**Direct Connect**

# User Guide

**Issue** 01

**Date** 2024-04-30

# Contents

# 1 Connections

## 1.1 Creating a Connection

**Figure 1-1** shows how Direct Connect connects your on-premises data center to a VPC.

**Figure 1-1** Connecting your on-premises data center to a VPC
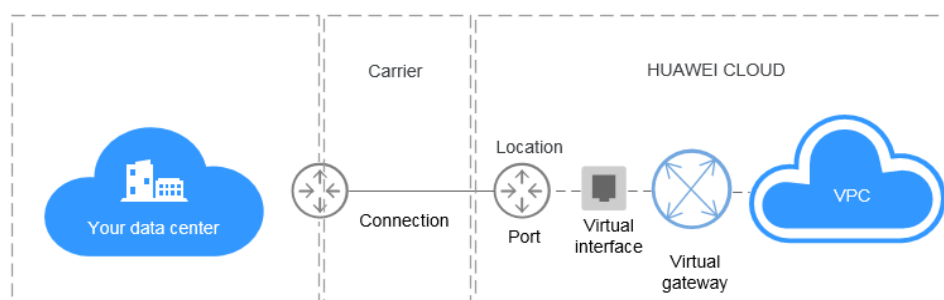


### Self-Service Connection

- **Scenario**

  You need to create a connection to connect your on-premises data center to the Direct Connect location you have selected to build a hybrid cloud.

  After you create a connection on the console, Huawei Cloud will provide you with a port for exclusive use. To establish the connection, you need to connect the leased line to the Direct Connect location you have selected. **Figure 1-2** shows the process of connecting your on-premises data center to Huawei Cloud using Direct Connect.

**Figure 1-2** Self-service installation process
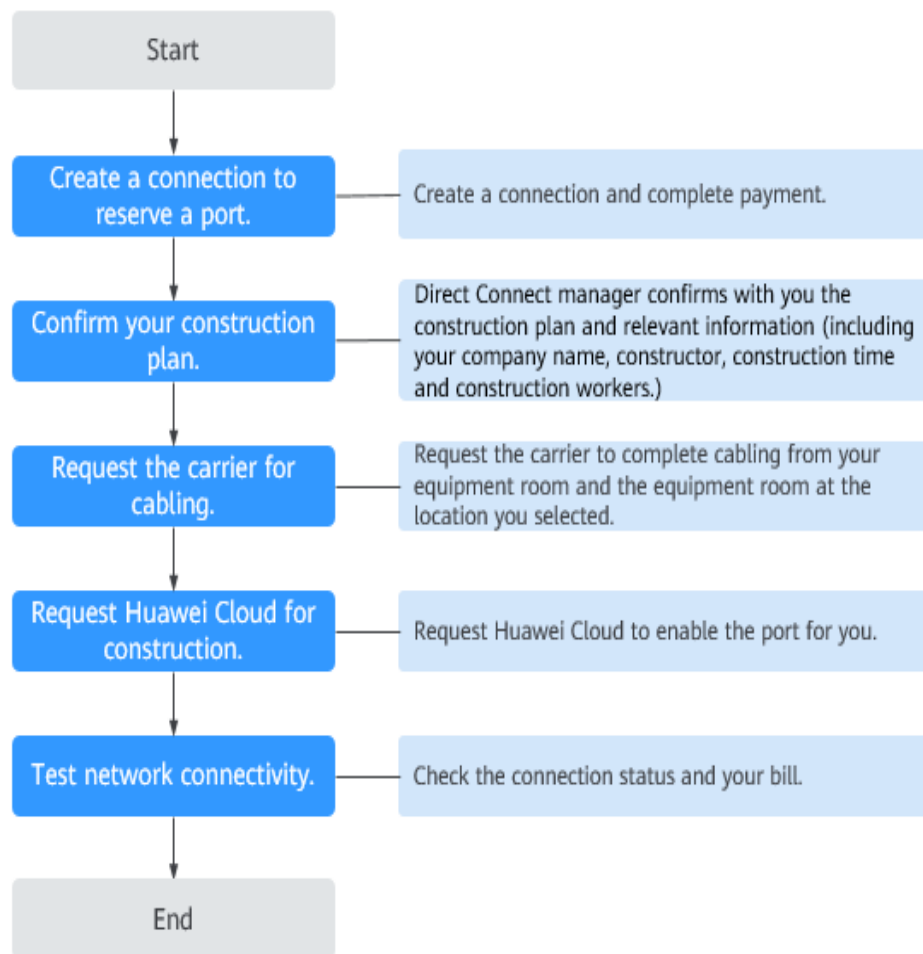


- **Procedure**

  a. Create a connection.

     i. Log in to the management console.

     ii. On the console homepage, click [icon] in the upper left corner and select the desired region and project.

     iii. Hover on [icon] to display **Service List** and choose **Networking** > **Direct Connect**.

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

     v. Click **Create Connection** in the upper right corner.

     vi. On the **Create Connection** page, enter the equipment room details and select the Direct Connect location and port based on **Table 1-1**.

**Figure 1-3** Creating a self-service connection
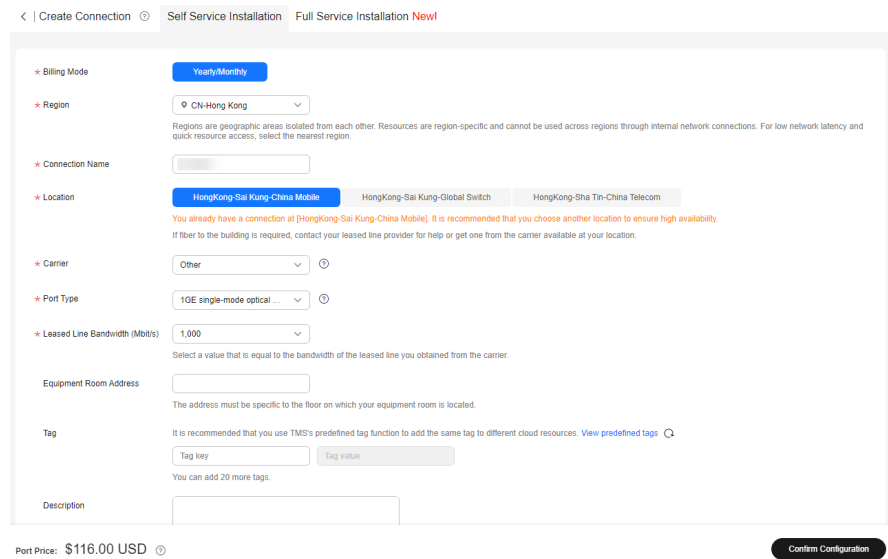


**Table 1-1** Parameters required for creating a connection

| Parameter | Description |
|---|---|
| Billing Mode | Specifies how you will be billed for the connection. Currently, only **Yearly/Monthly** is supported. |
| Region | Specifies the region where the connection resides. You can also change the region in the upper left corner of the console. |
| Connection Name | Specifies the name of your connection. |
| Location | Specifies the Direct Connect location where your leased line can be connected to. |
| Carrier | Specifies the carrier that provides the leased line. |
| Port Type | Specifies the type of the port that the leased line is connected to: 1GE, 10GE, 40GE, and 100GE. |
| Leased Line Bandwidth | Specifies the bandwidth of the connection in the unit of Mbit/s. This is the bandwidth of the leased line you bought 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, for example, XX Equipment Room, XX Building, No. XX, Huajing Road, Pudong District, Shanghai. |

| Parameter | Description |
|---|---|
| Tag | Identifies the connection. A tag consists of a key and one or more values. You can add 20 tags to a connection.<br><br>Tag keys and values must meet the requirements listed in **Table 1-2**.<br>**NOTE**<br>If a predefined tag has been created on Tag Management Service (TMS), you can directly select the corresponding tag key and value.<br><br>For details about predefined tags, see **Predefined Tag Overview**.<br><br>If you have configured tag policies for Direct Connect, you need to add tags to your connections based on the tag policies. If you add a tag that does not comply with the tag policies, connections may fail to be created. Contact the administrator to learn more about tag policies. |
| Description | Provides supplementary information about the connection. |
| Contact Person/ Phone Number/ Email | Specifies who is responsible for your connection.<br>**CAUTION**<br>If you do not provide any contact information, we will contact the person in your account information. |
| Required Duration | Specifies how long the connection will be used for. |
| Auto-renew | Specifies whether to automatically renew the subscription to ensure service continuity.<br><br>For example, if you select this option and the required duration is three months, the system automatically renews the subscription for another three months. |
| Enterprise Project | Provides a cloud resource management mode where cloud resources and members are centrally managed by project. |

**Table 1-2** Tag key and value requirements

| Parameter | Requirements |
|---|---|
| Key | • Cannot be left blank.<br>• Must be unique for each resource.<br>• Can contain a maximum of 36 characters.<br>• Can contain only letters, digits, hyphens, underscores, and Unicode characters from \u4e00 to \u9fff. |

| Parameter | Requirements |
|-----------|--------------|
| Value | ● Can be left blank.<br>● Can contain a maximum of 43 characters.<br>● Can contain only letters, digits, period, hyphens, underscores, and Unicode characters from \u4e00 to \u9fff. |

    vii.  Click **Next**.

    viii.  Confirm the connection information and click **Pay Now**.

    ix.  Confirm the order, select a payment method, and click **Confirm**.

b.  Connect your on-premises data center to the cloud.

    i.  After you have paid for the order, the system automatically allocates a connection ID for you, and the connection information is displayed on the management console. The connection status is **Creating**, when you will be contacted to confirm the construction plan and relevant information (including your company name, constructor, expected construction time, and construction workers).

    ii.  After having confirmed the construction plan, you can arrange the carrier to deploy the dedicated line and connect it to your equipment room based on your construction plan.

    iii.  In normal cases, Huawei resident engineers will connect the dedicated line to the Huawei Cloud gateway port within two working days.

    iv.  After the construction is complete, the connection status becomes **Normal**, indicating that the connection is ready.

&#9906; **NOTE**

Create a virtual gateway and associate the virtual gateway with the VPC.

Create a virtual interface to associate the connection with the created virtual gateway, and connect your on-premises data center to the VPC through the connection.

## Full-Service Connection

● **Scenario**

Huawei Cloud completes all operations required for connecting your on-premises data center to the cloud, including integrating the network resources and ports.

**Figure 1-4** shows the entire process.

&#9906; **NOTE**

Full-service connections are now available in the following regions: CN-Hong Kong and CN South-Guangzhou.

**Figure 1-4** Full-service installation process
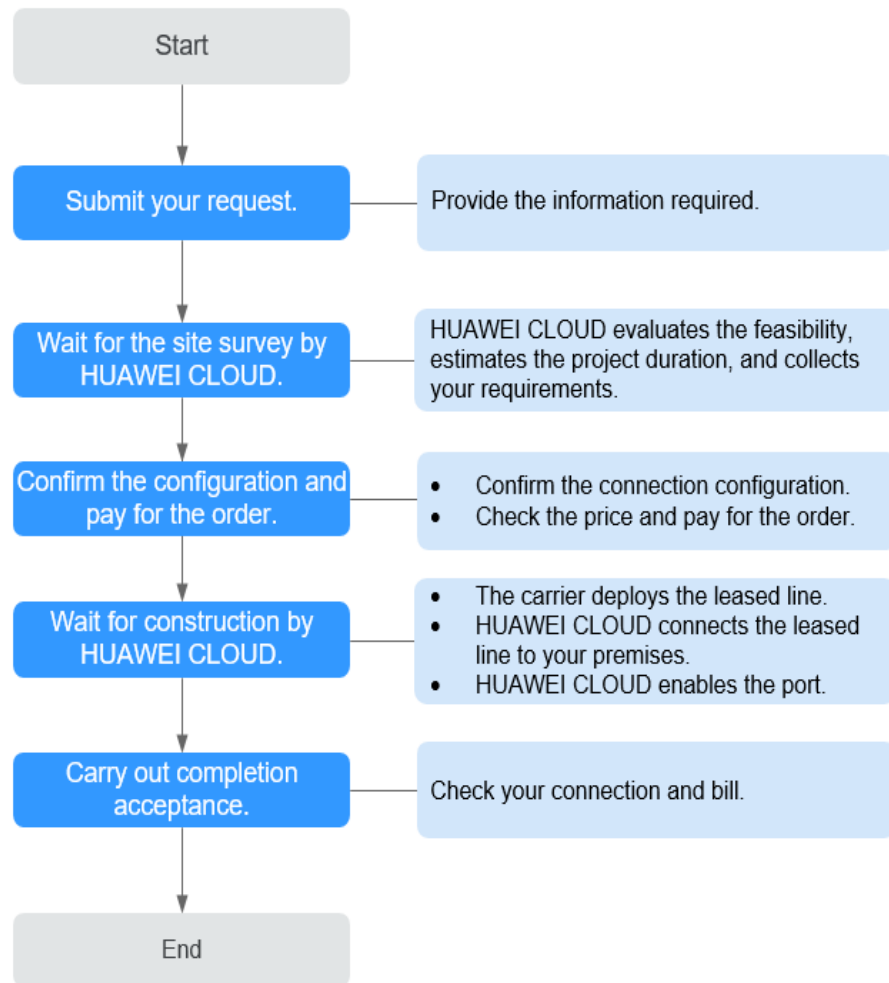


- **Procedure**
  a. Submit your request.
     i.  Navigate to the Direct Connect console after login and click **Create Connection**. Click **Full Service Installation** in the navigation bar.
     ii. Provide information about your equipment room and select a Huawei Cloud location. For details about the parameters, see **Table 1-3**.

**Figure 1-5** Creating a full-service connection



**Table 1-3** Parameter description

| Parameter | Description |
|---|---|
| Equipment Room Address | Specifies the address of your equipment room. The address must be specific to the room and cabinet number, for example, Cabinet XX, XX Equipment Room, XX Building, No. XX, Huajing Road, Pudong District, Shanghai. |
| Available Carriers | Specifies the carriers that are allowed to enter your equipment room. |
| Port Type | Specifies the type of port on the device in your equipment room for connecting to the leased line. |
| Region | Specifies the region where the connection resides. You can also change the region in the upper left corner of the console. |
| Location | Specifies the Direct Connect location where your leased line can be connected to. |
| Port Type | Specifies the type of the port that the leased line is connected to. There are four types of ports: 1GE, 10GE, 40GE, and 100GE. |
| Connection Name | Specifies the name of your connection. |
| Leased Line Bandwidth | Specifies the bandwidth of the connection in the unit of Mbit/s. |

| Parameter | Description |
|---|---|
| Billing Mode | Specifies how you will be billed for the connection. Currently, only **Yearly/Monthly** is supported. |
| Required Duration | Specifies how long the connection will be used for. |
| Enterprise Project | Provides a cloud resource management mode where cloud resources and members are centrally managed by project. |
| Contact Person | Specifies the name of the person who is responsible for connecting your on-premises data center to the cloud. |
| Phone Number | Specifies the phone number of the person who is responsible for connecting your on-premises data center to the cloud. |
| Email | Specifies the email address of the person who is responsible for connecting your on-premises data center to the cloud. |

    iii.   Click **Submit**.

  b.   Wait for Huawei Cloud's site survey.

      Huawei Cloud evaluates your requirements and the carrier's resources and confirms whether your requirements can be met. If your requirements can be met, Huawei Cloud will place an order to you.

      📖 **NOTE**

        Generally, the site survey takes three working days.

  c.   Confirm and pay for the order.

    i.   On the **Connections** page, locate the target connection and click **Confirm Configuration** in the **Operation** column.

    ii.   Confirm the connection configuration and expenses, and then click **Next**.

       📖 **NOTE**

        You need to read and agree to the **Full-Service Installation Statement** before paying for the order.

    iii.   On the purchase page, select a payment mode and click **Pay**.

       📖 **NOTE**

        If you select **Download Contract and Pay**, download a contract on the contract page and then request your financial department to process the payment. Discounts, if any, will automatically apply.

  d.   Wait for Huawei Cloud to complete the following work:

    i.   Contacts the carrier to deploy the leased line.

  ii. Connects your on-premises data center to the cloud using the leased line.

  iii. Contacts the carrier to complete in-building cabling.

   📖 NOTE

    This step is required when you choose a full-service connection with a dedicated port and need cabling for your site.

  iv. Enables the port.

 e. Confirm that you want to enable Direct Connect.

  i. On the **Connections** page, locate the target connection and click **Confirm Completion** in the **Operation** column.

  ii. Click **OK**. Confirm that your connection is available for use, and the billing starts.

# 1.2 Viewing a Connection

## Scenarios

After a connection is created, you can view its details.

## Procedure

1. Log in to the management console.

2. On the console homepage, click 📍 in the upper left corner and select the desired region and project.

3. Hover on ☰ to display **Service List** and choose **Networking** > **Direct Connect**.

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

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

# 1.3 Modifying a Connection

## Scenarios

After creating a connection, you can modify its name, bandwidth, equipment room address, and description.

## Procedure

1. Log in to the management console.

2. On the console homepage, click 📍 in the upper left corner and select the desired region and project.

3. Hover on ☰ to display **Service List** and choose **Networking** > **Direct Connect**.

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

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

6. Modify the connection and click **OK**.

# 1.4 Unsubscribing from a Connection

## Scenarios

If you do not need to use a self-service connection any longer, you can unsubscribe from it.

📖 **NOTE**

You can only unsubscribe from connections that are in the **Normal** state. If a connection is being created, you can unsubscribe from it after the connection is created.

## Procedure

1. Log in to the management console.

2. On the console homepage, click ![icon] in the upper left corner and select the desired region and project.

3. Hover on ![icon] to display **Service List** and choose **Networking** > **Direct Connect**.

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

5. Locate the connection that you want to unsubscribe from and click **Unsubscribe** in the **Operation** column.

6. Locate the target connection and click **Unsubscribe from Resource** in the **Operation** column.

7. On the **Unsubscribe** page, select the reason for unsubscription, confirm the refund amount, and select **I understand a Handling fees will be charged for this unsubscription**.

8. Click **Confirm**.

# 1.5 Renewing a Connection

## Scenarios

You can renew the subscription when a connection is about to expire.

## Procedure

1. Log in to the management console.

2. On the console homepage, click ![icon] in the upper left corner and select the desired region and project.

3. Hover on ═ to display **Service List** and choose **Networking** > **Direct Connect**.

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

5. Locate the connection you want to renew and choose **More** > **Renew** in the **Operation** column.

6. Set the duration that you want to renew the connection and click **Pay**. Then pay the order as prompted.

# 1.6 Managing Connection Tags

## Scenarios

After a connection is created, you can view its tags or add, edit or delete a tag.

A tag is the identifier of a connection and consists of a key and a value. You can add 20 tags to a connection.

📖 **NOTE**

If a predefined tag has been created on Tag Management Service (TMS), you can directly select the corresponding tag key and value.

For details about predefined tags, see **Predefined Tag Overview**.

If you have configured tag policies for Direct Connect, you need to add tags to your connections based on the tag policies. If you add a tag that does not comply with the tag policies, connections may fail to be created. Contact the administrator to learn more about tag policies.

## Adding a Tag

Add a tag to an existing connection.

1. Log in to the management console.

2. On the console homepage, click 📍 in the upper left corner and select the desired region and project.

3. Hover on ═ to display **Service List** and choose **Networking** > **Direct Connect**.

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

5. Locate the connection and click its name to switch to the **Summary** page.

6. Click **Tags**.

7. Click **Add Tag**.

8. In the displayed dialog box, enter a key and a value.

   If you have configured tag policies for Direct Connect, you need to add tags to your connections based on the tag policies. If you add a tag that does not comply with the tag policies, connections may fail to be created. Contact the administrator to learn more about tag policies.

   **Table 1-4** describes the tag key and value requirements.

**Table 1-4** Tag key and value requirements

| Parameter | Requirements |
|---|---|
| Key | <ul><li>Cannot be left blank.</li><li>Must be unique for each resource.</li><li>Can contain a maximum of 36 characters.</li><li>Can contain only letters, digits, hyphens, underscores, and Unicode characters from \u4e00 to \u9fff.</li></ul> |
| Value | <ul><li>Can be left blank.</li><li>Can contain a maximum of 43 characters.</li><li>Can contain only letters, digits, period, hyphens, underscores, and Unicode characters from \u4e00 to \u9fff.</li></ul> |

9. Click **OK**.

## Editing a Tag

Modify the value of a tag added to a connection.

1. Log in to the management console.

2. On the console homepage, click [icon] in the upper left corner and select the desired region and project.

3. Hover on [icon] to display **Service List** and choose **Networking** > **Direct Connect**.

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

5. Locate the connection and click its name to switch to the **Summary** page.

6. Click **Tags**.

7. In the tag list, locate the tag you want to modify and click **Edit** in the **Operation** column.

8. Enter a new value.

9. Click **OK**.

## Deleting a Tag

Delete a tag from a connection.

> ⚠ CAUTION
>
> Deleted tags cannot be recovered.

1. Log in to the management console.

2. On the console homepage, click [icon] in the upper left corner and select the desired region and project.

3. Hover on ☰ to display **Service List** and choose **Networking** > **Direct Connect**.

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

5. Locate the connection and click its name to switch to the **Summary** page.

6. Click **Tags**.

7. In the tag list, locate the tag you want to delete and click **Delete** in the **Operation** column.

8. Click **Yes**.

# 2 Virtual Gateways

## 2.1 Creating a Virtual Gateway

### Scenarios

You can create a virtual gateway and associate it with the VPC or attach it to an enterprise router that you need to access.

☐ **NOTE**

Virtual gateways can be attached to enterprise routers in the following regions: CN North-Beijing4, CN East-Shanghai1, CN South-Guangzhou, CN-Hong Kong, AP-Bangkok, and AP-Singapore.

### Procedure

1. Log in to the management console.

2. On the console homepage, click ⬛ in the upper left corner and select the desired region and project.

3. Hover on ☰ to display **Service List** and choose **Networking** > **Direct Connect**.

4. In the navigation pane on the left, choose **Direct Connect** > **Virtual Gateways**.

5. Click **Create Virtual Gateway**.

6. Configure the parameters based on **Table 2-1**.

**Figure 2-1** Creating a virtual gateway



**Table 2-1** Parameters required for creating a virtual gateway

| Parameter | Description |
|---|---|
| Name | Specifies the virtual gateway name. <br> The name can contain 1 to 64 characters. |
| Enterprise Project | Provides a cloud resource management mode where cloud resources and members are centrally managed by project. |
| VPC | Specifies the VPC to be associated with the virtual gateway. |
| Local Subnet | Specifies the CIDR blocks of the subnets in the VPC to be accessed using Direct Connect. <br> You can add one or more CIDR blocks. If there are multiple CIDR blocks, separate every entry with a comma (,). |

| Parameter | Description |
|---|---|
| BGP ASN | Specifies the BGP ASN of the virtual gateway.<br>**NOTE**<br>Generally, Huawei Cloud's BGP ASN is 64512. There are two special cases:<br>● In the CN North-Beijing1 region, the default BGP ASN of Huawei Cloud is 65533.<br>● In the AP-Bangkok region, the BGP ASN of some Direct Connect locations is 65535 by default. For details, contact the Direct Connect manager. |
| Tag | Identifies the virtual gateway. A tag consists of a key and one or more values. You can add 20 tags to a virtual gateway.<br>Tag keys and values must meet the requirements listed in **Table 2-2**.<br>**NOTE**<br>If a predefined tag has been created on TMS, you can directly select the corresponding tag key and value.<br>For details about predefined tags, see **Predefined Tag Overview**.<br>If you have configured tag policies for Direct Connect, you need to add tags to your virtual gateways based on the tag policies. If you add a tag that does not comply with the tag policies, virtual gateways may fail to be created. Contact your administrator to learn more about tag policies. |
| Description | Provides supplementary information about the virtual gateway. |

**Table 2-2** Tag naming requirements

| Parameter | Requirements |
|---|---|
| Key | ● Cannot be left blank.<br>● Must be unique for each resource.<br>● Can contain a maximum of 36 characters.<br>● Can contain only letters, digits, hyphens, and underscores. |
| Value | ● Can be left blank.<br>● Can contain a maximum of 43 characters.<br>● Can contain only letters, digits, periods, hyphens, and underscores. |

7.  Click **OK**.

    Ensure that the virtual gateway is in the **Normal** state.

# 2.2 Viewing a Virtual Gateway

## Scenarios

You can view details about a virtual gateway.

## Procedure

1. Log in to the management console.

2. On the console homepage, click ⬛ in the upper left corner and select the desired region and project.

3. Hover on ☰ to display **Service List** and choose **Networking** > **Direct Connect**.

4. In the navigation pane on the left, choose **Direct Connect** > **Virtual Gateways**.

5. Locate the virtual gateway and click its name to view the details.

**Figure 2-2** Viewing a virtual gateway



# 2.3 Modifying a Virtual Gateway

## Scenarios
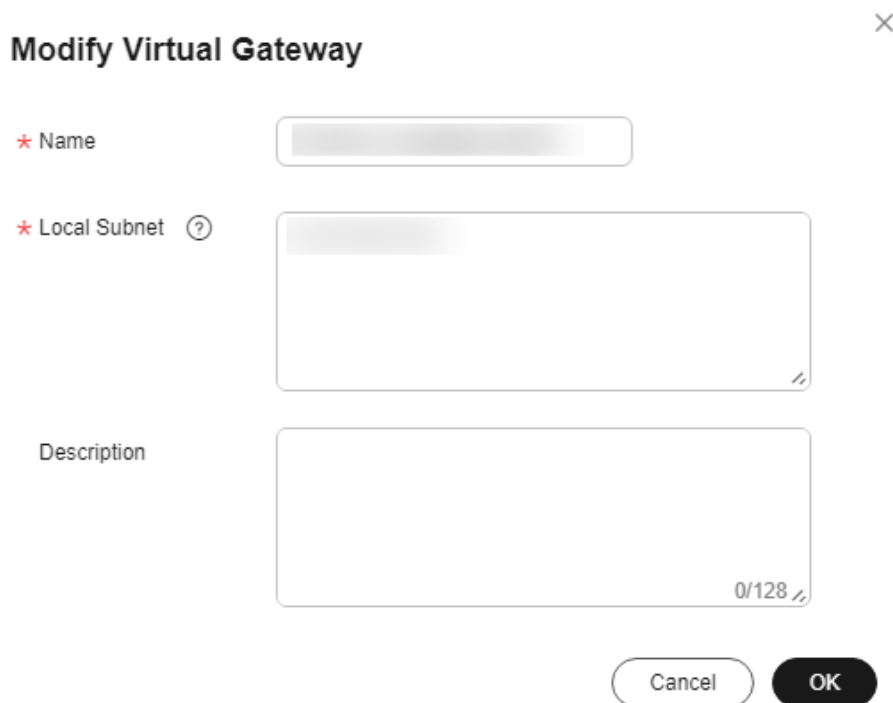
After creating a virtual gateway, you can modify its settings.

## Procedure

1. Log in to the management console.

2. On the console homepage, click ⬛ in the upper left corner and select the desired region and project.

3. Hover on ☰ to display **Service List** and choose **Networking** > **Direct Connect**.

4. In the navigation pane on the left, choose **Direct Connect** > **Virtual Gateways**.

5. Locate the virtual gateway you want to modify and click **Modify** in the **Operation** column.

6. Modify the name, local subnet, and description, and then click **OK**.

**Figure 2-3** Modifying a virtual gateway



## 2.4 Deleting a Virtual Gateway

### Scenarios

You can delete a virtual gateway if you do not need it any longer and there are no virtual interfaces associated with it.
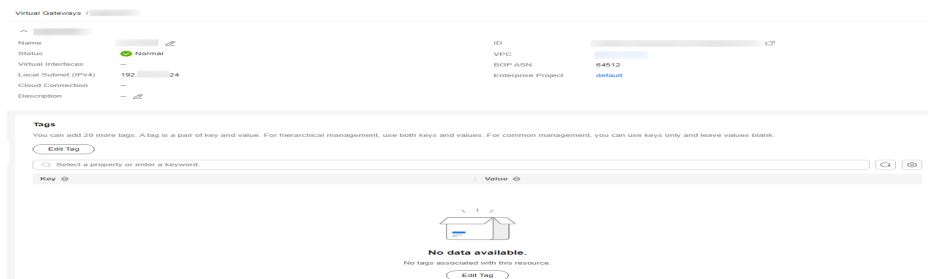
### Procedure

1. Log in to the management console.

2. On the console homepage, click [icon] in the upper left corner and select the desired region and project.

3. Hover on [icon] to display **Service List** and choose **Networking** > **Direct Connect**.

4. In the navigation pane on the left, choose **Direct Connect** > **Virtual Gateways**.

5. Locate the virtual gateway you want to delete and click **Delete** in the **Operation** column.

6. Click **Yes**.

**Figure 2-4** Deleting a virtual gateway
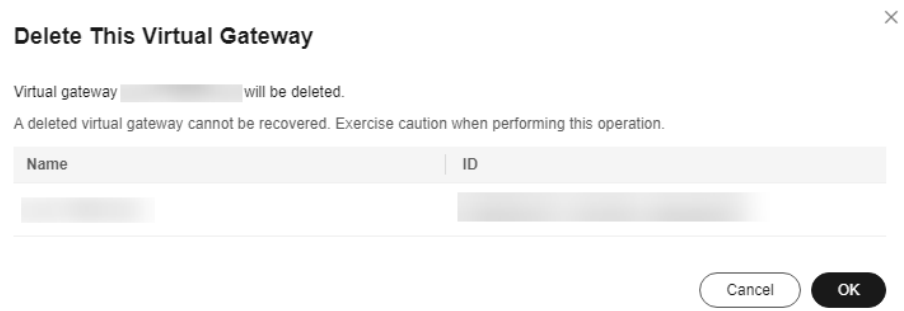
# 3 Global DC Gateways

## 3.1 Overview

### What Is a Global DC Gateway?

A global DC gateway can work with enterprise routers in the same region or different regions to build a central network so that your on-premises data center can access the VPCs over the Huawei backbone network. This can reduce network latency, simplify network topology, and improve O&M efficiency.

> 📖 **NOTE**
>
> Global DC gateways have been launched in some regions. You can view the regions where this feature is available on the console.

### Application Scenarios

#### Connecting an On-Premises Data Center to VPCs in Different Regions

A global DC gateway can be attached to enterprise routers in different regions.

**Figure 3-1** Communication between a global DC gateway and VPCs in different regions
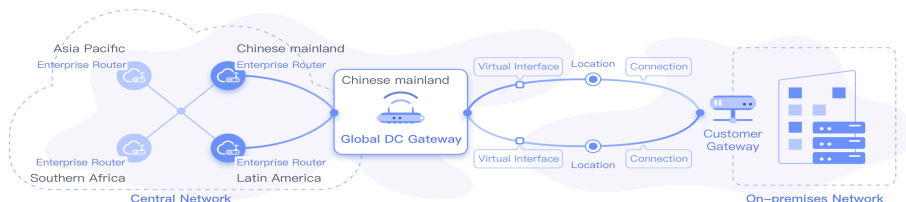


#### Connecting an On-Premises Data Center to VPCs in the Same Region

A global DC gateway can be attached to enterprise routers in the same region.

**Figure 3-2** Communication between a global DC gateway and VPCs in the same region
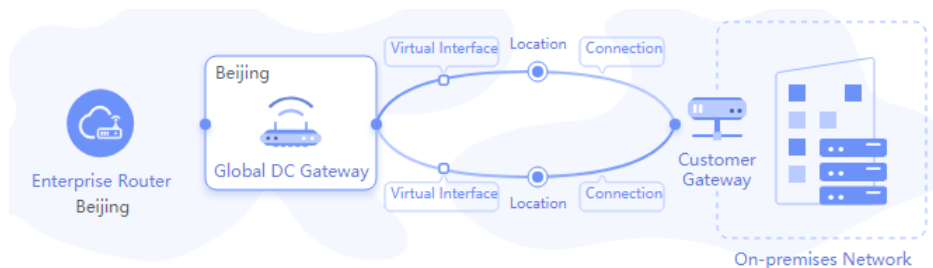


## Configuration Process

**Figure 3-3** shows the flowchart for configuring a global DC gateway.

**Figure 3-3** Process of configuring a global DC gateway
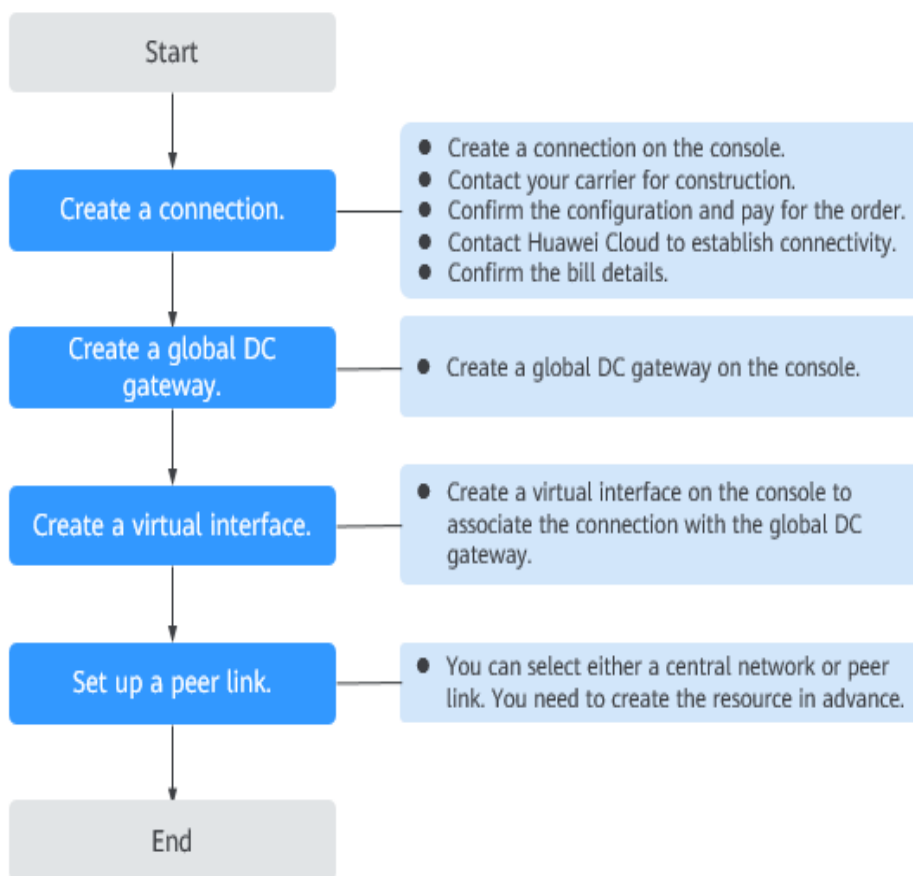


# 3.2 Creating a Global DC Gateway

## Scenarios

After a connection is created, you can create a global DC gateway for this connection.

## Procedure

1. Log in to the management console.

2. On the console homepage, click ⦿ in the upper left corner and select the desired region and project.

3. Hover on ☰ to display **Service List** and choose **Networking** > **Direct Connect**.

4. In the navigation pane on the left, choose **Direct Connect** > **Global DC Gateways**.

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

**Table 3-1** Parameters for creating a global DC gateway

| Parameter | Description |
|---|---|
| Name | Specifies the name of the global DC gateway.<br>● Only letters, digits, underscores (_), hyphens (-), and periods (.) are allowed.<br>● The name can contain 1 to 64 characters. |
| Enterprise Project | Provides a cloud resource management mode where cloud resources and members are centrally managed by project. |
| BGP ASN | Specifies the autonomous system number used on the cloud for a BGP session.<br>You can use the default ASN, or specify an ASN in the range of 64512–65534 or 1–4294967295. |
| Tag | Identifies the global DC gateway. A tag consists of a key and more than one value. You can add 20 tags to a global DC gateway.<br>Tag keys and values must meet the requirements listed in **Table 3-2**.<br>**NOTE**<br>If a predefined tag has been created on TMS, you can directly select the corresponding tag key and value.<br>For details about predefined tags, see **Predefined Tag Overview**.<br>If you have configured tag policies for Direct Connect, you need to add tags to your global DC gateways based on the tag policies. If you add a tag that does not comply with the tag policies, global DC gateways may fail to be created. Contact your administrator to learn more about tag policies. |
| Description | Provides supplementary information about the global DC gateway.<br>It can contain 0 to 128 characters. |

**Table 3-2** Tag naming requirements

| Parameter | Requirements |
|---|---|
| Key | • Cannot be left blank.<br>• Must be unique for each resource.<br>• Can contain a maximum of 36 characters.<br>• Can contain only letters, digits, hyphens, and underscores. |
| Value | • Can be left blank.<br>• Can contain a maximum of 43 characters.<br>• Can contain only letters, digits, periods, hyphens, and underscores. |

6. Click **OK** and then create a virtual interface. For details about parameter settings, see **Table 3-3**.

**Table 3-3** Parameters for creating a virtual interface

| Parameter | Description |
|---|---|
| Region | Specifies the region where the connection resides. You can also change the region in the upper left corner of the console. |
| Name | Specifies the virtual interface name.<br>The name can contain 1 to 64 characters. |
| Virtual Interface Priority | Specifies whether the virtual interface will be used prior to other virtual interfaces. There are two options: **Preferred** and **Standard**.<br>If multiple virtual interfaces are associated with one Direct Connect device, load is balanced among virtual interfaces with the same priority, while virtual interfaces with different priorities are working in active/standby pairs. |
| Connection | Specifies the connection you can use to connect your on-premises network to Huawei Cloud. |
| Gateway | Specifies the gateway that the virtual interface connects to.<br>The default option is **Global DC Gateway**. |
| Global DC Gateway | Specifies the global DC gateway that will be used. |

| Parameter | Description |
|---|---|
| VLAN | Specifies the ID of the VLAN for the virtual interface. You need to configure the VLAN if you create a self-service 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 bandwidth that can be used by the virtual interface, in Mbit/s. The bandwidth cannot exceed that of the connection or LAG. |
| Enterprise Project | Provides a cloud resource management mode where cloud resources and members are centrally managed by project. |
| Tag | Identifies the virtual interface. A tag consists of a key and one or more values. You can add 20 tags to a virtual interface. Tag keys and values must meet the requirements listed in **Table 3-4**. NOTE If a predefined tag has been created on TMS, you can directly select the corresponding tag key and value. For details about predefined tags, see **Predefined Tag Overview**. If you have configured tag policies for Direct Connect, you need to add tags to your virtual interfaces based on the tag policies. If you add a tag that does not comply with the tag policies, virtual interfaces may fail to be created. Contact your administrator to learn more about tag policies. |
| IP Address Family | Specifies the address type of the virtual interface. The default option is **IPv4**. |
| Local Gateway | Specifies the gateway on the Huawei Cloud network. |
| Remote Gateway | Specifies the gateway on your on-premises network. The remote gateway must be in the same IP address range as the local gateway. Generally, a subnet with a 30-bit mask is recommended. |
| Remote Subnet | Specifies the subnets and masks of your on-premises network. If there are multiple subnets, use commas (,) to separate them. |

| Parameter | Description |
|-----------|-------------|
| Routing Mode | Specifies whether static routing or dynamic routing is used to route traffic between your on-premises network and the cloud network.<br><br>For better internet availability, choose BGP routing if you have or plan to have multiple connections. |
| BGP ASN | Specifies the ASN of the BGP peer.<br><br>This parameter is required when BGP routing is selected.<br><br>**CAUTION**<br>In scenarios where enterprise routers are used, the BGP ASN of the virtual interface cannot be the same as that of the enterprise router to which the virtual gateway is attached. Otherwise, a BGP route loop occurs, causing network disconnection. |
| BGP MD5 Authentication Key | Specifies the password used to authenticate the BGP peer using MD5.<br><br>This parameter is mandatory when BGP routing is selected, and the parameter values on both gateways must be the same.<br><br>The key contains 8 to 255 characters and must contain at least two types of the following characters:<br>● Uppercase letters<br>● Lowercase letters<br>● Digits<br>● Special characters: ~!, .:;-_"(){}[]/@#$ %^&* +\|= |
| Description | Provides supplementary information about the virtual interface. |

**Table 3-4** Tag naming requirements

| Parameter | Requirements |
|-----------|--------------|
| Key | ● Cannot be left blank.<br>● Must be unique for each resource.<br>● Can contain a maximum of 36 characters.<br>● Can contain only letters, digits, hyphens, and underscores. |

| Parameter | Requirements |
|-----------|--------------|
| Value | <ul><li>Can be left blank.</li><li>Can contain a maximum of 43 characters.</li><li>Can contain only letters, digits, periods, hyphens, and underscores.</li></ul> |

7. Click **OK** and then specify how the global DC gateway will be used.

   The global DC gateway is used to set up a peer link with an enterprise router. **Table 3-5** describes the parameters.

   **Table 3-5** Parameters for associating a global DC gateway with a central network or an enterprise router

| Parameter | Description |
|-----------|-------------|
| Name | Specifies the name of the peer link you want to set up. <ul><li>The name can contain only letters, digits, underscores (_), hyphens (-), and periods (.).</li><li>The name can contain 1 to 64 characters.</li></ul> |
| Global DC Gateway | Specifies the global DC gateway used for setting up the peer link. By default, the created global DC gateway is selected. |
| Peer Link Type | The default option is **Enterprise Router**. |
| Link To | Specifies the enterprise router at the other end of the peer link. |

8. Click **OK**.

# 3.3 Viewing a Global DC Gateway

## Scenarios

After a global DC gateway is created, you can view its details, such as, its name, ID, status, location, BGP ASN, virtual interfaces, enterprise project, IP address family, peer links, tags, and routes.

## Procedure

1. Log in to the management console.

2. On the console homepage, click [icon] in the upper left corner and select the desired region and project.

3. Hover on ☰ to display **Service List** and choose **Networking** > **Direct Connect**.

4. In the navigation pane on the left, choose **Direct Connect** > **Global DC Gateways**.

5. In the global DC gateway list, view the name, ID, status, location, BGP ASN, enterprise project, virtual interfaces, and peer links.

   Click the name of the global DC gateway to view more information.

   – On the **Basic Information** tab, view the name, ID, status, enterprise project, description, location, BGP ASN, the number of peer links, virtual interfaces, IP address family, the time when the gateway was created, and routes.

   – On the **Peer Links** tab, view the name, ID, status, bandwidth, resource type, resource linked to the global DC gateway, region, and location of each peer link.

   – On the **Tags** tab, view the tags added to the global DC gateway.

# 3.4 Modifying a Global DC Gateway

## Scenarios

You can modify the name, IP address family, and description of an existing global DC gateway.

## Procedure

1. Log in to the management console.

2. On the console homepage, click 📍 in the upper left corner and select the desired region and project.

3. Hover on ☰ to display **Service List** and choose **Networking** > **Direct Connect**.

4. In the navigation pane on the left, choose **Direct Connect** > **Global DC Gateways**.

5. In the global DC gateway list, click the name of the global DC gateway you want to modify to go to the **Basic Information** page.

   You can also click ✎ on the right of the global DC gateway name to change its name.

6. On the **Basic Information** tab, modify its name, description, IP address family, and routes.

   – Modifying the name or description: Click ✎ next to the name or description, enter a new name or description as prompted, and click ✓ .

   – Modifying the IP address family: Click **Modify** on the right of **IP Address Family**, change the address family of the global DC gateway, and click **OK**.

– Modifying the routes: In the lower part of the page, add or delete the routes for the global DC gateway.

# 3.5 Deleting a Global DC Gateway

## Scenarios

You can delete a global DC gateway you no longer need.

## Constraints

If a global DC gateway is in use, it cannot be deleted. You need to delete the resources associated with the global DC gateway, as described in **Table 3-6**.

**Table 3-6** Reasons that a global DC gateway cannot be deleted and solutions

| Reason | Solution |
|---|---|
| The global DC gateway has a virtual interface associated. | Delete the virtual interfaces. For details, see **Deleting a Virtual Interface**. |
| The global DC gateway has peer links. | Delete the peer links. For details about how to view the peer links, see **Viewing Peer Links**. |

## Procedure

1. Log in to the management console.

2. On the console homepage, click ![location icon] in the upper left corner and select the desired region and project.

3. Hover on ![menu icon] to display **Service List** and choose **Networking** > **Direct Connect**.

4. In the navigation pane on the left, choose **Direct Connect** > **Global DC Gateways**.

5. In the global access gateway list, locate the global DC gateway you want to delete and click **Delete** in the **Operation** column.

6. Click **OK**.

# 3.6 Managing Global DC Gateway Tags

## Scenarios

After a global DC gateway is created, you can add tags to it, or edit, view or delete its tags.

A tag is an identifier of a global DC gateway and consists of a key and more than one value. You can add 20 tags to a global DC gateway.

⬛ **NOTE**

If a predefined tag has been created on TMS, you can directly select the corresponding tag key and value.

For details about predefined tags, see **Predefined Tag Overview**.

If you have configured tag policies for Direct Connect, you need to add tags to your global DC gateways based on the tag policies. If you add a tag that does not comply with the tag policies, global DC gateways may fail to be created. Contact your administrator to learn more about tag policies.

## Adding a Tag

Add a tag to an existing global DC gateway.

1.  Log in to the management console.

2.  On the console homepage, click 📍 in the upper left corner and select the desired region and project.

3.  Hover on ☰ to display **Service List** and choose **Networking** > **Direct Connect**.

4.  In the navigation pane on the left, choose **Direct Connect** > **Global DC Gateways**.

5.  Click the name of the global DC gateway that you want to add a tag to.

6.  Click the **Tags** tab.

7.  Click **Add Tag**.

8.  In the displayed dialog box, enter a key and a value.

    **Table 3-7** describes the tag key and value requirements.

**Table 3-7** Tag naming requirements

| Parameter | Requirements |
|-----------|--------------|
| Key | <ul><li>Cannot be left blank.</li><li>Must be unique for each resource.</li><li>Can contain a maximum of 36 characters.</li><li>Can contain only letters, digits, hyphens, and underscores.</li></ul> |
| Value | <ul><li>Can be left blank.</li><li>Can contain a maximum of 43 characters.</li><li>Can contain only letters, digits, periods, hyphens, and underscores.</li></ul> |

9.  Click **OK**.

## Editing a Tag

Modify the value of a tag added to a global DC gateway.

1. Log in to the management console.

2. On the console homepage, click ⬛ in the upper left corner and select the desired region and project.

3. Hover on ≡ to display **Service List** and choose **Networking** > **Direct Connect**.

4. In the navigation pane on the left, choose **Direct Connect** > **Global DC Gateways**.

5. Click the name of the global DC gateway whose tag you want to modify.

6. Click the **Tags** tab.

7. In the tag list, locate the tag you want to modify and click **Edit** in the **Operation** column.

8. Enter a new value.

9. Click **OK**.

## Deleting a Tag

Delete a tag from a global DC gateway.

---

⚠️ CAUTION

Deleted tags cannot be recovered.

---

1. Log in to the management console.

2. On the console homepage, click ⬛ in the upper left corner and select the desired region and project.

3. Hover on ≡ to display **Service List** and choose **Networking** > **Direct Connect**.

4. In the navigation pane on the left, choose **Direct Connect** > **Global DC Gateways**.

5. Click the name of the global DC gateway that you want to delete a tag from.

6. Click the **Tags** tab.

7. In the tag list, locate the tag you want to delete and click **Delete** in the **Operation** column.

8. Click **Yes**.

# 4 Virtual Interfaces

## 4.1 Creating a Virtual Interface

### Scenarios

After the connection and the gateway are ready, you need to create a virtual interface so that your network can access the VPC.

### Procedure

1. Log in to the management console.

2. On the console homepage, click ⬦ in the upper left corner and select the desired region and project.

3. Hover on ☰ to display **Service List** and choose **Networking** > **Direct Connect**.

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

5. Click **Create Virtual Interface**.

   Configure the parameters based on **Table 4-1**.

**Figure 4-1** Creating a virtual interface



**Table 4-1** Parameters for creating a virtual interface

| Parameter | Description |
|---|---|
| Region | Specifies the region where the connection resides. You can also change the region in the upper left corner of the console. |
| Name | Specifies the virtual interface name. The name can contain 1 to 64 characters. |
| Virtual Interface Priority | Specifies whether the virtual interface will be used prior to other virtual interfaces. There are two options: **Preferred** and **Standard**. If multiple virtual interfaces are associated with one Direct Connect device, load is balanced among virtual interfaces with the same priority, while virtual interfaces with different priorities are working in active/standby pairs. |
| Connection | Specifies the connection you can use to connect your on-premises network to Huawei Cloud. |
| Virtual Gateway | Specifies the virtual gateway that the virtual interface connects to. |
| VLAN | Specifies the ID of the VLAN for the virtual interface. You need to configure the VLAN if you create a connection on your own. The VLAN for a hosted connection will be allocated by the carrier or partner. You do not need to configure the VLAN. |

| Parameter | Description |
|---|---|
| Bandwidth | Specifies the bandwidth that can be used by the virtual interface, in Mbit/s. The bandwidth cannot exceed that of the connection. |
| Enable Rate Limiting | Limits the highest bandwidth that can be used by the virtual interface. If this option is enabled, the rate limit gradients are as follows:<br>● If the bandwidth is less than or equal to 100 Mbit/s, the rate limit gradient is 10 Mbit/s.<br>● If the bandwidth is greater than 100 Mbit/s but is less than or equal to 1,000 Mbit/s, the rate limit gradient is 100 Mbit/s.<br>● If the bandwidth is greater than 1,000 Mbit/s but is less than or equal to 100 Gbit/s, the rate limit gradient is 1 Gbit/s.<br>● If the bandwidth is greater than 100 Gbit/s, the rate limit gradient is 10 Gbit/s.<br>For example, if the bandwidth is 52 Mbit/s, the actual rate limit is 60 Mbit/s. If the bandwidth is 115 Mbit/s, the actual rate limit is 200 Mbit/s.<br>**NOTE**<br>Bandwidth limiting of virtual interfaces is being and will be launched in each region. You can view the regions where the option is rolled out on the management console. |
| Enterprise Project | Provides a cloud resource management mode where cloud resources and members are centrally managed by project. |
| Tag | Identifies the virtual interface. A tag consists of a key and one or more values. You can add 20 tags to a virtual interface.<br>Tag keys and values must meet the requirements listed in **Table 4-2**.<br>**NOTE**<br>If a predefined tag has been created on TMS, you can directly select the corresponding tag key and value.<br>For details about predefined tags, see **Predefined Tag Overview**.<br>If you have configured tag policies for Direct Connect, you need to add tags to your virtual interfaces based on the tag policies. If you add a tag that does not comply with the tag policies, virtual interfaces may fail to be created. Contact your administrator to learn more about tag policies. |
| IP Address Family | Specifies the address type of the virtual interface.<br>**IPv4** is selected by default. |
| Local Gateway | Specifies the gateway on the Huawei Cloud network. |

| Parameter | Description |
|---|---|
| Remote Gateway | Specifies the gateway on your on-premises network.<br><br>The remote gateway must be in the same IP address range as the local gateway. Generally, a subnet with a 30-bit mask is recommended. |
| Remote Subnet | Specifies the subnets and masks of your on-premises network. If there are multiple subnets, use commas (,) to separate them. |
| Routing Mode | Specifies whether static routing or dynamic routing is used to route traffic between your on-premises network and the cloud network.<br><br>If there are or will be two or more connections, select BGP routing to achieve higher availability. |
| BGP ASN | Specifies the autonomous system number (ASN) of the BGP peer.<br><br>This parameter is required when BGP routing is selected. |
| BGP MD5 Authentication Key | Specifies the password used to authenticate the BGP peer using MD5.<br><br>This parameter is mandatory when BGP routing is selected, and the parameter values on both gateways must be the same.<br><br>The key contains 8 to 255 characters and must contain at least two types of the following characters:<br>● Uppercase letters<br>● Lowercase letters<br>● Digits<br>● Special characters ~!, .:;-_"(){}[]/@#$ %^&*+\|= |
| Description | Provides supplementary information about the virtual interface. |

**Table 4-2** Tag naming requirements

| Parameter | Requirements |
|---|---|
| Key | ● Cannot be left blank.<br>● Must be unique for each resource.<br>● Can contain a maximum of 36 characters.<br>● Can contain only letters, digits, hyphens, and underscores. |

| Parameter | Requirements |
|---|---|
| Value | ● Can be left blank.<br>● Can contain a maximum of 43 characters.<br>● Can contain only letters, digits, periods, hyphens, and underscores. |

If you want to create a virtual interface for other accounts, configure the parameters based on **Table 4-3**.

**Table 4-3** Parameters for creating a virtual interface for another account

| Parameter | Description |
|---|---|
| Virtual Interface Account | Specifies the account that owns the virtual interface. You create a virtual interface for another account so that this account can use your connection to access the VPC. |
| Region | Specifies the region where the connection resides. You can also change the region in the upper left corner of the console. |
| Name | Specifies the virtual interface name.<br>The name can contain 1 to 64 characters. |
| Virtual Interface Priority | Specifies whether the virtual interface will be used prior to other virtual interfaces. There are two options: **Preferred** and **Standard**.<br>If multiple virtual interfaces are associated with one Direct Connect device, load is balanced among virtual interfaces with the same priority, while virtual interfaces with different priorities are working in active/standby pairs. |
| Connection | Specifies the connection you can use to connect your on-premises network to Huawei Cloud. |
| Project ID | Specifies the ID of the project that the virtual gateway belongs to. On the management console, hover the cursor on the account name in the upper right corner and select **My Credentials**. On the **My Credentials** page, view the project ID. |
| ID | Specifies the ID of the virtual gateway. In the virtual gateway list, hover the cursor on the virtual gateway name and view the name and ID of the virtual gateway. |

| Parameter | Description |
|---|---|
| VLAN | Specifies the ID of the VLAN for the virtual interface.<br><br>You need to configure the VLAN if you create a self-service connection.<br><br>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 bandwidth that can be used by the virtual interface, in Mbit/s. The bandwidth cannot exceed that of the connection. |
| Enable Rate Limiting | Limits the highest bandwidth that can be used by the virtual interface. If this option is enabled, the rate limit gradients are as follows:<br><br>● If the bandwidth is less than or equal to 100 Mbit/s, the rate limit gradient is 10 Mbit/s.<br><br>● If the bandwidth is greater than 100 Mbit/s but is less than or equal to 1,000 Mbit/s, the rate limit gradient is 100 Mbit/s.<br><br>● If the bandwidth is greater than 1,000 Mbit/s but is less than or equal to 100 Gbit/s, the rate limit gradient is 1 Gbit/s.<br><br>● If the bandwidth is greater than 100 Gbit/s, the rate limit gradient is 10 Gbit/s.<br><br>For example, if the bandwidth is 52 Mbit/s, the actual rate limit is 60 Mbit/s. If the bandwidth is 115 Mbit/s, the actual rate limit is 200 Mbit/s. |
| Tag | Identifies the virtual interface. A tag consists of a key and one or more values. You can add 20 tags to a virtual interface.<br><br>Tag keys and values must meet the requirements listed in **Table 4-4**.<br><br>**NOTE**<br>If a predefined tag has been created on TMS, you can directly select the corresponding tag key and value.<br><br>For details about predefined tags, see **Predefined Tag Overview**.<br><br>If you have configured tag policies for Direct Connect, you need to add tags to your virtual interfaces based on the tag policies. If you add a tag that does not comply with the tag policies, virtual interfaces may fail to be created. Contact your administrator to learn more about tag policies. |
| IP Address Family | Specifies the address type of the virtual interface.<br><br>**IPv4** is selected by default. |
| Local Gateway | Specifies the gateway on the Huawei Cloud network. |

| Parameter | Description |
|---|---|
| Remote Gateway | Specifies the gateway on your on-premises network.<br><br>The remote gateway must be in the same IP address range as the local gateway. Generally, a subnet with a 30-bit mask is recommended. |
| Remote Subnet | Specifies the subnets and masks of your on-premises network. If there are multiple subnets, use commas (,) to separate them. |
| Routing Mode | Specifies whether static routing or dynamic routing is used to route traffic between your on-premises network and the cloud network.<br><br>If there are or will be two or more connections, select BGP routing to achieve higher availability. |
| BGP ASN | Specifies the ASN of the BGP peer.<br><br>This parameter is required when BGP routing is selected. |
| BGP MD5 Authentication Key | Specifies the password used to authenticate the BGP peer using MD5.<br><br>This parameter is mandatory when BGP routing is selected, and the parameter values on both gateways must be the same.<br><br>The key contains 8 to 255 characters and must contain at least two types of the following characters:<br>● Uppercase letters<br>● Lowercase letters<br>● Digits<br>● Special characters ~!, .:;-_"(){}[]/@#$ %^&*+\|= |
| Description | Provides supplementary information about the virtual interface. |

**Table 4-4** Tag naming requirements

| Parameter | Requirements |
|---|---|
| Key | ● Cannot be left blank.<br>● Must be unique for each resource.<br>● Can contain a maximum of 36 characters.<br>● Can contain only letters, digits, hyphens, and underscores. |

| Parameter | Requirements |
|---|---|
| Value | ● Can be left blank.<br>● Can contain a maximum of 43 characters.<br>● Can contain only letters, digits, periods, hyphens, and underscores. |

 NOTE

When you configure the local and remote gateways, note the following:

- The local gateway is used by Huawei Cloud for connecting to your equipment room. After you configure **Local Gateway** on the console, the configuration will be automatically delivered to the gateway used by Huawei Cloud.
- The remote gateway is used by your equipment room for connecting to Huawei Cloud. After you configure **Remote Gateway** on the console, you also need to configure the gateway deployed in your equipment room.
- The local and remote gateways must use the same CIDR block and cannot conflict with service IP addresses on the network.

6. Click **Create Now**.

   Ensure that the virtual interface is in the **Normal** state.

7. Ping the IP address of a server in the VPC from your on-premises data center to check network connectivity.

# 4.2 Viewing a Virtual Interface

## Scenarios

You can view details about a virtual interface.

## Procedure

1. Log in to the management console.

2. On the console homepage, click  in the upper left corner and select the desired region and project.

3. Hover on  to display **Service List** and choose **Networking** > **Direct Connect**.

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

5. In the virtual interface list, click the name of the virtual interface you wan to view and go to the **Basic Information** page of the virtual interface.

**Figure 4-2** Viewing a virtual interface



# 4.3 Modifying a Virtual Interface

## Scenarios

After a virtual interface is created, you can modify its name, bandwidth, rate limiting, and priority as well as the name, remote subnet, and description of a virtual interface.
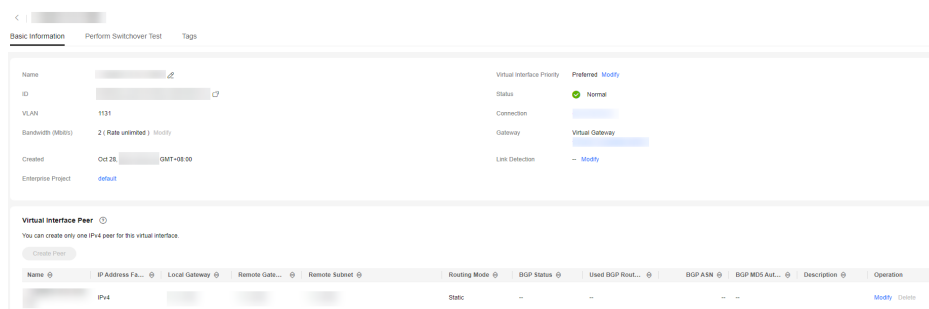
## Procedure

1. Log in to the management console.

2. On the console homepage, click ![icon] in the upper left corner and select the desired region and project.

3. Hover on ![icon] to display **Service List** and choose **Networking** > **Direct Connect**.

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

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

**Figure 4-3** Modifying virtual interface 1



You can also click the name of the virtual interface to go to the **Basic Information** page of the virtual interface, where you can modify the name, bandwidth, rate limiting, priority, and peer of the virtual interface.

For details virtual interface peers, see **Virtual Interface Peers**.

---

**Figure 4-4** Modifying virtual interface 2



📖 **NOTE**

> If multiple virtual interfaces are associated with one Direct Connect device, load is balanced among virtual interfaces with the same priority, while virtual interfaces with different priorities are working in active/standby pairs.

# 4.4 Deleting a Virtual Interface

## Scenarios

You can delete a virtual interface if you do not need it any longer.
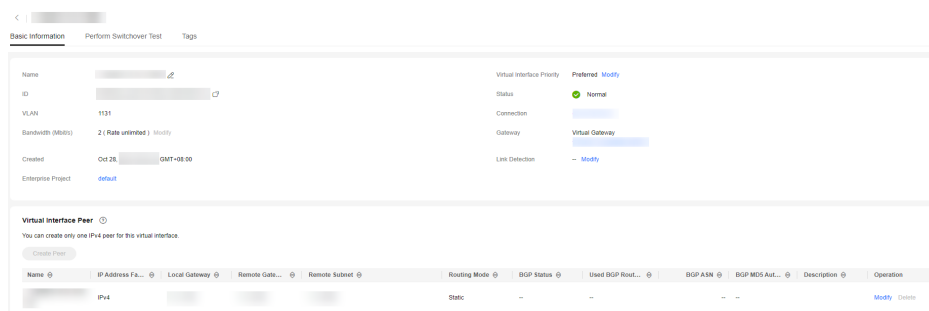
## Procedure

1. Log in to the management console.

2. On the console homepage, click ![icon] in the upper left corner and select the desired region and project.

3. Hover on ![icon] to display **Service List** and choose **Networking** > **Direct Connect**.

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

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

6. In the displayed dialog box, enter **DELETE** and click **OK**.

**Figure 4-5** Deleting a virtual interface

Delete This Virtual Interface                                                    ✕

Virtual interface [          ] will be deleted.
A deleted virtual interface cannot be recovered. Exercise caution when performing this operation.

| Name | ID |
|------|----|
|      |    |

To confirm deletion, enter **"DELETE"** below.   Auto Enter

DELETE

Cancel   OK

# 4.5 Virtual Interface Peers

## Function

A virtual interface peer is a configuration of a virtual interface to support the IPv4/IPv6 dual stack and is used to connect the customer gateway to the virtual gateway. A virtual interface peer is automatically created when you create a virtual interface.

## Constraints

A virtual interface has at least one virtual interface peer, and the last virtual interface peer cannot be deleted.
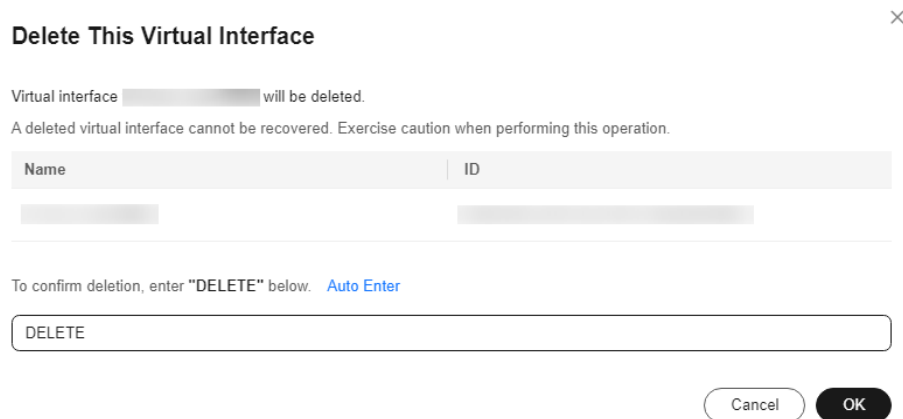
## Viewing a Virtual Interface Peer

1. Log in to the management console.

2. On the console homepage, click [icon] in the upper left corner and select the desired region and project.

3. Hover on [icon] to display **Service List** and choose **Networking** > **Direct Connect**.

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

5. Locate the virtual interface and click its name.

6. In the lower part of the page, locate the virtual interface peer you want to view and view its details.

## Modifying a Virtual Interface Peer

1. Log in to the management console.

2. On the console homepage, click [icon] in the upper left corner and select the desired region and project.

3. Hover on ≡ to display **Service List** and choose **Networking** > **Direct Connect**.

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

5. Locate the virtual interface and click its name.

6. In the lower part of the page, locate the virtual interface peer you want to modify and click **Modify** in the **Operation** column.

7. Modify the virtual interface peer. An IPv4 virtual interface peer is used as an example here.

**Figure 4-6** Modifying a virtual interface peer



8. Click **OK**.

# 5 Historical Connections

## 5.1 Viewing a Historical Connection

### Scenarios

You can view details about a connection that was originally requested through email or on the phone rather than using the console.

### Procedure

1. Log in to the management console.

2. On the console homepage, click  in the upper left corner and select the desired region and project.

3. Hover on  to display **Service List** and choose **Networking** > **Direct Connect**.

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

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

## 5.2 Modifying a Historical Connection

### Scenarios

You can modify the name and remote subnets of a historical connection.

### Procedure

1. Log in to the management console.

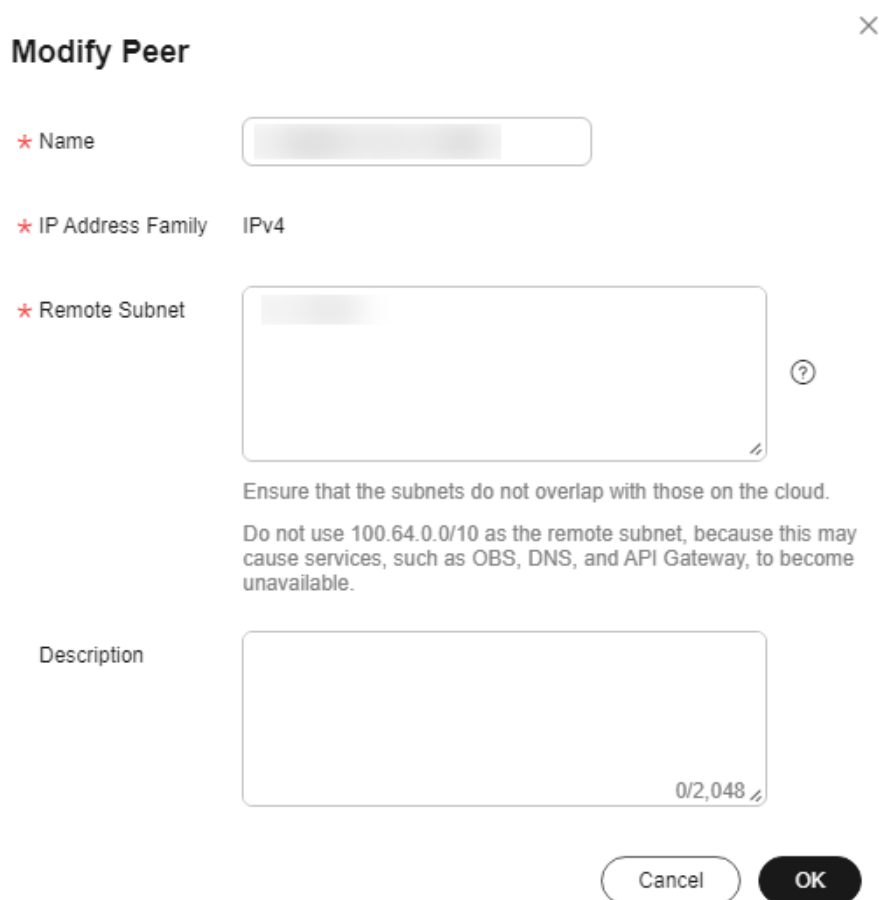2. On the console homepage, click  in the upper left corner and select the desired region and project.

3. Hover on ≡ to display **Service List** and choose **Networking** > **Direct Connect**.

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

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

6. Modify the connection and then click **OK**.

# 6 Partner Connections

## 6.1 Operations Connections

### Creating an Operations Connection

**Scenarios**

If you are a partner, you can create an operations connection.

**Procedure**

1. Log in to the management console.

2. On the console homepage, click ⊙ in the upper left corner and select the desired region and project.

3. Hover on ☰ to display **Service List** and choose **Networking** > **Direct Connect**.

4. Click **Create Operations Connection**.

5. Configure the parameters and then click **Create Now**.

6. Confirm the order and click **Pay**.

7. Click **Pay**.

### Viewing an Operations Connection

**Scenarios**

You can view details about an operations connection that you have created.

**Procedure**

1. Log in to the management console.

2. On the console homepage, click ⊙ in the upper left corner and select the desired region and project.

3. Hover on ☰ to display **Service List** and choose **Networking** > **Direct Connect**.

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

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

6. View details about the operations connection.

## Modifying an Operations Connection

**Scenarios**

You can modify the name, bandwidth, equipment room address, and description of an operations connection.

**Procedure**

1. Log in to the management console.

2. On the console homepage, click 📍 in the upper left corner and select the desired region and project.

3. Hover on ☰ to display **Service List** and choose **Networking** > **Direct Connect**.

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

5. Locate the operations connection you want to modify and click **More** > **Modify** in the **Operation** column.

6. Modify the connection and then click **OK**.

## Unsubscribing from an Operations Connection

**Scenarios**

You can unsubscribe from an operations connection if you no longer need it.

**Prerequisites**

Delete the virtual gateway and virtual interface associated with your connection, delete the connection, and unsubscribe from the operations connection.

**Procedure**

1. Log in to the management console.

2. On the console homepage, click 📍 in the upper left corner and select the desired region and project.

3. Hover on ☰ to display **Service List** and choose **Networking** > **Direct Connect**.

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

5. Locate the operations connection that you want to unsubscribe from and choose **More** > **Unsubscribe** in the **Operation** column.

6. Locate the target operations connection and click **Unsubscribe from Resource** in the **Operation** column.

7. On the displayed **Unsubscribe** page, confirm the amount to be refunded.
8. Click **Confirm**.

### Renewing an Operations Connection

**Scenarios**

You can renew the subscription if an operations connection is going to expire soon.

**Procedure**

1. Log in to the management console.

2. On the console homepage, click  in the upper left corner and select the desired region and project.

3. Hover on  to display **Service List** and choose **Networking** > **Direct Connect**.

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

5. Locate the operations connection you want to renew and choose **More** > **Renew** in the **Operation** column.

6. Set the duration that you want to renew the connection and click **Pay**. Then pay the order as prompted.

# 6.2 Hosted Connections

## Creating a Hosted Connection

**Scenarios**

If you are a partner, you can create a hosted connection for your user.

**Procedure**

1. Log in to the management console.

2. On the console homepage, click  in the upper left corner and select the desired region and project.

3. Hover on  to display **Service List** and choose **Networking** > **Direct Connect**.

4. Click **Create Hosted Connection**.

5. Configure the parameters and then click **OK**.

## Viewing a Hosted Connection

**Scenarios**

You can view details about a hosted connection you have created as a partner.

**Procedure**

1. Log in to the management console.

2. On the console homepage, click [icon] in the upper left corner and select the desired region and project.

3. Hover on [icon] to display **Service List** and choose **Networking** > **Direct Connect**.

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

5. Locate the operations connection that the hosted connection depends on and click **Manage Hosted Connection** in the **Operation** column.

6. Locate the hosted connection you want to view and click [icon] on the left of its name to view the details.

## Modifying a Hosted Connection

### Scenarios

You can modify the name, bandwidth, equipment room address, and description of a hosted connection.

### Procedure

1. Log in to the management console.

2. On the console homepage, click [icon] in the upper left corner and select the desired region and project.

3. Hover on [icon] to display **Service List** and choose **Networking** > **Direct Connect**.

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

5. Locate the operations connection that the hosted connection depends on and click **Manage Hosted Connection** in the **Operation** column.

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

7. Modify the hosted connection and click **OK**.

## Deleting a Hosted Connection

### Scenarios

You can delete a hosted operation if you do not need it any longer.

### Procedure

1. Log in to the management console.

2. On the console homepage, click [icon] in the upper left corner and select the desired region and project.

3. Hover on [icon] to display **Service List** and choose **Networking** > **Direct Connect**.

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

5. Locate the operations connection that the hosted connection depends on and click **Manage Hosted Connection** in the **Operation** column.

6. Locate the hosted connection you want to delete and click **Delete** in the **Operation** column.

7. Click **Yes**.

# 7 Network Topology

## Scenarios

After creating a connection, you can view the connection status and resource information in the Direct Connect network topology.

☐ **NOTE**

The network topology function has been available in the following regions: CN North-Beijing4, CN East-Shanghai1, CN South-Guangzhou, CN Southwest-Guiyang1, CN-Hong Kong, AP-Bangkok, AP-Singapore, AF-Johannesburg, and LA-Mexico City2.

## Procedure

1. Log in to the management console.

2. On the console homepage, click ![] in the upper left corner and select the desired region and project.

3. Hover on ☰ to display **Service List** and choose **Networking** > **Direct Connect**.

4. In the navigation pane on the left, choose **Direct Connect** > **Network Topology**.

5. View your connections, their virtual gateways and virtual interfaces, and VPCs that can be accessed over these connections.

   ☐ **NOTE**

   If a site survey is being performed, cabling is not complete, or the specification is being changed, the connection is displayed as abnormal in the network topology. You can check its status on the connection list page.

# 8 Monitoring

## 8.1 Overview

Monitoring is critical to ensuring the performance, reliability, and availability of a service. Monitoring data lets you keep track of the status of your resources. Cloud Eye collects and displays monitoring data for you in a convenient, visualized manner. You can use Cloud Eye to automatically monitor connections in real time and manage alarms and notifications, so that you can keep track of the performance of each connection.

To learn more information, see the following topics:

- **Metrics**
- **Network Quality Metrics (Plug-ins Required)**
- **Setting Alarm Rules**
- **Viewing Monitoring Metrics**

## 8.2 Metrics

### Function

**Table 8-1** describes the metrics reported by Direct Connect to Cloud Eye as well as their namespace and dimensions. You can use the management console to query the metrics of the monitored objects and alarms generated for Direct Connect.

📖 **NOTE**

You can view metrics of standard connections, full-service connections (dedicated port), and hosted connections.

### Namespace

SYS.DCAAS

## Metrics

**Table 8-1** Direct Connect metrics

| ID | Metric | Description | Value Range | Monitored Object | Monitoring Interval |
|---|---|---|---|---|---|
| network_incoming_bits_rate | Network Incoming Bandwidth | Bit rate for inbound data to the Direct Connect side of a connection<br>Unit: bit/s | ≥ 0 bits/s | Connections and historical connections | 1 minute |
| network_outgoing_bits_rate | Network Outgoing Bandwidth | Bit rate for outbound data from the Direct Connect side of a connection<br>Unit: bit/s | ≥ 0 bits/s | Connections and historical connections | 1 minute |
| network_incoming_bytes | Network Incoming Traffic | Number of bytes for inbound data to the Direct Connect side of a connection<br>Unit: byte | ≥ 0 bytes | Connections and historical connections | 1 minute |
| network_outgoing_bytes | Network Outgoing Traffic | Number of bytes for outbound data from the Direct Connect side of a connection<br>Unit: byte | ≥ 0 bytes | Connections and historical connections | 1 minute |
| network_incoming_packets_rate | Network Incoming Packet Rate | Packet rate for inbound data to the Direct Connect side of a connection<br>Unit: Packet/s | ≥ 0 packets/s | Connections and historical connections | 1 minute |
| network_outgoing_packets_rate | Network Outgoing Packet Rate | Packet rate for outbound data from the Direct Connect side of a connection<br>Unit: Packet/s | ≥ 0 packets/s | Connections and historical connections | 1 minute |

| ID | Metric | Description | Value Range | Monitored Object | Monitoring Interval |
|---|---|---|---|---|---|
| network_incoming_packets | Network Incoming Packets | Number of packets for inbound data to the Direct Connect side of a connection<br>Unit: Packet | ≥ 0 packets | Connections and historical connections | 1 minute |
| network_outgoing_packets | Network Outgoing Packets | Number of packets for outbound data from the Direct Connect side of a connection<br>Unit: Packet | ≥ 0 packets | Connections and historical connections | 1 minute |
| network_status | Port Status | Status of the port used by a connection | 0-DOWN<br>1-UP | Connections and historical connections | 1 minute |
| bgp_receive_route_num_v4 | IPv4 Routes | Number of IPv4 routes that a virtual interface learned through BGP | ≥ 0 | Virtual interface | 1 minute |
| bgp_receive_route_num_v6 | IPv6 Routes | Number of IPv6 routes that a virtual interface learned through BGP | ≥ 0 | Virtual interface | 1 minute |

**Dimensions**

| Key | Value |
|---|---|
| direct_connect_id | Connection |
| virtual_interface_id | Virtual interface |
| history_direct_connect_id | Historical connection |

# 8.3 Network Quality Metrics (Plug-ins Required)

The network quality of connections is monitored using two plug-ins, and there are two key metrics: network latency and packet loss rate.

The following are the two plug-ins:

- dc-nqa-collector: monitors the connections requested using the Direct Connect console.
- history-dc-nqa-collector: monitors historical connections.

For details, see **Installing the Direct Connect Metric Collection Plug-ins**.

◫ NOTE

- Automated connections are requested using the console and can be self-service or full-service connections. Each connection has at least a virtual gateway and a virtual interface, and their routes are automatically advertised. Connections in most regions are automated connections.
- Historical connections requested by email or phone do not have virtual gateways and virtual interfaces, and their routes must be configured manually. This type of connection is only available in some regions.

## Metrics

**Table 8-2** Network quality metrics

| ID | Metric Name | Description | Value Range | Monitored Object | Monitoring Interval |
|---|---|---|---|---|---|
| latency | Latency | Network latency of a connection<br>Unit: ms | ≥ 0 ms | Connections and historical connections | 1 minute |
| packet_loss_rate | Packet Loss Rate | Packet loss rate of a connection<br>Unit: Percentage | 0–100% | Connections and historical connections | 1 minute |

## Dimensions

| Key | Value |
|---|---|
| virtual_interface_id | Virtual interface (associated with an automated connection) |
| history_direct_connect_id | Historical connection |

# 8.4 Configuring Alarm Rules

## Scenarios

You can configure alarm rules to customize monitored objects and notification policies and to learn connection status at any time.

## Procedure

1. Log in to the management console.

2. On the console homepage, click ⊙ in the upper left corner and select the desired region and project.

3. Hover on ☰ to display **Service List** and choose **Management & Governance** > **Cloud Eye**.

4. In the navigation pane on the left, choose **Alarm Management** > **Alarm Rules**.

5. On the **Alarm Rules** page, click **Create Alarm Rule**.

6. After configuring the parameters, click **Create**.

   After the alarm rule is created, the system automatically notifies you when an alarm is triggered.

   📖 **NOTE**

   For more examples of creating alarm rules, see **Cloud Eye User Guide**.

# 8.5 Viewing Metrics

1. Log in to the management console.

2. On the console homepage, click ⊙ in the upper left corner and select the desired region and project.

3. Hover on ☰ to display **Service List** and choose **Management & Governance** > **Cloud Eye**.

   **Figure 8-1** Cloud Eye
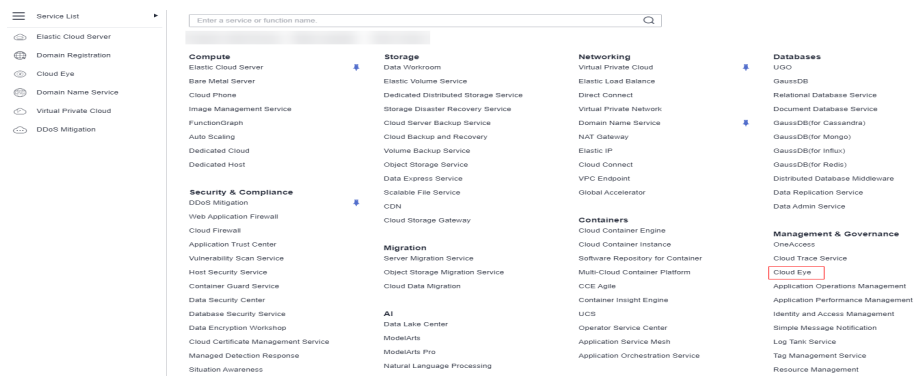
4. In the navigation pane on the left, choose **Cloud Service Monitoring** > **Direct Connect**.

5. Locate the connection and click **View Metric** in the **Operation** column.

   You can view data of the last 1, 3, 12, or 24 hours, or last 7 days. You can also specify a time period.

# 9 Permissions Management

## 9.1 Creating a User and Granting Permissions

Use **IAM** to implement fine-grained permissions control for your Direct Connect resources. With IAM, you can:

- Create IAM users for employees based on the organizational structure of your enterprise. Each IAM user has their own security credentials, providing access to cloud resources.

- Grant only the permissions required for users to perform a task.

- Entrust an account or cloud service to perform professional and efficient O&M on your cloud resources.

Skip this part if your account does not require individual IAM users.

**Figure 9-1** shows the process for granting permissions.

### Prerequisites

Before you assign permissions to a user group, you need to understand Direct Connect permissions that can be assigned to the user group and select permissions based on actual requirements. For details about the system permissions of Direct Connect, see **Permissions**. For the system policies of other services, see **System Permissions**.

**Process Flow**

**Figure 9-1** Process for granting Direct Connect permissions
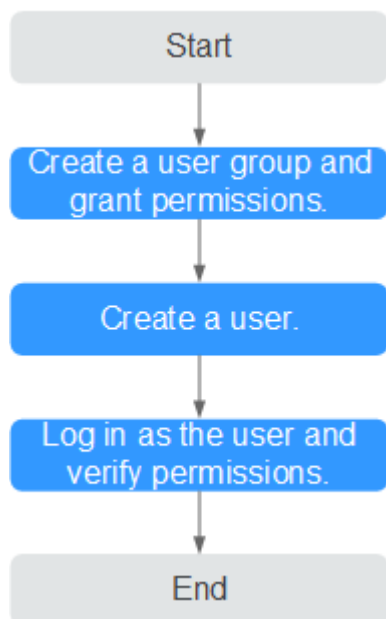


1. **Create a user group and assign permissions**.

   Create a user group on the IAM console and assign the **Direct Connect Administrator** policy to the group.

2. **Create a user and add the user to the user group**

   Create a user on the IAM console and add the user to the group created in **1**.

3. **Log in to the management console as the created user**.

   Log in to the Direct Connect console using the created user, and verify that the user has read-only permissions for Direct Connect.

   – In the service list, choose **Networking** > **Direct Connect**. Click **Create Connection** in the upper right corner. If the connection is successfully created, the **Direct Connect Administrator** policy has already taken effect.

   – Choose any other service in the Service List. A message will appear indicating that you have no sufficient permissions to access the service.

# 9.2 Example Custom Policies

Custom policies can be created to supplement the system-defined policies of Direct Connect.

You can create custom policies in either of the following ways:

- Visual editor: Select cloud services, actions, resources, and request conditions. This does not require knowledge of policy syntax.

- JSON: Edit JSON policies from scratch or based on an existing policy.

For details, see **Creating a Custom Policy**. The following are examples custom policies created for Direct Connect.

## Example Custom Policies

- Example 1: Allowing users to update a virtual gateway
  ```
  {
      "Version": "1.1",
      "Statement": [
          {
              "Effect": "Allow",
              "Action": [
                  "dcaas:vgw:update"
              ]
          }
      ]
  }
  ```

- Example 2: Denying users to delete a connection

  A deny policy must be used together with other policies. If permissions assigned to a user contain both Allow and Deny actions, the Deny action takes precedence over the Allow action.

  The following method can be used if you need to assign permissions of the **DCAAS FullAccess** policy to a user but also forbid the user from deleting connections. Create a custom policy for denying connection deletion, and assign both policies to the group the user belongs to. Then the user can perform all operations on Direct Connect except deleting connections.

  The following is an example of a deny policy:
  ```
  {
      "Version": "1.1",
      "Statement": [
          {
              "Effect": "Deny",
              "Action": [
                  "dcaas:directConnect:delete"
              ]
          }
      ]
  }
  ```

- Example 3: Defining permissions for multiple services in a policy

  A custom policy can contain the actions of multiple services that are of the global or project-level type.

  The following is an example policy containing actions of multiple services:
  ```
  {
      "Version": "1.1",
      "Statement": [
          {
              "Effect": "Allow",
              "Action": [
                  "vpc:vpcs:list",
                  "vpc:subnets:get",
                  "vpc:routes:list"
              ]
          },
          {
              "Effect": "Allow",
              "Action": [
                  "dcaas:vif:list",
                  "dcaas:vgw:list",
                  "dcaas:directConnect:list"
              ]
          }
      ]
  }
  ```

# 10 Interconnecting with CTS

## 10.1 Key Operations Recorded by CTS

With CTS, you can record operations associated with Direct Connect for later query, audit, and backtrack operations.

**Table 10-1** lists the operations that can be recorded by CTS.

**Table 10-1** Direct Connect operations that can be recorded by CTS

| Operation | Resource Type | Trace Name |
|---|---|---|
| Creating a connection | dcaasConnection | createConnection |
| Modifying a connection | dcaasConnection | modifyConnection |
| Deleting a connection | dcaasConnection | deleteConnection |
| Creating a virtual gateway | dcaasVirtualGateway | createVirtualGateway |
| Modifying a virtual gateway | dcaasVirtualGateway | modifyVirtualGateway |
| Deleting a virtual gateway | dcaasVirtualGateway | deleteVirtualGateway |
| Creating a virtual interface | dcaasVirtualInterface | createVirtualInterface |
| Modifying a virtual interface | dcaasVirtualInterface | modifyVirtualInterface |
| Deleting a virtual interface | dcaasVirtualInterface | deleteVirtualInterface |

# 10.2 Viewing Traces

## Scenarios

After you enable CTS, the system starts recording operations on cloud resources. You can view traces of the last seven days on the CTS console.

This topic describes how to query these records.

## Procedure

1.  Log in to the management console.

2.  On the console homepage, click ⬕ in the upper left corner and select the desired region and project.

3.  Hover on ☰ to display **Service List** and choose **Management & Governance** > **Cloud Trace Service**.

4.  In the navigation pane on the left, choose **Trace List**.

5.  Specify filtering criteria. The following filters are available:

    –   **Trace Type**, **Trace Source**, **Resource Type**, and **Search By**

        Select a filter criterion from the drop-down list.

        ▪   If you select **Trace name** for **Search By**, you need to specify a trace name.

        ▪   If you select **Resource ID** for **Search By**, you need to specify a resource ID.

        ▪   If you select **Resource name** for **Search By**, you need to specify a resource name.

    –   **Operator**: Select a user who performs operations.

    –   **Trace Status**: Select **All trace statuses**, **Normal**, **Warning**, or **Incident**.

    –   Time range: You can specify the time period to query traces.

6.  Click ⌄ on the left of the record to be queried to extend its details.

7.  Locate a trace and click **View Trace** in the **Operation** column.

# 11 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. Click [icon] in the upper left corner and select the desired region and project.

3. In the upper right corner of the page, choose **Resources** > **My Quotas**.
   The **Service Quota** page is displayed.

   **Figure 11-1** My Quotas
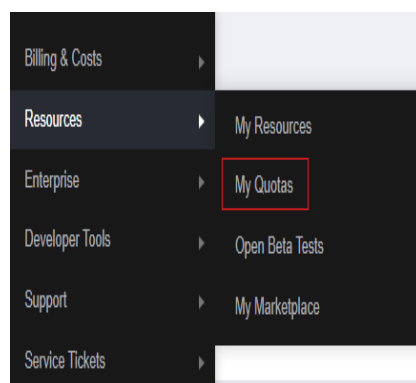
   

4. View the used and total quota of each type of resources on the displayed page.
   If a quota cannot meet service requirements, apply for a higher quota.

## How Do I Apply for a Higher Quota?

1. Log in to the management console.

2. In the upper right corner of the page, choose **Resources** > **My Quotas**.
The **Service Quota** page is displayed.

**Figure 11-2** My Quotas
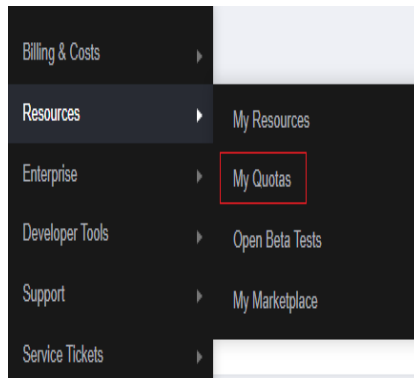


3. Click **Increase Quota** in the upper right corner of the page.

**Figure 11-3** Increasing quota



4. On the **Create Service Ticket** page, configure parameters as required.

In the **Problem Description** area, fill in the content and reason for adjustment.

5. After all necessary parameters are configured, select **I have read and agree to the Ticket Service Protocol and Privacy Statement** and click **Submit**.

# 12 Appendixes

## 12.1 Dual-Connection Switchover Test

### Function

Dual-connection access ensures high SLA. To achieve this, dual-connection automatic switchover needs to be supported. Before O&M of dual-connection access, you can perform switchover tests on the console to verify connectivity and simplify the delivery process.

📖 **NOTE**

This function is available in the following regions: CN North-Beijing1, CN North-Beijing4, CN North-Ulanqab1, CN East-Shanghai1, CN East-Shanghai2, CN South-Guangzhou, CN Southwest-Guiyang1, CN-Hong Kong, AP-Bangkok, and AP-Singapore.

### Application Scenarios

Perform the dual-connection switchover test before the connections are used for network connectivity.

### Prerequisites

There are two connections, with each having a virtual interface associated.

### Procedure

1. Log in to the management console.

2. On the console homepage, click 📍 in the upper left corner and select the desired region and project.

3. Hover on ☰ to display **Service List** and choose **Networking** > **Direct Connect**.

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

5. Enable the switchover test for the virtual interface associated with one connection, for example, connection 1 and check the connectivity between an ECS and the on-premises data center.

   a. On the **Virtual Interfaces** page, click the name of the target virtual interface.

   b. On the **Switchover Test** page of the virtual interface, click **Switchover Test**.

   c. In the **Perform Switchover Test** dialog box, enable the switchover test and click **OK**

   **Figure 12-1** Enabling switchover test
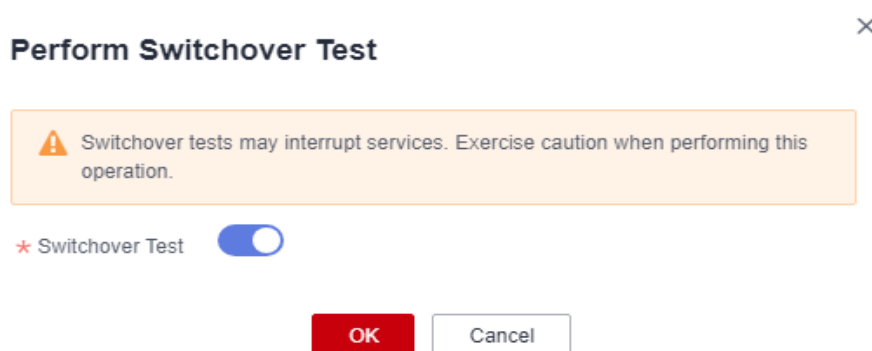
   

   d. Refresh the page. On the **Basic Information** page of the virtual interface, ensure that its status is **Disabled manually**.

   e. Run the **ping** command on an ECS to verify the connectivity between the ECS and the on-premises data center. If a response packet is received, the switchover test is successful.

6. Disable the switchover test for the virtual interface associated with connection 1 to restore access over dual connections.

   a. On the **Switchover Test** page of the virtual interface, click **Switchover Test**.

   b. In the **Perform Switchover Test** dialog box, disable the switchover test and click **OK**

   **Figure 12-2** Disabling switchover test
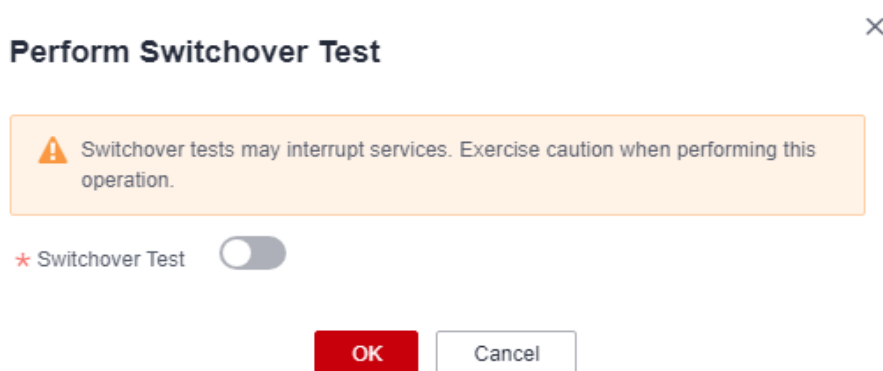
    c.    Refresh the page. On the **Basic Information** page of the virtual interface, ensure that its status is **Normal**.

    d.    Run the **ping** command on the ECS to verify the connectivity between the ECS and the on-premises data center. If a response packet is received, the switchover test is successful.

7.    Repeat **5** and **6** to perform a switchover test on the virtual interface associated with connection 2.

📖 **NOTE**

In the switchover test record, if the operation type is displayed as **Enable**, the **shutdown** command is executed, and the virtual interface is disabled. If the operation type is displayed as **Disable**, the **undo shutdown** command is executed, and the virtual interface is enabled.

# 12.2 Connection Bandwidth Testing Methods

## Scenarios

After your on-premises data center is connected to the cloud, you need to test the link performance to ensure that the connection can meet your service requirements. This section describes how you can use iPerf3 to test the bandwidth of a connection.

## Prerequisites

- Network connectivity between your on-premises data center and the cloud has been established, and the routes have been configured.

- A network access device is available in the on-premises data center as the client or server in the iPerf3 tests.

  The IP address of the network access device is 192.168.0.1.

- Six ECSs that can access the Internet are available as the clients or servers in the iPerf3 tests. The ECSs establish control connections with the on-premises network access device for transmitting test information and test results.

  In this example, the six ECSs use the c7.large.2 flavor and image CentOS 8.2 64bit (40 GB), and their IP addresses are from 172.16.0.2 to 172.16.0.7.

## Procedure

**Step 1** Install iPerf3 and set up the test environment.

Install iPerf3 on the on-premises network access device and on the six ECSs. The following describes how to install iPerf3 on an ECS.

1.    Log in to the ECS.

2.    Install iPerf3.

    a.    Download iPerf3.
```
yum install iperf3
```

    b.    Check whether the installation is successful.
```
iperf3 -v
```

    The installation is successful when the system displays the following information:

**Step 2** Use iPerf3 to test the bandwidth of a connection.

**Table 12-1** describes the parameters related to iPerf3.

**Table 12-1** iPerf3 parameter description

| Parameter | Description |
|---|---|
| -s | A server-specific parameter. It indicates that iPerf3 runs in server mode. |
| -c | A client-specific parameter. It indicates that iPerf3 runs in client mode. |
| -i | The interval between reports, in seconds. |
| -p | • Server: The listening port on the server. The default value is 5201. Both TCP and UDP are listened on.<br>• Client: The port for the client to connect to the server. The default value is 5201. If the -u parameter also exists, the connection is initiated through UDP. Otherwise, a TCP connection is used by default. |
| -u | UDP is used to send packets. If this parameter is not specified, TCP is used. |
| -l | The length of the read/write buffer. It is recommended that you set this parameter to **16** when testing the packet forwarding performance and to **1400** when testing the bandwidth. |
| -b | The bandwidth (in bit/s) used if a UDP connection is established. |
| -t | The total transmission time, in seconds. It is the duration for iPerf3 to repeatedly send data packets of a specified length within a specified period. The default value is 10 seconds. |
| -A | CPU affinity. You can bind the iPerf3 process to the logical CPU with the corresponding number to prevent the iPerf3 process from being scheduled among different CPUs. |

1.  Test the bandwidth of the connection with the on-premises network access device functioning as the server.

    a.  Run the following commands on the on-premises network access device to start the iPerf3 process in server mode and specify different ports:
    ```
    iperf3 -s -i 1 -p 16001
    iperf3 -s -i 1 -p 16002
    iperf3 -s -i 1 -p 16003
    iperf3 -s -i 1 -p 16004
    iperf3 -s -i 1 -p 16005
    iperf3 -s -i 1 -p 16006
    ```

    b.  Run the **iperf3 -u -l 16 -b 100m -t 120 -c server_ip -i 1 -p port** command on each ECS to start the iPerf3 process in client mode and specify different ports of the on-premises network access device.

    Example commands are as follows:

```
iperf3 -u -l 16 -b 100m -t 120 -c 192.168.0.1 -i 1 -p 16001 #First ECS
iperf3 -u -l 16 -b 100m -t 120 -c 192.168.0.1 -i 1 -p 16002 #Second ECS
iperf3 -u -l 16 -b 100m -t 120 -c 192.168.0.1 -i 1 -p 16003 #Third ECS
iperf3 -u -l 16 -b 100m -t 120 -c 192.168.0.1 -i 1 -p 16004 #Fourth ECS
iperf3 -u -l 16 -b 100m -t 120 -c 192.168.0.1 -i 1 -p 16005 #Fifth ECS
iperf3 -u -l 16 -b 100m -t 120 -c 192.168.0.1 -i 1 -p 16006 #Sixth ECS
```

2.  Test the bandwidth of the connection with the on-premises network access device as a client.

    a.  Run the **iperf3 -s -i 1 -p 16001** command on each ECS to start the iPerf3 process in server mode and specify the port.

    b.  Run the following commands on the on-premises network access device to start six iPerf3 processes in client mode:
    ```
    iperf3 -u -l 16 -b 100m -t 120 -c 172.16.0.2 -i 1 -p 16001
    iperf3 -u -l 16 -b 100m -t 120 -c 172.16.0.3 -i 1 -p 16001
    iperf3 -u -l 16 -b 100m -t 120 -c 172.16.0.4 -i 1 -p 16001
    iperf3 -u -l 16 -b 100m -t 120 -c 172.16.0.5 -i 1 -p 16001
    iperf3 -u -l 16 -b 100m -t 120 -c 172.16.0.6 -i 1 -p 16001
    iperf3 -u -l 16 -b 100m -t 120 -c 172.16.0.7 -i 1 -p 16001
    ```

3.  Analyze the test result.

    After the iPerf3 process on the client is executed, the following information is displayed. The packets per second (PPS) of the tested link can be calculated using the formula: PPS = Number of packets received by the peer end/Time.

    ```
    [ ID] Interval        Transfer    Bandwidth      Jitter    Lost/Total Datagrams
    [  4]  0.00-10.00 sec  237 MBytes  199 Mbits/sec  0.027 ms  500/30352 (1.6%)
    [  4]  Sent 30352  datagrams
    ```

    The following table describes the fields in the command output.

    | Field | Description |
    |---|---|
    | Transfer | Transmitted data volume |
    | Bandwidth | Bandwidth of the connection |
    | Jitter | Jitter |
    | Lost/Total Datagrams | Number of lost packets/Total number of packets (packet loss rate) |

    **----End**

# 13 Change History

| Release On | Description |
|---|---|
| 2024-04-30 | This issue is the twenty-sixth official release, which incorporates the following changes:<br>● Added **Global DC Gateways**.<br>● Changed operation screenshots based on the latest console style. |
| 2023-10-30 | This issue is the twenty-fifth official release, which incorporates the following changes:<br>Added **bgp_receive_route_num_v4** and **bgp_receive_route_num_v6** in **Table 8-1**. |
| 2023-06-15 | This issue is the twenty-fourth official release, which incorporates the following changes:<br>● Added the **Virtual Interface Priority** parameter to the parameter table for **creating a virtual interface**.<br>● Added the **Virtual Interface Priority** parameter to the parameter table for creating a virtual interface in **Accessing a VPC over a Single Connection Through Static Routes**, **Accessing a VPC over a Single Connection Through BGP Routes**, **Accessing a VPC over Two Connections Through BGP Routes**, and **Connecting to Multiple VPCs that Do Not Need to Communicate with Each Other**. |
| 2023-05-05 | This issue is the twenty-third official release, which incorporates the following changes:<br>● Added **Dual-Connection Switchover Test**.<br>● Added **Connection Bandwidth Testing Methods**. |
| 2022-11-30 | This issue is the twenty-second official release, which incorporates the following changes:<br>Getting Started: Updated the connection configuration process in "Overview", "Preparations", and "Creating a Connection." |

| Release On | Description |
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| 2022-08-30 | This issue is the twenty-first official release, which incorporates the following changes:<br><br>Added **Network Topology**. |
| 2022-06-30 | This issue is the twentieth official release, which incorporates the following changes:<br><br>Tags can be used to identify connections. |
| 2021-05-30 | This issue is the nineteenth official release, which incorporates the following changes:<br><br>Optimized the entire document. |
| 2021-01-30 | This issue is the eighteenth official release, which incorporates the following changes:<br><br>● Added parameter configuration descriptions in section "Creating a Virtual Port" in chapter "Getting Started".<br>● Added FAQ "What Are 1GE and 10GE?"<br>● Optimized the entire document. |
| 2020-06-30 | This issue is the seventeenth official release, which incorporates the following changes:<br><br>● Updated **Step 1: Create a Connection** in chapter "Getting Started".<br>● Updated chapter "Best Practices".<br>● Modified some FAQ. |
| 2020-05-30 | This issue is the sixteenth official release, which incorporates the following changes:<br><br>● Updated section "Direct Connect Locations" in chapter "Service Overview".<br>● Modified sections "Process Description" and "Preparations" in chapter "Getting Started".<br>● Modified section "Monitoring" in chapter "User Guide".<br>● Classified FAQ. |
| 2020-04-30 | This issue is the fifteenth official release, which incorporates the following changes:<br><br>● Added sections "Network Planning" and "Billing" in chapter "Service Overview".<br>● Added new FAQ. |
| 2020-03-30 | This issue is the fourteenth official release, which incorporates the following changes:<br><br>● Updated chapter "Service Overview", section "Network Planning", and chapter "Monitoring".<br>● Added sections "Billing" and "Preparations".<br>● Optimized the entire document. |

| Release On | Description |
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| 2020-02-29 | This issue is the thirteenth official release, which incorporates the following changes:<br>● Optimized the entire document.<br>● Updated some FAQ. |
| 2019-12-30 | This issue is the twelfth official release, which incorporates the following changes:<br>Optimized the entire document. |
| 2019-11-30 | This issue is the eleventh official release, which incorporates the following changes:<br>Updated chapters "Getting Started" and "User Guide". |
| 2019-10-30 | This issue is the tenth official release, which incorporates the following changes:<br>● Updated the process for creating the connection.<br>● Optimized best practices. |
| 2019-09-30 | This issue is the ninth official release, which incorporates the following changes:<br>● Optimized the entire document.<br>● Updated some FAQ. |
| 2019-07-30 | This issue is the eighth official release, which incorporates the following changes:<br>Updated the operation process. |
| 2019-05-07 | This issue is the seventh official release, which incorporates the following changes:<br>Optimized the entire document. |
| 2018-08-30 | This issue is the sixth official release, which incorporates the following changes:<br>Added content about automatic connection creation. |
| 2018-05-30 | This issue is the fifth official release, which incorporates the following changes:<br>Added chapter "Interconnecting with CTS." |
| 2017-10-30 | This issue is the fourth official release, which incorporates the following changes:<br>Updated the steps for viewing details about and modifying a connection based on the latest management console. |
| 2017-07-30 | This issue is the third official release, which incorporates the following changes:<br>Added parameter **Project Name** for enabling Direct Connect. |

| Release On | Description |
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| 2017-04-28 | This issue is the second official issue, which incorporates the following changes:<br>Added the following FAQs:<br>● Can I Renew My Connections? How Can I Renew My Subscriptions?<br>● How Can I Unsubscribe from Direct Connect?<br>● Is a Connection Still Available After Being Frozen? |
| 2016-10-19 | This issue is the first official release. |