Global Accelerator

Best Practices

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HUAWEI

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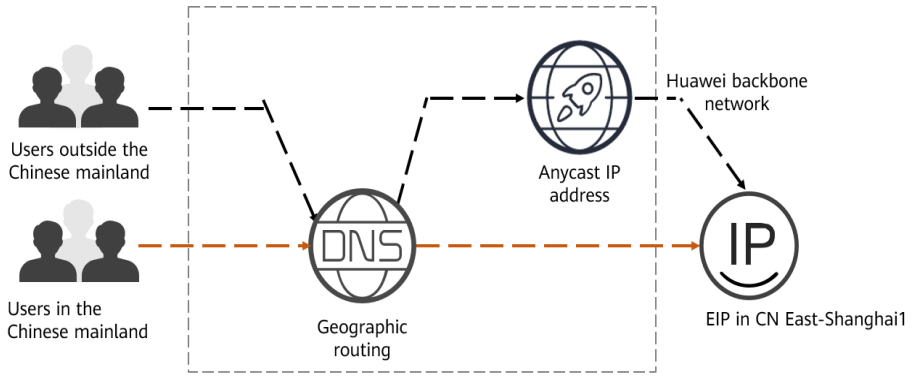
1 Using Global Accelerator to Speed Up Cross-Border Access to Web Servers

Overview

Application scenario: If you deploy your web server in the Chinese mainland, users outside the Chinese mainland may face problems such as high latency, packet loss, and jitter, due to unstable cross-border networks. To address these issues, you need a global accelerator.

Solution architecture: Suppose you have a web server deployed in CN East-Shanghai1 and your domain name has been licensed and mapped to the EIP in CN East-Shanghai1 bound to the server. Users can access your website using the domain name over the Internet. To accelerate cross-border access to your website, you can use DNS to map your domain name to the anycast IP address of a global accelerator, so that users across the globe can access your website faster through the Huawei backbone network.



Resource and Cost Planning

The following table describes the planned resources.

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Table 1-1 Resource and cost planning

Resource	Description	Quantity	Price
Global accelerator	You are charged based on how long each global accelerator is retained in your account. The smallest billing unit is one hour. Partial hours are counted as full hours. Global accelerator price = Unit price x Required duration	1	For details, see **Global Accelerator Pricing Details**.
Data transfer	You are charged for either the inbound or outbound traffic, in GB, whichever direction has more traffic. Data transfer price = Unit price x Traffic used	Per actual use	
Record sets added to the public zone	Three A record sets are required for users in different areas: • A record set with **Line** set to **Default** and **Value** set to the EIP bound to the web server deployed in CN East-Shanghai1. • A record set with **Line** set to **Region** > **Chinese mainland** and **Value** set to the EIP bound to the web server deployed in CN East-Shanghai1. • A record set with **Line** set to **Region** > **Global** and **Value** set to the anycast IP address of the global accelerator.	3	Free

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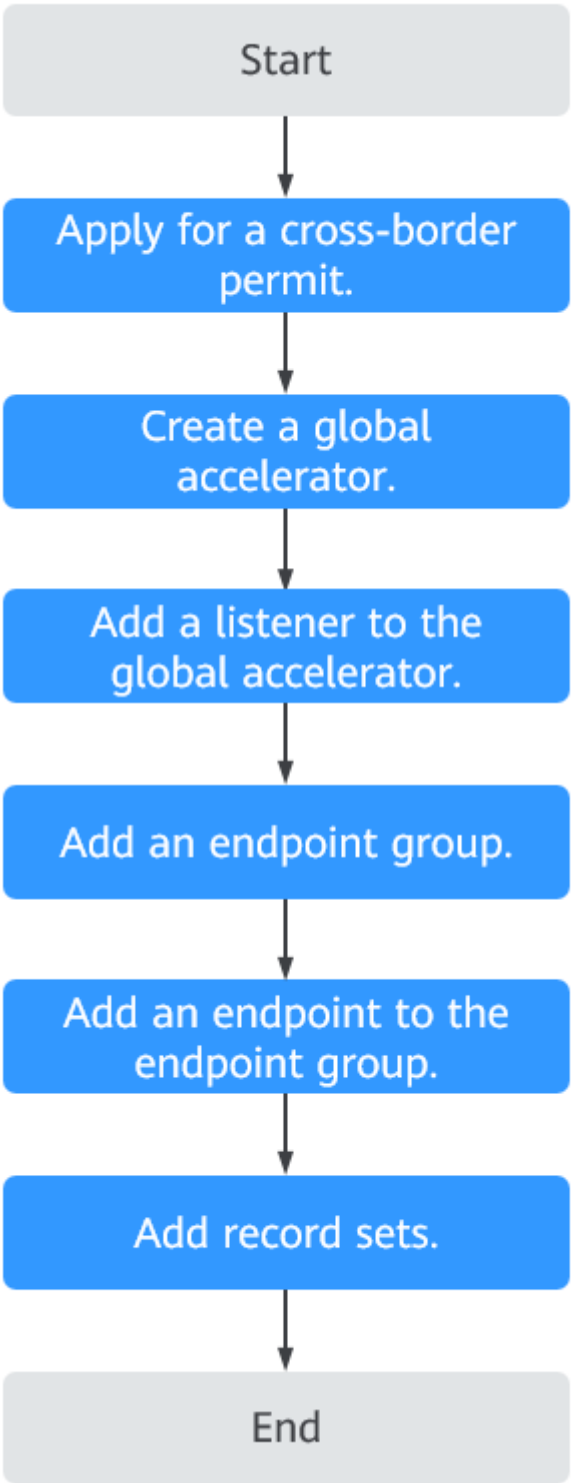
Flowchart



Step 1: Apply for a Cross-Border Permit

In accordance with the laws and administrative regulations of the Ministry of Industry and Information Technology (MIIT) of the People's Republic of China,

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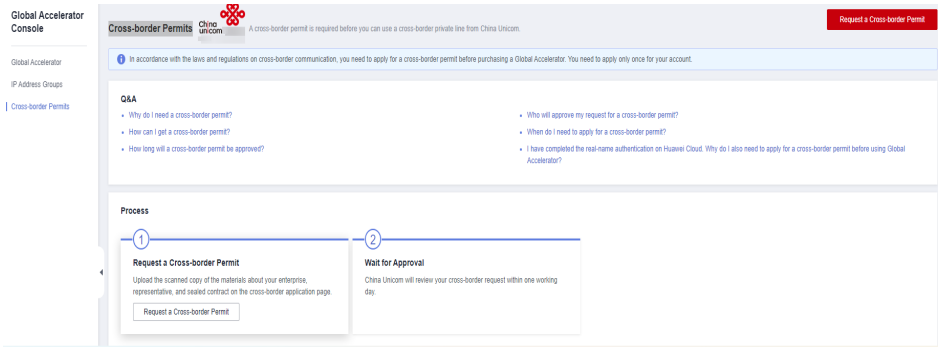
only China Mobile, China Telecom, and China Unicom are allowed for cross-border network communications, and a cross-border permit is required if you carry out business activities outside the Chinese mainland.

1. Log in to the **Cross-border Permits** page.
2. Click **Request a Cross-Border Permit**.

   The **Cross-Border Service Application System** page is displayed.

Figure 1-1 Applying for a cross-border permit



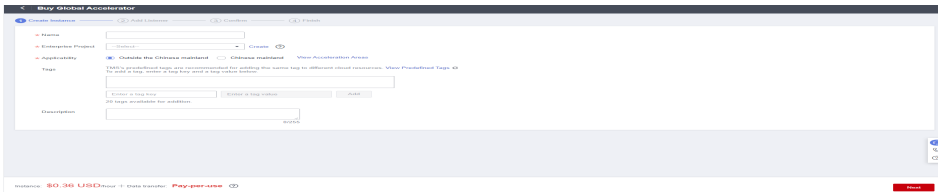
3. On the application page, set related parameters and upload related materials.
4. Click **Submit**.

Step 2: Buy a Global Accelerator

To use Global Accelerator for faster access, you first need to create a global accelerator.

1. Log in to the **Global Accelerator console**.
2. On the **Global Accelerator** page, click **Buy Global Accelerator**.

Figure 1-2 Buying a global accelerator



3. Set parameters. Select **Outside the Chinese mainland** for **Applicability**. For other parameters, see **Table 1-2**.

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Figure 1-3 Creating a global accelerator

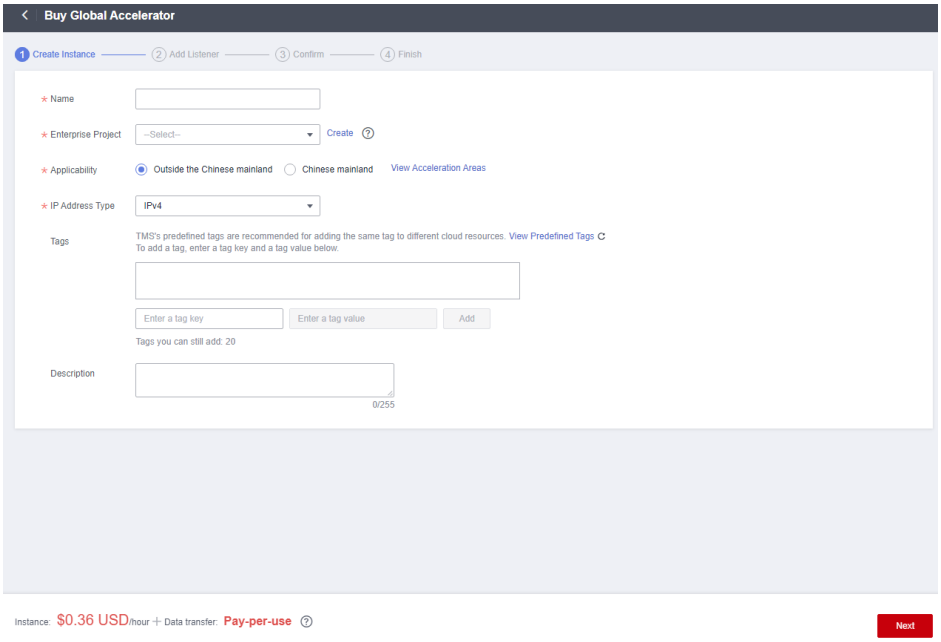

Table 1-2 Parameters for configuring a global accelerator

Parameter	Description
Name	Name of the global accelerator you want to create. Only letters, digits, and hyphens are allowed. You can enter up to 64 characters.
Enterprise Project	An enterprise project you would like to use to centrally manage your Global Accelerator resources. You can use an existing enterprise project or create one.
Applicability	Where the global accelerator will be used. There are two options: **Outside the Chinese mainland** or **Chinese mainland**. **Outside the Chinese mainland** is selected by default. **Outside the Chinese mainland** is recommended for this practice.
IP Address Type	The type of the IP address used by the global accelerator. If you select **Chinese mainland** for **Applicability**, you can select **IPv4** or **IPv4+IPv6**. Default value: **IPv4**.

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Parameter	Description
Tags	An identifier of the global accelerator. Each tag consists of a key and a value. You can add 20 tags for a global accelerator. **NOTE** If a predefined tag has been created in TMS, you can select the corresponding tag key and value. For details about predefined tags, see **Predefined Tag Overview**. If you have configured tag policies for Global Accelerator, you need to add tags to your accelerators based on the tag policies. If you add a tag that does not comply with the tag policies, global accelerators may fail to be created. Contact the administrator to learn more about tag policies.
Description	Supplementary information about the global accelerator. You can enter up to 255 characters.

4. Click **Next**.

Step 3: Add a Listener to the Global Accelerator

Add a listener to the global accelerator to route requests across endpoints based on the client affinity you set.

Configure the parameters as described in **Table 1-3**.

Figure 1-4 Adding a listener

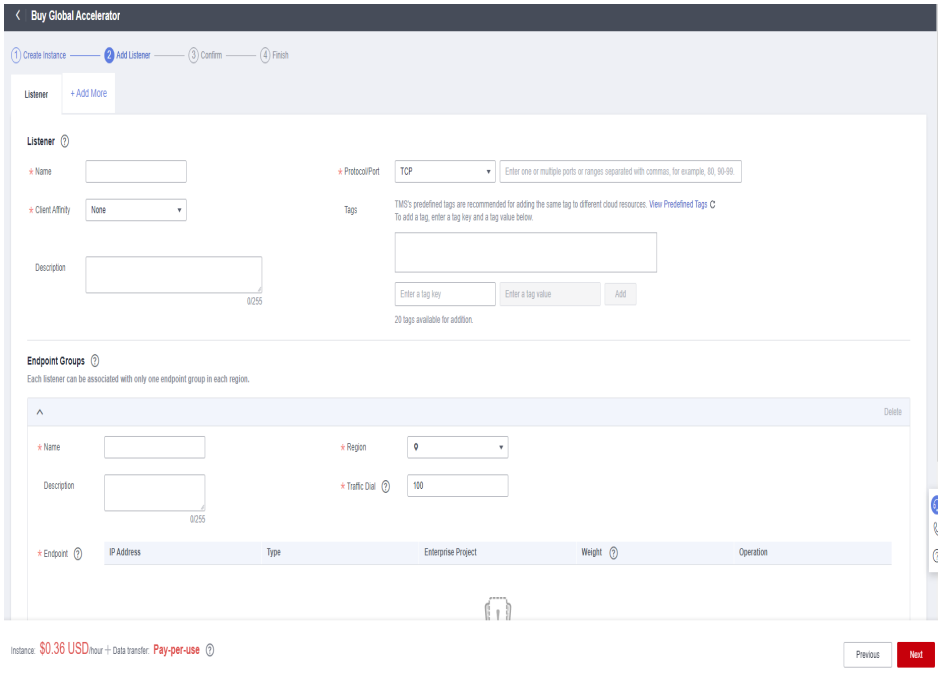

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Table 1-3 Parameters for configuring a listener

Parameter	Description
Name	Listener name. Only letters, digits, and hyphens are allowed. You can enter up to 64 characters.
Protocol	The protocol used by the listener to receive requests from clients. The protocol can be TCP or UDP.
Port	The ports or port ranges used by the listener to receive requests from clients. The port number ranges from 1 to 65535. You can enter one or more ports or port ranges separated by commas (,). Example: 1-10,11-50,51,52-200
Client Affinity	How requests are routed. There are two options: **None**: The listener routes requests evenly among the endpoints in the endpoint group. **Source IP address** (only for TCP and UDP listeners): The source IP address of each request is calculated using the consistent hashing algorithm to obtain a unique hash key, and all the endpoints are numbered and mapped to the hash keys. Requests from the same IP address are forwarded to the same endpoint for processing.
Tags	An identifier of the listener. Each tag consists of a key and a value. You can add up to 20 tags to a listener. **NOTE** If a predefined tag has been created in TMS, you can select the corresponding tag key and value. For details about predefined tags, see **Predefined Tag Overview**. If you have configured tag policies for Global Accelerator, you need to add tags to your listeners based on the tag policies. If you add a tag that does not comply with the tag policies, listeners may fail to be created. Contact the administrator to learn more about tag policies.
Description	Supplementary information about the listener. You can enter up to 255 characters.

Step 4: Associate an Endpoint Group with the Listener

Associate an endpoint group with the listener in the **CN East-Shanghai1** region and add an endpoint to this endpoint group as instructed by **Table 1-4**.

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Table 1-4 Parameters for configuring the endpoint group and endpoint

Item	Parameter	Description
Endpoint group	Name	Name of the endpoint group. Each listener can be associated with only one endpoint group in a given region. Only letters, digits, and hyphens are allowed. You can enter up to 64 characters.
	Region	Region where the endpoint group is used. Select **CN East-Shanghai1** for this practice.
	Description	Supplementary information about the endpoint group. You can enter up to 255 characters.
	Traffic Dial	The percentage of traffic directed to the endpoint group. If you increase the traffic dial, more requests will be distributed to this endpoint group. The value ranges from 0 to 100. If you set the traffic dial to 0, no requests will be distributed to this endpoint group. **NOTE** If a listener has multiple endpoint groups, traffic will be first distributed to the endpoint group with the lowest latency and then to other endpoint groups based on the traffic dial value you set.
	Endpoint	A single point of contact for clients. Global Accelerator distributes incoming traffic across healthy endpoints. Select **EIP** for this practice.
Health Check	Health Check	Whether to enable health check. If you disable health check, requests may be forwarded to unhealthy endpoints.
	Protocol	The protocol used for health check. It can be TCP. Default value: **TCP**.

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Item	Parameter	Description
	Port	The port used for health check. The port number ranges from 1 to 65535.
	Advanced Settings	
	Interval (s)	The maximum time between two consecutive health checks, in seconds. The interval ranges from 1 to 60.
	Timeout (s)	The maximum time required for waiting for a response to a health check request, in seconds. The timeout ranges from 1 to 60.
	Maximum Retries	The maximum number of health check retries allowed. The value ranges from 1 to 10.

Step 5: Add Record Sets

Add record sets to map your domain name to the anycast IP address of the global accelerator or the EIP bound to your web server.

This section uses Huawei Cloud DNS as an example.

1. Go to the **Public Zones** page.
2. On the **Public Zones** page, click the target domain name.
   The **Record Sets** page is displayed.
3. In the upper right corner of the page, click **Add Record Set**.
4. On **Add Record Set** page, add three record sets as instructed by **Table 1-5**.

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Figure 1-5 Adding an A record set

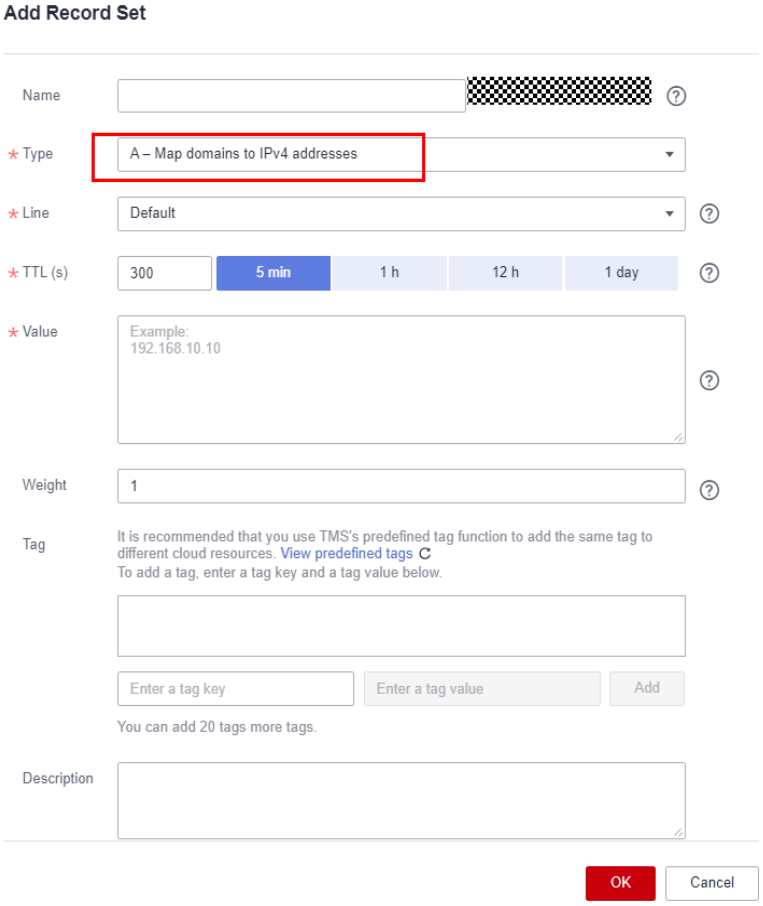

Table 1-5 Parameters for configuring an A record set

Parameter	Description
Name	Prefix of the domain name to be resolved. For example, if the domain name is **example.com**, the prefix can be as follows: • **www**: The domain name is www.example.com, which is usually used for a website. • Left blank: The domain name is example.com. The **Name** field cannot be set to an at sign (@). Just leave it blank. • ***: The domain name is *.example.com, which is a wildcard domain name, indicating all subdomains of example.com.
Type	Type of the record set. Select **A – Map domains to IPv4 addresses** for this practice.

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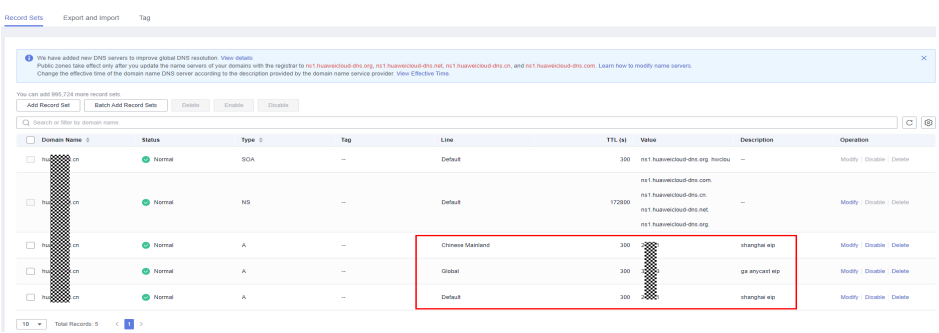
Parameter	Description
Line	Resolution line. The DNS server will return the IP address of the specified line, depending on where end users come from. Select **Default**, **Region** > **Chinese Mainland**, and **Region** > **Global** for the three record sets, respectively.
TTL (s)	Cache duration of the record set on a local DNS server, in seconds. The value ranges from 1 to 2147483647, and the default value is 300. If your service address changes frequently, set TTL to a smaller value. Retain the default value for this practice.
Value	IPv4 addresses mapped to the domain name. Set different values for the three record sets: • If **Line** is set to **Default** or **Chinese Mainland**, set the value to the EIP of the web server. • If **Line** is set to **Global**, set the value to the anycast IP address of the global accelerator.
Weight	(Optional) Weight of a record set. The value ranges from 0 to 1000, and the default value is 1. Retain the default value for this practice.
Tags	(Optional) Identifier of a record set. Each tag contains a key and a value. You can add a maximum of 10 tags to a record set.
Description	(Optional) Supplementary information about the record set. You can enter a maximum of 255 characters.

5. Click **OK**.
6. Switch back to the **Record Sets** tab.

   View the record sets you have added and ensure that their status is **Normal**.



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Verifying Acceleration

You can run the **curl** command on a Windows PC in the area where acceleration is required to check whether the access is accelerated.

1. Open the cmd window and run **nslookup <*Website domain name*>** to check whether the anycast IP address is returned.
2. Run the following command to check the latency of accessing the EIP in CN East-Shanghai1 over the public network:
   ```
   curl -o /dev/null -s -w "time_connect: %{time_connect}\ntime_starttransfer: %{time_starttransfer}
   \ntime_total: %{time_total}\n" "http[s]://<IP>[:<Port>]"
   ```

   NOTE

   - **IP**: EIP bound to your web server.
   - **Port**: HTTP port number used by the web server.
   - **time_connect**: time taken to establish a TCP connection, in seconds. It is from the time when a TCP connection request is initiated to the time when the connection is established.
   - **time_starttransfer**: time when transfer starts, in seconds. It is from the time when the client sends a request to the time when the endpoint replies with the first byte.
   - **time_total**: total connection time, in seconds. It is from the time when the client sends a request to the time when the endpoint responds to the request.
3. Run the following command to check the latency of accessing the anycast IP address:
   ```
   curl -o /dev/null -s -w "time_connect: %{time_connect}\ntime_starttransfer: %{time_starttransfer}
   \ntime_total: %{time_total}\n" "http[s]://<IP>[:<Port>]"
   ```

   NOTE

   Set **IP** in the command to the anycast IP address provided by Global Accelerator.
4. Compare the values of **time_connect** and view the latency before and after acceleration.

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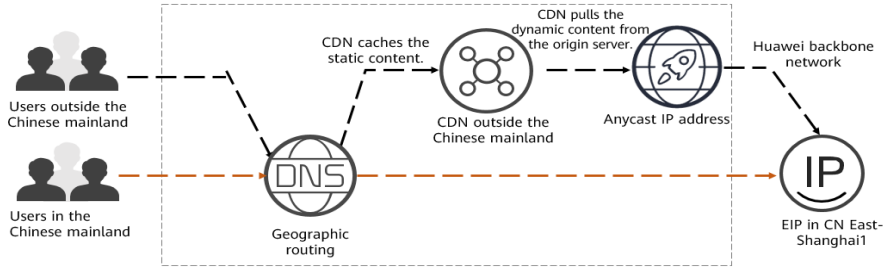
2 Using CDN and Global Accelerator to Speed Up Cross-Border Access

Overview

Application scenario: Suppose you have used a global accelerator to accelerate cross-border access to your website. To save costs, you can use Content Delivery Network (CDN) to accelerate static content, and use Global Accelerator to speed up dynamic requests to your web server.

Solution architecture



Resource and Cost Planning

The following table describes the planned resources.

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Table 2-1 Resource and cost planning

Resource	Description	Quantity	Price
Global accelerator	You are charged based on how long each global accelerator is retained in your account. The smallest billing unit is one hour. Partial hours are counted as full hours. Global accelerator price = Unit price x Required duration	1	For details, see **Global Accelerator Pricing Details**.
Data transfer	You are charged for either the inbound or outbound traffic, in GB, whichever direction has more traffic. Data transfer price = Unit price x Traffic used	Per actual use	
Record sets added to the public zone	Three record sets are required for end users in different areas: • A record set with **Line** set to **Default** and **Value** set to the EIP bound to the web server deployed in CN East-Shanghai1. • A record set with **Line** set to **Region** > **Chinese mainland** and **Value** set to the EIP bound to the web server deployed in CN East-Shanghai1. • A record set with **Line** set to **Region** > **Global** and **Value** set to the CNAME record allocated by CDN.	3	Free
The domain name added to CDN	**Service Area**: **Outside Chinese Mainland** **Type**: Select **IP Address**. **Address**: Set it to the anycast IP address of the global accelerator.	1	See **Content Delivery Network Pricing Details**.

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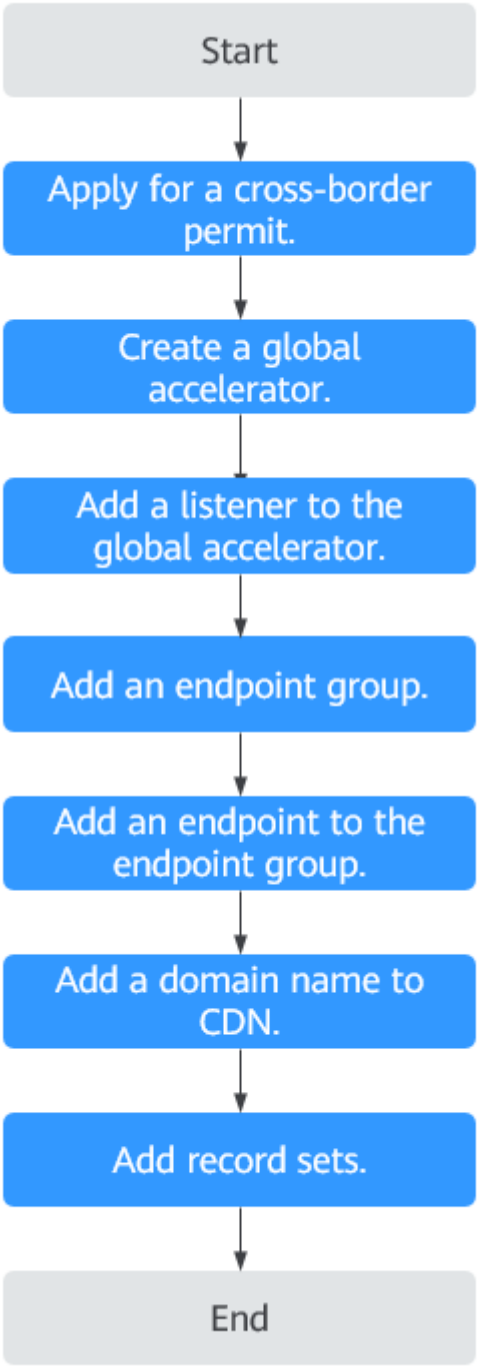
Flowchart



Step 1: Apply for a Cross-Border Permit

In accordance with the laws and administrative regulations of the Ministry of Industry and Information Technology (MIIT) of the People's Republic of China, only China Mobile, China Telecom, and China Unicom are allowed for cross-border network communications, and a cross-border permit is required if you carry out business activities outside the Chinese mainland.

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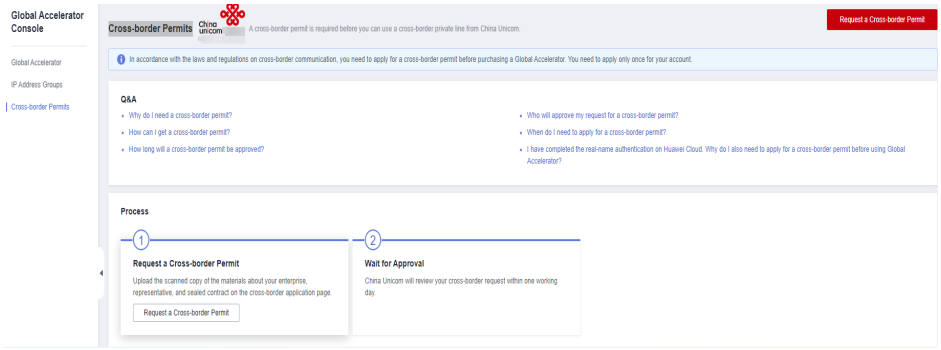
1. Log in to the **Cross-border Permits** page.
2. Click **Request a Cross-Border Permit**.
   The **Cross-Border Service Application System** page is displayed.

Figure 2-1 Applying for a cross-border permit



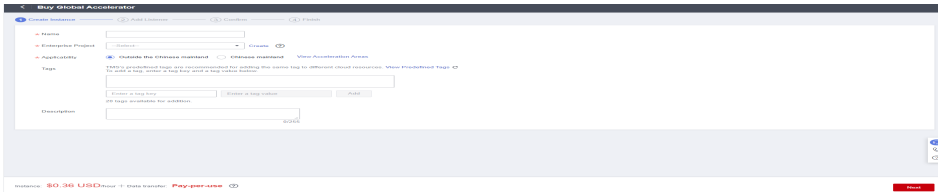
3. On the application page, set related parameters and upload related materials.
4. Click **Submit**.

Step 2: Buy a Global Accelerator

To use Global Accelerator for faster access, you first need to create a global accelerator.

1. Log in to the **Global Accelerator console**.
2. On the **Global Accelerator** page, click **Buy Global Accelerator**.

Figure 2-2 Buying a global accelerator



3. Set parameters. Select **Outside the Chinese mainland** for **Applicability**. For other parameters, see **Table 2-2**.

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Figure 2-3 Creating a global accelerator

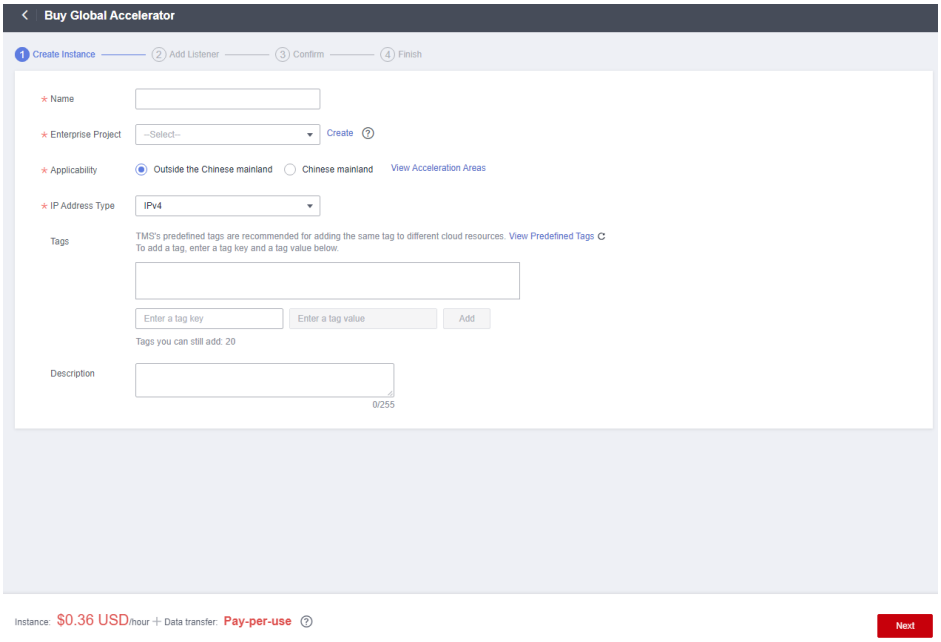

Table 2-2 Parameters for configuring a global accelerator

Parameter	Description
Name	Name of the global accelerator you want to create. Only letters, digits, and hyphens are allowed. You can enter up to 64 characters.
Enterprise Project	An enterprise project you would like to use to centrally manage your Global Accelerator resources. You can use an existing enterprise project or create one.
Applicability	Where the global accelerator will be used. There are two options: **Outside the Chinese mainland** or **Chinese mainland**. **Outside the Chinese mainland** is selected by default. **Outside the Chinese mainland** is recommended for this practice.
IP Address Type	The type of the IP address used by the global accelerator. If you select **Chinese mainland** for **Applicability**, you can select **IPv4** or **IPv4+IPv6**. Default value: **IPv4**.

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Parameter	Description
Tags	An identifier of the global accelerator. Each tag consists of a key and a value. You can add 20 tags for a global accelerator. **NOTE** If a predefined tag has been created in TMS, you can select the corresponding tag key and value. For details about predefined tags, see **Predefined Tag Overview**. If you have configured tag policies for Global Accelerator, you need to add tags to your accelerators based on the tag policies. If you add a tag that does not comply with the tag policies, global accelerators may fail to be created. Contact the administrator to learn more about tag policies.
Description	Supplementary information about the global accelerator. You can enter up to 255 characters.

4. Click **Next**.

Step 3: Add a Listener to the Global Accelerator

Add a listener to the global accelerator to route requests across endpoints based on the client affinity you set.

Configure the parameters as described in **Table 2-3**.

Figure 2-4 Adding a listener

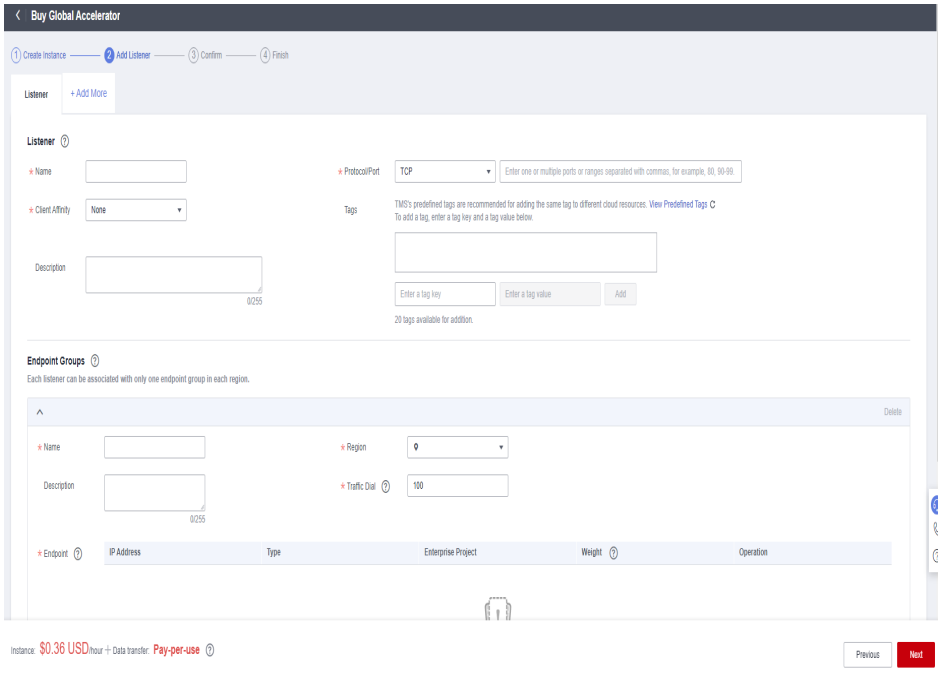

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Table 2-3 Parameters for configuring a listener

Parameter	Description
Name	Listener name. Only letters, digits, and hyphens are allowed. You can enter up to 64 characters.
Protocol	The protocol used by the listener to receive requests from clients. The protocol can be TCP or UDP.
Port	The ports or port ranges used by the listener to receive requests from clients. The port number ranges from 1 to 65535. You can enter one or more ports or port ranges separated by commas (,). Example: 1-10,11-50,51,52-200
Client Affinity	How requests are routed. There are two options: **None**: The listener routes requests evenly among the endpoints in the endpoint group. **Source IP address** (only for TCP and UDP listeners): The source IP address of each request is calculated using the consistent hashing algorithm to obtain a unique hash key, and all the endpoints are numbered and mapped to the hash keys. Requests from the same IP address are forwarded to the same endpoint for processing.
Tags	An identifier of the listener. Each tag consists of a key and a value. You can add up to 20 tags to a listener. **NOTE** If a predefined tag has been created in TMS, you can select the corresponding tag key and value. For details about predefined tags, see **Predefined Tag Overview**. If you have configured tag policies for Global Accelerator, you need to add tags to your listeners based on the tag policies. If you add a tag that does not comply with the tag policies, listeners may fail to be created. Contact the administrator to learn more about tag policies.
Description	Supplementary information about the listener. You can enter up to 255 characters.

Step 4: Associate an Endpoint Group with the Listener

Associate an endpoint group with the listener in the **CN East-Shanghai1** region and add an endpoint to this endpoint group as instructed by **Table 2-4**.

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Table 2-4 Parameters for configuring the endpoint group and endpoint

Item	Parameter	Description
Endpoint group	Name	Name of the endpoint group. Each listener can be associated with only one endpoint group in a given region. Only letters, digits, and hyphens are allowed. You can enter up to 64 characters.
	Region	Region where the endpoint group is used. Select **CN East-Shanghai1** for this practice.
	Description	Supplementary information about the endpoint group. You can enter up to 255 characters.
	Traffic Dial	The percentage of traffic directed to the endpoint group. If you increase the traffic dial, more requests will be distributed to this endpoint group. The value ranges from 0 to 100. If you set the traffic dial to 0, no requests will be distributed to this endpoint group. **NOTE** If a listener has multiple endpoint groups, traffic will be first distributed to the endpoint group with the lowest latency and then to other endpoint groups based on the traffic dial value you set.
	Endpoint	A single point of contact for clients. Global Accelerator distributes incoming traffic across healthy endpoints. Select **EIP** for this practice.
Health Check	Health Check	Whether to enable health check. If you disable health check, requests may be forwarded to unhealthy endpoints.
	Protocol	The protocol used for health check. It can be TCP. Default value: **TCP**.

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Item	Parameter	Description
	Port	The port used for health check. The port number ranges from 1 to 65535.
	Advanced Settings	
	Interval (s)	The maximum time between two consecutive health checks, in seconds. The interval ranges from 1 to 60.
	Timeout (s)	The maximum time required for waiting for a response to a health check request, in seconds. The timeout ranges from 1 to 60.
	Maximum Retries	The maximum number of health check retries allowed. The value ranges from 1 to 10.

Step 5: Add a Domain Name to CDN

On the **Add Domain Names** page, select **Outside Chinese mainland** for **Service Area** and set the IP address of the origin server to the anycast IP address of the global accelerator.

For details, see **Adding a Domain Name**.

Step 6: Add Record Sets

Add record sets to map your domain name to the anycast IP address of the global accelerator or the EIP bound to your web server.

This section uses Huawei Cloud DNS as an example.

1. Go to the **Public Zones** page.
2. On the **Public Zones** page, click the target domain name.

   The **Record Sets** page is displayed.
3. In the upper right corner of the page, click **Add Record Set**.
4. On **Add Record Set** page, add three record sets as instructed by **Table 2-5**.

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Figure 2-5 Adding an A record set

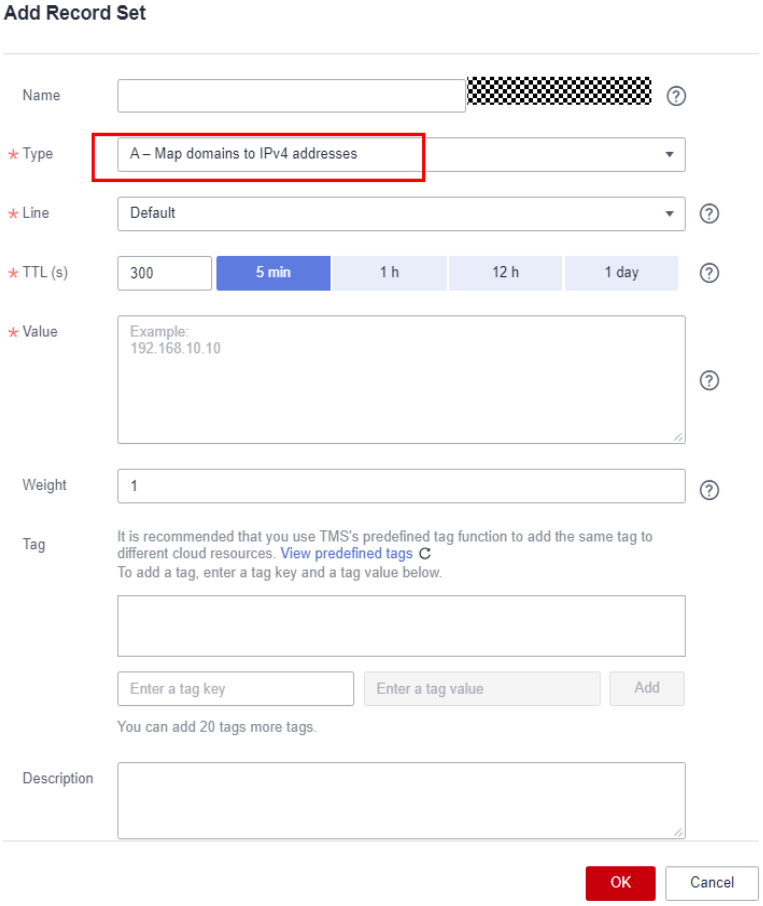

Table 2-5 Parameters for configuring a record set

Parameter	Description
Name	Prefix of the domain name to be resolved. For example, if the domain name is **example.com**, the prefix can be as follows: • **www**: The domain name is www.example.com, which is usually used for a website. • Left blank: The domain name is example.com. The **Name** field cannot be set to an at sign (@). Just leave it blank. • ***: The domain name is *.example.com, which is a wildcard domain name, indicating all subdomains of example.com.
Type	Type of the record set. Select **A – Map domains to IPv4 addresses** for this practice.

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Parameter	Description
Line	Resolution line. The DNS server will return the IP address of the specified line, depending on where end users come from. Select **Default**, **Region** > **Chinese Mainland**, and **Region** > **Global** for the three record sets, respectively.
TTL (s)	Cache duration of the record set on a local DNS server, in seconds. The value ranges from 1 to 2147483647, and the default value is 300. If your service address changes frequently, set TTL to a smaller value. Retain the default value for this practice.
Value	IPv4 addresses mapped to the domain name. Set different values for the three record sets: ● If **Line** is set to **Default** or **Chinese Mainland**, set the value to the EIP of the web server. ● If **Line** is set to **Global**: set the value to the CNAME record allocated by CDN.
Weight	(Optional) Weight of a record set. The value ranges from 0 to 1000, and the default value is 1. Retain the default value for this practice.
Tags	(Optional) Identifier of a record set. Each tag contains a key and a value. You can add a maximum of 10 tags to a record set.
Description	(Optional) Supplementary information about the record set. You can enter a maximum of 255 characters.

5. Click **OK**.
6. Switch back to the **Record Sets** tab.

   View the record sets you have added and ensure that their status is **Normal**.

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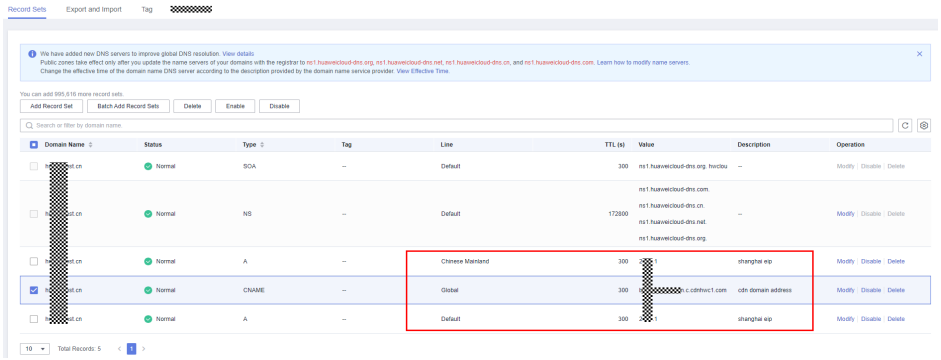

Verifying Acceleration

You can run the **curl** command on a Windows PC in the area where acceleration is required to check whether the access is accelerated.

Run the following command to check the latency of accessing the website over the public network:

```
curl -o /dev/null -s -w "time_connect: %{time_connect}\ntime_starttransfer: %{time_starttransfer}
\ntime_total: %{time_total}\n" "http[s]://<Website domain name>[:<Port>]"
```

NOTE

- *Port*: port for end users to access the website.
- **time_connect**: time taken to establish a connection, in seconds. It is from the time when a TCP connection request is initiated to the time when the connection is established.
- **time_starttransfer**: time when transfer starts, in seconds. It is from the time when the client sends a request to the time when the endpoint replies with the first byte.
- **time_total**: total connection time, in seconds. It is from the time when the client sends a request to the time when the endpoint responds to the request.

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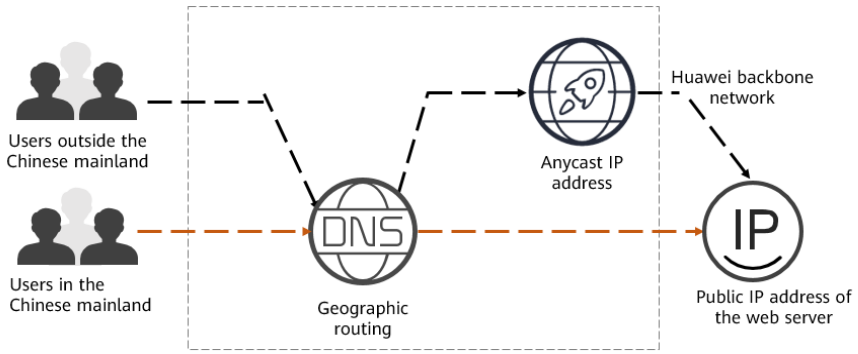
3 Using Global Accelerator to Speed Up Cross-Border Access to Third-Party On-premises Servers

Overview

Application scenario: Suppose you have a web server deployed in an on-premises data center in Hangzhou. Users can access your website over the public network. Due to unstable cross-border networks, users outside the Chinese mainland may face problems such as high latency, packet loss, and jitter. To address these issues, you need a global accelerator.

Solution architecture: To accelerate cross-border access to your website, you can use DNS to map your domain name to the anycast IP address of a global accelerator, so that users across the globe can access your website faster through the Huawei backbone network.



Resource and Cost Planning

The following table describes the planned resources.

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Table 3-1 Resource and cost planning

Resource	Description	Quantity	Price
Global accelerator	You are charged based on how long each global accelerator is retained in your account. The smallest billing unit is one hour. Partial hours are counted as full hours. Global accelerator price = Unit price x Required duration	1	For details, see **Global Accelerator Pricing Details**.
Data transfer	You are charged for either the inbound or outbound traffic, in GB, whichever direction has more traffic. Data transfer price = Unit price x Traffic used	Per actual use	
Record sets added to the public zone	Three A record sets are required for users in different areas: • A record set with **Line** set to **Default** and **Value** set to the public IP address bound to the web server deployed in your on-premises data center. • A record set with **Line** set to **Region** > **Chinese mainland** and **Value** set to the public IP address bound to the web server deployed in your on-premises data center. • A record set with **Line** set to **Region** > **Global** and **Value** set to the anycast IP address of the global accelerator.	3	Free

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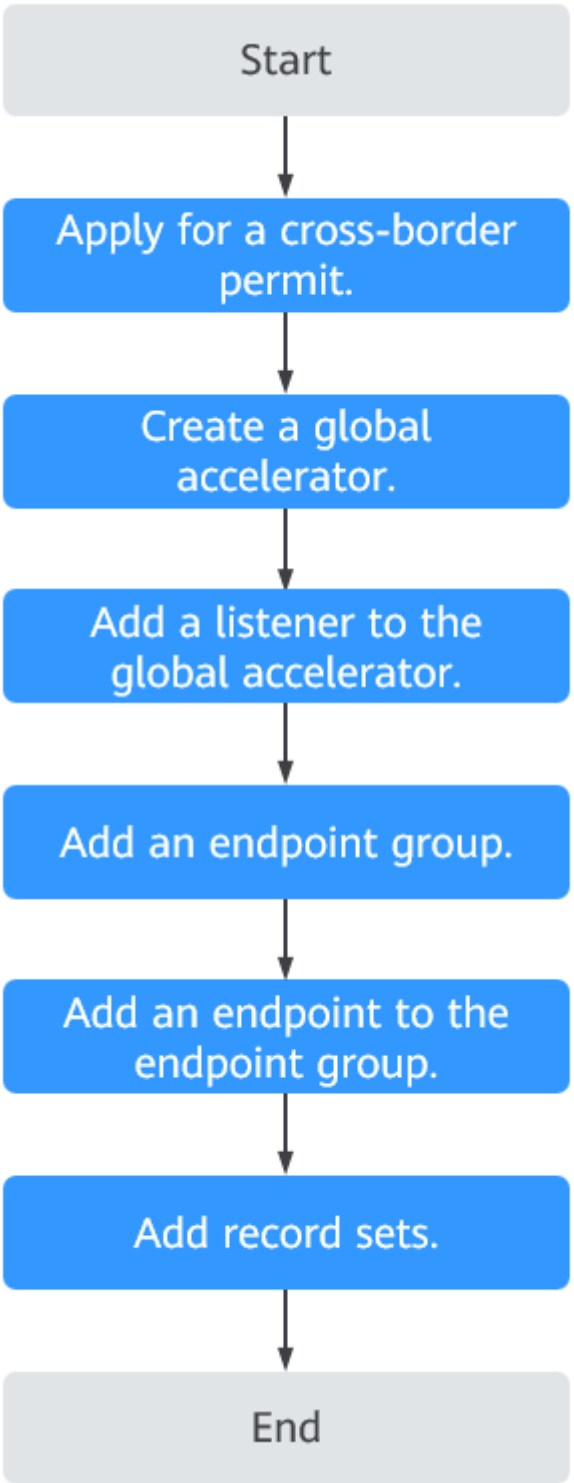
Flowchart



Step 1: Apply for a Cross-Border Permit

In accordance with the laws and administrative regulations of the Ministry of Industry and Information Technology (MIIT) of the People's Republic of China,

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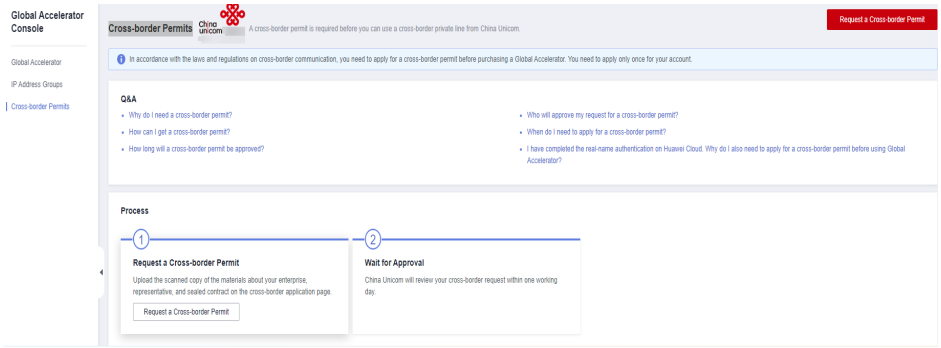
only China Mobile, China Telecom, and China Unicom are allowed for cross-border network communications, and a cross-border permit is required if you carry out business activities outside the Chinese mainland.

1. Log in to the **Cross-border Permits** page.
2. Click **Request a Cross-Border Permit**.

   The **Cross-Border Service Application System** page is displayed.

Figure 3-1 Applying for a cross-border permit



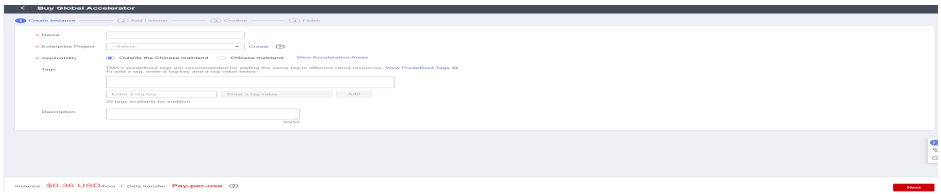
3. On the application page, set related parameters and upload related materials.
4. Click **Submit**.

Step 2: Buy a Global Accelerator

To use Global Accelerator for faster access, you first need to create a global accelerator.

1. Log in to the **Global Accelerator console**.
2. On the **Global Accelerator** page, click **Buy Global Accelerator**.

Figure 3-2 Buying a global accelerator



3. Set parameters. Select **Outside the Chinese mainland** for **Applicability**. For other parameters, see **Table 3-2**.

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Figure 3-3 Creating a global accelerator

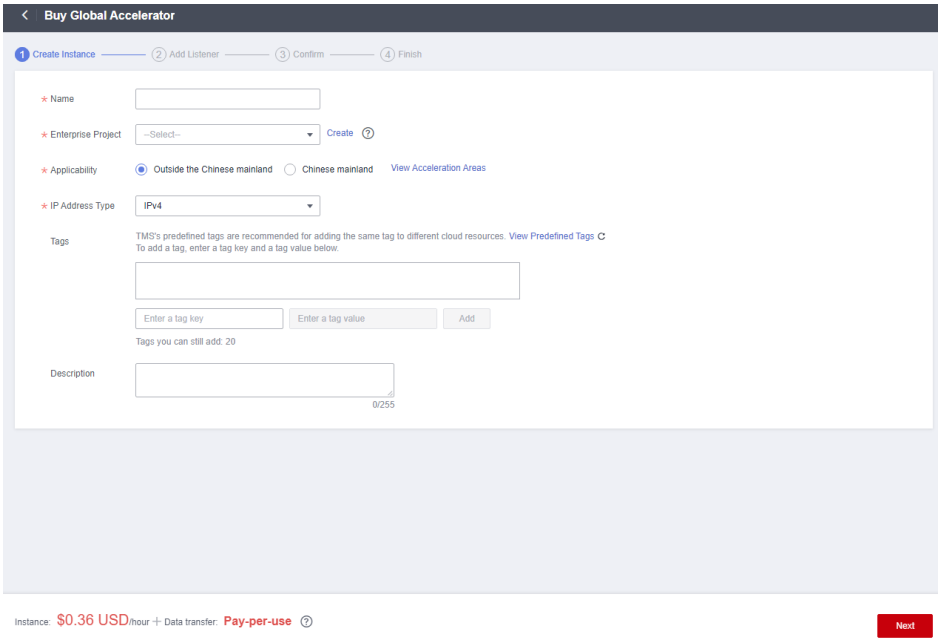

Table 3-2 Parameters for configuring a global accelerator

Parameter	Description
Name	Name of the global accelerator you want to create. Only letters, digits, and hyphens are allowed. You can enter up to 64 characters.
Enterprise Project	An enterprise project you would like to use to centrally manage your Global Accelerator resources. You can use an existing enterprise project or create one.
Applicability	Where the global accelerator will be used. There are two options: **Outside the Chinese mainland** or **Chinese mainland**. **Outside the Chinese mainland** is selected by default. **Outside the Chinese mainland** is recommended for this practice.
IP Address Type	The type of the IP address used by the global accelerator. If you select **Chinese mainland** for **Applicability**, you can select **IPv4** or **IPv4+IPv6**. Default value: **IPv4**.

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Parameter	Description
Tags	An identifier of the global accelerator. Each tag consists of a key and a value. You can add 20 tags for a global accelerator. **NOTE** If a predefined tag has been created in TMS, you can select the corresponding tag key and value. For details about predefined tags, see **Predefined Tag Overview**. If you have configured tag policies for Global Accelerator, you need to add tags to your accelerators based on the tag policies. If you add a tag that does not comply with the tag policies, global accelerators may fail to be created. Contact the administrator to learn more about tag policies.
Description	Supplementary information about the global accelerator. You can enter up to 255 characters.

4. Click **Next**.

Step 3: Add a Listener to the Global Accelerator

Add a listener to the global accelerator to route requests across endpoints based on the client affinity you set.

Configure the parameters as described in **Table 3-3**.

Figure 3-4 Adding a listener

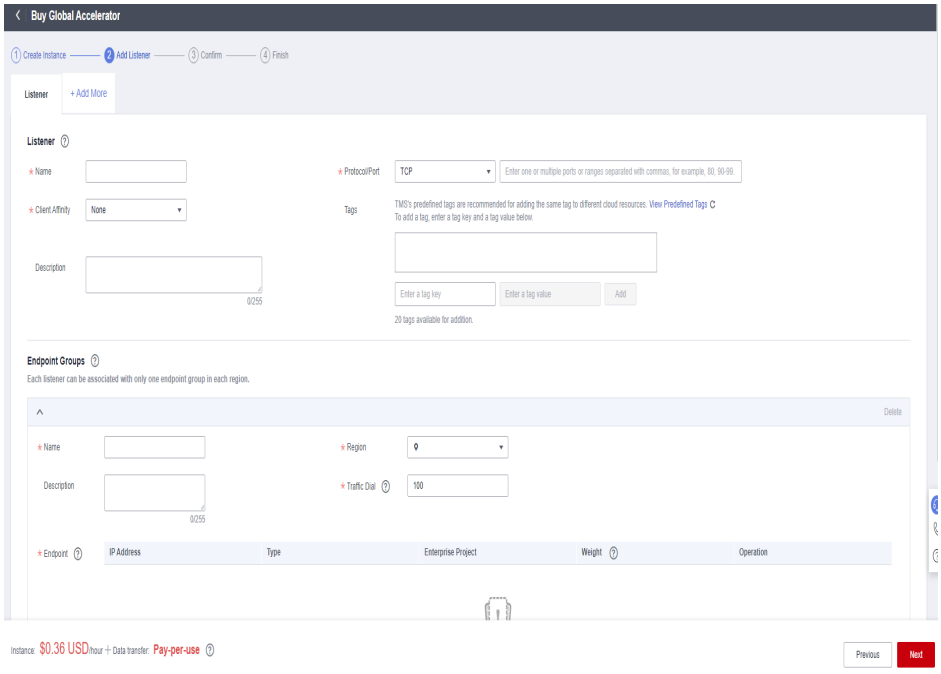

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Table 3-3 Parameters for configuring a listener

Parameter	Description
Name	Listener name. Only letters, digits, and hyphens are allowed. You can enter up to 64 characters.
Protocol	The protocol used by the listener to receive requests from clients. The protocol can be TCP or UDP.
Port	The ports or port ranges used by the listener to receive requests from clients. The port number ranges from 1 to 65535. You can enter one or more ports or port ranges separated by commas (,). Example: 1-10,11-50,51,52-200
Client Affinity	How requests are routed. There are two options: **None**: The listener routes requests evenly among the endpoints in the endpoint group. **Source IP address** (only for TCP and UDP listeners): The source IP address of each request is calculated using the consistent hashing algorithm to obtain a unique hash key, and all the endpoints are numbered and mapped to the hash keys. Requests from the same IP address are forwarded to the same endpoint for processing.
Tags	An identifier of the listener. Each tag consists of a key and a value. You can add up to 20 tags to a listener. **NOTE** If a predefined tag has been created in TMS, you can select the corresponding tag key and value. For details about predefined tags, see **Predefined Tag Overview**. If you have configured tag policies for Global Accelerator, you need to add tags to your listeners based on the tag policies. If you add a tag that does not comply with the tag policies, listeners may fail to be created. Contact the administrator to learn more about tag policies.
Description	Supplementary information about the listener. You can enter up to 255 characters.

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Step 4: Associate an Endpoint Group with the Listener

Associate an endpoint group with the listener. Select the region (**CN East-Shanghai1**) nearest to your web server and add an endpoint to this endpoint group as instructed by **Table 3-4**.

Table 3-4 Parameters for configuring the endpoint group and endpoint

Item	Parameter	Description
Endpoint group	Name	Name of the endpoint group. Each listener can be associated with only one endpoint group in a given region. Only letters, digits, and hyphens are allowed. You can enter up to 64 characters.
	Region	Region where the endpoint group is used. Select **CN East-Shanghai1** for this practice.
	Description	Supplementary information about the endpoint group. You can enter up to 255 characters.
	Traffic Dial	The percentage of traffic directed to the endpoint group. If you increase the traffic dial, more requests will be distributed to this endpoint group. The value ranges from 0 to 100. If you set the traffic dial to 0, no requests will be distributed to this endpoint group. **NOTE** If a listener has multiple endpoint groups, traffic will be first distributed to the endpoint group with the lowest latency and then to other endpoint groups based on the traffic dial value you set.
	Endpoint	A single point of contact for clients. Global Accelerator distributes incoming traffic across healthy endpoints. Select the public IP address the domain name of your on-premises server.

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Item	Parameter	Description
Health Check	Health Check	Whether to enable health check. If you disable health check, requests may be forwarded to unhealthy endpoints.
	Protocol	The health check protocol can be TCP. Default value: **TCP**.
	Port	The port used for health check. The port number ranges from 1 to 65535.
	Advanced Settings	
	Interval (s)	The maximum time between two consecutive health checks, in seconds. The interval ranges from 1 to 60.
	Timeout (s)	The maximum time required for waiting for a response to a health check request, in seconds. The timeout ranges from 1 to 60.
	Maximum Retries	The maximum number of health check retries allowed. The value ranges from 1 to 10.

Step 5: Add Record Sets

Add record sets to map your domain name to the anycast IP address of the global accelerator or the public IP address bound to your web server deployed in the on-premises data center.

This section uses Huawei Cloud DNS as an example.

1. Go to the **Public Zones** page.
2. On the **Public Zones** page, click the target domain name.
   The **Record Sets** page is displayed.
3. In the upper right corner of the page, click **Add Record Set**.
4. On **Add Record Set** page, add three record sets as instructed by **Table 3-5**.

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Figure 3-5 Adding an A record set

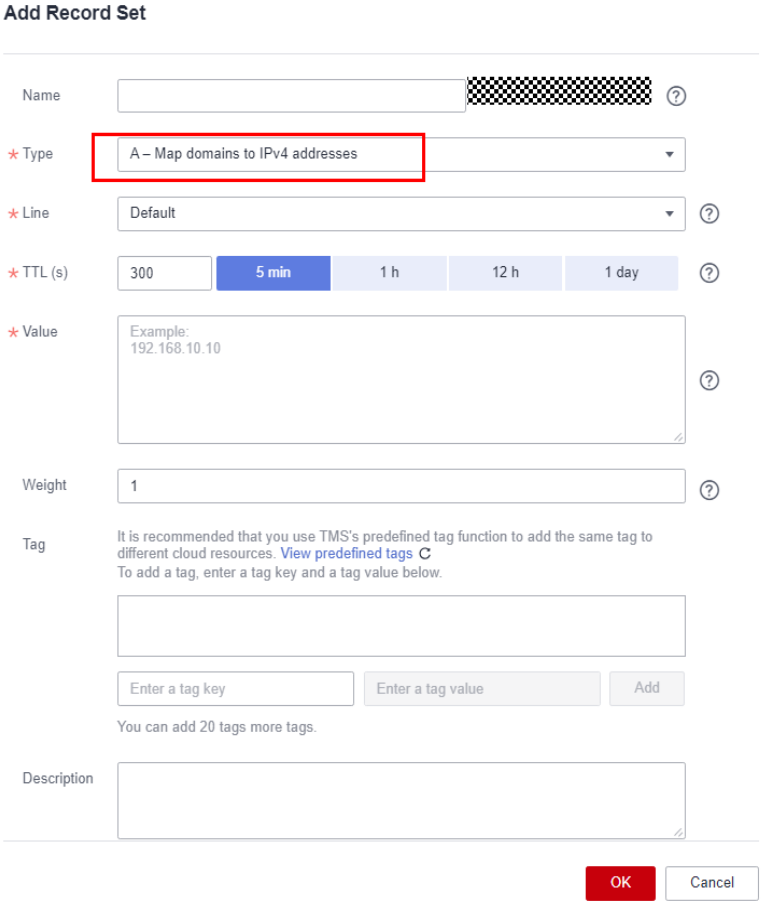

Table 3-5 Parameters for configuring an A record set

Parameter	Description
Name	Prefix of the domain name to be resolved. For example, if the domain name is **example.com**, the prefix can be as follows: • **www**: The domain name is www.example.com, which is usually used for a website. • Left blank: The domain name is example.com. The **Name** field cannot be set to an at sign (@). Just leave it blank. • *: The domain name is *.example.com, which is a wildcard domain name, indicating all subdomains of example.com.
Type	Type of the record set. Select **A – Map domains to IPv4 addresses** for this practice.

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Parameter	Description
Line	Resolution line. The DNS server will return the IP address of the specified line, depending on where end users come from. Select **Default**, **Region** > **Chinese Mainland**, and **Region** > **Global** for the three record sets, respectively.
TTL (s)	Cache duration of the record set on a local DNS server, in seconds. The value ranges from 1 to 2147483647, and the default value is 300. If your service address changes frequently, set TTL to a smaller value. Retain the default value for this practice.
Value	IPv4 addresses mapped to the domain name. Set different values for the three record sets: • If **Line** is set to **Default** or **Chinese Mainland**, set the value to the public IP address of your web server. • If **Line** is set to **Global**, set the value to the anycast IP address of the global accelerator.
Weight	(Optional) Weight of a record set. The value ranges from 0 to 1000, and the default value is 1. Retain the default value for this practice.
Tags	(Optional) Identifier of a record set. Each tag contains a key and a value. You can add a maximum of 10 tags to a record set.
Description	(Optional) Supplementary information about the record set. You can enter a maximum of 255 characters.

5. Click **OK**.
6. Switch back to the **Record Sets** tab.

   View the record sets you have added and ensure that their status is **Normal**.

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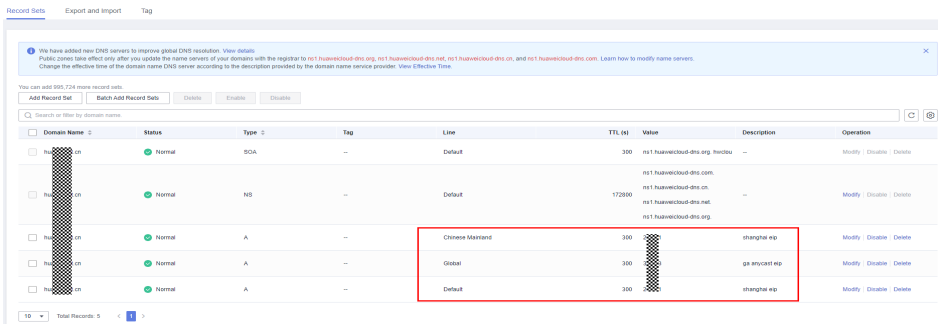

Verifying Acceleration

The listener uses TCP to receive requests from clients, so you can run the **curl** command to verify whether the access is accelerated. Run the **curl** command before and after you configure Global Accelerator and compare the values of **time_connect**.

1. Before you configure Global Accelerator, run the following command on a server in the area where acceleration is required:
   ```
   curl -o /dev/null -s -w "time_connect: %{time_connect}\ntime_starttransfer: %{time_starttransfer}\ntime_total: %{time_total}\n" "http[s]://<IP>[:<Port>]"
   ```

   NOTE

   - **IP**: public IP address bound to your web server deployed in the on-premises data center.
   - **Port**: HTTP port number used by the web server.
   - **time_connect**: time taken to establish a connection, in seconds. It is from the time when a TCP connection request is initiated to the time when the connection is established.
   - **time_starttransfer**: time when transfer starts, in seconds. It is from the time when the client sends a request to the time when the endpoint replies with the first byte.
   - **time_total**: total connection time, in seconds. It is from the time when the client sends a request to the time when the endpoint responds to the request.

2. After you configure Global Accelerator, run the following command:
   ```
   curl -o /dev/null -s -w "time_connect: %{time_connect}\ntime_starttransfer: %{time_starttransfer}\ntime_total: %{time_total}\n" "http[s]://<IP>[:<Port>]"
   ```

   NOTE

   Set **IP** in the command to the anycast IP address provided by Global Accelerator.

3. Compare the values of **time_connect** and view the latency before and after acceleration.

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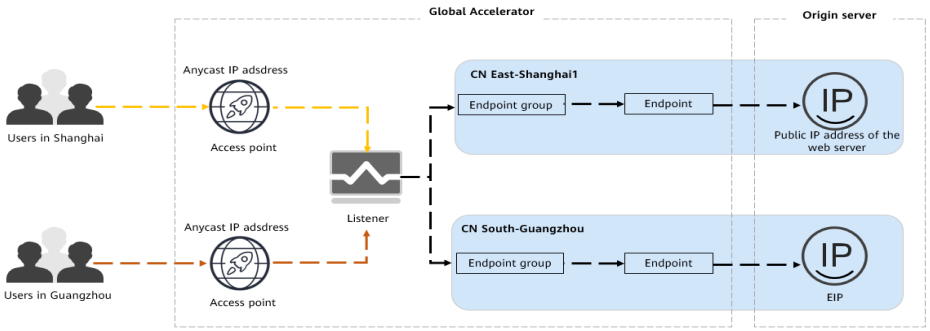
4 Using Global Accelerator to Accelerate Communications Between Cloud and On-Premises Servers and Implement Multi-active DR

Overview

Application scenario: Suppose you have a web server deployed in your on-premises data center in the Chinese mainland and you want to deploy your services in one or more regions on Huawei Cloud for multi-active DR.

Solution architecture: To achieve multi-active DR, you can deploy your services both in on-premises data center and on the cloud (CN South-Guangzhou region). And also you can use Global Accelerator to speed up access while keeping services highly reliable.



Resource and Cost Planning

The following table describes the planned resources.

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Table 4-1 Resource and cost planning

Resource	Description	Quantity	Price
Global accelerator	You are charged based on how long each global accelerator is retained in your account. The smallest billing unit is one hour. Partial hours are counted as full hours. Global accelerator price = Unit price x Required duration	1	For details, see **Global Accelerator Pricing Details**.
Data transfer	You are charged for either the inbound or outbound traffic, in GB, whichever direction has more traffic. Data transfer price = Unit price x Traffic used	Per actual use	
Record sets added to the public zone	Add an A record set with **Line** set to **Default** and **Value** set to the anycast IP address of the global accelerator.	1	Free

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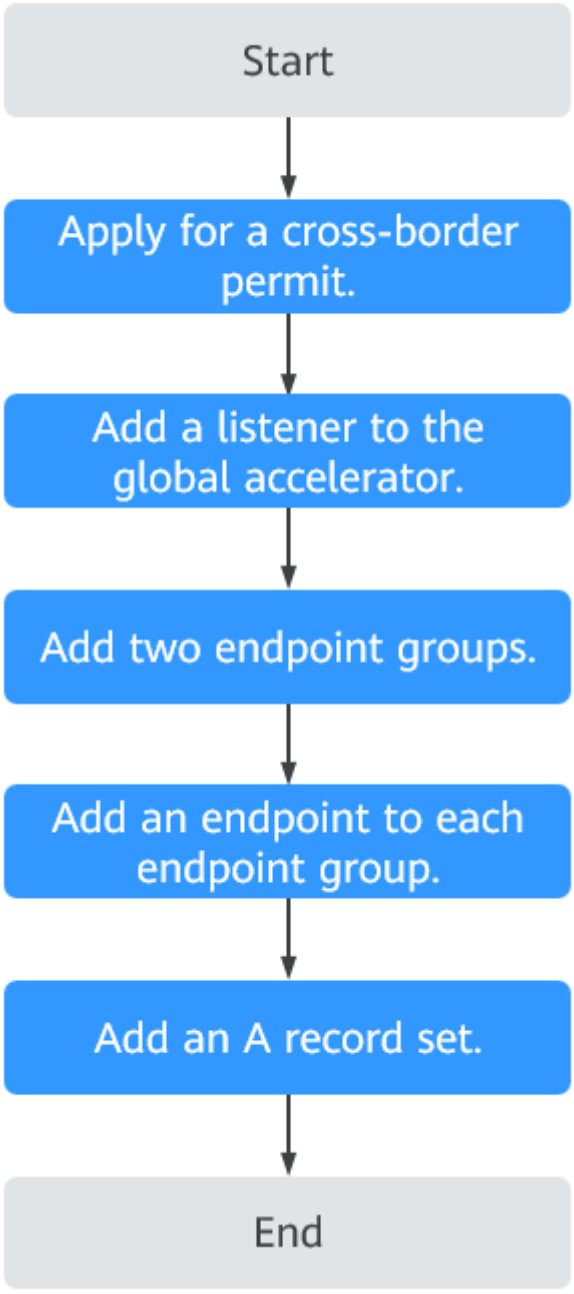
Flowchart



Step 1: Buy a Global Accelerator

To use Global Accelerator for faster access, you first need to create a global accelerator.

1. Log in to the **Global Accelerator console**.
2. On the **Global Accelerator** page, click **Buy Global Accelerator**.

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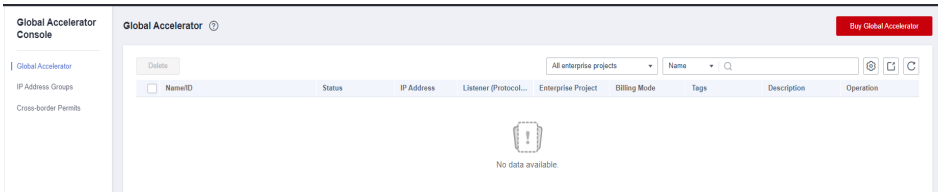
Figure 4-1 Creating a global accelerator



3. Configure the parameters. For details, see **Table 4-2**.

Figure 4-2 Creating a global accelerator

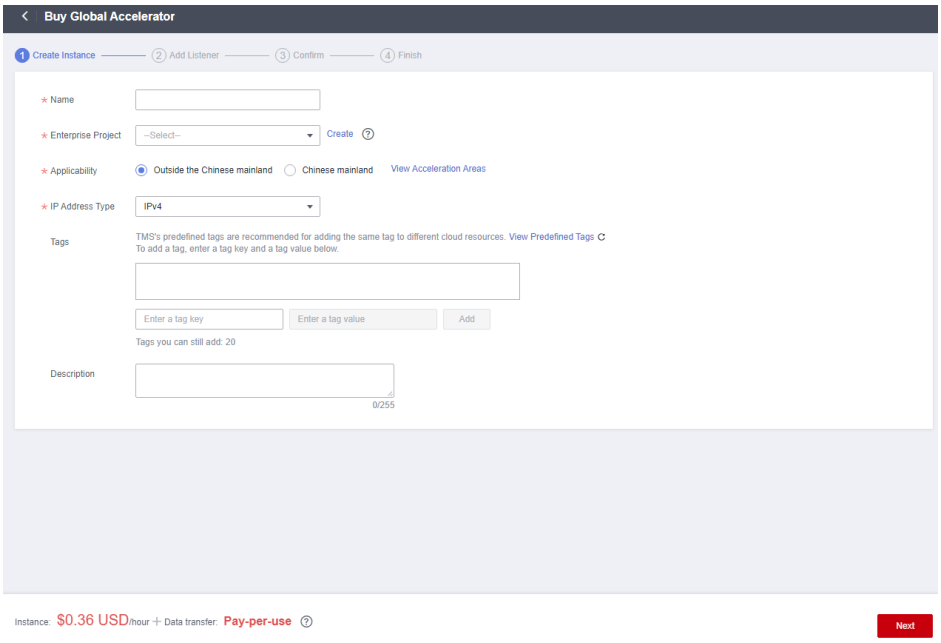


Table 4-2 Parameters for configuring a global accelerator

Parameter	Description
Name	Name of the global accelerator you want to create. Only letters, digits, and hyphens are allowed. You can enter up to 64 characters.
Enterprise Project	An enterprise project you would like to use to centrally manage your Global Accelerator resources. You can use an existing enterprise project or create one.
Applicability	Where the global accelerator will be used. There are two options: **Outside the Chinese mainland** or **Chinese mainland**. **Outside the Chinese mainland** is selected by default. **Chinese mainland** is recommended for this practice.

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Parameter	Description
IP Address Type	The type of the IP address used by the global accelerator. If you select **Chinese mainland** for **Applicability**, you can select **IPv4** or **IPv4+IPv6**. Default value: **IPv4**.
Tags	An identifier of the global accelerator. Each tag consists of a key and a value. You can add 20 tags for a global accelerator. **NOTE** If a predefined tag has been created in TMS, you can select the corresponding tag key and value. For details about predefined tags, see **Predefined Tag Overview**. If you have configured tag policies for Global Accelerator, you need to add tags to your accelerators based on the tag policies. If you add a tag that does not comply with the tag policies, global accelerators may fail to be created. Contact the administrator to learn more about tag policies.
Description	Supplementary information about the global accelerator. You can enter up to 255 characters.

4. Click **Next**.

Step 2: Add a Listener to the Global Accelerator

Add a listener to the global accelerator to route requests across endpoints based on the client affinity you set.

Configure the parameters as described in **Table 4-3**.

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Figure 4-3 Adding a listener

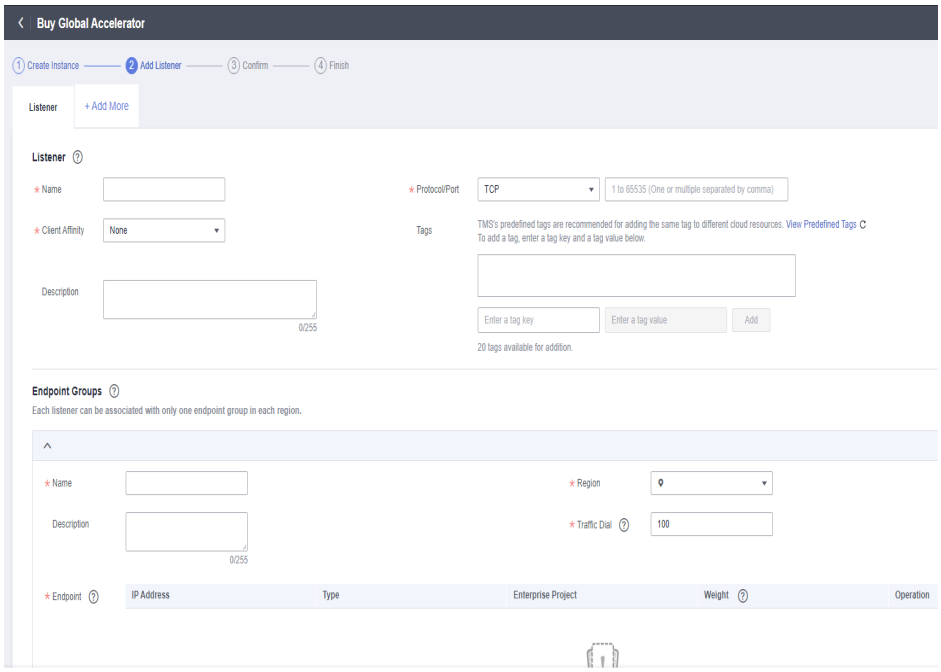

Table 4-3 Adding a listener

Parameter	Description
Name	Listener name. Only letters, digits, and hyphens are allowed. You can enter up to 64 characters.
Protocol	The protocol used by the listener to receive requests from clients. The protocol can be TCP or UDP.
Port	The ports or port ranges used by the listener to receive requests from clients. The port number ranges from 1 to 65535. You can enter one or more ports or port ranges separated by commas (,). Example: 1-10,11-50,51,52-200
Client Affinity	How requests are routed. There are two options: **None**: The listener routes requests evenly among the endpoints in the endpoint group. **Source IP address** (only for TCP and UDP listeners): The source IP address of each request is calculated using the consistent hashing algorithm to obtain a unique hash key, and all the endpoints are numbered and mapped to the hash keys. Requests from the same IP address are forwarded to the same endpoint for processing.

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Parameter	Description
Tags	An identifier of the listener. Each tag consists of a key and a value. You can add up to 20 tags to a listener. **NOTE** If a predefined tag has been created in TMS, you can select the corresponding tag key and value. For details about predefined tags, see **Predefined Tag Overview**. If you have configured tag policies for Global Accelerator, you need to add tags to listeners based on the tag policies. If you add a tag that does not comply with the tag policies, listeners may fail to be created. Contact the administrator to learn more about tag policies.
Description	Supplementary information about the listener. You can enter up to 255 characters.

Step 3: Associate Two Endpoints Group with the Listener

Associate two endpoint groups with the listener, one in CN East-Shanghai1 and the other in CN South-Guangzhou. For details, see **Table 4-4**.

Table 4-4 Parameters for configuring the endpoint groups and endpoints

Item	Parameter	Description
Endpoint group	Name	Name of the endpoint group. Each listener can be associated with only one endpoint group in a given region. Only letters, digits, and hyphens are allowed. You can enter up to 64 characters.
	Region	Region where the endpoint group is used. **Add one endpoint group in CN East-Shanghai1 and one in CN South-Guangzhou.**
	Description	Supplementary information about the endpoint group. You can enter up to 255 characters.

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Item	Parameter	Description
	Traffic Dial	The percentage of traffic directed to each endpoint group. If you increase the traffic dial, more requests will be distributed to this endpoint group. The value ranges from 0 to 100. If you set the traffic dial to 0, no requests will be distributed to this endpoint group. **Set the traffic dial of both endpoint groups to 100.** **NOTE** If a listener has multiple endpoint groups, traffic will be first distributed to the endpoint group with the lowest latency and then to other endpoint groups based on the traffic dial value you set.
	Endpoint	A single point of contact for clients. Global Accelerator distributes incoming traffic across healthy endpoints. **Add the public IP address of your web server to the endpoint group in CN East-Shanghai1 and the EIP to the endpoint group in CN South-Guangzhou.**
Health Check	Health Check	Whether to enable health check. If you disable health check, requests may be forwarded to unhealthy endpoints.
	Protocol	The health check protocol can be TCP. Default value: **TCP**.
	Port	The port used for health check. The port number ranges from 1 to 65535.
	Advanced Settings	
	Interval (s)	The maximum time between two consecutive health checks, in seconds. The interval ranges from **1** to **60**.

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Item	Parameter	Description
	Timeout (s)	The maximum time required for waiting for a response to a health check request, in seconds. The timeout ranges from **1** to **60**.
	Maximum Retries	The maximum number of health check retries allowed. The value ranges from **1** to **10**.

Step 4: Add a Record Set

Add an A record set to map your domain name to the anycast IP address of the global accelerator.

This section uses Huawei Cloud DNS as an example.

1. Go to the **Public Zones** page.
2. On the **Public Zones** page, click the target domain name.
   The **Record Sets** page is displayed.
3. In the upper right corner of the page, click **Add Record Set**.
4. On **Add Record Set** page, add an A record set as instructed by **Table 4-5**.

Figure 4-4 Adding an A record set

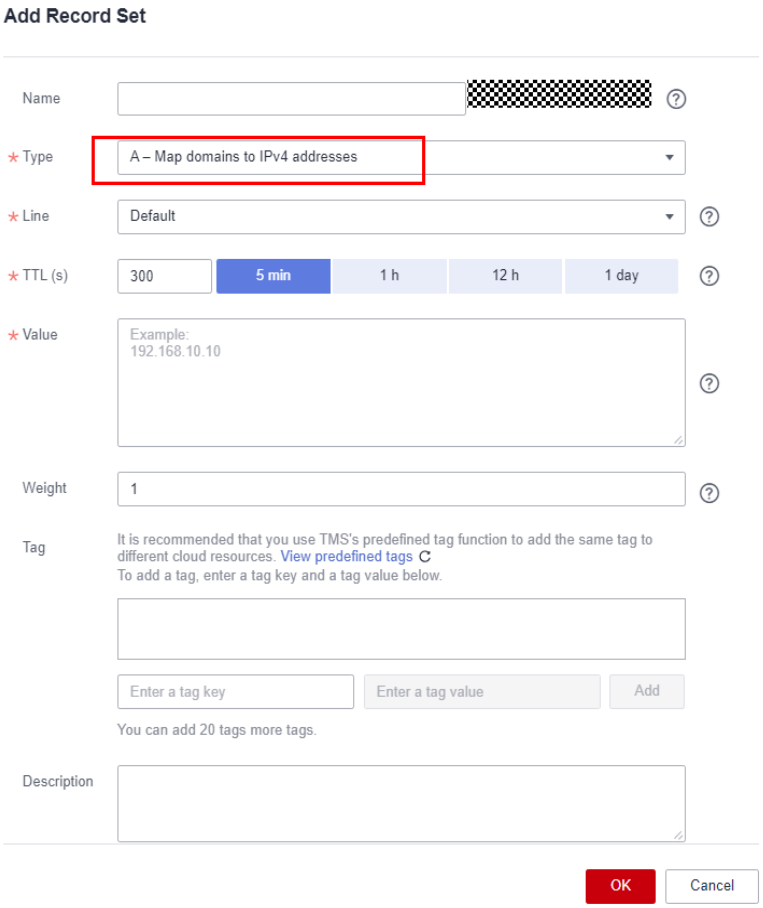

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Table 4-5 Parameters for configuring an A record set

Parameter	Description
Name	Prefix of the domain name to be resolved. For example, if the domain name is **example.com**, the prefix can be as follows: ● **www**: The domain name is www.example.com, which is usually used for a website. ● Left blank: The domain name is example.com. The **Name** field cannot be set to an at sign (@). Just leave it blank. ● ***: The domain name is *.example.com, which is a wildcard domain name, indicating all subdomains of example.com.
Type	Type of the record set. Select **A – Map domains to IPv4 addresses** for this practice.
Line	Resolution line. The DNS server will return the IP address of the specified line, depending on where end users come from. Set the value to **Default**.
TTL (s)	Cache duration of the record set on a local DNS server, in seconds. The value ranges from 1 to 2147483647, and the default value is 300. If your service address changes frequently, set TTL to a smaller value. Retain the default value for this practice.
Value	IPv4 addresses mapped to the domain name. **Set the value to the anycast IP address of the global accelerator.**
Weight	(Optional) Weight of a record set. The value ranges from 0 to 1000, and the default value is 1. Retain the default value for this practice.
Tags	(Optional) Identifier of a record set. Each tag contains a key and a value. You can add a maximum of 10 tags to a record set.
Description	(Optional) Supplementary information about the record set. You can enter a maximum of 255 characters.

5. Click **OK**.

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6. Switch back to the **Record Sets** tab.
   View the record set you have added and ensure that its status is **Normal**.

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5 Transferring the Source IP Address of a Client

Scenarios

Global Accelerator can transfer the client IP address to backend servers.

This section describes how the source IP addresses are transferred in different scenarios.

Constraints

The constraints on this feature vary by the listener's protocol.

- UDP: The client IP address cannot be transferred.
- TCP: The backend server must be configured differently depending on the endpoint type.

  For details, see the below table.

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Endpoint Type	Support for Client IP Address Transferring	Backend Server Configuration	Description
ECS	Supported	Not required (The source IP address in the packet received by the backend service is the source IP address of the client.)	• By default, Global Accelerator uses the TCP Option Address (TOA) kernel module to transfer client IP addresses to backend servers. You need to configure the TOA plug-in on each backend server to obtain the source IP addresses. For details, see **Configuring the TOA Module**. • If Proxy Protocol is enabled, the global accelerator uses it to transfer the source IP address of the client to backend servers. Ensure that Proxy Protocol is also enabled on your backend servers.
EIP		Required	
ELB			
IP address			
Custom domain name			
Custom EIP			

Transferring Client IP Addresses Using Proxy Protocol

The following uses an EIP as an endpoint to describe how to enable Proxy Protocol and view the obtained client IP addresses.

1. **Submit a service ticket** to enable Proxy Protocol.
2. Enable Proxy Protocol on the backend servers.

   To enable Proxy Protocol, add the corresponding port to either the http{} or stream{} module of Nginx.

```
http {
    #...
    server {
        listen 8080 proxy_protocol;    #Enable proxy protocol parsing on port 8080.
        #...
    }
}

stream {
    #...
    server {
        listen 8090 proxy_protocol;    #Enable proxy protocol parsing on port 8090.
        #...
    }
}
```

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3. Transfer the client IP addresses.

   After Proxy Protocol is enabled, Nginx preserves the source IP addresses of the clients in **proxy_protocol_addr**. You can save it in logs.

```
http {
    #...
    log_format  main  '[$time_local] $proxy_protocol_addr : $proxy_protocol_port $host "$request" '
    '$status $body_bytes_sent "$http_referer" '
    '"$http_user_agent" "$http_x_forwarded_for"';
}

stream {
    #...
    log_format  main  '[$time_local] $proxy_protocol_addr : $proxy_protocol_port $host "$request" '
    '$status $body_bytes_sent "$http_referer" '
    '"$http_user_agent" "$http_x_forwarded_for"';
}
```

4. Check the log to view the source IP addresses of the clients.

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