Alibaba Cloud
Express Connect

Product Introduction

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Generic conventions

Table -1: Style conventions

Style	Description	Example
⛔	This warning information indicates a situation that will cause major system changes, faults, physical injuries, and other adverse results.	⛔ **Danger:** Resetting will result in the loss of user configuration data.
⚠️	This warning information indicates a situation that may cause major system changes, faults, physical injuries, and other adverse results.	⚠️ **Warning:** Restarting will cause business interruption. About 10 minutes are required to restore business.
📋	This indicates warning information, supplementary instructions, and other content that the user must understand.	📋 **Note:** Take the necessary precautions to save exported data containing sensitive information.
	This indicates supplemental instructions, best practices, tips, and other content that is good to know for the user.	📋 **Note:** You can use **Ctrl** + **A** to select all files.
>	Multi-level menu cascade.	**Settings** > **Network** > **Set network type**
Bold	It is used for buttons, menus, page names, and other UI elements.	Click **OK**.
`Courier font`	It is used for commands.	Run the `cd /d C:/windows` command to enter the Windows system folder.
Italics	It is used for parameters and variables.	`bae log list --instanceid` *`Instance_ID`*
[] or [a|b]	It indicates that it is a optional value, and only one item can be selected.	`ipconfig` *`[-all|-t]`*
{} or {a|b}	It indicates that it is a required value, and only one item can be selected.	`swich` *`{stand | slave}`*

Contents

1 What is Express Connect?

Alibaba Cloud Express Connect helps you build private network communication channels between VPCs or between a VPC and your local IDC. These channels feature increased network topology flexibility and enhanced cross-network communication quality and security. Express Connect also helps you avoid unstable network quality, and prevents data theft during transmission.
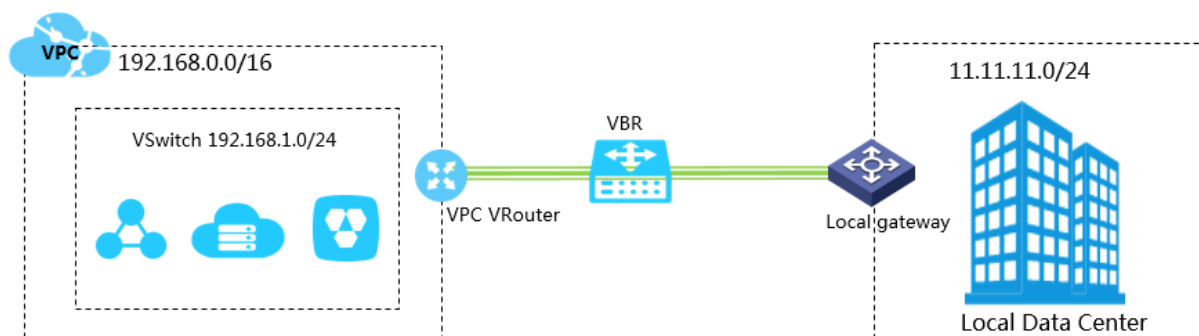
Functions

Express Connect provides the following functions:

- Physical connection

  You can use a leased line from your service provider to establish a physical connection from your local IDC to an Alibaba Cloud access point. After the physical connection is established, you can create a Virtual Border Router (VBR) to connect your local IDC with Alibaba Cloud to build hybrid clouds.

  As a private network connection, the physical connection does not pass through the Internet. Compared with traditional Internet connections, the physical connection is safer, faster, more reliable, and has less latency.

- VPC interconnection

  You can create a peering connection to build an intranet communication channel between two VPCs.

Benefits

The benefits of Express Connect are as follows:

- High-speed intercommunication

  Powered by the network virtualization technology of Alibaba Cloud, Express Connect can connect different network environments so that both ends can directly communicate with each

other through the intranet without going through the Internet. Even when both ends are far apart from each other, intranet communications can provide low latency and high bandwidth.

- Stability and reliability

  Built on the state-of-the-art infrastructure of Alibaba Cloud, Express Connect ensures stable and reliable communication between networks.

- Security

  Express Connect implements cross-network communication at the network virtualization layer , where all data is transmitted through the infrastructure of Alibaba Cloud and tenants are isolated from each other. This eliminates the risk of data theft during transmission.

- Pay-As-You-Go billing

  Express Connect provides different bandwidth specifications. You can purchase resources based on your service needs in Pay-As-You-Go billing mode to minimize your costs.

2 Physical connection

You can use a leased line from your service provider to establish a physical connection from your local IDC to an Alibaba Cloud access point. After the physical connection is established, you can create a Virtual Border Router (VBR) to connect your local IDC with Alibaba Cloud to build hybrid clouds. As a private network connection, the physical connection does not pass through the Internet. Compared with traditional Internet connections, the physical connection is safer, faster, more reliable, and has less latency.

Functions

The Express Connect physical connection interface (through which an ISP leased line connects to an Alibaba Cloud access point) provides the following functions:

- Multiple connection modes

  You can use a point-to-point Ethernet connection or MPLS VPN connection. The physical connection supports RJ45 and LC optical ports (maximum distance: 10 km) with a transmission rate from 1 Mbit/s to 100 Gbit/s.

- Redundant connections

  The physical connection uses Equal-Cost Multi-Path routing (ECMP) to implement redundancy with two leased lines.

  — If both leased lines are connected to different access points in the same region, the leased lines are naturally redundant to each other.

  — If both leased lines are connected to the same access point in the same region, you can select the first leased line as the redundant connection when applying for the second leased line.

Limits

The physical connection interface has the following limits:

- Physical connections do not support SDH G.703 or V.35 interfaces.

- Alibaba Cloud provides one or more access points in each accessible region. Different access points have different service provider restrictions. Before applying for leased line access, you must submit a ticket to obtain an access point and the restriction information of your service provider.

3 Virtual border routers

Alibaba Cloud isolates the physical connection ports of its customers and abstracts these ports into Virtual Border Routers (VBRs) based on the three-layer overlay and switch virtualization technology of the Software Defined Network (SDN) architecture. A VBR is a router between the Customer-Premises Equipment (CPE) and the VPC, and functions as a data forwarding bridge from the VPC to the local IDC.

Similar to the router in a VPC, a VBR also has a route table. You can configure route entries in the route table to forward VBR traffic.

Functions

VBR provides the following functions:

- Exchanges data packets as an intermediate router between the VPC and the local IDC.

- Attaches or identifies Virtual Local Area Network (VLAN) tags in Layer-3 sub-interface mode.

- Decides the port mode of the physical connection: Layer-3 route interface or VLAN-based Layer-3 sub-interface.

- Supports Border Gateway Protocol (BGP).

  BGP is a dynamic routing protocol based on Transmission Control Protocol (TCP). It is mainly used to exchange routing information and network accessibility information among autonomous systems. You can use BGP to implement intranet connection between the local IDC and the VBR. BGP can help you build hybrid clouds in a more efficient, flexible, and reliable manner.

Limits

- Source address policy routing is not supported.

- Each VBR has only one route table.

- Each route table supports 48 custom route entries.

- VBR can establish BGP peers only with the peered local IDC of a physical connection. Static routing is still needed between the VBR and the VPC.

- The supported BGP version is BGP4.

- The VBR supports IPv4 BGP, but does not support IPv6 BGP.

- A maximum of eight BGP peers can be created under each VBR.

- A maximum of 100 dynamic route entries can be added to a BGP peer.

- The Autonomous System Number (ASN) of Alibaba Cloud is 45104. It supports the transmission of 2-byte or 4-byte ASNs from the customer side.

4 Peering connections

You can establish a peering connection between two VPCs or between a VPC and a VBR.

Initiator and acceptor

When you establish a peering connection, one end (VPC or VBR) of the connection is the initiator , and the other end is the acceptor. Only the initiator can initiate a connection. The acceptor can only wait for the initiator to initiate a connection. The initiator and the acceptor are only used to control the process of connection establishment. After the connection is established, the communication link is bidirectional and there is no difference between the initiator and the acceptor.

For interconnections between VPCs under the same account, Express Connect provides an option to create the initiator and the acceptor at the same time. You do not need to manually initiate the connection. The system will automatically initiate and establish the connection. For interconnections between VPCs under different accounts, you must manually initiate a connection.

The following table compares the initiator and acceptor.

Item	Initiator	Acceptor
Is this end charged when VPCs are interconnected in the same region?	No	No
Is this end charged when VPCs are interconnected between different regions?	Yes	No
Is it required to configure peer information before initiating a connection?	Yes	Yes
Can this end initiate a connection?	Yes	No
Can this end send messages to the peer end after a connection is established?	Yes	Yes

Connection process and status

In the peering connection process, the initiator initiates a connection. The acceptor then receives the connection, after which the connection is established successfully.

During different stages of the connection process, the status of a peering connection is also different, as shown in the following table.

> **Note:**

If you choose to create both ends at the same time when establishing a peering connection, the system automatically initiates and establishes a connection. In this case, the initiator and the acceptor become activated after being created.

Connection process	Initiator status	Acceptor status
The initiator initiates a connection.	Connecting	Accepting
The connection is established.	Activated	Activated
The connection is suspended.	Suspending	Suspending
The connection is broken.	Suspended	Suspended
A connection is re-initiated.	Activating	Activating
The connection is established.	Activated	Activated

5 Scenarios

You can use Express Connect to create safe and high-speed private-network communication between two Virtual Private Clouds (VPCs) or between a VPC and a local IDC.

Connect a local IDC to a VPC through a physical connection

If your local IDC needs to communicate with a VPC through a private network, you can use the physical connection function of Express Connect to implement private-network communication on both sides. You can establish a physical connection by yourself or by an Alibaba partner. With the physical connection, you can fulfill private-network communication with high quality, high reliability, and high security between your local IDC and the VPC. Express Connect allows you to accomplish private-network communication between two VPCs, eliminating the risk of network instability and data theft during transmission.

Connect two VPCs

You can use Express Connect to implement private-network communication between two VPCs. Express Connect supports cross-region VPC interconnection.

6 Limits

Before using Express Connect, we recommend that you understand the limits.

Resource	Default limit
Maximum number of VBRs that can be created on a physical connection	5
Maximum number of physical connections that an account can access at an access point	2
Maximum number of idle VBRs (VBRs without interface) for an account	5

7 Terms

Term	Description
Express Connect	Alibaba Cloud Express Connect helps you build private-network communication channels between VPCs or between a VPC and your local IDC with increased network topology flexibility and enhanced cross -network communication quality and security.
Virtual Private Cloud (VPC)	VPC is a custom private network created on Alibaba Cloud. VPCs are logically isolated from each other. You can create and manage your cloud product instances, such as ECS instances, SLB instances, and RDS instances, in your VPC.
Physical connection interface	Physical interface through which the leased physical connection accesses an Alibaba Cloud access point.
VRouter	A VRouter is a hub that connects all VSwitches in the VPC and serves as a gateway to connect the VPC with other networks.
Virtual Border Router (VBR)	A VBR is a product mapping of the physical connection that you apply for to access a VSwitch. The VBR can be regarded as a router between your Customer-Premises Equipment (CPE) and the VPC, serving as a bridge for data exchange between your local IDC and the VPC.
Peering connection	Private-network communication channel between two VPCs or between a VPC and a VBR.
Access point	Geographical location where the physical connection accesses Alibaba Cloud. Each access point has two access devices. Each region has one or more access points, any of which can be used to access Alibaba Cloud VPCs.