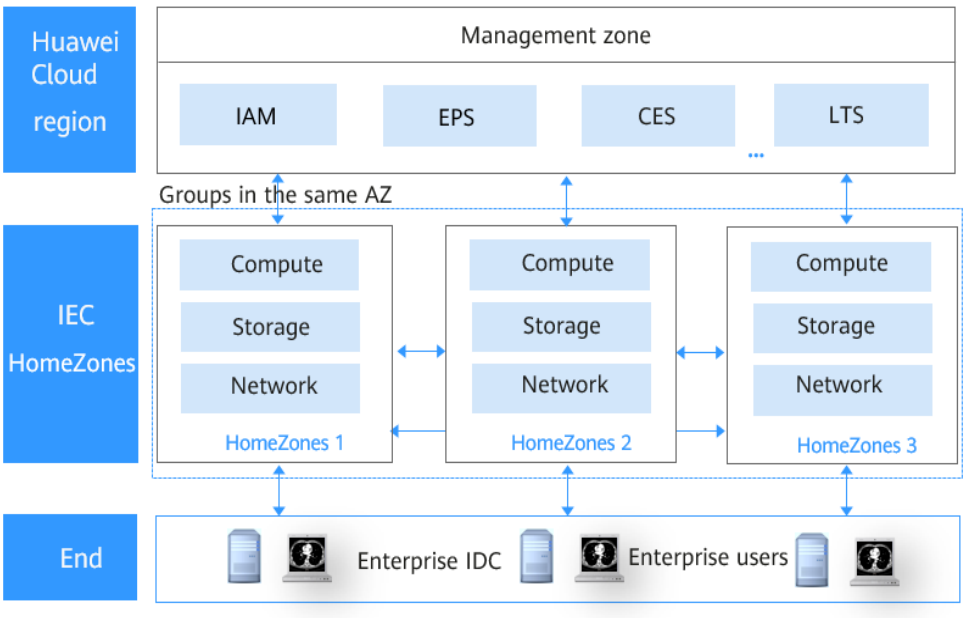
3 Application Scenarios

IEC is designed for low-latency and local data storage scenarios, including **Enterprise Applications**, **Interactive Live Streaming**, **Application Acceleration**, and **Self-built CDN**.

Enterprise Applications

Figure 3-1 Enterprise applications



Scenario characteristics

IEC can be started from a single HomeZones be smoothly expanded to up to three HomeZones. IEC SLA is the same as that of Huawei public cloud.

Highlights

- High availability: Consistent SLA with Huawei Cloud to ensure high reliability and stability of enterprise services
- High security: In addition to platform-level services such as Anti-DDoS, information security, and Network Detection and Response (NDR), tenant-

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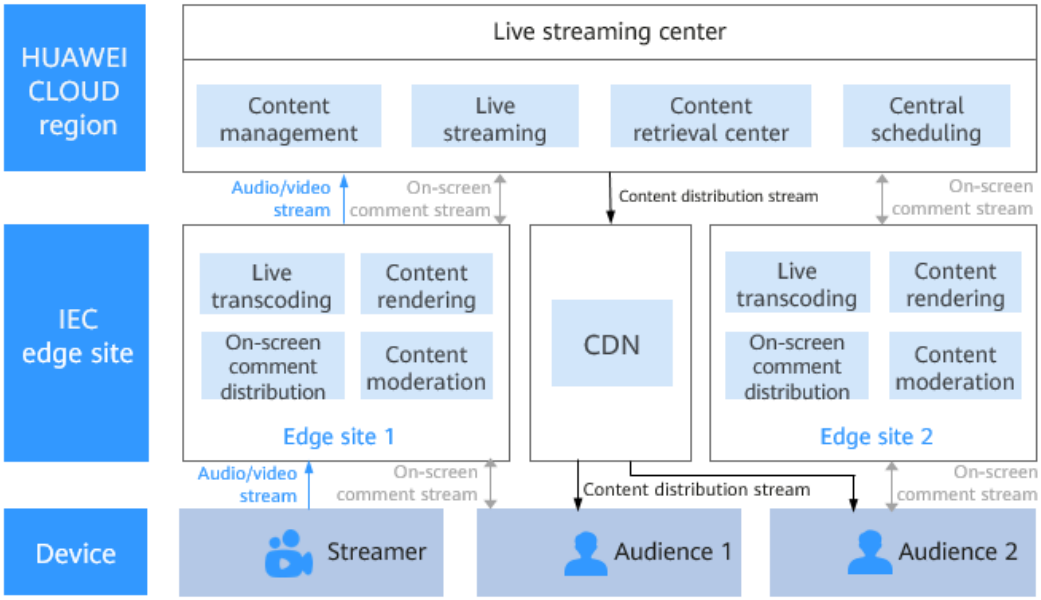
level security cloud services such as host security, database security, and Web Application Firewall (WAF) are also provided.

- Diverse cloud native services: IEC supports more than 30 cloud native services, meeting the requirements of enterprise services for cloud services.

Interactive Live Streaming

Figure 3-2 Interactive live streaming



Scenario characteristics

Deploying processing capabilities such as audio and video transcoding, distribution of on-screen comments, and content moderation at edge sites can significantly enhance service processing quality, improve response efficiency, and reduce traffic costs.

Advantages

- Multi-architecture computing power: IEC provides multi-architecture computing power, such as GPU and AI, to improve the cost-effectiveness in scenarios such as HD transcoding and content moderation.
- Traffic localization: helps optimize the cost of the bullet screen service.

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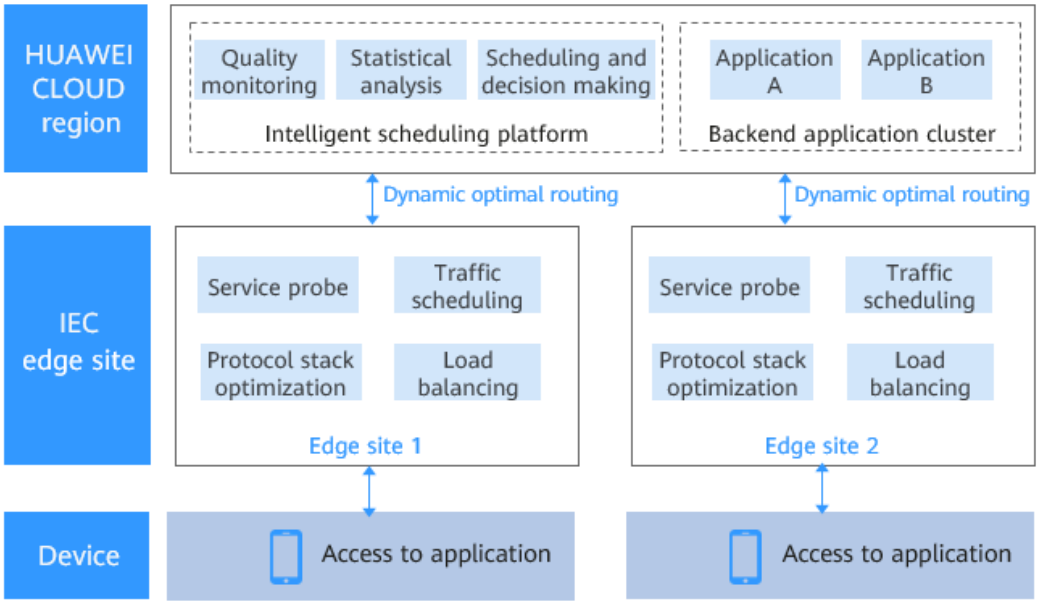
Application Acceleration

Figure 3-3 Application acceleration



Scenario characteristics

In application acceleration scenarios, such as game acceleration and application acceleration, edge nodes close to end users need to be selected and end-to-end network routing need to be optimized to reduce the end-to-end latency.

Advantages

- Elastic scalability: On-demand resource usage and batch edge service creation effectively cope with burst workload requirements.
- Efficient O&M: Unified management of multi-site resources and API-based service management, monitoring, and O&M

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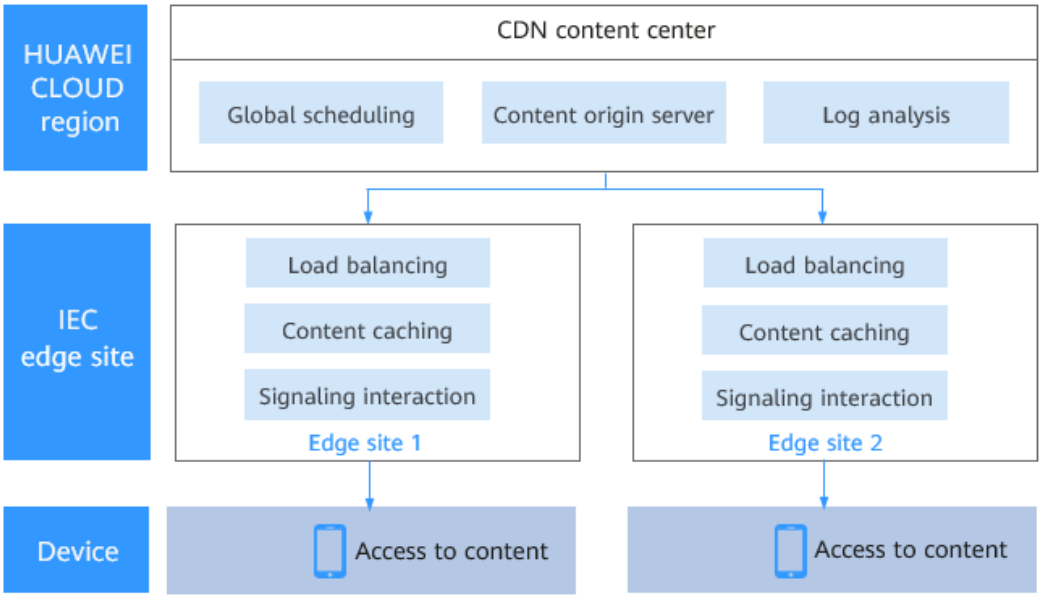
Self-built CDN

Figure 3-4 Self-built CDN



Scenario characteristics

Currently, most Internet enterprises or service providers lease IDCs to build their own CDNs, and they need to deploy and maintain a large number of edge nodes in multiple locations. To build and maintain your CDN more easily, you can use IEC that provides edge computing networks covering the Chinese mainland, global management, and automatic O&M capabilities.

Advantages

- Wide coverage: Edge sites are deployed in major regions and provinces in the Chinese mainland.
- Cost-effective: High-performance local storage instances with NVMe customized for the content distribution scenarios are available.

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4 Basic Concepts

HomeZones

HomeZones is the Huawei Cloud edge AZ where IEC is deployed. Infrastructure cloud services such as multi-architecture compute, storage, and network can be provided closer to you. Yo can flexibly deploy your workloads at the nearest edge sites to reduce network latency and costs.

Virtual Private Cloud (VPC)

Virtual Private Cloud (VPC) allows you to provision logically isolated virtual private networks for cloud resources, such as cloud servers, containers, and databases. You can create subnets, security groups, network ACLs, route tables, and more to manage cloud resources flexibly. You can also use EIPs to connect cloud resources in VPCs to the Internet, and use Direct Connect and VPN to connect on-premises data centers to VPCs to build a hybrid cloud network. You can create a VPC across a central AZ and a HomeZones to enable edge-cloud communication within the VPC.

Edge Gateway

An edge gateway can connect subnets in the same VPC that is used in both HomeZones and central AZs of the central cloud. You need to buy an edge gateway to transmit data plane data across HomeZones and central AZs.

Network Border Group

A public border group is the only group that Huawei Cloud advertises public IP address pools and subnets. Once assigned, IP addresses cannot be moved between different network border groups. Multiple HomeZones in the same region or city are usually in the same network border group and share the same subnet. Gateway instances that belong to the same network border group can provide multi-AZ disaster recovery.

Parent Region

The region that handles some of the HomeZones manage plane operations, such as API calls.

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5 IEC and Other Services

IEC can be deployed in HomeZones to provide infrastructure cloud services with low latency and local data storage. Common cloud services are as follows.

Compute and storage

Different types of ECS edge instances can be deployed in IEC HomeZones to provide compute and storage capabilities. Each edge instance type provides various flavors with different vCPU and memory specifications for you to choose from. For details about the instance specifications, see the actual deployment specifications of different IEC HomeZones.

Reliable, scalable, high-performance Elastic Volume Service disks (EVS disks) of different specifications can be attached to compute resources like ECSs and Bare Metal Servers (BMSs) for persistent data storage. For details about EVS disk types, see the actual deployment specifications of different IEC HomeZones.

IEC also supports Scalable File Service Turbo (SFS Turbo) and Object Storage Service (OBS).

Containers

You can create CCE Turbo clusters in a IEC HomeZones.

Internet and DirectConnect

IEC supports VPC, Elastic IP (EIP), and Direct Connect to provide local Internet access and Direct Connect access with low latency.

Virtual Private Network (VPN) and Cloud Connect are also supported.

For details about cloud services whose data plane can be deployed in IEC HomeZones, see **Table 5-1**.

Table 5-1 Cloud services whose data plane can be deployed in IEC HomeZones

Category	Cloud Service
Compute	Elastic Cloud Server (ECS)

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Storage	Elastic Volume Service (EVS)
Network	Virtual Private Cloud (VPC)
	Elastic Load Balance (ELB)
	Elastic IP (EIP)
	Virtual Private Network (VPN)
	Direct Connect
	Cloud Connect
Container	Cloud Container Engine (CCE)
Security	Web Application Firewall (WAF)
	Host Security Service (HSS)

IEC can also directly reuse management cloud services deployed in the parent region, such as Cloud Eye, Identity and Access Management (IAM), Cloud Trace Service (CTS), SoftWare Repository for Container (SWR), Enterprise Project Management Service (EPS), Key Management Service (KMS), and Tag Management Service (TMS).

In addition, the Huawei Cloud architecture provides security capabilities such as anti-DDoS, traffic monitoring system, and information security for you to ensure data security.

NOTE

Different HomeZones support different cloud services. For details, see the site function list.

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6 Billing

You can enable IEC HomeZones for free.

You only pay for the resources you deploy in your HomeZones. Huawei Cloud resources in HomeZones are priced differently from those in other AZs in the same region.

For details, see **Price Calculator**.

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