Elastic Load Balance

Best Practices

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1 Viewing Traffic Usage

Scenarios

In live video broadcasting, traffic often increases suddenly, which make the service unstable. To respond to this, most live video platforms use ELB to distribute traffic. By working with Cloud Eye, ELB allows you to monitor the traffic usage in real time, especially for public network load balancers. You can view the traffic consumed by the EIPs bound to load balancers to better balance your application workloads.

Prerequisites

Load balancers are running properly.

The associated backend servers are running normally and are not deleted or in the stopped or faulty state.

Viewing Traffic Usage of the Bound EIP

1. Log in to the management console.
2. In the upper left corner of the page, click and select the desired region and project.
3. Click **Service List**. Under **Networking**, click **Virtual Private Cloud**.
4. In the navigation pane on the left, choose **Elastic IP and Bandwidth** > **EIPs**.
5. Locate the EIP bound to the load balancer and click its name. On the **Bandwidth** page, you can view the data for the last 1, 3, 12 hours, last day, or last 7 days.

Figure 1-1 EIP traffic usage

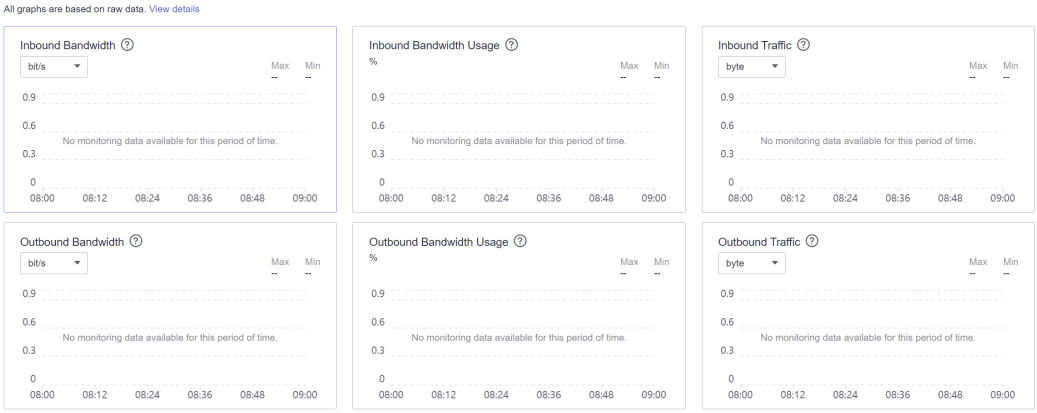


Table 1-1 EIP and bandwidth metrics

Metric	Meaning	Value Range	Monitored Object	Monitoring Period (Raw Data)
Outbound Bandwidth (originally named "Upstream Bandwidth")	Network rate of outbound traffic	≥ 0 bits/s	Bandwidth or EIP	1 minute
Inbound Bandwidth (originally named "Downstream Bandwidth")	Network rate of inbound traffic	≥ 0 bits/s	Bandwidth or EIP	1 minute
Outbound Bandwidth Usage	Usage of outbound bandwidth in percentage.	0–100%	Bandwidth or EIP	1 minute
Inbound Bandwidth Usage	Usage of inbound bandwidth in the unit of percent.	0-100%	Bandwidth or EIP	1 minute

Metric	Meaning	Value Range	Monitored Object	Monitoring Period (Raw Data)
Outbound Traffic (originally named "Upstream Traffic")	Network traffic going out of the cloud platform	≥ 0 bytes	Bandwidth or EIP	1 minute
Inbound Traffic (originally named "Downstream Traffic")	Network traffic going into the cloud platform	≥ 0 bytes	Bandwidth or EIP	1 minute

Viewing Load Balancer Traffic Metrics

1. Log in to the management console.
2. In the upper left corner of the page, click  and select the desired region and project.
3. Click **Service List**. Under **Networking**, click **Elastic Load Balance**.
4. Locate the load balancer and click its name.
5. Click the **Monitoring** tab, select load balancer for **Dimension**, and view the graphs of inbound and outbound rates.

   You can view data from the last 1, 3, 12 hours, last day, or the last 7 days. For details, see **ELB Metrics**.

2 Routing Traffic to Backend Servers in Different VPCs

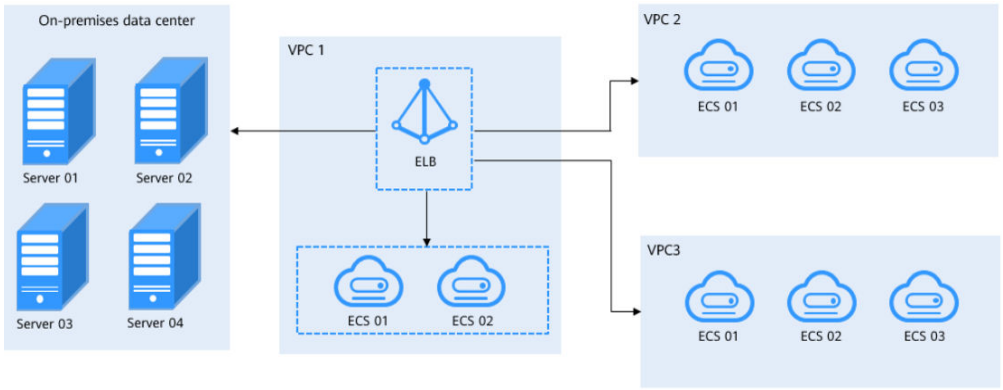
2.1 Overview

Scenarios

You have servers both in VPCs and your on-premises data center and want load balancers to distribute incoming traffic across these servers.

This section describes how to use a load balancer to route incoming traffic across cloud and on-premises servers.

Figure 2-1 Routing traffic across cloud and on-premises servers



Solution

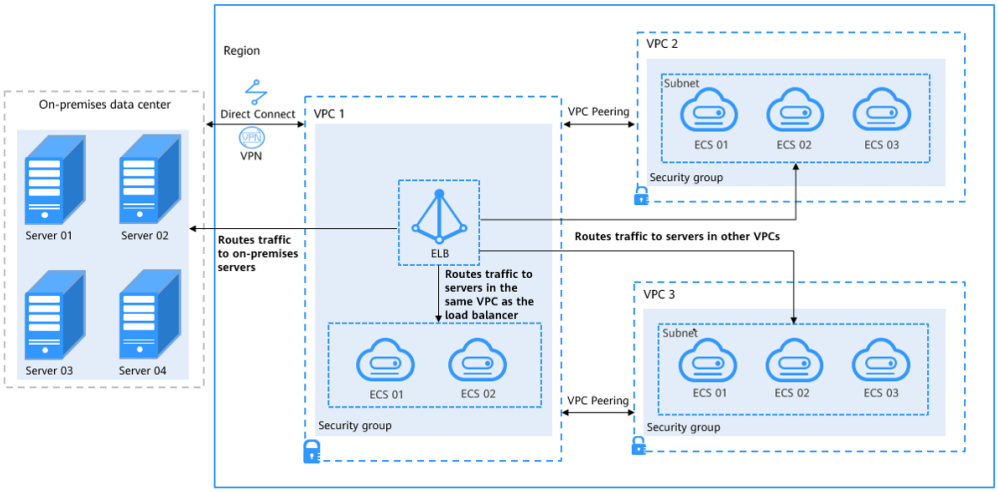
Dedicated load balancers can satisfy your needs. You can enable **IP as a Backend** when creating a dedicated load balancer and associate on-premises servers with this dedicated load balancer using their IP addresses.

As shown in **Figure 2-2**, ELB can realize hybrid load balancing.

- You can associate the servers in the same VPC as the load balancer no matter whether you enable **IP as a Backend**.

- If you enable **IP as a Backend**:
  - You can associate on-premises servers with the load balancer after the on-premises data center is connected to the cloud through Direct Connect or VPN.
  - You can also associate the servers in other VPCs different from the load balancer after the VPCs are connected to the VPC where the load balancer is running over VPC peering connections.
  - You can associate backend servers in the same VPC where the load balancer is running.

Figure 2-2 Associating servers with the load balancer



Advantages

You can add servers in the VPC where the load balancer is created, in a different VPC, or in an on-premises data center, by using private IP addresses of the servers to the backend server group of the load balancer. In this way, incoming traffic can be flexibly distributed to cloud and on-premises servers for hybrid load balancing.

- You can add backend servers in the same VPC as the load balancer.
- You can add backend servers in a VPC that is not the VPC where the load balancer is running by establishing a VPC peering connection between the two VPCs.
- You can add backend servers in your on-premises data center with the load balancer by connecting your on-premises data center to the cloud through Direct Connect or VPN.

Restrictions and Limitations

When you add IP as backend servers, note the following:

- If you do not enable the function when you create a load balancer, you can still enable it on the **Basic Information** page of the load balancer.
- IP as backend servers must use IPv4 addresses.
- IP as backend servers cannot use public IP addresses or IP addresses from the VPC where the load balancer works. Otherwise, requests cannot be routed to backend servers.

- If you enable **IP as a Backend** for a dedicated load balancer, you can add only TCP, HTTP, and HTTPS listeners to the load balancer.
- The subnet where the load balancer works must have at least 16 IP addresses. Otherwise, IP as backend servers cannot be added. You can add more subnets for more IP addresses on the **Basic Information** page of the load balancer.
- Security group rules of IP as backend servers must allow traffic from the subnet of the load balancer. Otherwise, health checks will fail.
- **IP as a Backend** cannot be disabled after it is enabled.
- Up to 492 backend servers (including common backend servers and IP as backend servers) can be associated with a listener.

2.2 Routing Traffic to Backend Servers in Different VPCs from the Load Balancer

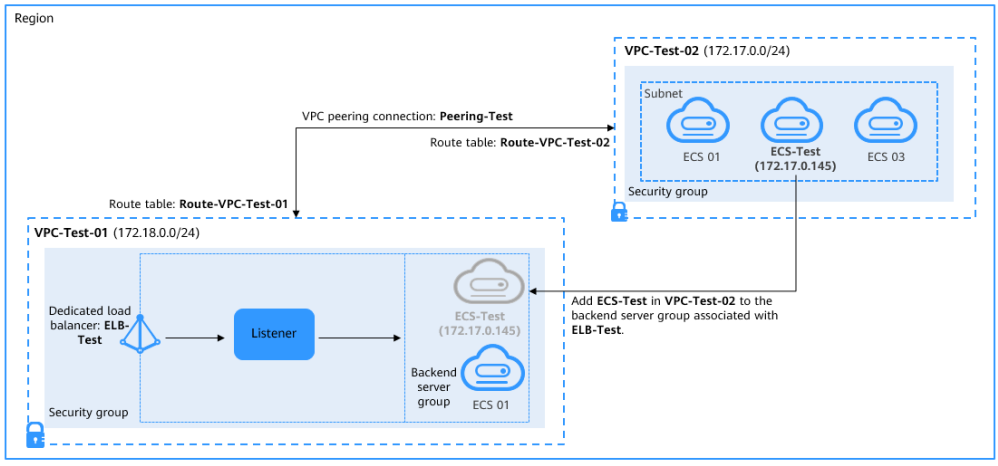
Scenarios

You can use ELB to route traffic to backend servers in two VPCs connected over a VPC peering connection.

Solution

- A dedicated load balancer named **ELB-Test** is running in **VPC-Test-01** (172.18.0.0/24).
- An ECS named **ECS-Test** is running in **VPC-Test-02** (172.17.0.0/24).
- **IP as a Backend** is enabled for the dedicated load balancer **ELB-Test**, and **ECS-Test** in **VPC-Test-02** (172.17.0.0/24) is added to the backend server group associated with **ELB-Test**.

Figure 2-3 Topology



Advantages

You can enable **IP as a Backend** for the dedicated load balancer to route incoming traffic to servers in different VPCs from the load balancer.

Resource and Cost Planning

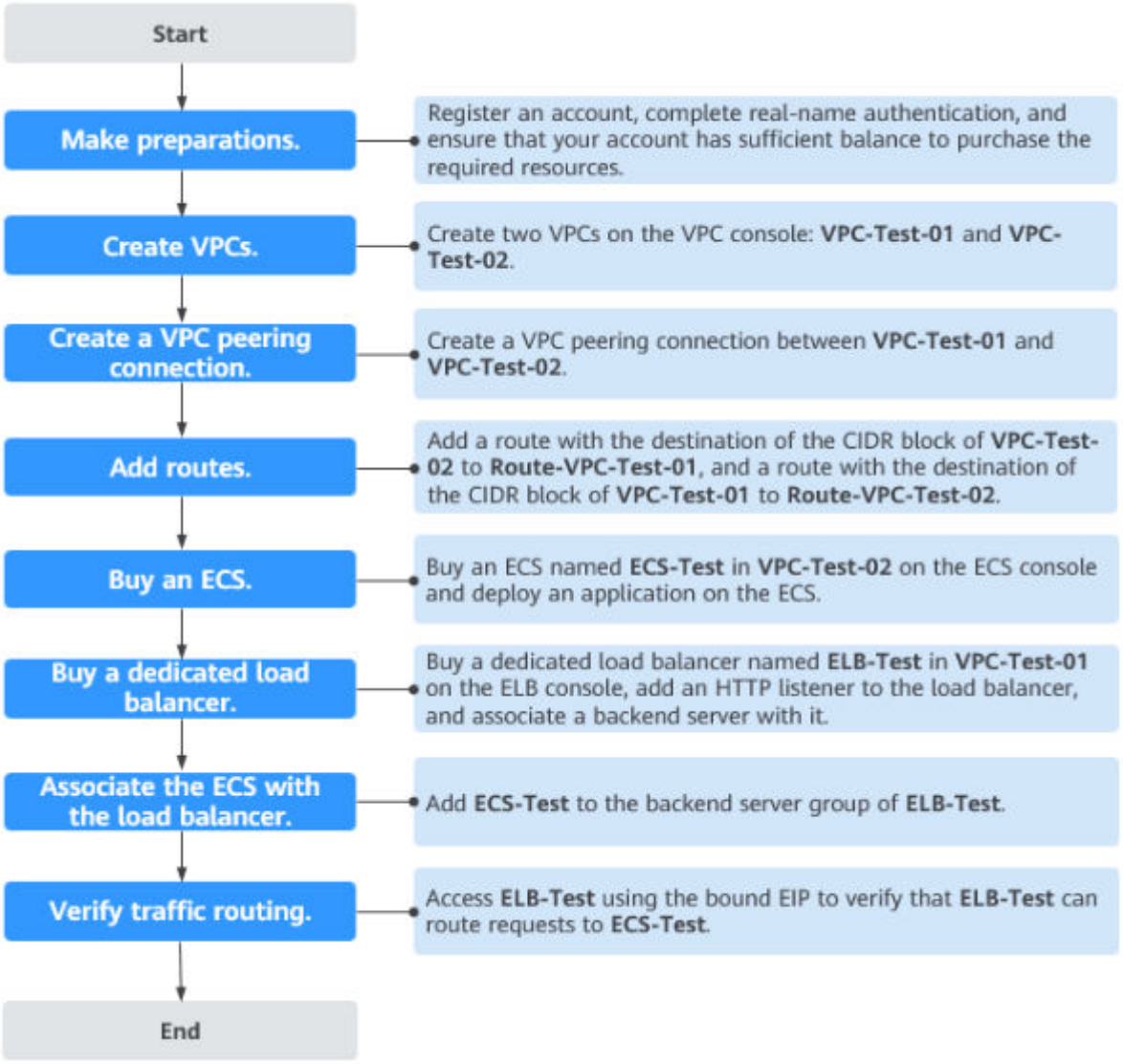
The actual cost shown on the Huawei Cloud console is used.

Table 2-1 Resource planning

Resource Type	Resource Name	Description	Quantity
VPC	VPC-Test-01	The VPC where **ELB-Test** is running: 172.18.0.0/24	1
	VPC-Test-02	The VPC where **ECS-Test** is running: 172.17.0.0/24	1
VPC peering connection	Peering-Test	The connection that connects the VPC where **ELB-Test** is running and the VPC where **ECS-Test** is running **Local VPC**: **172.18.0.0/24** **Peer VPC**: **172.17.0.0/24**	1
Route table	Route-VPC-Test-01	The route table of **VPC-Test-01** **Destination**: **172.17.0.0/24**	1
	Route-VPC-Test-02	The route table of **VPC-Test-02** **Destination**: **172.18.0.0/24**	1
ELB	ELB-Test	The dedicated load balancer	1
EIP	EIP-Test	The EIP (119.3.233.52) bound to **ELB-Test**	1
ECS	ECS-Test	The ECS works in **VPC-Test-02** **Private IP address**: **172.17.0.145**	1

Operation Process

Figure 2-4 Process of associating servers in a VPC that is different from the dedicated load balancer



Creating VPCs

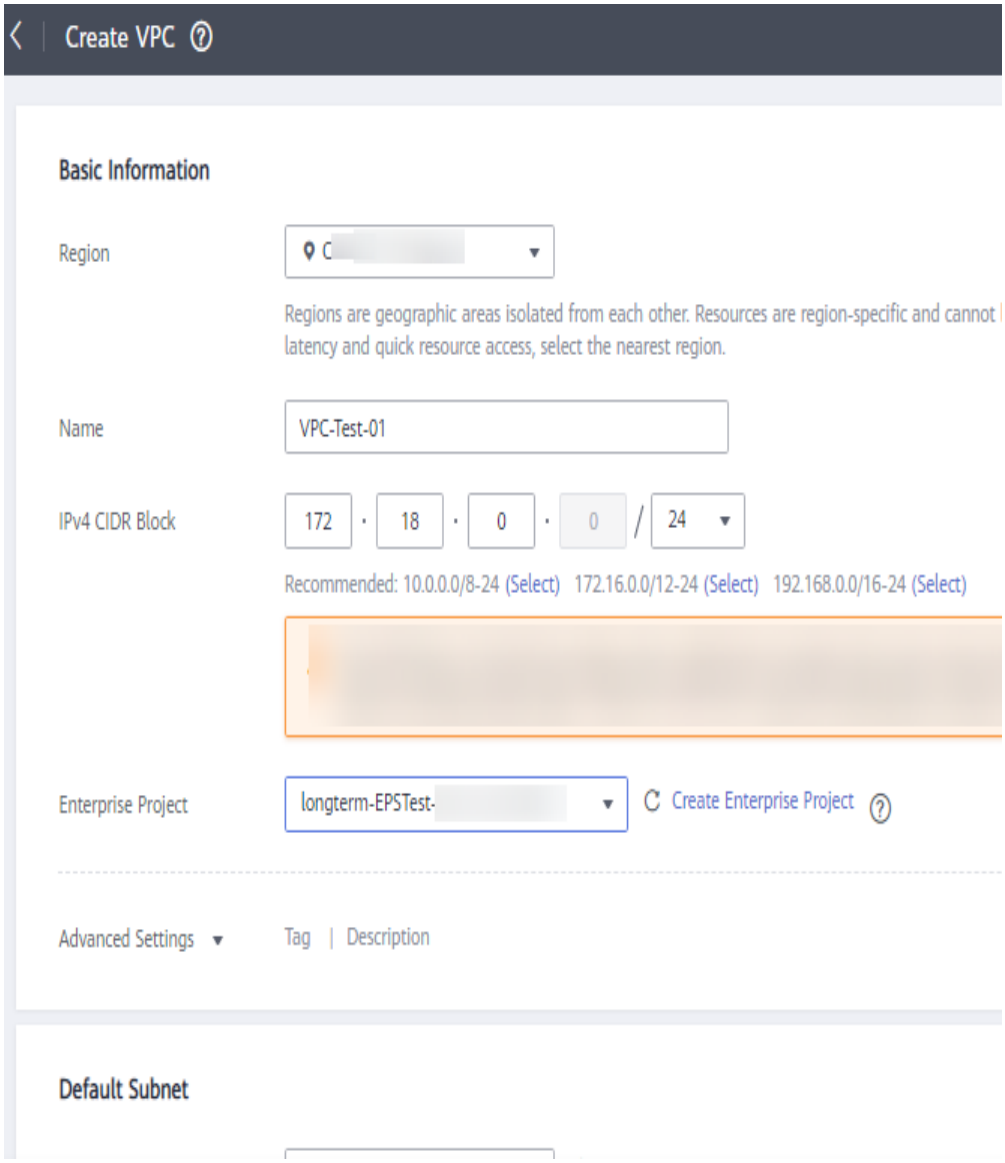
Step 1 Log in to the management console.

Step 2 Under **Networking**, select **Virtual Private Cloud**. On the **Virtual Private Cloud** page displayed, click **Create VPC**.

Step 3 Configure the parameters as follows and click **Create Now**. For details on how to create a VPC, see the *Virtual Private Cloud User Guide*.

- **Name**: **VPC-Test-01**
- **IPv4 CIDR Block**: **172.18.0.0/24**
- Configure other parameters as required.

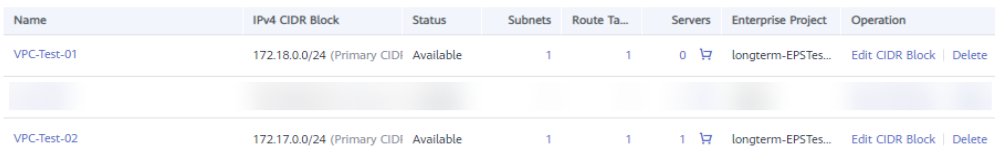
Figure 2-5 Creating **VPC-Test-01**



Step 4 Repeat **Step 2** and **Step 3** to create the other VPC.

- **Name**: **VPC-Test-02**
- **IPv4 CIDR Block**: **172.17.0.0/24**
- Configure other parameters as required.

Figure 2-6 Creating **VPC-Test-02**



----End

Creating a VPC Peering Connection

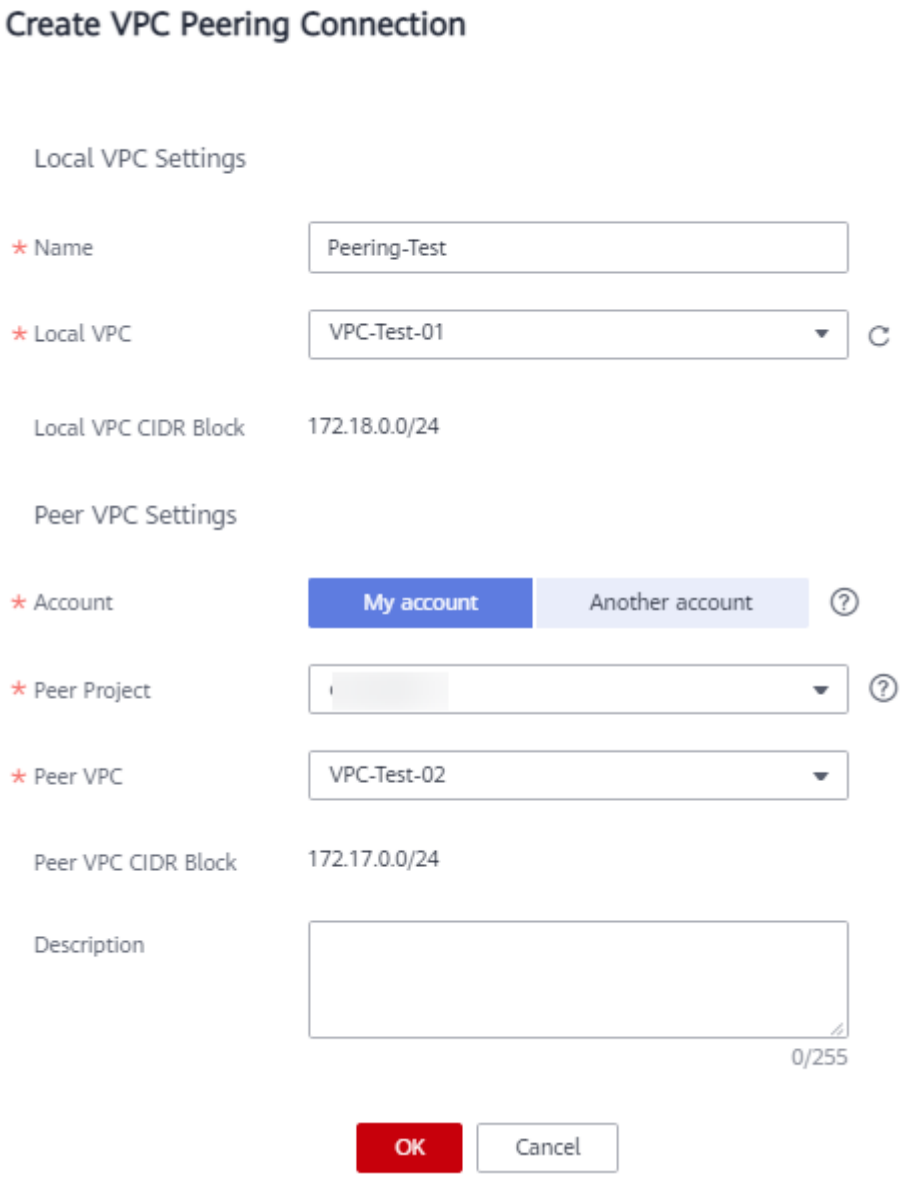
Step 1 In the navigation pane on the left, click **VPC Peering**.

Step 2 In the upper right corner, click **Create VPC Peering Connection**.

Step 3 Configure the parameters as follows and click **OK**. For details on how to create a VPC peering connection, see the ***Virtual Private Cloud User Guide***.

- **Name**: **Peering-Test**
- **Local VPC**: **VPC-Test-01**
- **Peer VPC**: **VPC-Test-02**
- Configure other parameters as required.

Figure 2-7 Creating **Peering-Test**



----End

Adding Routes for the VPC Peering Connection

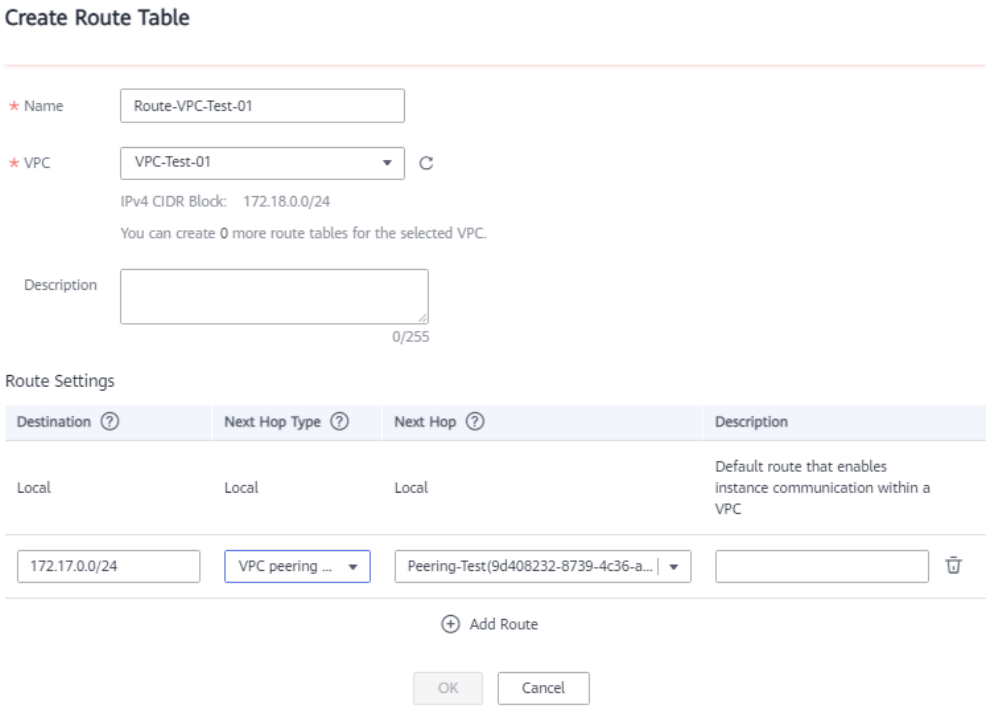
Step 1 In the navigation pane on the left, click **Route Tables**.

Step 2 In the upper right corner, click **Create Route Table**.

Step 3 Configure the parameters as follows and click **OK**. For details on how to create a route table, see the ***Virtual Private Cloud User Guide***.

- **Name**: **Route-VPC-Test-01**
- **VPC**: **VPC-Test-01**
- **Destination**: **172.17.0.0/24**
- **Next Hop Type**: **VPC peering connection**
- **Next Hop**: **Peering-Test**

Figure 2-8 Creating **Route-VPC-Test-01**



Step 4 Repeat **3** and **4** to create the other route table.

- **Name**: **Route-VPC-Test-02**
- **VPC**: **VPC-Test-02**
- **Destination**: **172.18.0.0/24**
- **Next Hop Type**: **VPC peering connection**
- **Next Hop**: **Peering-Test**

----End

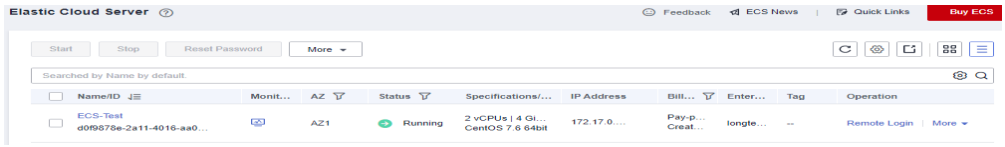
Creating an ECS

Step 1 Under **Computing**, click **Elastic Cloud Server**.

Step 2 In the upper right corner, click **Buy ECS**.

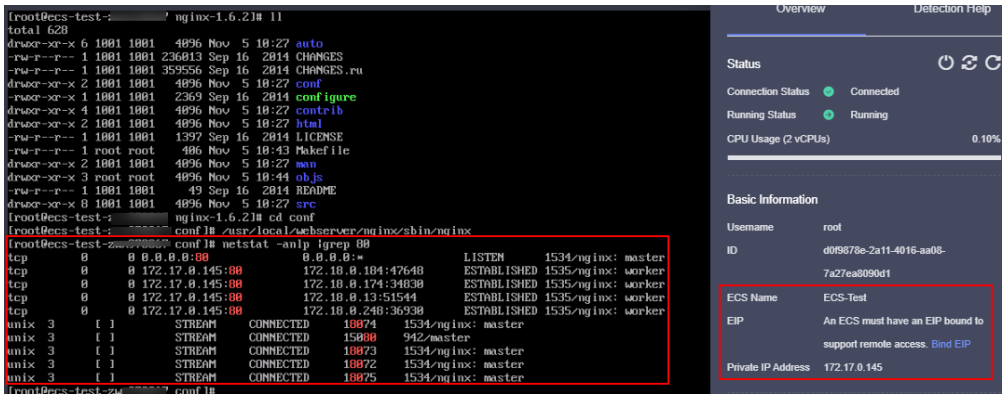
Step 3 Select **VPC-Test-02** as the **VPC** and set **ECS Name** to **ECS-Test**. Configure other parameters as required. For details, see **Elastic Cloud Server User Guide**.

Figure 2-9 Buying ECS-Test



Step 4 Deploy Nginx on the ECS.

Figure 2-10 Deploying Nginx on **ECS-Test**



----End

Buying a Dedicated Load Balancer and Adding an HTTP Listener and a Backend Server Group to the Load Balancer

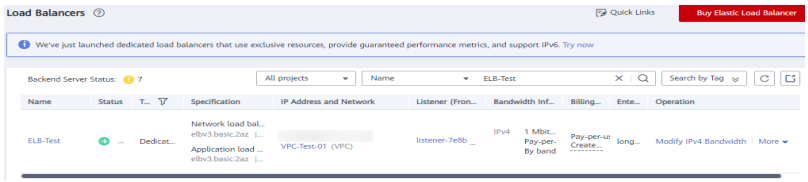
Step 1 Under **Networking**, click **Elastic Load Balance**.

Step 2 In the upper right corner, click **Buy Elastic Load Balancer**.

Step 3 Configure the parameters as follows. For details, see **Elastic Load Balance User Guide**.

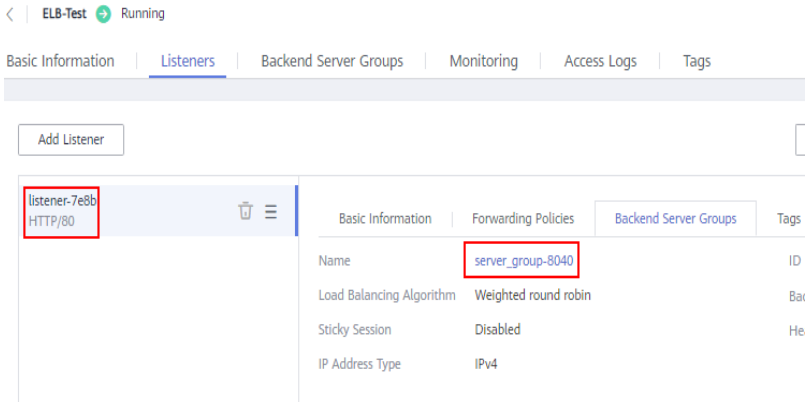
- **Type**: **Dedicated**
- **IP as a Backend**: Enable
- **VPC**: **VPC-Test-01**
- **Name**: **ELB-Test**
- Configure other parameters as required.

Figure 2-11 Buying **ELB-Test**



Step 4 Add an HTTP listener and a backend server group to the dedicated load balancer. For details, see **Elastic Load Balance User Guide**.

Figure 2-12 HTTP listener and backend server group



----End

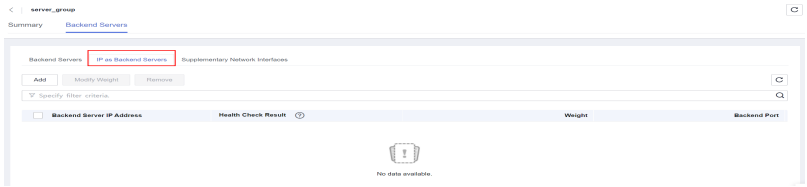
Adding the ECS to the Backend Server Group

Step 1 Locate the created dedicated load balancer and click its name **ELB-Test**.

Step 2 On the **Listeners** tab page, locate the HTTP listener added to the dedicated load balancer and click its name.

Step 3 In the **Backend Server Groups** tab on the right, click **IP as Backend Servers**.

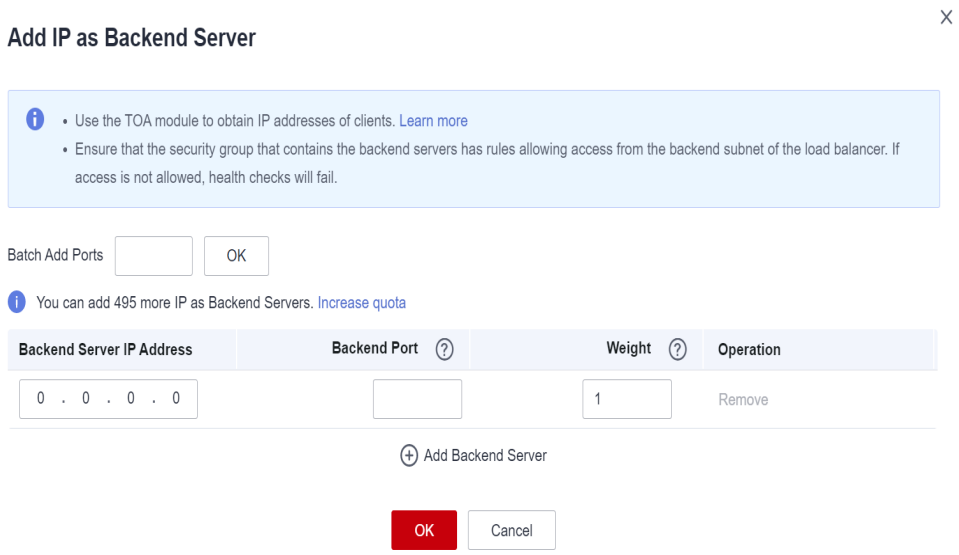
Figure 2-13 IP as backend servers



Step 4 Click **Add IP as Backend Server**, configure the parameters, and click **OK**. For details, see **Elastic Load Balance User Guide**.

- **Backend Server IP Address**: 172.17.0.145 (private IP address of **ECS-Test**)
- **Backend Port**: the port enabled for Nginx on **ECS-Test**
- **Weight**: Set this parameter as required.

Figure 2-14 Adding ECS-Test using its IP address



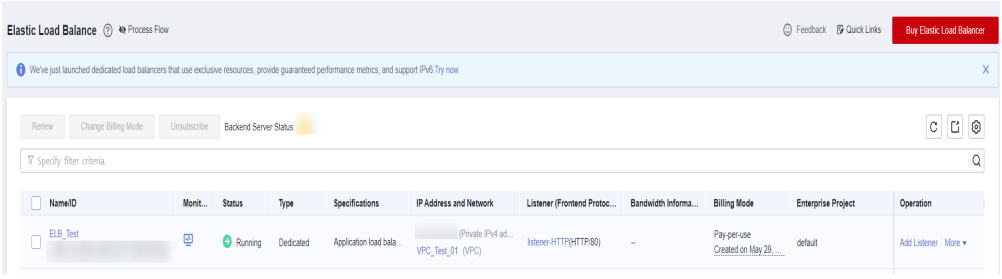
----End

Verifying Traffic Routing

Step 1 Locate the dedicated load balancer **ELB-Test** and click **More** in the **Operation** column.

Step 2 Select **Bind IPv4 EIP** to bind an EIP (119.3.233.52) to **ELB-Test**.

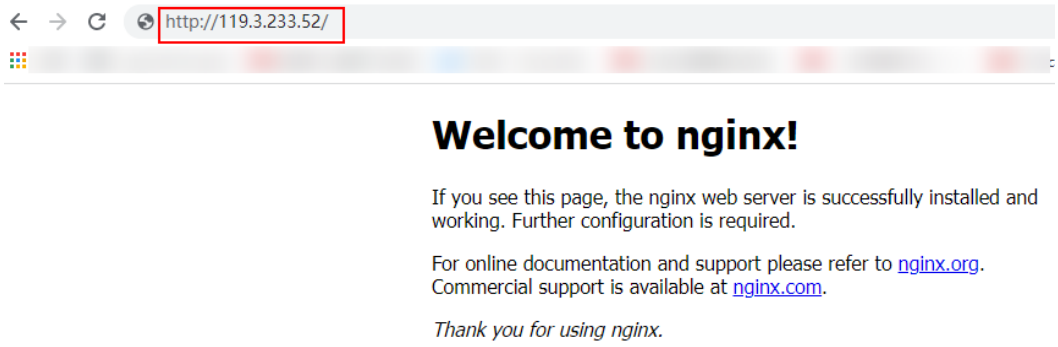
Figure 2-15 EIP bound to the load balancer



Step 3 Enter **http://119.3.233.52/** in the address box of your browser to access the dedicated load balancer.

If the following page is displayed, the load balancer routes the request to **ECS-Test**, which processes the request and returns the requested page.

Figure 2-16 Verifying that the request is routed to ECS-Test



----End

2.3 Routing Traffic to Backend Servers in the Same VPC as the Load Balancer

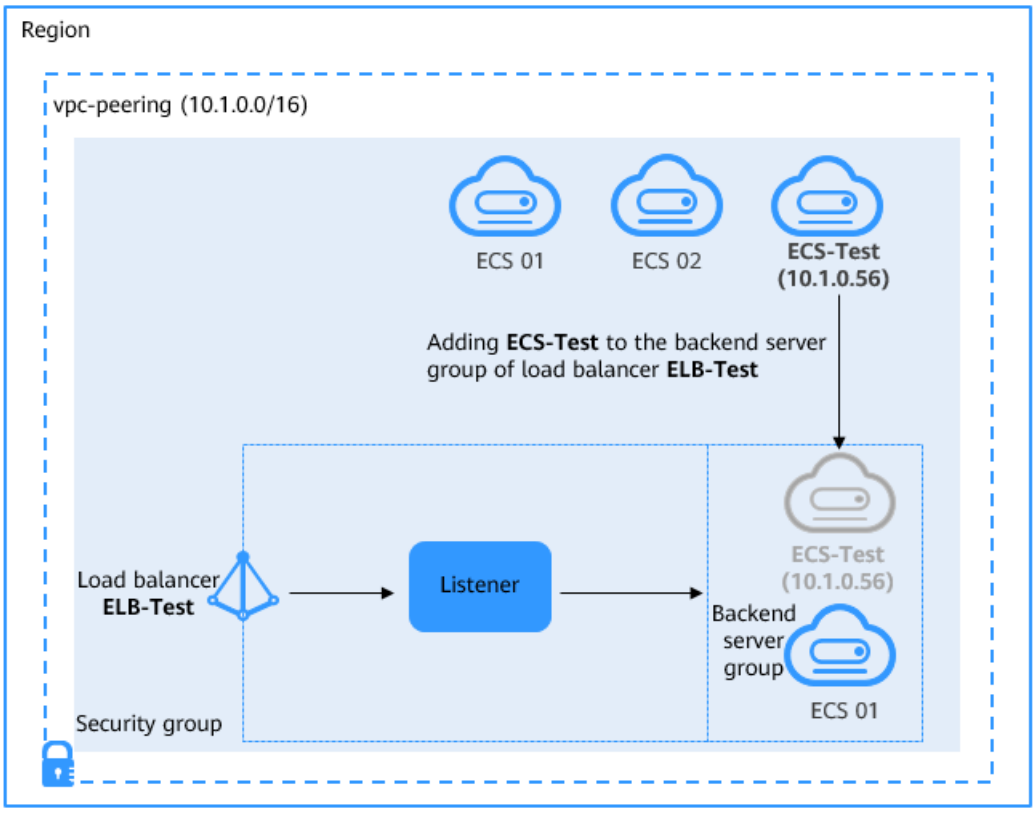
Scenarios

You can route traffic to backend servers in the VPC where the load balancer is running.

Solution

- A dedicated load balancer **ELB-Test** is running in a VPC named **vpc-peering** (10.1.0.0/16).
- The backend server **ECS-Test** is also running in **vpc-peering** (10.1.0.0/16).
- **ECS-Test** needs to be added to the backend server group associated with **ELB-Test**.

Figure 2-17 Adding a backend server in the same VPC as the load balancer



Advantages

You can add servers in the same VPC as the load balancer to the backend server group of the load balancer and then route incoming traffic to the servers.

Resource and Cost Planning

The actual cost shown on the Huawei Cloud console is used.

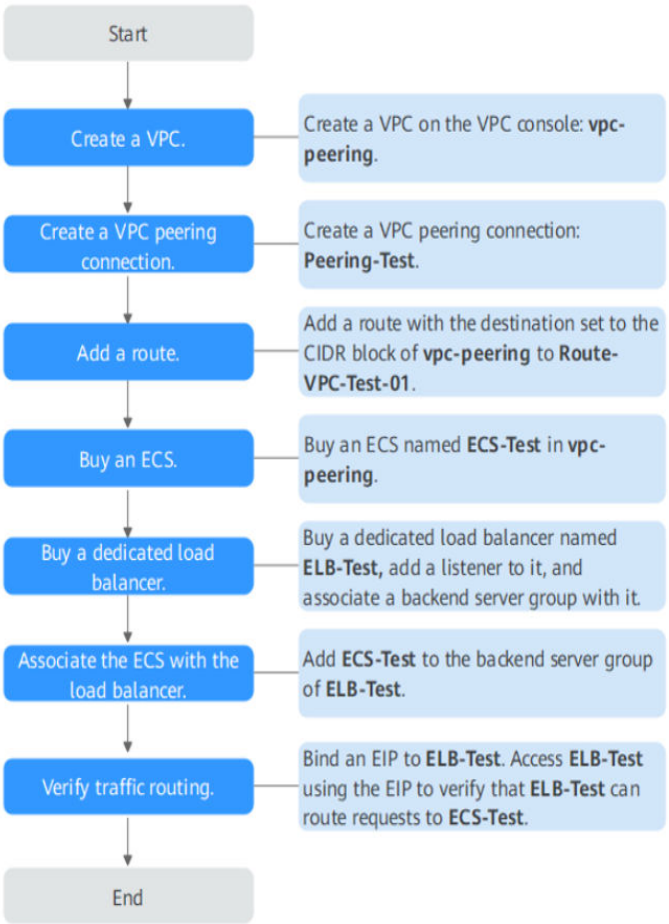
Table 2-2 Resource planning

Resource Type	Resource Name	Description	Quantity
VPC	vpc-peering	The VPC where **ELB-Test** and **ECS-Test** are running: 10.1.0.0/16	1
VPC peering connection	Peering-Test	The connection that connects the VPC where **ELB-Test** is running and other VPCs **Local VPC**: **10.1.0.0/16** **Peer VPC**: any VPC	1

Resource Type	Resource Name	Description	Quantity
Route table	Route-VPC-Test-01	The route table of **VPC-Test-01** **Destination**: **10.1.0.0/16**	1
ELB	ELB-Test	The dedicated load balancer named **ELB-Test** **Private IP address**: **10.1.0.9**	1
EIP	EIP-Test	The EIP (120.46.131.153) bound to **ELB-Test**	1
ECS	ECS-Test	The ECS works in **vpc-peering** **Private IP address**: **10.1.0.56**	1

Operation Process

Figure 2-18 Process for adding backend servers in the same VPC as the load balancer



Creating a VPC

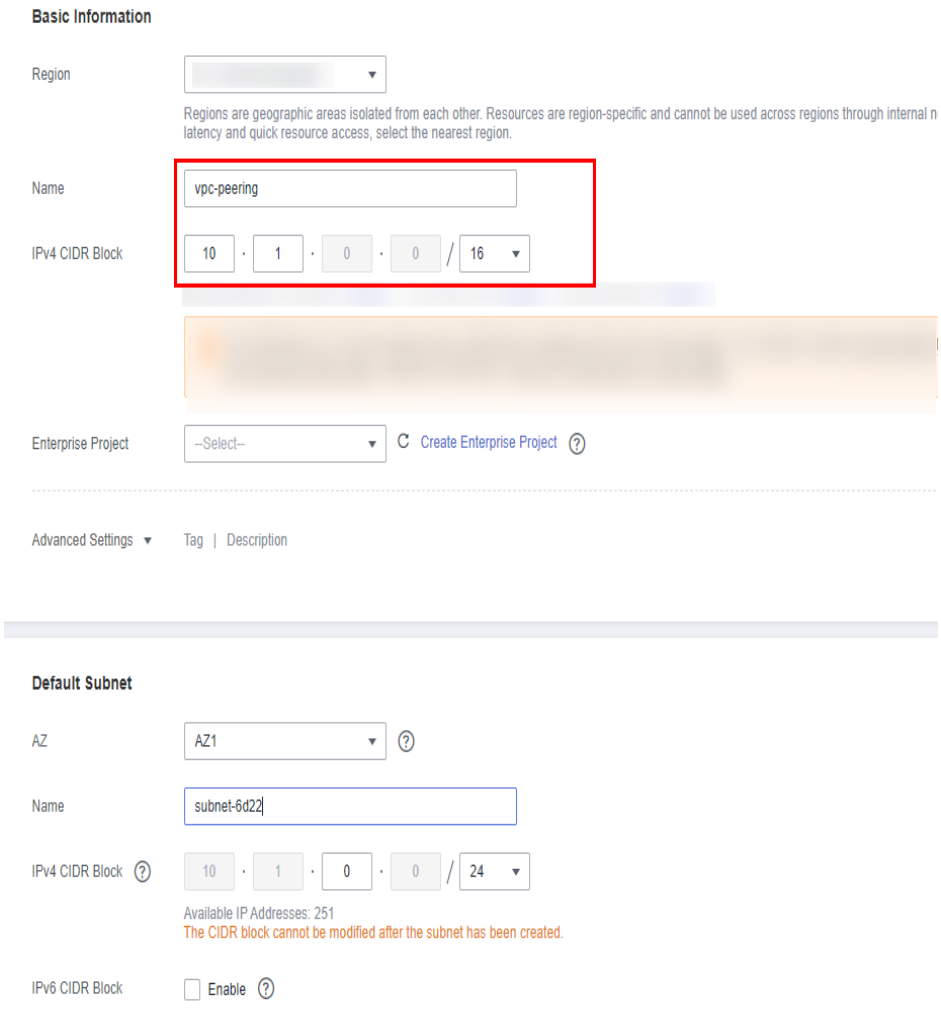
Step 1 Log in to the management console.

Step 2 Under **Networking**, select **Virtual Private Cloud**. On the **Virtual Private Cloud** page displayed, click **Create VPC**.

Step 3 Configure the parameters as follows and click **Create Now**. For details on how to create a VPC, see the ***Virtual Private Cloud User Guide***.

- **Name**: **vpc-peering**
- **IPv4 CIDR Block**: **10.1.0.0/16**
- Configure other parameters as required.

Figure 2-19 Creating **vpc-peering**



----End

Creating a VPC Peering Connection

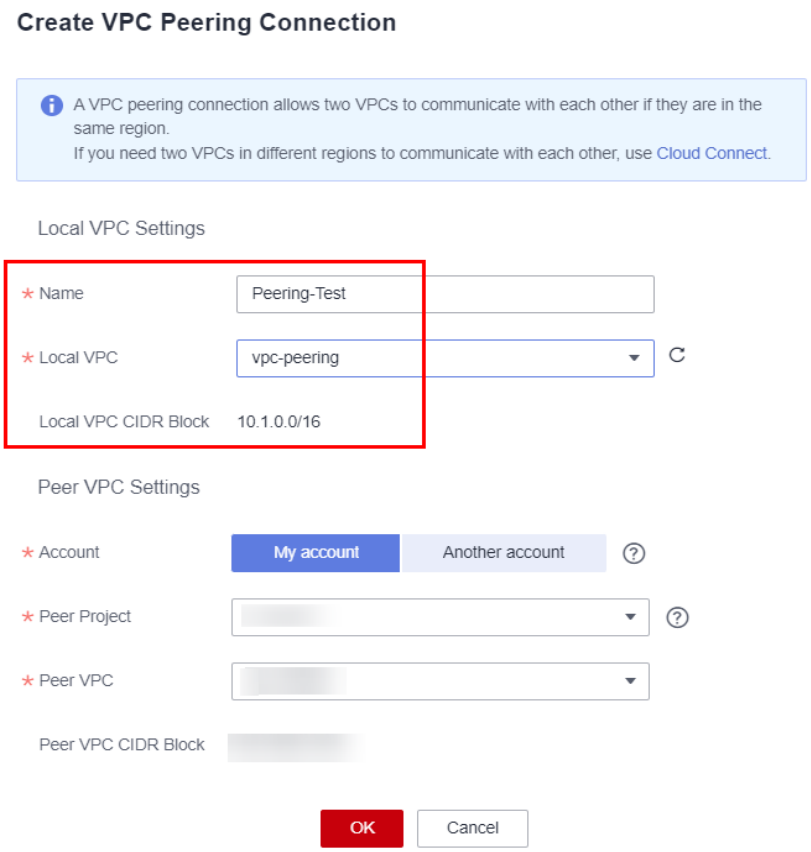
Step 1 In the navigation pane on the left, click **VPC Peering**.

Step 2 In the upper right corner, click **Create VPC Peering Connection**.

Step 3 Configure the parameters as follows and click **OK**. For details on how to create a VPC peering connection, see the ***Virtual Private Cloud User Guide***.

- **Name**: **Peering-Test**
- **Local VPC**: **vpc-peering**
- **Peer VPC**: any VPC
- Configure other parameters as required.

Figure 2-20 Creating **Peering-Test**



----End

Adding Routes for the VPC Peering Connection

Step 1 In the navigation pane on the left, click **Route Tables**.

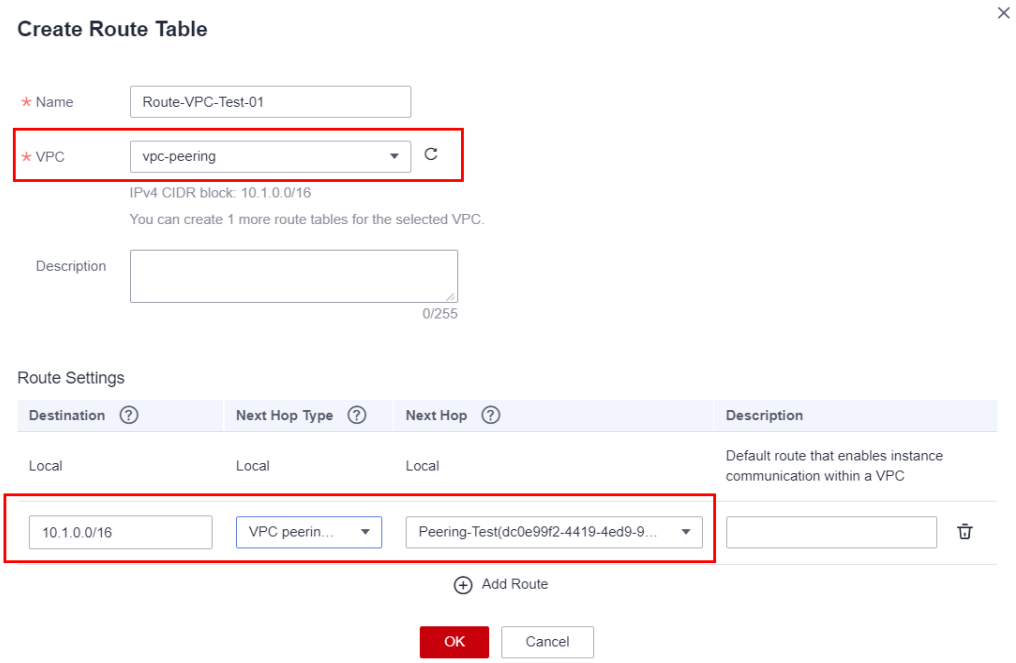
Step 2 In the upper right corner, click **Create Route Table**.

Step 3 Configure the parameters as follows and click **OK**. For details on how to create a route table, see the ***Virtual Private Cloud User Guide***.

- **Name**: **Route-VPC-Test-01**
- **VPC**: **vpc-peering**
- **Destination**: 10.1.0.0/16
- **Next Hop Type**: **VPC peering connection**

- **Next Hop**: **Peering-Test**

Figure 2-21 Creating **Route-VPC-Test-01**



----End

Creating an ECS

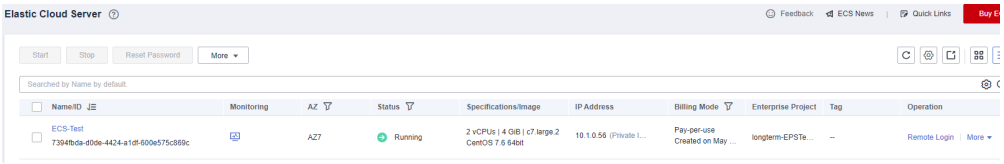
Step 1 Under **Computing**, click **Elastic Cloud Server**.

Step 2 In the upper right corner, click **Buy ECS**.

Step 3 Configure the parameters as required. For details, see **Elastic Cloud Server User Guide**.

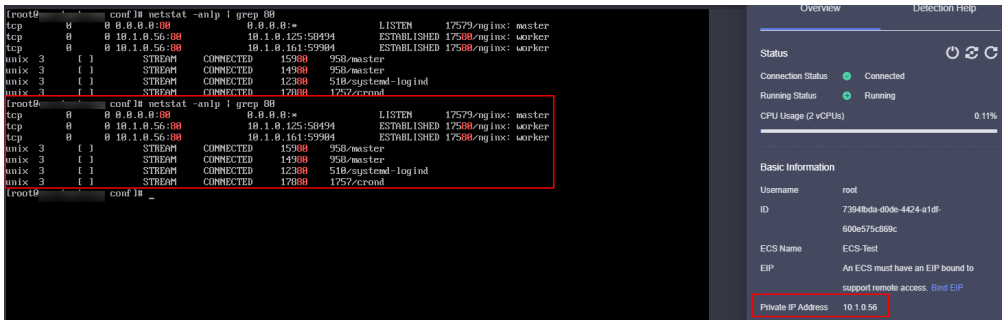
Select **vpc-peering** for VPC and set **Name** to **ECS-Test**.

Figure 2-22 Buying ECS-Test



Step 4 Deploy Nginx on the ECS.

Figure 2-23 Deploying Nginx on **ECS-Test**



----End

Buying a Dedicated Load Balancer and Adding an HTTP Listener and a Backend Server Group to the Load Balancer

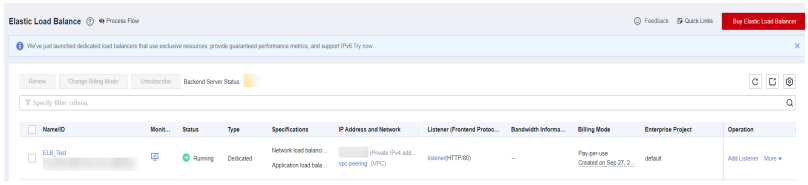
Step 1 Under **Networking**, click **Elastic Load Balance**.

Step 2 In the upper right corner, click **Buy Elastic Load Balancer**.

Step 3 Configure the parameters as follows. For details, see **Elastic Load Balance User Guide**.

- **Type**: **Dedicated**
- **IP as a Backend**: Enable
- **VPC**: **vpc-peering**
- **Name**: **ELB-Test**
- Configure other parameters as required.

Figure 2-24 Creating a dedicated load balancer named **ELB-Test**



Step 4 Add an HTTP listener and a backend server group to the created dedicated load balancer. For details, see **Elastic Load Balance User Guide**.

----End

Adding the ECS to the Backend Server Group

Step 1 Locate the dedicated load balancer and click its name **ELB-Test**.

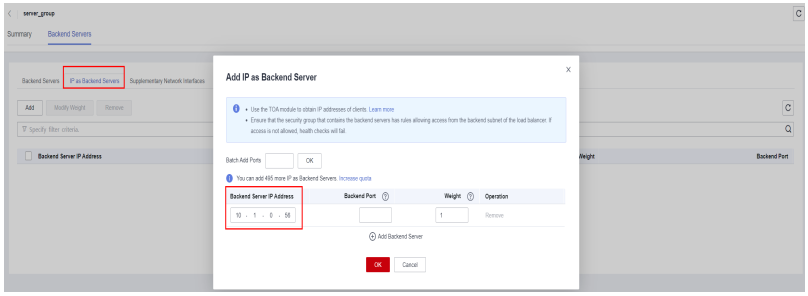
Step 2 On the **Listeners** tab page, locate the HTTP listener added to the dedicated load balancer and click its name.

Step 3 In the **Backend Server Groups** tab on the right, click **IP as Backend Servers**.

Step 4 Click **Add IP as Backend Server**, configure the parameters, and click **OK**. For details, see **Elastic Load Balance User Guide**.

- **Backend Server IP Address**: **10.1.0.56** (private IP address of **ECS-Test**)
- **Backend Port**: the port enabled for Nginx on **ECS-Test**
- **Weight**: Configure this parameter as required.

Figure 2-25 Adding IP as backend servers



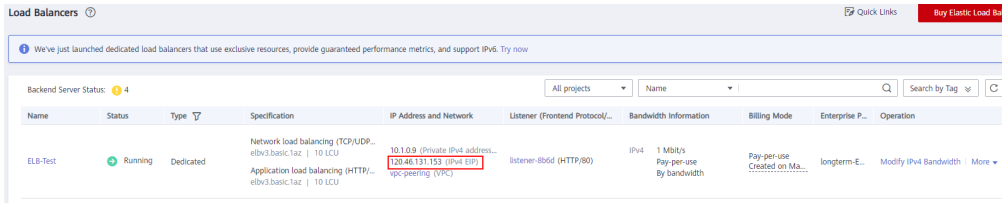
----End

Verifying Traffic Routing

Step 1 Locate the dedicated load balancer **ELB-Test** and click **More** in the **Operation** column.

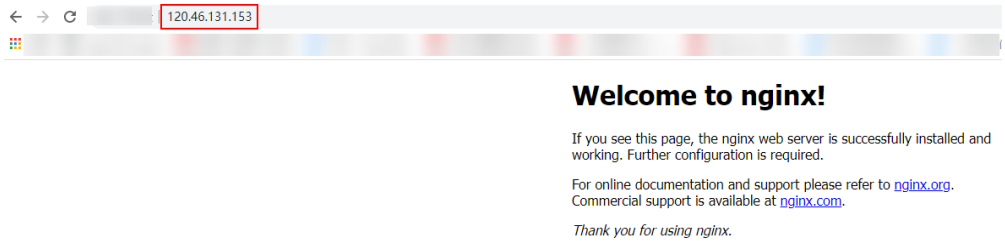
Step 2 Select **Bind IPv4 EIP** to bind an EIP (120.46.131.153) to **ELB-Test**.

Figure 2-26 EIP bound to the load balancer



Step 3 Enter **http://120.46.131.153/** in the address box of your browser to access the dedicated load balancer. If the following page is displayed, the load balancer routes the request to **ECS-Test**. After receiving the request from the load balancer, **ECS-Test** processes the request and returns the requested page.

Figure 2-27 Verifying traffic routing



----End