

# **Cloud Connect Network**

## **Product Introduction**

### **Product Documentation**



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# Product Introduction

## Overview

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## What is Cloud Connect Network

Cloud Connect Network (CCN) bridges between Tencent Cloud [VPCs](#) and between VPCs and local IDCs. It provides you with public and private network multi-point interconnection, route self-learning, linkage prioritization, failure fast convergence, and other capabilities. With its presence in over 20 regions around the world, 100+ Gbps bandwidth and 99.99% high availability, it helps you easily build fast, stable, secure, and flexible globally interconnected networks. CCN is typically used in:

1. **High-quality private network connection between VPCs:** online education with real-time audio and video systems across regions, game acceleration using private network interconnection across regions, and cross-region disaster recovery.
2. **Private network connection between VPCs and on-premises IDCs:** create a [dedicated tunnel](#) and connect multiple VPCs for public and private network interconnection by a single access. Ideal for hybrid clouds.

## Product Components

A CCN consists of:

- Associated network instances: network instances within the same CCN instance can communicate with each other. Supported network instance types include VPC, VPC (BM), and direct connect gateway. For more information, refer to [Associate Network Instance](#).

### Note :

The VPN gateway associated with CCN is now in beta test. To apply for its use, [Submit a Ticket] (<https://console.cloud.tencent.com/workorder/category>). For more information, see [Connecting IDC to CCN via VPN Gateway](#).

- Route table: CCN automatically learns routes of network instances added and present them in its route table. For more information, see [Viewing Routing Information](#).

# Feature Overview

CCN has the following features:

## **Full-mesh interconnection**

CCN features multi-node multi-route-level automatic forwarding and learning on the public and private network and route convergence in seconds, which allows you to interconnect all network instances with a simple step, and manage them easily.

## **Smart learning and scheduling**

CCN frees you from the heavy route maintenance with its Full Mesh interconnection between multiple nodes and links in public and private networks. The smart scheduling system monitors the multi-layer network topology, routes, and traffic of the entire network to connect your local services to the nearest point and ensure interconnection using the shortest link.

## **Automatic route forwarding**

CCN automatically learns multi-level routes, and updates the routing table if your network topology changes. This simple management replaces your extra manual configuration or updates, which in turn, greatly improves the scalability and OPS efficiency of your network.

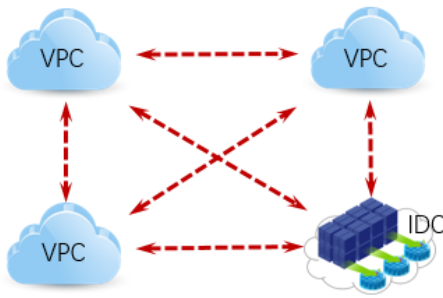
# Feature Comparison

## **CCN vs peering connection/dedicated tunnel**

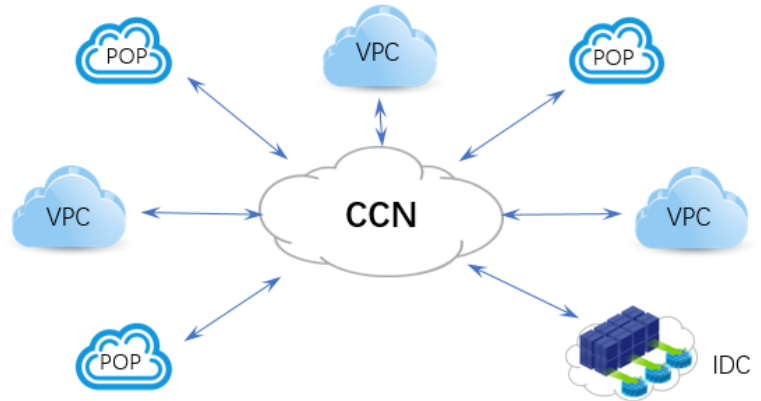
Without CCN, if you want to interconnect multiple VPCs and your IDC with multiple VPCs, you need to establish one peering connection for each pair of VPCs and one dedicated tunnel between your IDC and each VPC. And then, you also need to make sure VPC and IDC IP ranges do not overlap. After establishing the connection, you must manage the route tables of instances and manually add routing policies to make it all work.

On the other hand, doing the same with CCN would only require a CCN instance and adding all VPCs and the IDC to the CCN instance. After you add the instances to the CCN, it will automatically forward and learn all routes, saving you the hassle of manually configuring and managing the route tables of the instances.

For details on how to migrate existing applications to CCN, refer to [Best Practices](#).



Peer or Direct Connect  
Single-point interconnection



Full-mesh interconnection

CCN Benefit	Peering Connection/Dedicated Tunnel	CCN
Full-mesh links	<ol style="list-style-type: none"> <li>To interconnect multiple VPCs, you need to establish Cn2 peers.</li> <li>A single dedicated tunnel can only connect to one VPC.</li> <li>VPCs with overlapping IP ranges cannot be peered.</li> </ol>	<ol style="list-style-type: none"> <li>No peering connection needed. All instances added to the CCN instance are in a full mesh interconnection.</li> <li>Each dedicated tunnel can communicate with all VPCs and IDCs.</li> <li>CCN allows for network instances with overlapping CIDR blocks. This provides greater flexibility for interconnection.</li> </ol>
Automatic route learning	<ol style="list-style-type: none"> <li>Routes must be configured for every link.</li> <li>Manual updates are required for any link change.</li> </ol>	<ol style="list-style-type: none"> <li>Routes are automatically learned and forwarded.</li> <li>Route tables are dynamically updated without manual maintenance.</li> </ol>
Greater stability and reliability	Multi-cluster disaster recovery in a single zone.	Multi-zone hot backup disaster recovery with 99.99% high availability.
Lower costs	<ol style="list-style-type: none"> <li>You pay for each link separately.</li> <li>You pay a higher unit price.</li> </ol>	<ol style="list-style-type: none"> <li>You pay for all bandwidth in a region as a whole (similar to bandwidth packages), which evens out the price.</li> </ol>

		2. Unit price is more competitive.
Lower latency	Connections are established using lines randomly selected among multiple underlying lines. The latency difference can be 10 ms or more and the latency fluctuates.	Select the optimal line.

# Benefits

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## Full-mesh Interconnection and Easy Management

CCN provides you with enterprise-grade network services for single-point access and full-mesh interconnection. Through the automatic forwarding and learning of full-mesh multi-node multi-level routing and second-level routing convergence, all network instances on CCN can be interconnected in one step for easy management with no cumbersome route configuration and management required.

## Local Access and Intelligent Scheduling

Based on the multi-node and multi-link full-mesh interconnection, CCN helps you do away with cumbersome routing maintenance work. Its intelligent scheduling system is based on the unified detection of full-mesh multi-level network topology, routing and traffic and supports local access and shortest path routing for local businesses.

## Ultra-low Latency and High-speed Transfer

Tencent Cloud operates interconnected Internet Data Centers (IDCs) in more than 30 regions around the globe. CCN enables the interconnection between any two associated network instances via the shortest path on the private network, without possible link congestion caused by public networks. This greatly reduces the network latency for global multi-point interconnections to ensure high-speed data transmission.

## Reasonable Billing for Lower Costs

CCN is pay-per-use with a more reasonable monthly 95th percentile billing method, helping round off small fee amounts caused by network jitters. You only need to pay for the bandwidth resources actually used, avoiding the waste caused by prepayments.

## Multiple-layer Encryption for Security and Reliability



Based on MPLS-VPN technology, CCN isolates tenant networks from one another by encrypting the network at multiple layers. All data communications of the network instances in CCN do not pass through the Internet, which provides better communication quality and network availability and results in low latency and low packet loss. Further, CCN makes your data more secure and stable by guaranteeing communication quality through multi-level linkage redundancy.

## Bandwidth Monitoring for Flexible Adjustment

CCN has single-region egress bandwidth monitoring, speed limiting and alarming functions. Multi-metric monitoring can help you better manage your business. The upper bandwidth limit in each region can be adjusted at any time according to your business growth needs for easier controlling of the network.

# Use Cases

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## Use Case 1. Building a Hybrid Cloud

### Background

You have deployed a business VPC and a disaster recovery VPC on Tencent Cloud, and own an on-premise IDC off the cloud. You want to implement resource interconnection between your VPCs and the on-premise IDC.

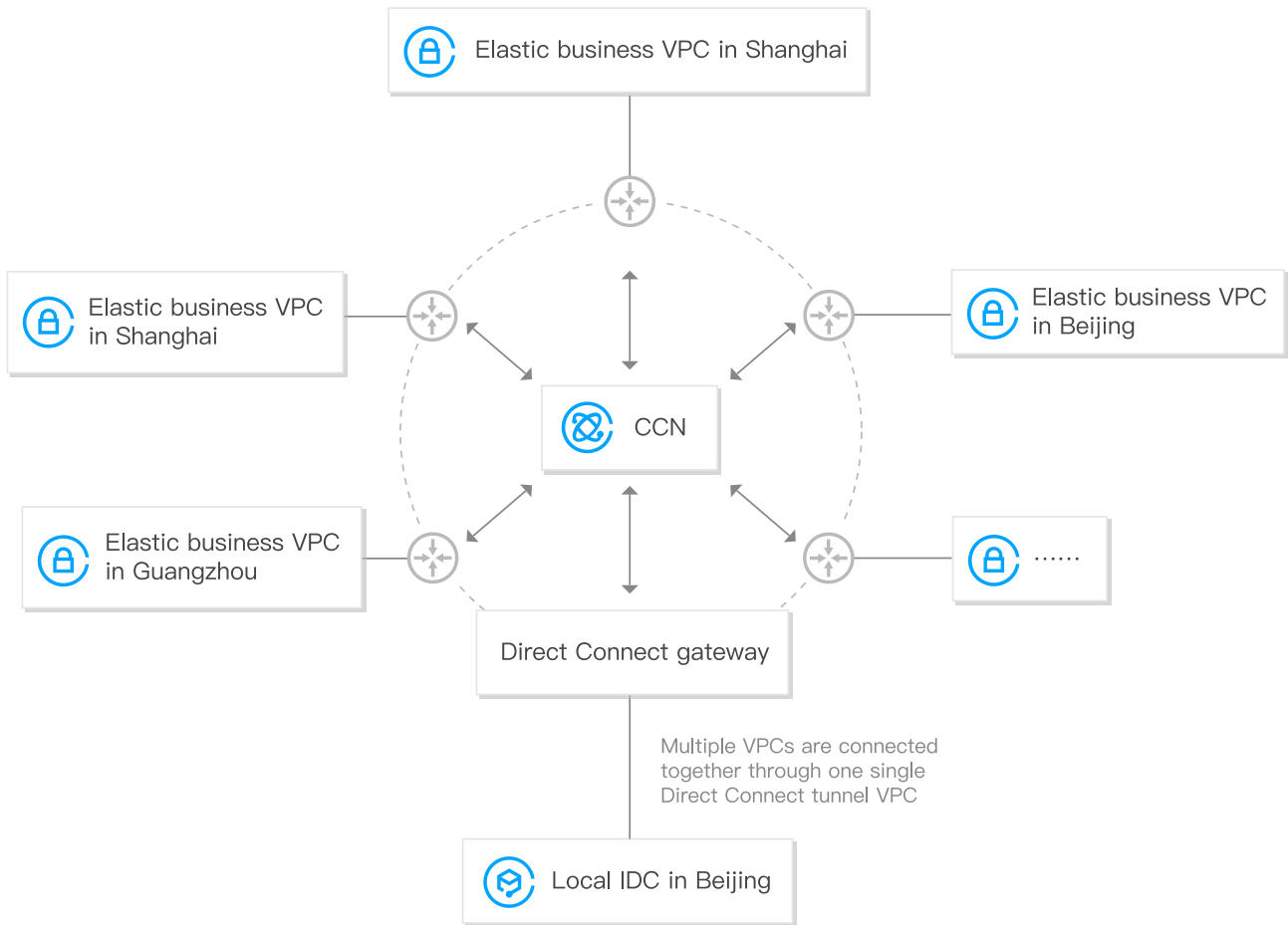
### Solution

Launch a cloud-based environment on Tencent Cloud, and connect it to the local IDC using Direct Connect. In this way, data is stored on cloud for disaster recovery, and elastic services can be deployed locally and on-cloud, creating a hybrid cloud solution.

After creating a CCN instance, you only need to integrate the direct connect gateway connected with the IDC, elastic business VPC and backup data centers into the instance. You do not need to create multiple peering connections and Direct Connect tunnels. The routes are generated automatically, which greatly simplifies the configuration workload.

Outcomes:

- Add VPCs to CCN to implement automatic routing, eliminating the need to create multiple peering connections.
- Add a direct connect gateway to CCN and connect multiple VPCs through one dedicated tunnel, achieving interconnection between your on-premise and on-cloud environments.



## Use Case 2. Online Education

### Background

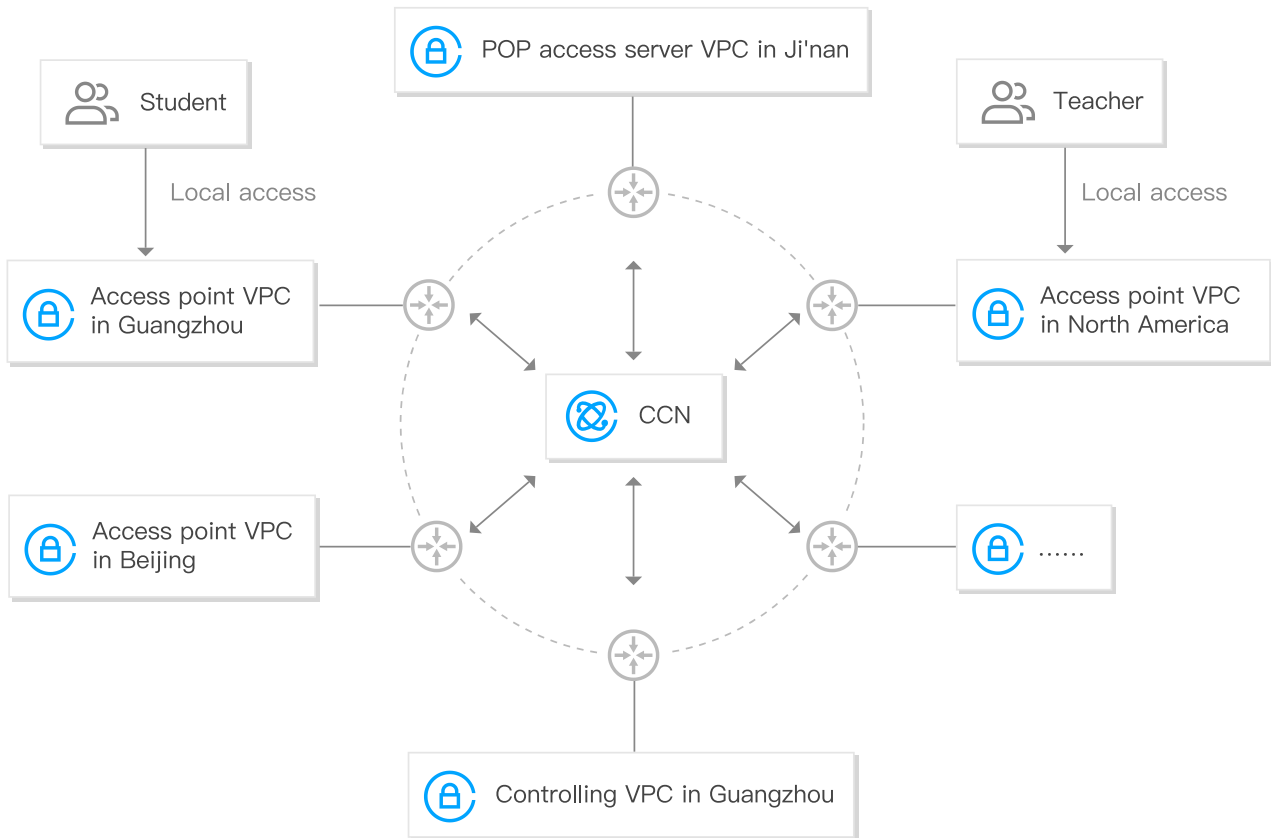
Teachers and students are located in different geographic locations for distance learning, making multiple VPCs and connections necessary for the interconnection if peering connection is used. High-quality interconnection across different regions is also required for live streaming platforms so as to ensure clear audio and video communications.

### Solution

Based on Tencent Cloud's coverage in over 20 regions around the globe and intelligent full-mesh scheduling algorithm, any two points can be interconnected through the shortest path on the private network with no public network bypassing and link congestion, providing global multi-point interconnection with reduced latency.

Outcomes:

- Teachers and students have local access to online services with high transfer quality and low latency.
- VPCs in different regions can interconnect with all other instances once connected to CCN.



## Use Case 3. Gaming Acceleration

### Background

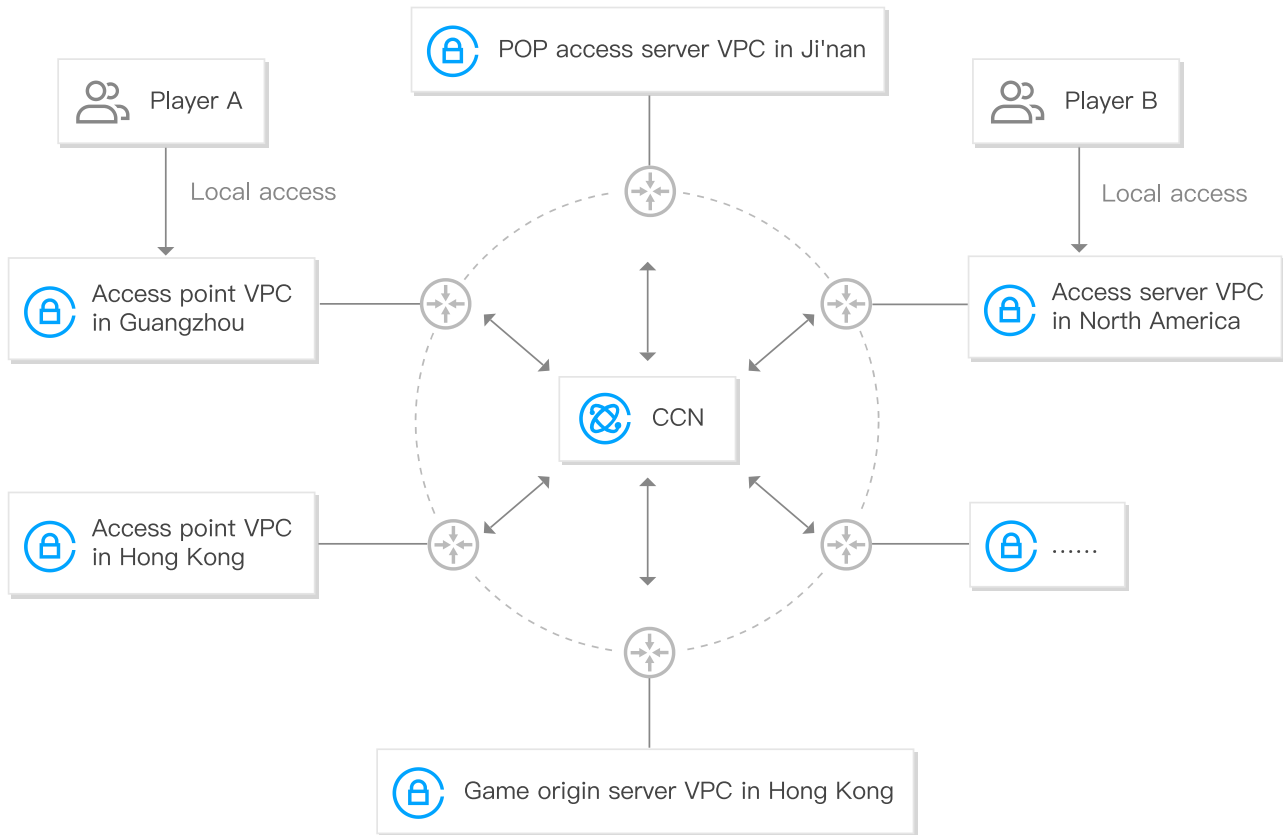
Online games have players around the world and is latency-sensitive. Multiple servers need to be deployed in different regions in order to meet the requirements of local access and cross-server PvP battles.

### Solution

With coverage in over 20 regions around the globe and based on full-mesh network topology and monitoring of routing and real-time bandwidth, CCN uses an intelligent scheduling system to achieve low-latency interconnection, allowing global players to battle on the same servers for an ultimate gaming experience.

Outcomes:

- Players have local access to the service VPCs with low latency.
- CCN uses a full-mesh topology to support multi-region VPC connection for a global network.



# Use Limits

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## Resource Limits

The table below lists the limits on the supported CCN resources.

Resource	Limit
Number of CCN instances per account	5
Number of network instances that can be bound to one CCN instance	25

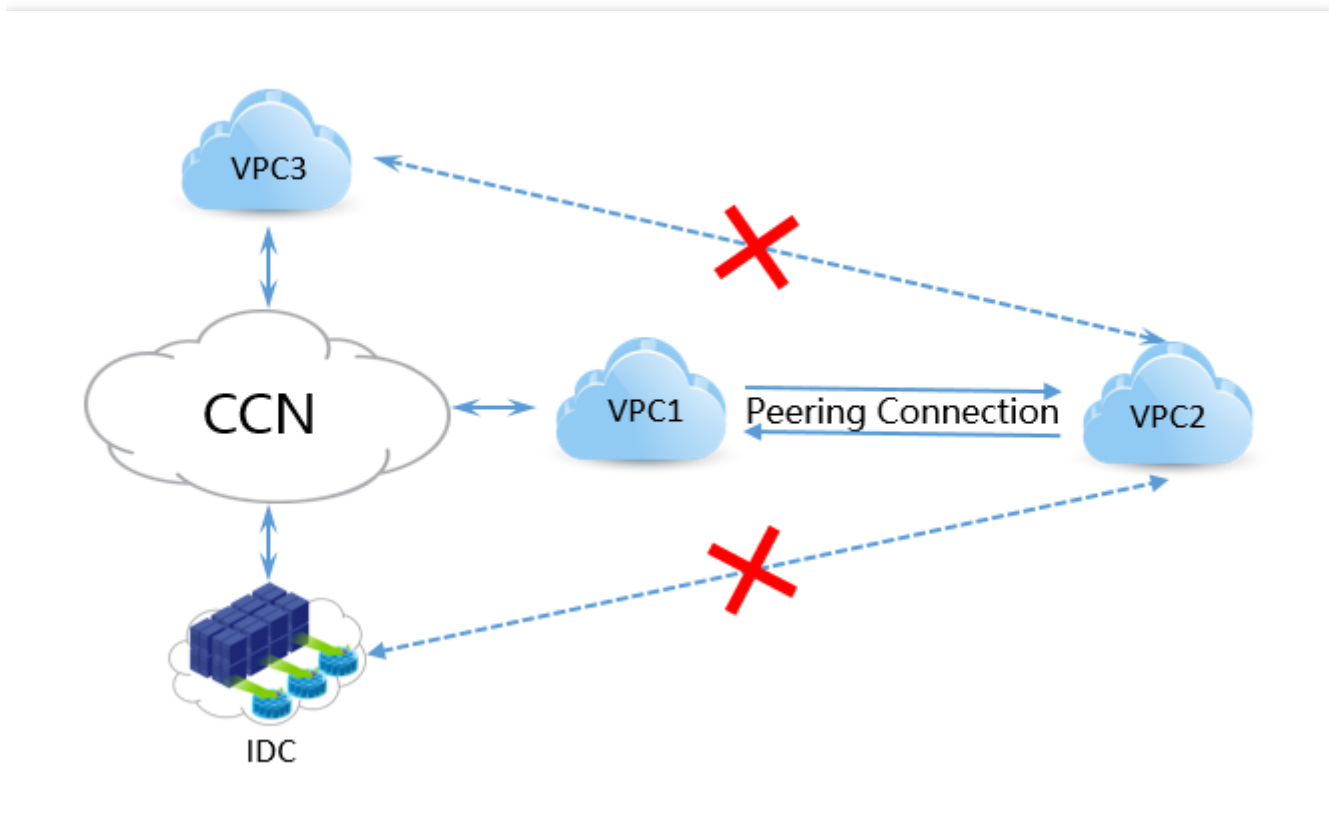
## Feature Limits

### Non-transferrable with a peering connection

The presence of a peering connection does not affect the interconnection implemented after a VPC is joined to CCN. CCN only distributes routes to the network instances associated with it for interconnection.

For example, as shown in the figure below, a peering connection has been established between VPC1 and VPC2. After VPC1 is added to a CCN instance, only VPC1 can interconnect with network instances VPC3 and IDC in CCN, while VPC2 can only interconnect with VPC1 through the peering

connection but not other instances in CCN.



## Route Limits

To ensure that the interconnection between multiple network instances is smooth, CCN restricts the CIDR blocks of the network instances.

### Limits on VPC CIDR blocks

CCN restricts CIDR blocks at the subnet level: two subnets with identical CIDR blocks in different VPCs cannot interconnect (see below for route validity rules); accordingly, even if the CIDR blocks of two VPCs overlap, as long as their subnets have different CIDR blocks, you can still add them to CCN for interconnection.

### Rules for CIDR overlapping conflict

1. If the CIDR blocks of network instances overlap, only the route of the network instance that is first associated with the CCN instance will take effect.
2. For a network instance already in CCN, if a route conflict occurs due to operations such as subnet creation, the new route will not take effect, and the existing valid route will remain valid.

## Rules for CIDR inclusive conflict

If the CIDR blocks of multiple network instances have an inclusive conflict, only the route of the network instance that is first associated with the CCN instance will take effect. However, you can enable invalid routes in the route table, which, once enabled, will forward data based on the longest mask matching rule.

### Example of an inclusive conflict

Assume that VPC 1 is first associated with CCN instance A, the CIDR block of its subnet A is `10.0.1.0/20`, and it can interconnect with other network instances in CCN instance A. Then, VPC 2 is associated with CCN instance A, and the CIDR block of its subnet B is `10.0.1.0/24`, which is included in the CIDR block of subnet A in VPC 1. In this case, a CIDR inclusive conflict occurs. As a result, the routing policy of subnet B in VPC 2 will become invalid by default, and VPC 2 cannot interconnect with other network instances in CCN instance A.

However, you can enable this invalid route in the route table of subnet B, which can forward data according to the longest mask matching rule. If the destination IP address of the routing policy is `10.0.1.0/24`, the data will be forwarded to subnet B in VPC 2 based on the rule.