Direct Connect

User Guide

Issue   01
Date   2022-03-30

Contents

1 Service Overview

1.1 Overview

What Is Direct Connect?

Direct Connect is a cloud service that allows you to establish a dedicated network connection between your premises and Flexible Engine. By using Direct Connect, you can establish private connectivity between Flexible Engine and your data center, office or collocation environment.

You can establish a connection between your router and Flexible Engine. If redundancy is required, we recommend that you establish two connections terminating at different locations. A connection consists of a single dedicated connection between ports on your router and Flexible Engine router.
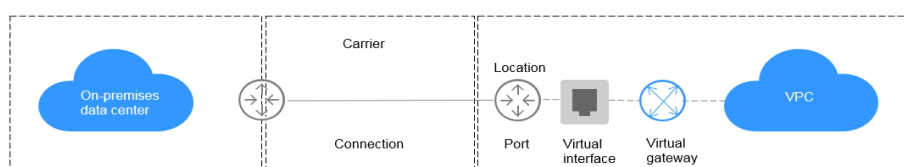
Application Scenarios

You need a dedicated network connection between your data center and a Virtual Private Cloud (VPC) to ensure high bandwidth, low latency, and robust security.

Components

There are three key components for you to use Direct Connect: connection, virtual gateway, and virtual interface.

- **Connection**

  A connection is a dedicated network connection between your on-premises data center and a Direct Connect location over a leased line provided by a carrier. You can request standard connections or hosted connections. If you are a partner, you can also request operations connections.

A standard connection provides a port that is exclusive to you and allows you to have multiple virtual interfaces associated.

A hosted connection allows multiple users to share one port. Partners provision hosted connections and specify VLANs for those connections. Each user can associate only one virtual interface with a hosted connection. If a partner has created an operations connection, you can request a hosted connection from the partner, who will allocate the VLAN and bandwidth to your hosted connection.

- **Virtual gateway**

  A virtual gateway is a logical gateway for accessing a VPC. A virtual gateway can be associated with only one VPC. Multiple connections can access the same VPC through a single virtual gateway.

- **Virtual interface**

  A virtual interface is an entrance for you to access VPCs through a leased line. A virtual interface associates your connection with a virtual gateway, which connects to a VPC so that your network can access the cloud.

1.2 Product Advantages

Direct Connect has the following advantages:

- **High security**

  Direct Connect establishes private connectivity between your premises and one or more VPCs while maintaining network isolation between different workloads.

- **Low latency**

  A dedicated network is used for data transmission, which brings high network performance, low latency, and excellent user experience.

- **High bandwidth**

  A single connection supports up to 10 Gbit/s bandwidth, meeting your connectivity needs today and tomorrow.

- **Great scalability**

  By connecting your on-premises network to the cloud, you gain access to virtually unlimited cloud resources for flexible, scalable hybrid deployment.

1.3 Network Requirements

- Your network must use a single-mode fiber with a 1GE or 10GE optical module to connect to the access device in the cloud.
- Auto-negotiation for the port must be disabled.
- Port speed and full-duplex mode must be manually configured.
- 802.1Q VLAN encapsulation must be supported on the entire connection, including intermediate devices.
- If BGP routing is used, your device must support BGP and BGP MD5 authentication.
- (Optional) You can configure Bidirectional Forwarding Detection (BFD) on the network.

- The maximum transmission unit (MTU) supported at the physical layer is 1522 bytes (14-byte Ethernet header + 4-byte VLAN tag + 1500-byte IP datagram + 4-byte frame check sequence).
- Private IP addresses are recommended on the cloud, and IP address ranges for interworking cannot conflict with each other.

1.4 Constraints and Limitations

Resource	Quota
Number of connections that can be created for an account in each region	10
Number of virtual interfaces that can be created for an account in each region	50
Number of routes for BGP sessions on a virtual interface	100
Number of static routes on a virtual interface	50

1.5 Basic Concepts

1.5.1 Connection

A connection is a dedicated network connection between your on-premises data center and a Direct Connect location over a leased line provided by a carrier. You can request standard connections or hosted connections. If you are a partner, you can also request operations connections.

A standard connection provides a port that is exclusive to you and allows you to have multiple virtual interfaces associated.

A hosted connection allows multiple users to share one port. Partners provision hosted connections and specify VLANs for those connections. Each user can associate only one virtual interface with a hosted connection. If a partner has created an operations connection, you can request a hosted connection from the partner, who will allocate the VLAN and bandwidth to your hosted connection.

1.5.2 Virtual Gateway

A virtual gateway is a logical gateway for accessing a VPC. A virtual gateway can be associated with only one VPC. Multiple connections can access the same VPC through a single virtual gateway.

1.5.3 Virtual Interface

A virtual interface is an entrance for you to access VPCs through a leased line. A virtual interface associates your connection with a virtual gateway, which connects to a VPC so that your network can access the cloud.

1.5.4 LAG

A link aggregation group (LAG) is a logical interface that uses the Link Aggregation Control Protocol (LACP) to aggregate multiple connections at a Direct Connect endpoint, so that you can treat these connections as a single one.

☐ NOTE

Restrictions

- You can associate a maximum of 10 standard connections terminated at the same location and with the same port type.
- You cannot associate connections that have virtual interfaces or have been associated with an LAG.
- You cannot associate connections that are not in the **Normal** state.
- After you select a connection that has a specific port type, connections that have other port types will not be available for selection.

1.5.5 Region and AZ

Concept

A region and availability zone (AZ) identify the location of a data center. You can create resources in a specific region and AZ.

- A region is a physical data center, which is completely isolated to improve fault tolerance and stability. The region that is selected during resource creation cannot be changed after the resource is created.
- An AZ is a physical location where resources use independent power supplies and networks. A region contains one or more AZs that are physically isolated but interconnected through internal networks. Because AZs are isolated from each other, any fault that occurs in one AZ will not affect others.

Figure 1-1 shows the relationship between regions and AZs.

Figure 1-1 Regions and AZs
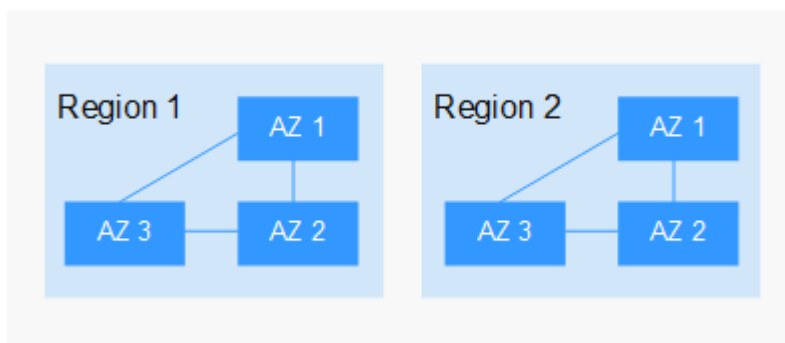
Selecting a Region

Select a region closest to your target users for lower network latency and quick access.

Selecting an AZ

When deploying resources, consider your applications' requirements on disaster recovery (DR) and network latency.

- For high DR capability, deploy resources in different AZs within the same region.
- For lower network latency, deploy resources in the same AZ.

Regions and Endpoints

Before you use an API to call resources, specify its region and endpoint. For more details, see **Regions and Endpoints**.

2 Getting Started

2.1 Process Description

Before using Direct Connect, you need to establish a connection, create a virtual gateway to associate it with the VPC, and create a virtual interface to connect to the VPC.

In order to establish a connection, you:

1. Need to create a connection on the console.
2. Once the connection is created, you will receive an LOA from Flexible Engine Operation.
3. With the LOA, you will be able to connect your network device to the Direct Connect port.
4. Once the connection is set up, you will be able to create a virtual gateway and virtual interface.

In case of any issue, we invite you to contact your sale representatives or to subscribe to Cloud Coach that will support you to set up the connection.

Figure 2-1 shows the whole process for connecting your on-premises data center to the cloud.

Figure 2-1 Enabling Direct Connect
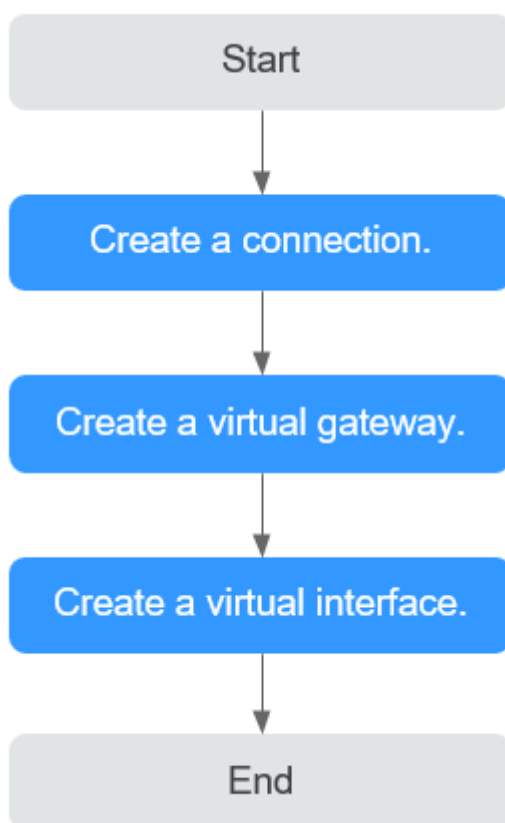
2.2 Establishing Network Connectivity

Scenarios

Establish network connectivity using Direct Connect if cloud servers in your VPC need to communicate with your on-premises data center.

Procedure

1. Log in to the management console.
2. In the service list, choose **Network** > **Direct Connect**.
3. In the navigation pane on the left, choose **Direct Connect** > **Connections**.
4. Click **Create Connection**.
5. Configure the parameters.

Table 2-1 Parameter description

Parameter	Description
Region	Specifies the region where the equipment room is located.

Parameter	Description
Connection Name	Specifies the name of your connection.
Location	Specifies the location where your leased line can access.
Carrier	Specifies the carrier that provides the leased line.
Port Type	Specifies the type of the port used by the connection. There are two types of ports: 1GE single-mode optical port and 10GE single-mode optical port. The port types vary at different locations. Select an appropriate type based on your requirements and confirm with the carrier before you create the connection to avoid construction delay due to inappropriate port type.
Leased Line Bandwidth	Specifies the bandwidth of the connection in the unit of Mbit/s. This is the bandwidth of the leased line you have purchased from the carrier.
Your Equipment Room Address	Specifies the address of your equipment room. The address must be specific to the floor on which your equipment room is located.
Description	Provides supplementary information about the connection.
Contact Person Name/ Contact Number/ Contact Email	Specifies information about the person who is responsible for your connection. **CAUTION** If the contact information is not provided, your account information will be queried. This will increase the review period.

6. Click **OK**. You will be contacted for confirming the required information, such as the status, device ID, and access interface.

2.3 Creating a Virtual Gateway

Scenarios

After creating a connection, you need to create a virtual gateway to associate it with the VPC to be accessed.

Procedure

1. Log in to the management console.
2. In the service list, choose **Network** > **Direct Connect**.
3. In the navigation pane on the left, choose **Direct Connect** > **Virtual Gateways**.

4. Click **Create Virtual Gateway**.

5. Configure the parameters.

Table 2-2 Parameter description

Parameter	Description
Name	Specifies the virtual gateway name. The name can contain 1 to 64 characters, including letters, digits, underscores (_), hyphens (-), and periods (.).
VPC	Specifies the VPC to be associated with the virtual gateway.
Subnet CIDR Block	Specifies the CIDR blocks of subnets in the VPC to connect to the on-premises network.
Description	Provides supplementary information about the virtual gateway. You can enter 0 to 64 characters.

6. Click **OK**.

2.4 Creating a Virtual Interface

Scenarios

After the connection and the virtual gateway are ready, create a virtual interface so that your on-premises network can access the VPC.

Procedure

1. Log in to the management console.

2. In the service list, choose **Network** > **Direct Connect**.

3. In the navigation pane on the left, choose **Direct Connect** > **Virtual Interfaces**.

4. Click **Create Virtual Interface**.

5. Configure the parameters. Click **Create Now**.

Table 2-3 Parameter description

Parameter	Description
Region	Select the region of the VPC that needs to communicate with the on-premises data center.

Parameter	Description
Name	Specifies the virtual interface name. The name can contain 1 to 64 characters, including letters, digits, underscores (_), hyphens (-), and periods (.).
Connection	Specifies the connection with which the virtual interface is to be associated. A virtual interface can be associated with only one connection.
Virtual Gateway	Select the virtual gateway with which the virtual interface is to be associated. A virtual interface can be associated with only one virtual gateway.
VLAN	Specifies the virtual interface VLAN ID. You need to configure the VLAN if you create a standard connection. The VLAN for a hosted connection will be allocated by the carrier or partner. You do not need to configure the VLAN.
Bandwidth	Specifies the virtual interface bandwidth in the unit of Mbit/s. If the selected connection is a hosted connection, the virtual interface exclusively uses the connection bandwidth.
Local Gateway	Specifies the IP address for connecting to the cloud network.
Remote Gateway	Specifies the IP address for connecting to your on-premises network.
Remote Subnet	Specifies the subnets used by the on-premises network. Specifies the remote subnet using CIDR notation. You can enter a maximum of 50 subnets. Ensure that each subnet is unique and separate every two subnets with commas (,).
Routing Mode	Specifies the routing mode. Two options are available, **Static** and **BGP**. If there are two or more connections, select BGP routing.
BGP ASN	Specifies the ASN of the BGP peer.
BGP MD5	Specifies the MD5 password of the BGP peer.

Parameter	Description
Description	Provides supplementary information about the virtual interface. You can enter 0 to 64 characters.

3 Management

3.1 Managing Connections

3.1.1 Viewing a Connection

Scenarios

View details of a connection.

Procedure

1. Log in to the management console.
2. In the service list, choose **Network** > **Direct Connect**.
3. In the navigation pane on the left, choose **Direct Connect** > **Connections**.
4. In the connection list, locate the target connection and click ∨ before its name to view the details.

3.1.2 Modifying a Connection

Scenarios

Modify the name and description of a connection.

Procedure

1. Log in to the management console.
2. In the service list, choose **Network** > **Direct Connect**.
3. In the navigation pane on the left, choose **Direct Connect** > **Connections**.
4. In the connection list, locate the connection and click **Modify** in the **Operation** column.
5. Modify the connection and click **OK**.

3.1.3 Deleting a Connection

Scenarios

Delete a connection if you no longer need it. Before deleting a connection, delete the virtual interfaces associated with the connection.

Procedure

1. Log in to the management console.
2. In the service list, choose **Network** > **Direct Connect**.
3. In the navigation pane on the left, choose **Direct Connect** > **Connections**.
4. Locate the connection you want to delete and click **Delete** in the **Operation** column.
5. Click **Yes**.

3.2 Managing Virtual Gateways

3.2.1 Viewing a Virtual Gateway

Scenarios

View details of a virtual gateway.

Procedure

1. Log in to the management console.
2. In the service list, choose **Network** > **Direct Connect**.
3. In the navigation pane on the left, choose **Direct Connect** > **Virtual Gateways**.
4. Locate the virtual gateway you want to view and click ⌄ before its name to view the details.

3.2.2 Modifying a Virtual Gateway

Scenarios

Modify the name, subnet CIDR block, and description of a virtual gateway.

Procedure

1. Log in to the management console.
2. In the service list, choose **Network** > **Direct Connect**.
3. In the navigation pane on the left, choose **Direct Connect** > **Virtual Gateways**.
4. Locate the virtual gateway you want to modify, click **Modify** in the **Operation** column, and modify the virtual gateway.

5.   Modify the parameters and click **OK**.

3.2.3 Deleting a Virtual Gateway

Scenarios

Delete a virtual gateway if you no longer need it. Before deleting the virtual gateway, you need to delete all associated virtual interfaces.

Procedure

1.   Log in to the management console.
2.   In the service list, choose **Network** > **Direct Connect**.
3.   In the navigation pane on the left, choose **Direct Connect** > **Virtual Gateways**.
4.   Locate the virtual gateway you want to delete and click **Delete** in the **Operation** column.
5.   Click **Yes**.

3.3 Managing Virtual Interfaces

3.3.1 Viewing a Virtual Interface

Scenarios

View details of a virtual interface.

Procedure

1.   Log in to the management console.
2.   In the service list, choose **Network** > **Direct Connect**.
3.   In the navigation pane on the left, choose **Direct Connect** > **Virtual Interfaces**.

4.   Locate the virtual interface you want to view and click ⌄ before its name to view the details.

3.3.2 Modifying a Virtual Interface

Scenarios

Modify the name, remote subnet, description, of a virtual interface.

Procedure

1.   Log in to the management console.
2.   In the service list, choose **Network** > **Direct Connect**.

3. In the navigation pane on the left, choose **Direct Connect** > **Virtual Interfaces**.

4. Locate the virtual interface you want to modify and click **Modify** in the **Operation** column.

5. Modify the virtual interface and click **OK**.

3.3.3 Deleting a Virtual Interface

Scenarios

Delete a virtual interface if you no longer need it.

Procedure

1. Log in to the management console.

2. In the service list, choose **Network** > **Direct Connect**.

3. In the navigation pane on the left, choose **Direct Connect** > **Virtual Interfaces**.

4. Locate the virtual interface you want to delete and click **Delete** in the **Operation** column.

5. Click **Yes**.

3.4 LAGs

3.4.1 Creating a LAG

Scenarios

Create a LAG to aggregate multiple connections at a Direct Connect endpoint.

Procedure

1. Log in to the management console.

2. In the service list, choose **Network** > **Direct Connect**.

3. In the navigation pane on the left, choose **Direct Connect** > **LAGs**.

4. On the **LAGs** page, click **Create LAG**.

5. Configure the parameters based on **Table 3-1**.

Table 3-1 Parameter description

Parameter	Description
Name	Specifies the name of the LAG. The name can contain 1 to 64 characters.
Location	Specifies the location where your leased line can access.

Parameter	Description
LACP Type	Specifies how you want the LAG to work. • **Manual**: LACP is not enabled on your gateway, and you want to manually configure the load to be evenly shared among all the connections associated with the LAG. • **Static**: LACP is enabled on your on-premises gateway. LACP will automatically determine the connections to which the load will be shared by checking the health status of each port.
Minimum Links	The minimum number of connections that must be active to ensure that a LAG is operational. Value range: **1** to **16**
Connections	Specifies the connection to be associated. **NOTE** • You can associate a maximum of 10 standard connections terminated at the same location and with the same port type. • Connections that have virtual interfaces associated or have been associated with a LAG are not allowed. • Connections that are not in the **Normal** state are not allowed. • After you select a connection that has a specific port type, connections that have other port types will not be available for selection.

6. Click **OK**.

3.4.2 Viewing a LAG

Scenarios

View details about a LAG you have created.

Procedure

1. Log in to the management console.
2. In the service list, choose **Network** > **Direct Connect**.
3. In the navigation pane on the left, choose **Direct Connect** > **LAGs**.

4. Locate the LAG you want to view and click ⌄ on the left of its name to view its details.

3.4.3 Modifying a LAG

Scenarios

Modify the name and minimum number of links of a created LAG, associate a connection with the LAG, or disassociate a connection from the LAG.

Modifying Basic Information

1. Log in to the management console.
2. In the service list, choose **Network** > **Direct Connect**.
3. In the navigation pane on the left, choose **Direct Connect** > **LAGs**.
4. Locate the LAG you want to modify and click **Modify** in the **Operation** column. In the displayed dialog box, modify its name and minimum number of links.
5. Click **OK**.

Disassociating a Connection from a LAG

1. Log in to the management console.
2. In the service list, choose **Network** > **Direct Connect**.
3. In the navigation pane on the left, choose **Direct Connect** > **LAGs**.
4. Locate the LAG and click ⌄ next to its name to view the associated connections.
5. Locate the connection you want to disassociate from the LAG and click **Disassociate Connection** in the **Operation** column.
6. Click **Yes**.

Associating a Connection with the LAG

1. Log in to the management console.
2. In the service list, choose **Network** > **Direct Connect**.
3. In the navigation pane on the left, choose **Direct Connect** > **LAGs**.
4. Locate the LAG and click **Associate Connection** in the **Operation** column.
5. Specifies the connection to be associated.
6. Click **OK**.

3.4.4 Deleting a LAG

Scenarios

Delete a LAG if you do not need it any longer.

Procedure

1. Log in to the management console.
2. In the service list, choose **Network** > **Direct Connect**.

3. In the navigation pane on the left, choose **Direct Connect** > **LAGs**.

4. Locate the LAG you want to delete and click **Delete** in the **Operation** column.

5. Click **Yes**.

3.5 Managing Historical Connections

3.5.1 Viewing a Historical Connection

Scenarios

View details of a connection that you requested through email or phone call.

Procedure

1. Log in to the management console.

2. In the service list, choose **Network** > **Direct Connect**.

3. In the navigation pane on the left, choose **Direct Connect** > **Historical Connections**.

4. Locate the connection you want to view and click ⌄ before its name to view the details.

3.5.2 Modifying a Historical Connection

Scenarios

Modify the name and remote subnets of a historical connection.

Procedure

1. Log in to the management console.

2. In the service list, choose **Network** > **Direct Connect**.

3. In the navigation pane on the left, choose **Direct Connect** > **Historical Connections**.

4. Locate the connection you want to modify and click **Modify** in the **Operation** column.

5. Modify the parameters and click **OK**.

3.6 Managing Operations or Hosted Connections

3.6.1 Operations Connection

Viewing an Operations Connection

Scenarios

View details of an operations connection you created as a partner.

Procedure

1. Log in to the management console.

2. In the service list, choose **Network** > **Direct Connect**.

3. In the navigation pane on the left, choose **Direct Connect** > **Connections**.

4. Locate the operations connection you want to view and click its name.

5. View detailed information about the operations connection.

Modifying an Operations Connection

Scenarios

Modify an operations connection you created as a partner.

Procedure

1. Log in to the management console.

2. In the navigation pane on the left, choose **Direct Connect** > **Connections**.

3. Click the name of the operations connection you want to modify. On the displayed page, change its name.

Deleting an Operations Connection

Scenarios

Delete an operations connection if you no longer need it. Before deleting the operations connection, you need to delete all hosted connections created over it.

Procedure

1. Log in to the management console.

2. In the service list, choose **Network** > **Direct Connect**.

3. In the navigation pane on the left, choose **Direct Connect** > **Connections**.

4. Locate the operations connection you want to delete and click **Delete** in the **Operation** column.

5. Click **Yes**.

3.6.2 Hosted Connection

Viewing a Hosted Connection

Scenarios

View details of a hosted connection you created as a partner.

Procedure

1. Log in to the management console.

2. In the service list, choose **Network** > **Direct Connect**.

3. In the navigation pane on the left, choose **Direct Connect** > **Connections**.

4. Locate the operations connection on which the hosted connection is created and click **Manage Hosted Connection** in the **Operation** column.

5. Locate the hosted connection you want to view and click ˅ before its name to view the details.

Modifying a Hosted Connection

Scenarios

Modify the name, bandwidth, and description of a hosted connection you created as a partner.

Procedure

1. Log in to the management console.
2. In the navigation pane on the left, choose **Direct Connect** > **Connections**.
3. Locate the operations connection on which the hosted connection is created and click **Manage Hosted Connection** in the **Operation** column.
4. Locate the hosted connection you want to modify and click **Modify** in the **Operation** column.
5. Modify the parameters and click **OK**.

Deleting a Hosted Connection

Scenarios

Delete a hosted connection if you no longer need it.

Procedure

1. Log in to the management console.
2. In the service list, choose **Network** > **Direct Connect**.
3. In the navigation pane on the left, choose **Direct Connect** > **Connections**.
4. Locate the operations connection on which the hosted connection is created and click **Manage Hosted Connection** in the **Operation** column.
5. Locate the hosted connection you want to delete and click **Delete** in the **Operation** column.
6. Click **Yes**.

3.7 Quotas

What Is Quota?

Quotas can limit the number or amount of resources available to users, such as the maximum number of ECSs or EVS disks that can be created.

If the existing resource quota cannot meet your service requirements, you can apply for a higher quota.

How Do I View My Quotas?

1. Log in to the management console.

2. In the upper right corner of the page, click   .

    The **Service Quota** page is displayed.

3. View the used and total quota of each type of resources on the displayed
    page.

    If a quota cannot meet service requirements, apply for a higher quota.

How Do I Apply for a Higher Quota?

The system does not support online quota adjustment.

If you need to adjust a quota, contact the operations administrator.

4 FAQs

4.1 Is BGP Routing Supported in Direct Connect?

Yes. Direct Connect allows you to use BGP for routing.

4.2 What Are the Network Requirements for Connections?

- Your network must use a single-mode fiber with a 1GE or 10GE optical module to connect to the access device in the cloud.
- Auto-negotiation for the port must be disabled. Port speed and full-duplex mode must be manually configured.
- 802.1Q VLAN encapsulation must be supported on the entire connection, including intermediate devices.
- If BGP routing is used, your device must support BGP and BGP MD5 authentication.
- (Optional) You can configure Bidirectional Forwarding Detection (BFD) on the network.
- The maximum transmission unit (MTU) supported at the physical layer is 1522 bytes (14-byte Ethernet header + 4-byte VLAN tag + 1500-byte IP datagram + 4-byte frame check sequence).
- Private IP addresses are recommended on the cloud, and IP address ranges for interworking cannot conflict with each other.

4.3 Can I Access a VPC Using a Direct Connect Connection and a VPN Connection?

No.

This is because that VPN connections working in active-active mode will use Direct Connect resources. If you are using a VPN connection to access a VPC, some Direct Connect resources will be occupied. As a result, you cannot use a Direct Connect

connection to access the same VPC. Similarly, if you are using a Direct Connect connection to access a VPC, you cannot use a VPN connection to access the same VPC.

5 Change History

Release On	Description
2022-03-30	This issue is the fourth official release.
2021-06-30	This issue is the third official release.
2020-03-30	This issue is the second official release.
2019-11-30	This issue is the first official release.