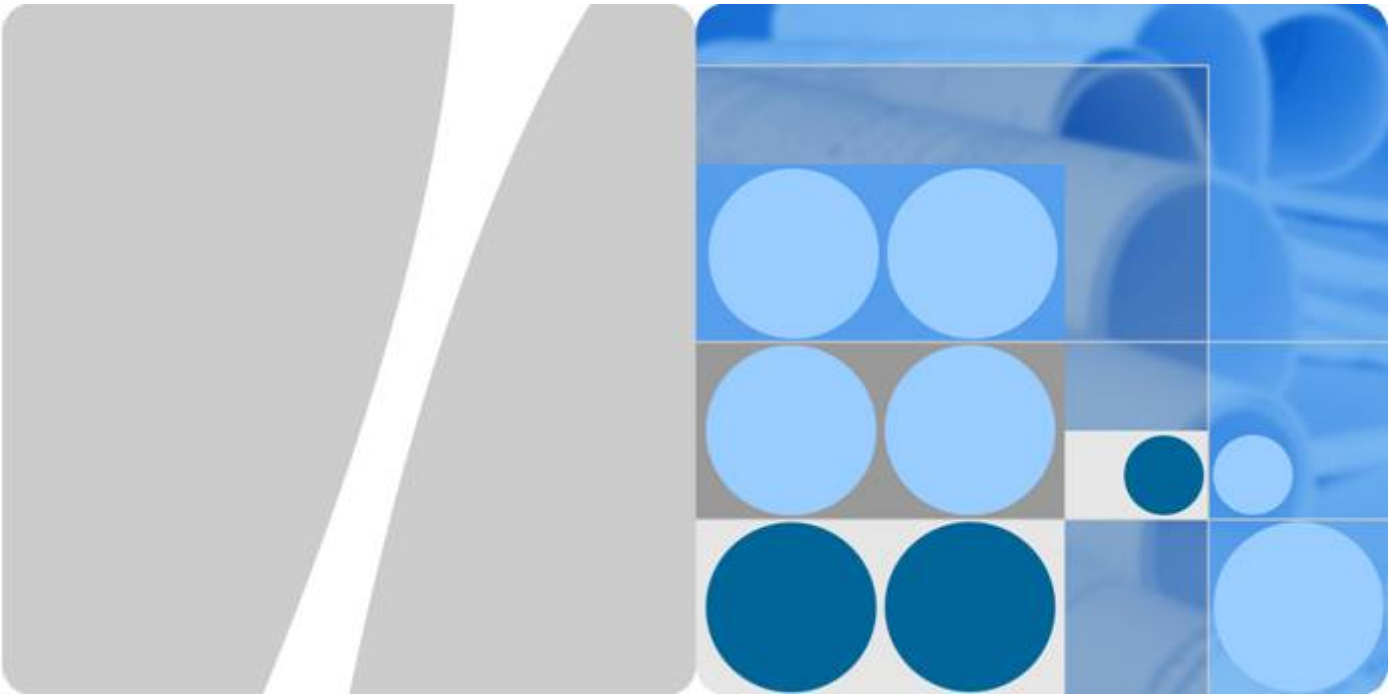

Enterprise Router

User Guide

Date 2023-12-30

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1 Service Overview

1.1 What's an Enterprise Router?

An enterprise router connects virtual private clouds (VPCs) and on-premises networks to build a central hub network. It has high specifications, provides high bandwidth, and delivers high performance. Enterprise routers use the Border Gateway Protocol (BGP) to learn, dynamically select, or switch between routes, thereby ensuring the service continuity and significantly improving network scalability and O&M efficiency.

Figure 1-1 and **Figure 1-2** show the networks with and without enterprise routers, respectively. **Table 1-1** compares the two networks.

Figure 1-1 A network without enterprise routers

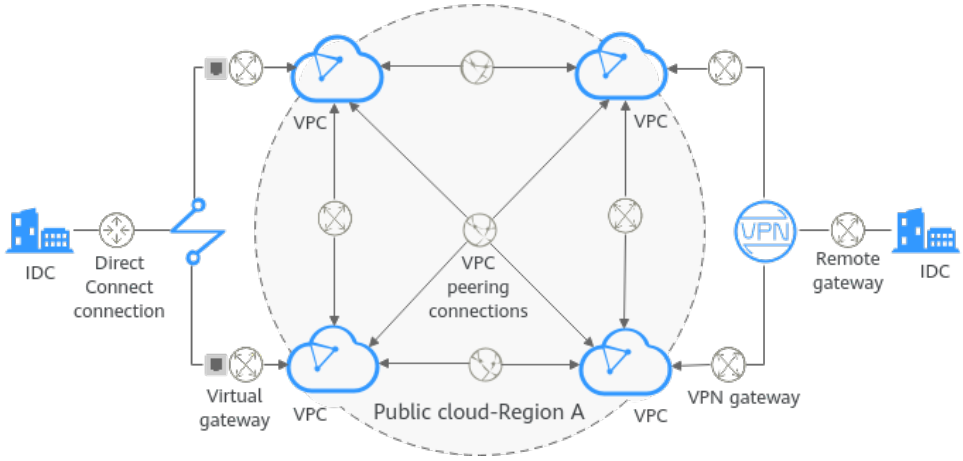


Figure 1-2 A network with enterprise routers

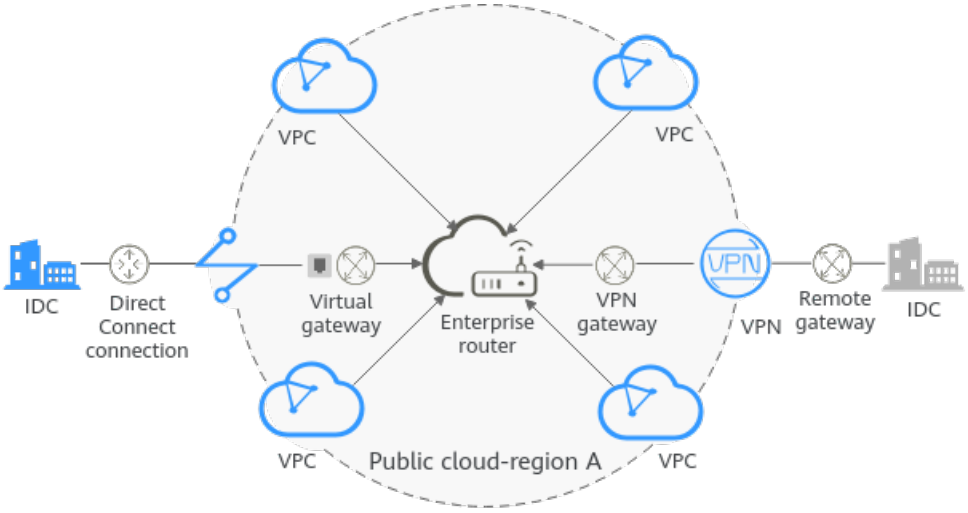


Table 1-1 Comparison between the networks with and without enterprise routers

Item	Without Enterprise Routers	With Enterprise Routers	Benefits of Using Enterprise Routers
Communications among VPCs in the same region	• Create six VPC peering connections between these four VPCs in the same region. • Add 12 routes, with three routes for each VPC to communicate with the other three VPCs.	• Attach the four VPCs to one enterprise router. This router can then handle the traffic from and to all the connected VPCs. • Add routes to the route tables of these four VPCs for routing traffic through the enterprise router. The enterprise router can automatically learn the VPC CIDR blocks and add them to its route table.	• There is no need to configure a large number of VPC peering connections. • Fewer routes need to be added, simplifying the maintenance.

Item	Without Enterprise Routers	With Enterprise Routers	Benefits of Using Enterprise Routers
Communications between an on-premises data center and VPCs	Establish Direct Connect or VPN connections between each VPC and the data center.	Attach the Direct Connect or VPN connection to the enterprise router. These VPCs can then share the connection.	• Route propagation simplifies the route configuration and the O&M. • Multiple lines work in load-sharing or active/standby mode to achieve higher availability.

The comparison shows that the network with enterprise routers is simpler and highly scalable and is also easier to maintain.

1.2 Why Using Enterprise Routers

Enterprise routers have the following advantages:

High Performance

Enterprise routers use exclusive resources and are deployed in clusters to deliver the highest possible performance for workloads on large-scale networks.

High Availability

Enterprise routers can be deployed in multiple availability zones to work in active-active or multi-active mode, thereby ensuring service continuity and real-time seamless switchovers.

Simplified Management

Enterprise routers can connect to multiple VPCs, Direct Connect connections, or enterprise routers in different regions and route traffic among them. The network topology is simpler and the network is easier to manage and maintain.

- For cross-VPC communications, you only need to maintain the route tables on the VPCs without requiring so many VPC peering connections.
- For communications between VPCs and an on-premises data center, multiple VPCs can connect to an enterprise router and then communicate with the data center over one Direct Connect or VPN connection. You do not need to establish a Direct Connect or VPN connection between the data center and each of the VPCs.
- Enterprise routers can automatically learn, update, and synchronize routes, eliminating the need to manually configure or update routes whenever the network topology changes.

Seamless Failover Between Lines

Enterprise routers use the Border Gateway Protocol (BGP) to select the best path from multiple lines working in load-sharing or active/standby mode. If a single line fails, services can be failed over to another functioning line within seconds to ensure service continuity.

1.3 When to Use Enterprise Routers

You can use enterprise routers to build cloud, on-premises, or hybrid networks. Here are some typical application scenarios:

- **Scenario 1: Multiple VPCs communicating or not communicating with each other on the cloud, but communicating with the on-premises data center through a Direct Connect connection**
- **Scenario 2: Dynamic switchover between multiple Direct Connect connections**
- **Scenario 3: Active/Standby Direct Connect and VPN connections**

Scenario 1: Multiple VPCs communicating or not communicating with each other on the cloud, but communicating with the on-premises data center through a Direct Connect connection

Figure 1-3 Diagram for scenario 1

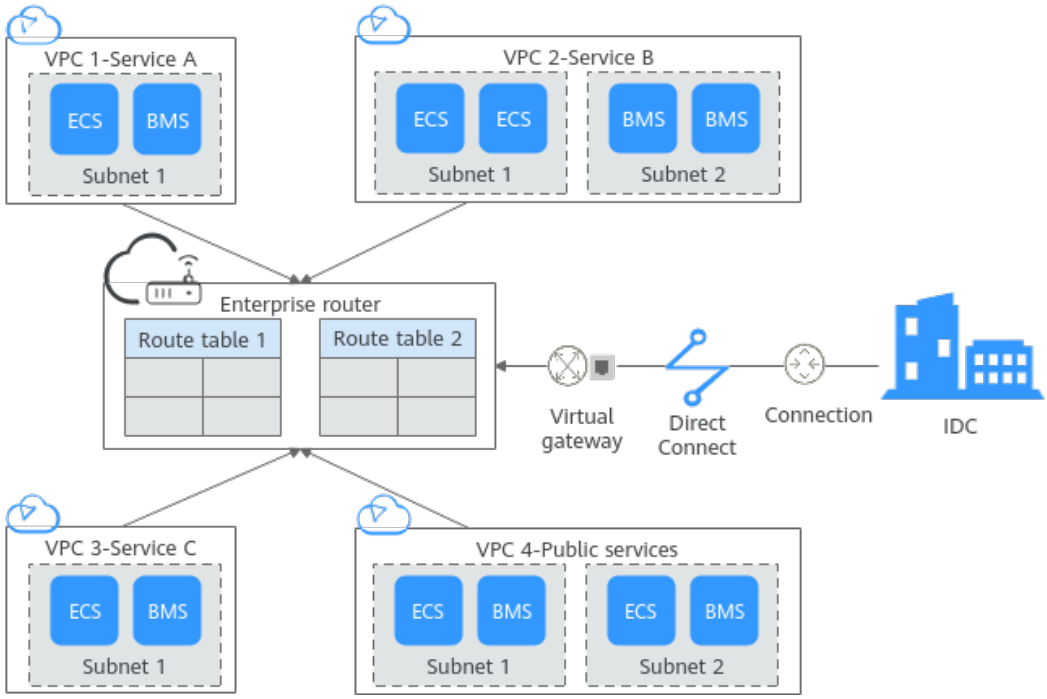


Table 1-2 Using enterprise routers in scenario 1

Customer Requirements	Multiple service networks communicate or do not communicate with each other on the cloud but communicate with the on-premises data center. For example, an enterprise requires three VPCs for running their workloads on the public cloud, and the three VPCs (services A, B, and C) need to access public services in VPC 4 and the on-premises data center.
Pain Points	• VPC peering connections are required for communications among these VPCs, but they will complicate the network topology and make the network hard to manage. • VPC peering connections and routes are required for the public service VPC to communicate with each VPC. However, VPC peering connections do not fit in large-scale networks because of the following limitations: – A maximum of 50 VPC peering connections can be created in one region. – A VPC route table can have a maximum of 200 routes. • Direct Connect connections are required for each VPC to communicate with the on-premises data center, but they will incur high costs.
Benefits of Using Enterprise Routers	• VPCs can be associated with different route tables on the enterprise router to enable communication or isolation. The network topology is simple and easy to manage. • Enterprise routers can route traffic among all the connected VPCs without the need to configure a large number of VPC peering connections. – Each enterprise router can have a maximum of 2,000 routes in each route table, making it ideal for large-scale complex networks. • Multiple VPCs can access the on-premises data center over a Direct Connect connection, eliminating the need to configure multiple Direct Connect connections and reducing the costs.

Scenario 2: Dynamic switchover between multiple Direct Connect connections

Figure 1-4 Diagram for scenario 2

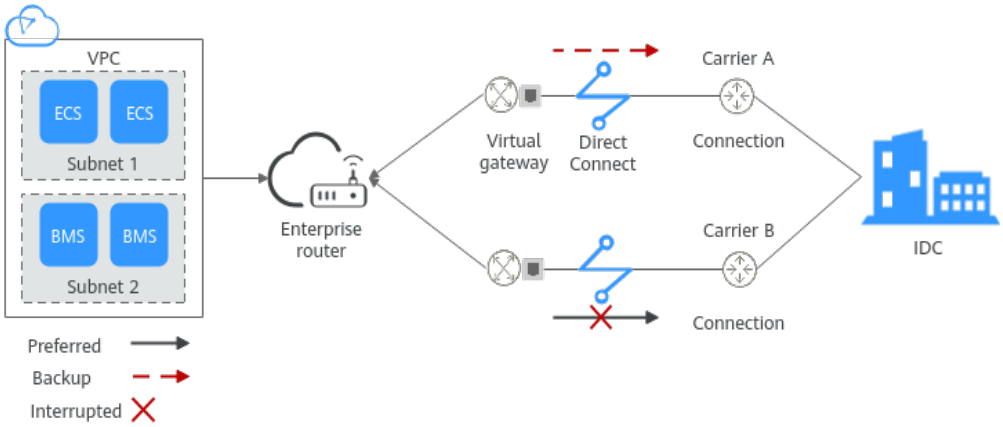


Table 1-3 Using enterprise routers in scenario 2

Customer Requirements	Some services run on the public cloud and some in the on-premises data center. Two independent high-bandwidth Direct Connect connections are deployed between the public cloud and the data center to enable communication between them.
Pain Points	Two Direct Connect connections are independent of each other and cannot work in load-sharing or active/standby mode.
Benefits of Using Enterprise Routers	Direct Connect connections are connected to the enterprise router. • Two Direct Connect connections can work in load-sharing mode to ensure high bandwidth and reliability. • Two Direct Connect connections can also work in active/standby mode. If one of the connections becomes unavailable, services are switched over to the other available connection within seconds, preventing service interruptions.

Scenario 3: Active/Standby Direct Connect and VPN connections

Figure 1-5 Diagram for scenario 3

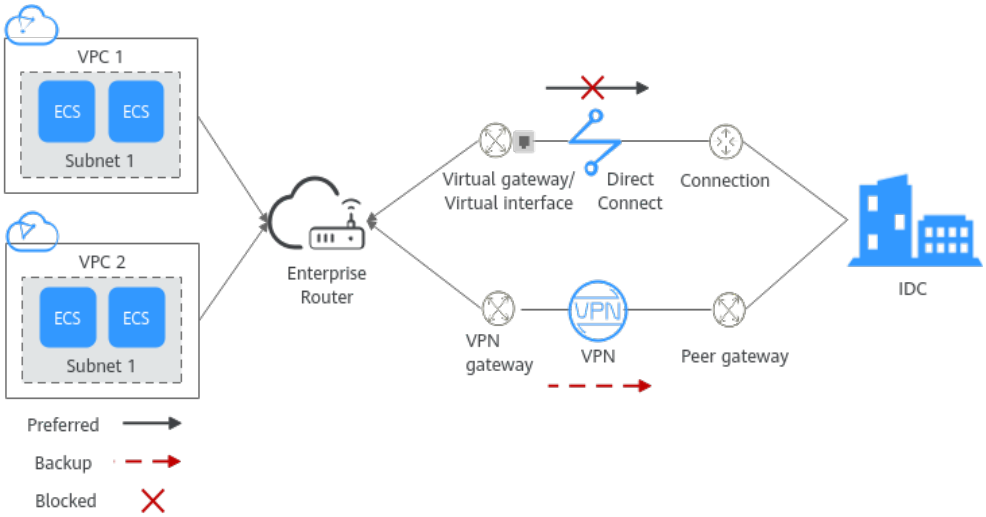


Table 1-4 Using enterprise routers in scenario 3

Customer Requirements	An enterprise is running workloads in their on-premises data center and on the public cloud. A single Direct Connect connection connects the on-premises data center to the cloud, which cannot ensure reliability.
Pain Points	To control costs, the customer cannot afford another Direct Connect connection.
Benefits of Using Enterprise Routers	In this example, there are two connections, one Direct Connect connection and a VPN connection. Enterprise Router, Direct Connect, and VPC are used to build a hybrid cloud. When the Direct Connect connection becomes faulty, the VPN connection takes over to ensure that connectivity is not interrupted.

1.4 Functions

An enterprise router provides the functions listed in **Table 1-5**, allowing you to:

- Manage attachments, custom route tables, associations, propagations, and routes.
- Manage permissions, tags, and quota to improve service security.

Table 1-5 Functions of an enterprise router

Function	Description	Reference
Enterprise routers	An enterprise router is a high-performance centralized router that supports route learning. When creating an enterprise router, you can set parameters such as its region, AZ, and name. After an enterprise router is created, you can still change its parameters based on service requirements.	**Creating an Enterprise Router**
Attachments	You can add attachments to attach network instances to the enterprise router. Different network instances are attached through different consoles. • VPCs are attached through the Enterprise Router console. • Virtual gateways are attached through the Direct Connect console. • VPN gateways are attached through the VPN console.	**Attachment Overview**
Route tables	Route tables are used by enterprise routers to forward packets. Route tables contain associations, propagations, and routes. An enterprise router can have multiple route tables. You can associate attachments with different route tables to enable communication or isolation between network instances.	**Route Table Overview**
Associations	Associations are created manually or automatically to associate attachments with enterprise router route tables. • Manually: Select a route table and create an association for an attachment in the route table. • Automatically: You just need to enable **Default Route Table Association** and specify the default route table. The system automatically creates an association for an attachment in the default route table.	**Association Overview**

Function	Description	Reference
Propagations	A propagation is created manually or automatically to enable an enterprise router to learn the routes to an associated attachment. • Manually: Select a route table and create a propagation for an attachment in the route table. • Automatically: You just need to enable **Default Route Table Propagation** and specify the default route table. A propagation is automatically created for an attachment in the default propagation route table.	**Propagation Overview**
Routes	A route consists of information such as the destination address, next hop, and route type. There are two types of routes: • Propagated routes • Static routes	**Route Overview**
Sharing	You are the owner of the enterprise router, and other accounts are the users of your enterprise router. After you share your enterprise router with other accounts, these other users can attach their network instances to your enterprise router, so that their network instances can access your enterprise router. This allows VPCs in the same region but different accounts to be attached to the same enterprise router.	**Sharing Overview**
Flow logs	The flow log function records traffic logs of attachments on enterprise routers in real time. The logs allow you to monitor the network traffic of attachments and analyze network attacks, helping you achieve efficient O&M. Flow logs can capture traffic of the following types of attachments: • VPC • Virtual gateway • VPN gateway	**Flow Log Overview**
Monitoring	You can use Cloud Eye to monitor the network status of enterprise routers and their attachments.	**Supported Metrics**
Auditing	You can use Cloud Trace Service (CTS) to record operations associated with your enterprise routers for future query, audit, and backtracking.	**Key Operations Recorded by CTS**

Function	Description	Reference
Permissions	You can use Identity and Access Management (IAM) to set different permissions for employees in your enterprise to control their access to enterprise routers.	**Creating a User and Granting Permissions**
Tags	Tags are used to identify cloud resources. You can add tags to enterprise routers and route tables.	**Overview**
Quotas	Quotas can limit the number or amount of resources available to users, for example, how many enterprise routers can be created, how many attachments can be created for each enterprise router, and how many routes can be added to each route table.	**Overview**

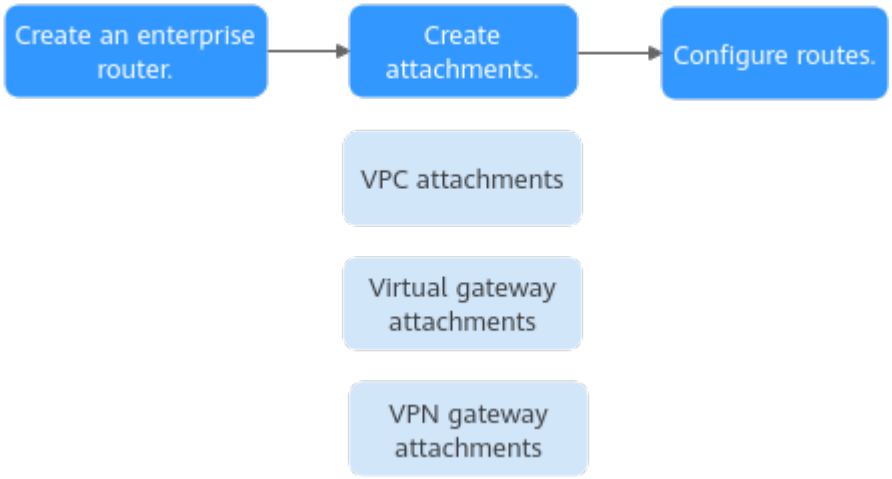
1.5 How Enterprise Routers Work

You can attach your network connections to an enterprise router to quickly construct diversified networks and meet various service requirements. **Figure 1-6** shows the process of using an enterprise router, including creating an enterprise router, adding attachments to the enterprise router, and configure routes.

Currently, enterprise routers support the following attachments:

- **VPC attachment**: Attach VPCs from the same region as that of an enterprise router to the router.
- **Virtual gateway attachment**: Attach Direct Connect virtual gateways from the same region as that of an enterprise router to the router.
- **VPN gateway attachment**: Attach VPN gateways from the same region as that of an enterprise router to the router.

Figure 1-6 Processing of using an enterprise router



The following describes how an enterprise router works.

Figure 1-7 How an enterprise router works

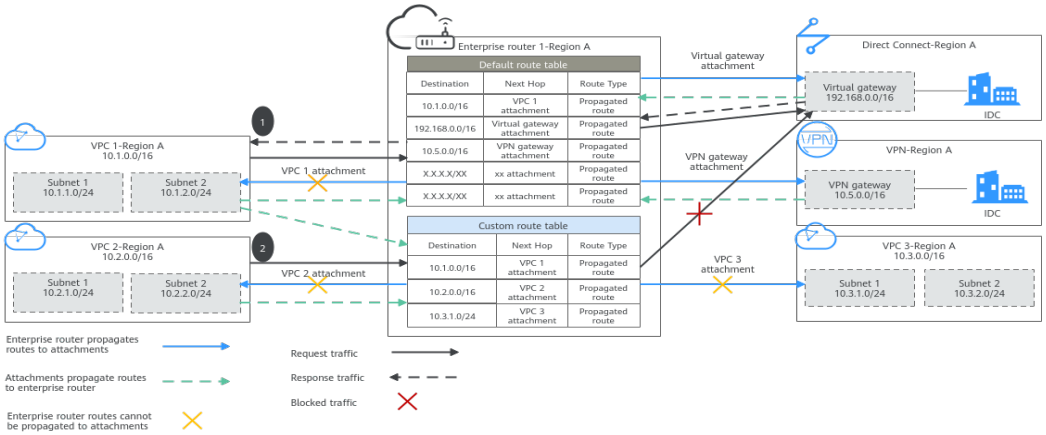


Table 1-6 Network traffic flows

No.	Route	Description
1	Request from VPC 1 to Direct Connect virtual gateway	After receiving requests from VPC 1 to the virtual gateway, enterprise router 1 searches the default route table for the route to the virtual gateway and forwards the requests through this route.
	Response from Direct Connect virtual gateway to VPC 1	After receiving responses from the virtual gateway to VPC 1, enterprise router 1 searches the default route table for the route to VPC 1 and forwards the responses through this route.
2	Request from VPC 2 to Direct Connect virtual gateway	Enterprise router 1 cannot forward requests from VPC 2 to the virtual gateway because the custom route table of enterprise router 1 that is associated with VPC 2 does not contain the route to this virtual gateway.

Table 1-7 Working principles of an enterprise router

No.	Action	Description
1	Add **attachments** to the enterprise router.	Attach network instances to enterprise router 1 in region A. • Network instances from the same region – **VPC attachments**: VPC 1, VPC 2, and VPC 3 – **Virtual gateway attachment**: Virtual gateway – **VPN gateway attachment**: VPN gateway

No.	Action	Description
2	Associate the **attachments** with the **route tables** of the enterprise router. Each attachment can only be associated with one route table.	• Associate VPC 1 with the default route table of enterprise router 1 and create a propagation to propagate the routes learned from VPC 1 attachment to the default route table and custom route table of enterprise router 1. • Associate VPC 2 with the custom route table of enterprise router 1 and create a propagation to propagate the routes learned from VPC 2 to the custom route table. • Associate VPC 3 with the custom route table of enterprise router 1, and add static routes for VPC 3 to this custom route table. • Associate the Direct Connect virtual gateway with the default route table of enterprise router 1 and create a propagation to propagate the routes learned from the virtual gateway attachment to the default route table. • Associate the VPN gateway with the default route table of enterprise router 1 and create a propagation to propagate the routes learned from the VPN gateway attachment to the default route table.
3	Create **propagation** for the attachments to propagate the **routes** to the enterprise router's **route tables**. You can create multiple propagation records for the same attachment.	

Attachments

If you want to attach a network instance to an enterprise router, you need to add an attachment of a specific type to the enterprise router. The attachment type varies according to the network instance, as listed in **Table 1-8**.

Table 1-8 Attachments

Attachment Type	Network Instance
VPC attachment	VPC
Virtual gateway attachment	Virtual gateway of Direct Connect
VPN gateway attachment	VPN gateway

Route Tables

Route tables are used by enterprise routers to forward packets. Route tables contain associations, propagations, and routes. Route tables are classified into custom and default route tables, as detailed in **Table 1-9**.

Table 1-9 Route tables

Route Table	Description
Custom route table	You can create multiple custom route tables on an enterprise router and use different routes for flexible communication and isolation between network instances.
Default route table	If you enable **Default Route Table Association** and **Default Route Table Propagation**, the system then automatically associates and propagates new attachments with the default route table. You can specify a custom route table as the default route table. If you do not specify any route table as the default route table, the system automatically creates a default route table.

Associations

Each attachment can be associated with one route table for:

- Packet forwarding: Packets from the attachment are forwarded through the routes specified in the associated route table.
- Route propagation: The routes in the associated route tables are automatically propagated to the route table of the attachment.

Not all attachments can propagate routes. For details, see **Table 1-10**.

Table 1-10 Associations

Attachment	Route Learning
VPC	Not supported
Virtual gateway	Supported
VPN gateway	Supported

Route Propagation

You can create a propagation for each attachment to propagate routes to one or more route tables on an enterprise router.

For VPC attachments, their CIDR blocks are propagated to the enterprise router. For other attachments, all routes are propagated to the enterprise router. For details, see **Table 1-11**.

Table 1-11 Propagation

Attachment	Propagated Routes to Enterprise Router
VPC	VPC CIDR blocks
Virtual gateway	All routes
VPN gateway	All routes

Routes

Routes are used to forward packets. A route contains information such as the destination, next hop, and route type. **Table 1-12** describes the routes of different types.

Table 1-12 Routes

Route Type	Description	Attachment
Propagated routes	Propagated routes are automatically learned through propagation and cannot be modified or deleted.	• VPC • Virtual gateway • VPN gateway
Static routes	Static routes are manually created and can be modified or deleted.	• VPC

1.6 Billing

Enterprise routers are free of charge. If you create attachments to an enterprise router, you will be charged for attachments and the amount of traffic flowing through the attachments. For details, see **Table 1-13**.

You can use an enterprise router to connect different types of attachments, including VPC, virtual gateway, and VPN gateway. In addition, an enterprise router can connect attachments from different accounts.

Table 1-13 Enterprise router billing items

Billing Item	Attachment Type	Description
Attachment	• VPC • Virtual gateway • VPN gateway	Hourly billing starts when an attachment is created and stops when the attachment is deleted. If an attachment is created to a shared enterprise router, hourly billing starts when the enterprise router owner accepts the attachment. An attachment of an enterprise router is billed hourly and only in full hours. If the usage duration is less than one hour, the attachment is still billed for a full hour. The following uses a VPC attachment as an example. • Scenario 1: You added a VPC attachment to an enterprise router at 12:36 on July 6, 2022 and deleted the attachment at 12:57 on July 6, 2022. In this case, you need to pay for a full hour. • Scenario 2: You added a VPC attachment to an enterprise router at 12:59 on July 6, 2022 and deleted the attachment at 13:01 on July 6, 2022. In this case, your usage spanned 2 clock hours, so you need to pay for 2 full hours. The price of different types of attachments is subject to that displayed on the console.
Traffic	• VPC • Virtual gateway • VPN gateway	The amount of traffic flows from an attachment to an enterprise router (inbound traffic) is billed. The price of traffic per GB is subject to that displayed on the console.

An attachment creator pays for its attachment and used traffic.

For example, if a shared enterprise router has VPC attachments from its owner and other accounts. If the owner creates attachments to the enterprise router, the owner pays for the attachments and used traffic. If the other accounts create attachments to the enterprise router, these accounts pay for the attachments and used traffic.

NOTE

Only VPC attachments can be added to shared enterprise routers.

1.7 Permissions

If you need to assign different permissions to employees in your enterprise to control their access to your cloud resources, you can use the Identity and Access Management (IAM) for fine-grained permissions management. IAM provides functions such as identity authentication, permissions management, and access control.

On the IAM console, you can create IAM users and assign permissions to control their access to specific resources. For example, you can create IAM users for software developers and assign permissions to allow them to use enterprise router resources but disallow them from performing any high-risk operations such as deleting such resources.

IAM is free of charge.

For more information, see **IAM Service Overview**.

Enterprise Router Permissions

By default, new IAM users do not have any permissions assigned. You need to add them to one or more groups and attach policies or roles to these groups so that these users can inherit permissions from the groups and perform specified operations on cloud services.

An enterprise router is a project-level service deployed in a specific region. You need to select a project for which the permissions will be granted. If you select **All projects**, the permissions will be granted for all the projects. You need to switch to the authorized region before accessing an enterprise router.

Table 1-14 lists all the system-defined policies on enterprise routers.

Table 1-14 System-defined policies on enterprise routers

System Policy	Description	Type	Dependency
ER FullAccess	Administrator permissions for enterprise routers. Users with such permissions can operate and use all resources on enterprise routers.	System policy	None
ER ReadOnlyAccess	Read-only permissions for enterprise routers. Users with such permissions can only view data on enterprise routers.	System policy	None

Table 1-15 lists the common operations supported by each system-defined policy. You can select a proper one as required.

Table 1-15 Common operations supported by each system policy

Operation	Tenant Administrator	Tenant Guest	ER FullAccess	ER ReadOnlyAccess
Creating an enterprise router	√	x	√	x
Modifying an enterprise router	√	x	√	x
Viewing an enterprise router	√	√	√	√
Deleting an enterprise router	√	x	√	x
Adding a Virtual Private Cloud (VPC) to an enterprise router	√	x	√	x
Deleting a VPC attachment	√	x	√	x
Viewing attachments of all types	√	√	√	√
Creating a route table	√	x	√	x
Renaming a route table	√	x	√	x
Viewing a route table	√	√	√	√
Deleting a route table	√	x	√	x
Creating an association for an attachment in a route table	√	x	√	x
Viewing associations in a route table	√	√	√	√
Deleting an association from a route table	√	x	√	x

Operation	Tenant Administrator	Tenant Guest	ER FullAccess	ER ReadOnlyAccess
Creating a propagation for an attachment in the route table	√	x	√	x
Viewing a propagation in a route table	√	√	√	√
Deleting a propagation from a route table	√	x	√	x
Creating a static route	√	x	√	x
Modifying a static route	√	x	√	x
Viewing a route	√	√	√	√
Deleting a static route	√	x	√	x
Creating a flow log	√	x	√	x
Viewing a VPC flow log	√	√	√	√
Disabling a flow log	√	x	√	x
Enabling a flow log	√	x	√	x
Deleting a flow log	√	x	√	x
Adding a resource tag	√	x	√	x
Modifying a resource tag	√	x	√	x
Viewing a resource tag	√	√	√	√
Deleting a resource tag	√	x	√	x

Related Links

- What Is IAM?
- Creating a User and Granting Permissions

1.8 Notes and Constraints

Specifications

Table 1-16 lists the specifications of the enterprise router.

Table 1-16 Enterprise router specifications

Item	Default Setting	Adjustable
Maximum number of enterprise routers that can be created by each account	1	Contact customer service.
Maximum forwarding capability supported by each enterprise router	100 Gbit/s	Contact customer service.

Constraints

- Enterprise routers cannot be used together with virtual IP addresses of VPCs. If virtual IP addresses are used, contact customer service.
- Traffic cannot be forwarded from a VPC to the enterprise router that it attached to if you set the destination of a route whose next hop is the enterprise router to 0.0.0.0/0 in the VPC route table and if:
  - An ECS in the VPC has an EIP bound.
  - The VPC is being used by ELB, NAT Gateway, VPC Endpoint, or Distributed Cache Service (DCS).

  To solve this problem, refer to **Why Traffic Can't Be Forwarded from a VPC with a Route Destination of 0.0.0.0/0 to Its Enterprise Router?**
- The VPC route table does not allow you to add a route whose destination address is 100.64.x.x and next hop is an enterprise router.

  To solve this problem, refer to **How Do I Route Traffic to 100.64.x.x Through an Enterprise Router?**

1.9 Enterprise Router and Other Services

Table 1-17 Interactions between an enterprise router and other cloud services

Service	Interaction
Virtual Private Cloud (VPC)	You can attach VPCs to an enterprise router to enable communication between multiple VPCs without configuring a large number of VPC peering connections.

Service	Interaction
Direct Connect	You can attach a Direct Connect virtual gateway to an enterprise router to connect VPCs to an on-premises data center through one Direct Connect connection.
Virtual Private Network (VPN)	You can attach a VPN gateway to an enterprise router to connect VPCs to an on-premises data center through a shared VPN connection.
Identity and Access Management (IAM)	You can use IAM to assign different permissions to different users to control their access to enterprise router resources.
Cloud Eye	You can use Cloud Eye to monitor the network status of enterprise routers and their attachments, and report alarms when exceptions occur, ensuring smooth service running.
Cloud Trace Service (CTS)	You can use CTS to record operations associated with your enterprise routers for future query, audit, and backtracking.
Tag Management Service (TMS)	You can use tags to identify enterprise routers and route tables.

1.10 Region and AZ

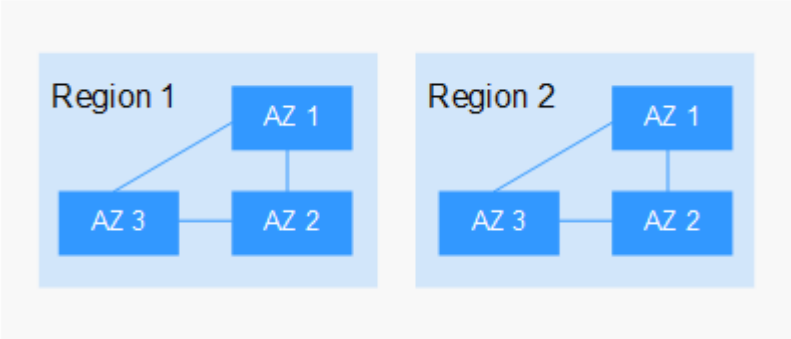
Concept

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 1-8 shows the relationship between regions and AZs.

Figure 1-8 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 Selecting a Networking Scheme

You can use enterprise routers to build a central network and to simplify the network architecture. There are two typical schemes to use Enterprise Router together with Direct Connect to allow an on-premises data center to access multiple VPCs.

Figure 2-1 Networking for allowing an on-premises data center to access two service VPCs directly (scheme 2)

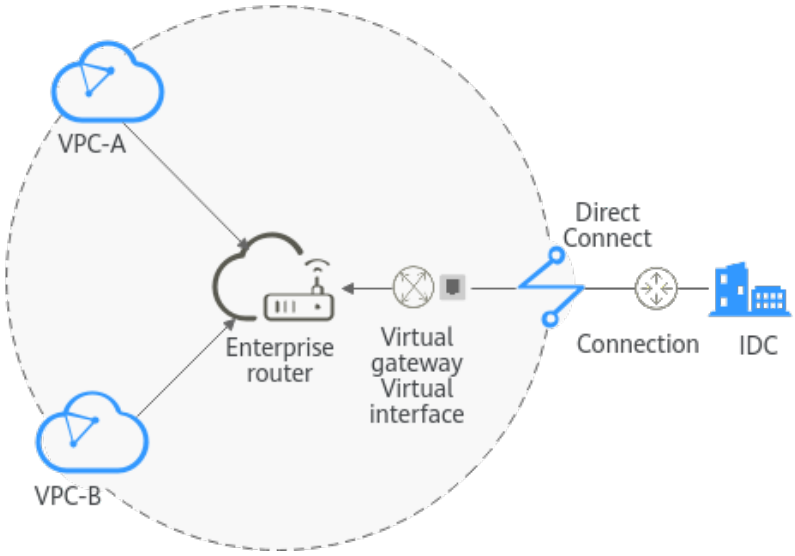


Figure 2-2 Networking for allowing an on-premises data center to access two service VPCs over a transit VPC (scheme 2)

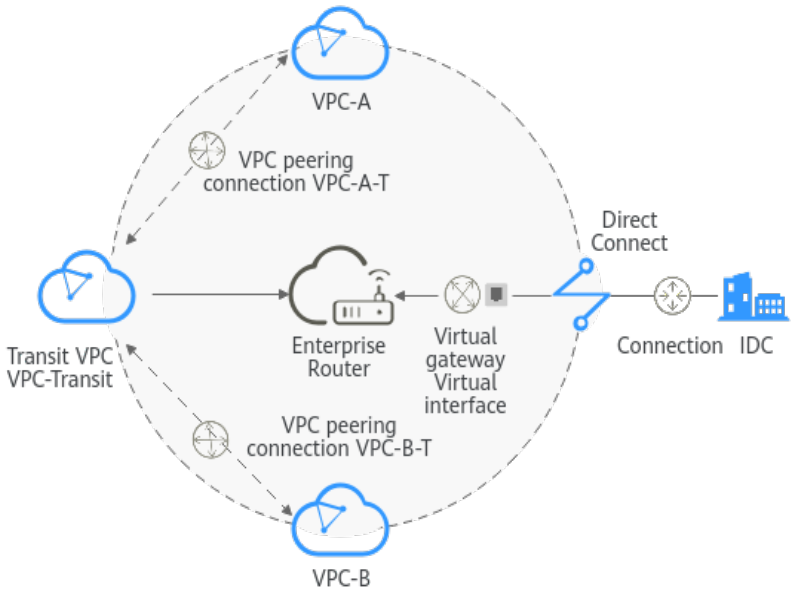


Table 2-1 Comparison between the two schemes

Scheme	Networking Architecture	Network Path Description	Configuration Guide	Remarks
Scheme 1	As shown in **Figure 2-1**: Two service VPCs (VPC-A and VPC-B) and the Direct Connect virtual gateway are attached to an enterprise router.	• The enterprise router enables the two VPCs to communicate with each other. • Direct Connect enables the on-premises data center to access the cloud, and the enterprise router connects the on-premises data center to both VPCs.	• Connectivity between VPCs: **Using an Enterprise Router to Enable Communications Between VPCs in the Same Region** • Connectivity between VPCs and an on-premises data center: **Using Enterprise Router and Direct Connect to Allow Communications Between an On-Premises Data Center and VPCs**	For details, see **How Do I Select a Networking Scheme?**.

Scheme	Networking Architecture	Network Path Description	Configuration Guide	Remarks
Scheme 2	As shown in **Figure 2-2**: The two service VPCs (VPC-A and VPC-B) are not attached to the enterprise router. Instead, a transit VPC (VPC-Transit) is used. The transit VPC and the Direct Connect virtual gateway are attached to the enterprise router.	• Each service VPC is connected to the transit VPC through a VPC peering connection. • Direct Connect enables the on-premises data center to access the cloud, and the enterprise router connects the on-premises data center to the two service VPCs.	**Using Enterprise Router and a Transit VPC to Allow an On-premises Data Center to Access Service VPCs**	

How Do I Select a Networking Scheme?

In scheme 1, the service VPCs are directly attached to the enterprise router. In scheme 2, a transit VPC is used and attached to the enterprise router. Each service VPC is connected to the transit VPC over a VPC peering connection. Compared with scheme 1, scheme 2 costs less and eliminates some constraints, as detailed below:

- Scheme 2 uses less traffic and fewer attachments.
  - Traffic between service VPCs is routed through VPC peering connections instead of enterprise routers, reducing traffic costs.
  - Only the transit VPC is attached to the enterprise router. You can pay less for the attachments.
- Scheme 2 frees you from the following constraints that scheme 1 has on attaching service VPCs to an enterprise router:
  - If resources in a service VPC have virtual IP addresses bound, the service VPC cannot be attached to an enterprise router.
  - If a service VPC is used by ELB, VPC Endpoint, NAT Gateway (private NAT gateways), or DCS, contact customer service to confirm the service compatibility and preferentially use a transit VPC for networking.

- Traffic cannot be forwarded from a VPC to the enterprise router if you set the destination of a route in the VPC route table to 0.0.0.0/0 and:
  - An ECS in the VPC has an EIP bound.
  - The VPC is being used by ELB, NAT Gateway, VPC Endpoint, or DCS.
- The VPC route table does not allow you to add a route whose destination address is 100.64.x.x and next hop is an enterprise router.
- If dedicated load balancers in the service VPCs have IP as backend enabled, the VPCs cannot communicate with each other using an enterprise router.
- If a VPC attached to an enterprise router has a NAT gateway associated and **Scenario** of the SNAT or DNAT rules is set to **Direct Connect/Cloud Connect**, the network from the on-premises data center to the VPC is disconnected.

NOTICE

If you still want to use scheme 1 to attach service VPCs to an enterprise router, contact customer service to evaluate the feasibility.

2.2 Using an Enterprise Router to Enable Communications Between VPCs in the Same Region

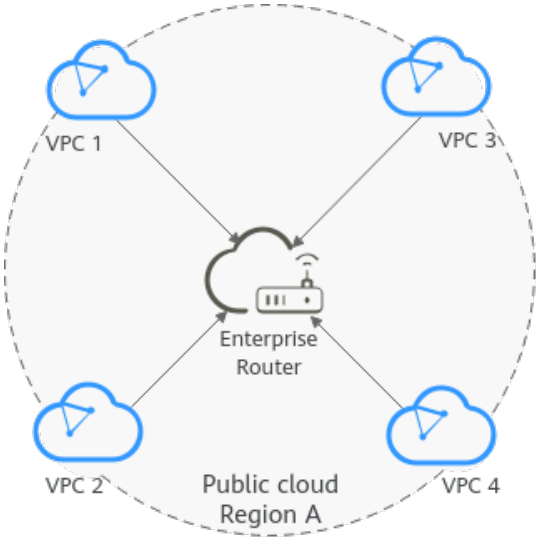
2.2.1 Quick Start

Background

Four VPCs are created in region A on public cloud and they need to communicate with each other.

You can create an enterprise router in region A and attach the four VPCs to the enterprise router. The enterprise router can route traffic among the VPCs so that they can communicate with each other.

Figure 2-3 Communications among VPCs in the same region



NOTE

This document describes how to use an enterprise router to quickly allow multiple VPCs in the same region to communicate with each other.

You can **share an enterprise router** with different accounts to attach VPCs of these accounts to the same enterprise router for communication.

Procedure

Figure 2-4 shows the procedure for using an enterprise router to allow multiple VPCs in the same region to communicate with each other.

Figure 2-4 Flowchart for connecting VPCs in the same region

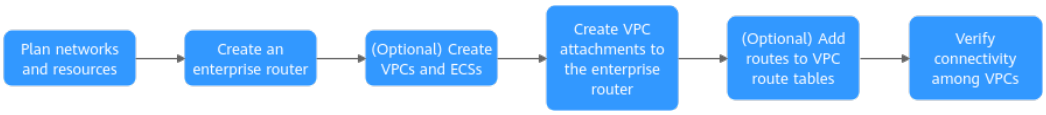


Table 2-2 Steps for connecting VPCs in the same region

No.	Step	Description
1	**Step 1: Plan Networks and Resources**	Plan CIDR blocks and the number of resources.
2	**Step 2: Create an Enterprise Router**	Create one enterprise router for connecting VPCs in the same region.
3	**Step 3: (Optional) Create VPCs and ECSs**	Create four VPCs and four ECSs. You can change the resource quantity and specifications as needed. If you already have these resources, skip this step.

No.	Step	Description
4	Step 4: Create VPC Attachments to the Enterprise Router	Attach the four VPCs to the enterprise router.
5	Step 5: (Optional) Add Routes to VPC Route Tables	Add routes to the route tables of the VPCs for communication with the enterprise router. • If you enable **Auto Add Routes** when creating a VPC attachment, you do not need to manually add static routes to the VPC route table. Instead, the system automatically adds routes (with this enterprise router as the next hop and 10.0.0.0/8, 172.16.0.0/12, and 192.168.0.0/16 as the destinations) to all route tables of the VPC. • If an existing route in the VPC route tables has a destination to 10.0.0.0/8, 172.16.0.0/12, or 192.168.0.0/16, the routes will fail to be added. In this case, do not need to enable **Auto Add Routes**. After the attachment is created, manually add routes.
6	Step 6: Verify Connectivity Among VPCs	Log in to the ECS and run the **ping** command to verify the connectivity among VPCs.

2.2.2 Step 1: Plan Networks and Resources

To use an enterprise router to connect VPCs in the same region, you need to:

- **Network Planning**: Plan CIDR blocks of VPCs and subnets, and route tables of VPCs and the enterprise router.
- **Resource Planning**: Plan the quantity, names, and parameters of cloud resources, including VPCs, ECSs, and the enterprise router.

Network Planning

Figure 2-5 and **Table 2-4** show the network planning and its description for communications among VPCs in the same region.

Figure 2-5 Network planning for communications among VPCs in the same region

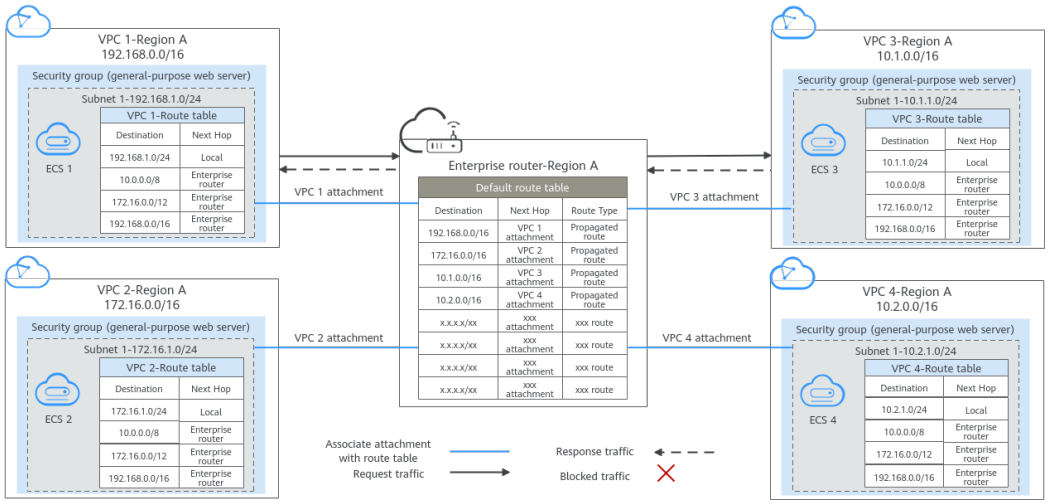


Table 2-3 Network traffic flows

Scenario	Description
Request from VPC 1 to VPC 3	1. The route table of VPC 1 has a route with next hop set to the enterprise router to forward traffic from VPC 1 to the enterprise router. 2. The route table of the enterprise router has a propagated route with next hop set to the VPC 3 attachment to forward traffic from the enterprise router to VPC 3.
Response from VPC 3 to VPC 1	1. The route table of VPC 3 has a route with next hop set to the enterprise router to forward traffic from VPC 3 to the enterprise router. 2. The route table of the enterprise router has a propagated route with next hop set to the VPC 1 attachment to forward traffic from the enterprise router to VPC 1.

Table 2-4 Network planning for communications among VPCs in the same region

Resource	Description
VPC	• The CIDR blocks of the VPCs to be connected cannot overlap with each other. In this example, the CIDR blocks of the VPCs are propagated to the enterprise router route table as the destination in routes. The CIDR blocks cannot be modified and overlapping CIDR blocks may cause route conflicts. If your existing VPCs have overlapping CIDR blocks, do not use propagated routes. Instead, you need to manually add static routes to the route table of the enterprise router. The destination can be VPC subnet CIDR blocks or smaller ones. • Each VPC has a default route table. • Routes in the default route table can be: – Local: a system route for communications between subnets in a VPC. – Enterprise router: custom routes with 10.0.0.0/8, 172.16.0.0/12, and 192.168.0.0/16 as the destinations for routing traffic from a VPC subnet to the enterprise router. See **Table 2-5** for route details.
Enterprise router	After **Default Route Table Association** and **Default Route Table Propagation** are enabled and a VPC attachment is created, the system will automatically: • Associate VPC attachments with the default route table of the enterprise router. • Propagate VPC attachments with the default route table of the enterprise router. The route table automatically learns the VPC CIDR block as the destination of routes. For details, see **Table 2-6**.
ECS	The four ECSs are in different VPCs. If the ECSs are associated with different security groups, add rules to their security groups to allow access to each other.

Table 2-5 VPC route table

Destination	Next Hop	Route Type
10.0.0.0/8	Enterprise router	Static route: Custom
172.16.0.0/12	Enterprise Router	Static route: Custom
192.168.0.0/16	Enterprise Router	Static route: Custom

NOTE

- If you enable **Auto Add Routes** when creating a VPC attachment, you do not need to manually add static routes to the VPC route table. Instead, the system automatically adds routes (with this enterprise router as the next hop and 10.0.0.0/8, 172.16.0.0/12, and 192.168.0.0/16 as the destinations) to all route tables of the VPC.
- If an existing route in the VPC route tables has a destination to 10.0.0.0/8, 172.16.0.0/12, or 192.168.0.0/16, the routes will fail to be added. In this case, do not to enable **Auto Add Routes**. After the attachment is created, manually add routes.
- Do not set the destination of a route (with an enterprise router as the next hop) to 0.0.0.0/0 in the VPC route table. If an ECS in the VPC has an EIP bound, the VPC route table will have a policy-based route with 0.0.0.0/0 as the destination, which has a higher priority than the route with the enterprise router as the next hop. In this case, traffic is forwarded to the EIP and cannot reach the enterprise router.

Table 2-6 Enterprise router route table

Destination	Next Hop	Route Type
VPC 1 CIDR block: 192.168.0.0/16	VPC 1 attachment: er-attach-01	Propagated route
VPC 2 CIDR block: 172.16.0.0/16	VPC 2 attachment: er-attach-02	Propagated route
VPC 3 CIDR block: 10.1.0.0/16	VPC 3 attachment: er-attach-03	Propagated route
VPC 4 CIDR block: 10.2.0.0/16	VPC 4 attachment: er-attach-04	Propagated route

Resource Planning

The enterprise router, VPCs, and ECSs must be in the same region. You can select any AZ within the region.

NOTE

The following resource details are only examples. You can modify them as required.

- One enterprise router.

Table 2-7 Enterprise router details

Enterprise Router Name	ASN	Default Route Table Association	Default Route Table Propagation	Association Route Table	Propagation Route Table	Attachment
er-test-01	64512	Enable	Enable	Default route table	Default route table	er-attach-01
						er-attach-02

Enterprise Router Name	ASN	Default Route Table Association	Default Route Table Propagation	Association Route Table	Propagation Route Table	Attachment
						er-attach-03
						er-attach-04

- Four VPCs, each with a unique CIDR block.

  Table 2-8 VPC details

VPC Name	VPC CIDR Block	Subnet Name	Subnet CIDR Block	Association Route Table
vpc-demo-01	192.168.0.0/16	subnet-demo-01	192.168.1.0/24	Default route table
vpc-demo-02	172.16.0.0/16	subnet-demo-02	172.16.1.0/24	Default route table
vpc-demo-03	10.1.0.0/16	subnet-demo-03	10.1.1.0/24	Default route table
vpc-demo-04	10.2.0.0/16	subnet-demo-04	10.2.1.0/24	Default route table

- Four ECSs in four different VPCs.

  Table 2-9 ECS details

ECS	Image	VPC	Subnet	Security Group	Private IP Address
ecs-demo-01	Public image: EulerOS 2.56	vpc-demo-01	subnet-demo-01	sg-demo (general-purpose web server)	192.168.1.12
ecs-demo-02		vpc-demo-02	subnet-demo-02		172.16.1.189
ecs-demo-03		vpc-demo-03	subnet-demo-03		10.1.1.105
ecs-demo-04		vpc-demo-04	subnet-demo-04		10.2.1.83

2.2.3 Step 2: Create an Enterprise Router

Scenarios

This section describes how to create an enterprise router.

Procedure

Step 1 Log in to the management console.

Step 2 Click in the upper left corner and select the desired region and project.

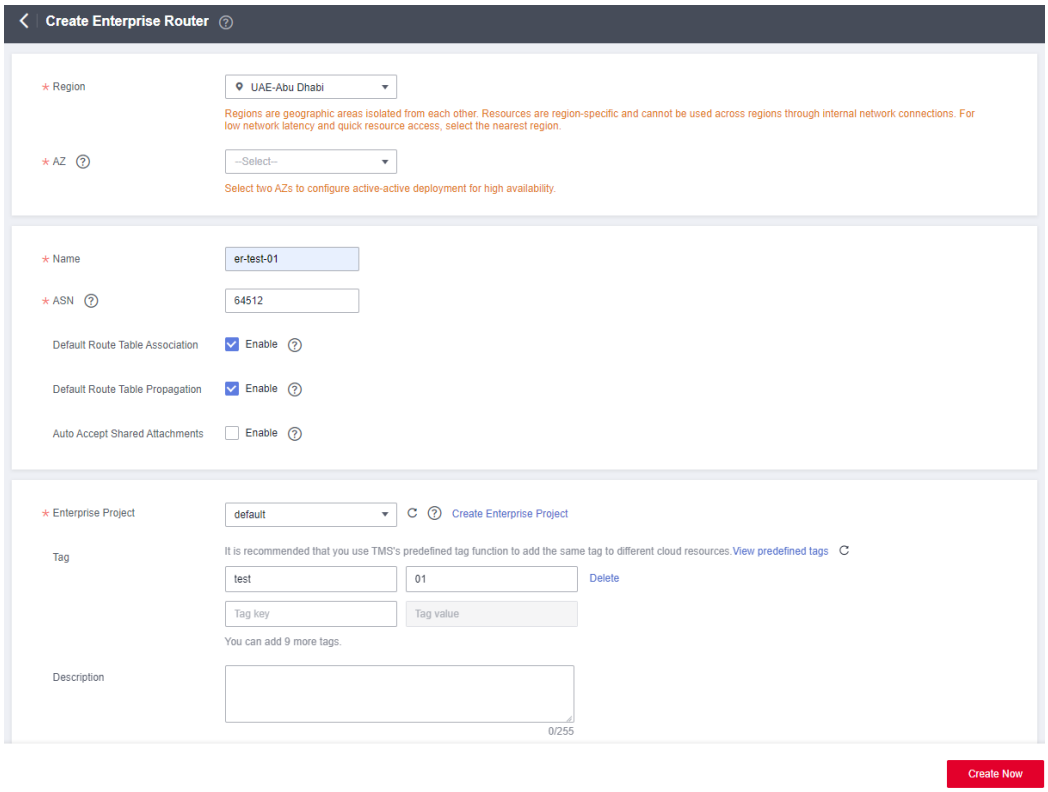
Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Click **Create Enterprise Router** in the upper right corner.

The **Create Enterprise Router** page is displayed.

Figure 2-6 Create Enterprise Router



Step 5 Configure the parameters based on **Table 2-10**.

Table 2-10 Parameters for creating an enterprise router

Parameter	Setting	Example Value
Region	Select the region nearest to your target users. Once the enterprise router is created, the region cannot be changed.	-
AZ	Select two AZs to deploy your enterprise router. You can change them after the enterprise router is created.	AZ1 AZ2
Name	Specify the enterprise router name. You can change it after the enterprise router is created.	er-test-01
ASN	Set the Autonomous System Number (ASN) for the cloud side of a Border Gateway Protocol (BGP) session. You cannot change it after the enterprise router is created.	64512
Default Route Table Association	If you select this option, you do not need to create route tables or associations. You can change your option after the enterprise router is created.	Enable
Default Route Table Propagation	If you select this option, you do not need to create route tables, propagations, or routes. You can change your option after the enterprise router is created.	Enable
Auto Accept Shared Attachments	If you do not select this option, you must accept the requests for creating attachments to this enterprise router from other users with whom this enterprise router is shared.	Disable
Enterprise Project	Select an enterprise project for the enterprise router. You can change it after the enterprise router is created.	default
Tag	Add tags to help you identify your enterprise router. You can change them after the enterprise router is created.	**Tag key**: test **Tag value**: 01
Description	Provide supplementary information about the enterprise router. You can change it after the enterprise router is created.	-

Step 6 Click **Create Now**.

Step 7 Confirm the enterprise router configurations and click **Submit**.

The enterprise router list is displayed.

Step 8 Check the enterprise router status.

If the status changes from **Creating** to **Normal**, the enterprise router is successfully created.

----End

2.2.4 Step 3: (Optional) Create VPCs and ECSs

Scenarios

This section describes how to create VPCs and ECSs.

If you already have VPCs and ECS, skip this section.

Notes and Constraints

- The CIDR blocks of the VPCs to be connected cannot overlap with each other.

  In this example, the CIDR blocks of the VPCs are propagated to the enterprise router route table as the destination in routes. The CIDR blocks cannot be modified and overlapping CIDR blocks may cause route conflicts.

  If your existing VPCs have overlapping CIDR blocks, do not use propagated routes. Instead, you need to manually add static routes to the route table of the enterprise router. The destination can be VPC subnet CIDR blocks or smaller ones.
- Four ECSs must be in the same security group. If your ECSs are in different security groups, add rules to their security groups to allow access to each other.

Procedure

Step 1 Create four VPCs with subnets.

For details, see **Creating a VPC**.

For VPC and subnet details in this example, see **Table 2-8**.

Step 2 Create four ECSs.

For details, see **Creating an ECS**.

For ECS details in this example, see **Table 2-9**.

----End

2.2.5 Step 4: Create VPC Attachments to the Enterprise Router

Scenarios

This section describes how to attach the four VPCs to the enterprise router.

Procedure

Step 1 Log in to the management console.

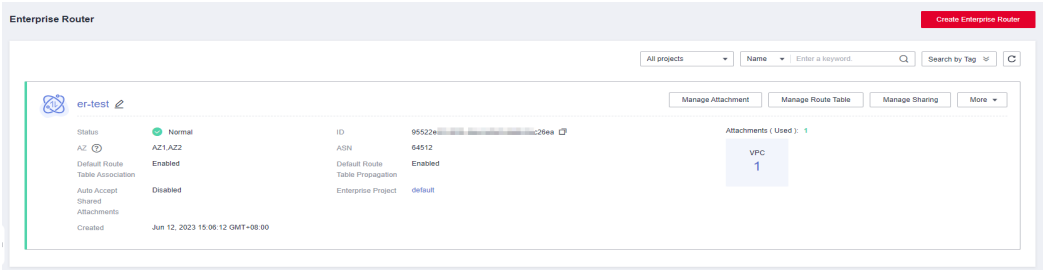
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

Figure 2-7 Searching for an enterprise router



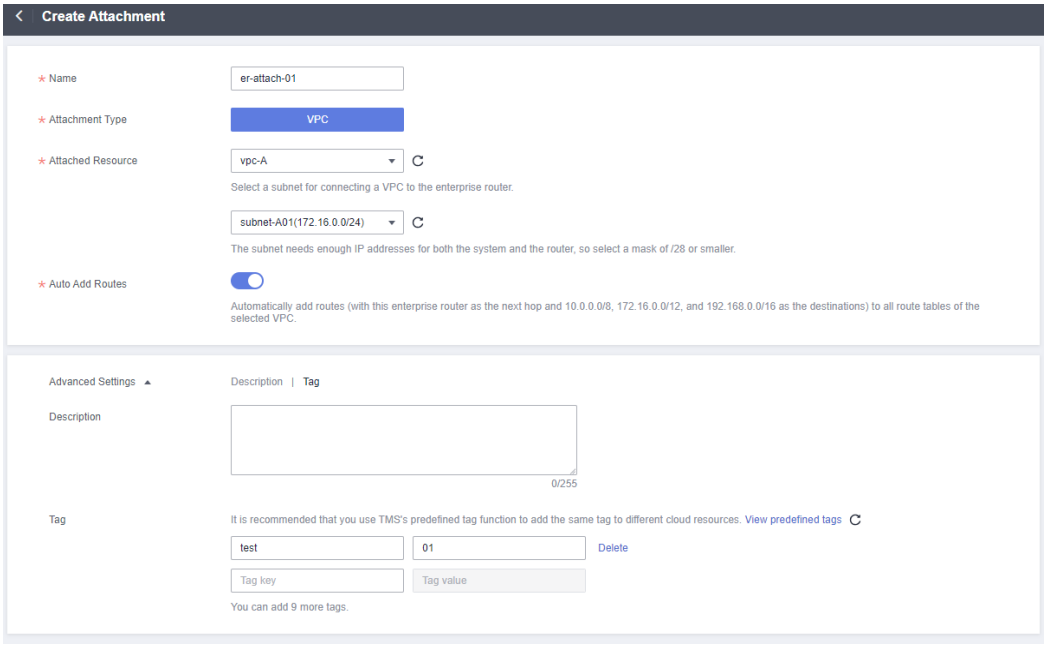
Step 5 Go to the **Attachments** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Attachment**.
- Click the enterprise router name and click **Attachments**.

Step 6 On the **Attachments** tab, click **Create Attachment**.

The **Create Attachment** dialog box is displayed.

Figure 2-8 Create Attachment



Step 7 Configure the parameters based on **Table 2-11**.

Table 2-11 Parameter description

Parameter	Setting	Example Value
Name	Specify the name of the VPC attachment. You can change it after the attachment is created.	er-attach-01

Parameter	Setting	Example Value
Attachment Type	1. Select **VPC**. The type cannot be changed after the attachment is created. 2. Select the VPC to be attached to the enterprise router from the drop-down list. The VPC cannot be changed after the attachment is created. 3. Select the subnet to be attached to the enterprise router from the drop-down list. The subnet cannot be changed after the attachment is created. – You can select any subnet in the VPC. All subnets in the same VPC can communicate with each other by default and the enterprise router can connect to the entire VPC. – You are advised to select a subnet that is dedicated for connecting to the enterprise router. To ensure that the subnet has enough IP addresses for the system and the enterprise router, make the subnet mask /28 or smaller.	• Attachment Type: VPC • VPC: vpc-demo-01 • Subnet: subnet-demo-01
Auto Add Routes	• If you enable **Auto Add Routes** when creating a VPC attachment, you do not need to manually add static routes to the VPC route table. Instead, the system automatically adds routes (with this enterprise router as the next hop and 10.0.0.0/8, 172.16.0.0/12, and 192.168.0.0/16 as the destinations) to all route tables of the VPC. • If an existing route in the VPC route tables has a destination to 10.0.0.0/8, 172.16.0.0/12, or 192.168.0.0/16, the routes will fail to be added. In this case, do not to enable **Auto Add Routes**. After the attachment is created, manually add routes. • Do not set the destination of a route (with an enterprise router as the next hop) to 0.0.0.0/0 in the VPC route table. If an ECS in the VPC has an EIP bound, the VPC route table will have a policy-based route with 0.0.0.0/0 as the destination, which has a higher priority than the route with the enterprise router as the next hop. In this case, traffic is forwarded to the EIP and cannot reach the enterprise router.	Enable

Parameter	Setting	Example Value
Description	Provide supplementary description about the attachment. You can change it after the attachment is created.	-
Tag	Add tags to help you identify your attachment. You can change them after the attachment is created.	**Tag key**: test **Tag value**: 01

Step 8 Click **OK**.

The attachment list is displayed.

Step 9 Check the attachment status.

If the status changes from **Creating** to **Normal**, the attachment is successfully created.

Step 10 Repeat **Step 5** to **Step 9** to attach the other three VPCs to the enterprise router.

NOTICE

In the example given, **Default Route Table Association** and **Default Route Table Propagation** are enabled when you create the enterprise router. After the VPCs are attached to the enterprise router, the system will automatically:

- Associate VPC attachments with the route table of the enterprise router.
- Propagate VPC attachments to the route table of the enterprise router. The CIDR blocks of the VPCs are propagated to the route table.

----End

2.2.6 Step 5: (Optional) Add Routes to VPC Route Tables

Scenarios

This section describes how to add routes to VPC route tables for traffic to route through the enterprise router.

NOTE

- If you enable **Auto Add Routes** when creating a VPC attachment, you do not need to manually add static routes to the VPC route table. Instead, the system automatically adds routes (with this enterprise router as the next hop and 10.0.0.0/8, 172.16.0.0/12, and 192.168.0.0/16 as the destinations) to all route tables of the VPC.
- If an existing route in the VPC route tables has a destination to 10.0.0.0/8, 172.16.0.0/12, or 192.168.0.0/16, the routes will fail to be added. In this case, do not need to enable **Auto Add Routes**. After the attachment is created, manually add routes.

Notes and Constraints

- If your VPC only has a default route table, all subnets in it are associated with the default route table. You only need to add routes to the default route table for traffic to route through the enterprise router.
- If your VPC has multiple custom route tables and different subnets in the VPC are associated with different route tables, you need to add routes to each route table associated with the subnets for traffic to route through the enterprise router.

Procedure

Step 1 Log in to the management console.

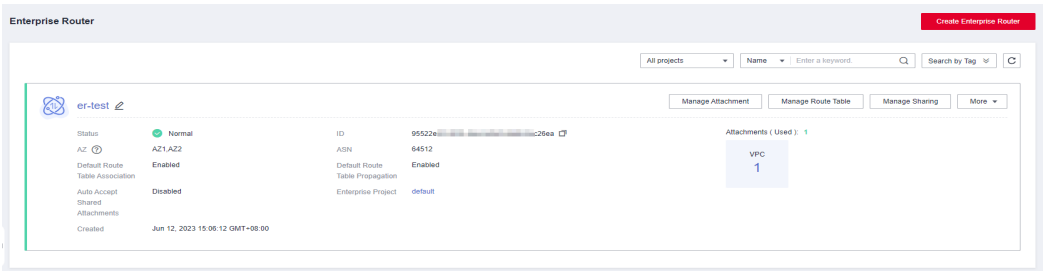
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

Figure 2-9 Searching for an enterprise router



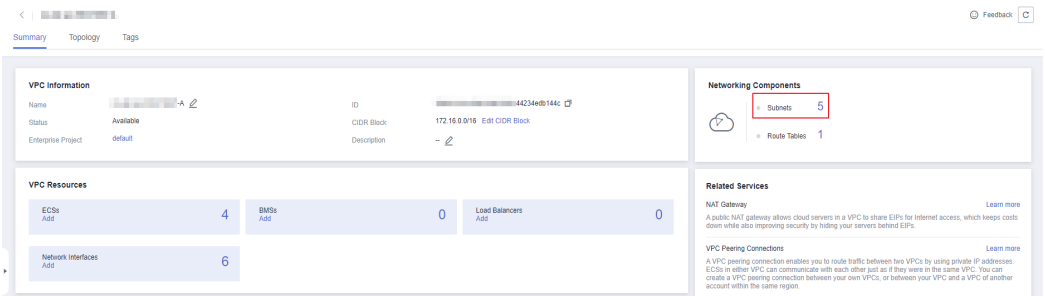
Step 5 Go to the **Attachments** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Attachment**.
- Click the enterprise router name and click **Attachments**.

Step 6 Locate the target attachment and click the VPC in the **Attached Resource** column.

The VPC basic information page is displayed.

Figure 2-10 VPC information



Step 7 In the **Networking Components** area, click the number next to **Subnets**.

The **Subnets** page is displayed.

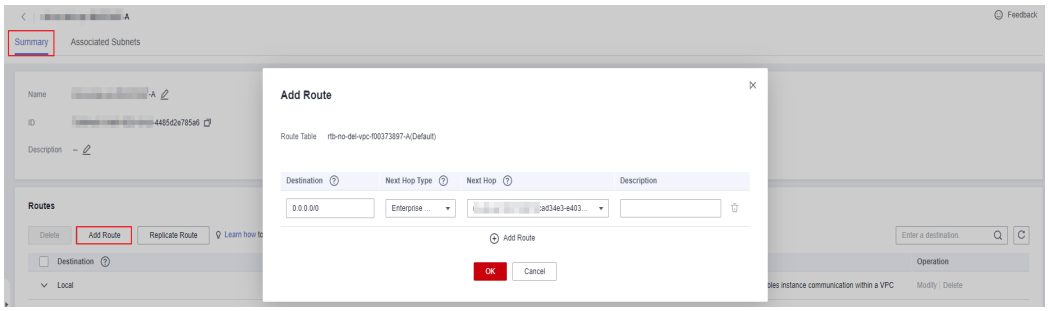
Step 8 Locate the target subnet and click the route table name in the **Route Table** column.

The route table details page is displayed.

Step 9 Under **Routes**, click **Add Route**.

The **Add Route** dialog box is displayed.

Figure 2-11 Add Route



Step 10 Configure the parameters based on **Table 2-12**.

Table 2-12 Parameter description

Parameter	Setting	Example Value
Destination	The destination is used to route traffic from this VPC to other VPCs attached to the enterprise router. You can change it after the route is created. • Set the destination to the CIDR blocks of VPCs or their subnets that your VPC need to communicate with. • Do not set the destination of a route (with an enterprise router as the next hop) to 0.0.0.0/0 in the VPC route table. If an ECS in the VPC has an EIP bound, the VPC route table will have a policy-based route with 0.0.0.0/0 as the destination, which has a higher priority than the route with the enterprise router as the next hop. In this case, traffic is forwarded to the EIP and cannot reach the enterprise router.	10.0.0.0/8
Next Hop Type	Select **Enterprise Router**. You can change it after the route is created.	Enterprise Router
Next Hop	Select the target enterprise router. You can change it after the route is created.	er-test-01
Description	Provide supplementary information about the route. You can change the route after it is created.	-

Step 11 Click **OK**.

You can view the route in the route list.

Step 12 Repeat **Step 6** to **Step 11** to add routes to route tables of other VPCs.

----End

2.2.7 Step 6: Verify Connectivity Among VPCs

Scenarios

This section describes how to log in to ECSs and verify the connectivity between VPCs.

Procedure

Step 1 Log in to the ECS.

Multiple methods are available for logging in to an ECS. For details, see **Logging In to an ECS**.

In this example, use VNC provided on the management console to log in to an ECS.

Step 2 Run the following command on the ECS:

ping *IP address of the ECS*

If you log in to ecs-demo-01 to verify the connectivity between vpc-demo-01 and vpc-demo-02, run the following command:

ping 10.1.1.105

If information similar to the following is displayed, the two VPCs can communicate with each other.

```
[root@ecs-demo-01 ~]# ping 10.1.1.105
PING 10.1.1.105 (10.1.1.105) 56(84) bytes of data.
64 bytes from 10.1.1.105: icmp_seq=1 ttl=64 time=1.14 ms
64 bytes from 10.1.1.105: icmp_seq=2 ttl=64 time=0.644 ms
64 bytes from 10.1.1.105: icmp_seq=3 ttl=64 time=0.599 ms
64 bytes from 10.1.1.105: icmp_seq=4 ttl=64 time=0.639 ms
^C
--- 10.1.1.105 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3004ms
rtt min/avg/max/mdev = 0.599/0.756/1.142/0.223 ms
[root@ecs-demo-01 ~]#
```

Step 3 Repeat **Step 1** to **Step 2** to verify the connectivity between other VPCs.

----End

3 Enterprise Routers

3.1 Creating an Enterprise Router

Scenarios

This section describes how to create an enterprise router.

Procedure

Step 1 Log in to the management console.

Step 2 Click in the upper left corner and select the desired region and project.

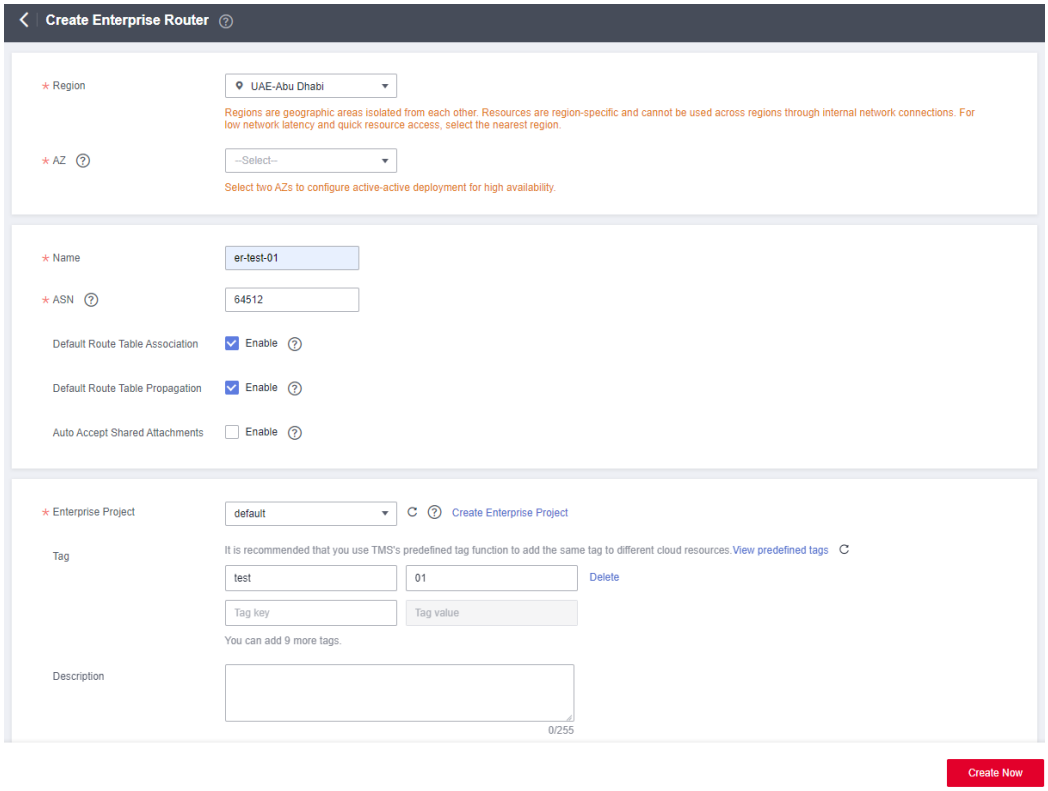
Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Click **Create Enterprise Router** in the upper right corner.

The **Create Enterprise Router** page is displayed.

Figure 3-1 Create Enterprise Router



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

Table 3-1 Parameters for creating an enterprise router

Parameter	Setting	Example Value
Region	Mandatory Select the region nearest to you to ensure the lowest latency possible.	-
AZ	Mandatory An AZ is a physical location where resources use independent power supplies and networks. AZs are physically isolated but interconnected through an internal network. Each region contains multiple AZs. If one AZ is unavailable, the other AZs in the same region continue to provide services. We recommend you to select two AZs. The enterprise router will be deployed in both AZs that work in active-active mode, ensuring reliability and disaster recovery. Traffic in an AZ is preferentially transmitted to the enterprise router in the same AZ to reduce latency.	AZ1 AZ2

Parameter	Setting	Example Value
Name	Mandatory Enter a name for the enterprise router. The name: • Must contain 1 to 64 characters. • Can contain letters, digits, underscores (_), hyphens (-), and periods (.).	er-test-01
ASN	Mandatory An autonomous system is an IP network that is managed by an entity and has the same routing policy. On a BGP network, each autonomous system is assigned a unique ASN to differentiate them. You can use the default ASN, or specify one from 64512 to 65534 or from 4200000000 to 4294967294. Networks in the same region can be considered as an AS.	64512
Default Route Table Association	Optional Enabled by default Enabling **Default Route Table Association** can simplify network configurations. After this function is enabled: 1. An enterprise router automatically comes with a route table named **defaultRouteTable**. By default, this route table is the default association route table. After the enterprise router is created, you can create a custom route table and set it as the default association route table to replace the original one if needed. For details, see **Modifying an Enterprise Router**. 2. If you create an attachment to this enterprise router, the attachment will be automatically associated with the default association route table.	Enable

Parameter	Setting	Example Value
Default Route Table Propagation	Optional Enabled by default Enabling **Default Route Table Propagation** can simplify network configurations. After this function is enabled: 1. An enterprise router automatically comes with a route table named **defaultRouteTable**. By default, this route table is the default propagation route table. If both **Default Route Table Association** and **Default Route Table Propagation** are enabled, **defaultRouteTable** is not only the default association route table but also the default propagation route table. After the enterprise router is created, you can create a custom route table and set it as the default propagation route table to replace the original one if needed. For details, see **Modifying an Enterprise Router**. 2. If you create an attachment to this enterprise router, the attachment will be automatically propagated to the default propagation route table.	Enable
Auto Accept Shared Attachments	Optional As the owner, you can share your enterprise router with other users. These other users can create attachments for your enterprise router. • If you do not select this option, you must manually accept attachments to this enterprise router from the accounts that this enterprise router is shared with. • If you select this option, the system will automatically accept attachments to this enterprise router from the accounts that this enterprise router is shared with. For details, see **Sharing Overview**.	Disable
Enterprise Project	Mandatory Select an enterprise project that the enterprise router will be added to. An enterprise project facilitates project-level management and grouping of cloud resources and users. The default project is **default**.	default

Parameter	Setting	Example Value
Tag	Optional Add tags to help you quickly find your enterprise router. For details, see **Overview**.	**Tag key**: test **Tag value**: 01
Description	Optional Describe the enterprise router for easy identification.	-

Step 6 Click **Create Now**.

Step 7 Confirm the enterprise router configurations and click **Submit**.

The enterprise router list is displayed.

Step 8 Check the enterprise router status.

If the status changes from **Creating** to **Normal**, the enterprise router is successfully created.

----End

Follow-Up Operations

- After an enterprise router is created, attach network instances to the enterprise router and configure routes. For details, see **Getting Started**.
- If **Default Route Table Association** and **Default Route Table Propagation** are not enabled for an enterprise router, you need to:
  a. Create a custom route table for the enterprise router. For details, see **Creating a Route Table**.
  b. Create associations for the attachments of the enterprise router. For details, see **Creating an Association for an Attachment in a Route Table**.
  c. Use either of the following methods to add routes for the attachment to the route table:
     - Create a propagation in the route table. For details, see **Creating a Propagation for an Attachment in the Route Table**.
       After the propagation is created, routes of the attachments to the enterprise router will be automatically propagated to the route table of the enterprise router.
     - Add static routes to the route table. For details, see **Creating a Static Route**.

3.2 Modifying an Enterprise Router

Scenarios

This section describes how to modify settings of an enterprise router. You can:

- Modify the name of an enterprise router.
- Enable or disable **Default Route Table Association**.
- Enable or disable **Default Route Table Propagation**.

Procedure

Step 1 Log in to the management console.

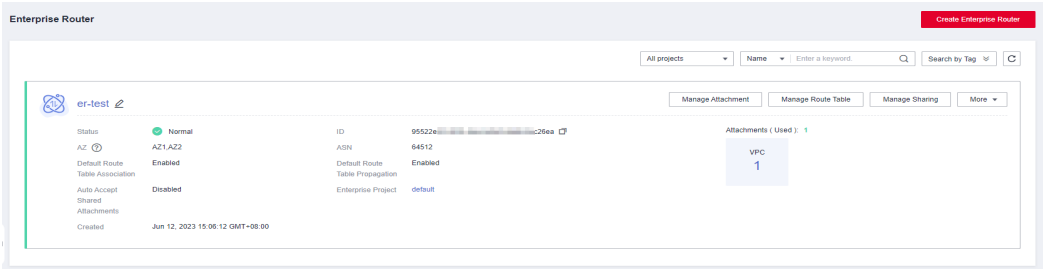
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

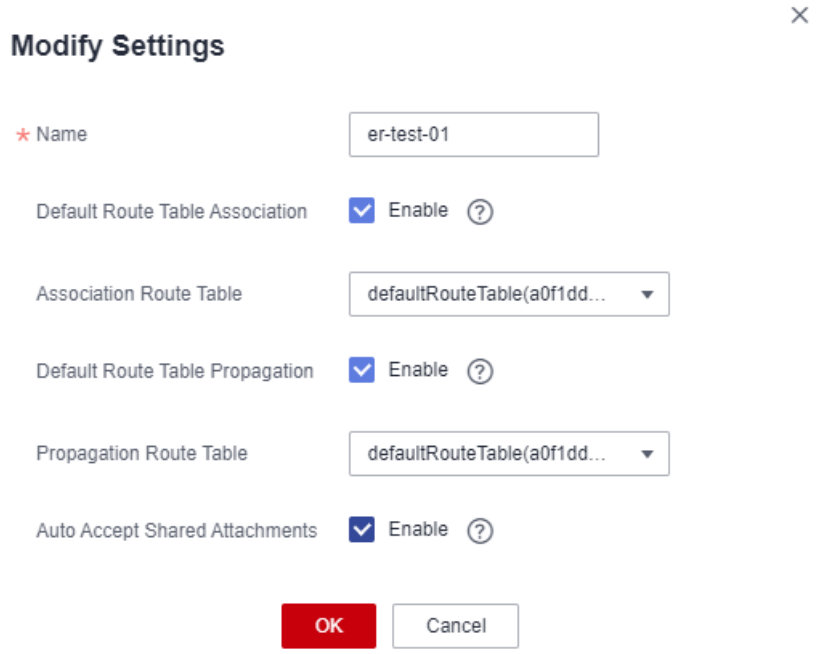
Figure 3-2 Searching for an enterprise router



Step 5 In the upper right corner of the target enterprise router, choose **More** > **Modify Settings**.

The **Modify Settings** page is displayed.

Figure 3-3 Modify Settings



Step 6 Modify the enterprise router based on **Table 3-2**.

Table 3-2 Parameter description

Parameter	Setting	Example Value
Name	Mandatory If you want to change the name of the enterprise router, enter a new name. The name: • Must contain 1 to 64 characters. • Can contain letters, digits, underscores (_), hyphens (-), and periods (.).	er-test-01
Default Route Table Association	Optional Enabling **Default Route Table Association** can simplify network configurations. After this function is enabled: 1. Select a route table for **Default Association Route Table**. 2. If you create an attachment to this enterprise router, the attachment will be automatically associated with the default association route table.	Enable

Parameter	Setting	Example Value
Association Route Table	Optional If you enable **Default Route Table Association**, select a route table for **Association Route Table**. ● You can select a custom route table. ● If you do not select a route table, the system will create a route table named **defaultRouteTable** as the default association route table. If a route table named **defaultRouteTable** already exists, the system will not create it again.	er-rtb-b931
Default Route Table Propagation	Optional Enabling **Default Route Table Propagation** can simplify network configurations. After this function is enabled: 1. Select a route table for **Association Route Table**. 2. If you create an attachment to this enterprise router, the attachment will be automatically propagated to the default propagation route table.	Enable
Propagation Route Table	Optional If you enable **Default Route Table Propagation**, select a route table for **Propagation Route Table**. ● You can select a custom route table. ● If you do not select a route table, the system will create a route table named **defaultRouteTable** as the default propagation route table. If a route table named **defaultRouteTable** already exists, the system will not create it again.	er-rtb-b931

Parameter	Setting	Example Value
Auto Accept Shared Attachments	Optional As the owner, you can share your enterprise router with other users. These other users can create attachments for your enterprise router. • If you do not select this option, you must manually accept attachments to this enterprise router from the accounts that this enterprise router is shared with. • If you select this option, the system will automatically accept attachments to this enterprise router from the accounts that this enterprise router is shared with. For details, see **Sharing Overview**.	Enable

Step 7 Click **OK**.

The enterprise router list is displayed.

Step 8 Check the enterprise router settings.

The settings take effect immediately.

----End

3.3 Viewing an Enterprise Router

Scenarios

This section describes how to view basic information about an enterprise router, including the AZs, default route table association and propagation, and creation time.

You can also view other information about the enterprise router, including:

- Attachments, such as their name, type, and attached resources. For details, see **Viewing Details About an Attachment**.
- Route tables, such as the default route table and custom route tables. For details, see **Viewing Route Tables**.
- Tags. For details, see **Viewing a Tag**.

Procedure

Step 1 Log in to the management console.

Step 2 Click in the upper left corner and select the desired region and project.

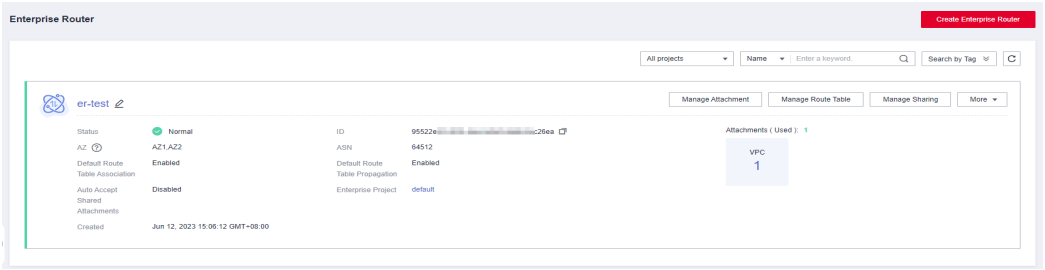
Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

In addition to the information shown in the enterprise router list, you can go to **Step 5** to view more details.

Figure 3-4 Searching for an enterprise router



Step 5 Click the name of the target enterprise router to go to the **Basic Information** page.

View detailed information about the enterprise router.

Figure 3-5 Basic Information

----End

3.4 Deleting an Enterprise Router

Scenarios

This section describes how to delete an enterprise router.

Notes and Constraints

- An enterprise router that has attachments cannot be deleted. To delete such an enterprise router, delete its attachments first. For details, see **Deleting an Attachment**.
- An enterprise router that has route tables can be deleted directly.
- An enterprise router that is shared with other accounts can be deleted directly.

Procedure

Step 1 Log in to the management console.

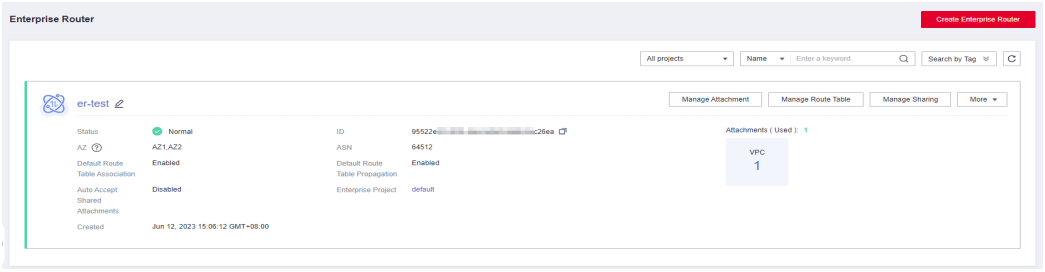
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

Figure 3-6 Searching for an enterprise router



Step 5 In the upper right corner of the target enterprise router, choose **More** > **Delete**.

A confirmation dialog box is displayed.

Step 6 Click **Yes**.

A deleted enterprise router cannot be recovered.

----End

4 Attachments

4.1 Attachment Overview

You can create an attachment to attach a network instance to an enterprise router. The attachment type varies according to the network instance.

Figure 4-1 Attachments

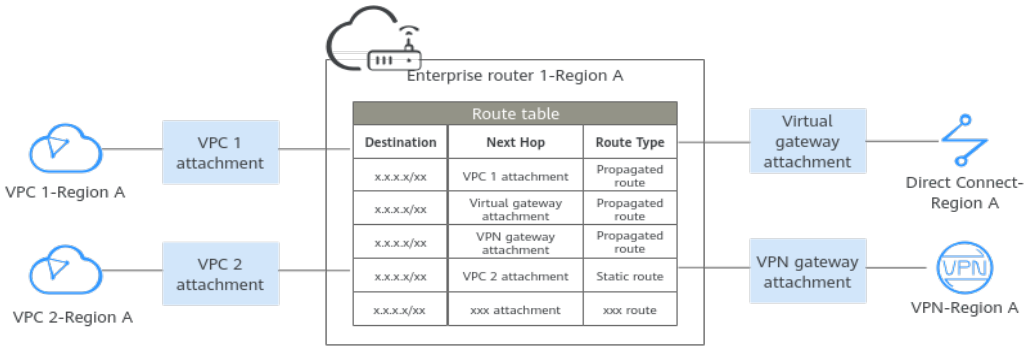


Table 4-1 Attachments

Attachment Type	Network Instance	Create Attachment	View Attachment	Delete Attachment
VPC attachment	VPC	Adding VPC Attachments to an Enterprise Router	Viewing Details About an Attachment	Deleting a VPC Attachment

Attachment Type	Network Instance	Create Attachment	View Attachment	Delete Attachment
Virtual gateway attachment	Virtual gateway of Direct Connect	Add virtual gateway attachments to an enterprise router. To create a virtual gateway, refer to "Establishing Network Connectivity" in the *Direct Connect User Guide*.		**Deleting a Virtual Gateway Attachment**
VPN gateway attachment	VPN gateway	Add VPN gateway attachments to an enterprise router. To create a VPN gateway, refer to "Creating a VPN Gateway" in the *Virtual Private Network User Guide*.		**Deleting a VPN Gateway Attachment**

4.2 Adding VPC Attachments to an Enterprise Router

Scenarios

This section describes how to attach VPCs to an enterprise router so that these VPCs can communicate with each other.

Notes and Constraints

- If you use the propagated routes of a VPC attachment, the route table of the enterprise router automatically learns the VPC CIDR block as the destination of routes. The CIDR block cannot be changed. To ensure that routes in the route table do not conflict, the CIDR blocks of all VPCs attached to the enterprise router cannot overlap. Otherwise, communication fails.
- If your existing VPCs have overlapping CIDR blocks, do not use propagated routes. Instead, manually add static routes to the route table of the enterprise router. The destination of the routes can be VPC subnet CIDR blocks or smaller ones.

Procedure

Step 1 Log in to the management console.

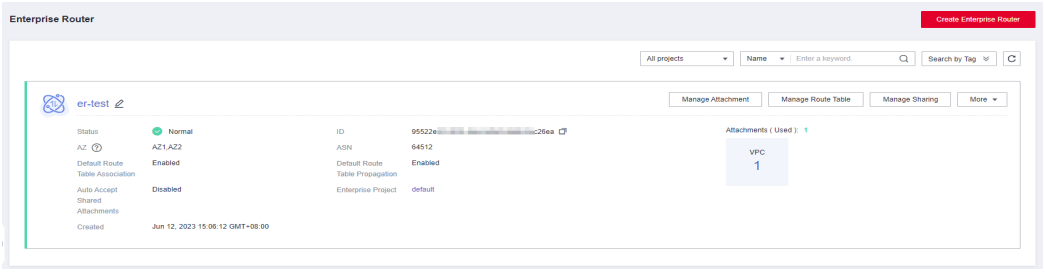
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

Figure 4-2 Searching for an enterprise router



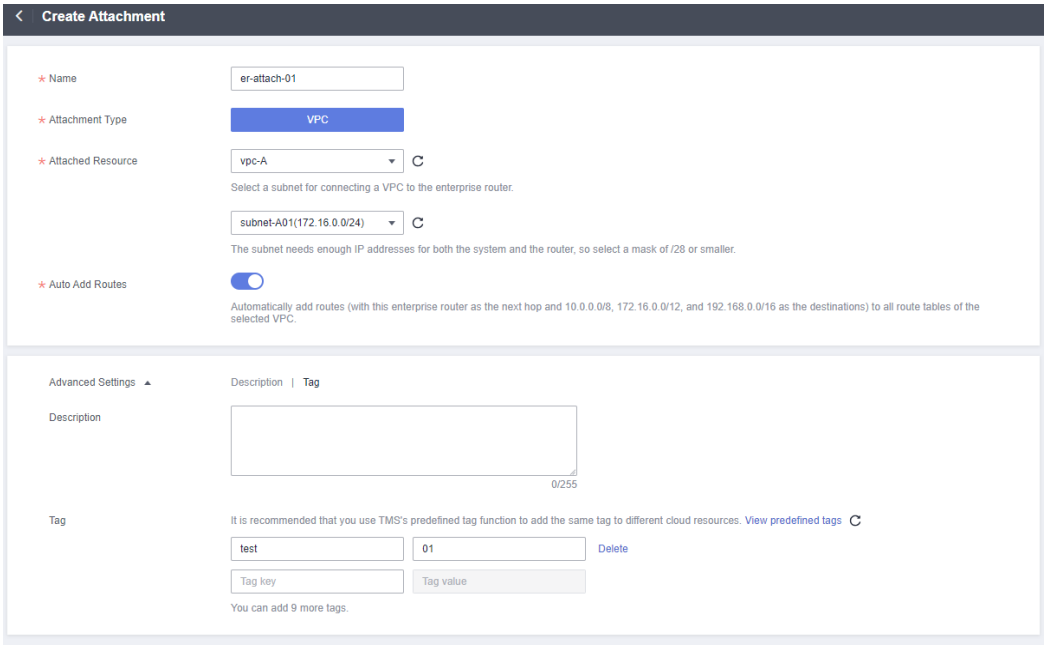
Step 5 Go to the **Attachments** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Attachment**.
- Click the enterprise router name and click **Attachments**.

Step 6 On the **Attachments** tab, click **Create Attachment**.

The **Create Attachment** dialog box is displayed.

Figure 4-3 Create Attachment



Step 7 Configure the parameters based on **Table 4-2**.

Table 4-2 Parameters for adding a VPC attachment

Parameter	Setting	Example Value
Name	Mandatory Enter the attachment name. The name: • Must contain 1 to 64 characters. • Can contain letters, digits, underscores (_), hyphens (-), and periods (.).	er-attach-01
Attachment Type	Mandatory 1. Select the attachment type. Select **VPC**, indicating that the instance to be attached to the enterprise router is a VPC. The methods for creating attachments vary depending on the attachment type. For details, see **Attachment Overview**. 2. Select the VPC to be attached to the enterprise router. You can enter a VPC name to quickly find the target VPC. 3. Select a subnet in the selected VPC. You can enter a subnet name to quickly find the target subnet. – You can select any subnet in the VPC. All subnets in the same VPC can communicate with each other by default and the enterprise router can connect to the entire VPC. – You are advised to select a subnet that is dedicated for connecting to the enterprise router. To ensure that the subnet has enough IP addresses for the system and the enterprise router, make the subnet mask /28 or smaller.	• Attachment Type: VPC • VPC: vpc-A • Subnet: subnet-A01
Auto Add Routes	Optional • Enable this option if you want to automatically add routes (with this enterprise router as the next hop and 10.0.0.0/8, 172.16.0.0/12, and 192.168.0.0/16 as the destinations) to all route tables of the selected VPC. • Do not enable this option if an existing route in the VPC route tables has a destination set to 10.0.0.0/8, 172.16.0.0/12, or 192.168.0.0/16 because the routes will fail to be added. After the attachment is created, manually **Step 5: (Optional) Add Routes to VPC Route Tables**.	Enable

Parameter	Setting	Example Value
Description	Optional Describe the attachment for easy identification.	-
Tag	Optional Add tags to help you quickly find your attachment. For details, see **Overview**.	**Tag key**: test **Tag value**: 01

Step 8 Click **OK**.

The attachment list is displayed.

Step 9 Check the attachment status.

If the status changes from **Creating** to **Normal**, the attachment is successfully created.

----End

Follow-up Procedure

If **Default Route Table Association** and **Default Route Table Propagation** are not enabled for an enterprise router, you need to:

1. Create a custom route table for the enterprise router. For details, see **Creating a Route Table**.
2. Create associations for the attachments of the enterprise router. For details, see **Creating an Association for an Attachment in a Route Table**.
3. Use either of the following methods to add routes for the attachment to the route table:
   - Create a propagation in the route table. For details, see **Creating a Propagation for an Attachment in the Route Table**.

     After the propagation is created, routes of the attachments to the enterprise router will be automatically propagated to the route table of the enterprise router.
   - Add static routes to the route table. For details, see **Creating a Static Route**.

4.3 Changing the Name of an Attachment

Scenarios

This section describes how to change the name of an attachment.

Procedure

Step 1 Log in to the management console.

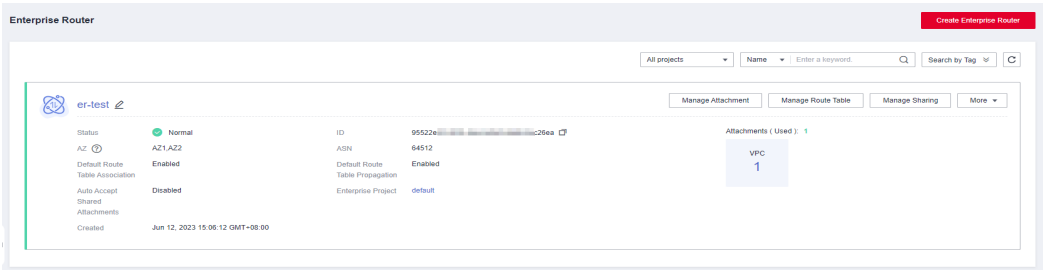
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

Figure 4-4 Searching for an enterprise router



Step 5 Go to the **Attachments** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Attachment**.
- Click the enterprise router name and click **Attachments**.

Step 6 In the attachment list, click next to the attachment name.

The **Edit** dialog box is displayed.

Step 7 Enter a new name.

Table 4-3 Parameter description

Parameter	Setting	Example Value
Name	Mandatory Enter the attachment name. The name: • Must contain 1 to 64 characters. • Can contain letters, digits, underscores (_), hyphens (-), and periods (.).	er-attach-01

Step 8 Click **OK**.

The attachment list is displayed.

----End

4.4 Viewing Details About an Attachment

Scenarios

This section describes how to view details about the attachments of an enterprise router, including the attachment name, attachment type, and attached resources.

The methods for viewing details about different types of attachments are the same. This section uses a VPC attachment as an example.

Procedure

Step 1 Log in to the management console.

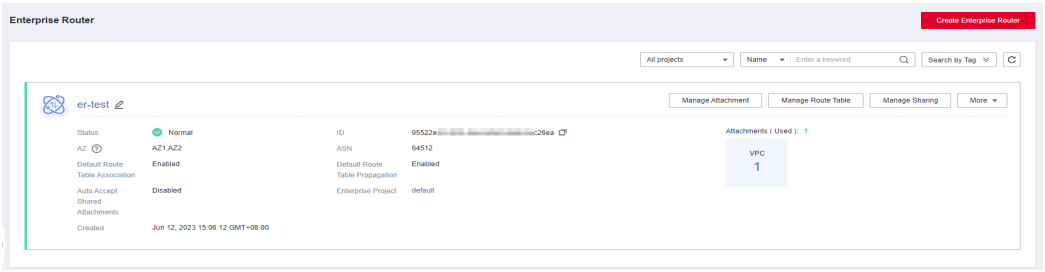
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

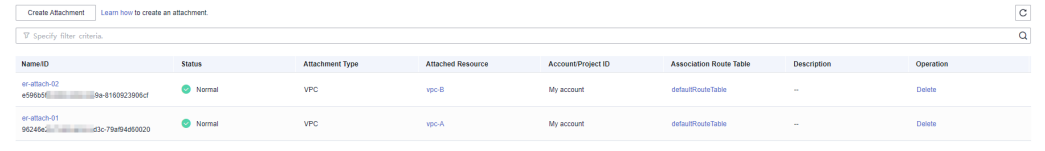
Figure 4-5 Searching for an enterprise router



Step 5 Go to the **Attachments** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Attachment**.
- Click the enterprise router name and click **Attachments**.

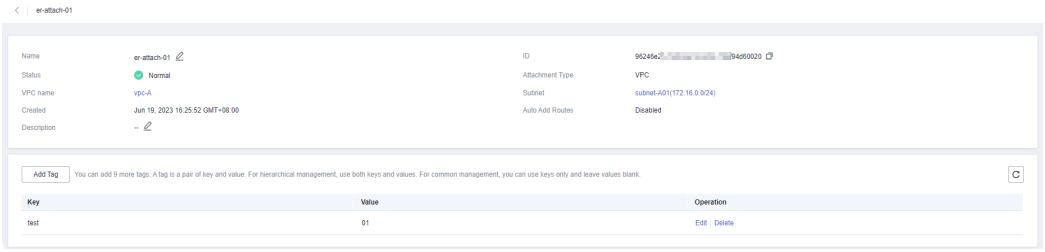
Figure 4-6 Viewing attachments



Step 6 On the **Attachments** tab, you can view:

- In the attachment list, you can view information such as the name, status, type, and attached resource.
- If you click the attachment name, you can view more information about the attachment on the displayed page, including the attachment ID, creation time, and tags.
- If you click the attached resource, you will go to the details page of the attached resource.

Figure 4-7 Viewing attachment details



----End

4.5 Deleting an Attachment

4.5.1 Deleting a VPC Attachment

Scenarios

This section describes how to delete a VPC attachment from an enterprise router.

Notes and Constraints

- Deleting an attachment will also delete its associations, propagations, and propagated routes in the route table.
- After an attachment is deleted, the next hop of its related static routes will be **Blackhole**. If the destination of a packet matches the blackhole route, the packet will be discarded.

  Figure 4-8 Blackhole route

- If flow logging is enabled for an attachment, flow logging will be disabled, but collected flow logs will not be deleted.

Procedure

Step 1 Log in to the management console.

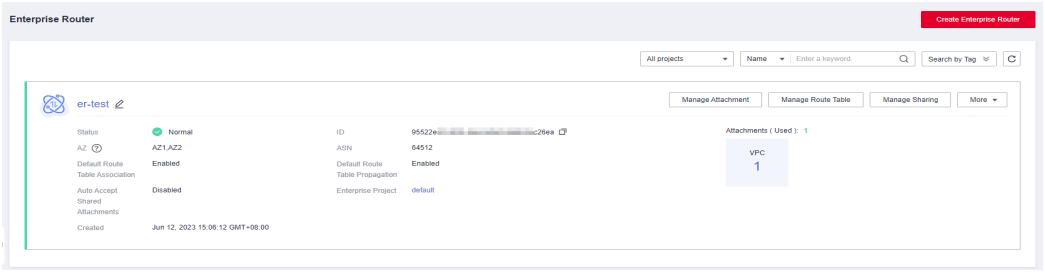
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

Figure 4-9 Searching for an enterprise router



Step 5 Go to the **Attachments** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Attachment**.
- Click the enterprise router name and click **Attachments**.

Step 6 In the attachment list, locate the target VPC attachment, and click **Delete** in the **Operation** column.

A confirmation dialog box is displayed.

Step 7 Confirm the information and click **Yes**.

A deleted attachment cannot be recovered.

----End

4.5.2 Deleting a Virtual Gateway Attachment

Scenarios

This section describes how to delete a virtual gateway attachment from an enterprise router.

Notes and Constraints

- Deleting an attachment will also delete its associations, propagations, and propagated routes in the route table.
- If flow logging is enabled for an attachment, flow logging will be disabled, but collected flow logs will not be deleted.

Procedure

Step 1 Log in to the management console.

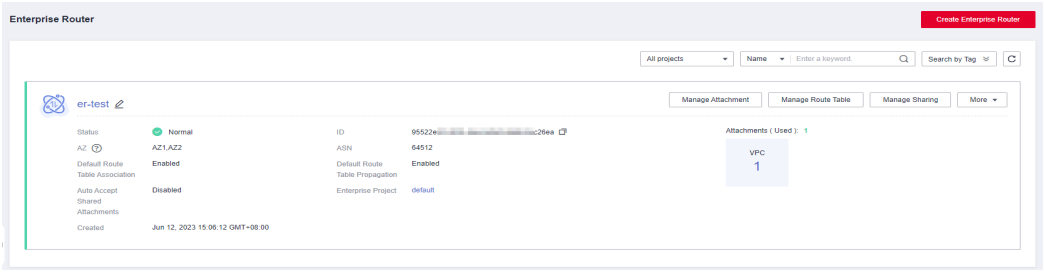
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

Figure 4-10 Searching for an enterprise router



Step 5 Go to the **Attachments** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Attachment**.
- Click the enterprise router name and click **Attachments**.

NOTICE

A virtual gateway attachment cannot be directly deleted on the **Attachments** page of the enterprise router.

A virtual gateway attachment will be automatically deleted after you perform the following operations to delete the virtual gateway and its virtual interfaces.

Step 6 Locate the target virtual gateway attachment and click the attached resource.

Example: vgw-demo

The virtual gateway attachment details page is displayed.

Step 7 On the details page, click the virtual gateway.

The virtual gateway list is displayed.

Step 8 Check whether the virtual gateway has virtual interfaces.

- If the virtual gateway has virtual interfaces, delete the virtual interfaces first.

  For details, see section "Deleting a Virtual Interface" in the **Direct Connect User Guide**.
- If the virtual gateway has no virtual interfaces, go to **Step 9**.

Step 9 Locate the target virtual gateway and click **Delete** in the **Operation** column.

A confirmation dialog box is displayed.

Step 10 Click **Yes**.

A deleted virtual gateway cannot be recovered.

----End

4.5.3 Deleting a VPN Gateway Attachment

Scenarios

This section describes how to delete a VPN gateway attachment from an enterprise router.

Notes and Constraints

- Deleting an attachment will also delete its associations, propagations, and propagated routes in the route table.
- If flow logging is enabled for an attachment, flow logging will be disabled, but collected flow logs will not be deleted.

Procedure

Step 1 Log in to the management console.

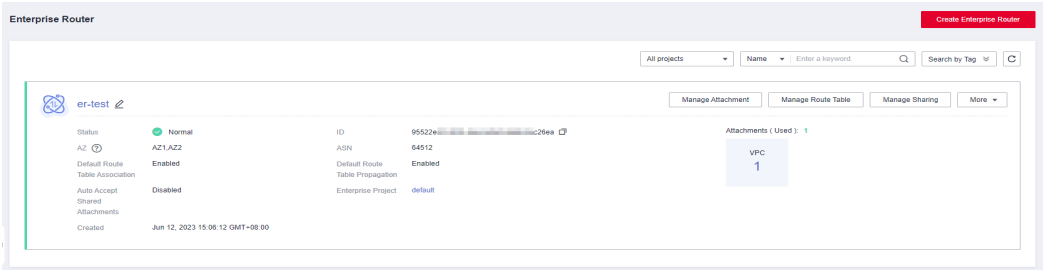
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

Figure 4-11 Searching for an enterprise router



Step 5 Go to the **Attachments** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Attachment**.
- Click the enterprise router name and click **Attachments**.

NOTICE

A VPN gateway attachment cannot be directly deleted on the **Attachments** page of the enterprise router.

A VPN gateway attachment will be automatically deleted after you perform the following operations to delete its VPN connections, unbind the EIP from the VPN gateway, and delete the VPN gateway.

Step 6 Locate the target VPN gateway attachment and click the attached resource.

Example: vpngw-demo

The VPN gateway attachment details page is displayed.

Step 7 On the attachment details page, click in the upper left corner.

The VPN gateway list is displayed.

Step 8 In the VPN gateway list, locate the target VPN gateway, click **More** in the **Operation** column, and click **Delete**.

A confirmation dialog box is displayed.

Step 9 Click **Yes**.

A deleted VPN gateway cannot be recovered.

----End

5 Route Tables

5.1 Route Table Overview

Route tables are used by enterprise routers to forward packets. Each route table contains associations, propagations, and routes. Route tables are classified into custom route tables and default route tables.

Table 5-1 Route tables

Route Table	Description
Custom route table	• A custom route table is an additional route table you optionally create for an enterprise router. • An enterprise router can have multiple custom route tables. You can associate attachments with different route tables to enable communication or isolation between network instances.

Route Table	Description
Default route table	A default route table is automatically created when an enterprise router is created. There are two types of default route tables: default association route table and default propagation route table. You can specify a route table both as the default association route table and the default propagation route table. You can also specify one route table as the default association route and another route table as the default propagation route table. • If **Default Route Table Association** is enabled and the default association route table is specified, attachments will be associated with the default association route table. If no default association route table is specified, a route table named **defaultRouteTable** will be created and used as the default association route table. • If **Default Route Table Propagation** is enabled and the default propagation route table is specified, attachments will be propagated to the default propagation route table. If no default propagation route table is specified, a route table named **defaultRouteTable** will be created and used as the default propagation route table. • If both **Default Route Table Association** and **Default Route Table Propagation** are enabled but the default association route table and the default propagation route table are not specified, the route table named **defaultRouteTable** will be used as both the default association route table and the default propagation route table. • If there is already a route table named **defaultRouteTable**, no additional **defaultRouteTable** will be created. • You can replace the default route table with a custom route table if needed.

5.2 Creating a Route Table

Scenarios

This section describes how to create a custom route table for an enterprise router.

Procedure

Step 1 Log in to the management console.

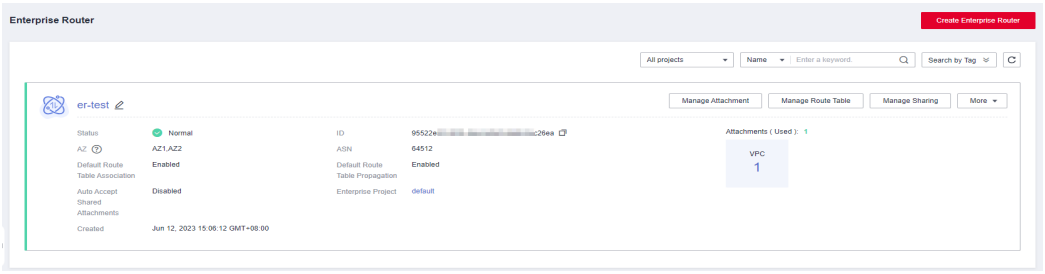
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

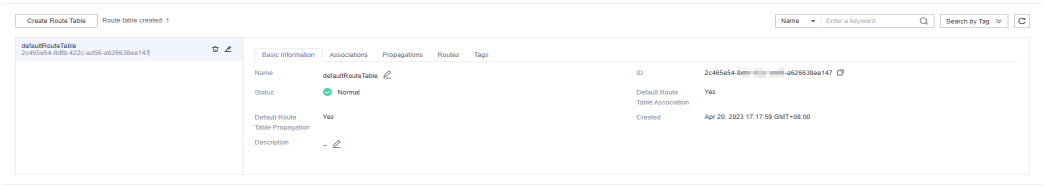
Figure 5-1 Searching for an enterprise router



Step 5 Go to the **Route Tables** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Route Table**.
- Click the enterprise router name and click **Route Tables**.

Figure 5-2 Route Tables



Step 6 On the **Route Tables** tab, click **Create Route Table**.

The **Create Route Table** dialog box is displayed.

Step 7 Configure the parameters based on **Table 5-2**.

Table 5-2 Parameters for creating a route table for an enterprise router

Parameter	Setting	Example Value
Name	Mandatory Enter a name for the route table. The name: • Must contain 1 to 64 characters. • Can contain letters, digits, underscores (_), hyphens (-), and periods (.).	er-rtb-01
Description	Optional Describe the route table for easy identification.	-
Tag	Optional Add tags to help you quickly find your route table. For details, see **Overview**.	**Tag key**: test **Tag value**: 01

Step 8 Click **OK**.

The route table list is displayed.

Step 9 View the route table status.

If the status changes from **Creating** to **Normal**, the route table is successfully created.

----End

5.3 Modifying a Route Table

Scenarios

This section describes how to modify the name and description of a route table.

Notes and Constraints

Only the name and description of route tables named **defaultRouteTable** and custom route tables can be changed.

Procedure

Step 1 Log in to the management console.

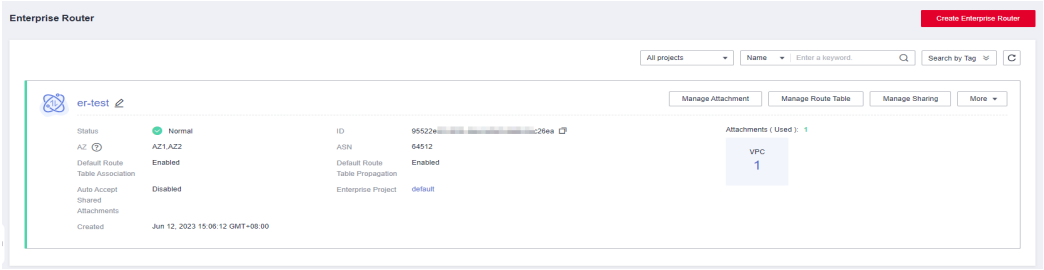
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

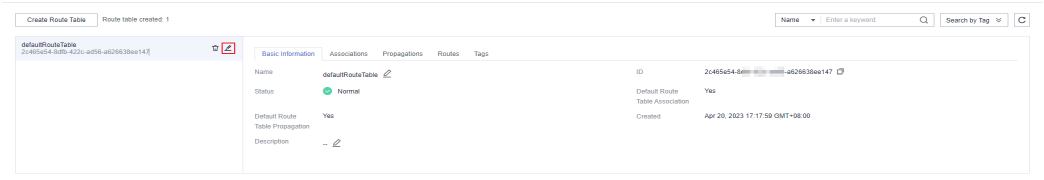
Figure 5-3 Searching for an enterprise router



Step 5 Go to the **Route Tables** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Route Table**.
- Click the enterprise router name and click **Route Tables**.

Figure 5-4 Renaming a route table



Step 6 In the route table list, click next to the name of the target route table.

The **Modify Route Table** dialog box is displayed.

Step 7 Enter a new name.

Table 5-3 Parameter description

Parameter	Setting	Example Value
Name	Mandatory Enter a new name for the route table. The name: • Must contain 1 to 64 characters. • Can contain letters, digits, underscores (_), hyphens (-), and periods (.).	er-rtb-01
Description	Optional Modify the description of the route table.	-

Step 8 Click **OK**.

The route table list is displayed.

----End

5.4 Viewing Route Tables

Scenarios

This section describes how to view route tables of an enterprise router.

Procedure

Step 1 Log in to the management console.

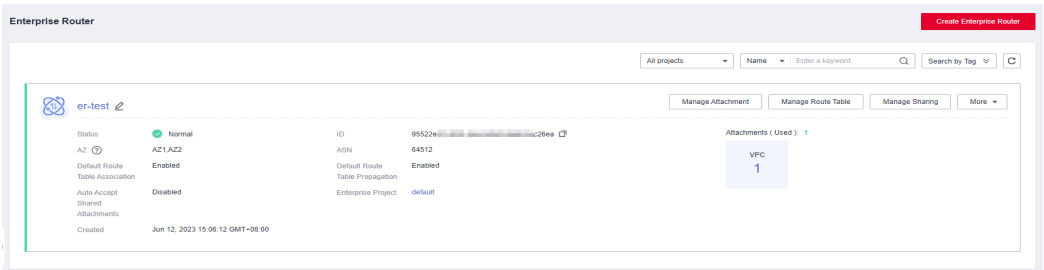
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

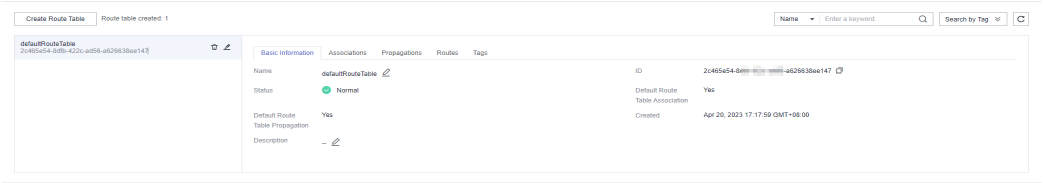
Figure 5-5 Searching for an enterprise router



Step 5 Go to the **Route Tables** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Route Table**.
- Click the enterprise router name and click **Route Tables**.

Figure 5-6 Route Tables



Step 6 In the route table list, click different tabs to view the route table information.

On the **Basic Information** tab, you can view the status of the route table and whether **Default Route Table Association** and **Default Route Table Propagation** are enabled.

----End

5.5 Deleting a Route Table

Scenarios

This section describes how to delete a route table of an enterprise router.

Notes and Constraints

- If a route table is used as the default association route table and/or default propagation route table, the route table cannot be deleted.
  - If **Default Route Association** is set to **Yes** on the basic information page of the route table, the route table is used as the default association route table.
  - Also, if **Default Route Propagation** is set to **Yes** on the basic information of the route table, the route table is used as the default propagation route table.

  To delete such a route table, change **Default Route Association** and **Default Route Propagation** settings. For details, see **Modifying an Enterprise Router**.
- A route table cannot be deleted if it contains an association or a propagation. You need to delete the association and propagation before deleting this route table.
  - For details about how to delete an association, see **Deleting an Association from a Route Table**.
  - For details about how to delete a propagation, see **Deleting a Propagation from a Route Table**.
- A route table can be deleted if it contains only static routes. Ensure that the routes are no longer required before deleting their route table.

Procedure

Step 1 Log in to the management console.

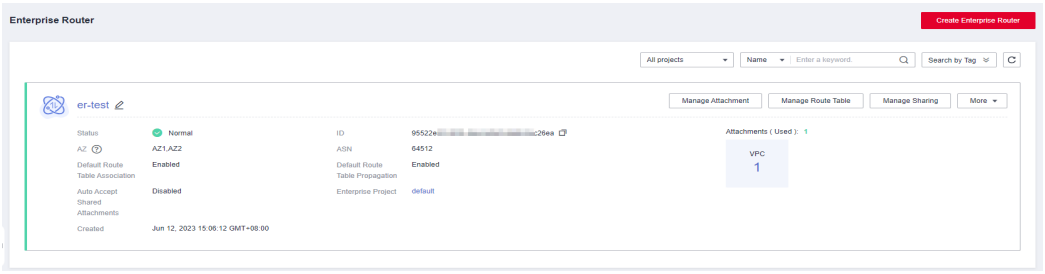
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

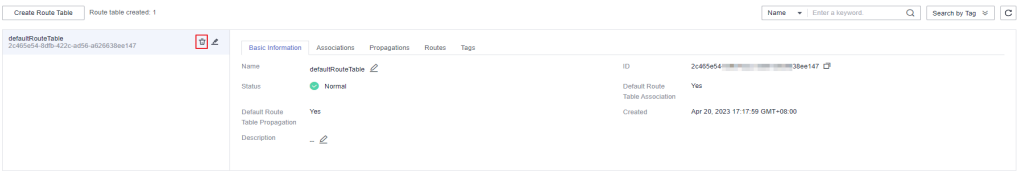
Figure 5-7 Searching for an enterprise router



Step 5 Go to the **Route Tables** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Route Table**.
- Click the enterprise router name and click **Route Tables**.

Figure 5-8 Deleting a route table



Step 6 In the route table list, click next to the name of the target route table.

A confirmation dialog box is displayed.

Step 7 Click **Yes**.

A deleted route table cannot be recovered.

----End

6 Associations

6.1 Association Overview

Each attachment can be associated with one route table for:

- Packet forwarding: Packets from the attachment are forwarded through the routes specified in the associated route table.
- Route propagation: The routes in the associated route tables are automatically propagated to the route table of the attachment.

Figure 6-1 Associations

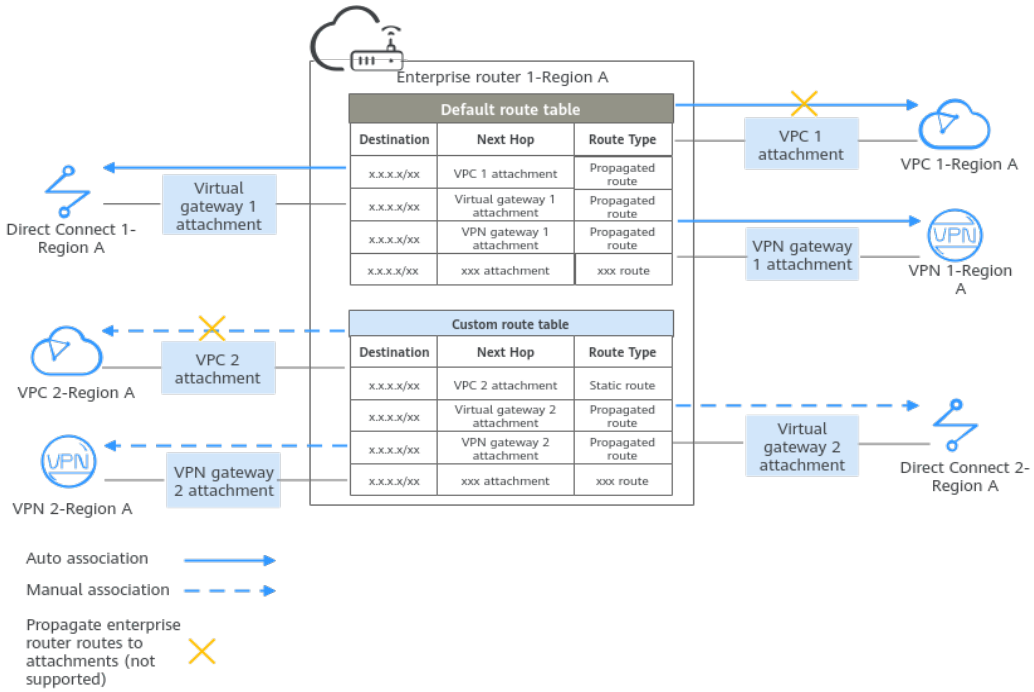


Table 6-1 Association description

Attachment Type	Route Learning	Way to Create Association	Description
VPC	Not supported	• Auto creation: If **Default Route Table Association** is enabled and the default association route table is specified, attachments are automatically associated with the default association route table. – If you want to enable this function when you create an enterprise router, refer to **Creating an Enterprise Router**. – If you want to enable this function after an enterprise router is created, refer to **Modifying an Enterprise Router**. • Manual creation: You can select a route table and create an association in it to associate an attachment with the route table. For details, see **Creating an Association for an Attachment in a Route Table**.	Each attachment can only be associated with one route table. Associations between attachments in **Figure 6-1** are described as follows: • Auto creation: The system automatically associates attachments, such as virtual gateway 1, VPC 1, and VPN gateway 1, with the default route table of the enterprise router. • Manual creation: You need to manually create associations in the custom route table of the enterprise router for attachments, such as VPC 2, VPN gateway 2, and virtual gateway 2.
Virtual gateway	Supported		
VPN gateway	Supported		

6.2 Creating an Association for an Attachment in a Route Table

Scenarios

This section describes how to create an association in a route table of an enterprise router to associate a specified attachment with the route table.

Notes and Constraints

Each attachment can only be associated with one route table. Packets from the attachment will be forwarded based on the route table.

Procedure

Step 1 Log in to the management console.

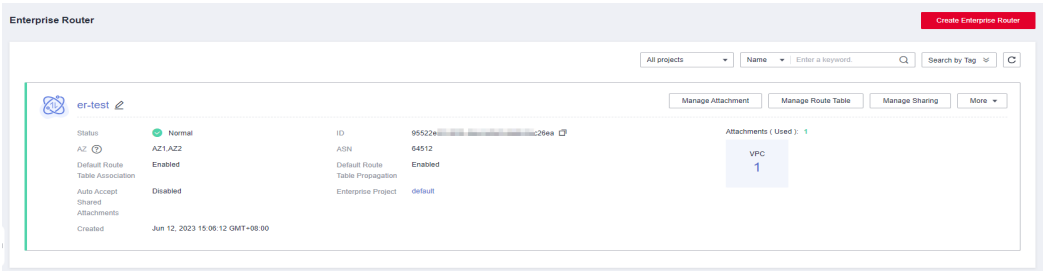
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

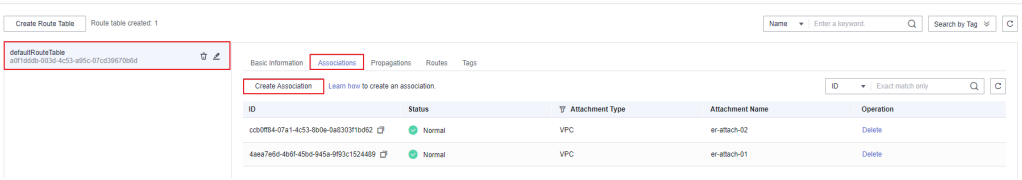
Figure 6-2 Searching for an enterprise router



Step 5 Go to the **Route Tables** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Route Table**.
- Click the enterprise router name and click **Route Tables**.

Figure 6-3 Create Association



Step 6 Click the route table where you want to create an association. On the **Associations** tab, click **Create Association**.

The **Create Association** dialog box is displayed.

Step 7 Configure the parameters based on **Table 6-2**.

Table 6-2 Parameters for creating an association

Parameter	Setting	Example Value
Attachment Type	Mandatory Select an attachment type. • **VPC** • **Virtual gateway** • **VPN gateway** For more information, see **Attachment Overview**.	VPC

Parameter	Setting	Example Value
Attachment	Mandatory In the drop-down list, select the attachment to be associated with the route table.	er-attach-02

Step 8 Click **OK**.

The association list is displayed. You can view your association.

----End

6.3 Viewing Associations in a Route Table

Scenarios

This section describes how to view associations in the route table of an enterprise router. You can also view all the attachments associated with this route table.

Procedure

Step 1 Log in to the management console.

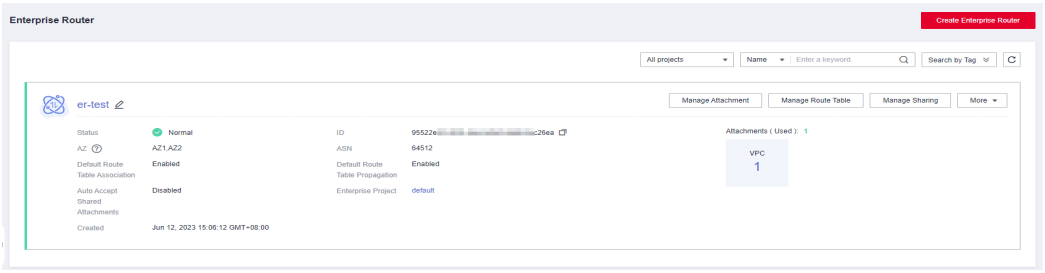
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

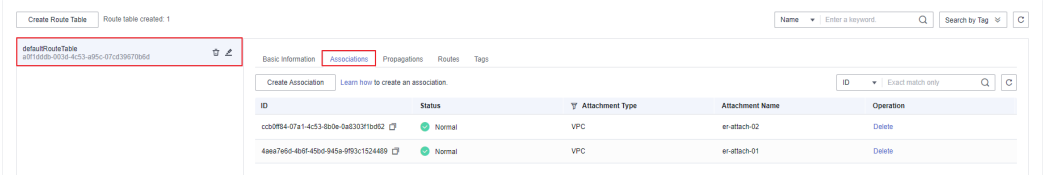
Figure 6-4 Searching for an enterprise router



Step 5 Go to the **Route Tables** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Route Table**.
- Click the enterprise router name and click **Route Tables**.

Figure 6-5 Viewing associations



Step 6 Click the route table where you want to view its associations. On the **Associations** tab, view the associations.

All attachments associated with the route table are displayed in the list. You can view their settings such as the ID, status, and name of each attachment.

----End

6.4 Deleting an Association from a Route Table

Scenarios

This section describes how to delete an association from the route table of an enterprise router.

Procedure

Step 1 Log in to the management console.

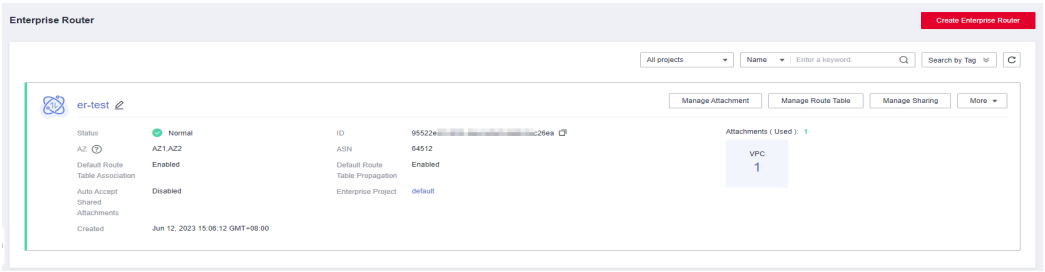
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

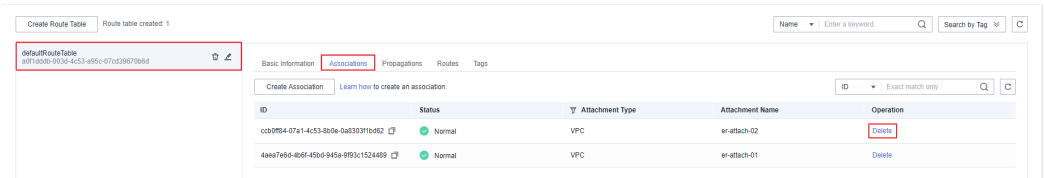
Figure 6-6 Searching for an enterprise router



Step 5 Go to the **Route Tables** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Route Table**.
- Click the enterprise router name and click **Route Tables**.

Figure 6-7 Deleting an association



Step 6 Click the route table that you want to delete an association from. On the **Associations** tab, locate the association you want to delete and click **Delete** in the **Operation** column.

A confirmation dialog box is displayed.

Step 7 Click **Yes**.

A deleted association cannot be recovered.

----End

7 Propagations

7.1 Propagation Overview

You can create a propagation for each attachment to propagate routes to one or more route tables on an enterprise router.

If you do not want to create a propagation, you can manually add static routes for attachments to the route tables.

Figure 7-1 Propagated routes and static routes

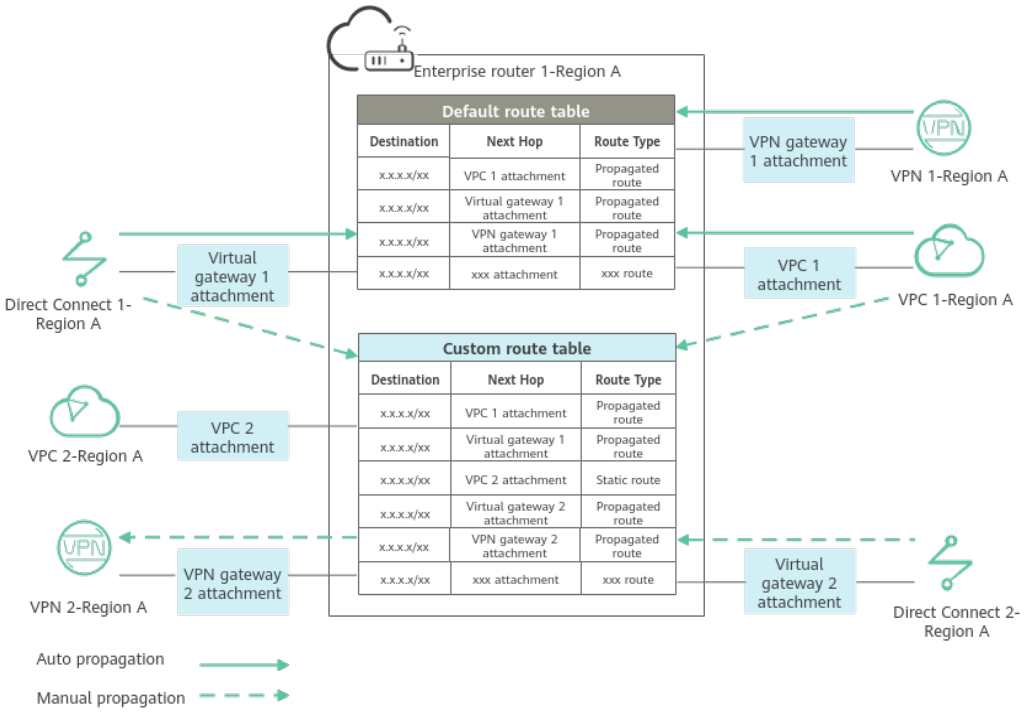


Table 7-1 Propagation description

Attachment Type	Propagated Info	Way to Create Propagation	Description
VPC	VPC CIDR blocks	• Auto creation: If **Default Route Table Propagation** is enabled and the default propagation route table is specified, attachments automatically propagate routes to the default propagation route table. – If you want to enable this function when you create an enterprise router, refer to **Creating an Enterprise Router**. – If you want to enable this function after an enterprise router is created, refer to **Modifying an Enterprise Router**. • Manual creation: You can select a route table and create a propagation for an attachment in the route table. For details, see **Creating a Propagation for an Attachment in the Route Table**.	An attachment can be propagated to different route tables. You can create propagations for attachments in **Figure 7-1** as follows: • Auto creation: Propagations are automatically created for the attachments, such as virtual gateway 1, VPN gateway 1, and VPC 1 attachments, in the default propagation route table of the enterprise router. • Manual creation: You need to manually create propagations in the custom route table of the enterprise router for attachments, such as virtual gateway 1, VPC 1, VPN gateway 2, and virtual gateway 2 attachments. • No propagation: If you do not want to use propagated routes, you need to manually add static routes to the custom route table of the enterprise router for attachments, such as VPC 2 attachment.
Virtual gateway	All routes		
VPN gateway	All routes		

7.2 Creating a Propagation for an Attachment in the Route Table

Scenarios

This section describes how to create a propagation in the route table of an enterprise router.

Notes

You can create propagations for the same attachment in different route tables.

Procedure

Step 1 Log in to the management console.

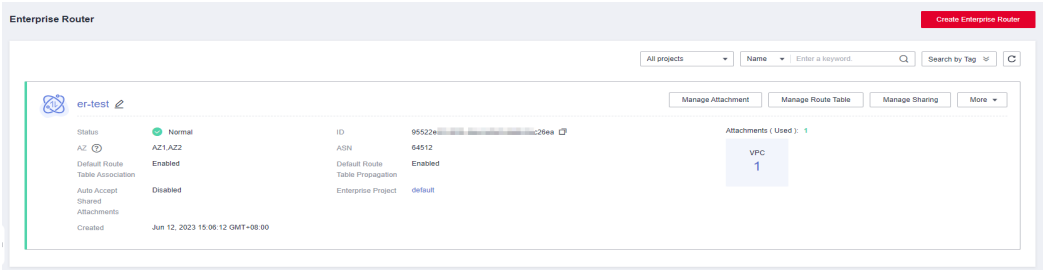
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

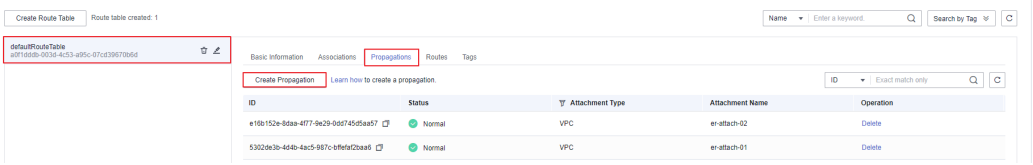
Figure 7-2 Searching for an enterprise router



Step 5 Go to the **Route Tables** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Route Table**.
- Click the enterprise router name and click **Route Tables**.

Figure 7-3 Create Propagation



Step 6 Click the route table where you want to create a propagation. On the **Propagations** tab, click **Create Propagation**.

The **Create Propagation** dialog box is displayed.

Step 7 Configure the parameters based on **Table 7-2**.

Table 7-2 Parameters for creating a propagation

Parameter	Setting	Example Value
Attachment Type	Mandatory Select an attachment type. • **VPC** • **Virtual gateway** • **VPN gateway** For more information, see **Attachment Overview**.	VPC
Attachment	Mandatory In the drop-down list, select the attachment who will propagate routes to the route table.	er-attach-02

Step 8 Click **OK**.

The propagation list is displayed. You can view your propagation.

----End

7.3 Viewing a Propagation in a Route Table

Scenarios

This section describes how to view a propagation in the route table of an enterprise router.

Procedure

Step 1 Log in to the management console.

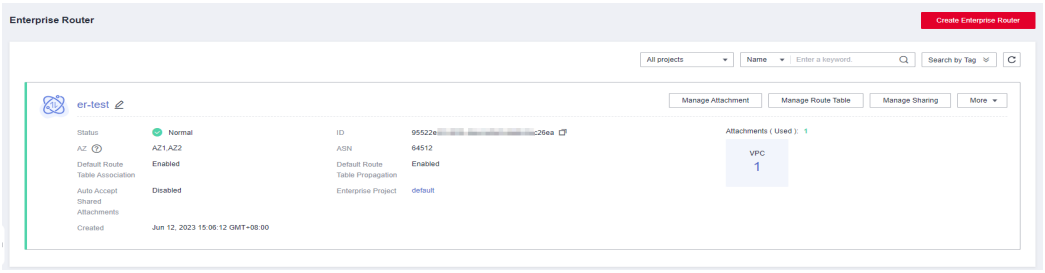
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

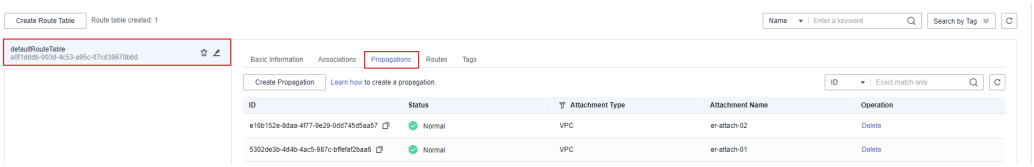
Figure 7-4 Searching for an enterprise router



Step 5 Go to the **Route Tables** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Route Table**.
- Click the enterprise router name and click **Route Tables**.

Figure 7-5 Viewing a propagation



Step 6 Click the route table where you want to view a propagation. On the **Propagations** tab, view your propagation.

All propagations associated with the route table are displayed in the list. You can view their settings such as the ID, status, and name of each propagation.

----End

7.4 Deleting a Propagation from a Route Table

Scenarios

This section describes how to delete a propagation from the route table of an enterprise router.

Notes and Constraints

Propagated routes are learned through propagation. Deleting a propagation will also delete the propagated routes.

Procedure

Step 1 Log in to the management console.

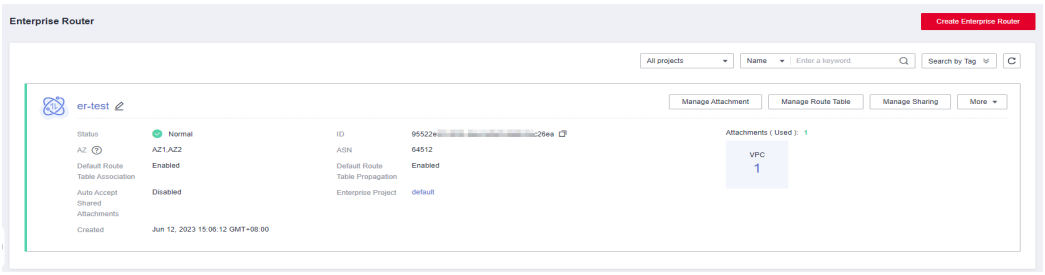
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

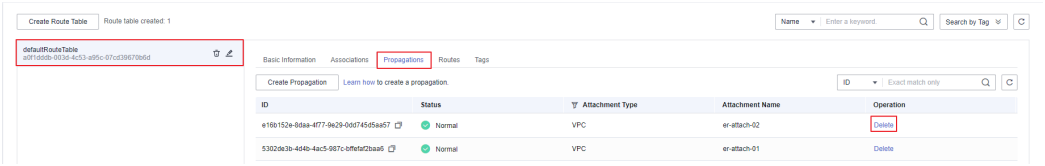
Figure 7-6 Searching for an enterprise router



Step 5 Go to the **Route Tables** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Route Table**.
- Click the enterprise router name and click **Route Tables**.

Figure 7-7 Deleting a propagation



Step 6 Click the route table where you want to delete a propagation. On the **Propagations** tab, locate the propagation you want to delete and click **Delete** in the **Operation** column.

A confirmation dialog box is displayed.

Step 7 Click **Yes**.

A deleted propagation cannot be recovered.

----End

8 Routes

8.1 Route Overview

What Is a Route?

Routes are used to forward packets. A route contains information such as the destination, next hop, and route type.

You can create a propagation for attachments to automatically propagate routes to route tables or manually add static routes to route tables.

Figure 8-1 Propagated routes and static routes

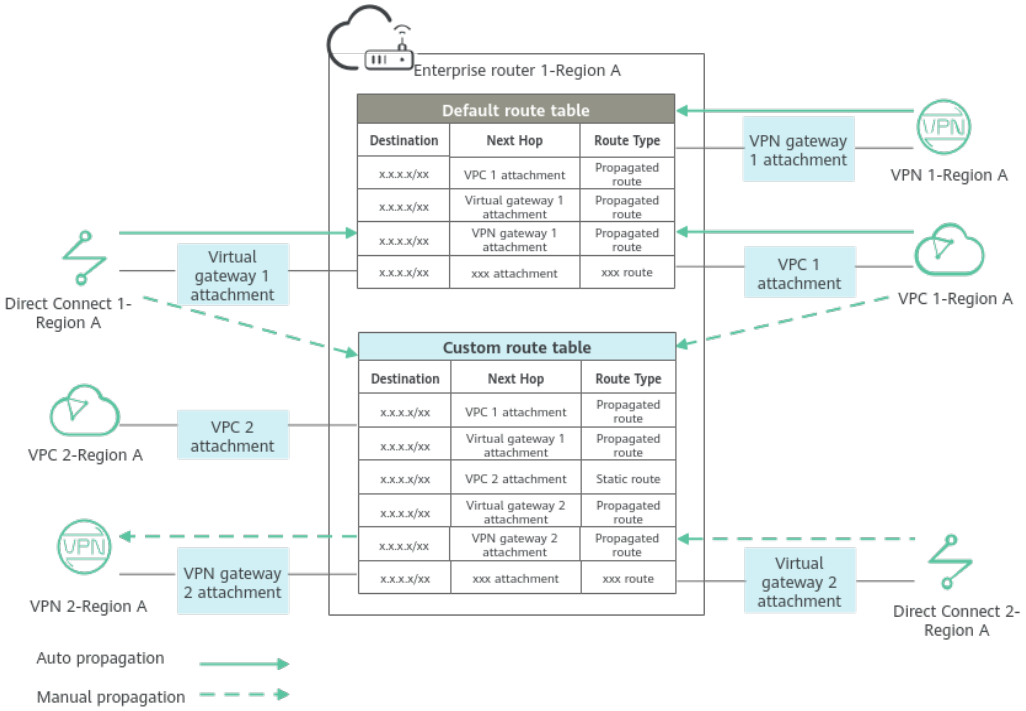


Table 8-1 Route types

Route Type	Description	How to Create	Description
Propagated routes	Propagated routes are routes that attachments propagate to the route tables of the enterprise router. They cannot be modified or deleted.	To create a propagation, see **Creating a Propagation for an Attachment in the Route Table**.	Routes are classified into propagated routes and static routes. The routes shown in **Figure 8-1** are described as follows: • Propagated routes are from: – Propagations automatically created in the default route table of the enterprise router for attachments, such as virtual gateway 1, VPN gateway 1 and VPC 1 attachments. – Propagations manually created in the custom route table of the enterprise router for attachments, such as virtual gateway 1, VPC 1, VPN gateway 2, and virtual gateway 2 attachments. • Static routes are manually added to the custom route table of the enterprise router for attachments, such as VPC 2 attachment.
Static routes	Static routes are manually created and can be modified or deleted.	To create a route, see **Creating a Static Route**.	

Route Priority

If there are multiple routes with the same destination but different targets in a route table, the route priority is as follows:

Static route > propagated route for attachment > propagated route for virtual gateway attachment > propagated route for VPN gateway attachment

NOTE

- Static routes are manually configured and the destination of each static route must be unique in a route table.
- Propagated routes are automatically learned by the system and may have the same destination in a route table.
- A static route and a propagated route may have the same destination in a route table.

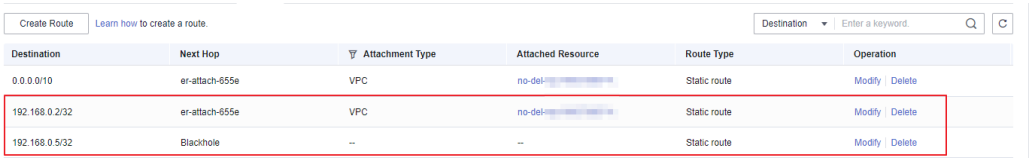
8.2 Creating a Static Route

Scenarios

You can create static routes in a route table of an enterprise router.

Static routes are classified into common routes and blackhole routes. A blackhole route only has a destination and has no next hop. It drops all traffic sent to the specified destination.

Figure 8-2 Common routes and blackhole routes



Procedure

Step 1 Log in to the management console.

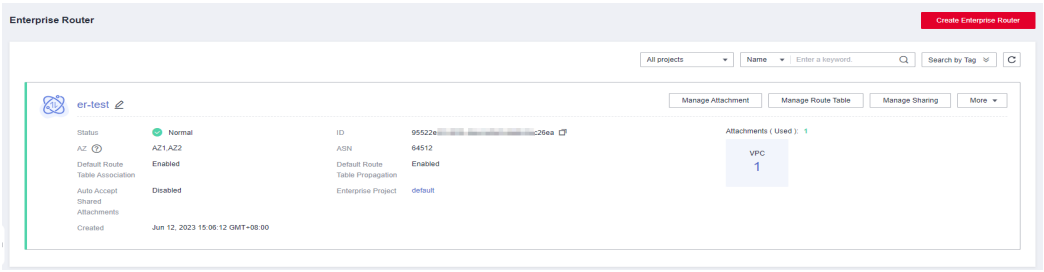
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

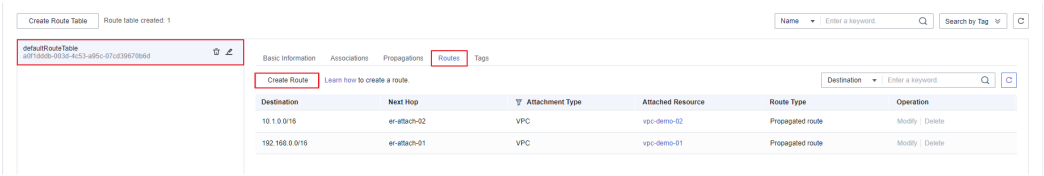
Figure 8-3 Searching for an enterprise router



Step 5 Go to the **Route Tables** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Route Table**.
- Click the enterprise router name and click **Route Tables**.

Figure 8-4 Creating a static route



Step 6 Click the route table where you want to create a static route. On the **Routes** tab, click **Create Route**.

The **Create Route** dialog box is displayed.

Step 7 Configure the parameters based on **Table 8-2**.

Table 8-2 Parameter description

Parameter	Setting	Example Value
Destination	Mandatory Enter the IP address or CIDR block of the attachment. For example, if it is a VPC attachment, enter the CIDR block of the VPC or a subnet of the VPC.	192.168.2.0/24
Blackhole Route	Optional If **Blackhole Route** is enabled, you do not need to configure **Attachment Type** and **Next Hop** for the route. If the destination of a route is the same as, or is contained in, that of this blackhole route, all packets destined for the destination will be dropped.	-
Attachment Type	• If **Blackhole Route** is not enabled, you need to configure this parameter. • If **Blackhole Route** is enabled, you do not need to configure this parameter. **VPC**: Create a static route for a VPC attachment. For more information, see **Attachment Overview**.	VPC
Next Hop	• If **Blackhole Route** is not enabled, you need to configure this parameter. • If **Blackhole Route** is enabled, you do not need to configure this parameter. In the drop-down list, select the target attachment.	er-attach-01

Step 8 Click **OK**.

Wait for 2 to 3 seconds, and click to refresh the route list. The created static route is displayed.

----End

8.3 Modifying a Static Route

Scenarios

This section describes how to modify static routes, including common routes and blackhole routes, in a route table of an enterprise router. For example, you can perform the following operations:

- Change a common route to a blackhole route.
- Change the attachment type and next hop of a common route.

Only static routes can be modified. Propagation routes cannot be modified.

Notes and Constraints

To change the destination of a static route, delete this static route and create another one with your desired destination.

Procedure

Step 1 Log in to the management console.

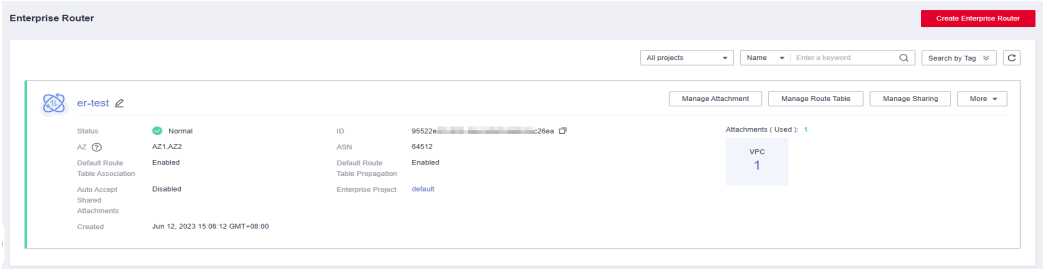
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

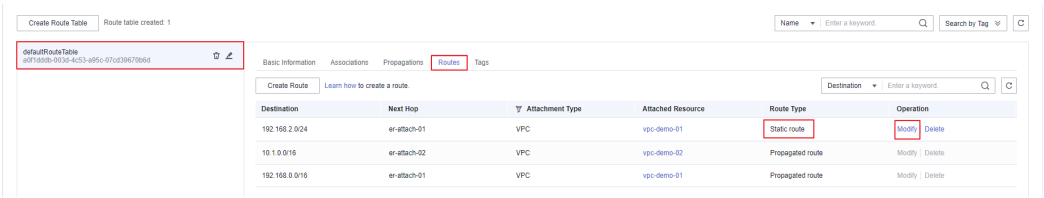
Figure 8-5 Searching for an enterprise router



Step 5 Go to the **Route Tables** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Route Table**.
- Click the enterprise router name and click **Route Tables**.

Figure 8-6 Modifying a static route



Step 6 Click the route table where you want to modify a route. On the **Routes** tab, locate the route and click **Modify** in the **Operation** column.

The **Modify Route** dialog box is displayed.

Step 7 Modify the route based on **Table 8-3**.

Table 8-3 Parameter description

Parameter	Setting	Example Value
Blackhole Route	Optional If **Blackhole Route** is enabled, you do not need to configure **Attachment Type** and **Next Hop** for the route. If the destination of a route is the same as, or is contained in, that of this blackhole route, all packets destined for the destination will be dropped.	-
Attachment Type	• If **Blackhole Route** is not enabled, you need to configure this parameter. • If **Blackhole Route** is enabled, you do not need to configure this parameter. **VPC**: You want to attach a VPC to an enterprise router. For more information, see **Attachment Overview**.	VPC
Next Hop	• If **Blackhole Route** is not enabled, you need to configure this parameter. • If **Blackhole Route** is enabled, you do not need to configure this parameter. Select the attachment from the drop-down list.	er-attach-01

Step 8 Click **OK**.

View the modified static route in the route list.

----End

8.4 Viewing Routes

Scenarios

View propagated routes and static routes in a route table of an enterprise router.

Procedure

Step 1 Log in to the management console.

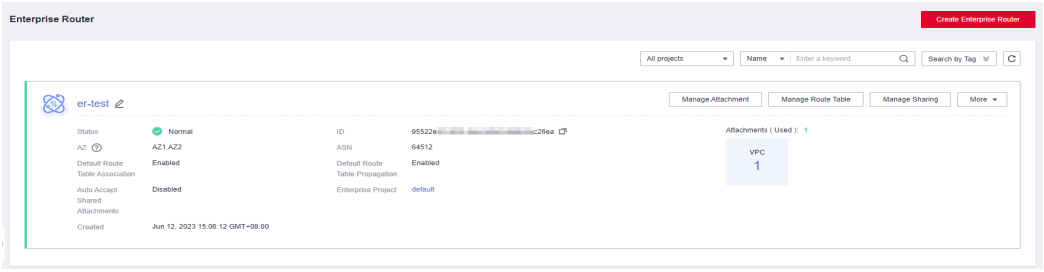
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

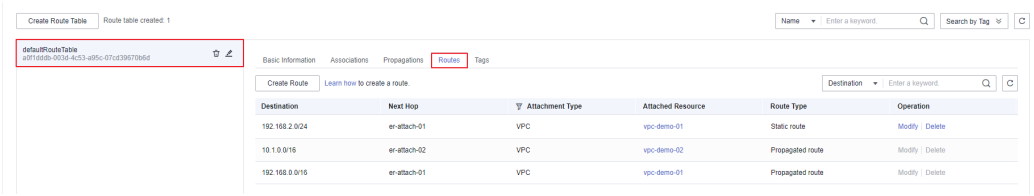
Figure 8-7 Searching for an enterprise router



Step 5 Go to the **Route Tables** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Route Table**.
- Click the enterprise router name and click **Route Tables**.

Figure 8-8 Viewing routes



Step 6 Click the route table whose routes you want to view. On the **Routes** tab, view the routes.

Each route includes information such as the destination, next hop, attachment type, and route type.

----End

8.5 Deleting a Static Route

Scenarios

Delete a static route from a route table of an enterprise router.

Only static routes can be deleted. To delete a propagated route, you need to delete its propagation. The route will be deleted together with the propagation. For details, see **Deleting a Propagation from a Route Table**.

Procedure

Step 1 Log in to the management console.

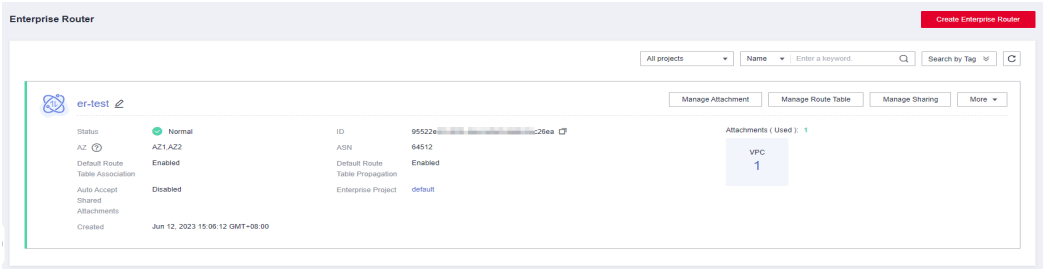
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

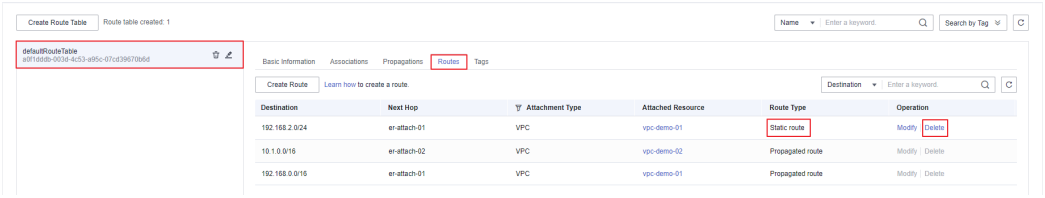
Figure 8-9 Searching for an enterprise router



Step 5 Go to the **Route Tables** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Route Table**.
- Click the enterprise router name and click **Route Tables**.

Figure 8-10 Deleting a static route



Step 6 Click the route table where you want to delete a route. On the **Routes** tab, locate the route and click **Delete** in the **Operation** column.

A confirmation dialog box is displayed.

Step 7 Click **Yes**.

A deleted static route cannot be recovered.

Wait for 2 to 3 seconds, and click to refresh the route list. The route does not exist in the list.

----End

9 Sharing

9.1 Sharing Overview

What Is Sharing?

You can share an enterprise router in your account with other accounts.

- You are the owner of the enterprise router.
- Other accounts are the users of the enterprise router.

After you share your enterprise router with other accounts, these other users can attach their network instances to your enterprise router, so that their network instances can access your enterprise router.

You can share an enterprise router in your account with other accounts so that these other accounts can attach their VPCs to your enterprise router.

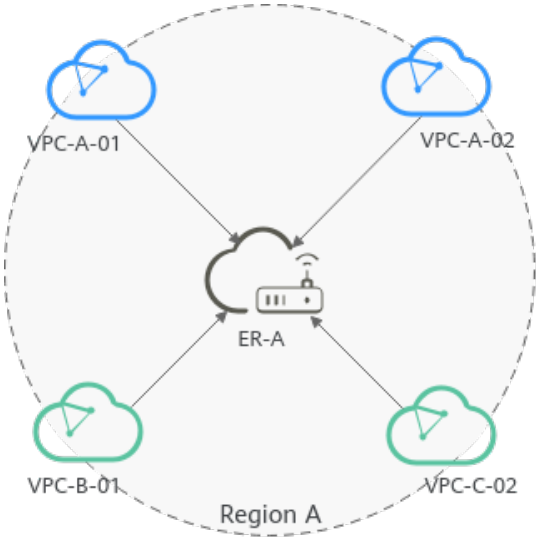
This example uses account A, account B, and account C to describe how you can build a network using one enterprise router. **Table 9-1** describes the resources of each account.

If account A shares enterprise router (ER-A) with account B and account C, the VPCs of accounts B and C can be attached to ER-A. **Figure 9-1** shows the networking.

Table 9-1 Accounts and their resources

Account	Enterprise Router	VPC
A	ER-A	VPC-A-01 VPC-A-02
B	ER-B	VPC-B-01
C	ER-C	VPC-C-01

Figure 9-1 Attaching VPCs in different accounts to the same enterprise router



Allowed Operations by the Owner and Other Users

The owner can perform all operations but these other users can perform only some of the operations. **Table 9-2** lists the operations that other users can perform.

Table 9-2 Allowed operations by other users

Role	Allowed Operation	Description
Other users (user accounts)	**Viewing an Enterprise Router**	Other users can view: The name of the shared enterprise router followed by **Shared with me**.
	Adding attachments to an enterprise router **Adding VPC Attachments to an Enterprise Router**	Other users: • Can only create VPC attachments. • Can create attachments to the shared enterprise router only after the owner account accepts the attachment requests. If **Auto Accept Shared Attachments** is enabled, a request from a user for creating an attachment will be automatically accepted. • Cannot add tags to their created attachments to the shared enterprise router. For details about the process for creating an attachment for an enterprise router in another account, see **Sharing an Enterprise Router with Other Users**.

Role	Allowed Operation	Description
	Viewing Details About an Attachment	Other users: Cannot view the tags added of their attachments.
	Changing the Name of an Attachment	Other users can change the names of their attachments created for the shared enterprise router.
	Deleting a VPC Attachment	Other users can delete their attachments created for the shared enterprise router without the approval of the owner account.

NOTE

Other users cannot view the **Route tables**, **Sharing**, **Flow logs**, and **Tags** tabs of the enterprise router.

Sharing an Enterprise Router with Other Users

As the owner, you can share your enterprise router with other users. These other users can create attachments for your enterprise router.

- If **Auto Accept Shared Attachments** is not enabled on your enterprise router, you must accept the attachment creation requests from other users.

Figure 9-2 Accepting or rejecting attachment creation requests

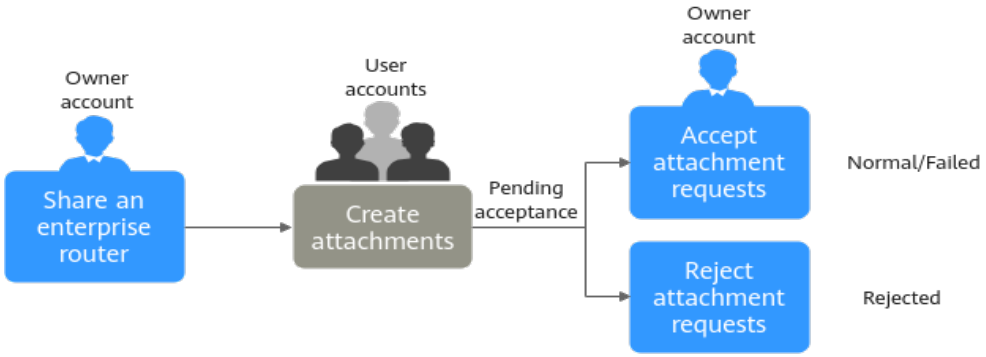


Table 9-3 Process description

No.	Step	Role	Description
1	**Creating a Sharing**	Owner	The owner creates a sharing to share an enterprise router with another user. This user can easily identify the shared enterprise router because its name is followed by **Shared with me**.
2	**Adding VPC Attachments to an Enterprise Router**	User	The user creates an attachment to the shared enterprise router. The attachment will be in the **Pending acceptance** state because **Auto Accept Shared Attachments** is disabled on the enterprise router.
3	**Accepting an Attachment Request**	Owner	The owner accepts the attachment request. The attachment status changes from **Pending acceptance** to **Creating**. • When the attachment status changes to **Normal**, the attachment is successfully created. • When the attachment status changes to **Failed**, the attachment fails to be created. Contact customer service. After an attachment is created, you can perform **Follow-up Procedure**.
	Rejecting an Attachment Request		The owner can also reject the attachment request. If the owner rejects the request, the attachment status changes from **Pending acceptance** to **Rejected**, and the attachment fails to be created. If this happens, contact the owner.

- If **Auto Accept Shared Attachments** is enabled on an enterprise router, the other users' requests to create attachments to this enterprise router will be automatically accepted without the approval from the owner.

Figure 9-3 Attachment requests automatically accepted

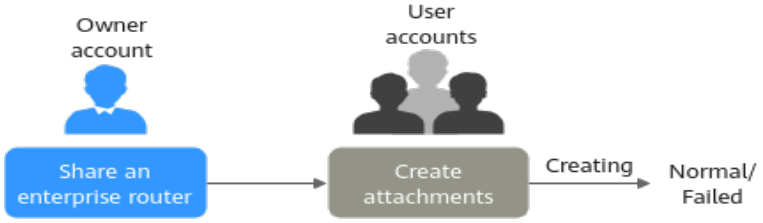


Table 9-4 Process description

No.	Step	Role	Description
1	Creating a Sharing	Owner	The owner creates a sharing to share an enterprise router with another user. This user can easily identify the shared enterprise router because its name is followed by **Shared with me**.
2	Adding VPC Attachments to an Enterprise Router	User account	**Auto Accept Shared Attachments** is enabled on the enterprise router. The user creates an attachment to the shared enterprise router. The attachment will be in the **Creating** state. • When the attachment status changes to **Normal**, the attachment is successfully created. • When the attachment status changes to **Failed**, the attachment fails to be created. Contact customer service.

9.2 Creating a Sharing

Scenarios

This section describes how to share your enterprise router with another user. After the enterprise router is shared, this user can view your enterprise router with its name followed by **Shared with me**.

Procedure

Step 1 Log in to the management console.

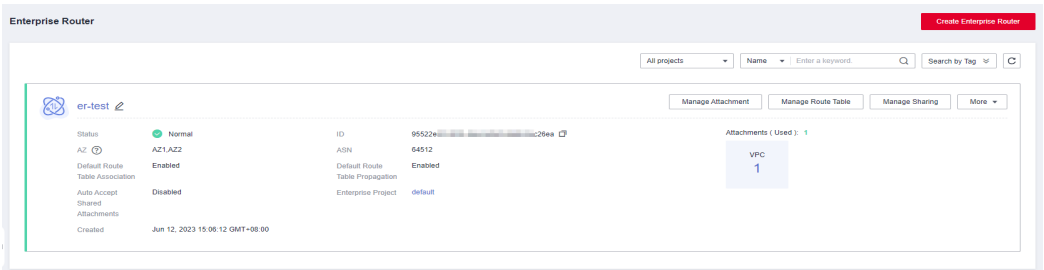
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

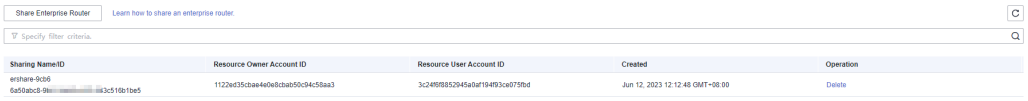
Figure 9-4 Searching for an enterprise router



Step 5 Go to the **Sharing** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Sharing**.
- Click the enterprise router name and click **Sharing**.

Figure 9-5 Sharing an enterprise router



Step 6 On the **Sharing** tab, click **Share Enterprise Router**.

The **Share Enterprise Router** dialog box is displayed.

Configure the parameters based on **Table 9-5**.

Table 9-5 Parameters for creating a sharing

Parameter	Setting	Example Value
Sharing Name	Mandatory Enter a name for the sharing. The name: • Must contain 1 to 64 characters. • Can contain letters, digits, underscores (_), hyphens (-), and periods (.).	ershare-ab
Resource User Account ID	Mandatory The ID of the account that you want to share the enterprise router with. **Learn how to obtain an account ID.**	2364e06b8XXXXXXdfeb

Step 7 Click **OK**.

The sharing list is displayed. You can view your sharing.

----End

9.3 Changing the Name of a Sharing

Scenarios

This section describes how you can change the name of a sharing.

Procedure

Step 1 Log in to the management console.

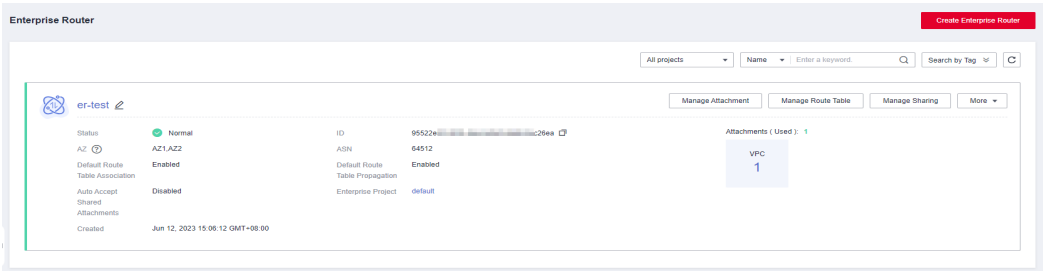
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

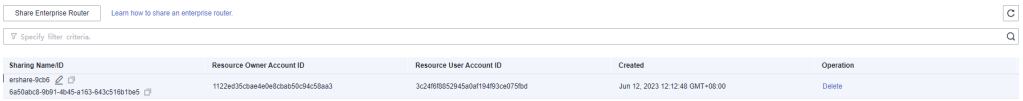
Figure 9-6 Searching for an enterprise router



Step 5 Go to the **Sharing** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Sharing**.
- Click the enterprise router name and click **Sharing**.

Figure 9-7 Editing sharing name



Step 6 In the sharing list, click next to the sharing.

The **Edit Sharing Name** dialog box is displayed.

Step 7 Enter a new name.

Table 9-6 Parameter for changing the name of a sharing

Parameter	Setting	Example Value
Name	Mandatory Enter the sharing name. The name: • Must contain 1 to 64 characters. • Can contain letters, digits, underscores (_), hyphens (-), and periods (.).	ershare-cd

Step 8 Click **OK**.

The sharing list is displayed.

----End

9.4 Viewing Sharing Details

Scenarios

After you share an enterprise router with other users, you can view information about the sharing and the other users, for example, the time when the sharing was created and the other users' account ID.

Procedure

Step 1 Log in to the management console.

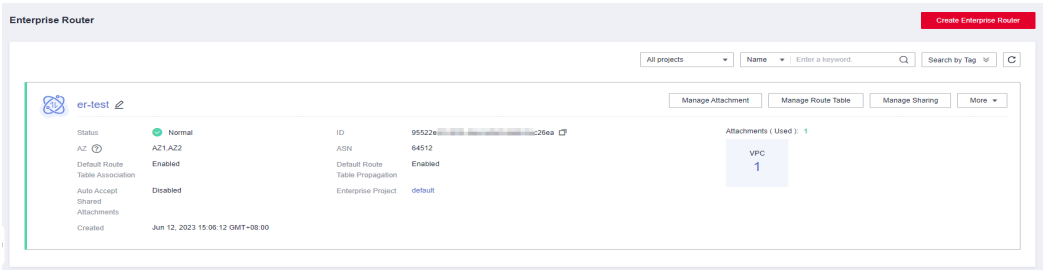
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

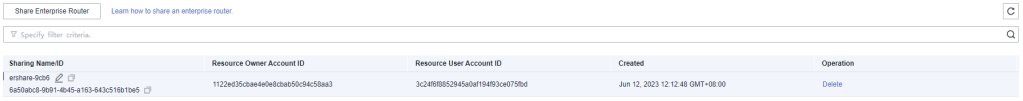
Figure 9-8 Searching for an enterprise router



Step 5 Go to the **Sharing** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Sharing**.
- Click the enterprise router name and click **Sharing**.

Figure 9-9 Viewing a sharing



Step 6 On the **Sharing** tab, you can view:

Sharing name, resource owner account ID, resource user account ID, and creation time.

----End

9.5 Accepting an Attachment Request

Scenarios

This section describes how to accept a request from another user for creating an attachment to your enterprise router.

NOTE

- If **Auto Accept Shared Attachments** is disabled on your enterprise router, you can choose to accept the attachment request or not.
- If **Auto Accept Shared Attachments** is enabled on your enterprise router, the attachment will be automatically accepted without your approval.

Procedure

Step 1 Log in to the management console.

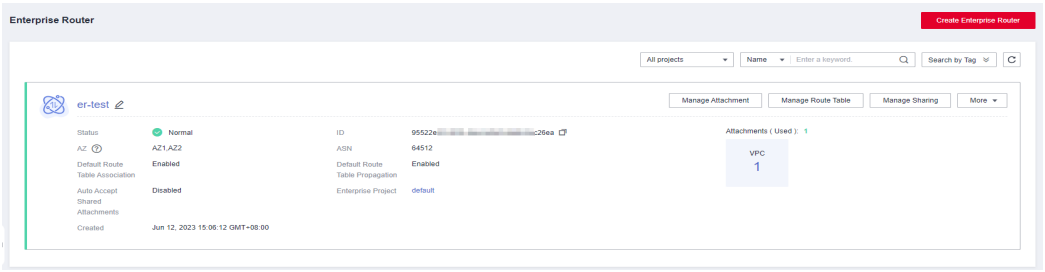
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

Figure 9-10 Searching for an enterprise router



Step 5 Go to the **Attachments** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Attachment**.
- Click the enterprise router name and click **Attachments**.

Step 6 In the attachment list, locate the attachment you want to accept and click **Accept** in the **Operation** column.

The owner accepts the attachment request. The attachment status changes from **Pending acceptance** to **Creating**.

- When the attachment status changes to **Normal**, the attachment is successfully created.
- When the attachment status changes to **Failed**, the attachment fails to be created. Contact customer service.

After an attachment is created, you can perform **Follow-up Procedure**.

----End

9.6 Rejecting an Attachment Request

Scenarios

This section describes how to reject a request from another user for creating an attachment to your enterprise router.

NOTE

- If **Auto Accept Shared Attachments** is disabled on your enterprise router, you can choose to accept the attachment request or not.
- If **Auto Accept Shared Attachments** is enabled on your enterprise router, the attachment will be automatically accepted without your approval.

Procedure

Step 1 Log in to the management console.

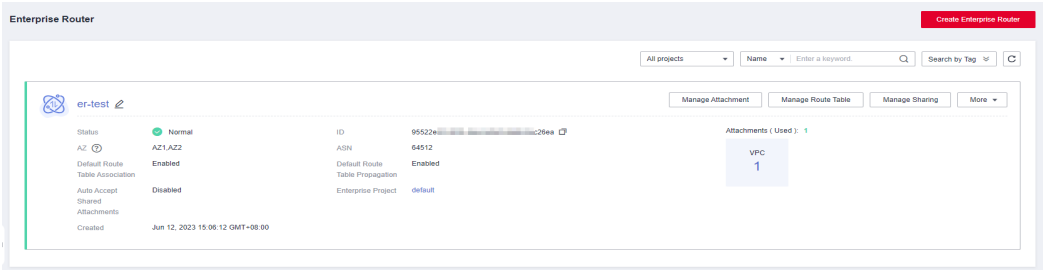
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

Figure 9-11 Searching for an enterprise router



Step 5 Go to the **Attachments** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Attachment**.
- Click the enterprise router name and click **Attachments**.

Step 6 In the attachment list, locate the attachment you want to reject and click **Reject** in the **Operation** column.

The owner can also reject the attachment request. If the owner rejects the request, the attachment status changes from **Pending acceptance** to **Rejected**, and the attachment fails to be created. If this happens, contact the owner.

----End

9.7 Deleting a Sharing

Scenarios

This section describes how to delete a sharing. After a sharing is deleted, your enterprise router cannot be used by other users anymore.

Notes and Constraints

Deleting a sharing will not delete the attachments created by other users.

Procedure

Step 1 Log in to the management console.

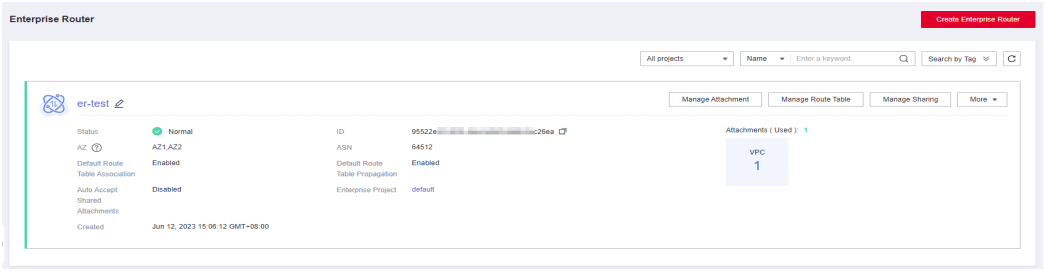
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

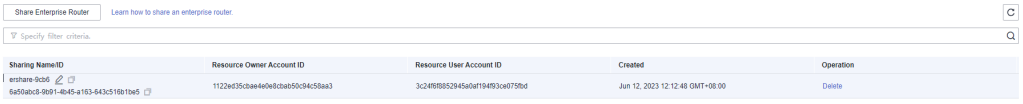
Figure 9-12 Searching for an enterprise router



Step 5 Go to the **Sharing** tab using either of the following methods:

- In the upper right corner of the enterprise router, click **Manage Sharing**.
- Click the enterprise router name and click **Sharing**.

Figure 9-13 Deleting a sharing



Step 6 Locate the sharing you want to delete and click **Delete** in the **Operation** column.

A confirmation dialog box is displayed.

Step 7 Click **Yes**.

A deleted sharing cannot be recovered.

----End

10 Flow Logs

10.1 Flow Log Overview

What Is a Flow Log?

Log Tank Service (LTS) can record flow logs for enterprise routers. A flow log records traffic of attachments on enterprise routers in real time. These logs allow you to monitor the network traffic of attachments and analyze network attacks, improving your O&M efficiency.

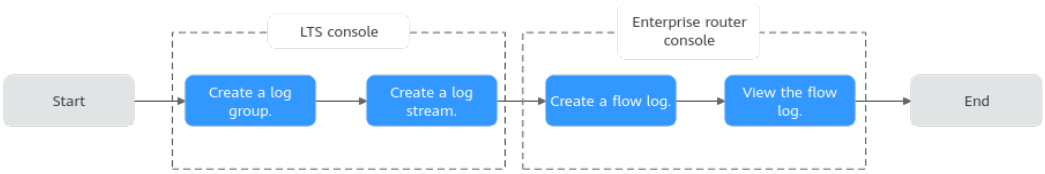
Flow logs can capture traffic of the following types of attachments:

- VPC
- Virtual gateway
- VPN gateway

Creation Process

Before creating a flow log for an enterprise router, you need to create a log group and a log stream on the LTS console.

Figure 10-1 Process of creating a flow log



Notes and Constraints

- By default, you can create a maximum of 20 flow logs.
- For TCP and UDP fragments, flow logs can record only the first fragment. Other fragments cannot be recorded because of incomplete packet header.
- Flow logs can only record traffic generated for network communications and do not capture traffic generated by the network. For example, BGP traffic used by an enterprise router to learn routes of attachments is not recorded.

10.2 Creating a Flow Log

Scenarios

This section describes how to create a flow log to record information about the traffic of enterprise router attachments.

Notes and Constraints

Only one flow log can be created for an attachment in the same log group and log stream.

Procedure

Step 1 Log in to the management console.

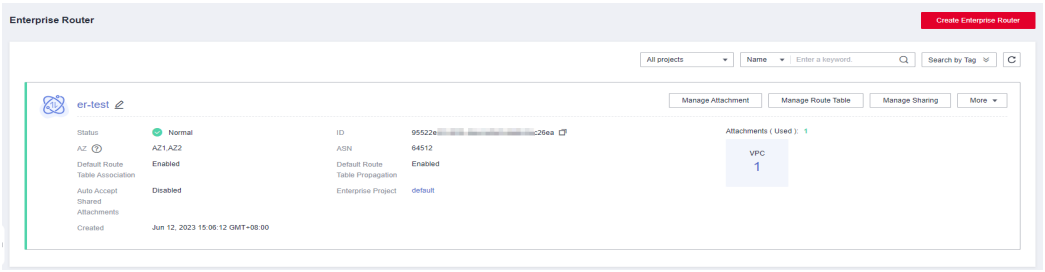
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

Figure 10-2 Searching for an enterprise router



Step 5 Click the enterprise router name and click **Flow Logs**.

The flow log list page is displayed.

Step 6 On the **Flow Logs** tab, click **Create Flow Log**.

The **Create Flow Log** dialog box is displayed.

Step 7 Configure the parameters based on **Table 10-1**.

Table 10-1 Parameters for creating a flow log

Parameter	Setting	Example Value
Name	Mandatory Enter a name for the flow log. The name: • Must contain 1 to 64 characters. • Can contain letters, digits, underscores (_), hyphens (-), and periods (.).	flowlog-ab
Resource Type	Mandatory Select the type of the resource whose traffic information is to be collected. The enterprise router flow log function can capture traffic of the following attachments: • VPC • Virtual gateway: Virtual gateway of Direct Connect • VPN gateway	Virtual gateway
Resource	Mandatory In the resource list, select the resource whose traffic information is to be collected.	vgw-ab
Log Group	Mandatory Select a log group. If there is no log group, click **Create Log Group**.	lts-group-ab
Log Stream	Mandatory Select a log stream. If there is no log stream, click **Create Log Stream**.	lts-topic-ab
Description	Optional Describe the flow log as required.	-

Step 8 Click **OK**.

The flow log list is displayed.

Step 9 View the flow log status.

If the flow status changes from **Creating** to **Enabled**, the flow log is successfully created.

----End

10.3 Viewing Details About a Flow Log

Scenarios

This section describes how to view details about a flow log, including the attachment ID, source/destination address, source/destination port, data packet size, and packet quantity.

Constraints

Flow logs are generated every 10 minutes. After creating a VPC flow log, you need to wait about 10 minutes before you can view the flow log record.

Procedure

Step 1 Log in to the management console.

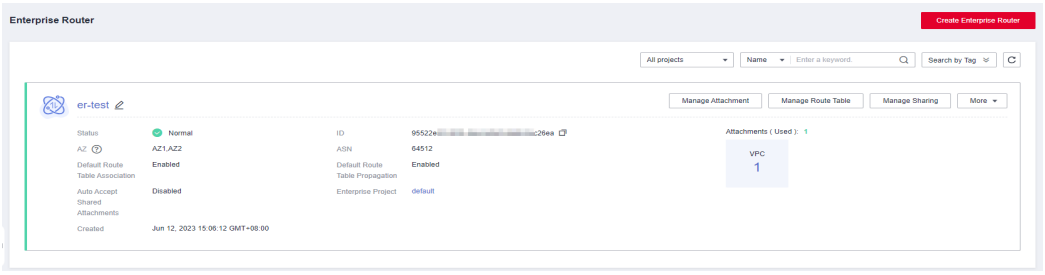
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

Figure 10-3 Searching for an enterprise router



Step 5 Click the enterprise router name and click **Flow Logs**.

The flow log list page is displayed.

Step 6 Locate the target flow log and click **View Log Record** in the **Operation** column.

The LTS console is displayed.

Step 7 View details about the flow log.

Flow log format:

```
<version> <project_id> <resource_id> <instance_id> <srcaddr> <dstaddr> <srcport> <dstport> <protocol> <packets> <bytes> <start> <end> <direct>
```

Example 1:

```
1 0605768ad980d5762f8ac010b919754c 9e00a67c-b21e-435f-9da6-20004b8392e9 a5cbd16c-7d99-4000-8f14-526ec48298ce 1.1.1.1 192.168.1.199 0 0 1 229 22442 1664007127 1664007727 ingress
```

Example 2:

```
1 0605768ad980d5762f8ac010b919754c 9e00a67c-b21e-435f-9da6-20004b8392e9
a5cbd16c-7d99-4000-8f14-526ec48298ce 192.168.1.199 1.1.1.1 8 0 1 229 22442 1664007127 1664007727
egress
```

Table 10-2 describes the flow log parameters.

Table 10-2 Enterprise router flow log parameters

Parameter	Description	Example
version	Flow log version	1
project_id	Project ID	5f67944957444bd6bb4fe3b367de8f3d
resource_id	ID of the attachment that the traffic is generated for	10a163ee-6efa-4e4d-9937-ead59f308497
instance_id	Enterprise router ID	a5cbd16c-7d99-4000-8f14-526ec48298ce
srcaddr	Source IP address	192.168.0.154
dstaddr	Destination IP address	192.168.3.25
srcport	Source port	38929
dstport	Destination port	53
protocol	Internet Assigned Numbers Authority (IANA) protocol number of the traffic For more information, see **Internet Protocol Numbers**.	17
packets	Number of data packets during the flow log capture	1
bytes	Size of the data packet during the flow log capture	96
start	The time when the capture started, in Unix seconds	1548752136
end	The time when the capture ended, in Unix seconds	1548752736
direct	Traffic direction • **ingress**: traffic going in to the attachment • **egress**: traffic going out of the attachment	egress

----End

10.4 Disabling a Flow Log

Scenarios

If flow logging is disabled, no flow logs will be collected in the next log collection period. Collected flow logs can still be viewed.

Procedure

Step 1 Log in to the management console.

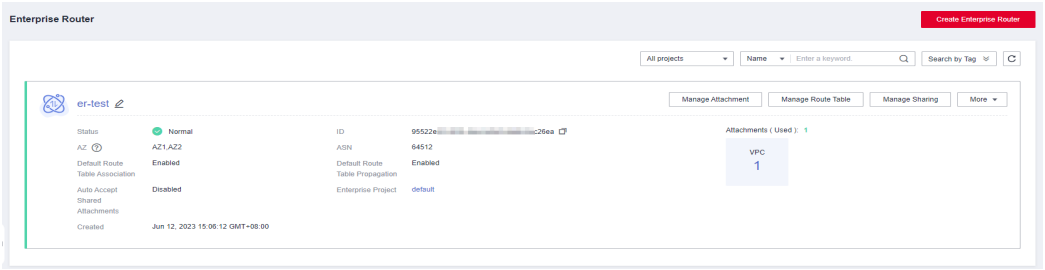
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

Figure 10-4 Searching for an enterprise router



Step 5 Click the enterprise router name and click **Flow Logs**.

The flow log list page is displayed.

Step 6 Locate the target flow log and click **Disable** in the **Operation** column.

A confirmation dialog box is displayed.

Step 7 Confirm the information and click **OK**.

The flow log list is displayed.

Step 8 View the flow log status.

If the flow status changes from **Modifying** to **Disabled**, the flow log is successfully disabled.

----End

10.5 Enabling a Flow Log

Scenarios

If flow logging is enabled, flow logs will be collected from the next log collection period.

Procedure

Step 1 Log in to the management console.

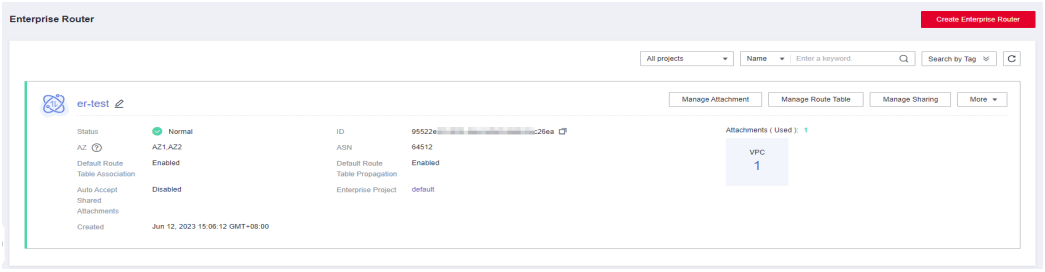
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

Figure 10-5 Searching for an enterprise router



Step 5 Click the enterprise router name and click **Flow Logs**.

The flow log list page is displayed.

Step 6 Locate the target flow log and click **Enable** in the **Operation** column.

A confirmation dialog box is displayed.

Step 7 Confirm the information and click **OK**.

The flow log list is displayed.

Step 8 View the flow log status.

If the flow status changes from **Modifying** to **Enabled**, the flow log is successfully enabled.

----End

10.6 Deleting a Flow Log

Scenarios

This section describes how to delete a flow log.

Notes and Constraints

After a flow log is deleted, information captured in the flow log is still available.

Procedure

Step 1 Log in to the management console.

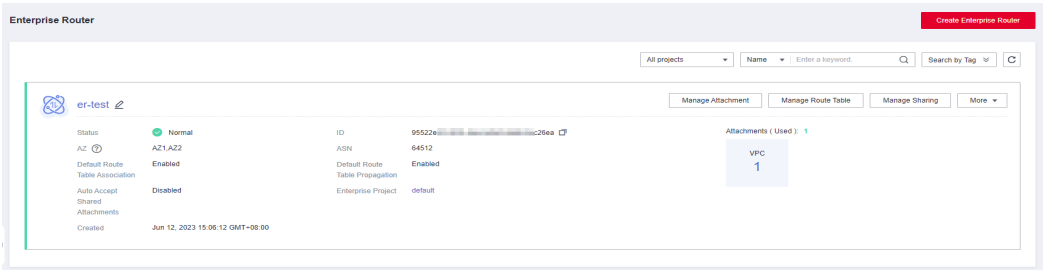
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

Figure 10-6 Searching for an enterprise router



Step 5 Click the enterprise router name and click **Flow Logs**.

The flow log list page is displayed.

Step 6 Locate the target flow log and click **Delete** in the **Operation** column.

A confirmation dialog box is displayed.

Step 7 Confirm the information and click **OK**.

The flow log list is displayed.

A deleted flow log cannot be recovered.

----End

11 Monitoring

11.1 Supported Metrics

Function

This section describes monitoring metrics reported by Enterprise Router to Cloud Eye as well as their namespaces, metrics, and dimensions. You can use the Cloud Eye management console or APIs to obtain the monitoring metrics and alarms generated for Enterprise Router.

Namespace

SYS.ER

Metrics

You can use Cloud Eye to monitor the network status of enterprise routes and their attachments.

- Table 11-1
- Table 11-2

Table 11-1 Monitoring metrics of an enterprise router

ID	Name	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
instance_bytes_in	Inbound Traffic	Network traffic going into the enterprise router Unit: byte	≥ 0	Enterprise router	1 minute

ID	Name	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
instance_bytes_out	Outbound Traffic	Network traffic going out of the enterprise router Unit: byte	≥ 0	Enterprise router	1 minute
instance_bits_rate_in	Inbound Bandwidth	Network traffic per second going into the enterprise router Unit: bit/s	≥ 0	Enterprise router	1 minute
instance_bits_rate_out	Outbound Bandwidth	Network traffic per second going out of the enterprise router Unit: bit/s	≥ 0	Enterprise router	1 minute
instance_packets_in	Inbound PPS	Packets per second going into the enterprise router Unit: packet/s	≥ 0	Enterprise router	1 minute
instance_packets_out	Outbound PPS	Packets per second going out of the enterprise router Unit: packet/s	≥ 0	Enterprise router	1 minute
instance_packets_drop_blackhole	Packets Dropped by Black Hole Route	Packets dropped by black hole route of the enterprise router Unit: count	≥ 0	Enterprise router	1 minute

ID	Name	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
instance_packets_drop_noroute	Packets Dropped Due to No Matching Routes	Packets dropped because the enterprise router has no matching routes Unit: count	≥ 0	Enterprise router	1 minute

Table 11-2 Monitoring metrics of an attachment

ID	Name	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
attachment_bytes_in	Inbound Traffic	Network traffic going into the attachment Unit: byte	≥ 0	Attachment	1 minute
attachment_bytes_out	Outbound Traffic	Network traffic going out of the attachment Unit: byte	≥ 0	Attachment	1 minute
attachment_bits_rate_in	Inbound Bandwidth	Network traffic per second going into the attachment Unit: bit/s	≥ 0	Attachment	1 minute
attachment_bits_rate_out	Outbound Bandwidth	Network traffic per second going out of the attachment Unit: bit/s	≥ 0	Attachment	1 minute
attachment_packets_in	Inbound PPS	Packets per second going into the attachment Unit: packet/s	≥ 0	Attachment	1 minute

ID	Name	Description	Value Range	Monitored Object	Monitoring Interval (Raw Data)
attachment_packets_out	Outbound PPS	Packets per second going out of the attachment Unit: packet/s	≥ 0	Attachment	1 minute
attachment_packets_drop_blackhole	Packets Dropped by Black Hole Route	Packets dropped by black hole route of the attachment Unit: count	≥ 0	Attachment	1 minute
attachment_packets_drop_noroute	Packets Dropped Due to No Matching Routes	Packets dropped because the attachment has no matching routes Unit: count	≥ 0	Attachment	1 minute

If a monitored object has multiple dimensions, all dimensions are mandatory when you use APIs to query the metrics.

- Query a single metric:
  ```
  dim.0=er_instance_id,d9f7b61f-e211-4bce-ac5f-2b76f3d0cf1d&dim.1=er_attachment_id,659614a0-e559-46c0-86ca-00c03c3d61b8
  ```
- Query metrics in batches:
  ```
  "dimensions": [
    {
      "name": "er_instance_id",
      "value": "d9f7b61f-e211-4bce-ac5f-2b76f3d0cf1d"
    },
    {
      "name": "er_attachment_id",
      "value": "659614a0-e559-46c0-86ca-00c03c3d61b8"
    }
  ]
  ```

Dimensions

Key	Value
er_instance_id	Enterprise router
er_attachment_id	Attachment

- The monitoring metric measurement dimension of an enterprise router is **er_instance_id**.
- The monitoring metric measurement dimensions of an attachment are **er_instance_id** and **er_attachment_id**.

11.2 Viewing Metrics

Scenarios

This section describes how to view monitoring metrics of enterprise routers and their attachments.

Procedure

Step 1 Log in to the management console.

Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List**. Under **Management & Governance**, click **Cloud Eye**.

The **Cloud Eye** console is displayed.

Step 4 In the navigation pane on the left, choose **Cloud Service Monitoring** > **Enterprise Router**.

The enterprise router list is displayed.

Step 5 View the real-time monitoring metrics of enterprise routers and their attachments:

- View metrics of an enterprise router.
  a. In the enterprise router list, locate the enterprise router and click **View Metric** in the **Operation** column.

     The metrics are displayed.
  b. View metrics of the enterprise router.
- View metrics of an attachment.

  a. In the enterprise router list, locate the enterprise router, click to view its attachments, locate the attachment, and click **View Metric** in the **Operation** column.

     The metrics are displayed.
  b. View metrics of the attachment.

----End

11.3 Creating Alarm Rules

Scenarios

This section describes how to create alarm rules and notifications for enterprise routers and their attachments.

You can create an alarm rule to configure the conditions that trigger an alarm and determine whether to send notifications when there is the alarm.

If you create an alarm rule for a metric, you can timely know metric exceptions and rectify the exceptions.

Procedure

Step 1 Log in to the management console.

Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List**. Under **Management & Governance**, click **Cloud Eye**.

The **Cloud Eye** console is displayed.

Step 4 In the navigation pane on the left, choose **Cloud Service Monitoring** > **Enterprise Router**.

The enterprise router list is displayed.

Step 5 Create alarm rules for enterprise routers and their attachments:

- Enterprise router
  a. In the enterprise router list, locate the enterprise router and click **Create Alarm Rule** in the **Operation** column.

     The **Create Alarm Rule** page is displayed.
  b. On the **Create Alarm Rule** page, set parameters as prompted.
- Attachment
  a. In the enterprise router list, locate the enterprise router, click to view its attachments, locate the attachment, and click **Create Alarm Rule** in the **Operation** column.

     The **Create Alarm Rule** page is displayed.
  b. On the **Create Alarm Rule** page, set parameters as prompted.

----End

12 Interconnecting with CTS

12.1 Key Operations Recorded by CTS

An enterprise router is a central router that interconnects all of your VPCs and on-premises networks.

With CTS, you can record operations associated with your enterprise routers for future query, audit, and backtracking.

Table 12-1 Enterprise router operations recorded by CTS

Operation	Resource Type	Trace Name
Creating an Enterprise Router	erInstance	createInstance
Modifying an Enterprise Router	erInstance	updateInstance
Deleting an Enterprise Router	erInstance	deleteInstance
Adding Attachments to an Enterprise Router	erAttachment	createAttachment
Modifying an Attachment	erAttachment	updateAttachment
Deleting an Attachment	erAttachment	deleteAttachment
Accepting an Attachment Request	erAttachment	acceptAttachment
Rejecting an Attachment Request	erAttachment	rejectAttachment
Creating a Route Table	erRouteTable	createRouteTable

Operation	Resource Type	Trace Name
Modifying Route Table Information	erRouteTable	updateRouteTable
Deleting a Route Table	erRouteTable	deleteRouteTable
Creating a Static Route	erStaticRoute	createStaticRoute
Batch Creating Static Routes	erStaticRoute	batchCreateStaticRoute
Deleting a Static Route	erStaticRoute	deleteStaticRoute
Batch Deleting Static Routes	erStaticRoute	batchDeleteStaticRoute
Modifying a Static Route	erStaticRoute	updateStaticRoute
Creating an Association	erAssociation	createAssociation
Deleting an Association	erAssociation	deleteAssociation
Creating a Propagation	erPropagation	createPropagation
Deleting a Propagation	erPropagation	deletePropagation
Creating a Flow Log	erFlowLog	createFlowLog
Disabling a Flow Log	erFlowLog	updateFlowLog
Enabling a Flow Log	erFlowLog	updateFlowLog
Deleting a Flow Log	erFlowLog	deleteFlowLog

12.2 Viewing Traces

Scenarios

After CTS is enabled, CTS starts recording operations on cloud resources. The CTS management console stores the last seven days of operation records.

This section describes how to query or export the last seven days of operation records on the management console.

Procedure

Step 1 Log in to the management console.

Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List**. Under **Management & Governance**, click **Cloud Trace Service**.

The **Cloud Trace Service** console is displayed.

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

The **Trace List** page is displayed.

Step 5 Specify filters as needed.

The following filters are available:

- **Trace Type**: Set it to **Management** or **Data**.
- **Trace Source**, **Resource Type**, and **Search By**
  - If you select **Trace name** for **Search By**, select a trace name.
  - If you select **Resource ID** for **Search By**, select or enter a resource ID.
  - If you select **Resource name** for **Search By**, select or enter a resource name.
- **Operator**: Select a specific operator (a user other than an account).
- **Trace Status**: Select **All trace statuses**, **Normal**, **Warning**, or **Incident**.
- Time range: Select any time range in the last seven days.

Step 6 Expand the trace for details.

Step 7 Click **View Trace**. A dialog box is displayed, in which the trace details are displayed.

For more information about CTS, see *Cloud Trace Service User Guide*.

----End

13 Permissions Management

13.1 Creating a User and Granting Permissions

This section describes how to use **IAM** to implement fine-grained permissions control for your Enterprise Router 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 Enterprise Router resources.
- Grant only the minimum permissions required for users to perform a given task.
- Entrust an account or a cloud service to perform professional and efficient O&M on your Enterprise Router resources.

If your account does not require individual IAM users, skip this topic.

Figure 13-1 shows the procedure for granting permissions.

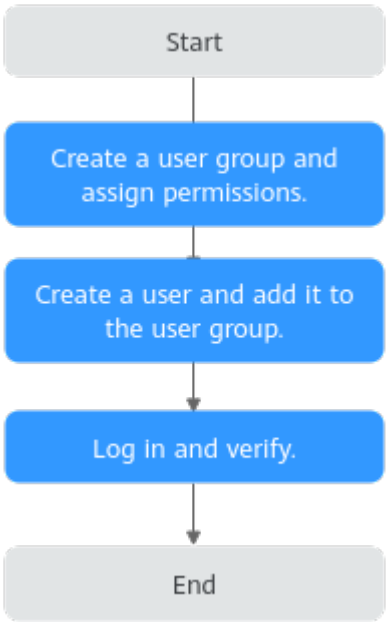
Prerequisites

You have learned about the permissions supported by Enterprise Router and choose policies or roles based on your requirements. For details, see **Permissions**.

For the permissions of other services, see **Permission Description**.

Process Flow

Figure 13-1 Process for granting Enterprise Router permissions



1. **Create a user group and assign permissions to it** (**ER ReadOnlyAccess** as an example).
2. **Create an IAM user and add it to the user group**.
3. Log in to the management console as the created user, switch to the authorized region, and verify that the user has only the **ER ReadOnlyAccess** permission.
   a. Click **Service List** and choose **Enterprise Router**. Then click **Create Enterprise Router** in the upper right corner. If the enterprise router fails to be created, the **ER ReadOnlyAccess** permission has taken effect.
   b. Choose any other service in the **Service List**. If a message appears indicating insufficient permissions to access the service, the **ER ReadOnlyAccess** permission has already taken effect.

13.2 Enterprise Router Custom Policies

Custom policies can be created to supplement the system-defined policies of Enterprise Router.

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

- Visual editor: Select cloud services, actions, resources, and request conditions. This does not require knowledge of policy syntax.
- JSON: Edit JSON policies from scratch or based on an existing policy.

For details about how to create custom policies, see **Creating a Custom Policy**. The following section contains examples of common Enterprise Router custom policies.

Example Custom Policies

- Example 1: Allowing users to create and delete enterprise routers

```
{
    "Version": "1.1",
    "Statement": [
        {
            "Effect": "Allow",
            "Action": [
                "er:instances:create",
                "er:instances:delete"
            ]
        }
    ]
}
```

- Example 2: Denying enterprise router deletion

  A policy with only Deny permissions must be used in conjunction with other policies to take effect. If the policies assigned to a user contain both Allow and Deny actions, the Deny actions take precedence over the Allow actions.

  The following method can be used if you need to assign the **ER FullAccess** permission to a user but also forbid the user from deleting enterprise routers. Create a custom policy for denying enterprise router deletion, and assign both policies to the group the user belongs to. Then the user can perform all operations on Enterprise Router except deleting enterprise routers. The following is an example of a deny policy:

```
{
    "Version": "1.1",
    "Statement": [
        {
            "Effect": "Deny",
            "Action": [
                "er:instances:delete"
            ]
        }
    ]
}
```

14 Tags

14.1 Overview

What Is a Tag?

Tags are used to identify the cloud resources for purposes of easy categorization and quick search. You can add tags to enterprise routers, attachments, and route tables using either of the methods:

- Add tags when you create an enterprise router, attachment, or route table.
- Add tags on the details page of an existing enterprise router, attachment, or route table. You can also edit or delete tags.

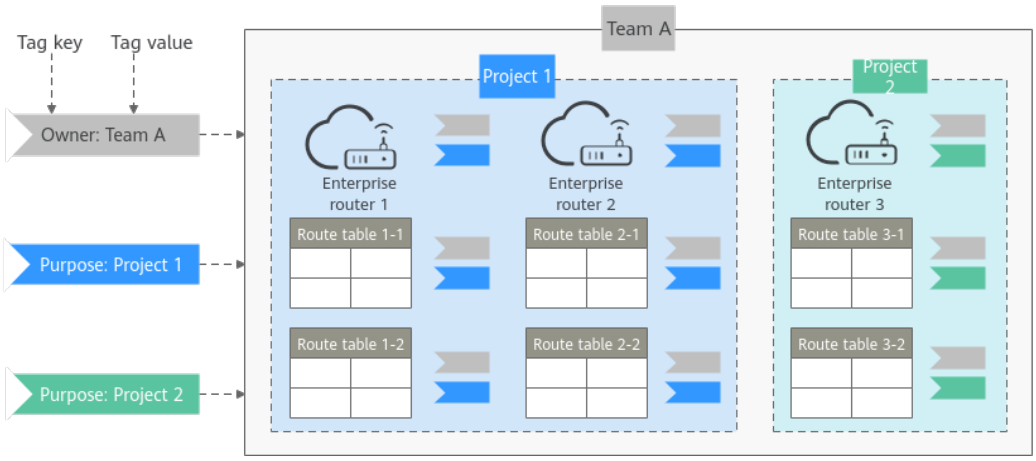
Basic Knowledge About Tags

Tags are used to identify cloud resources. When you have many cloud resources of the same type, you can use tags to classify cloud resources by dimension (for example, use, owner, or environment).

Figure 14-1 shows how tags work. In this example, you assign two tags to each cloud resource. Each tag contains a key and a value that you define. The key of one tag is **Owner**, and the key of another tag is **Usage**. Each tag has a value.

You can quickly search for specific cloud resources based on the tags added to them. For example, you can define a set of tags for cloud resources in an account to track the owner and usage of each cloud resource, making resource management easier.

Figure 14-1 Example tags added for Enterprise Router



Constraints on Using Tags

- Each tag consists of a tag key and a tag value. The rules for naming a tag key and a tag value are as follows:

  Tag key
  - Cannot be left blank.
  - Can contain a maximum of 36 characters.
  - Can consist of letters, digits, underscores (_), and hyphens (-).

  Tag value
  - Can be left blank.
  - Can contain a maximum of 43 characters.
  - Can consist of letters, digits, underscores (_), periods (.), and hyphens (-).
- Up to 10 tags can be added to each cloud resource.
- For each resource, each tag key must be unique, and each tag key can only have one tag value.

14.2 Adding a Tag

14.2.1 Adding a Tag to an Enterprise Router

Scenarios

Add a tag to an existing enterprise router.

Procedure

Step 1 Log in to the management console.

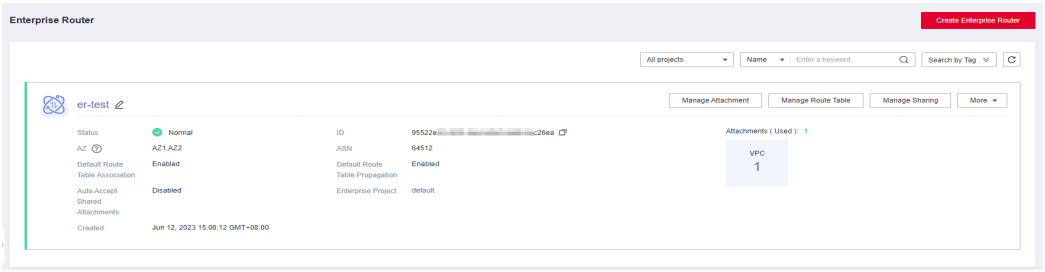
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

Figure 14-2 Searching for an enterprise router



Step 5 Click the enterprise router name and click **Tags**.

The tag list is displayed.

Step 6 Click **Add Tag**.

The **Add Tag** dialog box is displayed.

Step 7 Set the tag key and tag value as prompted, and click **OK**.

View the added tag in the tag list.

----End

14.2.2 Adding a Tag to an Attachment

Scenarios

Add a tag to an existing attachment.

Procedure

Step 1 Log in to the management console.

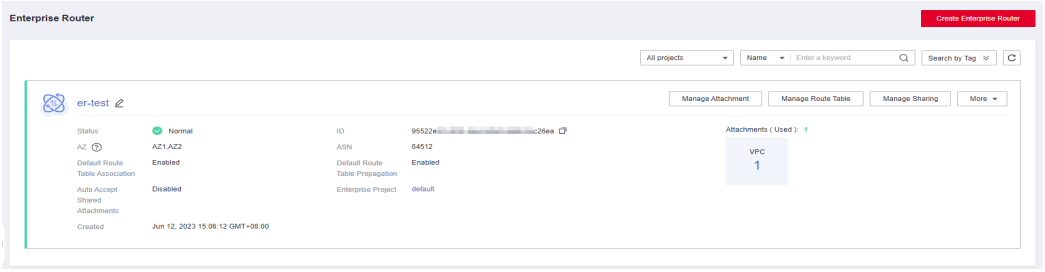
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

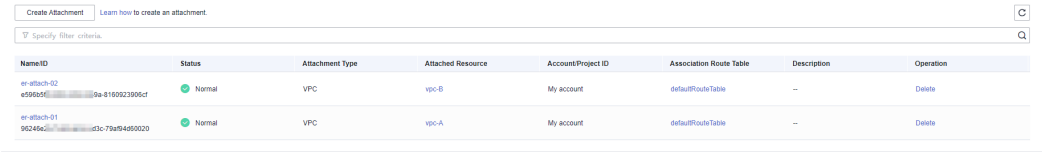
Figure 14-3 Searching for an enterprise router



Step 5 Click the enterprise router name and click **Attachments**.

The attachment list is displayed.

Figure 14-4 Viewing attachments



Step 6 Locate the attachment that you want to add a tag to and click its name.

The attachment details page is displayed.

Step 7 Click **Add Tag**.

The **Add Tag** dialog box is displayed.

Step 8 Set the tag key and tag value as prompted, and click **OK**.

View the added tag in the tag list.

----End

14.2.3 Adding a Tag to a Route Table

Scenarios

Add a tag to an existing route table.

Procedure

Step 1 Log in to the management console.

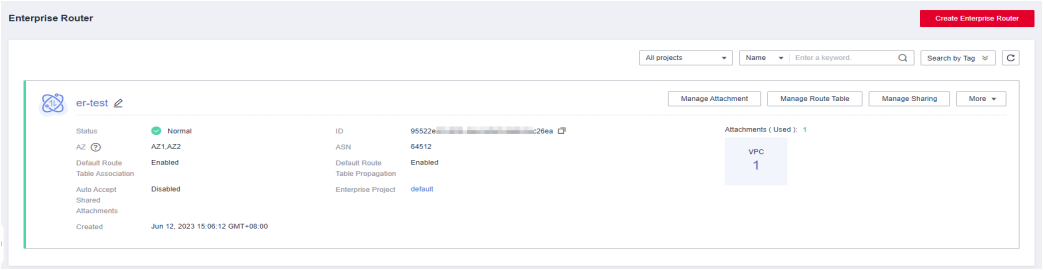
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

Figure 14-5 Searching for an enterprise router



Step 5 Click the enterprise router name and click **Route Tables**.

The route table list is displayed.

Step 6 Locate the route table to which you want to add a tag. On the **Tags** tab, click **Add Tag** in the right pane.

The **Add Tag** dialog box is displayed.

Step 7 Set the tag key and tag value as prompted, and click **OK**.

View the added tag in the tag list.

----End

14.3 Editing a Tag

14.3.1 Editing an Enterprise Router Tag

Scenarios

Edit a tag added to an existing enterprise router.

Notes and Constraints

- Each tag consists of a tag key and a tag value. Only the tag value can be edited.
- To edit the tag key, delete it and add it again. For details, see **Deleting an Enterprise Router Tag** and **Adding a Tag to an Enterprise Router**.

Procedure

Step 1 Log in to the management console.

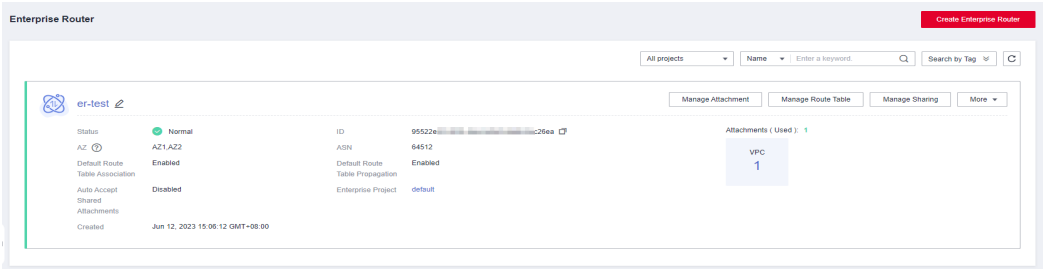
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

Figure 14-6 Searching for an enterprise router



Step 5 Click the enterprise router name and click **Tags**.

The tag list is displayed.

Step 6 Locate the tag you want to edit and click **Edit** in the **Operation** column.

The **Edit Tag** dialog box is displayed.

Step 7 Edit the tag value as prompted and click **OK**.

View the edited tag in the tag list.

----End

14.3.2 Editing an Attachment Tag

Scenarios

Modify a tag added to an existing attachment.

Notes and Constraints

- Each tag consists of a tag key and a tag value. Only the tag value can be edited.
- To edit the tag key, delete it and add it again. For details, see **Deleting an Attachment Tag** and **Adding a Tag to an Enterprise Router**.

Procedure

Step 1 Log in to the management console.

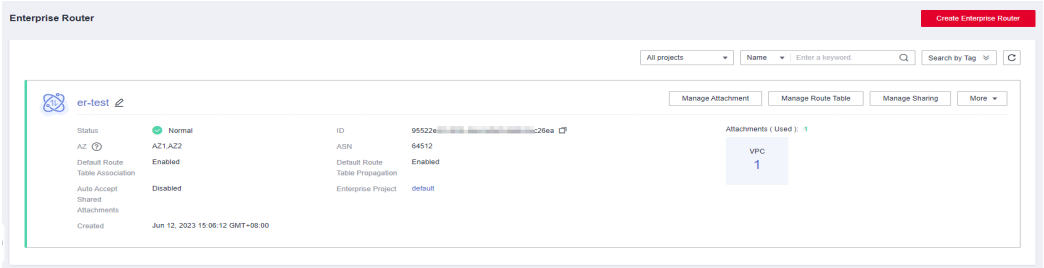
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

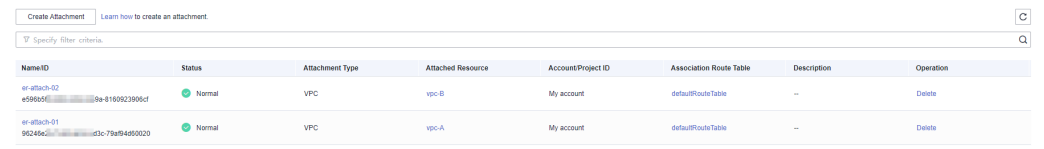
Figure 14-7 Searching for an enterprise router



Step 5 Click the enterprise router name and click **Attachments**.

The attachment list is displayed.

Figure 14-8 Viewing attachments



Step 6 Locate the attachment whose tag you want to edit and click its name.

The attachment details page is displayed.

Step 7 Locate the tag you want to edit and click **Edit** in the **Operation** column.

The **Edit Tag** dialog box is displayed.

Step 8 Edit the tag value as prompted and click **OK**.

View the edited tag in the tag list.

----End

14.3.3 Editing a Route Table Tag

Scenarios

Edit a tag added to an existing route table.

Notes and Constraints

- Each tag consists of a tag key and a tag value. Only the tag value can be edited.
- To edit the tag key, delete it and add it again. For details, see **Deleting a Route Table Tag** and **Adding a Tag to a Route Table**.

Procedure

Step 1 Log in to the management console.

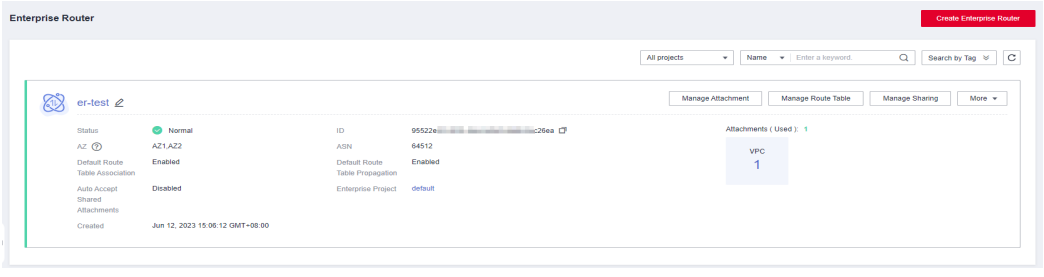
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

Figure 14-9 Searching for an enterprise router



Step 5 Click the enterprise router name and click **Route Tables**.

The route table list is displayed.

Step 6 Locate the route table whose tag you want to edit. On the **Tags** tab, locate the tag you want to edit and click **Edit** in the **Operation** column.

The **Edit Tag** dialog box is displayed.

Step 7 Edit the tag value as prompted and click **OK**.

View the edited tag in the tag list.

----End

14.4 Searching for a Cloud Resource by Tag

14.4.1 Searching for an Enterprise Router by Tag

Scenarios

Search for an enterprise router using a tag added to that enterprise router.

Procedure

Step 1 Log in to the management console.

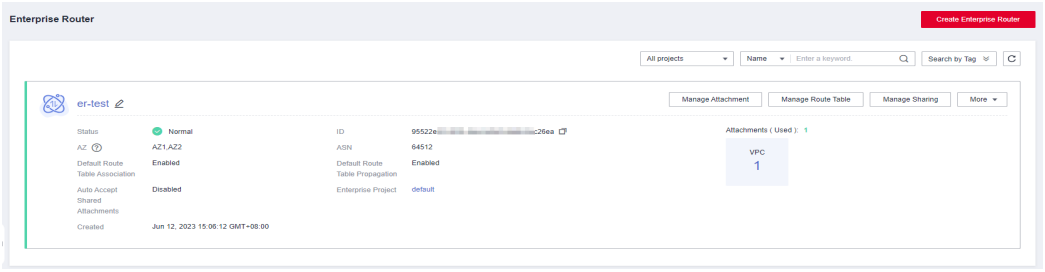
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Click **Search by Tag**.

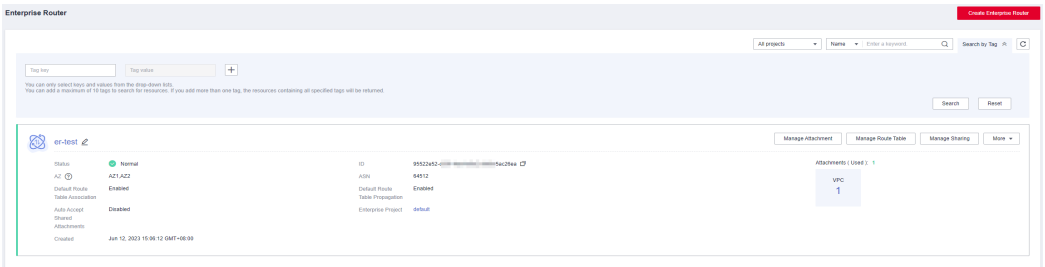
Figure 14-10 Searching for an enterprise router



Step 5 Enter or select a tag key and a tag value.

- If you need to query a resource with multiple tags, click to add multiple tags. A maximum of 10 tags can be added at a time.
- You can click to delete the added tags one by one or click **Reset** to clear all of them.

Figure 14-11 Searching for an enterprise router by tag



Step 6 Click **Search**.

The resource with the tags is displayed in the list.

----End

14.4.2 Searching for an Attachment by Tag

Scenarios

Search for an attachment using a tag added to that attachment.

Procedure

Step 1 Log in to the management console.

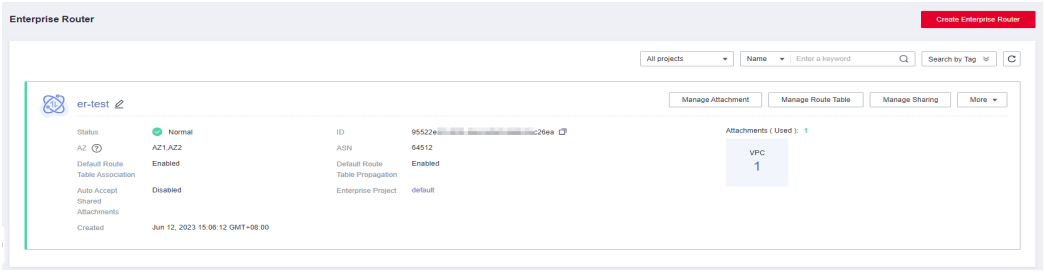
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

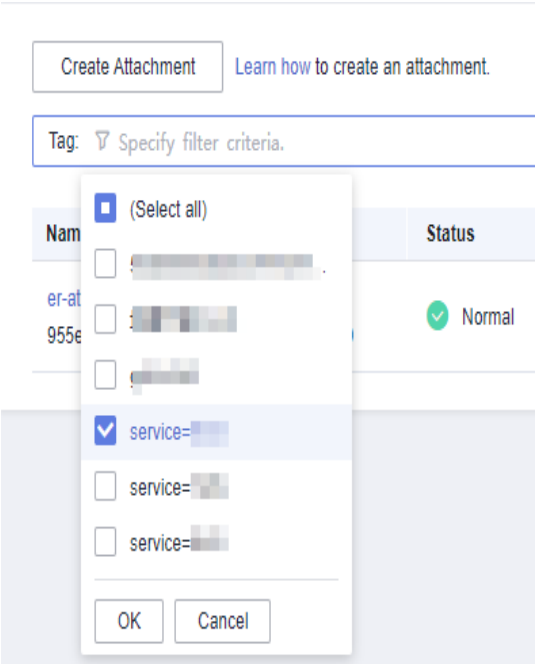
Figure 14-12 Searching for an enterprise router



Step 5 Click the enterprise router name and click **Attachments**.

The attachment list is displayed.

Figure 14-13 Searching for an attachment by tag



Step 6 Click the search box, select **Tag** for **Property**, select the tag to be searched for, and click **OK**.

The resource with the tag is displayed in the list.

----End

14.4.3 Searching for a Route Table by Tag

Scenarios

Search for a route table using a tag added to that enterprise router.

Procedure

Step 1 Log in to the management console.

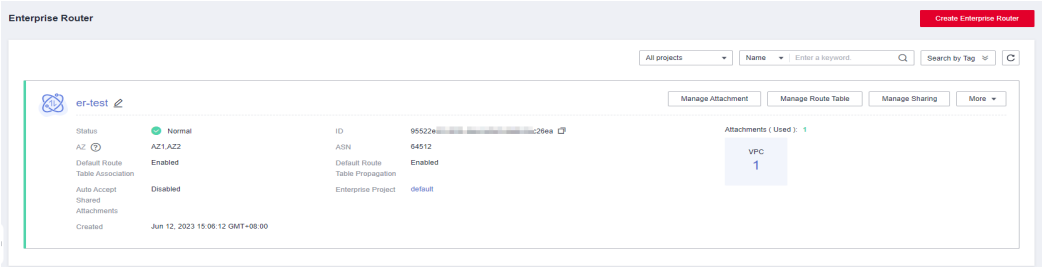
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

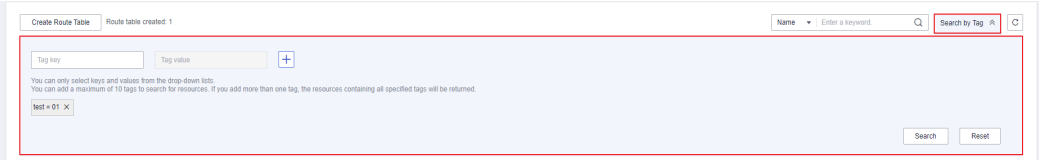
Figure 14-14 Searching for an enterprise router



Step 5 Click the enterprise router name and click **Route Tables**.

The route table list is displayed.

Figure 14-15 Searching for a route table by tag



Step 6 Click **Search by Tag**.

Step 7 Enter or select a tag key and a tag value.

- If you need to query a resource with multiple tags, click to add multiple tags. A maximum of 10 tags can be added at a time.
- You can click to delete the added tags one by one or click **Reset** to clear all of them.

Step 8 Click **Search**.

The resource with the tags is displayed in the list.

----End

14.5 Viewing a Tag

14.5.1 Viewing an Enterprise Router Tag

Scenarios

View a tag added to an enterprise router.

Procedure

Step 1 Log in to the management console.

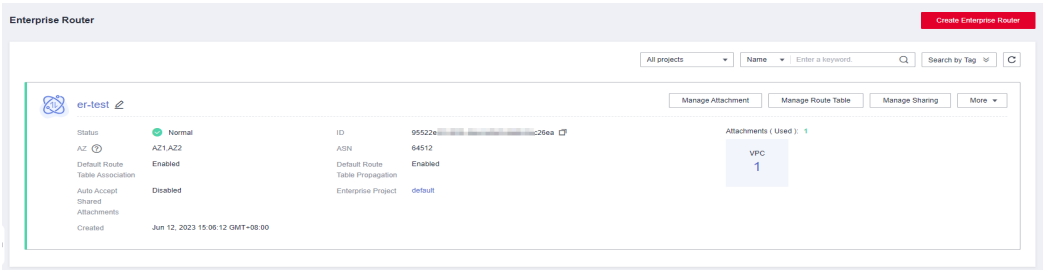
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

Figure 14-16 Searching for an enterprise router



Step 5 Click the enterprise router name and click **Tags**.

The tag list is displayed.

Step 6 Locate the tag and view its details, including the tag key and tag value.

----End

14.5.2 Viewing an Attachment Tag

Scenarios

View a tag added to an attachment.

Procedure

Step 1 Log in to the management console.

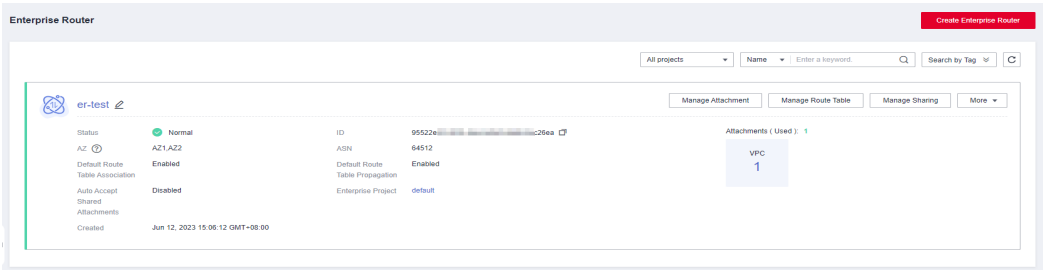
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

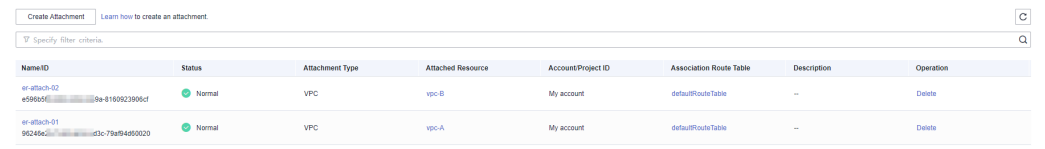
Figure 14-17 Searching for an enterprise router



Step 5 Click the enterprise router name and click **Attachments**.

The attachment list is displayed.

Figure 14-18 Viewing attachments



Step 6 Locate the attachment whose tag you want to view and click its name.

The attachment details page is displayed.

Step 7 Locate the tag and view its details, including the tag key and tag value.

----End

14.5.3 Viewing a Route Table Tag

Scenarios

View a tag added to a route table.

Procedure

Step 1 Log in to the management console.

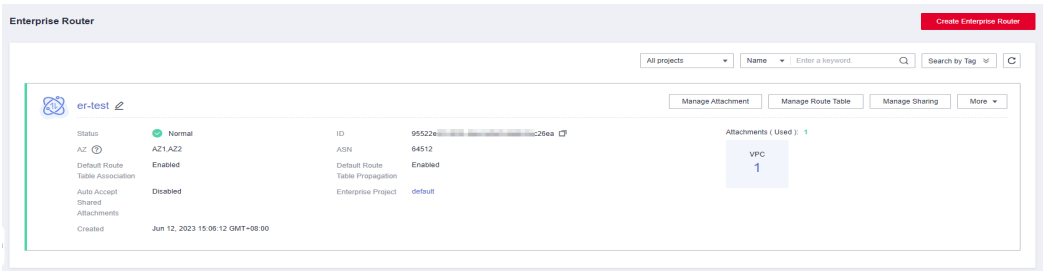
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

Figure 14-19 Searching for an enterprise router



Step 5 Click the enterprise router name and click **Route Tables**.

The route table list is displayed.

Step 6 Locate the tag and view its details, including the tag key and tag value.

----End

14.6 Deleting a Tag

14.6.1 Deleting an Enterprise Router Tag

Scenarios

Delete a tag from an enterprise router.

Procedure

Step 1 Log in to the management console.

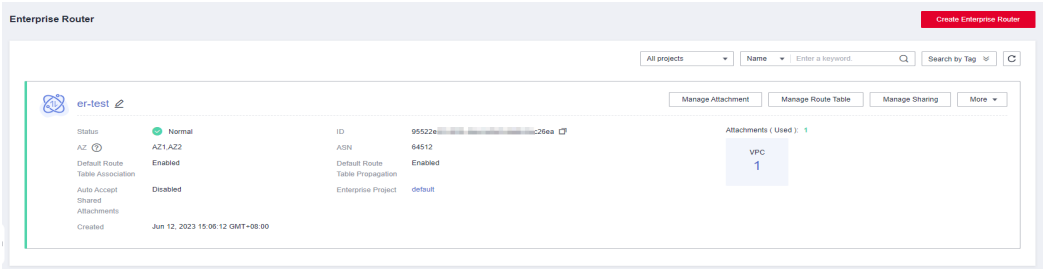
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

Figure 14-20 Searching for an enterprise router



Step 5 Click the enterprise router name and click **Tags**.

The tag list is displayed.

Step 6 Locate the tag you want to delete and click **Delete** in the **Operation** column.

A confirmation dialog box is displayed.

Step 7 Click **Yes**.

A deleted tag cannot be recovered.

----End

14.6.2 Deleting an Attachment Tag

Scenarios

Delete a tag added to an attachment.

Procedure

Step 1 Log in to the management console.

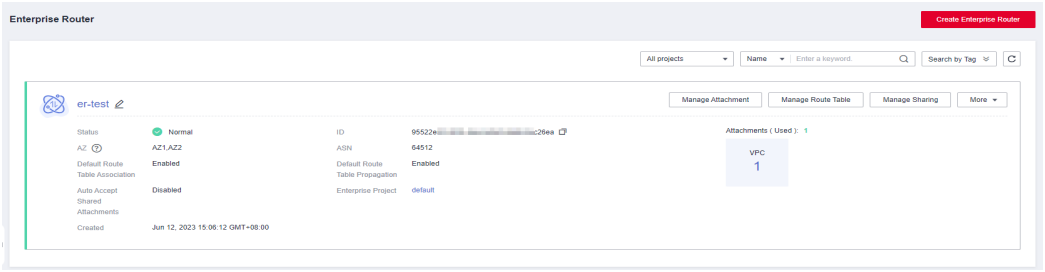
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

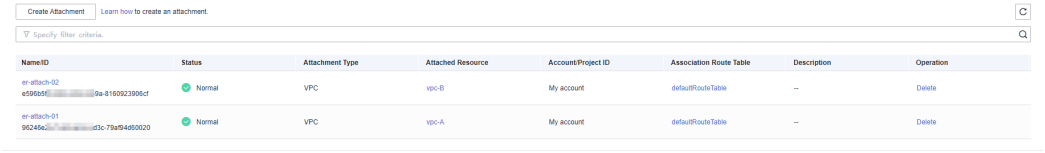
Figure 14-21 Searching for an enterprise router



Step 5 Click the enterprise router name and click **Attachments**.

The attachment list is displayed.

Figure 14-22 Viewing attachments



Step 6 Locate the attachment whose tag you want to delete and click its name.

The attachment details page is displayed.

Step 7 Locate the tag you want to delete and click **Delete** in the **Operation** column.

A confirmation dialog box is displayed.

Step 8 Click **Yes**.

A deleted tag cannot be recovered.

----End

14.6.3 Deleting a Route Table Tag

Scenarios

Delete a tag added to a route table.

Procedure

Step 1 Log in to the management console.

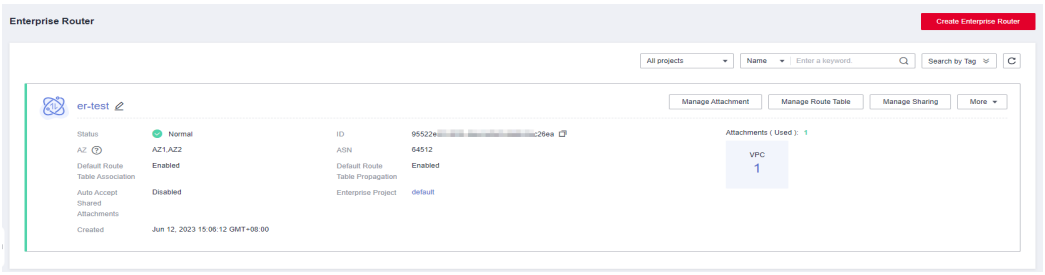
Step 2 Click in the upper left corner and select the desired region and project.

Step 3 Click **Service List** and choose **Networking** > **Enterprise Router**.

The **Enterprise Router** homepage is displayed.

Step 4 Search for the target enterprise router by name.

Figure 14-23 Searching for an enterprise router



Step 5 Click the enterprise router name and click **Route Tables**.

The route table list is displayed.

Step 6 Locate the tag you want to delete and click **Delete** in the **Operation** column.

A confirmation dialog box is displayed.

Step 7 Click **Yes**.

A deleted tag cannot be recovered.

----End

15 Quotas

15.1 Overview

Quotas can limit the number or amount of resources available to users, for example, how many enterprise routers can be created, how many attachments can be created for each enterprise router, and how many routes can be added to each route table.

You can also request for increased quotas if your existing quotas cannot meet your service requirements.

15.2 Viewing Quotas

Scenarios

The following provides operations for you to view the quotas of enterprise routers and related resources in your account.

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.

15.3 Increasing Quotas

Scenarios

The following provides operations for you to increase the quotas of enterprise routers and related resources in your account.

How Do I Apply for a Higher Quota?

The system does not support online quota adjustment. If you need to adjust a quota, call the hotline or send an email to the customer service mailbox. Customer service personnel will timely process your request for quota adjustment and inform you of the real-time progress by making a call or sending an email.

Before dialing the hotline number or sending an email, make sure that the following information has been obtained:

- Account name, project name, and project ID, which can be obtained by performing the following operations:

  Log in to the management console using the cloud account, click the username in the upper right corner, select **My Credentials** from the drop-down list, and obtain the account name, project name, and project ID on the **My Credentials** page.
- Quota information, which includes:
  - Service name
  - Quota type
  - Required quota

Learn how to obtain the service hotline and email address.

16 FAQ

16.1 Why Traffic Can't Be Forwarded from a VPC with a Route Destination of 0.0.0.0/0 to Its Enterprise Router?

Scenarios

Traffic cannot be forwarded from a VPC to the enterprise router that it is attached to if you set the destination of a route in the VPC route table to 0.0.0.0/0 and:

- An ECS in the VPC has an EIP bound.

  NOTE

  Refer to solution 1.

- The VPC is being used by ELB, NAT Gateway, VPC Endpoint, or DCS.

  NOTE

  Refer to solution 1 or solution 2.

Solutions

Select a solution based on your actual service scenario.

- Solution 1: Change the destination (0.0.0.0/0) of the default route to a specific IP address range, for example, 192.168.0.0/16.
- Solution 2: Add eight routes with specific IP address ranges as the destination to replace the default route (with a destination of 0.0.0.0/0).

Table 16-1 Route destinations and next hops

Destination	Next Hop
128.0.0.0/1	Enterprise router
64.0.0.0/2	Enterprise router
32.0.0.0/3	Enterprise router

Destination	Next Hop
16.0.0.0/4	Enterprise router
8.0.0.0/5	Enterprise router
4.0.0.0/6	Enterprise router
2.0.0.0/7	Enterprise router
1.0.0.0/8	Enterprise router

16.2 How Do I Route Traffic to 100.64.x.x Through an Enterprise Router?

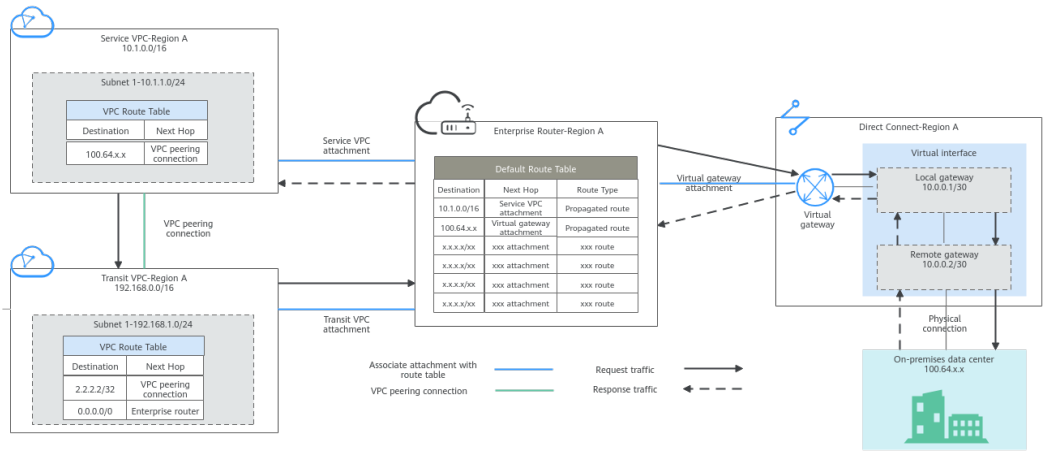
Scenarios

A route with 100.64.x.x as the destination and an enterprise router as the next hop cannot be added to a VPC route table.

Solutions

If you want to route traffic to 100.64.x.x through an enterprise router, you need to create a transit VPC. **Figure 16-1** shows the network diagram.

Figure 16-1 Transit VPC network diagram



The request traffic from the service VPC to the on-premises data center will be forwarded through the transit VPC, but the response traffic will not. For details, see **Table 16-2**.

Table 16-2 Network traffic flows

Path	Description
Request traffic: service VPC → transit VPC → enterprise router → virtual gateway → on-premises data center	1. The service VPC route table has a route with the VPC peering connection as the next hop to forward traffic from the service VPC to the transit VPC. 2. The transit VPC route table has a route with next hop set to the enterprise router to forward traffic from the transit VPC to the enterprise router. 3. The enterprise router route table has a route with next hop set to virtual gateway attachment to forward traffic from the enterprise router to the virtual gateway. 4. The virtual gateway is connected to the virtual interface. Traffic from the virtual gateway is forwarded to the physical connection through the remote gateway of the virtual interface 5. Traffic is sent to the on-premises data center over the connection.
Response traffic: on-premises data center → virtual gateway → enterprise router → service VPC	1. Traffic is forwarded to the virtual interface through the connection. 2. The virtual interface is connected to the virtual gateway. Traffic from the virtual interface is forwarded to the virtual gateway through the local gateway of the virtual interface. 3. Traffic is forwarded from the virtual gateway to enterprise router. 4. The enterprise router route table has a route with next hop set to the service VPC attachment to forward traffic from the enterprise router to the service VPC.

The required resources and routes are as follows:

- **Table 16-3**: Required service VPC, transit VPC, enterprise router, and Direct Connect connection that connects the cloud and the on-premises data center
- **Table 16-4**: Required routes of the service VPC, transit VPC, and enterprise router

Table 16-3 Resource planning

Resource	Quantity	Description
VPC	2	Service VPC that your services are deployed and needs to be attached to the enterprise router • VPC CIDR block: 10.1.0.0/16 • Subnet CIDR block: 10.1.1.0/24

Resource	Quantity	Description
		Transit VPC that is connected to the service VPC over a VPC peering connection and needs to be attached to the enterprise router • VPC CIDR block: 192.168.0.0/16 • Subnet CIDR block: 192.168.1.0/24
Enterprise router	1	Three attachments on the enterprise router: • Service VPC attachment: service VPC • Transit VPC attachment: transit VPC • Virtual gateway attachment: virtual gateway of Direct Connect
Direct Connect	1	• Connection • Virtual gateway that needs to be attached to the enterprise router • Virtual interface – Local gateway: 10.0.0.1/30 – Remote gateway: 10.0.0.2/30 – Remote subnet: subnet of the on-premises data center (100.64.x.x)

Table 16-4 Route planning

Route Table	Destination	Next Hop	Route Type
Service VPC	100.64.x.x	VPC peering connection	Static route (custom)
Transit VPC	2.2.2.2/32 **NOTE** 2.2.2.2/32 is mandatory and must be added.	VPC peering connection	Static route (custom)
	0.0.0.0/0	Enterprise router	Static route (custom)
Enterprise router	10.1.0.0/16	Service VPC attachment	Propagated route
	100.64.x.x	Virtual gateway attachment	Propagated route

Step 1 Create a transit VPC, attach it to the enterprise router, and associate the transit VPC with the default route table of the enterprise router.

- The subnet of the transit VPC cannot overlap with that of the service VPC. Otherwise, the VPC peering connection to be created in **Step 2** cannot take effect.
- The transit VPC cannot have the following situations. Otherwise, the default route (0.0.0.0/0) to be configured in **Step 3** cannot forward traffic.
  - An ECS in the VPC has an EIP bound.
  - The VPC is being used by ELB, NAT Gateway, VPC Endpoint, or DCS.

Step 2 Create a VPC peering connection between the service VPC and transit VPC.

NOTICE

You do not need to add routes for the VPC peering connection. For details about the routes to be added, see **Step 3**.

Step 3 Add routes to the VPC route tables.

For details about required routes, see **Table 16-4**.

1. Add the route to the service VPC route table.
2. Add two routes to the transit VPC route table.

----End

16.3 How Do I Enable Two Attachments of an Enterprise Router to Learn Routes from Each Other?

If you want two attachments of an enterprise router to learn routes from each other, the router and each attachment must have a unique ASN. In this way, the enterprise router advertises the learned route information between the attachments.

If you want a virtual gateway and a VPN gateway attached to an enterprise router to learn routes from each other, their ASNs can be as follows:

- Enterprise router: 64512
- Virtual gateway attachment: 64513 (BGP ASN of the virtual gateway)
- VPN gateway attachment: 64515 (BGP ASN of the VPN gateway)

NOTE

VPC attachments do not support route learning.

A Change History

Released On	Description
2023-12-30	Modified the following content: Added **Selecting a Networking Scheme**.
2023-11-30	Modified the following content: Modified the screenshot for creating an attachment in **Adding VPC Attachments to an Enterprise Router**.
2023-07-30	Modified the following content: Added **Flow Log Overview** to **Deleting a Flow Log**.
2023-06-30	Modified the following content: • Deleted section "Changing the AZs of an Enterprise Router." • Added descriptions that VPN can be attached to an enterprise router.
2023-03-10	Modified the following content: • Added **When to Use Enterprise Routers**. • Added **Functions**. • Added **How Enterprise Routers Work**. • Added **Increasing Quotas**. • Added **How Do I Route Traffic to 100.64.x.x Through an Enterprise Router?** • Added **How Do I Enable Two Attachments of an Enterprise Router to Learn Routes from Each Other?**

Released On	Description
2022-12-30	Modified the following content: • Added **Billing**. • Added description about virtual gateway attachments. • Added **Supported Metrics** to **Creating Alarm Rules**. • Added **Key Operations Recorded by CTS** to **Viewing Traces**.
2022-08-30	Modified the following content: Added content about sharing.
2022-07-30	This issue is the first official release.