Alibaba Cloud
Cloud Enterprise Network

User Guide

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Generic conventions

Table -1: Style conventions

Style	Description	Example
	This warning information indicates a situation that will cause major system changes, faults, physical injuries, and other adverse results.	 Danger: Resetting will result in the loss of user configuration data.
	This warning information indicates a situation that may cause major system changes, faults, physical injuries, and other adverse results.	 Warning: Restarting will cause business interruption. About 10 minutes are required to restore business.
	This indicates warning information, supplementary instructions, and other content that the user must understand.	 Notice: Take the necessary precautions to save exported data containing sensitive information.
	This indicates supplemental instructions, best practices, tips, and other content that is good to know for the user.	 Note: You can use Ctrl + A to select all files.
>	Multi-level menu cascade.	Settings > Network > Set network type
Bold	It is used for buttons, menus , page names, and other UI elements.	Click OK.
`Courier font`	It is used for commands.	Run the `cd /d C:/windows` command to enter the Windows system folder.
Italics	It is used for parameters and variables.	`bae log list --instanceid` *Instance_ID*
[] or [a|b]	It indicates that it is a optional value, and only one item can be selected.	`ipconfig` *[-all|-t]*

Style	Description	Example
{} or {a|b}	It indicates that it is a required value, and only one item can be selected.	`swich {stand | slave}`

Contents

1 CEN instances

After creating a CEN instance, you can attach networks to the CEN instance, buy bandwidth packages and set the cross-region interconnection bandwidth if required, thereby rapidly building a secure, reliable, and enterprise-class global network.

Create a CEN instance

To create a CEN instance, complete these steps:

1. Log on to the *CEN console*.
2. On the Instances page, click Create CEN instance.
3. Configure the CEN instance according to the following information:

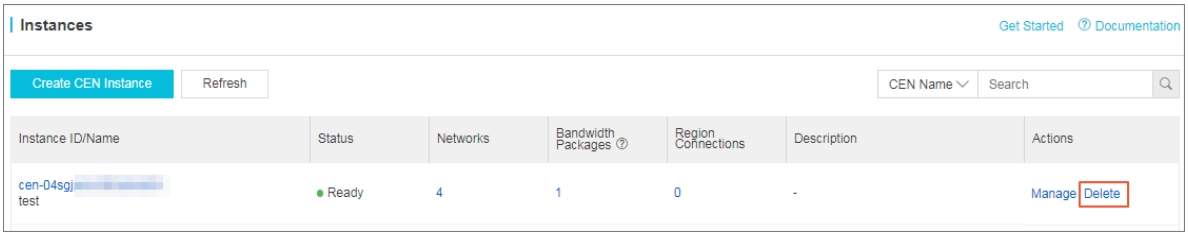
Configuration	Description
Name	Enter the name of the CEN instance. The name can be 2-128 characters in length. It can start with an uppercase letter, lowercase letter, or Chinese character. It can contain numbers, underscores (_), and hyphens (-), but cannot start with `http://` or `https://`.
Description	Enter the description of the CEN instance. The description can contain from 2 to 256 characters and cannot begin with `http://` or `https://`.
Attach networks	You can attach networks of your account or other accounts to a CEN instance. For more information, see *Networks*.

Delete a CEN instance

Before deleting a CEN instance, make sure there is no bandwidth package or network under the instance.

To create a CEN instance, complete these steps:

1. Log on to the *CEN console*.
2. Click Delete in the Actions column of the target CEN instance.



3. In the displayed dialog box, click OK.

2 Networks

Attach networks

You can attach networks in the same account or a different to a CEN instance. To attach a network in a different account, authorization is required.

Attach a network in the same account

1. Log on to the *CEN console*.
2. Click the ID of the target CEN instance.
3. Click Attach Network.
4. Choose Your Account, and configure the network according to the following information:

Configuration	Description
Network Type	Select the type of the network to attach.
Region	Select the region of the network.
Networks	Select the network. Note: You cannot select a network already attached to a CEN instance or connected using Express Connect.
Description	Enter the description of the network. The description can contain 2-256 characters, and cannot start with `http://` or `https://`.

5. Click OK.

Attach a network in a different account

To attach a network belonging to a different account, you must get authorized. The network owner must first authorize CEN to attach the network on the corresponding VPC page and VBR page. For more information, see *Cross-account network authorization*.

1. Log on to the *CEN console*.
2. Click the ID of the target CEN instance.
3. Click Attach Network.
4. Choose Different Account, and configure the network according to the following information:

Configuration	Description
Owner Account	Enter the ID of the account that owns the network to attach.
Network Type	Select the type of the network to attach.
Region	Select the region of the authorized network.
Networks	Enter the ID of the network to attach.

5. Click OK.

Cross-account network authorization

To attach a network belonging to a different account, you must get authorized.

Cross-account authorization for VPC

1. Use the account of the target VPC to log on to the *VPC console*.
2. In the left-side navigation pane, click VPC.
3. Click the ID of the target VPC, and then click CEN Cross Account Authorization in the CEN cross account authorization information area.
4. In the displayed dialog box, enter the ID of the account and the CEN instance to authorize.
5. Click OK.

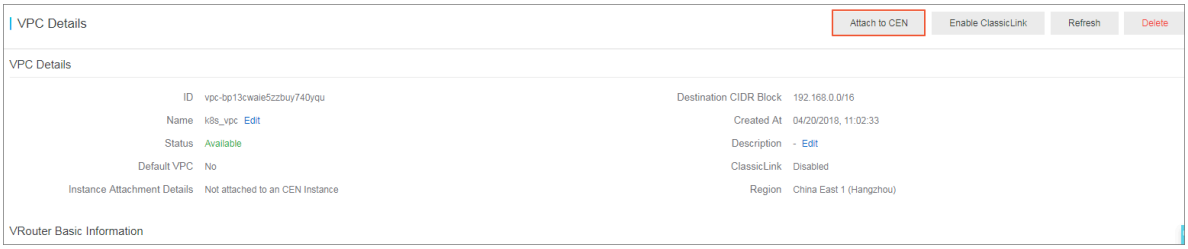
Cross-account authorization for VBR

1. Use the account of the target VBR to log on to the *Express Connect console*.
2. In the left-side navigation pane, click Physical Connection > Virtual Border Router.
3. Click the ID of the VBR to attach, and then click CEN Cross Account Authorization in the CEN cross account authorization information area.
4. In the displayed dialog box, enter the ID of the account and the CEN instance to authorize.

Rapidly join in a CEN instance

On the VPC Details or VBR Details page, you can rapidly join in a CEN instance of your account.

- On the VPC Details page, click Attach to CEN, and then select the created CEN instance. Click OK.



- On the VBR Details page, click Attach to CEN, and then select the created CEN instance. Click OK.

Detach a network

1. Log on to the *CEN console*.
2. Click the ID of the target CEN instance.
3. Click Detach in the Actions column of the target network.
4. In the displayed dialog box, click OK.

3 Attach a network in a different account

To attach a network belonging to a different account, you must get authorized.

Cross-account authorization for VPC

1. Use the account of the target VPC to log on to the VPC console.
2. In the left-side navigation pane, click VPC.
3. Click the ID of the target VPC, and then click CEN Cross Account Authorization in the CEN cross account authorization information area.
4. In the displayed dialog box, enter the ID of the account and the CEN instance to authorize, and then click OK.

Cross-account authorization for VBR

1. Use the account of the target VBR to log on to the Express Connect console.
2. In the left-side navigation pane, click Physical Connection > Virtual Border Router.
3. Click the ID of the VBR to attach, and then click CEN Cross Account Authorization in the CEN cross account authorization information area.
4. In the displayed dialog box, enter the ID of the account and the CEN instance to authorize, and then click OK.

4 Cross-region interconnection bandwidth

To connect networks in different regions, you must set cross-region interconnection bandwidth after buying a bandwidth package. The total bandwidth set for all the interconnected regions of a bandwidth package cannot exceed the bandwidth of the bandwidth package. By default, 1 Kbps bandwidth is provided for connectivity test. To run normal business, you must buy a bandwidth package and set a proper interconnection bandwidth.

For example, a CEN instance is bound to a bandwidth package of 20 Mbps and the interconnection areas are Mainland China and North America. You can set the cross-region interconnection bandwidth between US West 1 and China East 1, China East 2, China South 1, and so on. However, the total bandwidth set for all the interconnected regions cannot exceed 20 Mbps.

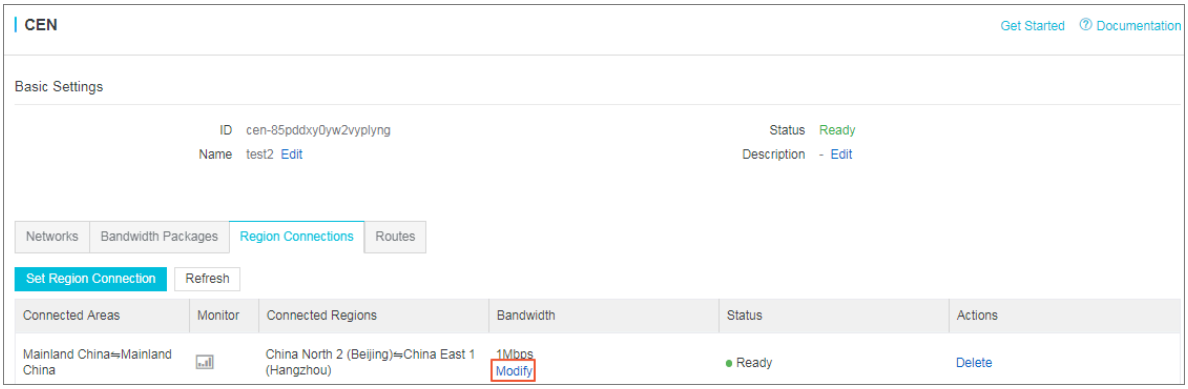
Set a cross-region interconnection bandwidth

1. Log on to the *CEN console*.
2. On the Instances page, click the ID of the target instance.
3. Click Region Connections, and then click Set Region Connection.
4. Configure the cross-region bandwidth, and then click OK.

Configuration	Description
Bandwidth package	Select the bandwidth package bound to the CEN instance.
Connected Regions	Select the regions to connect.
Bandwidth	Enter the bandwidth.

Modify cross-region interconnection bandwidth

1. Log on to the *CEN console*.
2. On the Instances page, click the ID of the target instance.
3. Click Region Connections, and then click Modify in the Bandwidth column of the target cross-region interconnection bandwidth.
4. In the dialog box, click OK.



Delete a cross-region interconnection bandwidth

1. Log on to the *CEN console*.
2. On the Instances page, click the ID of the target instance.
3. Click Region Connections, and then click Delete in the Bandwidth column of the target cross-region interconnection bandwidth.
4. The displayed dialog box, click OK.

5 Bandwidth package

5.1 Manage bandwidth packages

To connect networks in different regions, you must buy a bandwidth package and set cross-region bandwidths.

What is the bandwidth package

The CEN bandwidth package is an abstracted object that includes an interconnection bandwidth and interconnection areas. To buy a bandwidth package, you must specify the areas to connect. An area consists of one or more Alibaba Cloud regions. The areas in CEN include Mainland China, Asia Pacific, North America, and Europe.

The relationship between a region and a region is shown in the following table:

Area	Included regions
Mainland China	China (Qingdao), China (Beijing), China (Zhangjiakou), China (Shenzhen), China (Hangzhou), China (Shanghai), China (Hohhot)
North America	US (Silicon Valley), US (Virginia)
Asia Pacific	Hong Kong, Singapore, Malaysia (Kuala Lumpur), Japan (Tokyo), India (Mumbai), Indonesia (Jakarta)
Europe	Germany (Frankfurt), UK (London)
Australia	Australia (Sydney)

Buy a bandwidth package

To connect networks in different regions, you must buy a bandwidth package and set cross-region bandwidths. Connecting networks in the same region does not require a bandwidth package.

Note:
To delete a bandwidth package, you must open a ticket.

To buy a bandwidth package, complete these steps:

1. Log on to the *CEN console*.
2. Click the ID of the target cloud enterprise instance.

3. On the Bandwidth Packages page, click Buy Bandwidth Package, and then click Buy Bandwidth Package (Subscription).
4. Configure the bandwidth package according to the following information:

Configuration	Description
Cloud Enterprise Network	Select the CEN instance that requires a bandwidth package.
Areas	Select the areas to connect.
Bandwidth	Select the bandwidth of the bandwidth package. Note: The interconnection area cannot be modified after the bandwidth package is created.
Bandwidth Package Name	Enter the name of the bandwidth package.

Unbind bandwidth package

You can unbind bandwidth packets from an instance of cloud enterprise network , this bandwidth package can then be bound to other cloud Enterprise Network instances.

Notice:

- Before deleting a bandwidth package, delete region connections using the bandwidth package.
- The bandwidth package is still charged even if it is unbound from a CEN instance. To avoid additional charges, open a ticket to delete the bandwidth package.

To unbind a bandwidth package, complete these steps:

1. Log on to the *CEN console*.
2. Click the ID of the target cloud enterprise instance.
3. On the CEN page, click Bandwidth Packages.
4. Click the Unbind option under the Action column of the target bandwidth package.
5. In the displayed dialog, click Confirm.

Bind bandwidth package

You can bind an unbound bandwidth package to another CEN instance.

To bind a bandwidth package, complete these steps:

1. Log on to the *CEN console*.
2. Click the ID of the target cloud enterprise instance.
3. On the CEN page, click the Bandwidth Packages tab.
4. Click the Bind option under the Action column of the target bandwidth package.
5. In the displayed dialog, click Confirm.

Modify bandwidth

You can change the bandwidth of the bandwidth package at any time, and the change takes effect immediately.

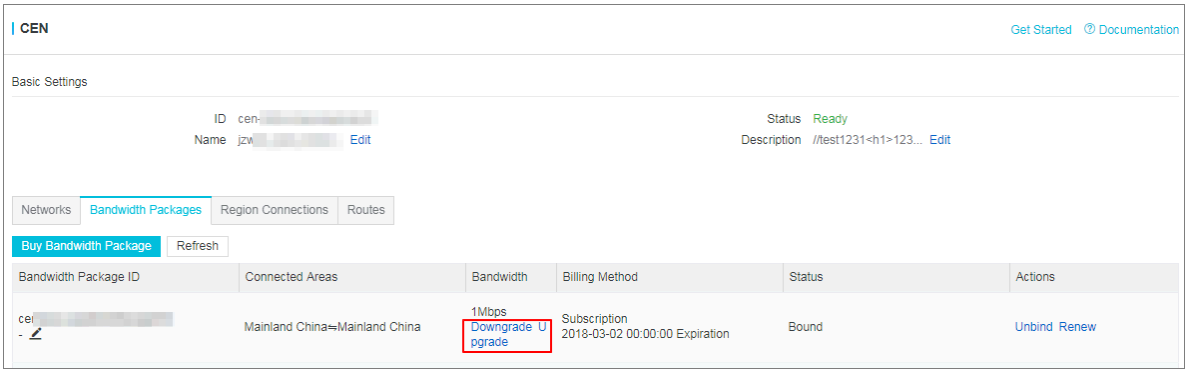
To modify the bandwidth, complete these steps:

1. Log on to the *CEN console*.
2. Click the ID of the target cloud enterprise instance.
3. On the CEN page, click the Bandwidth Packages tab.
4. Click the Downgrade or the Upgrade option under the Bandwidth column of the target bandwidth package.
5. Modify the bandwidth, and then complete the payment.

Renew a bandwidth package

To renew a bandwidth package, complete these steps:

1. Log on to the *CEN console*.
2. Click the ID of the target cloud enterprise instance.
3. On the CEN page, click the Bandwidth Packages tab.
4. Click the Renew option under the Action column of the target bandwidth package.



5. Select the renew duration and complete the payment.

6 Health check

CEN provides the health check function so that you can monitor the network conditions of local data centers connected to the attached VBRs.

Configure health check

To configure the health check, complete these steps:

1. Log on to the *CEN console*.
2. In the left-side navigation pane, click Health Check.
3. Select the region of the CEN instance and click Add Health Check.
4. On the displayed page, configure the following:

Configuration	Description
Instances	Select the CEN instance associated with the VBR.
Virtual Border Router (VBR)	Select the VBR to monitor.
Source IP	Any unused IP address in the VPC attached to the CEN instance.
Target IP	The IP address of the customer premises equipment connected to the VBR.

View monitoring data

To view the monitoring data after configuring the health check, complete these steps:

1. Log on to the *CEN console*.
2. In the left-side navigation pane, click Health Check.
3. Click the monitoring icon to view the monitoring data.
   - Outbound bandwidth: The bandwidth of data transmission from Alibaba Cloud to the local data center.
   - Inbound bandwidth: The bandwidth of data transmission from the local data center to the Alibaba Cloud.
   - Packet loss: The loss rate of data transmitted between the Alibaba Cloud and the local data center.

7 Manage routes

7.1 View CEN routes

CEN automatically realizes the multi-node adaptive routing forwarding and distribution. The adaptive routing process improves the network performance.

View CEN routes on the CEN console

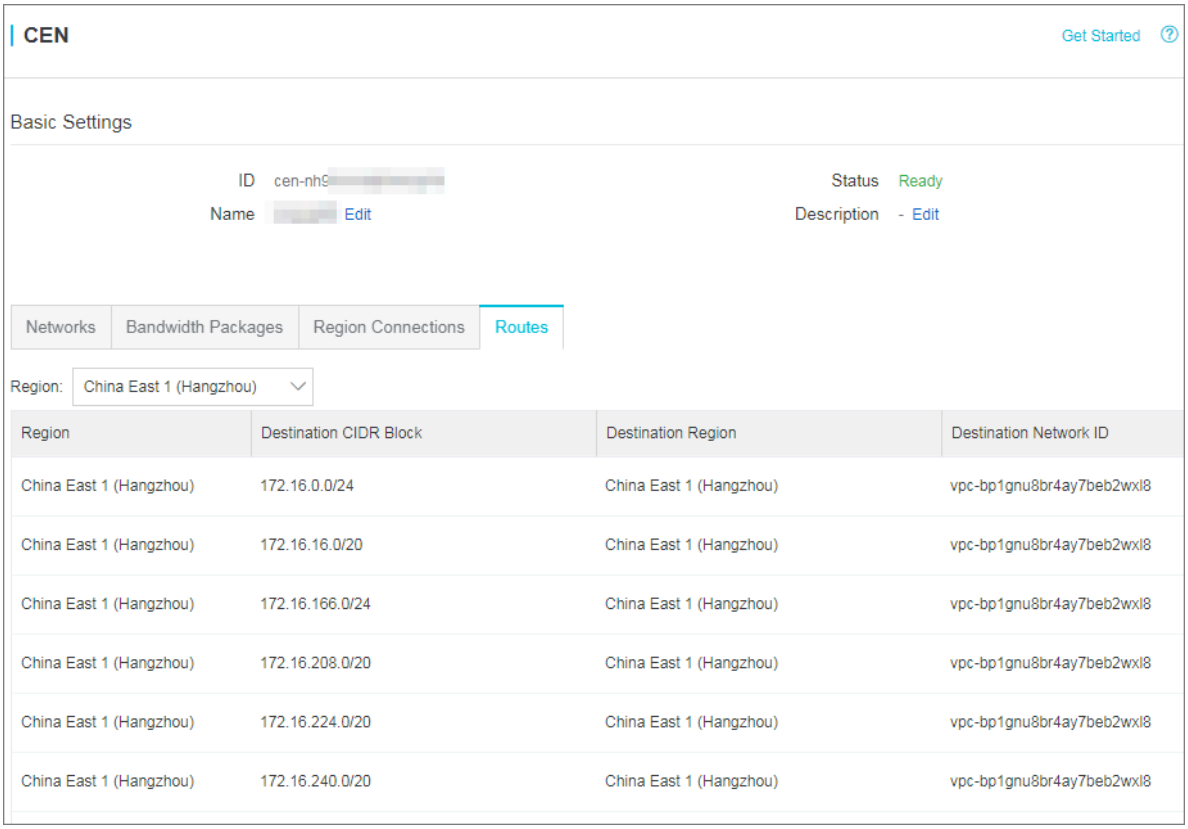
You can view routes of networks in other regions learned by the CEN instance. For example, a CEN instance has attached a VPC in China North 1 (Qingdao) and another VPC in China North 2 (Beijing). You can follow these steps to view routes learned from the VPC in China North 1.

To view the learned routes, complete these steps:

1. Log on to the *CEN console*.
2. Click the ID of the target CEN instance.
3. Click Routes and select the region to query.

   Descriptions of fields in a route entry are as follows:

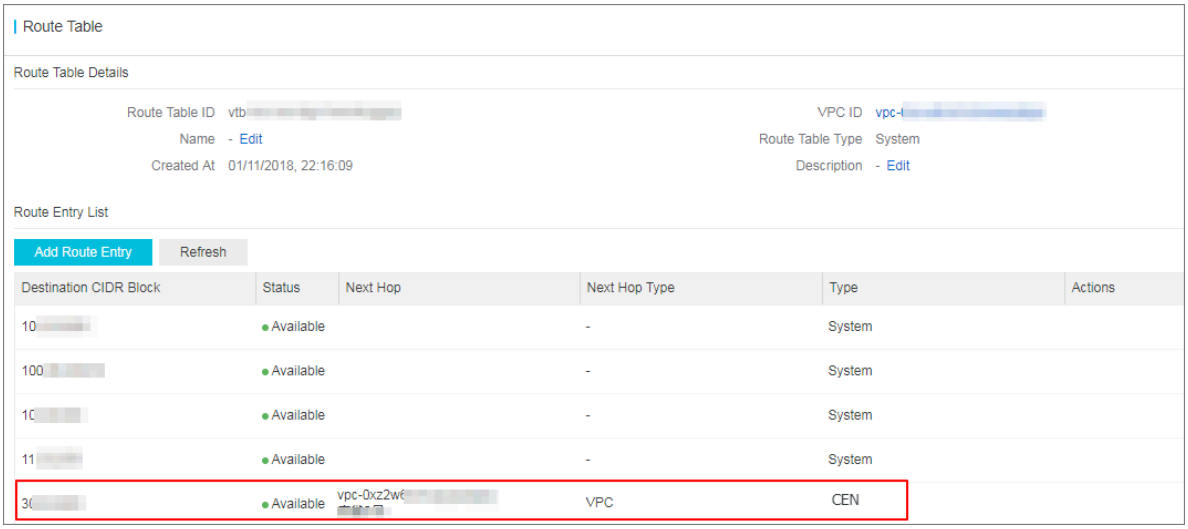
Field	Description
Region	The region of the routes to query.
CIDR Block	The learned CIDR block.
Destination Region	The region of the learned CIDR block.
Destination Network ID	The network to which the destination CIDR block belongs.



View learned CEN routes in a VPC

To view the learned routes and conflict routes in a VPC, complete these steps:

1. Log on to the *VPC console*.
2. In the left-side navigation pane, click Route Tables.
3. Click the ID of the target route table, then you can view CEN route entries in the Route Entry List.
4. Click the icon next to the next hop of the CEN route entry to view the detailed information.



View learned CEN routes in a VBR

To view the learned routes and conflict routes in a VBR, complete these steps:

1. Log on to the *Express Connect*.
2. In the left-side navigation pane, click Physical Connection > Virtual Border Router.
3. Click the ID of the target VBR, then you can view CEN route entries in the Route Entry List.

7.2 Manage network routes

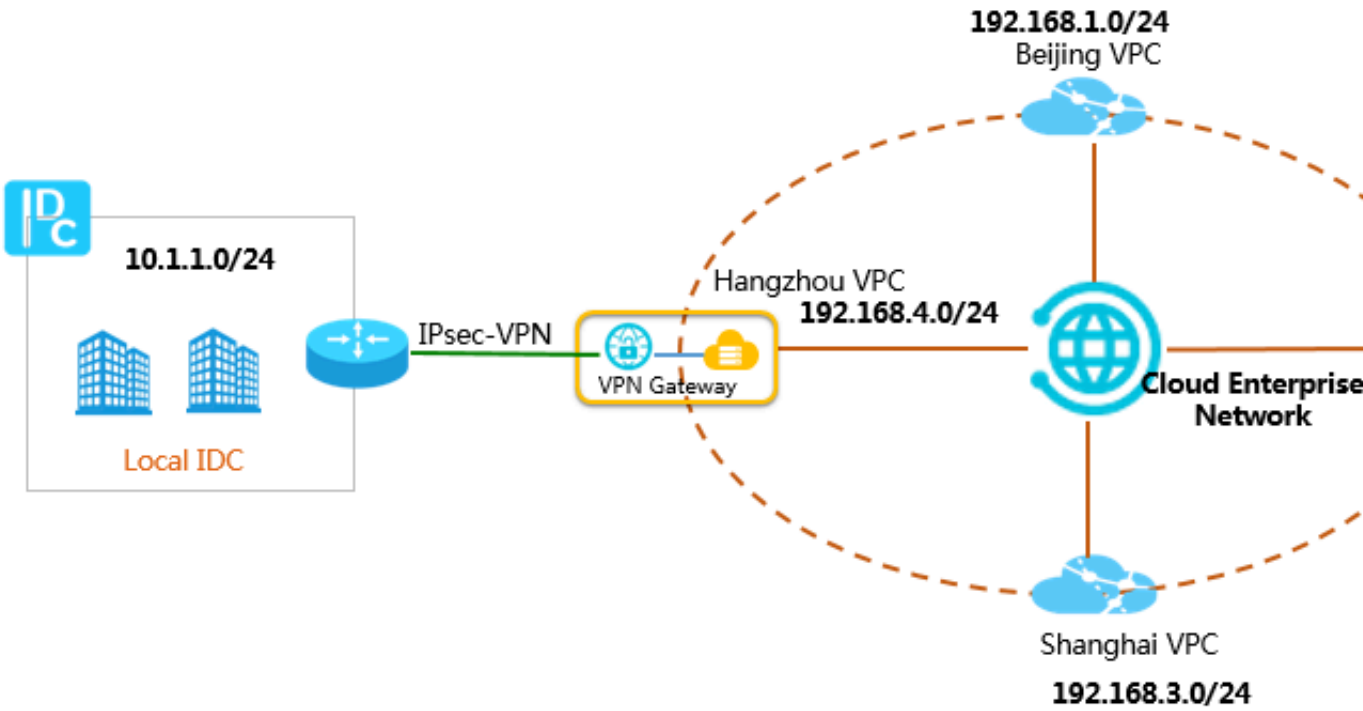
Cloud Enterprise Network (CEN) supports publishing and withdrawing route entries of attached networks. You can publish a route entry of an attached VPC or VBR to a CEN instance, then other attached networks can learn the route if there is no route conflict. You can withdraw a published route entry when CEN does not need it any more.

Note:
Currently, the console only supports publishing and withdrawing VPC routes and does not support publishing or withdrawing VBR routes. You can publish or withdraw VBR route entries by calling the *PublishRouteEntries* API.

The following table lists the route entries that can be published to CEN. You can withdraw a route entry that has been published to CEN. Once withdrawn, the route entry does not exist in the CEN instance anymore. If you have published a custom route entry to a CEN instance and then delete it from the VPC route table, the route entry is also deleted from the CEN instance.

Route entries	Network	Publish to CEN by default
A route entry pointing to an ECS instance	VPC	No
A route entry pointing to a VPN Gateway	VPC	No
A route entry pointing to a HaVip	VPC	No
A VPC system route entry	VPC	Yes
A route entry pointing to a local data center	VBR	Yes
A BGP route entry	VBR	Yes

As shown in the following figure, four VPCs are attached to the CEN instance. The VPC in the Hangzhou region is configured with a VPN Gateway to connect to the local data center. After you publish the router entry pointing to the VPN Gateway in the VPC to the CEN instance, the other three VPCs learn the route and can also communicate with the local data center.

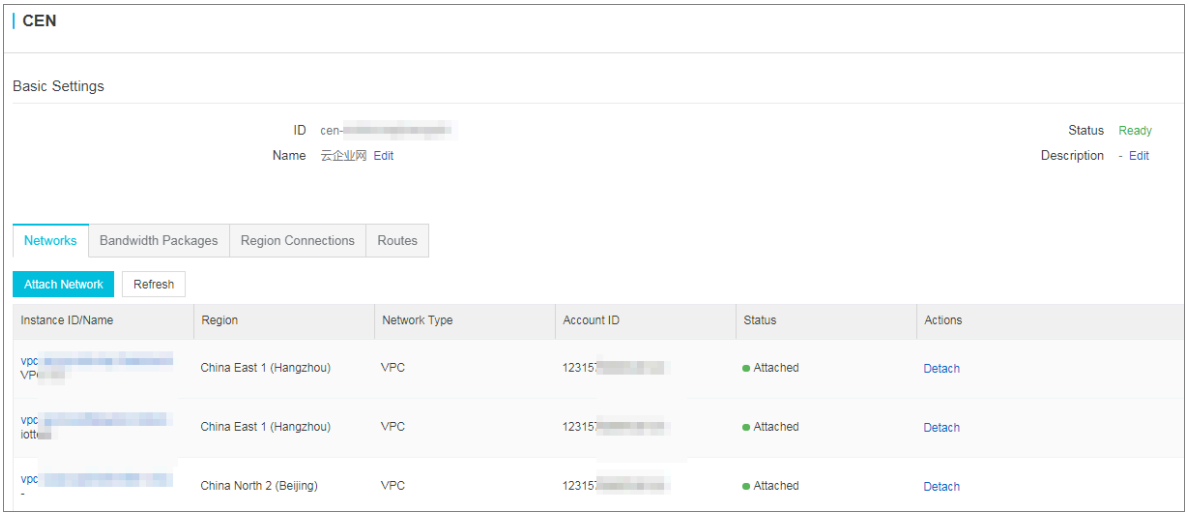


Publish a route entry to CEN

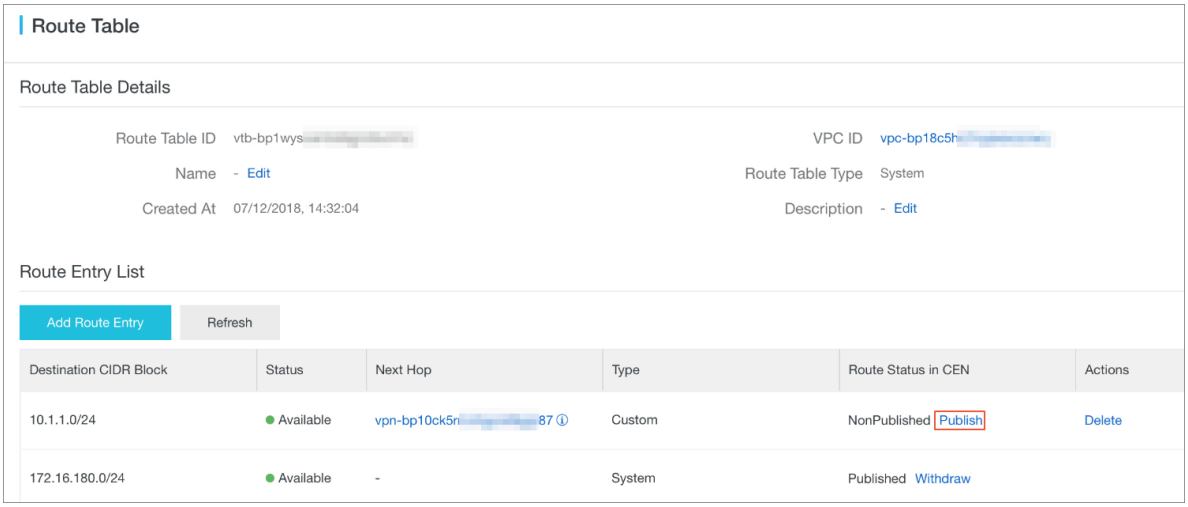
To publish a route entry in a VPC to CEN, complete these steps:

Note:
Make sure that the VPC is attached to the CEN.

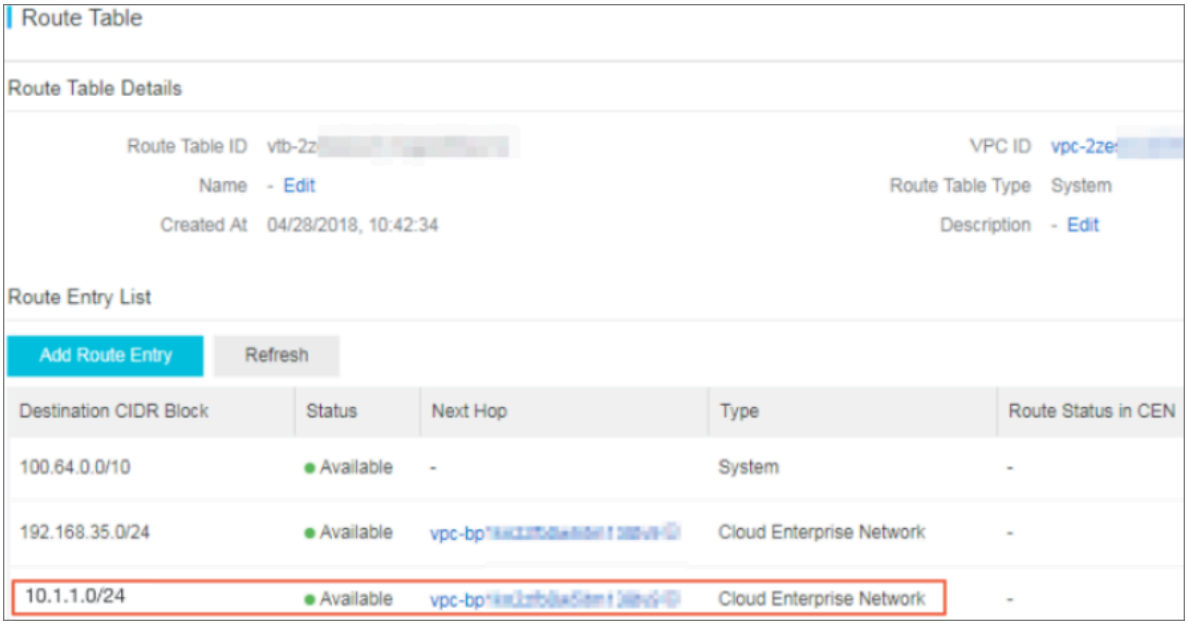
1. Log on to the *CEN console*.
2. On the Instances page, click the ID of the target CEN instance.
3. On the Networks page, click the ID of the target VPC.



4. On the VPC Details page, click the link to the route table.
5. On the Route Tables page, click the ID of the route table.
6. Find the target route entry and click Publish.



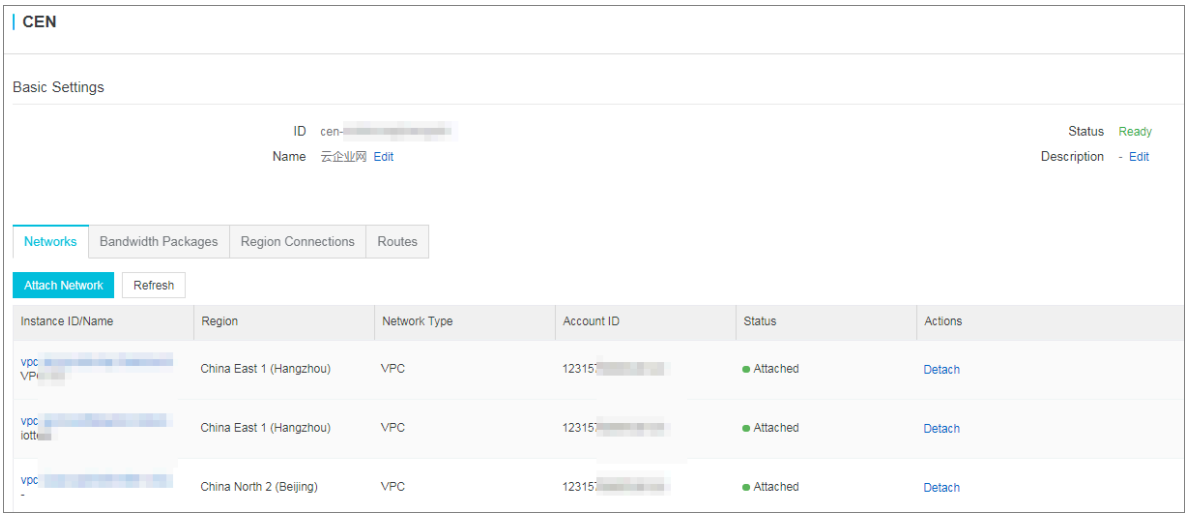
After the route entry is successfully published, you can view the learned routes in other networks.



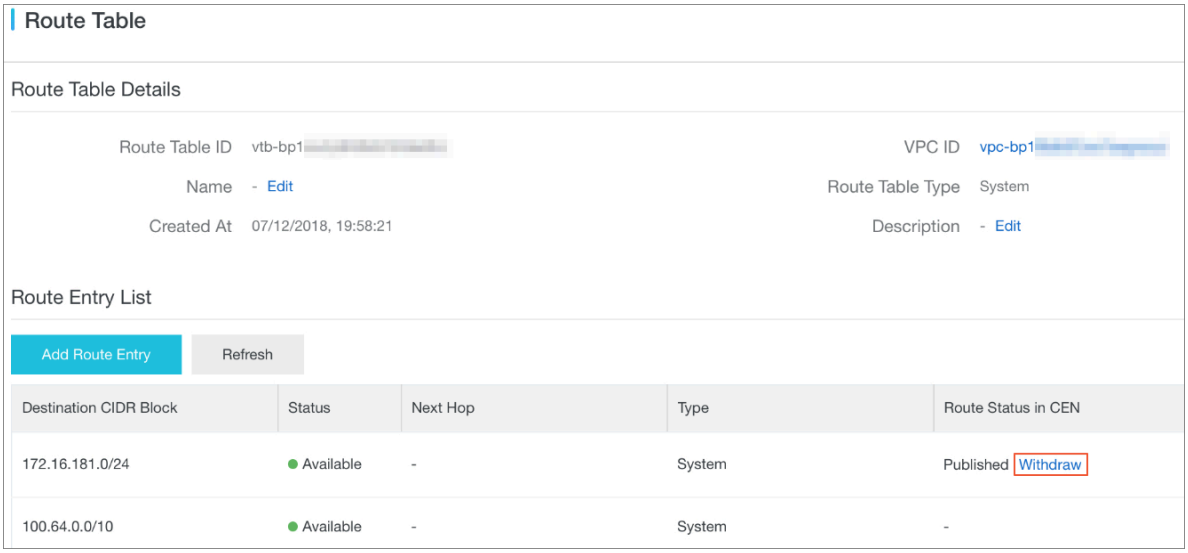
Withdraw a route entry from CEN

To withdraw a route entry published to CEN, complete these steps:

1. Log on to the *CEN console*.
2. On the Instances page, click the ID of the target CEN instance.
3. On the Networks page, click the ID of the target VPC.



4. On the VPC Details page, click the link to the route table.
5. On the Route Tables page, click the ID of the route table.
6. Find the target route entry and click Withdraw. In the displayed dialog box, click OK.



7.3 Enable overlapping routing

Cloud Enterprise Network (CEN) automatically learns routes from attached networks. If two routes overlap, the conflicted routes will be denied. With overlapping routing enabled, CEN can learn overlapping routes that have same prefix but different netmasks.

Enable overlapping routing

For example, VPC-A is already attached to a CEN instance. A custom route entry with the destination CIDR block of 192.168.1.0/24 and next hop of an ECS instance is added to the VPC-A. By default, all learned the routes of IP address 192.168.1.0/x (1<=x<=32) published by other networks will be denied by CEN.

Similarly, if VPC-A has a route entry destined to 192.168.1.0/24 that is learned from CEN, you are not allowed to add a custom rout entry with the destination CIDR block 192.168.1.0/x (1<=x<=32), and all the routes with the destination CIDR block 192.168.1.0/x (1<=x<=32) will be denied by VPC-A.

After overlapping routing is enabled

With overlapping routing enabled, CEN can learn overlapping routes that have same prefix but different netmasks.

For example, VPC-A is already attached to a CEN instance. A custom route entry with the destination CIDR block of 192.168.1.0/24 and next hop of an ECS instance is added to the VPC-A. After overlapping routing is enabled, VPC-A can learn the route entry

with the destination CIDR block 192.168.0.0/16 published by other networks in the CEN instance.

At the same time, the route entry with the CIDR block 168.1.0/24 and 192.168.0.0/16 can also be learned by CEN. CEN uses the longest prefix match algorithm to route traffic.

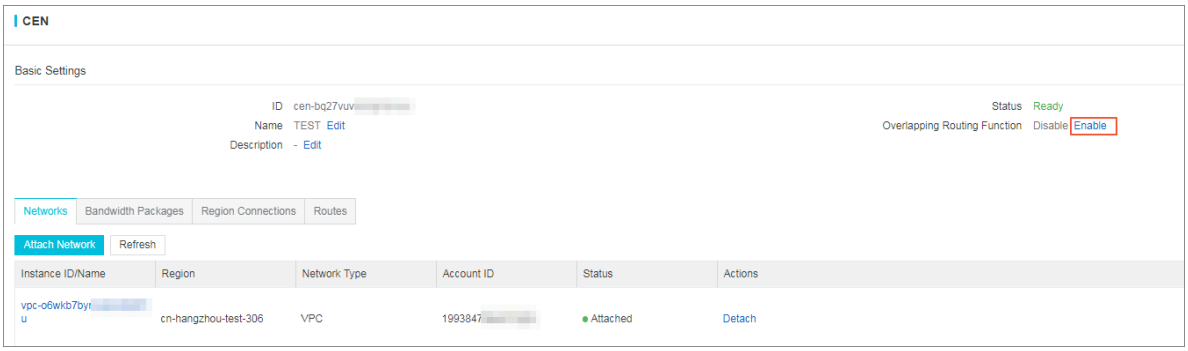
Exception

After this function is enabled, VPC will not accept routes that are subsets of a VSwitch . For example, the CIDR block of a VSwitch is 10.0.0.0/16, then the VPC that the VSwitch is located will not accept the route with the CIDR block 10.0.0.0/24 but will accept the route with the CIDR block 10.0.0.0/8.

Procedure

To enable the overlapping routing function, complete these steps:

1. Log on to the *CEN console*.
2. Click the ID of the target CEN instance.
3. In the Basic Settings area, click Enable next to the Overlapping Routing Function option.



Notice:

Once the overlapping routing function is enabled, it cannot be disabled.