Alibaba Cloud Server Load Balancer

Log management

Issue: 20190905

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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 View operation logs

You can view the logs of operations performed on Server Load Balancer (SLB) instances, HTTP listeners, and server certificates in the past one month.

Context

Operation logs are recorded in ActionTrail. ActionTrail records the operations acted on your Alibaba Cloud resources. You can query operation records in the ActionTrail console and store the records to Object Storage Service (OSS).

Procedure

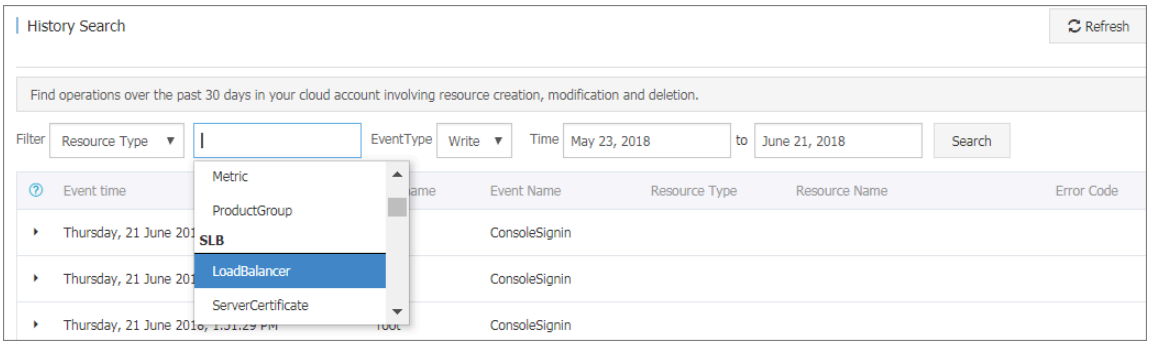
1. Log on to the SLB console.
2. In the left-side navigation pane, choose Logs > Operation Logs.
3. Click View Operation Logs.

4. On the History Search page, follow these steps to view operation logs:

   a) Select Resource Type as a filter.

   b) Select the SLB resource whose operation logs you want to view.

      In this example, select LoadBalancer.



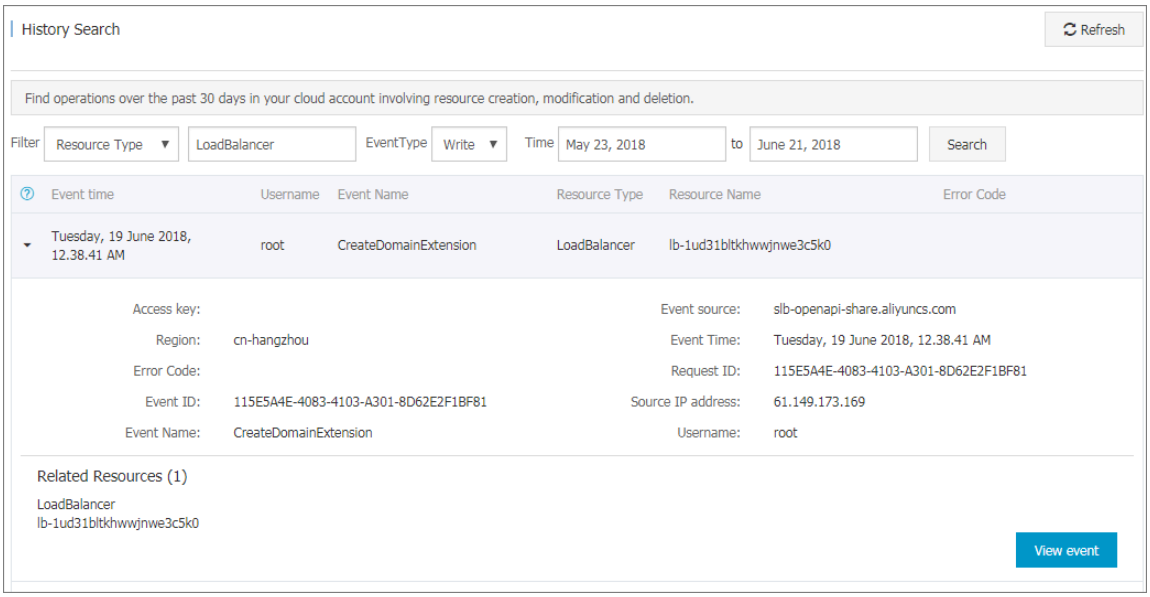
   c) Select an event type.

      In this example, select All.

   d) Select the time range to search.

   e) Click Search to view logs of operations performed on the selected resource.

      To view more details of a record, click the record.



2 Health check logs

2.1 Store health check logs

You can view the health logs of Server Load Balancer (SLB) in the past three days on the Health Check Logs page. If you want to get health check logs generated three days or longer before, you can store the health check logs to Object Storage Service (OSS) where you can also download the health check logs.

Context

You can view the health check logs of backend servers by using the health check log function of SLB. Currently, logs in the past three days are provided. If you want to view more logs, store the health check logs to OSS.

You can enable and disable the storage function at any time. After the storage function is enabled, SLB creates a folder named `AliyunSLBHealthCheckLogs` in the selected OSS bucket to store health check logs of SLB. Health check logs are generated on an hourly basis and the system automatically creates a subfolder named after the date to store the log files generated in that day, for example, `20170707`.

The log files generated in each hour of a day are named after the time when they are generated. For example, the name of a log file generated between 00:00-01:00 is `01.txt` and the name of a log file generated between 01:00-02:00 is `02.txt`.

Note:

Health check logs are generated only when the health status of a backend server is abnormal. If no failures occur to backend servers in an hour, no health check logs are generated in that hour.

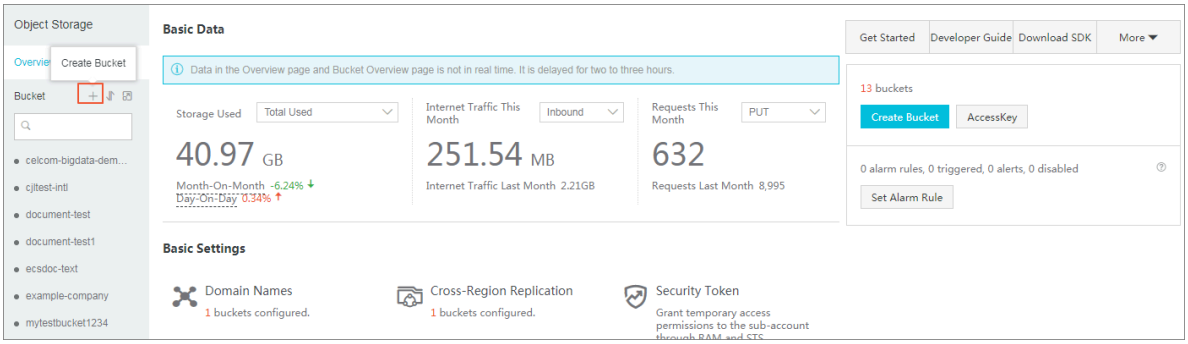
To store health check logs, follow these steps:

1. Create a bucket
2. Authorize SLB to access OSS
3. Configure log storage

Step 1 Create a bucket

1. Open the OSS product page and click Buy Now to activate the OSS service.

2. Log on to the OSS console.
3. Click Create Bucket.



4. In the Create Bucket dialog box, configure the bucket and click OK.

> **Note:**
> Make sure that the bucket and the SLB instance belong to the same region.

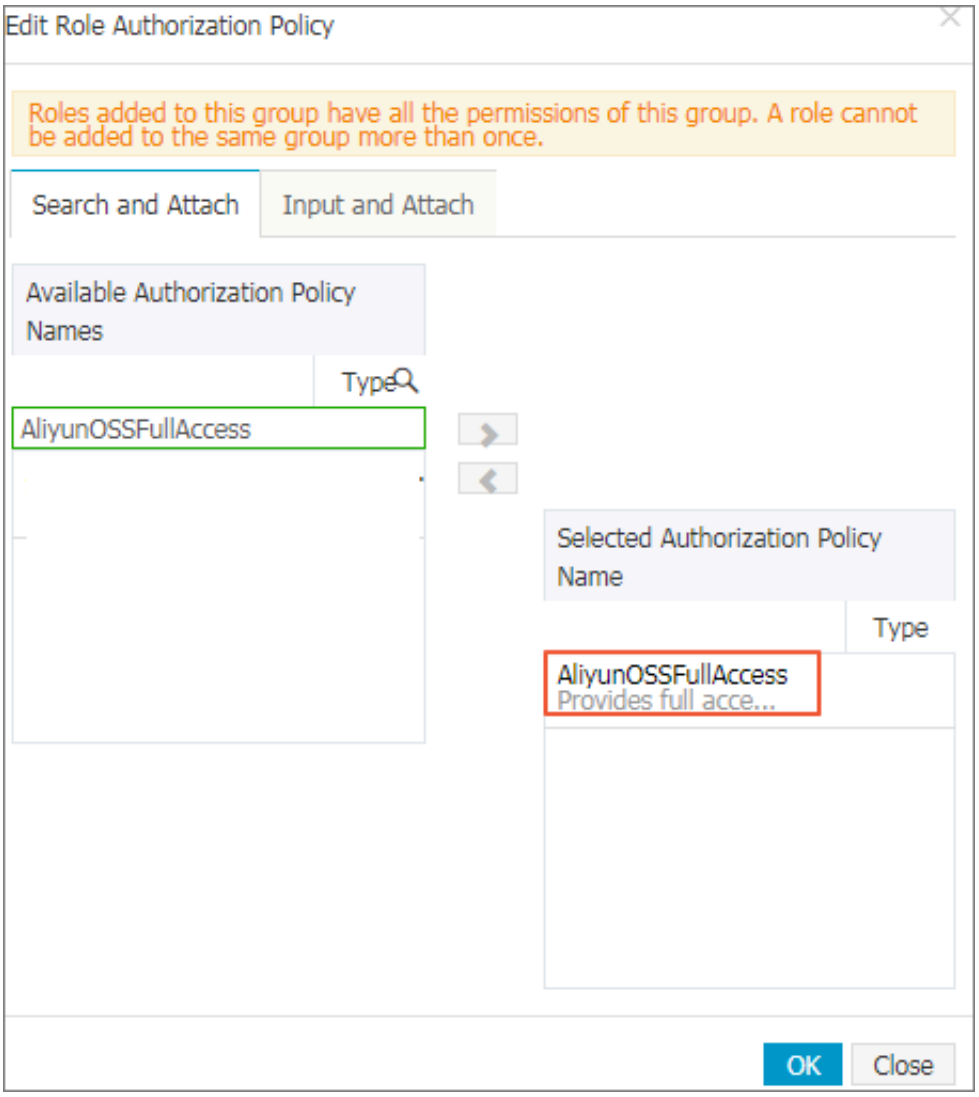
Step 2 Authorize SLB to access OSS

After creating a bucket, you must authorize the role `SLBLogDefa ultRole` to access OSS resources.

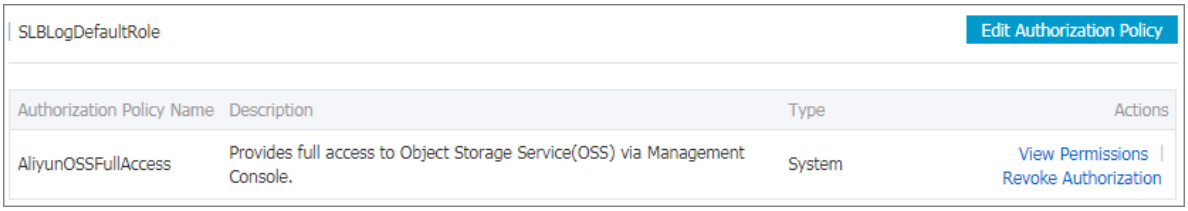
> **Notice:**
> The authorization is required only for the first time.

1. In the left-side navigation pane of the SLB console, choose Logs > Health Check Logs.
2. On the Health Check Logs page, click the Log Storage tab.
3. Click 1. Activate OSS. if OSS has not been activated yet.
4. After you activate the OSS service, return to the Health Check Logs page, click Activate Now in the 2. Authorize the required RAM role. section.
5. Read the authorization description, and then click Confirm Authorization Policy.
6. Log on to the RAM console.
7. In the left-side navigation pane, click Roles, find the role named SLBLogDefaultRole, and then click Authorize.

8. In the Edit Role Authorization Policy dialog box, find the AliyunOSSFullAccess policy, click the policy, and then click OK.



After the authorization, click the name of the role SLBLogDefaultRole, and then click the Role Authorization Policies tab to view the attached policy.



Step 3 Configure log storage

1. Log on to the Server Load Balancer console.
2. In the left-side navigation pane, choose Logs > Health Check Logs.
3. On the Health Check Logs page, click the Log Storage tab.

4. Find the target region and click Configure Log Storage.

5. In the Configure Log Storage dialog box, select a bucket to store health check logs, and then click OK.
6. Turn on the status switch to enable log storage.

2.2 View health check logs

You can view the health check logs of Server Load Balancer (SLB) instances generated in the past three days through the SLB console.

Procedure

1. Log on to the Server Load Balancer console.
2. In the left-side navigation pane, choose Logs > Health Check Logs.
3. On the Health Check Logs page, click the Logs tab.

Note:
Health check logs are generated only when the health status of a backend server is abnormal. Health check logs are generated every one hour. If no failure occurs to backend servers in an hour, no health check logs are generated in that hour.

- The `SLB_instan ce_IP : port to Added_ECS_ instance_I P : port abnormal ; cause : XXX` log message indicates that the backend server is abnormal. Troubleshoot according to the detailed error message.
- The `SLB_instan ce_IP : port to Added_ECS_ instance_I P : port normal` log message indicates that the backend server becomes normal again.

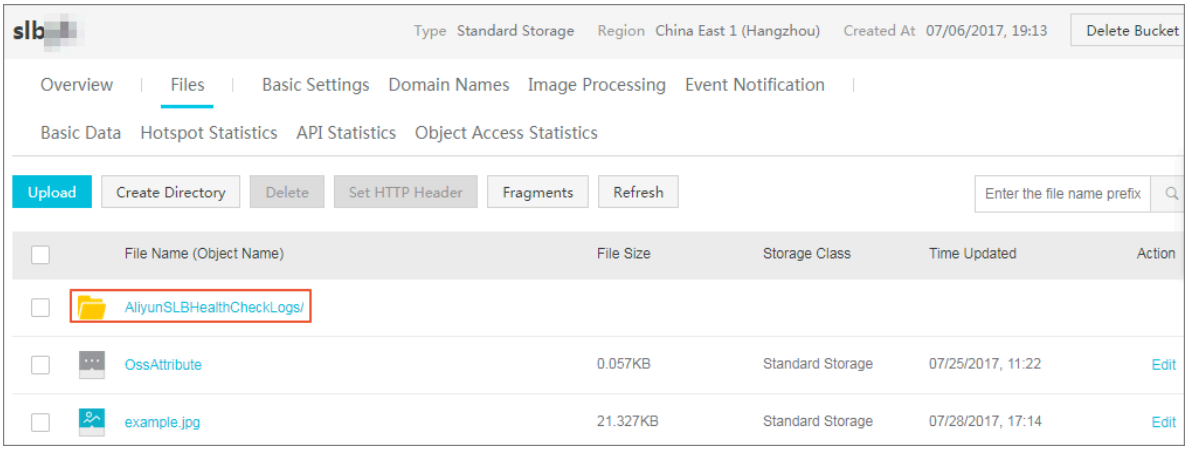
2.3 Download health check logs

You can download health check logs of Server Load Balancer (SLB) instances in the Object Storage Service (OSS) console.

Procedure

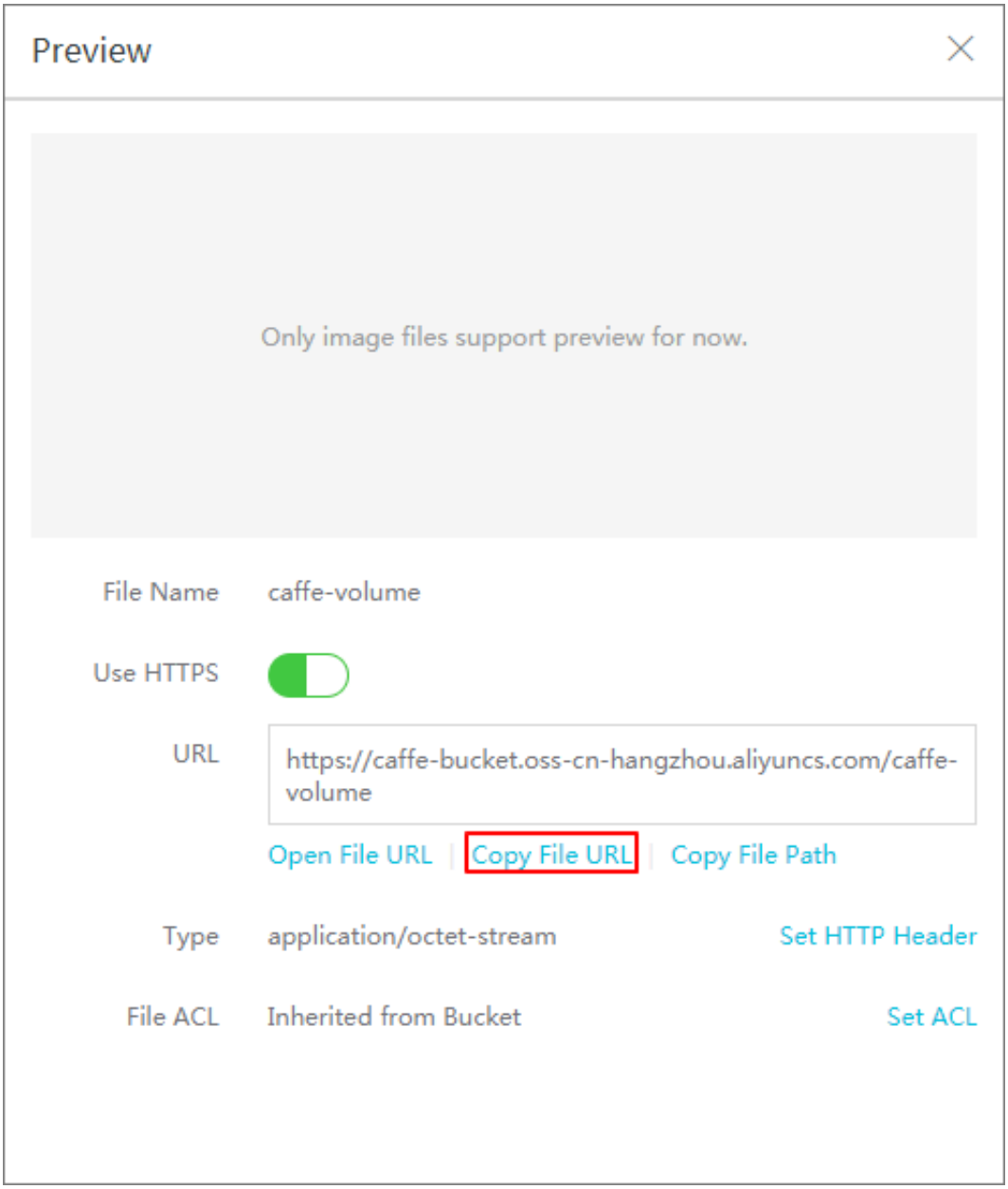
1. Log on to the OSS console.
2. On the Overview page, click the target bucket and then click Files.

3. On the Files page, click the `AliyunSLBH ealthCheck Logs /` folder.



4. Click the folder of the heath logs to download.

5. Click More of the target file. Then, click Copy File URL.



6. Enter the copied URL in the browser to download the logs.

3 Authorize a RAM user to use access logs

Before a RAM user uses the access log function, the RAM user must be authorized by the corresponding Alibaba Cloud account.

Prerequisites

The account has enabled the access log function.

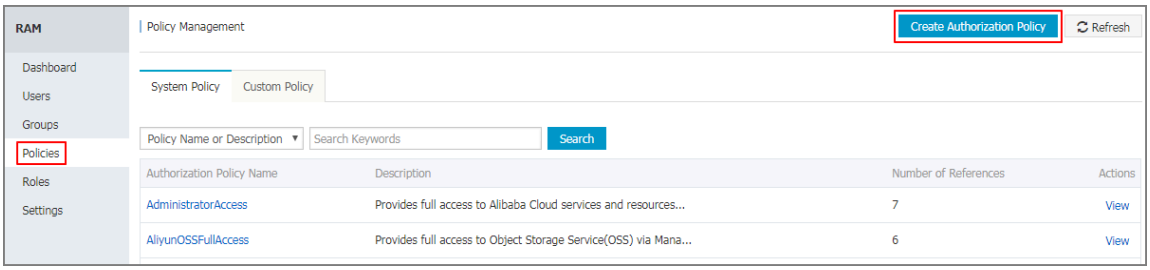
1. Log on to the RAM console by using the credentials of your account.
2. Click Roles to see whether the account has the AliyunLogArchiveRole.

   If the account does not have this role, log on to the SLB console by using the credentials of the account, select Logs > Access Logs, click Authorize. In the displayed dialog box, click Confirm Authorization Policy.

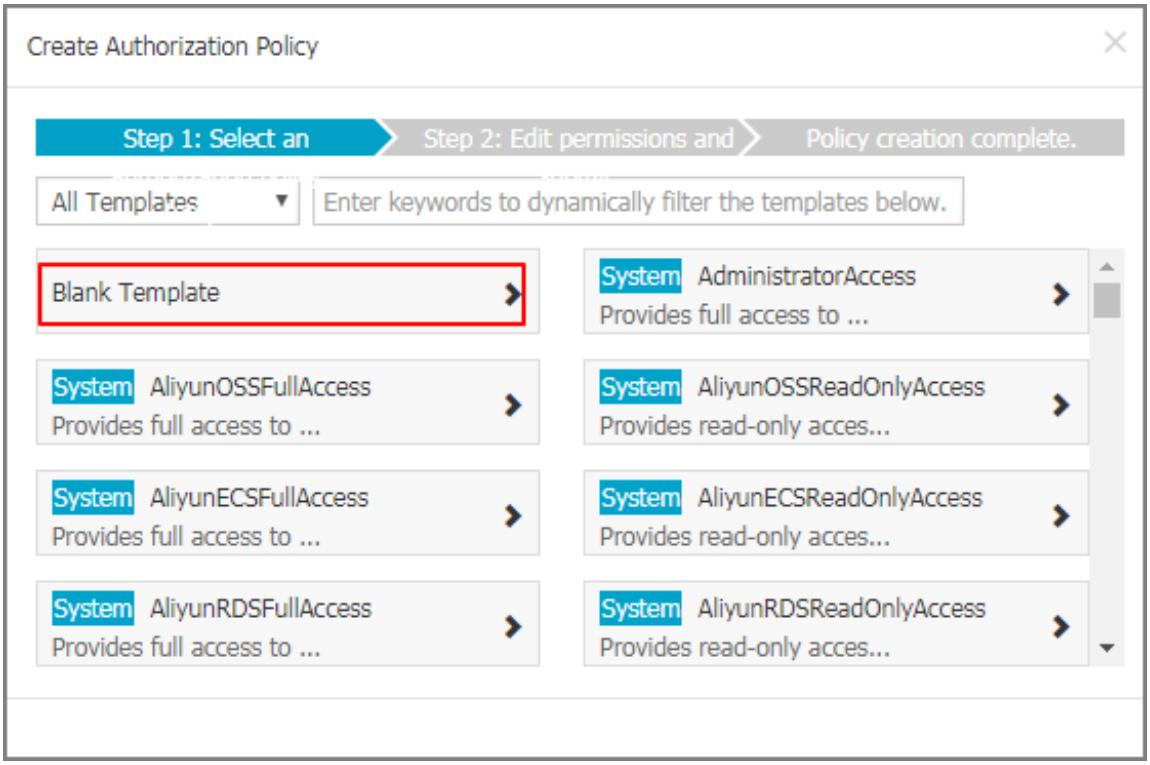
   > Note:
   > This operation is required only at the first time.

Procedure

1. Create an authorization policy:
   a) Log on to the RAM console by using the credentials of your account.
   b) In the left-side navigation pane, click Policies, and then click Create Authorization Policy.



   c) Click Blank Template.



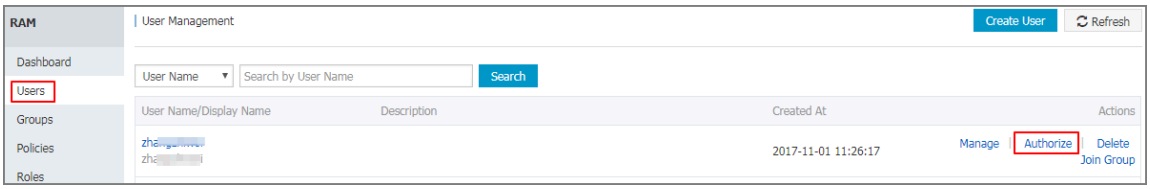
   d) Enter a policy name, such as SlbAccessLogPolicySet, and then enter the following policy. Click Create Authorization Policy.

```
{
" Statement  ":[
 {
   " Action  ":[
     " slb : Create *",
     " slb : List *"
   ],
   " Effect ": " Allow ",
   " Resource ": " acs : log :*:*: project /*"
 },
 {
   " Action ": [
     " log : Create *",
```

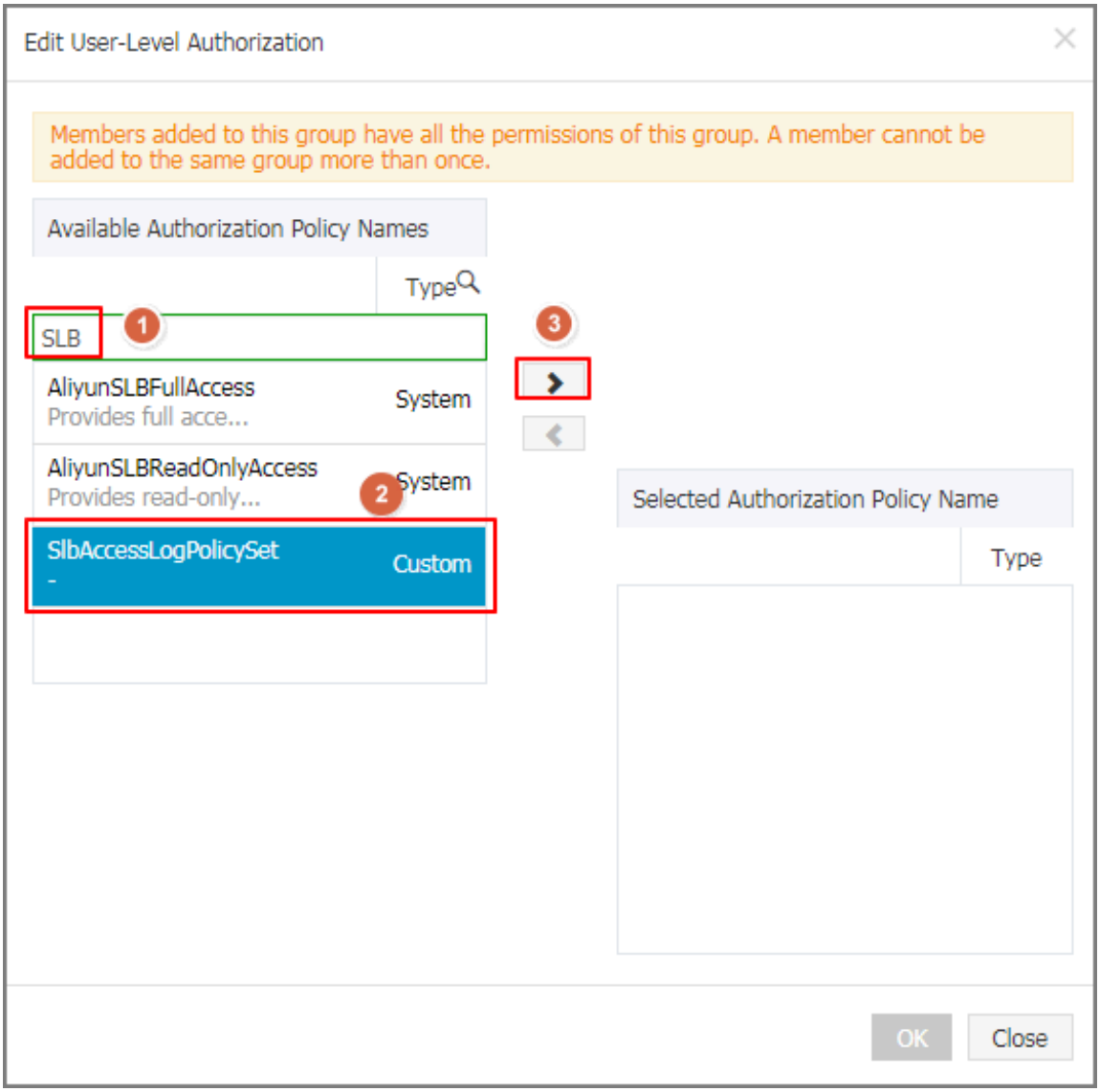
```
      " log : List *"
    ],
    " Effect ": " Allow ",
    " Resource ": " acs : log :*:*: project /*"
  },
  {
    " Action ": [
      " log : Create *",
      " log : List *",
      " log : Get *",
      " log : Update *"
    ],
    " Effect ": " Allow ",
    " Resource ": " acs : log :*:*: project /*/ logstore /*"
  },
  {
    " Action ": [
      " log : Create *",
      " log : List *",
      " log : Get *",
      " log : Update *"
    ],
    " Effect ": " Allow ",
    " Resource ": " acs : log :*:*: project /*/ dashboard /*"
  },
  {
    " Action ": " cms : QueryMetri  c *",
    " Resource ": "*",
    " Effect ": " Allow "
  },
  {
    " Action ": [
      " slb : Describe *",
      " slb : DeleteAcce  ssLogsDown  loadAttrib  ute ",
      " slb : SetAccessL  ogsDownloa  dAttribute ",
      " slb : DescribeAc  cessLogsDo  wnloadAttr  ibute "
    ],
    " Resource ": "*",
    " Effect ": " Allow "
  },
  {
    " Action ": [
      " ram : Get *",
      " ram : ListRoles "
    ],
    " Effect ": " Allow ",
    " Resource ": "*"
  }
],
" Version ": " 1 "
}
```

e) Click Close.

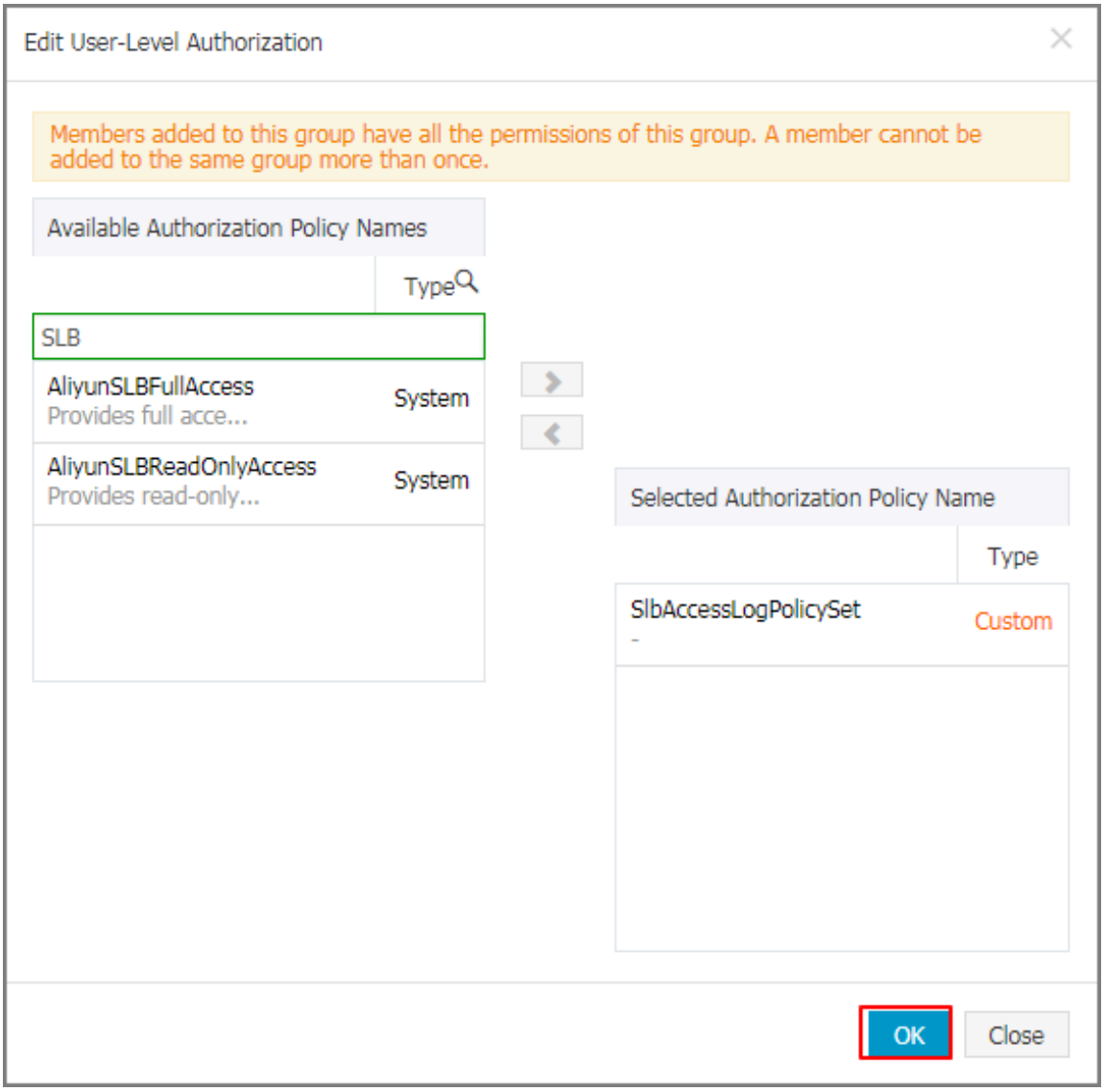
2. Attach the created policy to the RAM user:
   a) In the left-side navigation pane, click Users.
   b) Find the target RAM user (the user who uses the SLB access log function) and click Authorize.



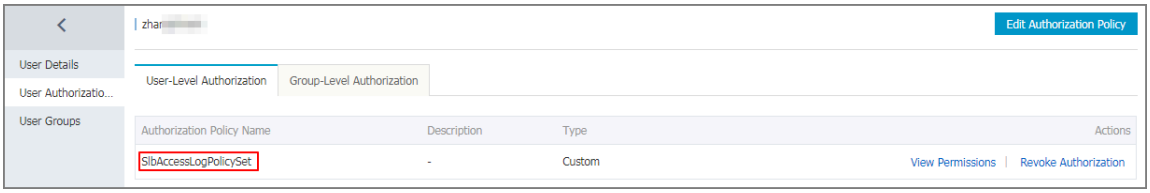
   c) Search the created authorization policy and attach the policy to the RAM user.



   d) Click OK.



e) Go back to the user details page to check whether the policy has been attached to the target RAM user.



4 Configure access logs

This topic describes how to configure access logs. By using Alibaba Cloud Log Service, you can analyze the access logs of a Server Load Balancer (SLB) instance to understand the behavior and geographical distribution of client users and troubleshoot problems.

What are access logs?

Access logs collect detailed information of all requests sent to an SLB instance, including the request time, client IP address, latency, request URL, and server response. As the entry of Internet access, SLB receives massive client requests. You can use access logs to analyze user behavior and geographical distribution, and troubleshoot problems.

After you enable the SLB access log feature, you can store access logs in the Logstore of Log Service to collect and analyze the access logs. You can also disable the access log feature at any time.

SLB access logs can be used free of charge. You only need to pay for fees incurred by the use of Log Service.

Note:

- Only Layer-7 SLB supports access logs and the access log function is available in all regions.
- Make sure that the HTTP header value does not contain `||`. Otherwise, the exported logs may be misplaced.

Benefits

The following are benefits of SLB access logs:

- Easy to use

  The access log function frees developers and maintenance staff from tedious and time-consuming log processing so that they can concentrate on business development and technical research.

- Cost-effective

  Access logs are typically massive. Processing access logs takes a lot of time and consumes a lot of resources. With Log Service, the processing of access logs is faster and cost-effective than self-built open-source solutions. Log Service can analyze one hundred million logs in one second.

- Real-time

  Scenarios such as DevOps, monitoring, and alerting require real-time log data. Traditional data storage and analysis tools cannot meet this requirement. For example, it takes a long time to ETL data to Hive where a lot of time is spent on data integration. Powered by its powerful big data computing capability, Log Service can process and analyze access logs in seconds.

- Flexible

  You can enable or disable the SLB access log feature according to the instance specification. Additionally, you can set the storage period (1 to 365 days) as needed and the Logstore's capacity is scaleable to meet increasing service demands.

Configure access logs

Before you configure access logs, make sure that:

- A Layer-7 listener is added.
- Log Service is activated.

To configure access logs, complete these steps:

1. Log on to the SLB console.
2. In the left-side navigation pane, choose Logs > Access Logs.
3. Select a region.
4. Click Authorize, and then click Confirm Authorization Policy to authorize SLB to write logs to Log Service.

   If you are a RAM user, you must obtain permissions from the corresponding account. For more information, see #unique_11.

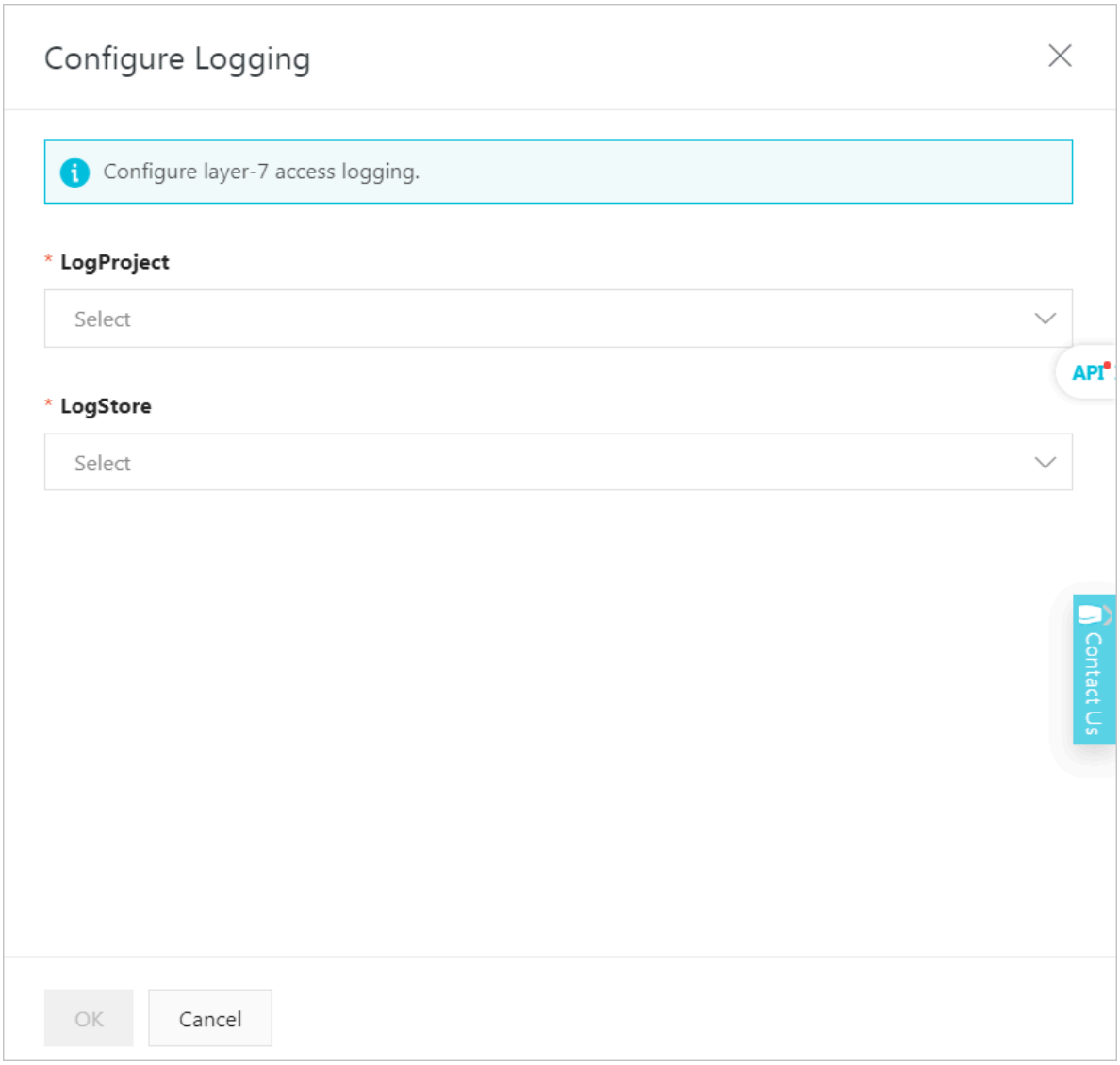
   > Note:
   > This step is required only at the first time.

5. On the Access Logs page, find the target SLB instance and click Configure Logging.

6. Select the LogProject and LogStore and then click OK.

   If there is no available LogStore, click Log Service console to create log projects.

> **Note:**
> Make sure that the name of the LogProject is globally unique and the region of the LogProject is the same as that of the SLB instance.



Search and analyze access logs

After configuring SLB access logs, you can search and view logs by using the following indexing fields.

Field	Description
body_bytes_sent	The size of HTTP body (in byte) sent to the client.
client_ip	The client IP address.

Field	Description
host	The host header in the request.
http_user_agent	The received http_user_agent header in the request.
request_length	The length of the request including startline, HTTP header, and HTTP body.
request_method	The request method.
request_time	The interval of time from when SLB receives the first request to the time when SLB returns a response.
request_uri	The URL of the received request.
Slbid	The ID of the SLB instance.
status	The status of the SLB response.
Upstream_addr	The IP address and port number of the backend server.
upstream_response_time	The interval of time from when SLB establishes a connection with the backend server to the time when SLB receives the last byte of the response.
upstream_status	The response status code of the backend server received by SLB.

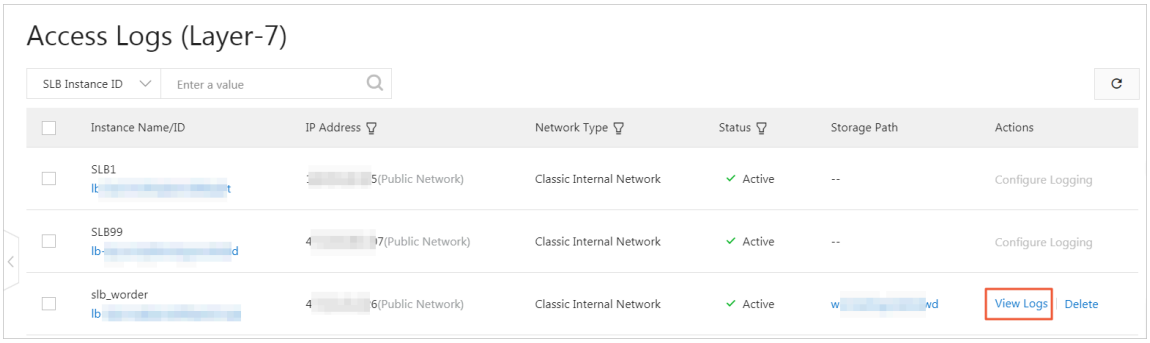
Search access logs

To search access logs, complete these steps:

1. Go to the log search page. You can navigate to the search page from the SLB console or the Log Service Console:

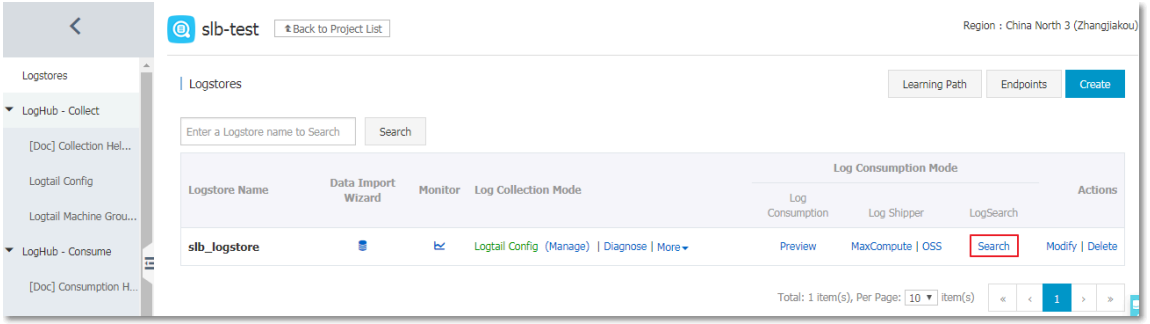
   - From the SLB console:

     On the Access Logs page, click View Logs.

   - From the Log Service Console:

     On the Logstores page, click Search of the target Logstore.

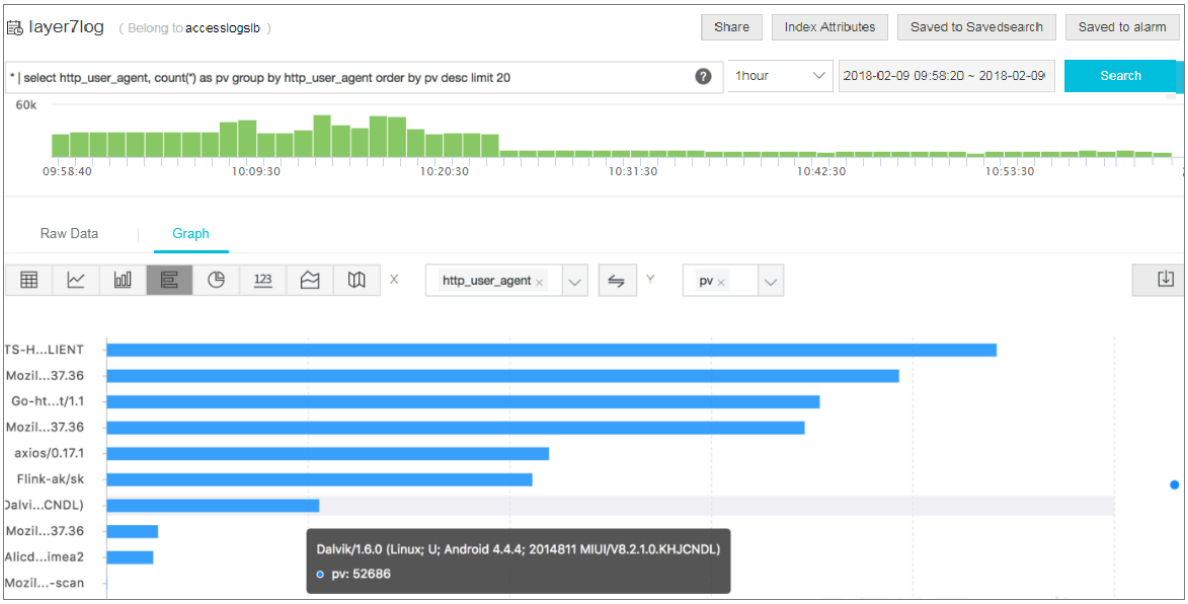
     

2. Click the target log field to view detailed information.
3. Enter an SQL statement to query access logs.

   For example, enter the following SQL statement to query the Top20 clients, which is used for analyzing the request source to assist business decision-making.

```
* | select ip_to_prov ince ( client_ip ) as client_ip_
 province , count (*) as pv group by
```

```
client_ip_ province order by pv desc limit 50
```

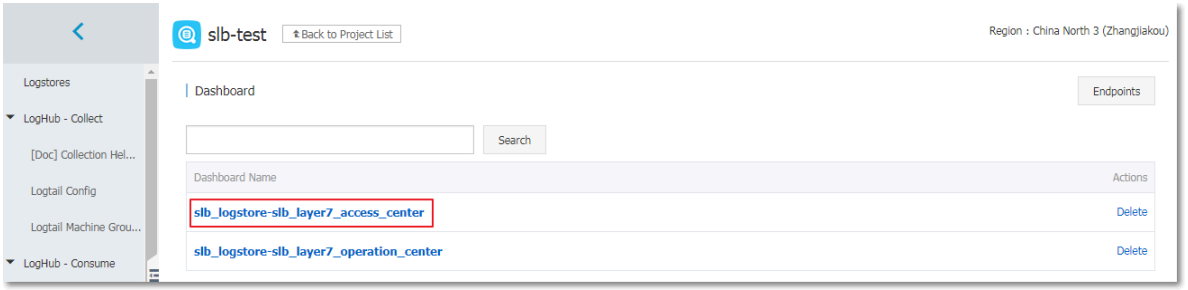


Analyze access logs

You can analyze access logs through the dashboard, which provides rich graphic information.

To analyze access logs, complete these steps:

1. In the Log Service console, click the project link of the SLB instance.
2. In the left-side navigation pane, choose LogSearch/Analytics - Query > Dashboard, and then click the name of the access log.

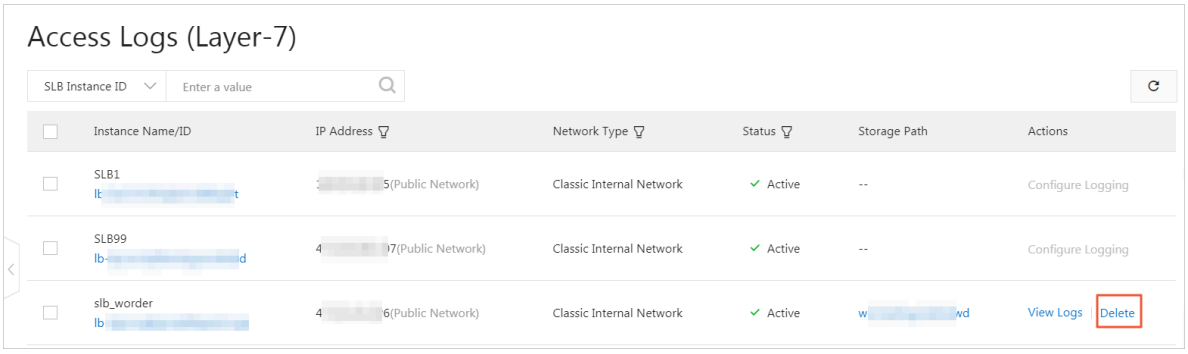


Disable the access log function

To disable the access log function, complete these steps:

1. Log on to the SLB console.
2. In the left-side navigation pane, choose Logs > Access Logs.
3. Select the region of the target SLB instance.

4. On the Access Logs page, find the target instance and click Delete.



5. In the displayed dialog box, click OK.

5 FAQ

5.1 What can I do if health checks generate an excessive number of logs?

SLB can automatically save health check logs generated in three days. If too many health check logs are generated and affect your maintenance, you can reduce health check logs or prevent certain logs from being generated through the following methods.

 Note:
If you reduce health check logs, SLB faults may be missed. Therefore, we recommend that you consider the risks of the following methods and use the methods with caution.

- Get access logs
- Adjust health check frequency
- Close Layer-7 health checks
- Change Layer-7 SLB to Layer-4 SLB
- Disable application logs on the health check page

Get access logs

HTTP health checks use the HEAD request method by default (the GET method will be supported later). Therefore, you can obtain access logs by filtering out HEAD requests.

Adjust health check frequency

You can increase the interval between two health checks to reduce the health check frequency and generated logs.

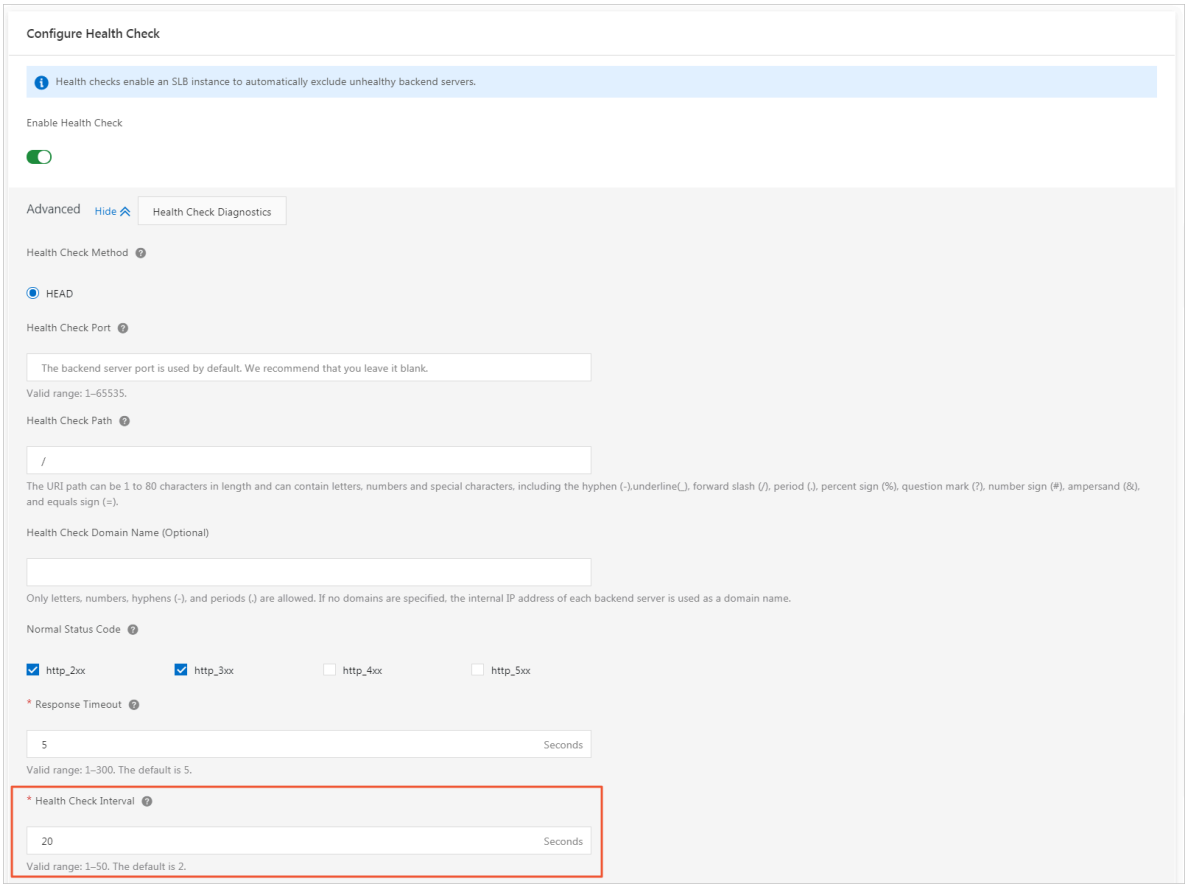
Potential risks

After you increase the interval, if a backend ECS instance fails, the time needed for SLB to detect the faulty ECS instance is increased accordingly.

Procedure

1. Log on to the SLB console.

2. On the Server Load Balancer page, click the ID of the target SLB instance.
3. Click the Listeners tab, find the target listener, and click Configure in the Actions column.
4. On the Configure Listener page, click Next and then click Next again to go to the Health Check tab.
5. Adjust the Health Check Interval. Value range: 1 to 50. Unit: seconds. The greater the interval is, the lower the health check frequency is, and the fewer logs are generated by backend servers. Modify the interval according to your actual situation.



6. Click OK.

Close Layer-7 health checks

When Layer-7 (HTTP or HTTPS) SLB is used, health checks are performed through HTTP HEAD requests. Application logs of backend servers record the health check requests, leading to a large number of logs.

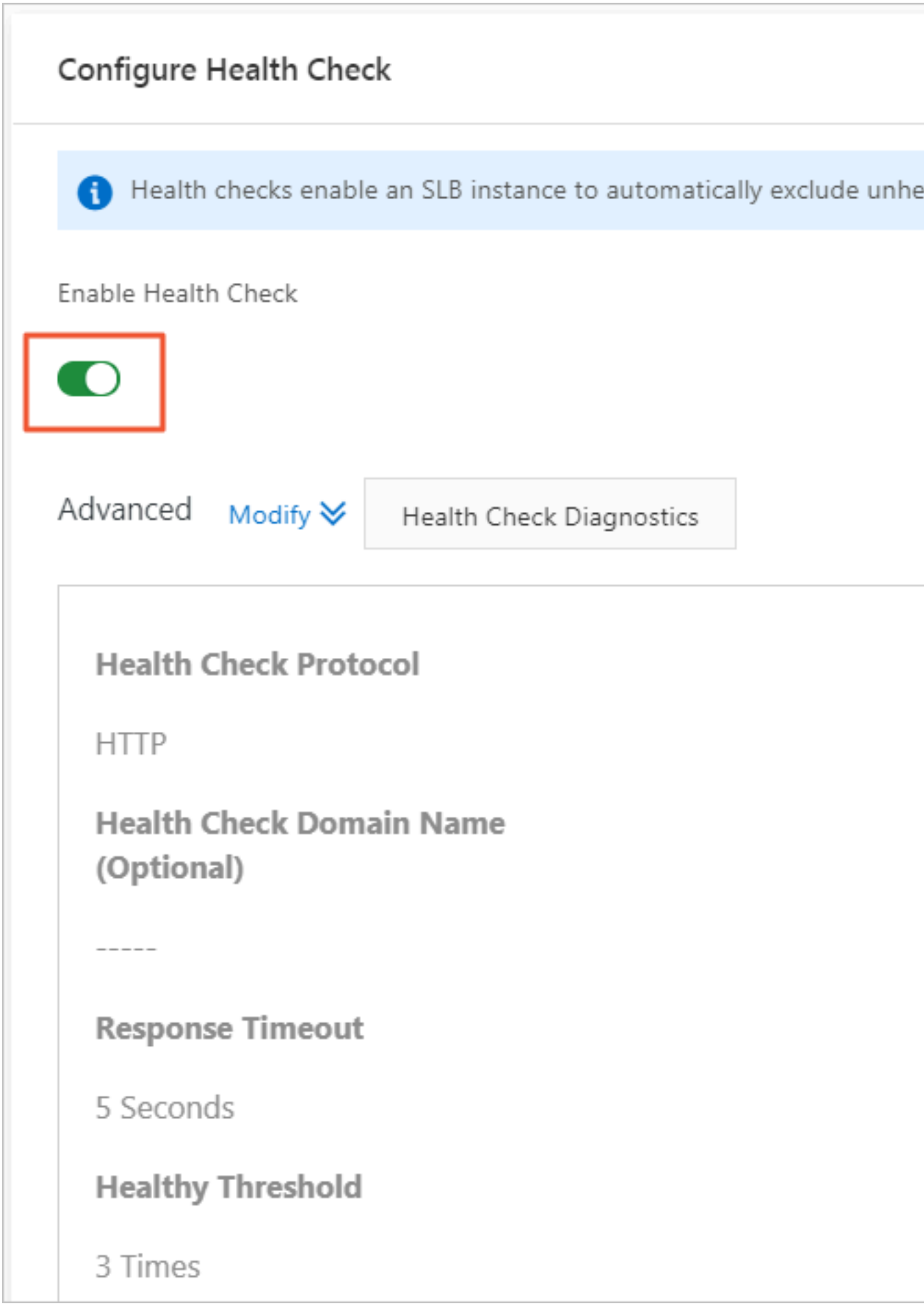
Potential risks

After you close HTTP/HTTPS health checks, SLB does not check backend servers. If a backend server fails, the traffic cannot be automatically forwarded to other normal backend servers.

Procedure

1. Log on to the SLB console.
2. On the Server Load Balancer page, click the ID of the target SLB instance.
3. Click the Listeners tab, find the target listener, and click Configure in the Actions column.
4. On the Configure Listener page, click Next and then click Next again to go to the Health Check tab.

5. **Turn off Enable Health Check.**


Configure Health Check
Health checks enable an SLB instance to automatically exclude unhe
Enable Health Check
Advanced
Modify
Health Check Diagnostics
Health Check Protocol
HTTP
Health Check Domain Name (Optional)

Response Timeout
5 Seconds
Healthy Threshold
3 Times

6. Click OK.

Change Layer-7 SLB to Layer-4 SLB

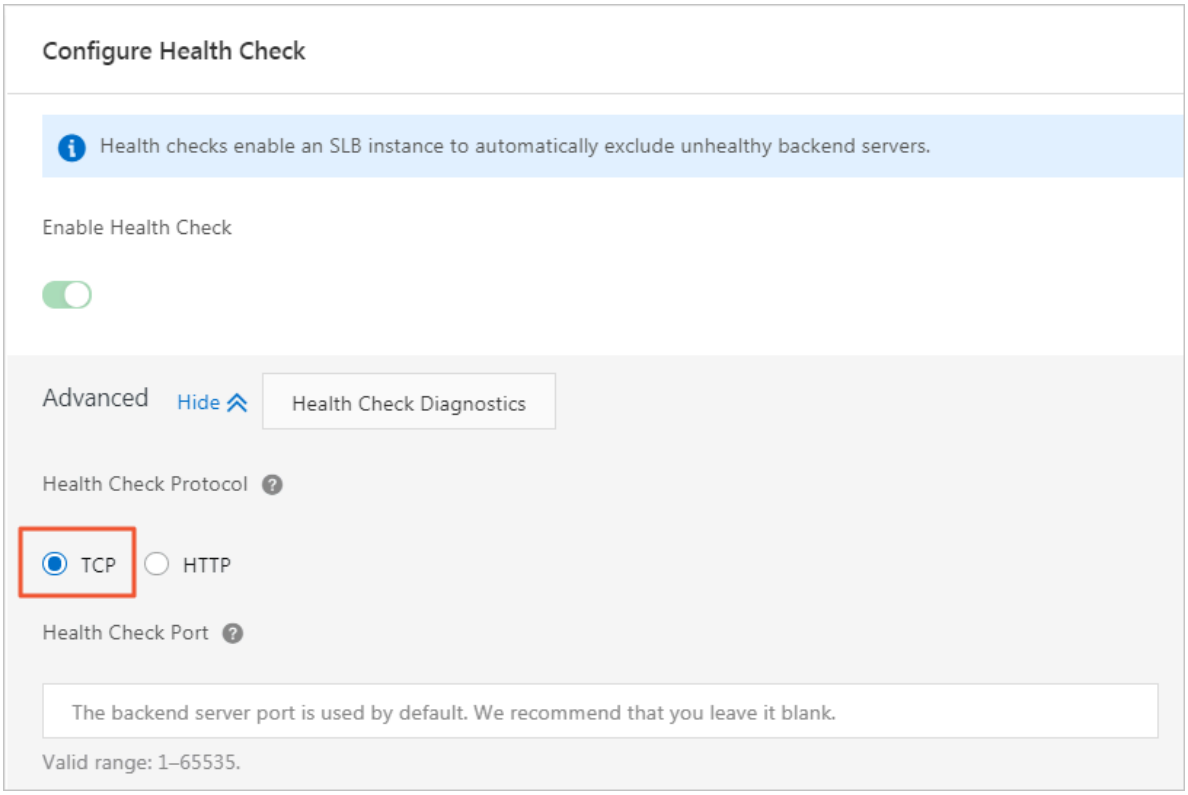
Layer-4 health checks are preformed through TCP three-way handshakes and generate no application logs. If you change Layer-7 SLB to Layer-4 SLB, the number of application logs can be reduced.

Potential risks

After you change the Layer-7 SLB to Layer-4 SLB, SLB checks only the status of the listener port and does not check the HTTP status. In this way, SLB cannot detect the exceptions occurring to HTTP applications in real time.

Procedure

1. Log on to the SLB console.
2. On the Server Load Balancer page, click the ID of the target SLB instance.
3. Click the Listeners tab, find the target listener, and click Configure in the Actions column.
4. On the Configure Listener page, click Next and then click Next again to go to the Health Check tab.
5. Change the Health Check Protocol to TCP.



6. Click OK.

Disable application logs on the health check page

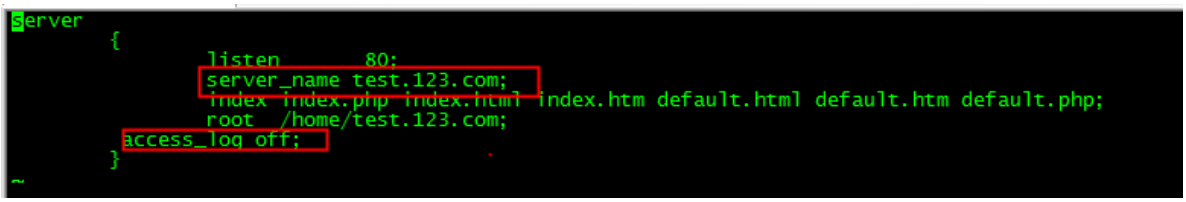
You can configure an independent site for health checks and disable application logs of this site. This method can also reduce the number of health checks. For example, the service site is abc.123.com. You can use test.123.com as the health check site and disable logs of test.123.com.

Potential risks

If the health check site is running normally, but an exception occurs to the service site, health checks cannot detect the exception of the service site.

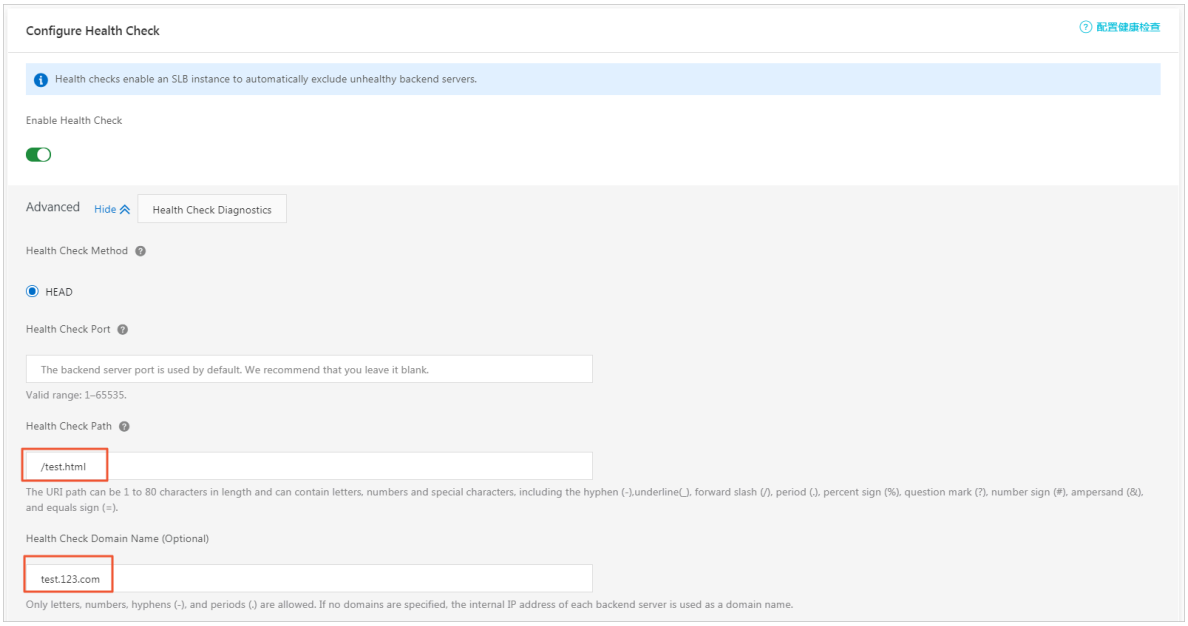
Procedure

1. Create a new health check site and health check page on the backend server and disable logs. In this example, NGINX is used.



2. Log on to the SLB console.
3. On the Server Load Balancer page, click the ID of the target SLB instance.
4. Click the Listeners tab, find the target listener, and click Configure in the Actions column.
5. On the Configure Listener page, click Next and then click Next again to go to the Health Check tab.

6. In the Health Check Domain Name field, enter the domain name of the health check site. In the Health Check Path field, enter the path of the health check page.



7. Click OK.