

# Elastic Load Balance

## Getting Started

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# 1 Using ELB to Distribute Traffic to a Web Application Across ECSs

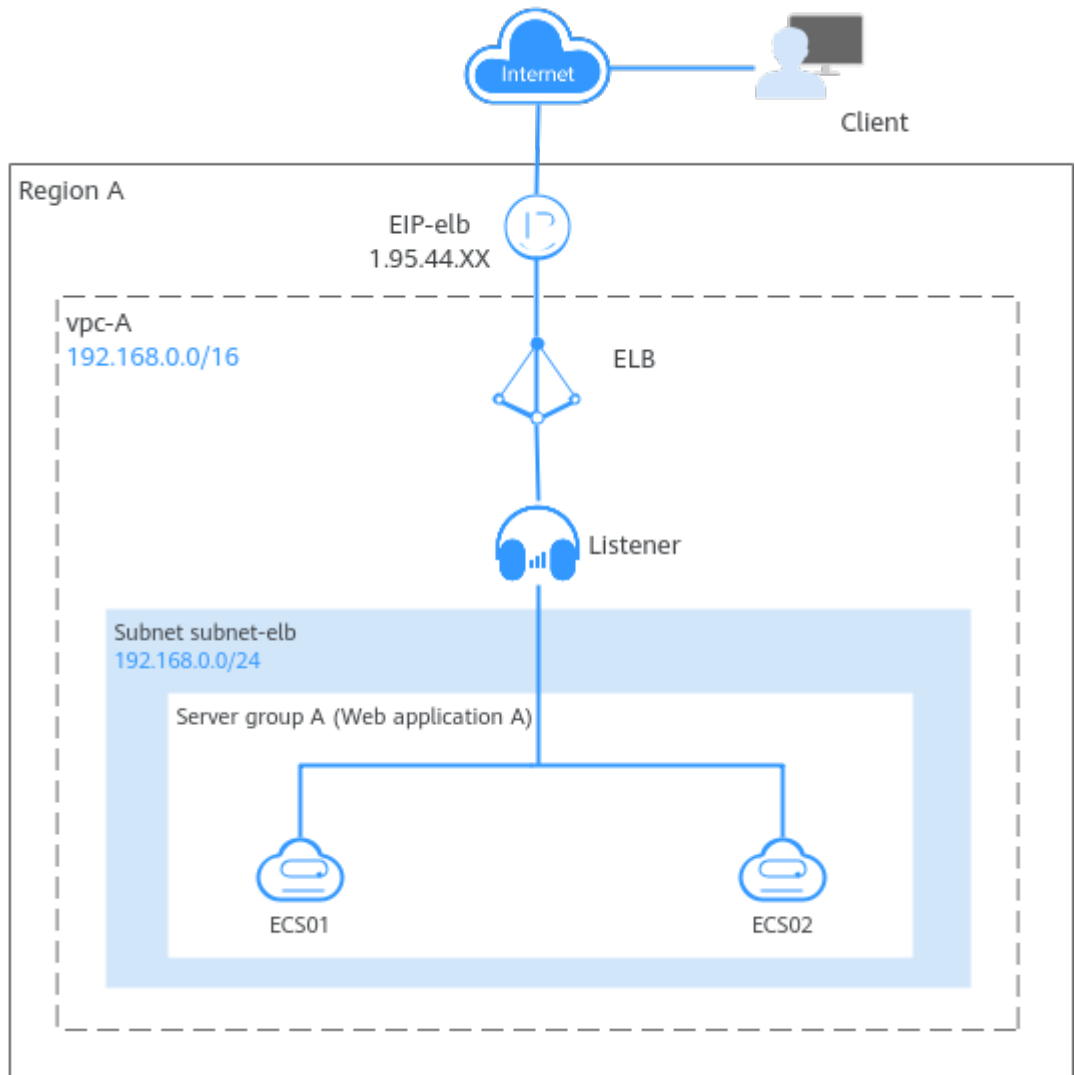
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## Scenarios

ELB distributes traffic across ECSs, which eliminates single points of failure (SPOFs) and makes your application more available.

If you have a web application that needs to handle heavy traffic, you can deploy your application on two ECSs (**ECS01** and **ECS02** in this example) and create a load balancer to distribute traffic across these ECSs.

**Figure 1-1** Using ELB to distribute traffic to an application



## Procedure

You can follow the process in [Figure 1-2](#) to use a load balancer to distribute traffic to a web application.

**Figure 1-2** Distributing traffic to a web application deployed in multiple ECSs



Procedure	What to Do
<b>Preparations</b>	Before using cloud services, sign up for a HUAWEI ID, enable Huawei Cloud services, complete real-name authentication, and top up your account.

Procedure	What to Do
<b>Step 1: Create a VPC and Two ECSs</b>	<ul style="list-style-type: none"><li>• Create a VPC with an IPv4 CIDR block and create a subnet in the VPC.<ul style="list-style-type: none"><li>– VPC IPv4 CIDR block: 192.168.0.0/16</li><li>– Subnet IPv4 CIDR block: 192.168.0.0/24</li></ul></li><li>• Buy two ECSs in the VPC subnet you have created.</li></ul>
<b>Step 2: Deploy the Application</b>	Deploy Nginx on the two ECSs.
<b>Step 3: Create a Load Balancer</b>	Create a load balancer with elastic specifications to receive requests from clients and distribute the requests to backend servers.
<b>Step 4: Configure Security Group Rules</b>	Configure security group rules to allow traffic from the backend subnet where the load balancer works to the backend servers.
<b>Step 5: Add a Listener</b>	Add a listener to the load balancer to check requests from clients and route requests to backend servers in the backend server group.
<b>Step 6: Verify Load Balancing</b>	Access the domain name of the load balancer to check whether different backend servers can be accessed.

## Preparations

Before using ELB, you need to:

- [Create a HUAWEI ID and enable Huawei Cloud services.](#)
- [Complete real-name authentication.](#)
- [Top up your account.](#)

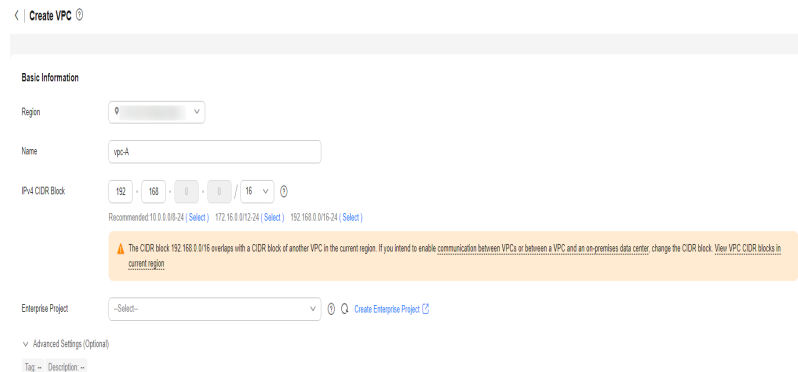
## Step 1: Create a VPC and Two ECSs

You need to plan the region for your load balancer, and create a VPC and two ECSs. Ensure that the ECSs and load balancer are in the same AZ and VPC.

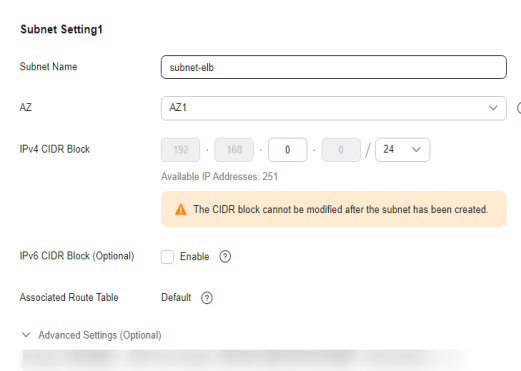
1. Create a VPC.

Configure the VPC as shown in the below figure. For details, see [Creating a VPC](#).

**Figure 1-3** Configuring a VPC



**Figure 1-4** Configuring a VPC subnet



VPC Configurations

- Configuring a VPC

Parameter	Example Value	Description
Region	CN-Hong Kong	The region where the VPC is created. Select the region nearest to you to ensure the lowest possible latency. The VPC, ECS, and EIP used in this example must be in the same region.
Name	vpc-A	The VPC name. Set it to <b>vpc-A</b> .
IPv4 CIDR Block	192.168.0.0/16	The IPv4 CIDR block of <b>vpc-A</b> .
Enterprise Project	default	The enterprise project by which VPCs are centrally managed. Select an existing enterprise project for <b>vpc-A</b> .
Advanced Settings (Optional)	-	In this example, retain the default value.

- Configuring a VPC subnet

Parameter	Example Value	Description
AZ	AZ1	A geographic location with independent power supply and network facilities in a region. Each region contains multiple AZs. AZs are physically isolated but connected through an internal network. Subnets of a VPC can be located in different AZs without affecting communications. You can select any AZ in a region.  The ECS and VPC can be in different AZs. For example, you can select AZ1 for the ECS and AZ3 for the VPC subnet.
Subnet Name	subnet-elb	The subnet name. Set it to <b>subnet-elb</b> .
IPv4 CIDR Block	192.168.0.0/24	The IPv4 CIDR block of <b>subnet-elb</b> , which is a unique CIDR block with a range of IP addresses in <b>vpc-A</b> .
IPv6 CIDR Block (Optional)	Do not enable	Whether to assign IPv6 addresses.
Associated Route Table	Default	The default route table that <b>subnet-elb</b> is associated with. The default route table has a preset system route that allows subnets in a VPC to communicate with each other.
Advanced Settings (Optional)	-	In this example, retain the default value.

## 2. Create two ECSs.

Configure the ECSs as described in the below table. For details, see [Quickly Creating an ECS](#).

ECS Configurations

- Configuring the network parameters for the two ECSs

Parameter	Example Value	Description
ECS Name	<ul style="list-style-type: none"><li>• ECS01</li><li>• ECS02</li></ul>	Names of the two ECSs. Set them to <b>ECS01</b> and <b>ECS02</b> .



Parameter	Example Value	Description
Region	CN-Hong Kong	The region where the ECSs are deployed. Select the same region as that of <b>vpc-A</b> .
AZ	<ul style="list-style-type: none"><li>AZ1</li><li>AZ2</li></ul>	The AZ where the ECSs are deployed. Select different AZs for the two ECSs.
Network	<ul style="list-style-type: none"><li>vpc-A</li><li>subnet-elb</li></ul>	The VPC subnet where the ECSs work. Select <b>vpc-A</b> and <b>subnet-elb</b> for the two ECSs.
EIP	<ul style="list-style-type: none"><li>EIP01</li><li>EIP02</li></ul>	The EIP bound to each ECS for Internet access.

## Step 2: Deploy the Application

Deploy Nginx on the two ECSs and edit two HTML pages so that a page with message "Welcome to ELB test page one!" is returned when **ECS01** is accessed, and the other page with message "Welcome to ELB test page two!" is returned when **ECS02** is accessed.

1. [Log in to the ECSs](#).
2. Install and start Nginx.

CentOS 7.6 is used as an example here.

Deploying Nginx

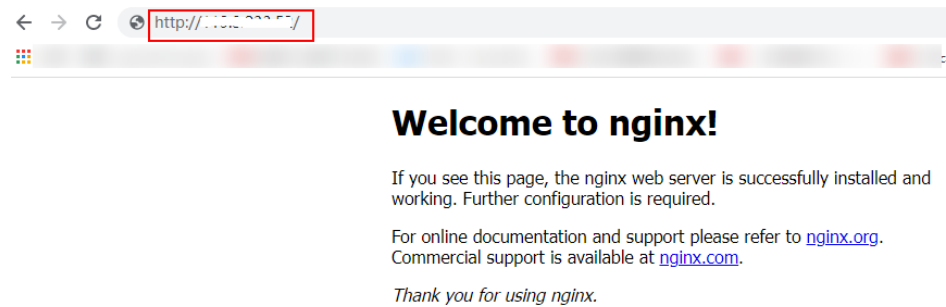
- a. Run the **wget** command to download the Nginx installation package for your operating system in use.  

```
wget http://nginx.org/packages/centos/7/noarch/RPMS/nginx-release-centos-7-0.el7ngx.noarch.rpm
```
- b. Run the following command to create the Nginx yum repository.  

```
rpm -ivh nginx-release-centos-7-0.el7ngx.noarch.rpm
```
- c. Run the following command to install Nginx:  

```
yum -y install nginx
```
- d. Run the following commands to start Nginx and configure automatic Nginx enabling upon ECS startup:  

```
systemctl start nginx  
systemctl enable nginx
```
- e. Enter **http://EIP bound to the ECS** in the address box of your browser. If the following page is displayed, Nginx has been installed.

**Figure 1-5** Nginx installed successfully

3. Modify the HTML page of **ECS01**.

Modify the **index.html** file in the default root directory of Nginx **/usr/share/nginx/html** to identify access to **ECS01**.

Modifying the HTML Page of **ECS01**

a. Run the following command to open the **index.html** file:

```
vim /usr/share/nginx/html/index.html
```

b. Press **i** to enter editing mode.

c. Modify the **index.html** file.

Modify the following content:

```
...
<body>
  <h1>Welcome to <strong>ELB</strong> test page one!</h1>

  <div class="content">
    <p>This page is used to test the <strong>ELB</strong>!</p>

    <div class="alert">
      <h2>ELB01</h2>
      <div class="content">
        <p><strong>ELB test (page one)!</strong></p>
        <p><strong>ELB test (page one)!</strong></p>
        <p><strong>ELB test (page one)!</strong></p>
      </div>
    </div>
  </div>
</body>
```

d. Press **Esc** to exit the editing mode. Then, enter **:wq** to save the settings and exit the file.

4. Modify the HTML page of **ECS02** by referring to step **3** to identify the access to **ECS02**.

Modifying the HTML Page of **ECS02**

a. Run the following command to open the **index.html** file:

```
vim /usr/share/nginx/html/index.html
```

b. Press **i** to enter editing mode.

c. Modify the **index.html** file.

Modify the following content:

```
...
<body>
  <h1>Welcome to <strong>ELB</strong> test page two!</h1>

  <div class="content">
    <p>This page is used to test the <strong>ELB</strong>!</p>

    <div class="alert">
```

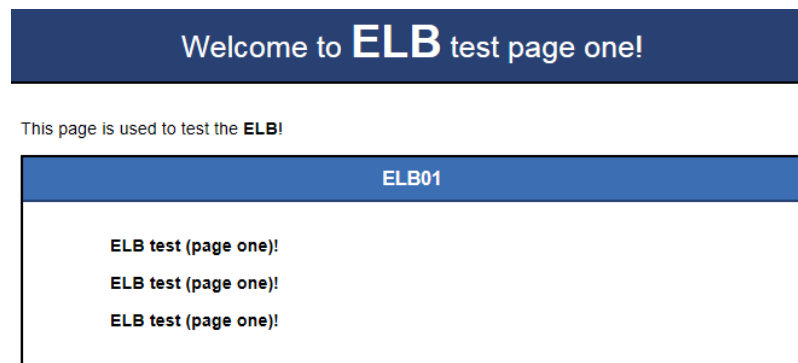
```
<h2>ELB02</h2>
<div class="content">
  <p><strong>ELB test (page two)!</strong></p>
  <p><strong>ELB test (page two)!</strong></p>
  <p><strong>ELB test (page two)!</strong></p>
</div>
</div>
</div>
</body>
```

- d. Press **Esc** to exit the editing mode. Then, enter **:wq** to save the settings and exit the file.
5. Use your browser to access **http://ECS01 EIP** and **http://ECS02 EIP** to verify that Nginx has been deployed.

If the modified HTML pages are displayed, Nginx has been deployed.

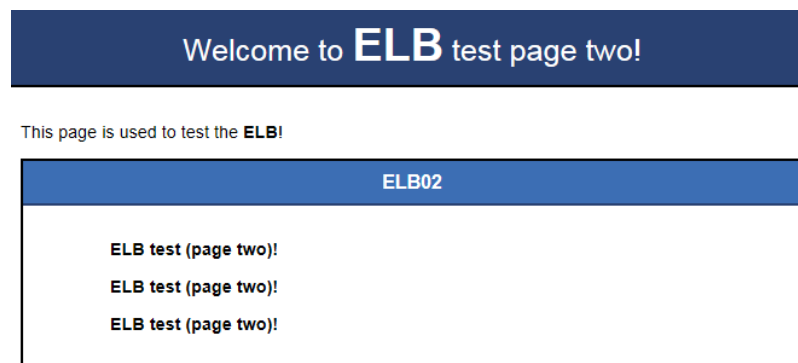
- HTML page of **ECS01**

**Figure 1-6** Nginx successfully deployed on **ECS01**



- HTML page of **ECS02**

**Figure 1-7** Nginx successfully deployed on **ECS02**



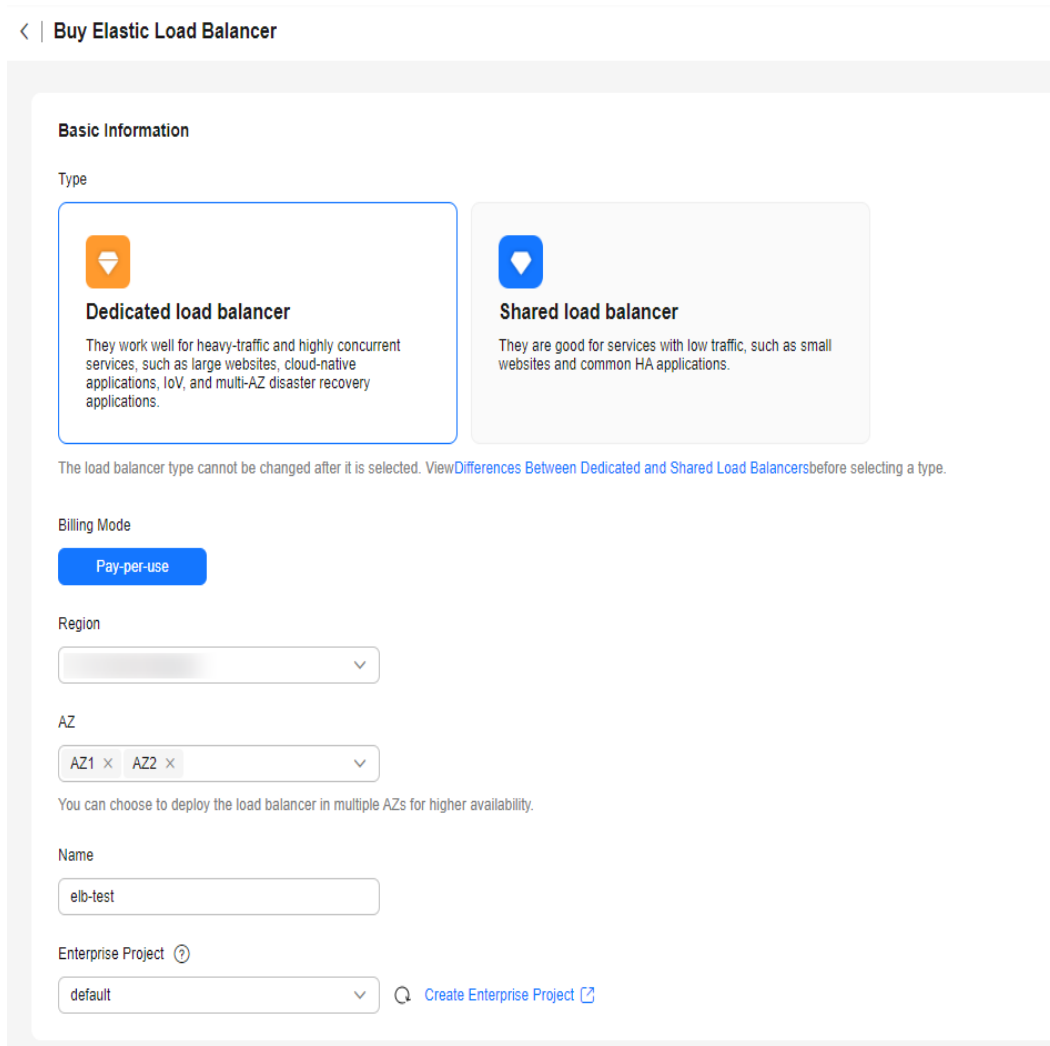
### Step 3: Create a Load Balancer

The load balancer needs an EIP to access the application deployed on the ECSs over the Internet. You can determine whether to bind an EIP to the load balancer based on your requirements.

1. Go to the [Buy Elastic Load Balancer](#) page.
2. On the displayed page, set the parameters as required.

**Figure 1-8** lists the basic parameters in this example.

**Figure 1-8** Configuring the basic information



Basic Configurations

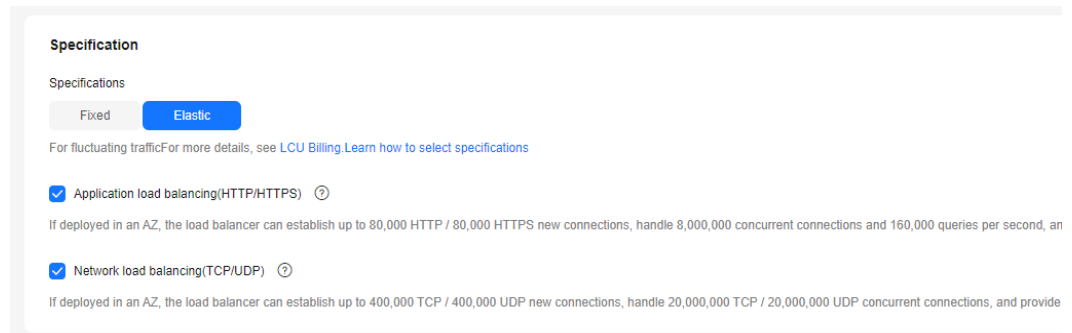
- Configuring the basic information

Parameter	Example Value	Description
Type	Dedicated load balancer	Specifies the type of the load balancer. Select <b>Dedicated load balancer</b> . A dedicated load balancer uses dedicated resources. Its performance is not affected by other load balancers.
Billing Mode	Pay-per-use	Specifies the billing mode of the dedicated load balancer.
Region	-	Specifies the desired region. Resources in different regions cannot communicate with each other over internal networks. Select the same region as the ECSs.

Parameter	Example Value	Description
AZ	<ul style="list-style-type: none"> <li>AZ1</li> <li>AZ2</li> </ul>	Specifies the AZ of the load balancer. Select multiple AZs if you need DR capability. The load balancer performance multiplies as the number of AZs increases.
Name	elb-test	Specifies the name of the load balancer.
Enterprise Project	default	Specifies an enterprise project by which cloud resources and members are centrally managed.

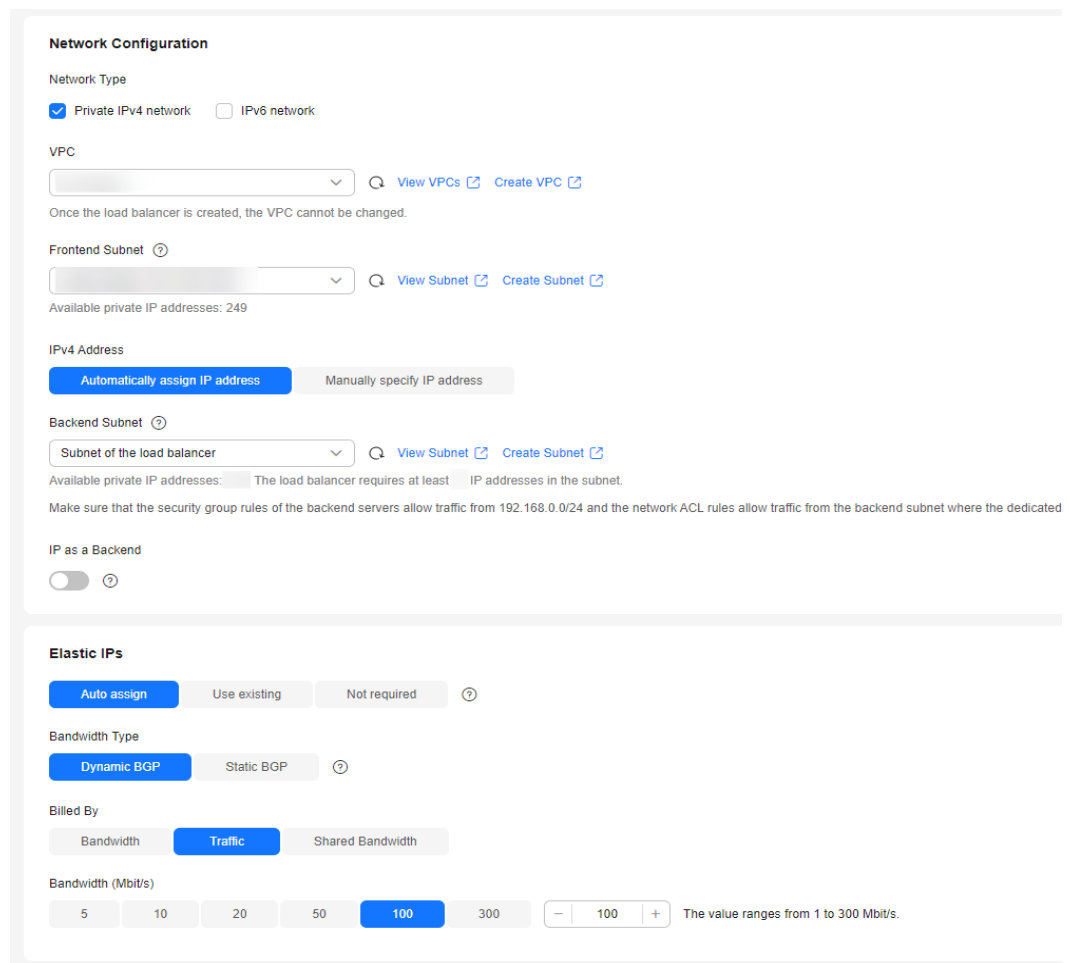
- Set **Specifications** to **Elastic**, as shown in **Figure 1-9**.

**Figure 1-9** Load balancer specifications



- Configure the network parameters and EIP information based on **Figure 1-10**.

Figure 1-10 Network parameters




Network Configurations

- Configuring network parameters

Parameter	Example Value	Description
Network Type	Private IPv4 network	Specifies the network where the load balancer works. In this example, select <b>Private IPv4 network</b> . The load balancer uses the private IPv4 address to process private network requests. To let the load balancer route requests over the Internet, bind an EIP to it.
VPC	-	Specifies the VPC where the load balancer works. In this example, select <b>vpc-A</b> .

Parameter	Example Value	Description
Frontend Subnet	-	Specifies the frontend subnet from which an IPv4 address will be assigned to the load balancer to receive client requests. If IPv6 is enabled, an IPv6 address will also be assigned to the load balancer.
IPv4 Address	Automatically assign IP address	Specifies how you want the IPv4 address to be assigned.
Backend Subnet	Subnet of the load balancer	Specifies the backend subnet from which an IP address will be assigned to the load balancer to forward requests to backend servers.
IP as a Backend	-	Specifies whether to add IP addresses as backend servers that are not in the VPC of the load balancer. In this example, leave this feature disabled.
<b>Elastic IPs</b>		
EIP	New EIP	Specifies the public IP address that will be bound to the load balancer for receiving and forwarding requests over the Internet. This parameter is mandatory when <b>Network Type</b> is set to <b>IPv4 public network</b> .
Bandwidth Type	Dynamic BGP	Specifies the link type (BGP) when a new EIP is used.
Billed By	Traffic	Specifies how the bandwidth will be billed. In this example, select <b>Traffic</b> . You need to specify a maximum bandwidth and pay for the outbound traffic you use.
Bandwidth (Mbit/s)	100	Specifies the maximum bandwidth when a new EIP is used, in Mbit/s. The value ranges from 1 Mbit/s to 300 Mbit/s.

- Specifies the maximum bandwidth. Click  to expand the advanced settings and add a description and tags to the load balancer.
- Click **Next**.
- Confirm the configuration and submit your request.
- View the newly created load balancer in the load balancer list.

## Step 4: Configure Security Group Rules

To ensure normal communications between the load balancer and backend servers, you need to check the security group and network ACL rules.

- The security groups configured for backend servers must have inbound rules to allow health check and service traffic from backend subnet of the load balancer to backend servers. By default, the backend subnet of a load balancer is the same as the subnet where the load balancer works.
- Network ACL rules are optional for subnets. If network ACL rules are configured for the backend subnet of the load balancer, the inbound rules must allow traffic from the backend subnet to the backend servers.

For details about how to configure security group and network ACL rules, see [Security Group and Network ACL Rules](#)

You can configure security group rules based on [Table 1-1](#).

**Table 1-1** Security group rules

Direction	Action	Type	Protocol & Port	Source/Destination	Description
Inbound	Allow	IPv4	TCP: 80	Source: 192.168.0.0/24	Allows outbound traffic to ECSs in the security group.
Outbound	Allow	IPv4	All	Destination: 0.0.0.0/0	Allows the ECSs in the security group to access the Internet.

## Step 5: Add a Listener

Add a listener to the created load balancer. When you add the listener, create a backend server group, configure a health check, and add the two ECSs to this backend server group. If a backend server is detected unhealthy, the load balancer will stop routing traffic to it until the backend server recovers.

1. On the load balancer list page, locate load balancer **elb-test** and click its name.
2. On the **Listeners** tab, click **Add Listener** and configure parameters based on [Table 1-2](#).

**Table 1-2** Parameters for configuring a listener

Parameter	Example Value	Description
Name	listener	Specifies the listener name.
Frontend Protocol	HTTP	Specifies the protocol that will be used by the load balancer to receive requests from clients.
Frontend Port	80	Specifies the port that will be used by the load balancer to receive requests from clients.



Parameter	Example Value	Description
Redirect	-	Specifies whether to redirect requests from the HTTP listener to an HTTPS listener. Disable it in this example.
Access Control	All IP addresses	Specifies how access to the listener is controlled. For details, see <a href="#">What Is Access Control?</a>
Transfer Client IP Address	-	Specifies whether to transmit IP addresses of the clients to backend servers. This feature is enabled for dedicated load balancers by default and cannot be disabled.
Advanced Forwarding	-	Specifies whether to enable the advanced forwarding policy. Once it is enabled, more forwarding rules and actions are supported. Enable it in this example.

3. Retain the default values for **Advanced Settings**. Click **Next: Configure Request Routing Policy**. On the **Configure Routing Policy** page, select **Create new** for **Backend Server Group**.  
Set **Load Balancing Algorithm** to **Weighted round robin** and retain the default values for other parameters.
4. Click **Next: Add Backend Server**.
  - Backend servers: Click **Add Backend Server** and select **ECS01** and **ECS02** from the server list.
  - Backend ports: Set them to **80**. **ECS01** and **ECS02** will use this port to communicate with the load balancer.
5. Configure health check parameters. In this example, retain the default settings.
6. Click **Next: Confirm**, confirm the settings, and click **Submit**.

## Step 6: Verify Load Balancing

After the load balancer is configured, you can access the domain name to check whether the two ECSs are accessible.

1. Modify the **C:\Windows\System32\drivers\etc\hosts** file on your PC to map the domain name to the EIP bound to the load balancer.  
View the EIP on the **Summary** page of the load balancer.

**Figure 1-11** hosts file on your PC

```
# localhost name resolution is handled within DNS itself.
# 127.0.0.1 localhost
# ::1 localhost

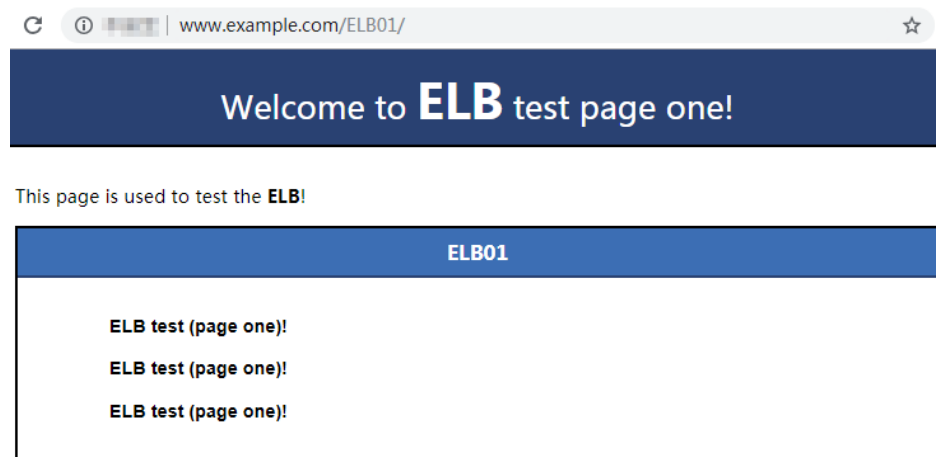
117.77.114.14 www.example.com
```

2. Choose **Start** and enter **cmd** to open the CLI.
3. Run the following command to check whether the domain name is mapped to the load balancer EIP:  

```
ping www.example.com
```

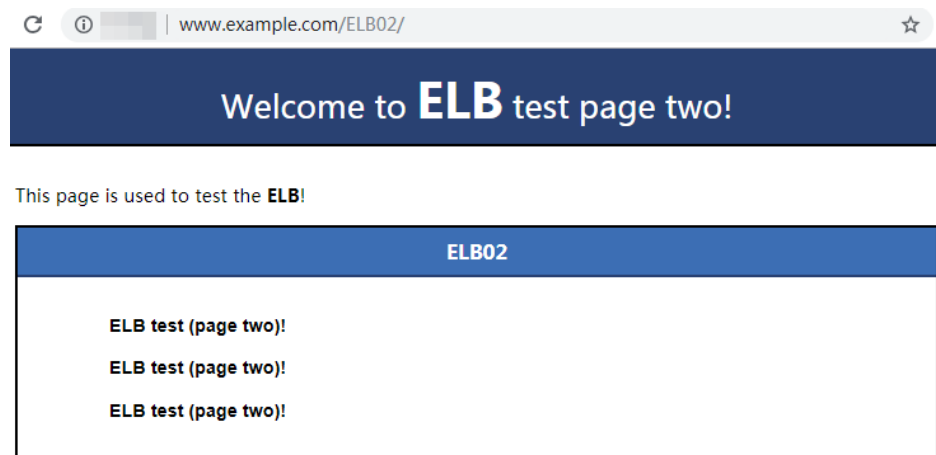
If data packets are returned, the domain name has been mapped to the load balancer EIP.
4. Use your browser to access **http://www.example.com**.  
If the following page is displayed, the load balancer has routed the request to **ECS01**.

**Figure 1-12** Accessing ECS01



5. Use your browser to access **http://www.example.com** again.  
If the following page is displayed, the load balancer has routed the request to **ECS02**.

**Figure 1-13** Accessing ECS02



# 2 Using ELB to Distribute Traffic to Multiple Web Applications Across ECSs

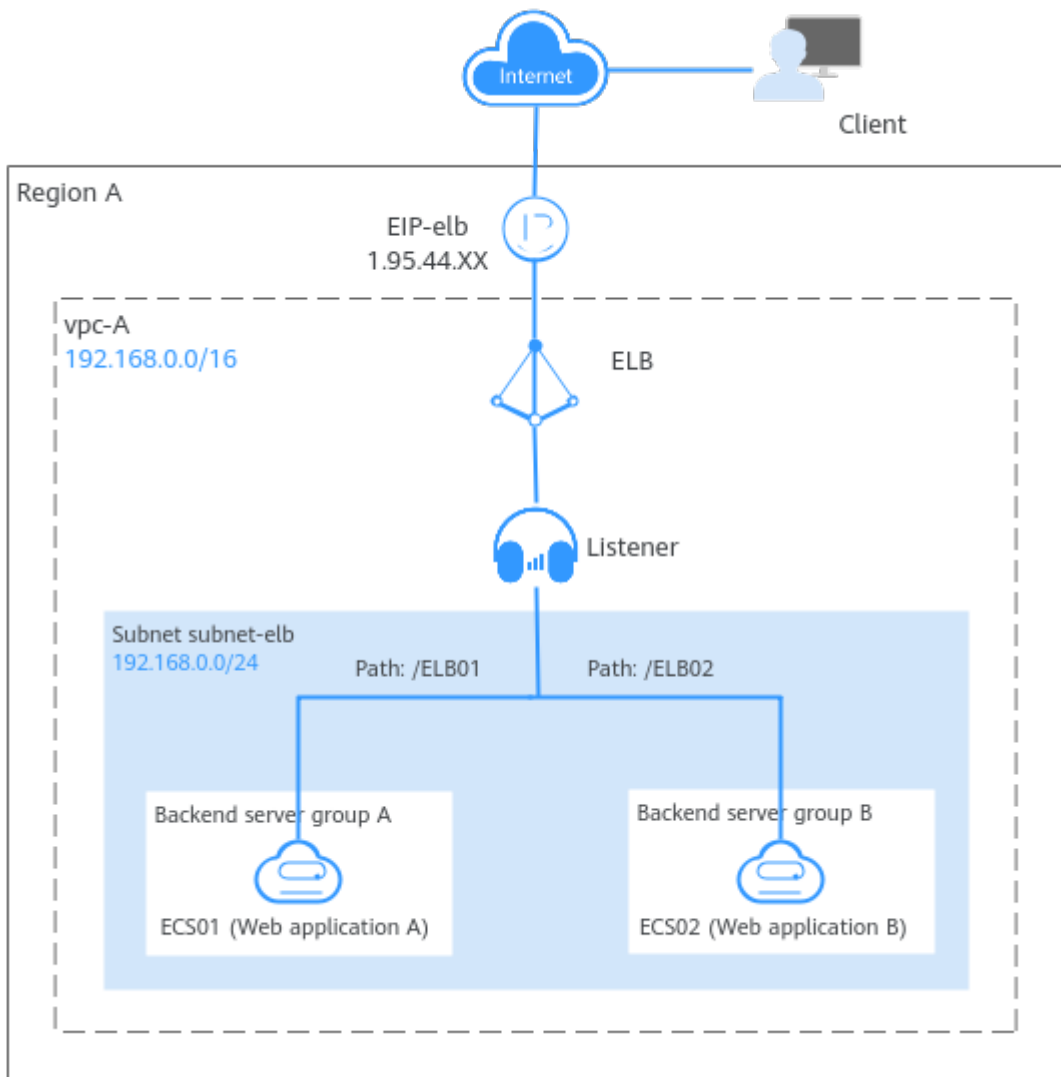
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## Scenarios

To forward requests based on domain names and paths, you need to create a load balancer, add an HTTP or HTTPS listener, and add forwarding policies to specify the domain names and paths.

If you have two web applications that are deployed on two ECSs (**ECS01** and **ECS02** in this example) but use the same domain name for access, you can set different paths to process requests.

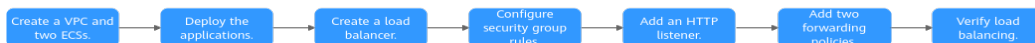
**Figure 2-1** Using ELB to distribute traffic to two applications



## Procedure

You can follow the process in [Figure 2-2](#) to use a load balancer to route requests to two web applications.

**Figure 2-2** Routing requests to two web applications deployed in separated ECSs



Procedure	What to Do
<b>Preparations</b>	Before using cloud services, sign up for a HUAWEI ID, enable Huawei Cloud services, complete real-name authentication, and top up your account.

Procedure	What to Do
<b>Step 1: Create a VPC and Two ECSs</b>	<ul style="list-style-type: none"><li>• Create a VPC with an IPv4 CIDR block and create a subnet in the VPC.<ul style="list-style-type: none"><li>– VPC IPv4 CIDR block: 192.168.0.0/16</li><li>– Subnet IPv4 CIDR block: 192.168.0.0/24</li></ul></li><li>• Buy two ECSs in the VPC subnet you have created.</li></ul>
<b>Step 2: Deploy the Applications</b>	Deploy Nginx on the two ECSs.
<b>Step 3: Create a Load Balancer</b>	Create a load balancer with elastic specifications to receive requests from clients and distribute the requests to backend servers.
<b>Step 4: Configure Security Group Rules</b>	Configure security group rules to allow traffic from the backend subnet where the load balancer works to the backend servers.
<b>Step 5: Add a Listener</b>	Add an HTTP listener to the load balancer to check requests from clients and route requests to backend servers in the backend server group.
<b>Step 6: Add Two Forwarding Policies</b>	Configure two forwarding policies for the HTTP listener to enable the listener to forward requests to different backend server groups based on the configured domain name and URL.
<b>Step 7: Verify Load Balancing</b>	Access the domain name of the load balancer to check whether different backend servers can be accessed.

## Preparations

Before using ELB, you need to:

- [Create a HUAWEI ID and enable Huawei Cloud services.](#)
- [Complete real-name authentication.](#)
- [Top up your account.](#)

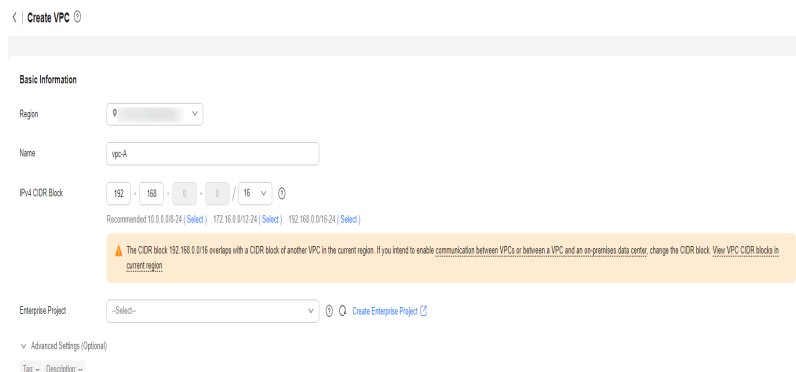
## Step 1: Create a VPC and Two ECSs

You need to plan the region for your load balancer, and create a VPC and two ECSs. Ensure that the ECSs and load balancer are in the same AZ and VPC.

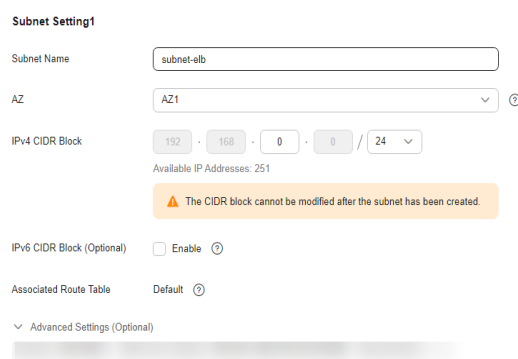
1. Create a VPC.

Configure the VPC as shown in the below figure. For details, see [Creating a VPC](#).

**Figure 2-3** Configuring a VPC



**Figure 2-4** Configuring a VPC subnet



VPC Configurations

- Configuring a VPC

Parameter	Example Value	Description
Region	CN-Hong Kong	The region where the VPC is created. Select the region nearest to you to ensure the lowest possible latency. The VPC, ECS, and EIP used in this example must be in the same region.
Name	vpc-A	The VPC name. Set it to <b>vpc-A</b> .
IPv4 CIDR Block	192.168.0.0/16	The IPv4 CIDR block of <b>vpc-A</b> .
Enterprise Project	default	The enterprise project by which VPCs are centrally managed. Select an existing enterprise project for <b>vpc-A</b> .
Advanced Settings (Optional)	-	In this example, retain the default value.

- Configuring a VPC subnet

Parameter	Example Value	Description
AZ	AZ1	A geographic location with independent power supply and network facilities in a region. Each region contains multiple AZs. AZs are physically isolated but connected through an internal network. Subnets of a VPC can be located in different AZs without affecting communications. You can select any AZ in a region.  The ECS and VPC can be in different AZs. For example, you can select AZ1 for the ECS and AZ3 for the VPC subnet.
Subnet Name	subnet-elb	The subnet name. Set it to <b>subnet-elb</b> .
IPv4 CIDR Block	192.168.0.0/24	The IPv4 CIDR block of <b>subnet-elb</b> , which is a unique CIDR block with a range of IP addresses in <b>vpc-A</b> .
IPv6 CIDR Block (Optional)	Do not enable	Whether to assign IPv6 addresses.
Associated Route Table	Default	The default route table that <b>subnet-elb</b> is associated with. The default route table has a preset system route that allows subnets in a VPC to communicate with each other.
Advanced Settings (Optional)	-	In this example, retain the default value.

## 2. Create two ECSs.

Configure the ECSs as described in the below table. For details, see [Quickly Creating an ECS](#).

ECS Configurations

- Configuring the network parameters for the two ECSs

Parameter	Example Value	Description
ECS Name	<ul style="list-style-type: none"><li>• ECS01</li><li>• ECS02</li></ul>	Names of the two ECSs. Set them to <b>ECS01</b> and <b>ECS02</b> .

Parameter	Example Value	Description
Region	CN-Hong Kong	The region where the ECSs are deployed. Select the same region as that of <b>vpc-A</b> .
AZ	<ul style="list-style-type: none"><li>AZ1</li><li>AZ2</li></ul>	The AZ where the ECSs are deployed. Select different AZs for the two ECSs.
Network	<ul style="list-style-type: none"><li>vpc-A</li><li>subnet-elb</li></ul>	The VPC subnet where the ECSs work. Select <b>vpc-A</b> and <b>subnet-elb</b> for the two ECSs.
EIP	<ul style="list-style-type: none"><li>EIP01</li><li>EIP02</li></ul>	The EIP bound to each ECS for Internet access.

## Step 2: Deploy the Applications

Deploy Nginx on the two ECSs and edit two HTML pages so that a page with message "Welcome to ELB test page one!" is returned when **ECS01** is accessed, and the other page with message "Welcome to ELB test page two!" is returned when **ECS02** is accessed.

1. [Log in to the ECSs](#).
2. Install and start Nginx.

CentOS 7.6 is used as an example here.

Deploying Nginx

- a. Run the **wget** command to download the Nginx installation package for your operating system in use.  

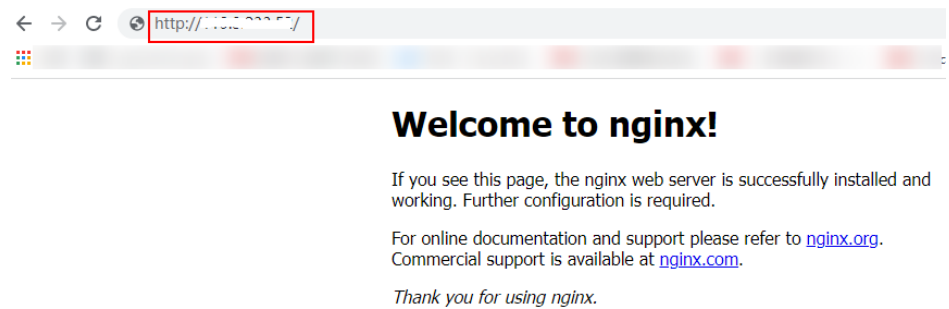
```
wget http://nginx.org/packages/centos/7/noarch/RPMS/nginx-release-centos-7-0.el7ngx.noarch.rpm
```
- b. Run the following command to create the Nginx yum repository. CentOS 7.6 is used as an example here.  

```
rpm -ivh nginx-release-centos-7-0.el7ngx.noarch.rpm
```
- c. Run the following command to install Nginx:  

```
yum -y install nginx
```
- d. Run the following commands to start Nginx and configure automatic Nginx enabling upon ECS startup:  

```
systemctl start nginx  
systemctl enable nginx
```
- e. Enter **http://EIP bound to the ECS** in the address box of your browser. If the following page is displayed, Nginx has been installed.



**Figure 2-5** Nginx installed successfully

### 3. Modify the HTML page of ECS01.

Move the **index.html** file from the default root directory of Nginx **/usr/share/nginx/html** to the **ELB01** directory and modify the file to identify access to ECS01.

#### Modifying the HTML Page of ECS01

- Create the **ELB01** directory and copy the **index.html** file to this directory:  

```
mkdir /usr/share/nginx/html/ELB01  
cp /usr/share/nginx/html/index.html /usr/share/nginx/html/ELB01/
```
- Run the following command to open the **index.html** file:  

```
vim /usr/share/nginx/html/ELB01/index.html
```
- Press **i** to enter editing mode.
- Modify the **index.html** file.

Modify the following content:

```
...  
<body>  
  <h1>Welcome to <strong>ELB</strong> test page one!</h1>  
  
  <div class="content">  
    <p>This page is used to test the <strong>ELB</strong>!</p>  
  
    <div class="alert">  
      <h2>ELB01</h2>  
      <div class="content">  
        <p><strong>ELB test (page one)!</strong></p>  
        <p><strong>ELB test (page one)!</strong></p>  
        <p><strong>ELB test (page one)!</strong></p>  
      </div>  
    </div>  
  </div>  
</body>
```

- Press **Esc** to exit the editing mode. Then, enter **:wq** to save the settings and exit the file.
- ### 4. Modify the HTML page of ECS02 by referring to step 3 to identify the access to ECS02.

#### Modifying the HTML Page of ECS02

- Create the **ELB02** directory and copy the **index.html** file to this directory:  

```
mkdir /usr/share/nginx/html/ELB02  
cp /usr/share/nginx/html/index.html /usr/share/nginx/html/ELB02/
```
- Run the following command to open the **index.html** file:  

```
vim /usr/share/nginx/html/ELB02/index.html
```
- Press **i** to enter editing mode.
- Modify the **index.html** file.

Modify the following content:

```
...  
<body>  
  <h1>Welcome to <strong>ELB</strong> test page two!</h1>  
  
  <div class="content">  
    <p>This page is used to test the <strong>ELB</strong>!</p>  
  
    <div class="alert">  
      <h2>ELB02</h2>  
      <div class="content">  
        <p><strong>ELB test (page two)!</strong></p>  
        <p><strong>ELB test (page two)!</strong></p>  
        <p><strong>ELB test (page two)!</strong></p>  
      </div>  
    </div>  
  </div>  
</body>
```

- e. Press **Esc** to exit the editing mode. Then, enter **:wq** to save the settings and exit the file.
5. Use your browser to access **http://ECS01 EIP/ELB01/** and **http://ECS02 EIP/ELB02/** to verify that Nginx has been deployed.

If the modified HTML pages are displayed, Nginx has been deployed.

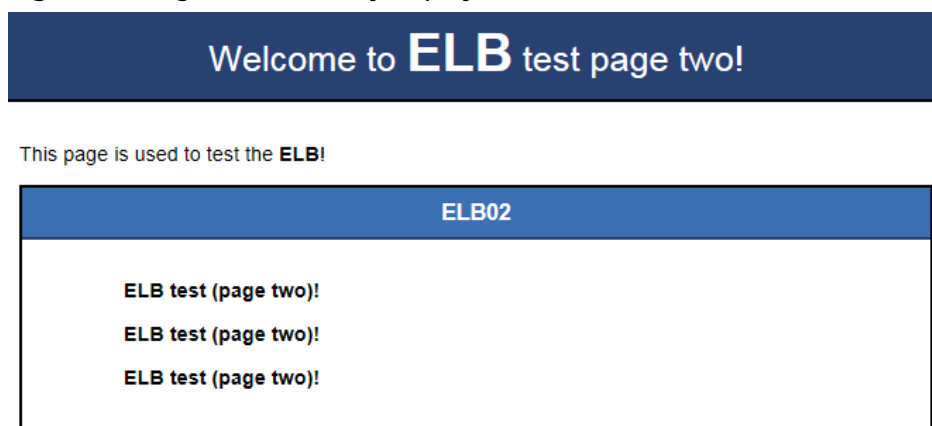
- HTML page of **ECS01**

**Figure 2-6** Nginx successfully deployed on **ECS01**



- HTML page of **ECS02**

**Figure 2-7** Nginx successfully deployed on **ECS02**



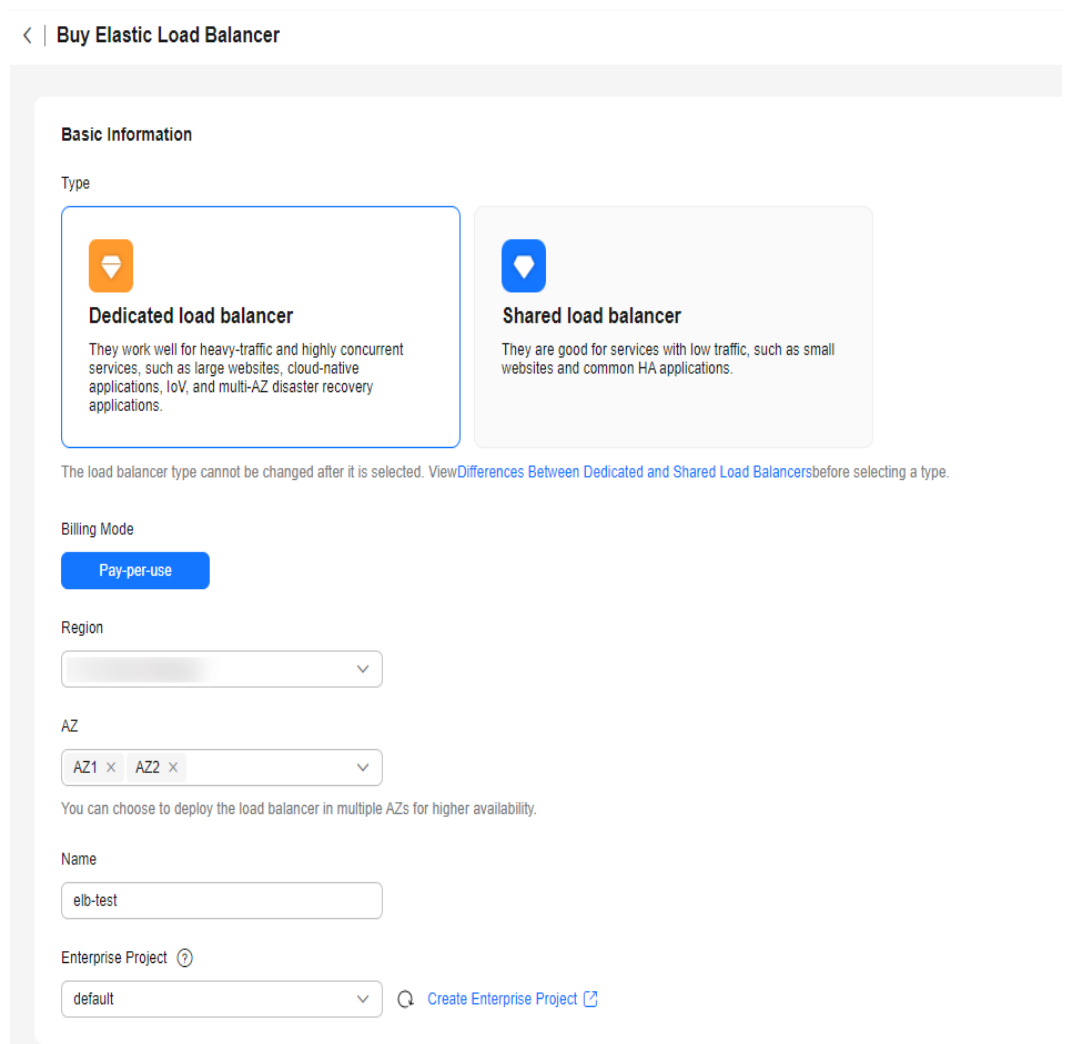
### Step 3: Create a Load Balancer

The load balancer needs an EIP to access the application deployed on the ECSs over the Internet. You can determine whether to bind an EIP to the load balancer based on your requirements.

1. Go to the [Buy Elastic Load Balancer](#) page.
2. On the displayed page, set the parameters as required.

**Figure 2-8** lists the basic parameters in this example.

**Figure 2-8** Configuring the basic information



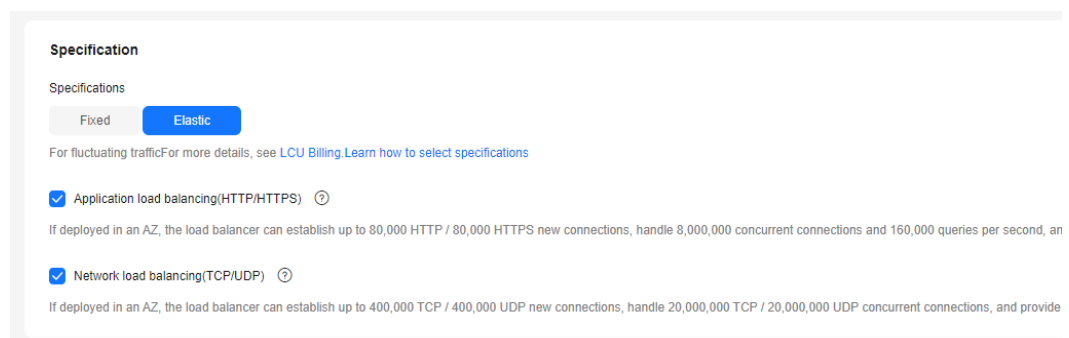
#### Basic Configurations

- Configuring the basic information

Parameter	Example Value	Description
Type	Dedicated load balancer	Specifies the type of the load balancer. Select <b>Dedicated load balancer</b> . A dedicated load balancer uses dedicated resources. Its performance is not affected by other load balancers.
Billing Mode	Pay-per-use	Specifies the billing mode of the dedicated load balancer.
Region	-	Specifies the desired region. Resources in different regions cannot communicate with each other over internal networks. Select the same region as the ECSs.
AZ	<ul style="list-style-type: none"> <li>AZ1</li> <li>AZ2</li> </ul>	Specifies the AZ of the load balancer. Select multiple AZs if you need DR capability. The load balancer performance multiplies as the number of AZs increases.
Name	elb-test	Specifies the name of the load balancer.
Enterprise Project	default	Specifies an enterprise project by which cloud resources and members are centrally managed.

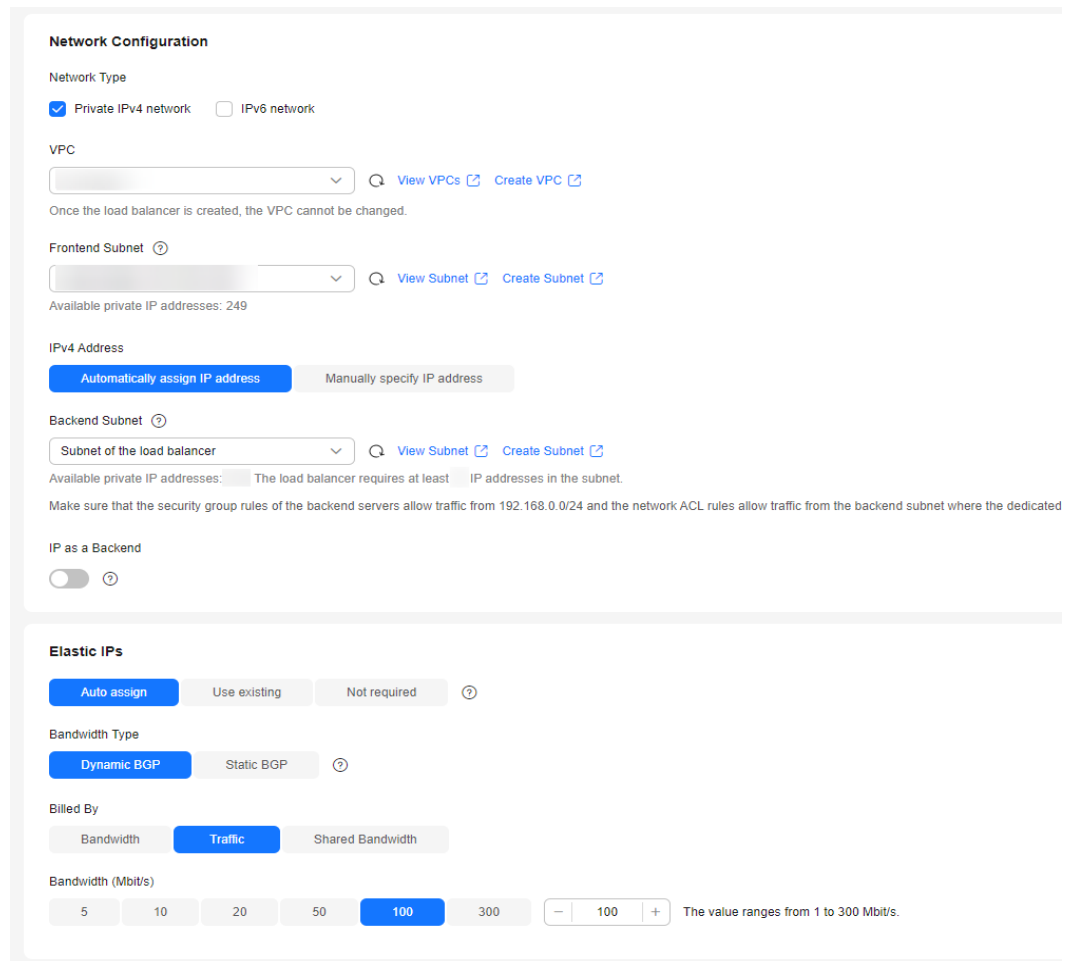
3. Set **Specifications** to **Elastic**, as shown in **Figure 2-9**.

**Figure 2-9** Load balancer specifications



4. Configure the network parameters and EIP information based on **Figure 2-10**.

Figure 2-10 Network parameters




### Network Configurations

- Configuring network parameters

Parameter	Example Value	Description
Network Type	Private IPv4 network	Specifies the network where the load balancer works. In this example, select <b>Private IPv4 network</b> . The load balancer uses the private IPv4 address to process private network requests. To let the load balancer route requests over the Internet, bind an EIP to it.
VPC	-	Specifies the VPC where the load balancer works. In this example, select <b>vpc-A</b> .

Parameter	Example Value	Description
Frontend Subnet	-	Specifies the frontend subnet from which an IPv4 address will be assigned to the load balancer to receive client requests. If IPv6 is enabled, an IPv6 address will also be assigned to the load balancer.
IPv4 Address	Automatically assign IP address	Specifies how you want the IPv4 address to be assigned.
Backend Subnet	Subnet of the load balancer	Specifies the backend subnet from which an IP address will be assigned to the load balancer to forward requests to backend servers.
IP as a Backend	-	Specifies whether to add IP addresses as backend servers that are not in the VPC of the load balancer. In this example, leave this feature disabled.
<b>Elastic IPs</b>		
EIP	New EIP	Specifies the public IP address that will be bound to the load balancer for receiving and forwarding requests over the Internet. This parameter is mandatory when <b>Network Type</b> is set to <b>IPv4 public network</b> .
Bandwidth Type	Dynamic BGP	Specifies the link type (BGP) when a new EIP is used.
Billed By	Traffic	Specifies how the bandwidth will be billed. In this example, select <b>Traffic</b> . You need to specify a maximum bandwidth and pay for the outbound traffic you use.
Bandwidth (Mbit/s)	100	Specifies the maximum bandwidth when a new EIP is used, in Mbit/s. The value ranges from 1 Mbit/s to 300 Mbit/s.

- Specifies the maximum bandwidth. Click  to expand the advanced settings and add a description and tags to the load balancer.
- Click **Next**.
- Confirm the configuration and submit your request.
- View the newly created load balancer in the load balancer list.

## Step 4: Configure Security Group Rules

To ensure normal communications between the load balancer and backend servers, you need to check the security group and network ACL rules.

- The security groups configured for backend servers must have inbound rules to allow health check and service traffic from backend subnet of the load balancer to backend servers. By default, the backend subnet of a load balancer is the same as the subnet where the load balancer works.
- Network ACL rules are optional for subnets. If network ACL rules are configured for the backend subnet of the load balancer, the inbound rules must allow traffic from the backend subnet to the backend servers.

For details about how to configure security group and network ACL rules, see [Security Group and Network ACL Rules](#)

You can configure security group rules based on [Table 2-1](#).

**Table 2-1** Security group rules

Direction	Action	Type	Protocol & Port	Source/Destination	Description
Inbound	Allow	IPv4	TCP: 80	Source: 192.168.0.0/24	Allows outbound traffic to ECSs in the security group.
Outbound	Allow	IPv4	All	Destination: 0.0.0.0/0	Allows the ECSs in the security group to access the Internet.

## Step 5: Add a Listener

Add a listener to the created load balancer. When you add the listener, create a backend server group, configure a health check, and add the two ECSs to this backend server group. If a backend server is detected unhealthy, the load balancer will stop routing traffic to it until the backend server recovers.

1. On the load balancer list page, locate load balancer **elb-test** and click its name.
2. On the **Listeners** tab, click **Add Listener** and configure parameters based on [Table 2-2](#).

**Table 2-2** Parameters for configuring a listener

Parameter	Example Value	Description
Name	listener	Specifies the listener name.
Frontend Protocol	HTTP	Specifies the protocol that will be used by the load balancer to receive requests from clients.
Frontend Port	80	Specifies the port that will be used by the load balancer to receive requests from clients.

Parameter	Example Value	Description
Redirect	-	Specifies whether to redirect requests from the HTTP listener to an HTTPS listener. Disable it in this example.
Access Control	All IP addresses	Specifies how access to the listener is controlled. For details, see <a href="#">What Is Access Control?</a>
Transfer Client IP Address	-	Specifies whether to transmit IP addresses of the clients to backend servers. This feature is enabled for dedicated load balancers by default and cannot be disabled.
Advanced Forwarding	-	Specifies whether to enable the advanced forwarding policy. Once it is enabled, more forwarding rules and actions are supported. Enable it in this example.

3. Retain the default values for **Advanced Settings**. Click **Next: Configure Request Routing Policy**. On the **Configure Routing Policy** page, select **Create new** for **Backend Server Group**.  
Set **Load Balancing Algorithm** to **Weighted round robin** and retain the default values for other parameters.
4. Click **Next: Add Backend Server**.
  - Backend servers: Click **Add Backend Server** and select **ECS01** and **ECS02** from the server list.
  - Backend ports: Set them to **80**. **ECS01** and **ECS02** will use this port to communicate with the load balancer.
5. Configure health check parameters. In this example, retain the default settings.
6. Click **Next: Confirm**, confirm the settings, and click **Submit**.

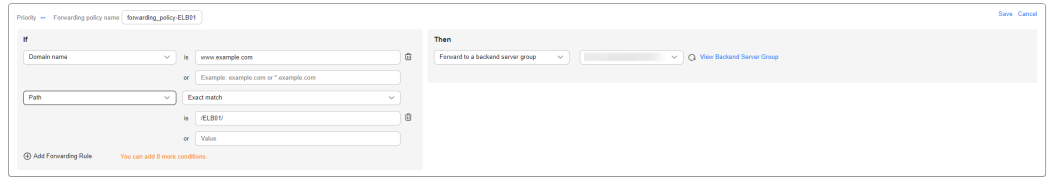
## Step 6: Add Two Forwarding Policies

The following describes how to configure forwarding policies to forward HTTP requests to the two ECSs, for example, requests from **www.example.com/ELB01/** to **ECS01** and **www.example.com/ELB02/** to **ECS02**.

1. On the listener list page, locate the listener you have added in the previous step and click **Add/Edit Forwarding Policy** in the **Forwarding Policies** column. In the displayed page, click **Add Forwarding Policy**.  
Configure the forwarding policy as shown in [Figure 2-11](#). For details about the parameters, see [Table 2-3](#).



**Figure 2-11** Configuring a forwarding policy



**Table 2-3** An example forwarding policy

Forwarding Policy Item	Setting
Name	Enter a forwarding policy name, for example, <b>forwarding_policy-ELB01</b> .
Forwarding rule	<b>Domain name:</b> Enter a domain name that will be used to forward the requests, for example, <b>www.example.com</b> . The domain name in the request must exactly match what is specified in the forwarding policy. <b>Path:</b> Specify a path to forward the requests, for example, <b>/ELB01/</b> .
Action	Select <b>Forward to a backend server group</b> .

2. Create a backend server group for forwarding policy **forwarding\_policy-ELB01**.
  - a. Select **Create Backend Server Group** from the drop-down list to the right of **Forward to a backend server group**.
  - b. In the **Configure Routing Policy** step, set the backend server group name to **server\_group-ELB01**.  
Use default settings for other parameters.
  - c. Click **Next**. In the **Add Backend Server** step, click **Add Backend Server**.
3. On the displayed page, select cloud server **ECS01**, set the backend port to **80**, and click **OK**.
4. Repeat **1** to **3** to add another forwarding policy, create a backend server group, and add **ECS02** to the backend server group.

## Step 7: Verify Load Balancing

After the load balancer is configured, you can access the domain name or the specified URL to check whether the two ECSs are accessible.

1. Modify the **C:\Windows\System32\drivers\etc\hosts** file on your PC to map the domain name to the EIP bound to the load balancer .  
View the EIP on the **Summary** page of the load balancer.

Figure 2-12 hosts file on your PC

```
# localhost name resolution is handled within DNS itself.  
# 127.0.0.1 localhost  
# ::1 localhost  
  
11.11.11.14 www.example.com
```

2. Choose **Start** and enter **cmd** to open the CLI.
3. Run the following command to check whether the domain name is mapped to the load balancer EIP:  
`ping www.example.com`  
If data packets are returned, the domain name has been mapped to the load balancer EIP.
4. Use your browser to access **http://www.example.com/ELB01/**.  
If the following page is displayed, the load balancer has routed the request to **ECS01**.

Figure 2-13 Accessing ECS01



**NOTE**

**ELB01/** indicates that the default directory named **ECS01** is accessed, while **ELB01** indicates the file name. This means the slash (/) following **ELB01** must be retained.

5. Use your browser to access **http://www.example.com/ELB02/**.  
If the following page is displayed, the load balancer has routed the request to **ECS02**.

**Figure 2-14** Accessing ECS02

