Elastic IP

Service Overview

Issue	01
Date	2023-03-31

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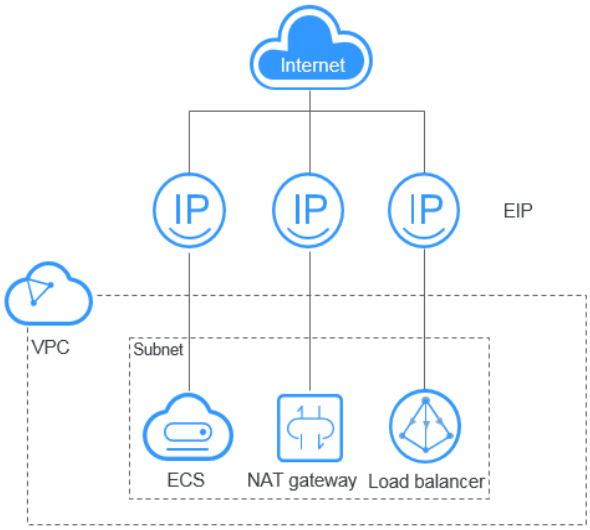
Contents

1 What Is Elastic IP?

The Elastic IP (EIP) service enables your cloud resources to communicate with the Internet using static public IP addresses and scalable bandwidths. If a resource has an EIP bound, it can directly access the Internet. If a resource only has a private IP address, it cannot directly access the Internet. EIPs can be bound to or unbound from ECSs, BMSs, virtual IP addresses, NAT gateways, or load balancers.

Each EIP can be bound to only one cloud resource.

Figure 1-1 Connecting to the Internet using an EIP



EIP Types

EIPs can use dynamic BGP.

- Dynamic BGP provides automatic failover and chooses the best path based on the real-time network conditions and preset policies.
- When a fault occurs on a carrier's link, dynamic BGP will quickly select another path to take over services, ensuring service availability.

NOTE

For more information about service availability, see **Huawei Cloud Service Level Agreement**.

Accessing EIP

You can access the EIP service through the management console or using HTTPS-based APIs.

- Management console

  Log in to the management console, select **Elastic IP** from the console homepage, and then perform operations on EIP resources.

- APIs

  If you need to integrate the EIP service provided by the cloud system into a third-party system for secondary development, you can use an API to access the EIP service. For details, see the **Elastic IP API Reference**.

2 Advantages

An EIP has the following advantages:

- Flexibility

  EIPs can be flexibly bound to or unbound from ECSs, BMSs, NAT gateways, load balancers, or virtual IP addresses. The bandwidth can be scaled according to service changes.

- Cost-effective

  EIPs are available on a pay-per-use (billed by bandwidth or traffic) or yearly/monthly (billed by bandwidth) basis. You can use shared bandwidth to enjoy lower bandwidth costs. Generally, if you have frequent data transfer needs, a yearly/monthly subscription is a more cost-effective option.

- Ease of use

  EIP binding, unbinding, and bandwidth adjustments take effect immediately.

3 Application Scenarios

Binding an EIP to an ECS

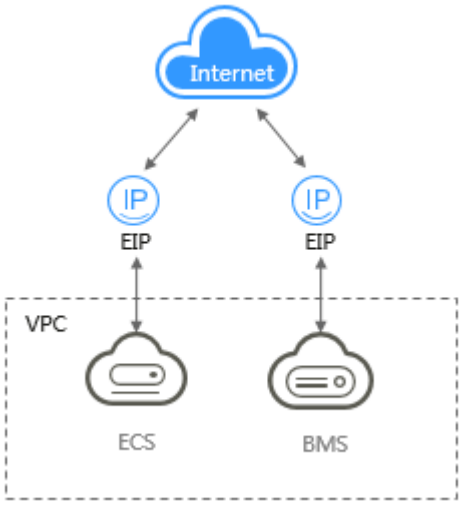
Scenario

You can bind an EIP to an ECS to enable the ECS to access the Internet.

Related Services

ECS, BMS, or VPC

Figure 3-1 Binding an EIP to a server



Binding an EIP to a NAT Gateway

Scenario

After an EIP is bound to a NAT gateway and SNAT and DNAT rules are added, multiple servers (such as ECSs and BMSs) can use the same EIP to access the Internet and provide services accessible from the Internet.

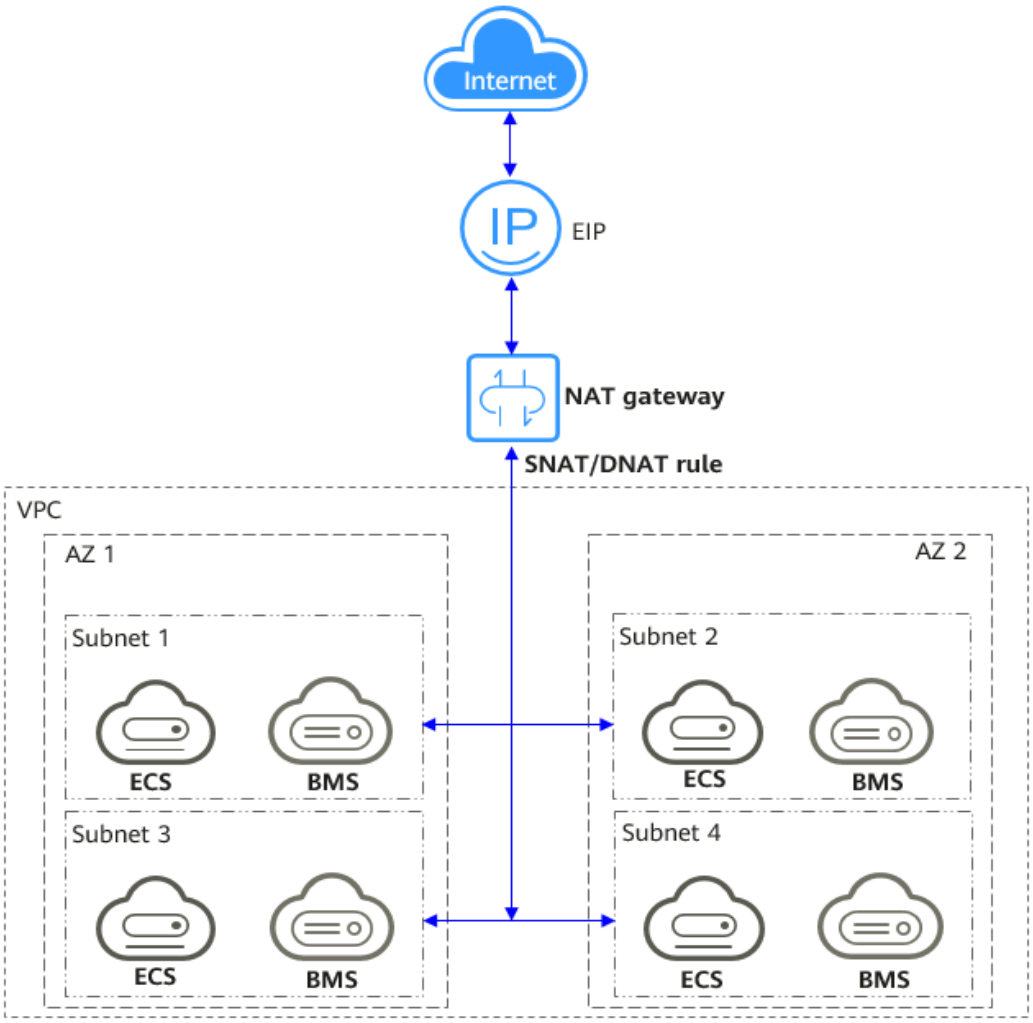
An SNAT rule allows servers in a specific VPC subnet to use the same EIP to access the Internet.

A DNAT rule enables servers in a VPC to provide services accessible from the Internet.

Related Services

NAT Gateway, cloud server (ECS and BMSs), and VPC

Figure 3-2 EIP used by a NAT gateway



Binding an EIP to a Load Balancer

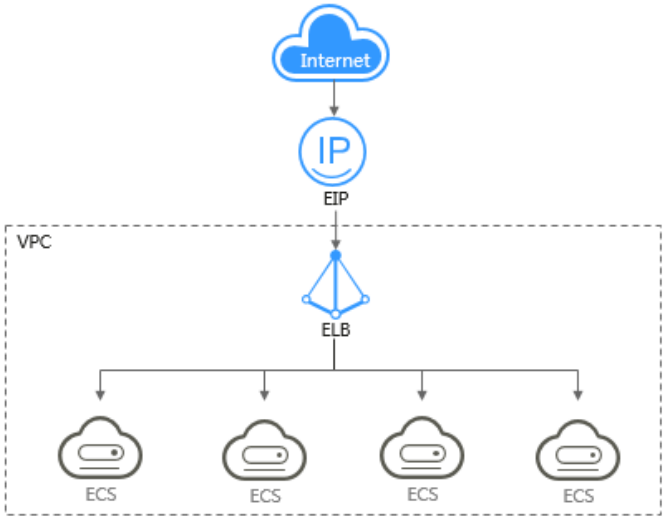
Scenario

After you attach an EIP to a load balancer, the load balancer can distribute requests from the Internet to backend servers.

Related Services

ELB, ECS, and VPC

Figure 3-3 EIP used by a load balancer



4 Functions

Table 4-1 lists the common functions of EIP.

Table 4-1 Common EIP functions

Category	Function	Description
EIP and Bandwidth	EIP	The EIP service enables your cloud resources to communicate with the Internet using static public IP addresses and scalable bandwidths. You can assign EIPs, bind them to or unbind them from cloud resources, release EIPs, and modify EIP bandwidth. For details, see **EIP Overview**.
	Shared Bandwidth	All ECSs, BMSs, and load balancers can share the same bandwidth if they reside in the same region and have EIPs bound. You can assign, modify, delete a shared bandwidth, add EIPs to a shared bandwidth, and remove EIPs from a shared bandwidth. For details, see **Shared Bandwidth Overview**.
Monitoring	Viewing Metrics	If you have subscribed to the VPC service, you can view bandwidth and EIP usage through Cloud Eye without adding plug-ins. On Cloud Eye, you can also create alarm rules, and customize monitored resources and notification policies. For details, see **Supported Metrics**.

5 Notes and Constraints

EIP

Note the following when using EIPs:

- Each EIP can only be bound to one cloud resource.
- An EIP that has already been bound to a cloud resource cannot be bound to another resource without first being unbound from the current resource.
- EIPs cannot be transferred across accounts.
- The maximum bandwidth of an EIP is 300 Mbit/s no matter whether it is billed by bandwidth or by traffic.
- If the used EIP bandwidth exceeds the purchased size or is attacked (usually by a DDoS attack), the EIP will be blocked but can still be bound or unbound.
- You can only release unbound EIPs.
- The system preferentially assigns EIPs to you from the ones you released, if any. However, if any of these EIPs is already assigned to another user, it cannot be re-assigned to you.

Bandwidth

- The smallest shared bandwidth that can be purchased is 5 Mbit/s. You can only add pay-per-use EIPs to a shared bandwidth.
- Within the validity period of a bandwidth used by a yearly/monthly EIP, you can only increase the bandwidth size. You can only reduce the bandwidth size when you renew the subscription.
- A shared bandwidth or dedicated bandwidth can only be used by resources owned by the same account.

NOTE

- Inbound bandwidth is the bandwidth consumed when data is transferred from the Internet to the cloud. Outbound bandwidth is the bandwidth consumed when data is transferred from the cloud to the Internet.

6 Billing

The EIP service provides multiple billing modes.

- **EIP Billing Modes**
- **Which Billing Option Is Right for Me?**
- **How Will I Be Billed If I Change My Bandwidth Size?**
- **How Do I Change the EIP Billing Mode?**

EIP Billing Modes

EIPs can be billed on a yearly/monthly or pay-per-use basis. The billing options and billing items depend on the billing mode.

- **Figure 6-1**
- **Table 6-1**

Figure 6-1 EIP billing

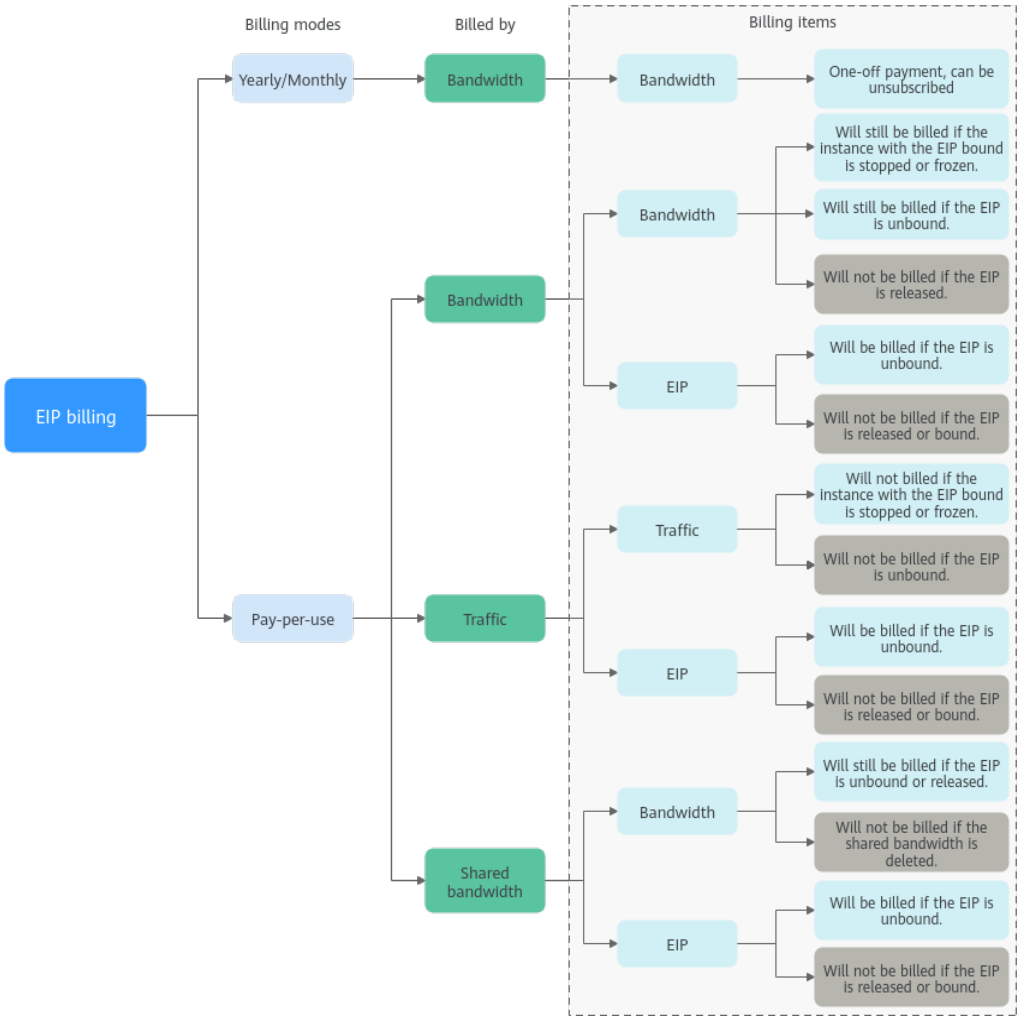


Table 6-1 EIP billing description

Billing Mode	Billed By	Billing Item	Billing Item Description	Impact of EIP Operations on Billing Items
Yearly/Monthly	Bandwidth	Bandwidth	If you buy a yearly/monthly EIP, you only need to pay for the bandwidth included in the subscription. You are billed based on your specified bandwidth size and usage duration. There is no limit on how much traffic you can use.	You can unsubscribe from a yearly/monthly subscription. Your actual usage fee and some preferential fees will be deducted from the refund amount.

Billing Mode	Billed By	Billing Item	Billing Item Description	Impact of EIP Operations on Billing Items
Pay-per-use	Bandwidth	• Bandwidth • EIP retention	If a pay-per-use EIP is billed by bandwidth: • Bandwidth: You are billed based on your specified bandwidth size and usage duration. There is no limit on how much traffic you can use. After the EIP is purchased, you can change your specified bandwidth size. The bandwidth you use will not exceed the bandwidth you specified. • EIP retention: If an EIP is not released, it will continue to be billed even if it is not bound to an instance.	After an EIP is purchased: • If the EIP is not bound to any instance, both the EIP and its bandwidth will be billed. • If the EIP is bound to an instance, only the bandwidth will be billed. **The bandwidth will be billed regardless of if the instance bound to the EIP is running or not.** • **After the EIP is unbound from an instance, the bandwidth will continue to be billed. Unless it is released, the EIP will still be billed.** • If the EIP is released, both the EIP and its bandwidth will not be billed.

Billing Mode	Billed By	Billing Item	Billing Item Description	Impact of EIP Operations on Billing Items
	Traffic	• Traffic • EIP retention	If a pay-per-use EIP is billed by traffic: • Traffic: You are billed based on your EIP type and the total amount of traffic going out of the cloud. The bandwidth size you set is only used to limit the maximum data transfer rate. To prevent high fees caused by burst traffic, specify a proper bandwidth size when you buy an EIP. If an EIP billed by traffic uses a dedicated bandwidth, only the bandwidth used in the outbound direction will be billed. • EIP retention: If an EIP is not released, it will continue to be billed even if it is not bound to an instance.	After an EIP is purchased: • If the EIP is not bound to an instance, you will be billed for the EIP itself, but not for traffic. • If the EIP is bound to an instance, only the used traffic will be billed. **If the instance bound to the EIP stops running and there is no traffic generated, there will be no traffic or EIP fees.** • **After the EIP is unbound from an instance, the traffic will not be billed but the EIP will still be billed.** • If the EIP is released, the EIP will not be billed.

Billing Mode	Billed By	Billing Item	Billing Item Description	Impact of EIP Operations on Billing Items
	Shared bandwidth	• Shared bandwidth • EIP retention	If a pay-per-use EIP is added to a shared bandwidth: • Share bandwidth: Only the shared bandwidth will be billed. There will be no additional bandwidth or traffic costs for EIPs added to the shared bandwidth. • EIP retention: If an EIP is not released, it will continue to be billed even if it is not bound to an instance.	After an EIP is purchased: • Shared bandwidth – No operations on the EIP will affect the billing of a shared bandwidth. For example, if you have released the EIP but have not deleted the shared bandwidth, the shared bandwidth will still be billed. – After a shared bandwidth is deleted, it will no longer be billed. • EIP retention – If the EIP is not bound to an instance, the EIP will still be billed. – **If the EIP is unbound from an instance, the EIP will be billed to keep it allocated to your account unless it is released.** – If the EIP is released or bound to an instance, the EIP will not be billed.

To save money, you can add multiple EIPs in the same region to a shared bandwidth. A shared bandwidth can be billed on a yearly/monthly or pay-per-use basis. For details, see **Table 6-2**. Currently, only pay-per-use EIPs can be added to a shared bandwidth.

- You can add an EIP to a shared bandwidth when buying the EIP.
- You can also add an existing EIP to a shared bandwidth. After the EIP is added to a shared bandwidth, there will be no additional bandwidth or traffic cost. You will only be billed for the shared bandwidth.

Table 6-2 Shared bandwidth billing details

Billing Mode	Billed By	Billing Item	Billing Item Description
Yearly/ Monthly	Bandwidth	Bandwidth	If you buy a yearly/monthly shared bandwidth, you are billed based on your specified bandwidth size and usage duration. There is no limit on how much traffic you can use.
Pay-per-use	Bandwidth	Bandwidth	You are billed based on your specified bandwidth size and usage duration. There is no limit on how much traffic you can use. After a shared bandwidth is purchased, you can change your specified bandwidth size. The bandwidth you use will not exceed the bandwidth you specified.

NOTE

- The price of bandwidth, traffic, and EIP depends on the region.
- The EIP bandwidth is the outbound bandwidth consumed when data is transferred from Huawei Cloud to the Internet. For example, when ECSs provide services accessible from the Internet and external users download resources from the ECSs, that consumes outbound bandwidth. Only the outbound bandwidth will be billed.
  - If your purchased or modified bandwidth is no more than 10 Mbit/s, the inbound bandwidth will be 10 Mbit/s, and the outbound bandwidth will be the same as the purchased or modified bandwidth.
  - If your purchased or modified bandwidth is more than 10 Mbit/s, both the inbound and outbound bandwidth will be the same as the purchased or modified bandwidth.

Which Billing Option Is Right for Me?

EIPs can be billed by bandwidth or traffic. **Table 6-3** shows the application scenarios of different billing options.

Cloud Eye monitors your network metrics, such as bandwidth and traffic. Based on the bandwidth usage, you can determine which billing option (by bandwidth or by traffic) is more cost-effective. Here are some suggestions for your reference:

- If you need less than 5 Mbit/s of bandwidth for a short time and the traffic is light, set your EIP to be billed by traffic.
- If you need less than 5 Mbit/s of bandwidth but the traffic is heavy set your EIP to be billed by bandwidth, and choose yearly/monthly or pay-per-use billing, depending on how long you will need the bandwidth for.
- If you need more than 5 Mbit/s of bandwidth and the bandwidth usage is greater than 20%, set your EIP to be billed by bandwidth.

For details, see **Viewing Metrics**.

Table 6-3 Application scenarios of EIP billing options

Billing Mode	Billed By	Scenario
Yearly/ Monthly	Bandwidth	Heavy or stable traffic
Pay-per-use	Bandwidth	Heavy or stable traffic
	Traffic	Light or sharply fluctuating traffic
	Shared bandwidth	Staggered traffic

How Will I Be Billed If I Change My Bandwidth Size?

If an EIP is not added to a shared bandwidth, the EIP uses the dedicated bandwidth regardless of it is billed by bandwidth or traffic. After an EIP is added to a shared bandwidth, only the shared bandwidth is billed.

- **Modifying Dedicated Bandwidth Size**
- **Modifying Shared Bandwidth Size**

When you change the bandwidth size, the bandwidth price and effective time depend on the billing mode, which applies to both dedicated and shared bandwidths. For details, see **Table 6-4**.

NOTE

Decreasing bandwidths may cause packet loss.

Table 6-4 Impact on billing after bandwidth size change

Billing Mode	Billed By	Change	Impact
Yearly/ Monthly	Bandwidth	Increase bandwidth	The change will take effect immediately. The increased bandwidth will be billed accordingly.

Billing Mode	Billed By	Change	Impact
	Bandwidth	Decrease bandwidth upon renewal	The change will not take effect immediately. You need to select a new bandwidth size and a renewal duration. The change will take effect in the first billing cycle after a successful renewal. • The order can be unsubscribed before the bandwidth takes effect. • The bandwidth cannot be modified in the first billing cycle.
Pay-per-use	Bandwidth	Increase or decrease the bandwidth	The change will take effect immediately.
	Traffic	Increase or decrease the bandwidth	The change will take effect immediately. The bandwidth size you set is only used to limit the maximum data transfer rate.

How Do I Change the EIP Billing Mode?

The EIP service has multiple billing modes you can choose from. You can change your EIP billing mode during the EIP usage period if necessary.

- **Table 6-5**
- **Changing Bandwidth Billing**

NOTE

Changing the billing mode does not change EIPs or interrupt their use.

Figure 6-2 EIP billing mode change

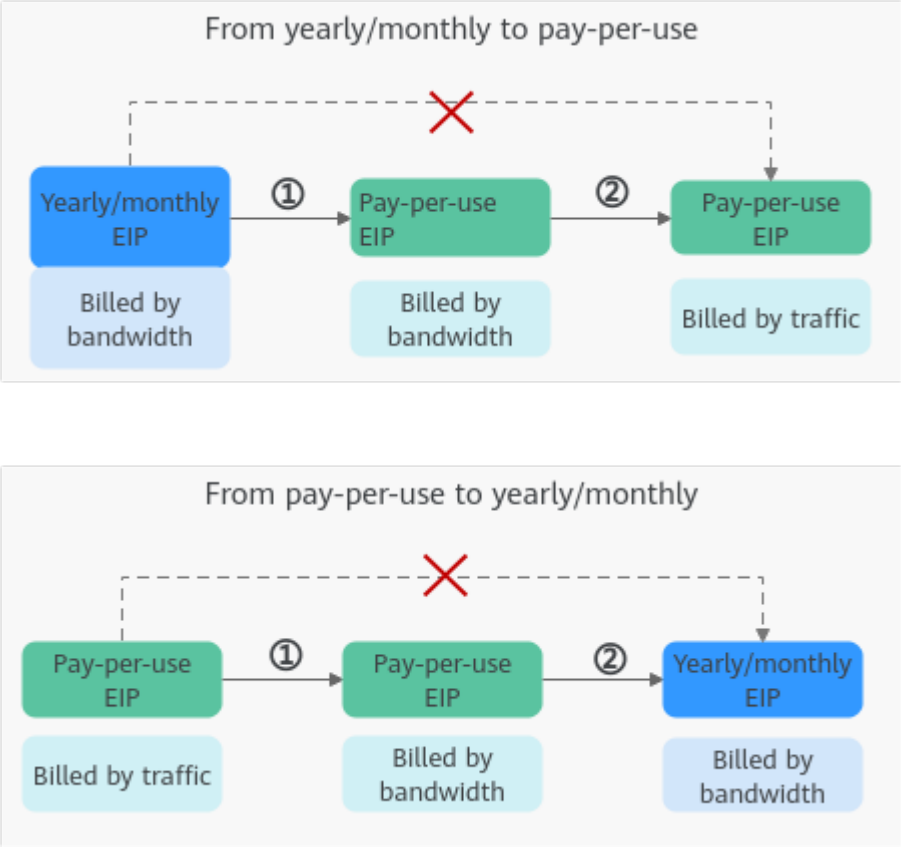


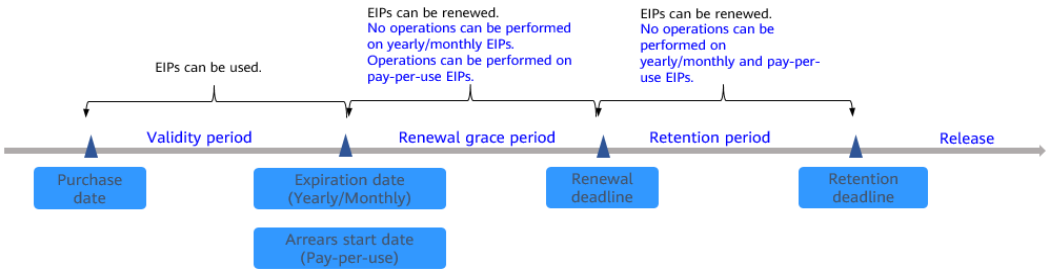
Table 6-5 EIP billing mode change description

Change	Description
From yearly/monthly to pay-per-use	• An EIP billed on a yearly/monthly basis can be directly changed to be billed by bandwidth on a pay-per-use basis upon expiration. • An EIP billed on a yearly/monthly basis cannot be directly changed to be billed by traffic on a pay-per-use basis. To change this: 1. Change the EIP to be billed by bandwidth on a pay-per-use basis. 2. Change the EIP to be billed by traffic on a pay-per-use basis. The new billing mode takes effect only after the yearly/monthly subscription expires.

Change	Description
From pay-per-use to yearly/monthly	• An EIP that is billed by bandwidth on a pay-per-use basis can be directly changed to be billed on a yearly/monthly basis. • An EIP that is billed by traffic on a pay-per-use basis cannot be directly changed to be billed on a yearly/monthly basis. To change this: 1. Change the EIP to be billed by bandwidth on a pay-per-use basis. 2. Change the EIP to be billed on a yearly/monthly basis. The new billing mode takes effect immediately.
• From billing by traffic (pay-per-use) to billing by bandwidth (pay-per-use) • From billing by bandwidth (pay-per-use) to billing by traffic (pay-per-use)	• An EIP billed by traffic on a pay-per-use basis can be directly changed to be billed by bandwidth on a pay-per-use basis. • An EIP billed by bandwidth on a pay-per-use basis can be directly changed to be billed by traffic on a pay-per-use basis. The new billing mode takes effect immediately.

How Do I Renew an EIP? What Will Happen If My Account Is in Arrears?

Figure 6-3 EIP/Bandwidth lifecycle



If your account is in arrears, pay the arrears within the specified time to prevent your resources from being frozen or released. For details, see **Repaying Outstanding Amount**.

If your account is in arrears, you will be impacted for using your resources.

- If your yearly/monthly resource has expired and is not renewed, the resource enters the grace period. If you do not renew the monthly/yearly resource within the grace period, the resource enters a retention period. If you do not renew the monthly/yearly resource within the retention period, the resource will be deleted.

You cannot perform any operations on yearly/monthly resources that are in the grace or retention period. For example, you cannot change your bandwidth if it is in the grace period or retention period.

To ensure that your services are not affected, **renew your EIP** before it expires.

- If your pay-per-use resource is in arrears, the resource enters the grace period. If you do not pay off the arrears of the pay-per-use resource within the grace period, the resource enters a retention period. If you do not pay off the arrears of the pay-per-use resource within the retention period, the resource will be deleted.

  You can still perform operations on pay-per-use resources in the grace period. However, you cannot perform any operations on them if they enter the retention period.

Unsubscription

If you have a yearly/monthly EIP that is unbound from an instance and is not expired, but you will no longer use it, you can unsubscribe from it.

- Yearly/monthly EIPs can be unsubscribed. Your actual usage fee and some preferential fees will be deducted from the refund amount.
- Pay-per-use EIPs cannot be unsubscribed. If you do not need the pay-per-use EIPs any more, release them. **Releasing an EIP**.

7 Permissions

If you need to assign different permissions to employees in your enterprise to access your EIP resources, IAM is a good choice for fine-grained permissions management. IAM provides identity authentication, permissions management, and access control, helping you securely manage access to your cloud resources.

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

If your does not need individual IAM users for permissions management, you may skip over this section.

IAM can be used free of charge. You pay only for the resources in your account. For more information, see **IAM Service Overview**.

EIP Permissions

New IAM users do not have any permissions assigned by default. You need to first add them to one or more groups and attach policies or roles to these groups. The users then inherit permissions from the groups and can perform specified operations on cloud services based on the permissions they have been assigned.

Currently, EIP permissions are included in VPC permissions.

VPC is a project-level service deployed for specific regions. When you set **Scope** to **Region-specific projects** and select the specified projects in the specified regions , the users only have permissions for VPCs in the selected projects. If you set **Scope** to **All resources**, users have permissions for VPCs in all region-specific projects. When accessing VPCs, the users need to switch to the authorized region.

You can grant permissions by using roles and policies.

- Roles: A coarse-grained authorization strategy provided by IAM to assign permissions based on users' job responsibilities. Only a limited number of service-level roles are available for authorization. When you grant permissions using roles, you also need to attach dependent roles. Roles are not ideal for fine-grained authorization and least privilege access.

- Policies: A fine-grained authorization strategy that defines permissions required to perform operations on specific cloud resources under certain conditions. This type of authorization is more flexible and is ideal for least privilege access. For example, you can grant VPC users only the permissions for managing a certain type of resources. A majority of fine-grained policies contain permissions for specific APIs, and permissions are defined using API actions. For the API actions supported by VPC, see **Permissions Policies and Supported Actions**.

Table 7-1 lists all the system-defined roles and policies supported by VPC.

Table 7-1 System-defined permissions for VPC

Policy Name	Description	Policy Type	Dependencies
VPC FullAccess	Full permissions for VPC	System-defined policy	To use the VPC flow log function, users must also have the **LTS ReadOnlyAccess** permission.
VPC ReadOnlyAccess	Read-only permissions on VPC.	System-defined policy	None
VPC Administrator	Most permissions on VPC, excluding creating, modifying, deleting, and viewing security groups and security group rules. To be granted this permission, users must also have the **Tenant Guest** permission.	System-defined role	**Tenant Guest** policy, which must be attached in the same project as **VPC Administrator**.

Table 7-2 lists the common operations supported by each system policy of VPC. Please choose proper system policies according to this table.

Table 7-2 Common operations supported by system-defined permissions

Operation	VPC ReadOnlyAccess	VPC Administrator	VPC FullAccess
Assigning an EIP	x	x	√
Viewing an EIP	√	x	√

Operation	VPC ReadOnlyAccess	VPC Administrator	VPC FullAccess
Releasing an EIP	x	x	√
Binding or unbinding an EIP	x	x	√
Adding an EIP to or removing an EIP from a shared bandwidth	x	x	√
Assigning a bandwidth	x	x	√
Viewing a bandwidth	√	x	√
Modifying a bandwidth	x	x	√
Deleting a bandwidth	x	x	√

Helpful Links

- What Is IAM?
- Creating a User and Granting EIP Permissions
- Permissions Policies and Supported Actions

8 EIP and Other Services

Figure 8-1 shows the relationship between EIP and other services.

Figure 8-1 EIP and related services

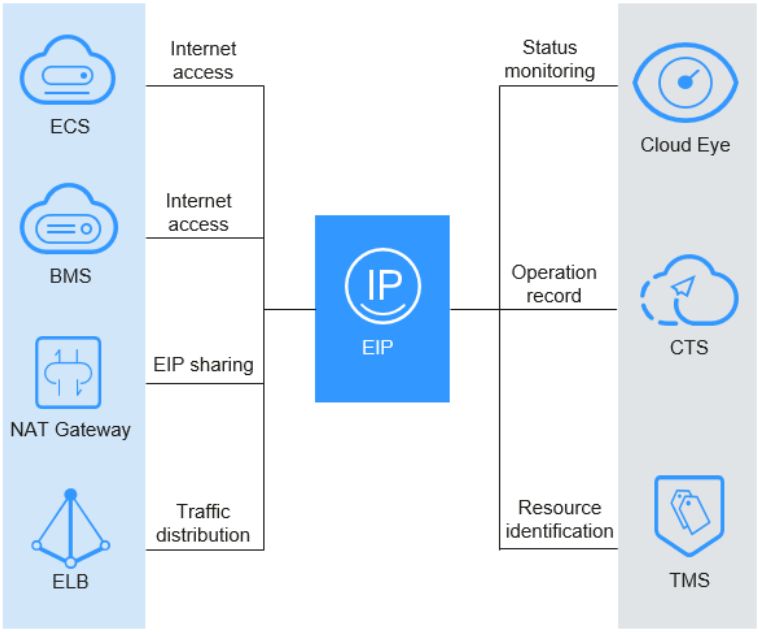


Table 8-1 Related services

Interactive Function	Service	Reference
Bind an EIP to a server to allow the server to access the Internet.	Elastic Cloud Server (ECS) BMS	**Binding an EIP** **Binding an EIP to a BMS**

Interactive Function	Service	Reference
Bind a virtual IP address to an EIP so that you can access the ECSs deployed in active/standby mode through the virtual IP address.	Virtual Private Cloud (VPC)	**Binding a Virtual IP Address to an EIP or ECS**
Configure ECSs to share one or more EIPs through a NAT gateway to access the Internet.	NAT Gateway	**Using SNAT to Access the Internet**
Distribute incoming traffic to multiple ECSs in a VPC.	ELB	**Elastic Load Balance**
Check the bandwidth and traffic usage.	Cloud Eye	**Viewing Metrics**
Record EIP-related operations for querying, auditing, and tracing back.	Cloud Trace Service (CTS)	**Viewing Audit Logs**
Add tags to EIPs so that you can quickly identify EIPs and manage them.	Tag Management Service (TMS)	**Managing EIP Tags**

9 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.

- Regions are divided based on geographical location and network latency. Public services, such as Elastic Cloud Server (ECS), Elastic Volume Service (EVS), Object Storage Service (OBS), Virtual Private Cloud (VPC), Elastic IP (EIP), and Image Management Service (IMS), are shared within the same region. Regions are classified into universal regions and dedicated regions. A universal region provides universal cloud services for common tenants. A dedicated region provides specific services for specific tenants.
- An AZ contains one or more physical data centers. Each AZ has independent cooling, fire extinguishing, moisture-proof, and electricity facilities. Within an AZ, computing, network, storage, and other resources are logically divided into multiple clusters. to support high-availability systems.

Selecting a Region

If your target users are in Europe, select the **EU-Dublin** region.

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.

10 Change History

Released On	Description
2023-03-31	This issue is the second official release. Updated the following content: • Added "How Do I Renew an EIP? What Will Happen If My Account Is in Arrears?" to **Billing**. • Added content about Cloud Trace Service (CTS) and Tag Management Service (TMS) in **EIP and Other Services**.
2022-08-30	This issue is the first official release.

