

**Direct Connect**

# **User Guide**

**Issue**            01  
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# 1 Service Overview

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## 1.1 Overview

### What Is Direct Connect?

Direct Connect establishes a dedicated connection between your data center and the cloud. You can use one connection to access cloud computing resources in different regions, helping build a secure and reliable hybrid environment.

### Application Scenarios

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

### Components

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

- **Connection**

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

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

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

- **Virtual gateway**

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

- **Virtual interface**

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

## 1.2 Product Advantages

Direct Connect has the following advantages:

- **High security**

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

- **Low latency**

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

- **High bandwidth**

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

- **Great scalability**

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

## 1.3 Network Requirements

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

## 1.4 Constraints and Limitations

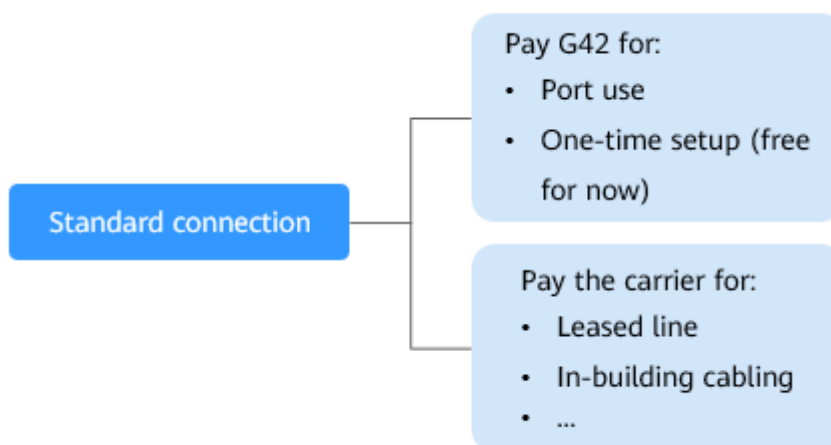
| Resource   | Quota |
|--|-------|
| Number of connections that can be created for an account in each region        | 10    |
| Number of virtual interfaces that can be created for an account in each region | 50    |
| Number of routes for BGP sessions on a virtual interface                       |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

## 1.5 Pricing

Direct Connect helps establish private connectivity between your on-premises data center and the cloud. If you want to have a dedicated port for exclusive use, you need to request a standard connection.

### Billing Items

The following figure shows the fees that you need to pay for a standard connection.



**Table 1-1** Standard connection pricing

| Payee   | Billing Items       | Description   |
|---------|---------------------|---|
| G42     | Port                | The port is billed based on its specifications.   |
|         | One-time setup      | Currently, you will not be billed for the one-time setup.   |
| Non-G42 | Leased line         | To connect your on-premises data center to the cloud, you need to lease a line from the carrier.              |
|         | In-building cabling | If you lease a line from a carrier, you also need to pay for the cabling inside the carrier's equipment room. |

## Billing Mode

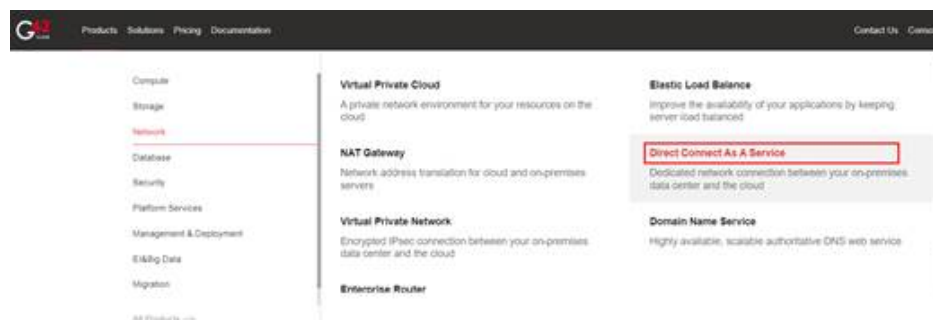
Direct Connect provides two billing options: pay-per-use or reserved instance (RI).

## What Is an RI?

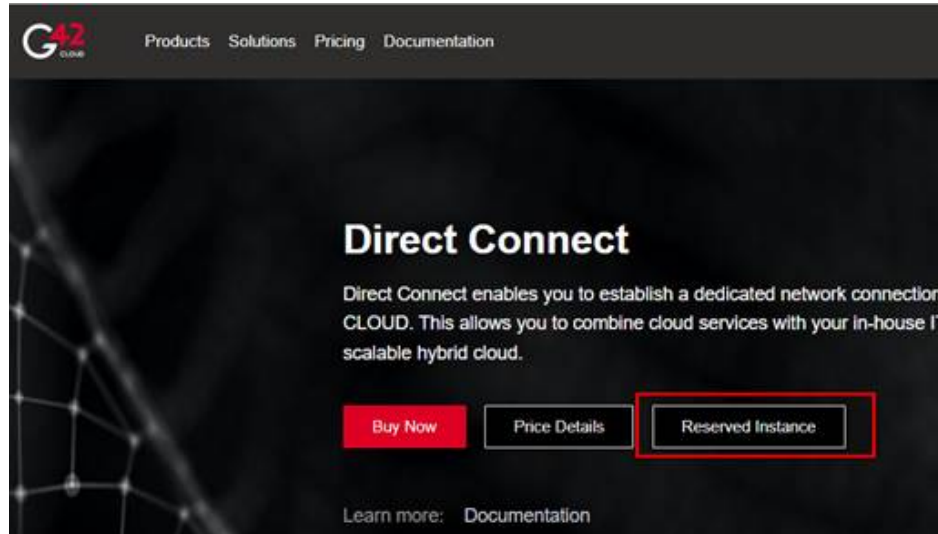
Reserved instances (RIs) help you save money by committing to one-year or three-year plans for resources. RIs provide you with a significant discount but do not affect the runtime state of your resources. After you purchase an RI, the discount automatically applies to matched resources. You can pay for the entire reserved instance term with full upfront or on a monthly basis, and you will get more discounts if you choose full upfront payment.

## Purchasing an RI

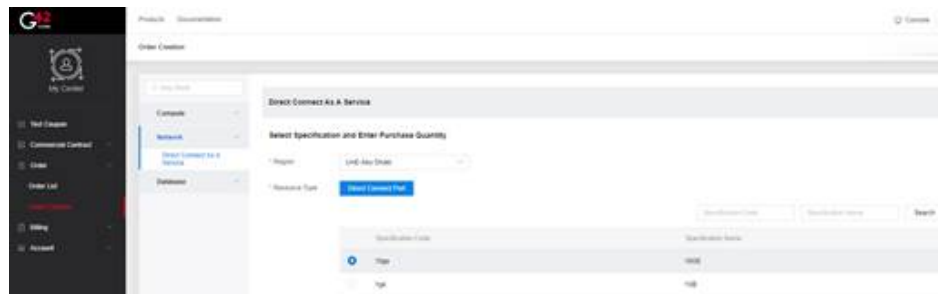
**Step 1** Go to the cloud service portal and click **Reserved Instance**.







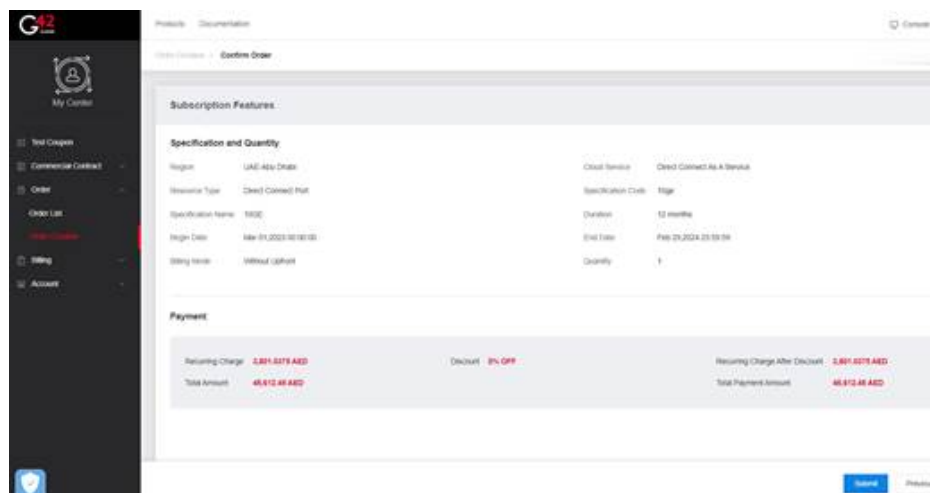
**Step 2** Select the specifications that match the desired pay-per-use instance specifications.



**Step 3** Select the validity period and payment method.



**Step 4** Confirm and submit the purchase information.



----End

## RI Billing Description

Before ordering RIs, you can first understand the matching rules and billing rules of RIs.

- **Matching dimensions**

The matching dimensions of RI orders and pay-per-use instance consumption bills include region, account name, cloud service, resource type, and specifications.

- **Matching rules**

After ordering RIs, the system will automatically match the pay-per-use instance at 04:00 am on the 1st of each month starting from the next month of the RI subscription month to match the highest resource utilization rate of the previous month's pay-per-use instance, that is, the most costly pay-per-use instance for the same specifications. If the number of RIs within the validity period is no less than the number of pay-per-use instances that have the same specifications as the RIs, all instances of this specification will be matched with RIs. Otherwise, the bill consumption amount of each instance is sorted from largest to smallest, and the largest amount is matched first, and the remaining unmatched instances are billed on a pay-per-use basis.

After the RIs are successfully matched, associate pay-per-use instances with RIs and update the usage of the RIs in the order. When the number of unused RIs is 0, the match will stop.

- **Billing rules**

At the beginning of each month, you can view the consumption records of the last month from the user center. After an RI is purchased successfully, regardless of whether it can be matched to a pay-per-use instance, you need to pay for the RI according to the payment type within the validity period.

If the RI is successfully matched with a pay-per-use instance, the pay-per-use instance fee is zero. If the RI does not match any pay-per-use instances, the instances are still billed on a pay-per-use basis.

## Unsubscribing from an RI

In principle, RIs cannot be unsubscribed from and will automatically expire after the validity period expires.

## 1.6 Permissions Management

If you need to assign different permissions to employees in your enterprise to access your Direct Connect resources, Identity and Access Management (IAM) is a good choice for fine-grained permissions management. IAM provides identity authentication, permissions management, and access control, helping you secure access to your resources.

With IAM, you can use your account to create IAM users, and assign permissions to the users to control their access to specific resources. For example, some software developers in your enterprise need to use Direct Connect but should not be allowed to delete other Direct Connect resources or perform any other high-risk operations. In this scenario, you can create IAM users for the software developers and grant them only the required permissions.

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

IAM is free. You pay only for the resources in your account.

For more information, see [IAM Service Overview](#).

### Direct Connect Permissions

By default, new IAM users do not have any permissions assigned. To assign permissions to these new users, add them to one or more groups, and attach permissions policies or roles to these groups.

Direct Connect is a project-level service deployed and accessed in specific physical regions. To assign permissions to a user group, specify the scope as region-specific projects and select projects for the permissions to take effect. If **All projects** is selected, the permissions will take effect for the user group in all region-specific projects. When accessing Direct Connect, the users need to switch to a region where they have been authorized to use this service.

[Table 1-2](#) lists all system-defined roles supported by Direct Connect.

**Table 1-2** Direct Connect roles

| Role Name                    | Description   | Type                | Dependency   |
|------------------------------|---|---------------------|--|
| Direct Connect Administrator | Has all permissions for Direct Connect resources.<br><br>For permissions of this role to take effect, users must also have the <b>Tenant Guest and VPC Administrator</b> permissions. | System-defined role | <b>Tenant Guest and VPC Administrator</b> <ul style="list-style-type: none"> <li>• <b>VPC Administrator:</b> project-level policy, which must be assigned in the same project as the <b>Direct Connect Administrator</b> policy</li> <li>• <b>Tenant Guest:</b> project-level policy, which must be assigned in the same project as the <b>Direct Connect Administrator</b></li> </ul> |

**Table 1-3** lists common operations supported by each system-defined role or policy of Direct Connect.

**Table 1-3** Common operations and required system-defined permissions

| Operation                         | Direct Connect Administrator |
|-----------------------------------|------------------------------|
| Creating a connection             | √                            |
| Viewing a connection              | √                            |
| Modifying a connection            | √                            |
| Deleting a connection             | √                            |
| Creating a virtual gateway        | √                            |
| Viewing a virtual gateway         | √                            |
| Modifying a virtual gateway       | √                            |
| Deleting a virtual gateway        | √                            |
| Creating a virtual interface      | √                            |
| Viewing a virtual interface       | √                            |
| Modifying a virtual interface     | √                            |
| Deleting a virtual interface      | √                            |
| Creating an operations connection | √                            |
| Viewing an operations connection  | √                            |

| Operation                          | Direct Connect Administrator |
|------------------------------------|------------------------------|
| Modifying an operations connection | √                            |
| Deleting an operations connection  | √                            |
| Creating a hosted connection       | √                            |
| Viewing a hosted connection        | √                            |
| Modifying a hosted connection      | √                            |
| Deleting a hosted connection       | √                            |

## Helpful Links

- [IAM Service Overview](#)
- [Creating a User and Granting Permissions](#)

## 1.7 Direct Connect and Other Services

[Table 1-4](#) shows the interaction between Direct Connect and other cloud services.

**Table 1-4** Interaction with other cloud services

| Cloud Service               | Interaction   |
|-----------------------------|---|
| Virtual Private Cloud (VPC) | You can use Direct Connect to connect your on-premises data center to VPCs.   |
| Enterprise Router           | You can connect your on-premises data center to an enterprise router, so that your data center can access the VPCs attached to the enterprise router. |
| NAT Gateway                 | On-premises servers can share a NAT gateway to access the Internet or provide services that are accessible from the Internet.                         |
| VPC Endpoint (VPCEP)        | A VPC endpoint can connect your on-premises data center to a cloud service through a VPN or Direct Connect connection over a private network.         |

## 1.8 Basic Concepts

### 1.8.1 Connection

A connection is a dedicated network connection between your on-premises data center and a Direct Connect location over a leased line provided by a carrier. You

can request standard connections or hosted connections. If you are a partner, you can also request operations connections.

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

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

## 1.8.2 Virtual Gateway

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

## 1.8.3 Virtual Interface

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

## 1.8.4 Region and AZ

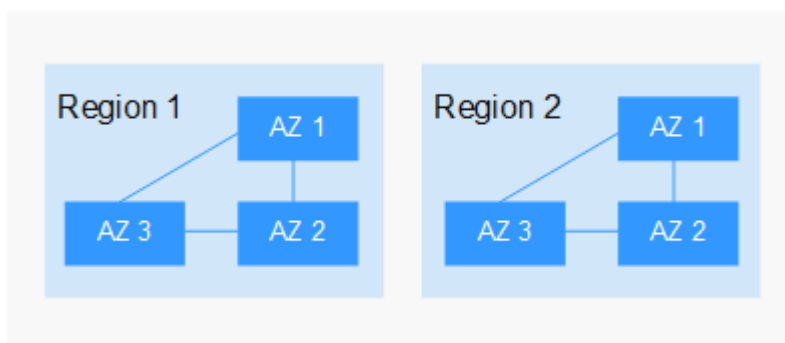
### Concept

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

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

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

**Figure 1-1** Regions and AZs



## Selecting a Region

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

## Selecting an AZ

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

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

## Regions and Endpoints

Before you use an API to call resources, specify its region and endpoint. For more details, see [Regions and Endpoints](#).

# 2 Getting Started

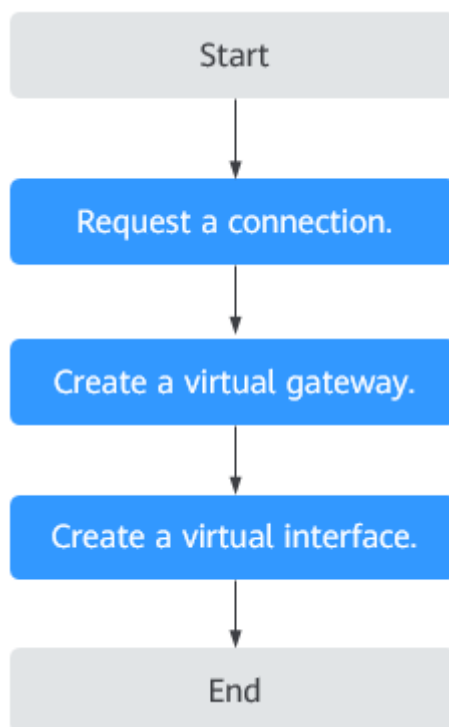
## 2.1 Process Description

Establish network connectivity to enable ECSs in your VPC to communicate with your data center or private network.

To do so, you first need to apply for a connection to reserve the port used to connect your on-premises data center to the Direct Connect location you select. After that, create a virtual gateway and associate it with a VPC, and finally create a virtual interface to connect to the VPC.

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

**Figure 2-1** Enabling Direct Connect





## 2.2 Establishing Network Connectivity

### Scenarios

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

### Procedure

1. Apply for a connection from your account manager. If you do not have an account manager, contact customer service.
2. Log in to the management console.
3. In the service list, choose **Network > Direct Connect**.
4. In the navigation pane on the left, choose **Direct Connect > Virtual Gateways**.
5. Click **Create Virtual Gateway**.
6. Configure the parameters.

**Table 2-1** Parameter description

| Parameter         | Description  |
|-------------------|--|
| Name              | Specifies the virtual gateway name.<br>The name can contain 1 to 64 characters, including letters, digits, underscores (_), hyphens (-), and periods (.).            |
| Attachment        | Specifies whether the virtual gateway is associated with a VPC or attached to an enterprise router.  |
| VPC               | Specifies the VPC to be associated with the virtual gateway.<br>This parameter is mandatory when you set <b>Attachment</b> to <b>VPC</b> .                           |
| Enterprise Router | Specifies the enterprise router that the virtual gateway is attached to.<br>This parameter is mandatory when you set <b>Attachment</b> to <b>Enterprise Router</b> . |
| Subnet CIDR Block | Specifies the CIDR blocks of subnets in the VPC to connect to the on-premises network.<br>This parameter is mandatory when you set <b>Attachment</b> to <b>VPC</b> . |
| Description       | Provides supplementary information about the virtual gateway.<br>You can enter 0 to 128 characters.  |

| Parameter         | Description   |
|-------------------|---|
| Configuration Fee | Shows the prices of the enterprise router attachment and of the traffic used by the enterprise router.<br>This parameter is displayed when you set <b>Attachment to Enterprise Router</b> . |

7. Click **OK**.
8. In the navigation pane on the left, choose **Direct Connect > Virtual Interfaces**.
9. Click **Create Virtual Interface**.
10. Set the parameters as prompted and then click **Create Now**.

**Table 2-2** Parameter description

| Parameter       | Description   |
|-----------------|---|
| Region          | Select the region of the VPC that needs to communicate with the on-premises data center.  |
| Name            | Specifies the virtual interface name.<br>The name can contain 1 to 64 characters, including letters, digits, underscores (_), hyphens (-), and periods (.).   |
| Connection      | Specifies the connection with which the virtual interface is to be associated.<br>A virtual interface can be associated with only one connection.   |
| Virtual Gateway | Select the virtual gateway with which the virtual interface is to be associated.<br>A virtual interface can be associated with only one virtual gateway.  |
| VLAN            | Specifies the virtual interface VLAN ID.<br>You need to configure the VLAN if you create a standard connection.<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 virtual interface bandwidth in the unit of Mbit/s.<br>If the selected connection is a hosted connection, the virtual interface exclusively uses the connection bandwidth.   |

| Parameter                  | Description  |
|----------------------------|--|
| IP Address Family          | <p>The value can be <b>IPv4</b> or <b>IPv6</b>.</p> <p>If the address type of the selected virtual gateway does not match the address type of the virtual interface peer, the virtual interfaces cannot communicate with each other after being created.</p> <p><b>NOTE</b><br/>Direct Connect allows you to create virtual interface peers to support IPv4/IPv6 dual stack. The IP address type of a virtual interface peer is determined by the associated connection.</p> |
| Local Gateway              | Specifies the IP address for connecting to the cloud network.  |
| Remote Gateway             | Specifies the IP address for connecting to your on-premises network.   |
| Remote Subnet              | <p>Specifies the subnets used by the on-premises network.</p> <p>Specifies the remote subnet using CIDR notation. You can enter a maximum of 50 subnets. Ensure that each subnet is unique and separate every two subnets with commas (,).</p>   |
| Routing Mode               | <p>Specifies the routing mode. Two options are available, <b>Static</b> and <b>BGP</b>.</p> <p>If there are two or more connections, select BGP routing.</p>   |
| BGP ASN                    | Specifies the autonomous system number (ASN) of the BGP peer.  |
| BGP MD5 Authentication Key | Specifies the MD5 password of the BGP peer.  |
| Description                | <p>Provides supplementary information about the virtual interface.</p> <p>You can enter 0 to 128 characters.</p>   |

# 3 Management

---


## 3.1 Managing Connections

### 3.1.1 Viewing a Connection

#### Scenarios

View details of a connection.

#### Procedure

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

### 3.1.2 Modifying a Connection

#### Scenarios

Modify the name and description of a connection.

#### Procedure

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


## 3.2 Managing Virtual Gateways

### 3.2.1 Viewing a Virtual Gateway

#### Scenarios

View details of a virtual gateway.

#### Procedure

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

### 3.2.2 Modifying a Virtual Gateway

#### Scenarios

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

#### Procedure

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

### 3.2.3 Deleting a Virtual Gateway

#### Scenarios

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

#### Procedure

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

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


## 3.3 Managing Virtual Interfaces

### 3.3.1 Viewing a Virtual Interface

#### Scenarios

View details of a virtual interface.

#### Procedure

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

### 3.3.2 Modifying a Virtual Interface

#### Scenarios

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

#### Procedure

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

### 3.3.3 Deleting a Virtual Interface

#### Scenarios

Delete a virtual interface if you no longer need it.

#### Procedure

1. Log in to the management console.

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


## 3.4 Managing Historical Connections

### 3.4.1 Viewing a Historical Connection

#### Scenarios

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

#### Procedure

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

### 3.4.2 Modifying a Historical Connection

#### Scenarios

Modify the name and remote subnets of a historical connection.

#### Procedure

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

## 3.5 Managing Operations or Hosted Connections

## 3.5.1 Operations Connection

### Viewing an Operations Connection

#### Scenarios

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

#### Procedure

1. Log in to the management console.
2. In the service list, choose **Network > Direct Connect**.
3. In the navigation pane on the left, choose **Direct Connect > Connections**.
4. Locate the operations connection you want to view and click its name.
5. View detailed information about the operations connection.

### Modifying an Operations Connection

#### Scenarios

Modify an operations connection you created as a partner.

#### Procedure

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


## 3.5.2 Hosted Connection

### Viewing a Hosted Connection

#### Scenarios

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

#### Procedure

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

### Modifying a Hosted Connection

#### Scenarios



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

#### Procedure

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

## 3.6 Monitoring

### 3.6.1 Installing the Direct Connect Metric Collection Plug-ins

Direct Connect plug-ins monitor the end-to-end network quality of connections along with two key metrics of remote subnets: network latency and packet loss rate.

There are two plug-ins:

- `dc-nqa-collector`: monitors the connections created on the Direct Connect console.
- `history-dc-nqa-collector`: monitors historical connections.

#### 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.

Historical connections are requested by email or phone. They do not have virtual gateways and virtual interfaces, and their routes must be configured manually. Historical connections exist only in some regions.

### Constraints

The plug-ins support only Linux. ECSs where the plug-ins are to be installed must be in the same VPC as the connection.

### Prerequisites

- Cloud Eye is available in the current region.
- You have obtained the monitoring plug-ins and one-click installation script from the Direct Connect manager.

### Procedure

**Step 1 Install the Agent provided by Cloud Eye for server monitoring.**

1. Log in to the management console.
2. Under **Management & Deployment**, select **Cloud Eye**.
3. In the navigation pane on the left, choose **Server Monitoring > Elastic Cloud Server**.
4. Click **Install and configure the Agent**.
5. Select the Agent based on the server type.  
x86 servers are recommended, and the image version must be 7.0 or later.
6. Copy the installation command and run it on the server.

```
[root@ecs-dces-ces ~]#  
[root@ecs-dces-ces ~]# cd /usr/local && wget --no-check-certificate https://telescope-cn-south-235.obs.gueta.edu.cn/scripts/agentInstall.sh && chmod 755 agentInstall.sh && ./agentInstall.sh
```

If **Telescope process starts successfully** is displayed, the Agent has been installed.

```
Connecting to telescope-cn-south-235.obs.gueta.edu.cn (telescope-cn-south-235.obs.gueta.edu.cn|193.50.135.143):  
WARNING: cannot verify telescope-cn-south-235.obs.gueta.edu.cn's certificate, issued by 'CN=ST=sc.O=huawei.com'  
Unable to locally verify the issuer's authority.  
WARNING: certificate common name 'obs.huawei.com' doesn't match requested host name 'telescope-cn-south-235.ob  
HTTP request sent, awaiting response... 200 OK  
Length: 221 (application/gzip)  
Saving to: 'agentInstall.sh'  
100%[=====>] 221 --.-K/s  
2021-01-14 19:26:04 (10.1 MB/s) - 'agentInstall.sh' saved [221/221]  
--2021-01-14 19:26:04-- http://telescope-cn-south-235.obs.gueta.edu.cn/agent/telescope_linux_amd64.tar.gz  
Resolving telescope-cn-south-235.obs.gueta.edu.cn (telescope-cn-south-235.obs.gueta.edu.cn):  
2.61  
Connecting to telescope-cn-south-235.obs.gueta.edu.cn (telescope-cn-south-235.obs.gueta.edu.cn):  
32.61:80... connected.  
HTTP request sent, awaiting response... 200 OK  
Length: 7838529 (7.5M) (application/gzip)  
Saving to: 'telescope_linux_amd64.tar.gz'  
100%[=====>] 7,838,529 --.-K/s  
2021-01-14 19:26:05 (203 MB/s) - 'telescope_linux_amd64.tar.gz' saved [7838529/7838529]  
telescope_linux_amd64/  
telescope_linux_amd64/bin/  
telescope_linux_amd64/bin/conf_ces.json  
telescope_linux_amd64/bin/logs_config.xml  
telescope_linux_amd64/bin/telescope  
telescope_linux_amd64/bin/agent  
telescope_linux_amd64/bin/conf.json  
telescope_linux_amd64/install.sh  
telescope_linux_amd64/telescope-1.2.2-release.json  
telescope_linux_amd64/telescope  
telescope_linux_amd64/uninstall.sh  
/bin/zsh  
ces flag NOT FOUND in __support_agent_list  
Current user is root.  
Current linux release version : CentOS  
Start to install telescope...  
In chkconfig  
Success to install telescope to dir: /usr/local/telescope.  
Starting telescope...  
Telescope process starts successfully.  
[root@ecs-dces-ces local]#
```

## Step 2 Upload the plug-ins to an OBS bucket.

1. Log in to the management console.
2. Choose **Service List > Storage > Object Storage Service**.
3. Click **Create Bucket**.
4. Configure the parameters.

Enter a bucket name and set **Bucket Policy to Public Read**.

### CAUTION

The public read permission allows any user to read objects in the bucket without identity authentication. To ensure data security, change the bucket policy to **Private** after configuring the plug-ins. You can modify the bucket policy as required.

5. Click **Create Now**.
6. Click the name of the created bucket on the bucket list page.
7. On the **Overview** page of the bucket, copy the access domain name.

8. In the navigation tree on the left, click **Objects**.
9. On the **Objects** page, click **Upload Object**.
10. Decompress the **dc\_plugins\_x86.rar** and upload the decompressed file to the OBS bucket.

### Step 3 Use the one-click installation script **dc-installer.sh** to configure the plug-ins.

1. Log in to an ECS as user **root**.
2. Create the **user.txt** file in the **usr/local/** directory and add user information, including the plug-ins download path, monitored resource ID, and remote IP address:

```
cd /usr/local/  
vi user.txt
```

The **user.txt** file contains the path of the plug-ins in the OBS bucket, virtual interface ID, and IP address of the remote gateway.

- Path of the plug-ins in the OBS bucket: Select **dc-nqa-collector** for automated connections. Select **history-dc-nqa-collector** for historical connections, as shown below:  
  
`https://cesplugin.obs.xxx.edu.cn/dc-nqa-collector`
- Information about monitored resources: Each resource occupies a line, and consists of a resource ID and a remote IP address separated from the resource ID by a comma (,). To add multiple resources, add lines in the same format, as shown below:

```
75e09ecf-xxxx-xxxx-xxx-e1295e03e5dc,x.x.x.x
```

- Resource ID: If **dc-nqa-collector** is used, resource ID is the virtual interface ID, which can be queried on the **Virtual Interfaces** page of the Direct Connect console. If **history-dc-nqa-collector** is used, resource ID is the historical connection ID, which can be queried on the **Historical Connections** page of the Direct Connect console.
- Remote IP address: the IP address of the remote gateway or an IP address in the remote subnet, which will be used to ping an IP address in the VPC. If **dc-nqa-collector** is used, you can query the IP address of the remote gateway on the **Virtual Interfaces** page. If **history-dc-nqa-collector** is used, you can query the IP address in the remote subnet on the **Historical Connections** page.

#### NOTE

Ensure that each resource ID matches one remote IP address. You cannot enter multiple IP addresses or CIDR blocks.

After the Agent is installed, if you want to add more resources to be monitored, edit the **user.txt** file by adding new IDs and IP addresses in sequence, and then perform **3**.

3. Run the one-click installation script.

Copy the storage path of the script in the OBS bucket.

Example command:

```
cd /usr/local && wget --no-check-certificate https://xxx.cn/dc-installer.sh && chmod 755 dc-installer.sh && ./dc-installer.sh
```

```
[root@ecs-dces-ces local]# cd /usr/local && wget --no-check-certificate https://cesplugin.obs.cn-south-235.guet.edu.cn/dc-installer.sh && chmod 755 dc-installer.sh && ./dc-installer.sh
```

```
64 bytes from 1.1.1.1: icmp_seq=4 ttl=254 time=6.91 ms
64 bytes from 1.1.1.1: icmp_seq=5 ttl=254 time=9.76 ms

--- 1.1.1.1 ping statistics ---
5 packets transmitted, 5 received, 0% packet loss, time 4886ms
rtt min/avg/max/mdev = 3.863/39.849/176.375/68.389 ms
Ping success. Continue to install dc-nqa-collector
--2021-01-14 19:30:11-- https://cesplugin.obs.cn-south-235.guet.edu.cn/dc-nqa-collector
Resolving cesplugin.obs.cn-south-235.guet.edu.cn (cesplugin.obs.cn-south-235.guet.edu.cn)... 188.125.32.61
Connecting to cesplugin.obs.cn-south-235.guet.edu.cn (cesplugin.obs.cn-south-235.guet.edu.cn)|188.125.32.61|:443...
WARNING: cannot verify cesplugin.obs.cn-south-235.guet.edu.cn's certificate, issued by '/C=cn/ST=sc/O=hw/OU=hw/CN=
Unable to locally verify the issuer's authority.
WARNING: certificate common name 'obs.huawei.com' doesn't match requested host name 'cesplugin.obs.cn-south-235.guet.edu.cn'
HTTP request sent, awaiting response... 200 OK
Length: 8866624 (7.7M) [application/octet-stream]
Saving to: 'dc-nqa-collector'

100%[=====] 8,866,624  --.-K/s

2021-01-14 19:30:11 (237 MB/s) - 'dc-nqa-collector' saved [8866624/8866624]

--2021-01-14 19:30:11-- https://cesplugin.obs.cn-south-235.guet.edu.cn/dc-nqa-conf.json
Resolving cesplugin.obs.cn-south-235.guet.edu.cn (cesplugin.obs.cn-south-235.guet.edu.cn)... 188.125.32.61
Connecting to cesplugin.obs.cn-south-235.guet.edu.cn (cesplugin.obs.cn-south-235.guet.edu.cn)|188.125.32.61|:443...
WARNING: cannot verify cesplugin.obs.cn-south-235.guet.edu.cn's certificate, issued by '/C=cn/ST=sc/O=hw/OU=hw/CN=LEVEL2-ROOT-C
Unable to locally verify the issuer's authority.
WARNING: certificate common name 'obs.huawei.com' doesn't match requested host name 'cesplugin.obs.cn-south-235.guet.edu.cn'
HTTP request sent, awaiting response... 200 OK
Length: 98 [application/json]
Saving to: 'dc-nqa-conf.json'

100%[=====] 98  --.-K/s in 8s

2021-01-14 19:30:11 (4.08 MB/s) - 'dc-nqa-conf.json' saved [98/98]

mv: 'dc-nqa-user-conf.json' and '/usr/local/telescope/plugins/dc/dc-nqa-user-conf.json' are the same file
cat: /usr/local/telescope/plugins/conf.json: No such file or directory
Restarting telescope...
Stopping telescope...
Stop telescope process successfully
Starting telescope...
Telescope process starts successfully.
ok, dc-nqa-collector install success!
root@ecs-deep-ecs-local:~#
```

#### Step 4 View monitoring information.

1. Log in to the management console.
2. Under **Management & Deployment**, select **Cloud Eye**.
3. In the navigation pane on the left, choose **Server Monitoring > Elastic Cloud Server**.  
Ensure that the Agent is in the **Running** state.
4. In the navigation pane on the left, choose **Cloud Service Monitoring > Direct Connect**.
5. Click the name of the monitored object to view the network delay and packet loss rate.

----End

## 3.7 Permissions

### 3.7.1 Creating a User and Granting Permissions

Use **IAM** to implement fine-grained permissions control over 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 specific task.
- Entrust another 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.

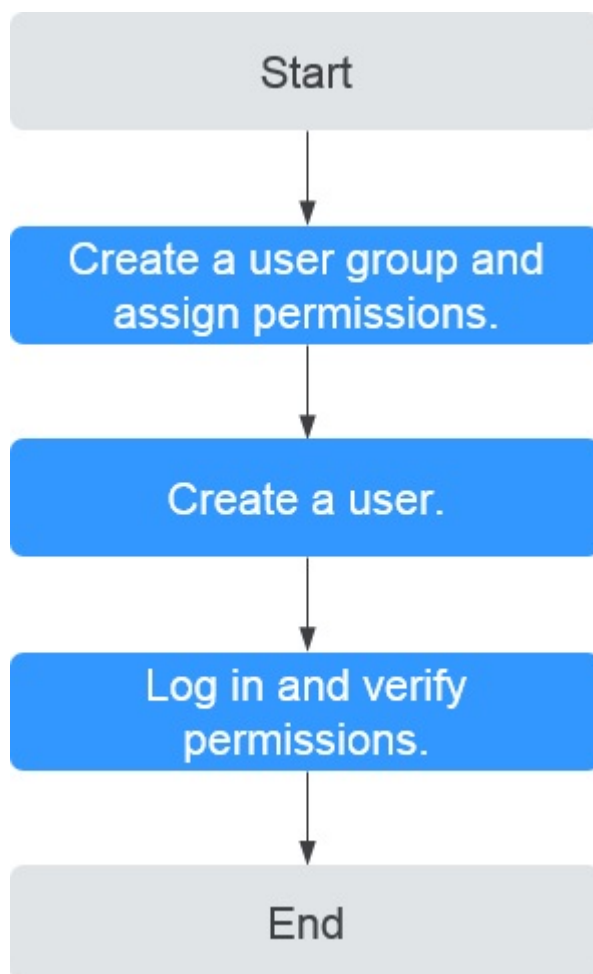
The following is the procedure for granting permissions.

## Prerequisites

Before assigning permissions to user groups, you should learn about Direct Connect system policies and select the policies based on service requirements. For details about system permissions of Direct Connect, see [Permissions Management](#). For system permissions of other cloud services, see [Permission Description](#).

## Process Flow

**Figure 3-1** Process for granting Direct Connect permissions



1. **Create a user group and assign permissions.**  
Create a user group on the IAM console and attach the **Direct Connect Administrator** policy to the group, which grants users read-only permissions to Direct Connect resources.
2. **Create a user and add the user to the user group** created in the preceding step.
3. **Log in to the management console as the created user**Log in to the management console as the created user.

Switch to the authorized region and verify the permissions.

- Choose **Service List > Network > Direct Connect**. On the displayed page, click **Create Connection**. If the connection fails to be created, the **Direct Connect Administrator** policy has taken effect.
- Choose any other service in **Service List**. If a message appears indicating that you have insufficient permissions to access the service, the **Direct Connect Administrator** policy has already taken effect.



## 3.8 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  in the upper left corner and select the desired region and project.
3. In the upper right corner of the page, click  .  
The **Service Quota** page is displayed.
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.
3. Click **Increase Quota** in the upper right corner of the page.
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**.

# 4 FAQs

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## 4.1 Is BGP Routing Supported in Direct Connect?

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

## 4.2 What Are the Network Requirements for Connections?

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

# 5 Change History

| Release On | Description   |
|------------|---|
| 2023-02-08 | This issue is the fourth official release, which incorporates the following changes:<br>Added the description of the RI billing mode in <a href="#">Pricing</a> .   |
| 2022-12-30 | This issue is the third official release, which incorporates the following changes: <ul style="list-style-type: none"><li>• Added <a href="#">Direct Connect and Other Services</a>.</li><li>• Added parameters related to enterprise routers in <a href="#">Table 2-1</a>.</li></ul> |
| 2022-08-30 | This issue is the second official release, which incorporates the following change:<br>Added <a href="#">Monitoring</a> .   |
| 2020-08-30 | This issue is the first official release.   |