Alibaba Cloud vpn gateway

User Guide

Issue: 20190711

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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 What is VPN Gateway?

VPN Gateway is an Internet-based service that securely and reliably connects enterprise data centers, office networks, and Internet terminals to Alibaba Cloud VPCs through encrypted channels. VPN Gateway supports both IPsec-VPN connection and SSL-VPN connection.

IPsec-VPN

The route-based IPsec-VPN not only facilitates the configuration and maintenance of VPN policies, but also provides flexible traffic routing methods.

You can use IPsec-VPN to connect a VPC to an on-premises data center or connect two VPCs. IPsec-VPN supports IKEv1 and IKEv2 protocols. Devices that support these two protocols can connect to Alibaba Cloud VPN Gateway, including devices of Huawei, H3C, Hillstone, SANGFOR, Cisco ASA, Juniper, SonicWall, Nokia, IBM, Ixia, and more.

IPsec-VPN can meet the demands of different scenarios. For more information, see IPsec-VPN scenarios.

SSL-VPN

You can create an SSL-VPN connection to connect a remote client to applications and services deployed in a VPC. When the deployment is complete, you can achieve remote access just by loading the certificate in the client and initiating the connection .

SSL-VPN can meet the demands of different scenarios. For more information, see SSL-VPN scenarios.

2 Manage a VPN Gateway

2.1 Create a VPN Gateway

To enable the IPsec-VPN or SSL-VPN function, you must create a VPN Gateway. After a VPN Gateway is created, a public IP address is allocated to it.

Procedure

1. Log on to the VPC console.
2. In the left-side navigation pane, choose VPN > VPN Gateways.
3. On the VPN Gateways page, click Create VPN Gateway.
4. On the purchase page, configure the VPN Gateway according to the following information, and then click Buy Now.

Configuration	Description
Name	Optional. The name of the VPN Gateway. The name must be 2 to 128 characters in length and can contain letters, numbers, periods (.), underscores (_) and hyphens (-). The name must start with a letter.
Region	Select the region of the VPN Gateway. If you want to use IPsec-VPN to connect a VPC to an on-premises data center or other VPCs, make sure that the VPN Gateway and the VPC are in the same region.
VPC	Select the VPC associated with the VPN Gateway.
Bandwidth	Select the bandwidth of the VPN Gateway. The bandwidth is the Internet bandwidth of the VPN Gateway.
IPsec-VPN	Select whether to enable the IPsec-VPN function. With IPsec-VPN enabled, you can establish a secure connection between an on-premises data center and a VPC or between two VPCs.

Configuration	Description
SSL-VPN	Select whether to enable the SSL-VPN function. With SSL-VPN enabled, you can create a point-to-site connection. After the connection is created, the client can directly access the VPC from a remote location without the need to configure a client gateway.
SSL connections	Select the maximum number of clients you want to connect to simultaneously. Note: You can only configure this option after you enable the SSL-VPN feature.
Billing Cycle	Select the validity period of purchase.
Auto Renew	Select whether to enable auto renewal: · If VPN Gateway is billed monthly, the auto renewal cycle is one month. · If VPN Gateway is billed yearly, the auto renewal cycle is one year.

2.2 Modify a VPN Gateway

This topic describes how to modify a VPN Gateway. After you create a VPN Gateway, you can modify the name and description of the VPN Gateway.

Prerequisites

A VPN Gateway is created. For more information, see Create a VPN Gateway.

Procedure

1. Log on to the VPC console.
2. In the left-side navigation pane, choose VPN > VPN Gateways.
3. Select the region of the target VPN Gateway.
4. On the VPN Gateways page, find the target VPN Gateway and click the  icon in the Instance ID/Name column to modify the instance name.

   The name must be 2 to 100 characters in length and can contain numbers, underscores (_) or hyphens (-). The name must start with a letter.

5. Click the icon in the Description column to modify the description.

   The description must be 2 to 256 characters in length and cannot start with http:// or https://.

2.3 Configure routes of a VPN Gateway

2.3.1 VPN Gateway route overview

After you create an IPsec-VPN connection, you must manually add a VPN Gateway route.

The route-based IPsec-VPN enables you to easily configure and maintain VPN policies , and provides flexible ways for routing traffic.

You can add the following two types of routes for a VPN Gateway:

- Policy-based routes.
- Destination-based routes.

Policy-based route

If a policy-based route is used, traffic is forwarded based on both the source IP address and the destination IP address.

For more information, see Add policy-based routes.

Note:
Policy-based routes take precedence over destination-based routes.

Destination-based route

If a destination-based route is used, traffic is forwarded based only on the destination IP address.

For more information, see Add Destination-based routes.

2.3.2 Add a policy-based route

After creating an IPsec connection, you can manually add a policy-based route. In this way, traffic is forwarded based on both the source IP address and the destination IP address.

Procedure

1. Log on to the VPC console.

2. In the left-side navigation pane, choose VPN > VPN Gateways.
3. Select the region of the target VPN Gateway.
4. On the VPN Gateways page, find the target VPN Gateway and click the instance ID in the Instance ID/Name column.
5. On the Policy-based Routing page, click Add Route Entry.
6. On the Add Route Entry page, configure a policy-based route according to the following information and click OK.

Configuration	Description
Destination CIDR Block	Enter the private CIDR block of the on-premises data center.
Source CIDR Block	The private CIDR block of the VPC.
Next Hop Type	Select IPsec-VPN connection.
Next Hop	Select the target IPsec connection instance.
Publish to VPC	Select whether to publish the new route entry to the VPC route table. · (Recommended) Yes: Publish the new route entry to the VPC route table. · No: Do not publish the new route entry to the VPC route table. Note: If you select No, after you add a policy-based route, you also need to publish the route in the policy-based route table.
Weight	Select a weight. Valid values: · 100 · 0 The larger the weight, the higher the routing priority.

2.3.3 Add a destination-based route

This topic describes how to add a destination-based route. After you add a destination-based route, you can forward traffic by using the specified destination IP address.

Procedure

1. Log on to the VPC console.

2. In the left-side navigation pane, choose VPN > VPN Gateways.
3. Select the region of the target VPN Gateway.
4. On the VPN Gateways page, find the target VPN Gateway and click the instance ID in the Instance ID/Name column.
5. On the Destination-based Routing tab, click Add Route Entry.
6. On the Add Route Entry page, configure a destination-based route, and then click OK. The following table describes the parameters.

Configuration	Description
Destination CIDR Block	Enter the private CIDR block to be accessed.
Next Hop Type	Select IPsec Connection.
Next Hop	Select the target IPsec-VPN connection instance.
Publish to VPC	Select whether to publish the new route entry to the VPC route table. · Yes (Recommended): Publish the new route entry to the VPC route table. · No: Do not publish the new route entry to the VPC route table. Note: If you select No, you must also publish the route entry in the destination-based route table after you add the destination-based route.
Weight	Select a weight. Valid values: · 100: high priority · 0: low priority Note: Destination-based routes with the same destination CIDR block cannot be configured with a weight of 100 at the same time.

2.4 Enable IPsec-VPN and SSL-VPN

This topic describes how to enable the SSL-VPN and IPsec-VPN functions. You can enable SSL-VPN and IPsec-VPN when you create a VPN Gateway or after you create it.

> Note:
> If you want to enable SSL-VPN for a VPN Gateway created before January 20, 2018, you need to open a ticket. For a VPN Gateway created after January 20, 2018, you can enable the SSL-VPN function in the console directly.

Enable IPsec-VPN

To enable IPsec-VPN, follow these steps:

1. Log on to the VPC console.
2. In the left-side navigation pane, choose VPN > VPN Gateways.
3. Select the region of the target VPN Gateway.
4. On the VPN Gateways page, find the target VPN Gateway and click Enable IPsec after IPsec in the Gateway Status column.
5. On the purchase page, complete the payment.

Enable SSL-VPN

To enable SSL-VPN, follow these steps:

1. Log on to the VPC console.
2. In the left-side navigation pane, choose VPN > VPN Gateways.
3. Select the region of the target VPN Gateway.
4. On the VPN Gateways page, find the target VPN Gateway and click Enable SSL after SSL in the Gateway Status column.
5. On the purchase page, complete the payment.

3 Manage a customer gateway

3.1 Create a customer gateway

When you use an IPsec-VPN connection to connect a VPC to an on-premises data center or connect two VPCs, you must create a customer gateway. By creating a customer gateway, you can register the local gateway to Alibaba Cloud and connect the customer gateway to the VPN Gateway. A customer gateway can be connected to multiple VPN Gateways.

Procedure

1. Log on to the VPC console.
2. In the left-side navigation pane, click VPN > Customer Gateways.
3. Select the region to which the target customer gateway belongs.

   Note:
   The customer gateway and the VPN Gateway you are connecting must be in the same region.
4. On the Customer Gateways page, click Create Customer Gateway.
5. On the Create Customer Gateway page, configure the customer gateway according to the following information.

Configuration	Description
Name	The name of the customer gateway. The name must be 2 to 128 letters in length and can contain numbers, hyphens, or underscores. It must start with a letter .
IP Address	The static public IP address configured for the gateway device of the on-premises data center.
Description	The description of the customer gateway. The description must be 2 to 256 characters in length. It cannot begin with http:// or https://.

6. Optional. Click +Add to add another customer gateway.
7. Click OK.

3.2 Modify a customer gateway

This topic describes how to modify a customer gateway. After creating a customer gateway, you can modify the name and the description of the customer gateway.

Prerequisites

A customer gateway is created. For more information, see Create a customer gateway.

Procedure

1. Log on to the VPC console.
2. In the left-side navigation pane, click VPN > Customer Gateways.
3. Select the region to which the target customer gateway belongs.
4. On the Customer Gateways page, find the target customer gateway and click the  icon in the Instance ID/Name column to modify the name of the customer gateway.

   The name must be 2 to 100 characters in length and can contain numbers, underscores (_) or hyphens (-). The name must start with a letter.
5. Click the  icon in the Description column to modify the description of the customer gateway.

   The description must be 2 to 256 characters in length and cannot start with http:// or https://.

3.3 Delete a customer gateway

This topic describes how to delete a customer gateway.

Procedure

1. Log on to the VPC console.
2. In the left-side navigation pane, click VPN > Customer Gateways.
3. Select the region to which the target customer gateway belongs.
4. On the Customer Gateways page, find the target customer gateway, and click Delete in the Actions column.
5. In the displayed dialog box, click OK.

4 Configure SSL-VPN

4.1 Configuration overview

This topic describes how to use the SSL-VPN function to connect a remote client to a VPC.

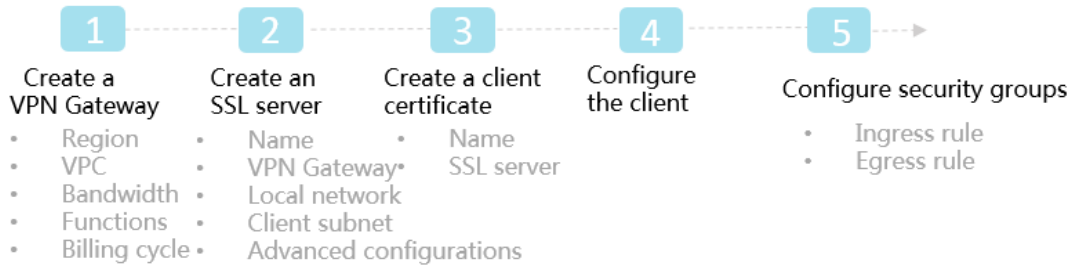
Prerequisites

The following conditions must be met before you deploy a VPN Gateway:

- The client and the VPC are not using the same private CIDR block.
- The client is able to access the Internet.

Procedure

The following figure illustrates the work flow of how to connect a client to a VPC by using the SSL-VPN function.



1. Create a VPN Gateway

   Create a VPN Gateway and enable the SSL-VPN function.

2. Create an SSL server

   Specify the IP address range of the SSL server and the IP address range used by the client.

3. Create a client certificate

   Create the client certificate according to server configurations, and then download the client certificate and configurations.

4. Configure the client

   Download and install client VPN software in the client, load the client certificate and configurations, and initiate the connection.

5. Configure security groups

   Make sure that the security group rules of ECS instances in the VPC allow remote access.

4.2 Manage an SSL server

4.2.1 Create an SSL server

This topic describes how to create an SSL server. To use the SSL-VPN function to establish a point-to-site connection, you must first create an SSL server.

Prerequisites

A VPN Gateway is created and the SSL-VPN function is enabled on it. For more information, see Create a VPN Gateway.

Procedure

1. Log on to the VPC console.
2. In the left-side navigation pane, click VPN > SSL Servers.
3. Select the target region.
4. On the SSL Servers page, click Create SSL Server.
5. On the Create SSL Server page, configure the SSL server according to the following information and click OK.

Configuration	Description
Name	The name of the SSL server. The name must be 2 to 128 characters in length and can contain letters, numbers, hyphens (-), and underscores (_). The name must start with a letter.
VPN Gateway	The associated VPN Gateway. Make sure that you have enabled the SSL-VPN function.

Configuration	Description
Local Network	The IP address range to be accessed by the client through SSL-VPN. It can be the IP address range of a VPC, a VSwitch, an on-premises data center connected to a VPC through a leased line, or a cloud service such as RDS or OSS. Click Add Local Network to add more local networks. Note: The subnet mask of the local network must be in the range of /16 to /29.
Client Subnet	The IP address range from which an IP address will be allocated to the virtual network card of the client. It is not the existing intranet IP address range of the client. When the client accesses the local end, the client uses the IP address allocated from the client subnet by the VPN Gateway to access the local network. Note: The client subnet and the local network cannot conflict with each other.
Advanced Configuration	
Protocol	The protocol used by the SSL connection. Valid values: UDP | TCP. We recommend that you use the UDP protocol.
Port	The port used by the SSL connection. Default value: 1194.
Encryption Algorithm	The encryption algorithm used by the SSL connection. Valid values: AES-128-CBC | AES-192-CBC | AES-256-CB
Enable Compression	Indicates whether to enable compression.

4.2.2 Modify an SSL server

This topic describes how to modify an SSL server. After an SSL server is created, you can modify the name, local network, client subnet, and advanced configuration of the SSL server.

Prerequisites

An SSL server is created. For more information, see Create an SSL server.

Procedure

1. Log on to the VPC console.

2. In the left-side navigation pane, click VPN > SSL Servers.
3. Select the target region.
4. On the SSL Servers page, find the target SSL server, and click Edit in the Actions column.
5. On the Edit SSL Server page, modify the name, local network, client subnet, and advanced configuration of the SSL server, and click OK.

4.2.3 Delete an SSL server

This topic describes how to delete an SSL server.

Procedure

1. Log on to the VPC console.
2. In the left-side navigation pane, click VPN > SSL Servers.
3. Select the target region.
4. On the SSL Servers page, find the target SSL server and click Delete in the Actions column.
5. In the displayed dialog box, click OK.

4.3 Manage an SSL client certificate

4.3.1 Create an SSL client certificate

This topic describes how to create an SSL client certificate. After creating an SSL server, you need to create an SSL client certificate.

Prerequisites

An SSL server is created. For more information, see Create an SSL server.

Context

Each user can retain up to 50 SSL client certificates. To increase the quota, open a ticket.

Procedure

1. Log on to the VPC console.
2. In the left-side navigation pane, click VPN > SSL Clients.
3. Select the target region.
4. On the SSL Clients page, click Create Client Certificate.

5. On the Create Client Certificate page, configure the client certificate according to the following information, and click OK.

Configuration	Description
Name	The name of the SSL client certificate. The name must be 2 to 128 characters in length and can contain numbers, hyphens, and underscores. It must start with a letter.
SSL Server	The associated SSL server.

4.3.2 Download an SSL client certificate

This topic describes how to download an SSL client certificate. To use the SSL-VPN function, you need to load an SSL client certificate to your client. After creating an SSL client certificate, you can download the certificate.

Prerequisites

An SSL client certificate is created. For more information, see Create an SSL client certificate.

Procedure

1. Log on to the VPC console.
2. In the left-side navigation pane, click VPN > SSL Clients.
3. Select the target region.
4. On the SSL Clients page, find the target client certificate and click Download in the Actions column.

4.3.3 Delete an SSL client certificate

This topic describes how to delete an SSL client certificate.

Procedure

1. Log on to the VPC console.
2. In the left-side navigation pane, click VPN > SSL Clients.
3. Select the target region.
4. On the SSL Clients page, find the target SSL client certificate, and click Delete in the Actions column.
5. In the displayed dialog box, click OK.

4.4 Modify the number of concurrent SSL connections

You can modify the number of clients simultaneously connected to a VPN Gateway according to your business needs.

Procedure

1. Log on to the VPC console.
2. In the left-side navigation pane, choose VPN > VPN Gateways.
3. Select the region of the target VPN Gateway.
4. On the VPN Gateways page, find the target VPN Gateway.
   - To increase the number of concurrent SSL connections, click Upgrade in the Concurrent SSL Connections column.
   - To reduce the number of concurrent SSL connections, click Downgrade in the Concurrent SSL Connections column.
5. On the Configuration Upgrade area, select a new number of SSL connections and complete the payment.

5 Configure IPsec-VPN connections

5.1 Configuration overview

This topic describes how to connect a VPC to an on-premises data center through IPsec-VPN.

Prerequisites

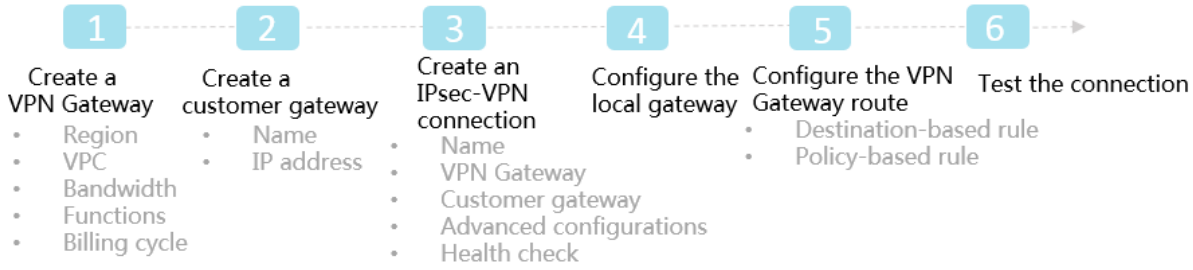
Before creating a site-to-site VPN connection, make sure the following conditions are met:

- The protocols IKEv1 and IKEv2 are supported by the gateway device of the on-premises data center.

  IPsec-VPN supports IKEv1 and IKEv2 protocols. Devices that support these two protocols can connect to Alibaba Cloud VPN Gateway, including devices of Huawei , H3C, Hillstone, SANGFOR, Cisco ASA, Juniper, SonicWall, Nokia, IBM, and Ixia.
- A static public IP address is configured for the local gateway.
- The IP address ranges of the VPC and on-premises data center to be connected do not conflict with each other.

Procedure

The following figure shows the procedure of connecting a VPC to an on-premises data center through IPsec-VPN.



1. Create a VPN Gateway

   Enable the IPsec-VPN function. Up to 10 IPsec-VPN connections can be established in a VPN Gateway.

2. Create a customer gateway

   By creating a customer gateway, you can register the local gateway to Alibaba Cloud and connect the customer gateway to the VPN Gateway. A customer gateway can be connected to multiple VPN Gateways.

3. Create an IPsec connection

   An IPsec connection is a VPN channel established between a VPN Gateway and a customer gateway. The encrypted communication between the VPN Gateway and the on-premises data center can be achieved only after the IPsec connection is established.

4. Configure the local gateway

   You need to load the VPN Gateway configurations to the local gateway device. For more information, see Local CPE configurations.

5. Configure the VPN Gateway route

   You need to configure a route in the VPN Gateway and publish it to the VPC route table. For more information, see VPN Gateway route overview.

6. Test the connection

   Log on to an ECS instance (without a public IP address) in the connected VPC. `ping` the private IP address of a server in the on-premises data center to check whether the connection is established.

For more information, see Establish a connection between a VPC and an on-premises data center.

5.2 Manage an IPsec-VPN connection

5.2.1 Create an IPsec-VPN connection

This topic describes how to create an IPsec-VPN connection. After you create a VPN Gateway and a customer gateway, you can create an IPsec-VPN connection to establish an encrypted communication tunnel.

Procedure

1. Log on to the VPC console.
2. In the left-side navigation pane, choose VPN > IPsec Connections.
3. Select a region.

4. On the IPsec Connections page, click Create IPsec Connection.
5. On the Create IPsec Connection page, configure the IPsec-VPN connection according to the following information and click OK.

Configuration	Description
Name	Enter the name of the IPsec-VPN connection. The name must be 2 to 128 characters in length and can contain letters, numbers, hyphens, or underscores. It must start with a letter.
VPN Gateway	Select the VPN Gateway to connect.
Customer Gateway	Select the customer gateway to connect.
Local Network	Enter the CIDR block of the VPC to be connected with the on-premises data center. This parameter is used for phase two negotiation.
+ Add Local Network	Add multiple CIDR blocks of the VPC to be connected with the on-premises data center. Note: If multiple CIDR blocks are entered, the IKEv2 version must be selected.
Remote Network	Enter the CIDR block of the on-premises data center to be connected with the VPC. This parameter is used for phase two negotiation.
+ Add Remote Network	Add multiple CIDR blocks of the on-premises data center to be connected with the VPC. Note: If multiple CIDR blocks are entered, the IKEv2 version must be selected.
Effective Immediately	Indicates whether the IPsec-VPN connection takes effect immediately. · Yes: Start the negotiation immediately once the configuration is complete. · No: Start the negotiation only when traffic is detected in the tunnel.
Advanced Configuration: IKE Configurations	

Configuration	Description
Pre-Shared Key	Enter the pre-shared key used for the authentication between the VPN Gateway and the customer gateway. By default, it is an automatically generated value. But you can also specify a pre-shared key.
Version	Select the IKE version to use. Compared with IKEv1, IKEv2 simplifies the SA negotiation process and provides better support for multiple-CIDR-block scenarios. We recommend that you select the IKE V2 protocol.
Negotiation Mode	Select the negotiation mode of the IKEv1. · Main mode: The negotiation process features high security. · Aggressive mode: The negotiation is fast and the success rate of negotiation is high. After the negotiation succeeds, the information transmission security is the same for the two modes.
Encryption Algorithm	Select an encryption algorithm used by phase one negotiatio n. Valid values: aes, aes192, aes256, des, 3des.
Encryption Algorithm	Select an authentication algorithm used by phase one negotiation. Valid values: sha1, md5, sha256, sha384, sha512.
DH Group	Select a Diffie-Hellman key exchange algorithm used by phase one negotiation.
SA Life Cycle (seconds)	Set the SA lifecycle for phase one negotiation. The default value is 86,400 seconds.
LocalId	It is the identification of the VPN Gateway used for phase one negotiation. The default value is the public IP address of the VPN Gateway. If you set the LocalId in the FQDN format, we recommend that you change the negotiation mode to the aggressive mode.
RemoteId	It is the identification of the customer gateway used for the first-stage negotiation. The default value is the public IP address of the customer gateway. If you set the RemoteId in the FQDN format, we recommend that you change the negotiation mode to the aggressive mode.
Advanced Configuration: IPSec Configurations	
Encryption Algorithm	Select the encryption algorithm of phase two negotiation. Valid values: aes, aes192, aes256, des, 3des.

Configuration	Description
Authentication Algorithm	Select an authentication algorithm used by phase two negotiation. Valid values: sha1, md5, sha256, sha384, sha512.
DH Group	Select a Diffie-Hellman key exchange algorithm used by phase two negotiation. · If you select any group that are not disabled, the PFS feature is enabled by default (perfect forward secrecy), so the key must be updated for each renegotiation and PFS must be enabled on the client. · For clients that do not support PFS, select Disabled.
SA Life Cycle (seconds)	Set the SA lifecycle for phase two negotiation. Default value: 86,400s.
Health Check	
Destination IP	The IP address of the on-premises data center that the VPC can communicate with through the IPsec-VPN connection.
Source IP	The IP address of the VPC that the on-premises data center can communicate with through the IPsec-VPN connection.
Retry Interval	The length of time before a health check is retried. Unit: second.
Retry Times	The number of times to attempt sending health check packets.

5.2.2 Modify an IPsec-VPN connection

This topic describes how to modify an IPsec-VPN connection. After creating an IPsec-VPN connection, you can modify its name, advanced configuration, and health check.

Prerequisites

An IPsec-VPN connection is created. For more information, see Create an IPsec-VPN connection.

Procedure

1. Log on to the VPC console.
2. In the left-side navigation pane, choose VPN > IPsec Connections.
3. Select a region.
4. On the IPsec Connections page, find the target connection and click Edit in the Actions column.

5. On the Modify IPsec Connections page, modify the name, advanced configuration, and health check of the IPsec-VPN connection, and then click OK.

5.2.3 Download the configuration of an IPsec-VPN connection

After the IPsec connection is configured and the negotiation succeeds, you can download the IPsec connection configuration and configure the local gateway.

Prerequisites

Make sure an IPsec-VPN connection is created. For more information, see Create an IPsec-VPN connection.

Procedure

1. Log on to the VPC console.
2. In the left-side navigation pane, choose VPN > IPsec Connections.
3. Select a region.
4. On the IPsec Connections page, find the target IPsec-VPN connection, and click Download Configuration in the Actions column.

> Note:
> The RemoteSubnet and LocalSubnet in the downloaded configuration are opposite to the local network and the remote network when you create an IPsec-VPN connection. From the perspective of VPN Gateway, the remote network is the on-premises data center and the local network is the VPC, whereas from the perspective of the on-premises data center, the remote network is the VPC and the local network is the on-premises data center.

5.2.4 View IPsec-VPN connection logs

This topic describes how to view the historical logs of an IPsec-VPN connection of up to the previous month. You can also analyze these logs to troubleshoot IPsec-VPN connection errors. The time range for log query is 10 minutes.

Procedure

1. Log on to the VPC console.
2. In the left-side navigation pane, choose VPN > IPsec Connections.
3. Select a region.
4. On the IPsec Connections page, find the target IPsec-VPN connection, and click View Logs in the Actions column.

5. On the IPsec Connection Logs page, set the time range and view the corresponding logs.

5.2.5 Delete an IPsec-VPN connection

This topic describes how to delete an IPsec-VPN connection.

Procedure

1. Log on to the VPC console.
2. In the left-side navigation pane, choose VPN > IPsec Connections.
3. Select a region.
4. On the IPsec Connections page, find the target IPsec-VPN connection, and click Delete in the Actions column.
5. In the displayed dialog box, click OK.

5.3 Configure local gateways

5.3.1 Configure an IPsec-VPN connection through a USG series Next-Generation Firewall device (Huawei)

This topic describes how to configure an IPsec-VPN connection through a USG series Next-Generation Firewall device from Huawei (known as USG series Huawei device) to connect an on-premises data center. When you use IPsec-VPN to establish a site-to-site connection, you need to configure your local gateway devices after configuring Alibaba Cloud VPN Gateway.

Alibaba Cloud VPN Gateway supports the standard IKEv1 and IKEv2 protocols. Therefore, all devices that support these two protocols can connect to Alibaba Cloud VPN Gateway (such as devices from Huawei, H3C, Hillstone, Sangfor, Cisco ASA, Juniper, SonicWall, Nokia, IBM, and Ixia).

The following sections take a USG series device from Huawei as an example to describe the network scenario and the following table describes the corresponding network configurations.

Network configuration		Example value
VPC	CIDR block of the VSwitch	192.168.10.0/24, 192.168.11.0/24
	Public IP address of the VPN Gateway	47.xx.xx.10

Network configuration		Example value
On-premises data center	CIDR block of the intranet	10.10.10.0/24
	Public IP address of the firewall	124.xx.xx.215/26
	Upstream Internet interface	10GE1/0/0
	Downstream intranet interface	10GE1/0/1

Note:
If the on-premises data center is associated with multiple CIDR blocks that need to connect with a VPC, we recommend that you create an equivalent number of IPsec-VPN connections on Alibaba Cloud so that each CIDR block of the on-premises data center is connected with a VPC CIDR block.

Configure an IKEv1 VPN

Prerequisites

- An IPsec-VPN connection is created in an Alibaba Cloud VPC. For more information, see #unique_44.
- The configuration of the IPsec-VPN connection is downloaded. The configurations in the following table are used in this example.

Protocol	Configuration	Example value
IKE	Authentication Algorithm	SHA-1
	Encryption Algorithm	AES-128
	DH Group	group 2
	IKE Version	IKE v1
	SA Life Cycle	86400
	Negotiation Mode	main
	PSK	123456
IPsec	Authentication Algorithm	SHA-1
	Encryption Algorithm	AES-128
	DH Group	group 2
	IKE Version	IKE v1

Protocol	Configuration	Example value
	SA Life Cycle	86400
	Negotiation Mode	esp

Procedure

To load customer gateway configurations to the USG series Huawei device, follow these steps:

1. Go to the Huawei firewall management page. Choose Network > Interface > Interface List. Add the upstream Internet interface 10GE1/0/0 to the untrust security zone and set the public IP address; add the downstream intranet interface 10GE1/0/1 to the trust security zone, and then set the private IP address.
2. Choose Policy > Security Policy > Add to create a security policy.
3. Choose Network > IPsec > IPsec Policy List > Add. Configure the peer site according to the following information:
   - Local Interface: Select the upstream Internet interface. In this example, select 10GE1/0/0.
   - Peer Address: Enter the public IP address of the VPN Gateway. In this example, enter 47.xx.xx. 10.
   - Pre-Shared Key: The pre-shared key is the same as the PSK at the Alibaba Cloud side. In this example, enter 123456.
4. On the Data Flow to Be Encrypted page, click Add. Add the data flow to be encrypted for all VSwitch CIDR blocks in the VPC according to the following information:
   - Source Address/Address-Set: Enter the private IP address segment of the on-premises data center. In this example, enter 10.10.10.0/24.
   - Destination Address/Address-Set: Enter the VSwitch IP address segment of the VPC. In this example, enter 192.168.10.0/24 and 192.168.11.0/24.
5. On the IKE/IPSec Protocol page, click Advanced. Configure IKE protocol parameters based on the IPsec-VPN connection configurations that you downloaded.
6. On the IPsec Parameters page, configure the IPSec protocol parameters based on the IPsec connection configurations that you downloaded.

7. Choose Network > Route > Static Route > Static Route List > Add to configure static routes for the firewall. When you add a default route, the next hop is the public IP address of the firewall. When you add a route to the VPC, the next hop is the public IP address of the VPN Gateway.

Configure an IKEv2 VPN

Prerequisites

- An IPsec-VPN connection is created in the Alibaba Cloud VPC.
- The configuration of the IPsec-VPN connection is downloaded. The configurations in the following table are used in this example.

Protocol	Configuration	Example value
IKE	Authentication Algorithm	SHA-1
	Encryption Algorithm	AES-128
	DH Group	group 2
	IKE Version	IKE v2
	SA Life Cycle	86400
	PRF Algorithm	SHA-1
	PSK	123456
IPsec	Authentication Algorithm	SHA-1
	Encryption Algorithm	AES-128
	DH Group	group 2
	IKE Version	Ike v2
	SA Life Cycle	86400
	Negotiation Mode	esp

Procedure

To load customer gateway configurations to USG series Huawei device, follow these steps:

1. Go to the Huawei firewall management page. Choose Network > Interface > Interface List. Add the upstream Internet interface 10GE1/0/0 to the untrust security zone and set the public IP address; add the downstream intranet interface 10GE1/0/1 to the trust security zone, and then set the private IP address.
2. Choose Policy > Security Policy > Add to create a security policy.

3. Choose Network > IPsec > IPsec Policy List > Add. Configure the peer site according to the following information:
   - Local Interface: Select the firewall upstream Internet interface. In this example, select 10GE1/0/0.
   - Peer Address: Enter the public IP address of the Alibaba Cloud VPN Gateway. In this example, enter 47.xx.xx. 10.
   - Pre-Shared Key: The pre-shared key is the same as the PSK at the Alibaba Cloud side. In this example, enter 123456.
4. On the Data Flow to Be Encrypted page, click Add. Add the data flow to be encrypted for all VSwitch CIDR blocks in the VPC according to the following information:
   - Source Address/Address-Set: Enter the private IP address segment of the on-premises data center. In this example, enter 10.10.10.0/24.
   - Destination Address/Address-Set: Enter the VSwitch IP address segment of the VPC. In this example, enter 192.168.10.0/24 and 192.168.11.0/24.
5. On the IKE/IPSec Protocol page, click Advanced. Configure IKE parameters based on the IPsec-VPN connection configurations that you downloaded.
6. On the IPsec Parameters page, configure the IPSec protocol parameters based on the IPsec connection that you downloaded.
7. Choose Network > Route > Static Route > Static Route List > Add to configure static routes for the firewall. Among them, when you add a default route, the next one is the public network IP of the firewall; when adding a route to a VPC, jump to the public IP of the VPN gateway.

5.3.2 Configure H3C firewall

When using IPsec-VPN to create a site-to-site connection, you must configure the local gateway according to the IPsec connection configured for the Alibaba Cloud VPN Gateway. This document takes H3C firewall as an example to show how to configure the VPN settings.

Prerequisites

- Make sure you have configured IPsec connections. For more information, see Establish a connection between a VPC and an on-premises data center.

- After you create an IPsec-VPN connection, download the configurations of the IPsec-VPN connection. For more information, see #unique_44.

  In this tutorial, the configurations of the IPsec-VPN connection are as follows:

  - IPsec-VPN configuration

Configurations		Value
IKE	Authentication Algorithm	sha1
	Encryption Algorithm	aes
	DH Group	group2
	IKE Version	ikev1
	SA Life Cycle (seconds)	86400
	Negotiation Mode	main
	PSK	h3c
IPsec	Authentication Algorithm	sha1
	Encryption Algorithm	aes
	DH Group	group2
	IKE Version	ikev1
	SA Life Cycle (seconds)	86400

  - Network configurations

Configuration		Value
VPC	Private CIDR block	192.168.10.0/24
	Public IP address of VPN Gateway	101.xxx.xxx.127
On-premises data center	Private CIDR block	192.168.66.0/24
	Public IP address of local gateway	122.xxx.xxx.248
	Uplink public port	Reth 1
	Downlink private port	G 2/0/10

Procedure

1. Log on to the firewall Web page and choose Network > VPN > IPsec > Policy.

2. Configure the H3C firewall IPsec policy based on the IPsec configurations of the Alibaba Cloud VPN Gateway. Click Add in the Protected Data Stream list, set the IP address range of the on-premises data center as the source IP address and the IP address range of the VPC as the destination IP address.
3. Choose IKE Proposal > Create.

   Configure the IKE proposal according to the IKE configurations of the Alibaba Cloud VPN Gateway.
4. Choose Network > VPN > IPsec > Policy.
5. Select the new IPsec policy and click Advanced Configuration.

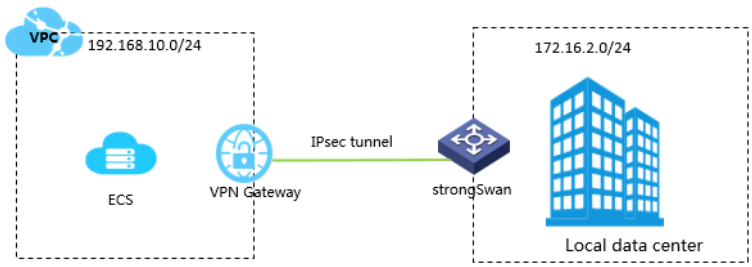
   Configure the IPsec protocol according to the information of the IPsec connection configured for the Alibaba Cloud VPN Gateway.
6. Choose Policy > Security Policy > Create to create the uplink security policy and downlink security policy.
7. Choose Network > Route > Static Route.
8. Add the default route, set the uplink interface as the next hop of the outbound traffic. In this tutorial, no configuration is required.

5.3.3 Configure strongSwan

When using IPsec-VPN to create a site-to-site connection, you must configure the local gateway according to the IPsec connection configured for the Alibaba Cloud VPN gateway. This article takes strongswan as an example to show you how to load a VPN configuration in a local site.

This document takes strongSwan as an example to show how to configure the VPN settings. The configurations used in this tutorial are as follows:

- The IP address range of the Alibaba Cloud VPC is 192.168.10.0/24.
- The IP address range of the local data center is 172.16.2.0/24.
- The public IP of strongSwan is 59.110.165.70.



Prerequisites

- Make sure you have configured IPsec connections. For more information, see Establish a connection between a VPC and an on-premises data center.
- After you create an IPsec connection, download the configurations of the created IPsec connection. For more information, see #unique_44.

Install strongSwan

1. Run the following command to install strongSwan.

```
# yum install strongSwan
```

2. Run the following to view the installed software version.

```
# strongswan version
```

Configure strongSwan

1. Run the following command to open the *ipsec.conf* file.

```
# vi /etc/strongswan/ipsec.conf
```

2. Refer to the following configurations to update the *ipsec.conf* file.

```
# ipsec.conf - strongSwan IPsec configuration file
# basic configuration
config setup
    uniqueids=never
conn %default
    authby=psk
    type=tunnel
conn tomyidc
    keyexchange=ikev1
    left=59.110.165.70
    leftsubnet=172.16.2.0/24
    leftid=59.110.165.70 (Public IP of the local gateway)
    right=119.23.227.125
    rightsubnet=192.168.10.0/24
    rightid=119.23.227.125 (Public IP of the VPN Gateway)
    auto=route
    ike=aes-sha1-modp1024
    ikelifetime=86400s
    esp=aes-sha1-modp1024
    lifetime=86400s
```

```
        type = tunnel
```

3. Configure the *ipsec.secrets* file.

   a. Run the following command to open the configuration file.

   ```
   # vi /etc/strongswan/ipsec.secrets
   ```

   b. Add the following configuration.

   ```
   59.110.165.70 119.23.227.125 : PSK yourpasswo
   rd
   ```

4. Enable system forwarding.

   ```
   # echo 1 > /proc/sys/net/ipv4/ip_forward
   ```

   For more configuration examples for different scenarios, see Configuration examples for different scenarios.

5. Run the following command to start the strongSwan service.

   ```
   # systemctl enable strongswan
   # systemctl start strongswan
   ```

6. Configure two routings in strongSwan. One is used to route the requests destined for the IDC client to strongSwan. The other one is used to route the requests destined for strongSwan to your IDC client.

5.3.4 Configure an IPsec-VPN connection through an SRX series Services Gateway firewall device from Juniper

This topic takes an SRX series Services Gateway firewall device from Juniper as an example to show how to configure the VPN settings to connect an on-premises data center to Alibaba Cloud VPC. When using IPsec-VPN to create a site-to-site connection, you must configure the local gateway according to the IPsec-VPN connection configured for the Alibaba Cloud VPN Gateway.

Prerequisites

- An IPsec-VPN connection is created in an Alibaba Cloud VPC. For more information, see Create an IPsec-VPN connection.

- The configuration of the IPsec-VPN connection is downloaded. For more information, see Download the configuration of an IPsec-VPN connection.

  The IPsec-VPN connection configurations in the following table are used in this example.

  - IPsec protocol

Configuration		Example value
IKE	Authentication Algorithm	md5
	Encryption Algorithm	3des
	DH Group	group2
	IKE Version	IKE v1
	SA Life Cycle	86400
	Negotiation Mode	main
	PSK	123456
IPsec	Authentication Algorithm	md5
	Encryption Algorithm	des
	DH Group	group2
	IKE Version	IKE v1
	SA Life Cycle	28800

  - Network configurations

Network configuration		Example value
VPC	CIDR block of the VSwitch	192.168.1.0/24
	Public IP address of the gateway	47.xxx.xxx.56
On-premises data center	CIDR block of the intranet	192.168.18.0/24
	Public IP address of the gateway	122.xxx.xxx.248

Procedure

To load customer gateway configurations to the Juniper firewall device, follow these steps:

1. Log on to the CLI of the firewall device.
2. Configure the basic network, security zone, and address book.

```
set   security   zones   security - zone   trust   address - book
address   net - cfgr_192 - 168 - 18 - 0 -- 24   192 . 168 . 18 . 0
/ 24
set   security   zones   security - zone   vpn   address - book
address   net - cfgr_192 - 168 - 1 - 0 -- 24   192 . 168 . 1 . 0 /
24
```

3. Configure IKE policies.

```
set   security   ike   policy   ike - policy - cfgr   mode   main
set   security   ike   policy   ike - policy - cfgr   pre - shared
- key   ascii - text  " 123456 "
```

4. Configure the IKE gateway, outbound interface, and protocol version.

```
set   security   ike   gateway   ike - gate - cfgr   ike - policy
ike - policy - cfgr
set   security   ike   gateway   ike - gate - cfgr   address   47 .
xxx . xxx . 56
set   security   ike   gateway   ike - gate - cfgr   external -
interface   ge - 0 / 0 / 3
set   security   ike   gateway   ike - gate - cfgr   version   v1 -
only
```

5. Configure IPsec policies.

```
set   security   ipsec   policy   ipsec - policy - cfgr   proposal
- set   standard
```

6. Apply IPsec policies.

```
set   security   ipsec   vpn   ipsec - vpn - cfgr   ike   gateway
ike - gate - cfgr
set   security   ipsec   vpn   ipsec - vpn - cfgr   ike   ipsec -
policy   ipsec - policy - cfgr
set   security   ipsec   vpn   ipsec - vpn - cfgr   bind -
interface   st0 . 0
set   security   ipsec   vpn   ipsec - vpn - cfgr   establish -
tunnels   immediatel  y
set   security   ipsec   policy   ipsec - policy - cfgr   perfect -
forward - secrecy   keys   group2
```

7. Configure outbound policies.

```
set   security   policies   from - zone   trust   to - zone   vpn
  policy   trust - vpn - cfgr   match   source - address   net -
cfgr_192 - 168 - 18 - 0 -- 24
set   security   policies   from - zone   trust   to - zone   vpn
policy   trust - vpn - cfgr   match   destinatio  n - address   net
- cfgr_192 - 168 - 1 - 0 -- 24
```

```
set security policies from - zone trust to - zone vpn
policy trust - vpn - cfgr match applicatio n any
set security policies from - zone trust to - zone vpn
policy trust - vpn - cfgr then permit
```

8. Configure inbound policies.

```
set security policies from - zone vpn to - zone trust
  policy vpn - trust - cfgr match source - address net -
cfgr_192 - 168 - 1 - 0 -- 24
set security policies from - zone vpn to - zone trust
policy vpn - trust - cfgr match destinatio n - address net
- cfgr_192 - 168 - 18 - 0 -- 24
set security policies from - zone vpn to - zone trust
policy vpn - trust - cfgr match applicatio n any
set security policies from - zone vpn to - zone trust
policy vpn - trust - cfgr then permit
```

5.3.5 Configure an IPsec-VPN connection through a Next-Generation Firewall (NGFW) device (Cisco)

This topic takes a Next-Generation Firewall (NGFW) device from Cisco as an example to show how to configure the VPN settings to connect an on-premises data center to Alibaba Cloud VPC. When using IPsec-VPN to create a site-to-site connection, you must configure the local gateway according to the IPsec-VPN connection configured for the Alibaba Cloud VPN Gateway.

The following table lists the network configurations of the VPC and the on-premises data center used in this example.

Configuration		Example value
VPC	VSwitch CIDR block	192.168.10.0/24, 192.168.11 .0/24
	Public IP address of the gateway	47. xxx. xxx.161
On-premises data center	Intranet CIDR block	10.10.10.0/24
	Public IP address of the firewall	124. xxx. xxx.171

Note:

If the on-premises data center is associated with multiple CIDR blocks that need to connect with a VPC, we recommend that you create an equivalent number of IPsec-VPN connections on Alibaba Cloud so that each CIDR block of the on-premises data center is connected with a VPC CIDR block.

Configure an IKEv1 VPN

Prerequisites

- An IPsec-VPN connection is created in an Alibaba Cloud VPC. For more information, see Create an IPsec-VPN connection.
- The configuration of the IPsec-VPN connection is downloaded. For more information, see Download the configuration of an IPsec-VPN connection. The configurations in the following table are used in this example.

Protocol	Configuration	Example value
IKE	Authentication Algorithm	SHA-1
	Encryption Algorithm	AES-128
	DH Group	group 2
	IKE Version	IKE v1
	SA Life Cycle	86400
	Negotiation Mode	main
	PSK	123456
IPsec	Authentication Algorithm	SHA-1
	Authentication Algorithm	AES-128
	DH Group	group 2
	IKE Version	IKE v1
	SA Life Cycle	86400
	Negotiation Mode	esp

Procedure

To load customer gateway configurations to the NGFW device from Cisco, follow these steps:

1. Log on to the CLI of the NGFW device.
2. Configure the isakmp policy.

```
crypto   isakmp   policy   1
authentica  tion   pre - share
encryption   aes
hash   sha
group    2
```

```
lifetime   86400
```

3. Configure the pre-shared key.

```
crypto   isakmp   key   123456   address   47 . xxx . xxx .  161
```

4. Configure the IPsec protocol.

```
crypto   ipsec   transform - set   ipsecpro64   esp - aes   esp -
sha - hmac
mode   tunnel
```

5. Configure the Access Control List (ACL) and define the data flow to be protected.

Note:

If multiple CIDR blocks are configured in the local gateway device, you need to add ACL policies for each CIDR block.

```
access - list   100   permit   ip   10 . 10 . 10 . 0   0 . 0 . 0 .
255   192 . 168 . 10 . 0   0 . 0 . 0 . 255
access - list   100   permit   ip   10 . 10 . 10 . 0   0 . 0 . 0 .
255   192 . 168 . 20 . 0   0 . 0 . 0 . 255
```

6. Configure IPsec policies.

```
crypto   map   ipsecpro64   10   ipsec - isakmp
set   peer   47 . xxx . xxx .  161
set   transform - set   ipsecpro64
set   pfs   group2
match   address   100
```

7. Apply IPsec policies.

```
interface   g0 / 0
crypto   map   ipsecpro64
```

8. Configure static routes.

```
ip   route   192 . 168 . 10 . 0   255 . 255 . 255 . 0   47 . xxx .
xxx .  161
ip   route   192 . 168 . 20 . 0   255 . 255 . 255 . 0   47 . xxx .
xxx .  161
```

9. Test the connectivity.

   You can perform a connectivity test by using a host in Alibaba Cloud that is connected to a host in your on-premises data center.

Configure an IKEv2 VPN

Prerequisites

- An IPsec-VPN connection is created in an Alibaba Cloud VPC. For more information, see Create an IPsec-VPN connection.

- The configurations of the IPsec-VPN connection are downloaded. For more information, see Download the configuration of an IPsec-VPN connection. The configurations in the following table are used in this example.

Protocol	Configuration	Example value
IKE	Authentication Algorithm	SHA-1
	Encryption Algorithm	AES-128
	DH Group	group 2
	IKE Version	IKE v2
	SA Life Cycle	86400
	PRF Algorithm	SHA-1
	PSK	123456
IPsec	Authentication Algorithm	SHA-1
	Encryption Algorithm	AES-128
	DH Group	group 2
	IKE Version	IKE v2
	SA Life Cycle	86400
	Negotiation Mode	esp

Procedure

To load customer gateway configurations to the NGFW device from Cisco, follow these steps:

1. Log on to the CLI of the NGFW device.
2. Configure the phase one IKE algorithm.

```
crypto   ikev2   proposal   daemon
encryption   aes - cbc - 128
integrity   sha1
group   2
```

3. Configure IKE v2 policies and apply the proposal.

```
crypto   ikev2   policy   ipsecpro64  _v2
proposal   daemon
```

4. Configure the pre-shared key.

```
crypto   ikev2   keyring   ipsecpro64  _v2
peer   vpngw
address   47 . xxx . xxx .  161
```

```
pre - shared - key   0   123456
```

5. Configure the identity authentication.

```
crypto   ikev2   profile   ipsecpro64  _v2
match   identity   remote   address   47 . xxx . xxx .  161   255 .
255 . 255 . 255
identity   local   address   10 . 10 . 10 . 1
authentica  tion   remote   pre - share
authentica  tion   local   pre - share
keyring   local   ipsecpro64  _v2
```

6. Configure the IPsec security protocol.

```
crypto   ipsec   transform - set   ipsecpro64  _v2   esp - aes
esp - sha - hmac
mode   tunnel
```

7. Configure the ACL (access control list) and define the data stream to be protected.

Note:

If multiple CIDR blocks are configured in the local gateway device, you need to add ACL policies for each CIDR block.

```
access - list   100   permit   ip   10 . 10 . 10 . 0   0 . 0 . 0 .
255   192 . 168 . 10 . 0   0 . 0 . 0 . 255
access - list   100   permit   ip   10 . 10 . 10 . 0   0 . 0 . 0 .
255   192 . 168 . 20 . 0   0 . 0 . 0 . 255
```

8. Configure IPsec policies.

```
crypto   map   ipsecpro64  _v2   10   ipsec - isakmp
set   peer   47 . xxx . xxx .  161
set   transform - set   ipsecpro64  _v2
set   ikev2 - profile   ipsecpro64  _v2
match   address   100
```

9. Apply IPsec policies.

```
interface   g0 / 1
crypto   map   ipsecpro64  _v2
```

10. Configure static routes.

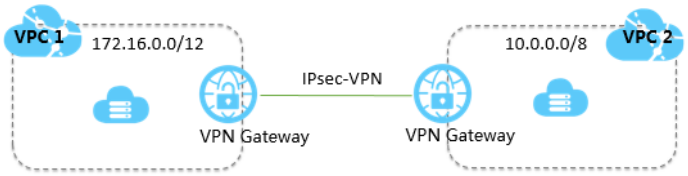
```
ip   route   192 . 168 . 10 . 0   255 . 255 . 255 . 0   47 . xxx .
xxx .  161
ip   route   192 . 168 . 20 . 0   255 . 255 . 255 . 0   47 . xxx .
xxx .  161
```

11. Test the connectivity.

You can perform a connectivity test by using a host in Alibaba Cloud that is connected to a host in your on-premises data center.

5.4 Establish a connection between two VPCs

This topic describes how to create an IPsec-VPN connection to connect two VPCs.



Two VPCs under the same account (labeled VPC1 and VPC2) are used as an example in this topic. The procedure of connecting two VPCs of different accounts is the same as that of connecting two VPCs under the same account. The only difference is that you must obtain the public IP address of the peer VPN Gateway and use this IP address to create a customer gateway.

VPC name	VPC CIDR block	VPC ID	ECS instance name
VPC1	172.25.0.0/12	vpc-xxxxz0	ECS1
VPC2	10.0.0.0/8	vpc-xxxxut	ECS2

Note:
VPN Gateway enables communication by creating an encrypted tunnel over the Internet, which means the communication performance depends on the quality of the Internet connection. If you have high requirements regarding the communication quality, you can use Express Connect. For more information, see #unique_57 and #unique_58.

Before you begin

The IP address ranges of the two VPCs do not conflict with each other.

Step 1: Create two VPN Gateways

To create a VPN Gateway, follow these steps:

1. Log on to the VPC console.
2. In the left-side navigation pane, choose VPN > VPN Gateways.
3. On the VPN Gateways page, click Create VPN Gateway.

4. On the purchase page, configure the VPN Gateway according to the following information, and click Buy Now.
   - Name: Enter the name of the VPN Gateway.
   - Region: Select the region to which the VPN Gateway belongs.

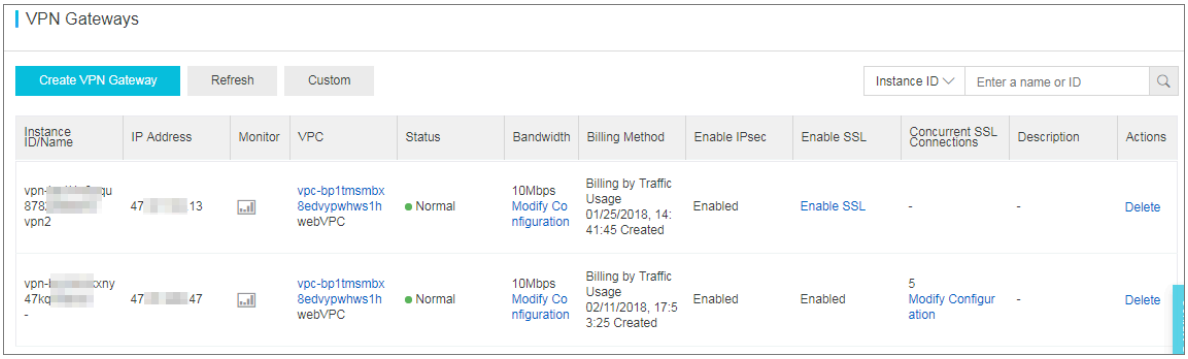
     Note:
     Make sure that the VPC and the VPN Gateway are in the same region.
   - VPC: Select the VPC to be connected.
   - Peak Bandwidth: Select a bandwidth. The bandwidth is the Internet bandwidth of the VPN Gateway.
   - IPsec-VPN: Select whether to enable the IPsec-VPN feature.
   - SSL-VPN: Select whether to enable the SSL-VPN feature. The SSL-VPN feature allows you to connect to a VPC from a computer anywhere.
   - SSL connections: Select the maximum number of clients you want to connect to simultaneously.

     Note:
     You can only configure this option after you enable the SSL-VPN feature.
   - Billing Cycle: Select the validity period of the purchase.
5. Repeat the preceding steps to create a VPN Gateway for the other VPC.

   The state of the newly created VPN gateway is in preparation and changes to normal for about two minutes or so. When it changes to Normal, it indicates that the VPN Gateway is ready to use. When the VPN gateway is created, the system automatically assigns two public IP addresses.

   Note:

It usually takes 1 to 5 minutes to create a VPN Gateway.



In this example, the public IP addresses assigned are 121. XXX. XX.143 and 118. XXX. XX.149, as shown in the following table.

VPC	VPN Gateway	IP address
Name: VPC1 ID: vpc-xxxxz0 IP address range: 172.16.0.0/12	vpn-xxxxxqwj	118.xxx.xx.149
Name: VPC2 ID: vpc-xxxxut IP address range: 10.0.0.0/8	vpn-xxxxxl5z	121.xxx.xx.143

Step 2: Create two customer gateways

To create a customer gateway, follow these steps:

1. In the left-side navigation pane, choose VPN > Customer Gateways.
2. Select a region.
3. On the Customer Gateways page, click Create Customer Gateway.
4. On the Create Customer Gateway page, configure the customer gateway according to the following information, and click OK.
   - Name: Enter a customer gateway name.
   - IP Address: Enter the public IP address of the local gateway.
   - Description: Enter a description of the customer gateway.

5. Repeat the preceding steps to create another customer gateway by using the public IP address of the other VPN Gateway.

   After creating two customer Gateways, the relationship among VPCs, VPN Gateways, and customer gateways is as follows:

VPC	VPN Gateway	IP address	customer gateway
Name: VPC1 ID: vpc-xxxxz0 IP address range: 172.16.0.0/12	vpn-xxxxxqwj	121.xxx.xx.143	user_VPC1
Name: PC2 ID: vpc-xxxxut IP address range: 10.0.0.0/8	vpn-xxxxxl5z	118.xxx.xx.149	user_VPC

Step 3: Create two IPsec-VPN connections

After creating the VPN Gateways and the customer gateways, you must create two IPsec-VPN connections to build the VPN channels:

1. In the left-side navigation pane, choose VPN > IPsec Connections.
2. Select a region.
3. On the IPsec Connections page, click Create IPsec Connection.

4. On the Create IPsec Connection page, configure the IPsec-VPN connection according to the following information and click OK.
   - Name: Enter a name for the IPsec-VPN connection.
   - VPN Gateway: Select the created VPN Gateway. In this example, select the VPN Gateway vpn-xxxxxqwj of VPC1.
   - Customer Gateway: Select the created customer gateway. In this example, select the customer gateway user_VPC2 of VPC2.
   - Local Network: Enter the CIDR block of the VPC to which the selected VPN Gateway belongs. In this example, enter the CIDR block 172.16.0.0/12 of VPC1.
   - Remote Network: Enter the CIDR block of the peer VPC. In this example, enter the CIDR block 10.0.0.0/8 of VPC2.
   - Effective Immediately: Select whether to start the negotiation immediately.
     - Yes: Start the negotiation immediately once the configuration is complete.
     - No: Start the negotiation only when traffic is detected in the tunnel.
   - Pre-Shared Key: Enter a pre-shared key. In this example, enter 1234567. This value must be the same as that configured in the other IPsec-VPN connection.
   - Health Check: Enable health checks and enter the destination IP address, source IP address, retry interval, and number of retries.

   Use the default configurations for other parameters.
5. Repeat the preceding steps to create an IPsec-VPN connection for the other VPC.

Step 4: Configure a route for each VPN Gateway

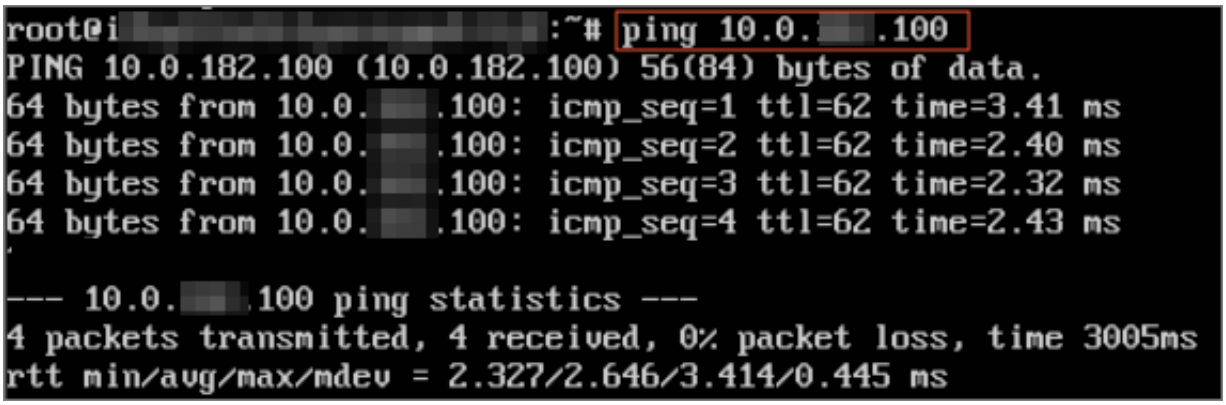
To configure a route for a VPN Gateway, follow these steps:

1. In the left-side navigation pane, choose VPN > VPN Gateways.
2. Select the region of the target VPN Gateway.
3. On the VPN Gateways page, find the target VPN Gateway and click the instance ID in the Instance ID/Name column.
4. On the Destination-based Routing page, click Add Route Entry.

5. On the Add Route Entry page, configure the destination-based route according to the following information and click OK.
   - Destination CIDR Block: Enter the private CIDR block of VPC2.
   - Next Hop: Select the target IPsec-VPN connection instance.
   - Publish to VPC: Select whether to publish the new route to the VPC route table. In this example, select Yes.
   - Weight: Select a weight. In this example, select 100.
6. Repeat the preceding steps to configure a route for the other VPN Gateway.

Step 5: Test the connection

Log on to ECS1, and then `ping` the private IP address of ECS2 to check whether the connection is established.



5.5 Configure multi-site connections

You can create IPsec-VPN connections between multiple sites and locations. With the VPN-Hub function, the connected sites can communicate with the connected VPC, and also communicate with each of the other sites. VPN-Hub meets the needs of large enterprises to establish intranet communications between different sites.

VPN-Hub overview

The VPN-Hub function is enabled by default. To achieve multi-site connections, you must create corresponding IPsec-VPN connections. A VPN Gateway can have up to ten IPsec-VPN connections. Therefore, you can connect up to ten office sites with one VPN Gateway.

The following scenario is used to illustrate connecting office sites in the cities of Shanghai, Hangzhou, and Ningbo. Before you begin, make sure that you have obtained the public IP address of the gateway device for each office site.

As shown in the following figure, to connect the three office sites (Shanghai, Hangzhou, and Ningbo), you only need to create a VPN Gateway and three customer gateways, and establish three IPsec-VPN connections.

Note:
Make sure the IP address ranges of all the connected sites do not conflict with each other.

Step 1: Create a VPN Gateway

Create a VPN Gateway in the region to which the VPC belongs. Three IPsec-VPN connections will be established for the VPN Gateway and are connected to the office sites in Shanghai, Hangzhou, and Ningbo. For more information, see Create a VPN Gateway.

Note:
Make sure that the IPsec-VPN function is enabled.

Step 2: Create an IPsec-VPN connection to the Shanghai office

1. Create a customer gateway and register the public IP address of the local gateway device to Alibaba Cloud to establish an IPsec-VPN connection.

   The IP address of the customer gateway is the public IP address of the gateway device of the Shanghai office. For more information, see Create a customer gateway.
2. Create an IPsec-VPN connection.

   Create an IPsec connection to connect the VPN Gateway and the customer gateway. For more information, see Create an IPsec-VPN connection.
3. Load VPN configurations to the gateway device of the local office site.

   Load VPN configurations according to the requirements on the gateway device of the local office site. For more information, see Local gateway configuration.

Step 3: Create additional IPsec-VPN connections for the other two sites

Follow the same procedures in the Step 2 to create two IPsec connections for the Hangzhou office and the Ningbo office.

Step 4: Configure the VPN Gateway route

To configure the VPN Gateway route, follow these steps:

1. Log on to the VPC console.
2. In the left-side navigation pane, choose VPN > VPN Gateways.
3. On the VPN Gateways page, select the region of the VPN Gateway.
4. Find the target VPN Gateway, and click the instance ID in the Instance ID/Name column.
5. On the Destination-based Routing page, click Add Route Entry.
6. Configure three route entries according to the following information and then click OK.
   - Destination CIDR Block: Enter the private CIDR block to be accessed.
   - Next Hop: Select the target IPsec-VPN connection instance.
   - Publish to VPC: Select whether to publish the new route to the VPC route table.
   - Weight: Select a weight.

   The following are the destination-based routes configured in this example:

Destination CIDR Block	Next Hop	Publish to VPC	Weight
10.10.10.0/24	IPsec-VPN connection instance 1	Yes	100
10.10.20.0/24	IPsec-VPN connection instance 2	Yes	100
10.10.30.0/24	IPsec-VPN connection instance 3	Yes	100

The IPsec-VPN connections to the three office sites have now been established. Each office site can now communicate with the VPC and can communicate with the other office sites over their intranet.

6 MTU notes

The maximum transmission unit (MTU) is the size (in bytes) of the largest packet supported by the network layer protocol (such as TCP), with headers and data included.

Network packets sent over IPsec tunnels are encrypted and then encapsulated in external packets for routing. Because an encapsulated internal packet itself must fit the MTU of the corresponding external packet, the MTU of the internal packet must be smaller.

Gateway MTU and system MTU

You must configure the MTU limit of the local VPN Gateway to not more than 1,400 bytes. We recommend that you set the MTU to 1,400 bytes.

For TCP traffic, the maximum length of data that can be carried by each packet segment can be negotiated by the sender and receiver when they communicate based on the maximum segment size (MSS).

7 Manage quotas

You can query the number of remaining resources in your quota through the VPC console. If the remaining quota number is insufficient for your requirements, you can open a ticket to apply for an increase to your quota.

Procedure

1. Log on to the VPC console.
2. In the left-side navigation pane, click Quota Management.
3. On the Quota Management page, click the VPN Gateway tab to view the quota usage of VPN Gateways under your account.
4. To increase your resource quota, click Apply in the Actions column.
   - Quantity for Application: the number of resources you require. You must enter a number that is greater than the current quota. For more information about the resource limits of NAT Gateway, see Limits .
   - Reason for Application: your reason for applying for an increase to your quota. We recommend that you include details about your specific scenario.
   - Mobile/Landline Phone Number: the mobile or landline phone number of the person to contact.
   - Email: the email address of the person to contact.
5. Click OK.

   The system then determines whether the quota application is reasonable. If the system determines the request is unreasonable, the application enters the Rejected state. If the application is reasonable, the application status enters the Approved state and the quota is automatically upgraded to the specified quota number.

   To view the history of quota applications, click Application History in the Application History column.