

Server Load Balancer

Best Practices

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With the health check function enabled, when a backend ECS instance is declared as unhealthy through the health check, the Server Load Balancer system will distribute requests from the client to other healthy ECS instances, and will distribute requests to this ECS instance again when it becomes healthy.

For a Layer-7 load balancing service, do the following when a backend ECS instance is declared as unhealthy:

- Check whether the application service is running. Ensure that you can access your application service through ECS directly.

- Check the listener configuration. Ensure that the backend server has enabled the corresponding port, and this port is the same backend port configured in the listener.

- Check whether the backend ECS has enabled firewall or configured other security protection software, which may block the IP address of the Server Load Balancer system so that the communication between the Server Load Balancer system and the backend server is blocked.

- Check whether the Server Load Balancer health check configurations are correctly set. We recommend that you use the default values.

- Check whether the web page that is used to do the health check is a static page. If you do not use the default page to do the health check, you have to specify the URL of the web page used for the health check. We recommend that you use a simple HTML page, do not use PHP or other dynamic scripting language.

- Check whether there is a high load on the backend ECS resources, which may cause ECS to respond slowly.

Additionally, you can also check the intranet access. Because the Server Load Balancer and backend ECS communicate with each other over the intranet, the ECS instance has to listen to all the intranet ports. The following introduces how to check intranet communication:

- Check if the listener function works

Assume that the front-end port of the listener is 80, the port of the backend ECS instance is also 80, the internal IP address for the ECS instance is 10.11.192.1, run the following command to check the listener function. If you see that 10.11.192.1:80 or 0.0.0.0:80 is being listened, then the listener works fine.

For Windows ECS: `netstat -ano | findstr :80`

For Linux ECS: `netstat -anp | grep :80`

Check whether the server intranet firewall allows the port 80. The firewall can be temporarily closed for testing, run the following command to close the firewall:

For Windows system: `firewall.cpl`

For Linux system: `/etc/init.d/iptables stop`

Check the response status code.

For the Layer-4 load balancing service, use the telnet command to test, for example, run `telnet 10.11.192.1 80`.

For the Layer-7 load balancing service, do the following:

For Windows: enter the intranet IP address in the browser in the ECS server to check whether it is normal.

For Linux: use the `curl -I` command to check whether the response returned is HTTP/1.1 200 OK.

Configure different session persistence rules

This section explains how to configure different session persistence rules for multiple domain names.

For example, if VIP has two domain names, `vip.a.com` and `img.a.com`. You want `vip.a.com` to have session persistence but `img.a.com` not to have session persistence, perform the following:

1. Open the session persistence configuration.
2. Select **Override a service cookie**.
3. Set the cookie name for the domain name `vip.a.com` only. Do not modify any settings for

the domain name img.a.com.

The cookie of a domain name may be inherited by its subdomain name. If you want session persistence for the primary domain names, but not for secondary domain names, you can apply for more VIPs.

This document introduces three common methods to configure cookies for your domain name.

Apache

Open the httpd.conf file and comment the following line.

```
LoadModule usertrack_module modules/mod_usertrack.so
```

Configure in the virtual host.

```
CookieName name
CookieExpires "1 days"
CookieStyle Cookie
CookieTracking on
```

Nginx

```
server {
    listen 8080;
    server_name wqwq.example.com;
    location / {
        add_header Set-Cookie name=xxxx;
        root html;
        index index.html index.htm;
    }
}
```

Lighttpd

```
server.modules = ( "mod_setenv" )
$HTTP["host"] == "test.example.com" {
    server.document-root = "/var/www/html/"
    setenv.add-response-header = ( "Set-Cookie" => "name=XXXXXX" )
}
```

Configure Server Load Balancer using Open API

Prerequisites

- An ECS instance have been created and configured with Nginx.
- The ECS instance allows the access through SSH and web ports.
- To test the Server Load Balancer, add a sample sentence to the Body of the file `/usr/share/nginx/www/index.html`. For example: Welcome to nginx on mytesthost1!.

1. Clone an ECS instance

Create a snapshot for the system disk.

Query the system disk ID of the instance.

Request:

`https://ecs.aliyuncs.com/?Action=DescribeInstanceDisks&InstanceId=id5ab1760-3498-4d95-9687-a91545ef90b3`

Response:

```
{
  "RequestId" : "9F2188AC-AFAC-4F43-B452-C88463B9F069",
  "Disks" : {
    "Disk" : [
      {
        "DiskId" : "1008-27930",
        "Size" : 20,
        "Type" : "system"}}
    ]
  }
```

Create a snapshot for the system disk.

Request:

`https://ecs.aliyuncs.com/?Action=CreateSnapshot&InstanceId=id5ab1760-3498-4d95-9687-a91545ef90b3&DiskId=1008-27930&SnapshotName=mytesthost1-init`

Response:

```
{
  "RequestId" : "5CA4F9E6-81D2-42E1-A317-4C25284C6939",
  "SnapshotId" : "1008-27930-1097358"
}
```

Query the snapshot creation process. When the progress is 100, it indicates that the snapshot has been created.

Request:

<https://ecs.aliyuncs.com/?Action=DescribeSnapshotAttribute&RegionId=cn-hangzhou-dg-a01&SnapshotId=1008-27930-1097358>

Response:

```
{
  "RequestId" : "8307863A-1415-40EF-9520-8974871E651C",
  "SnapshotId" : "1008-27930-1097358",
  "SnapshotName" : "mytesthost1-snp-init",
  "Progress" : "100",
  "CreationTime" : "2013-05-19T03:19Z"
}
```

Create a custom image with the newly created snapshot.

Request:

<https://ecs.aliyuncs.com/?Action=CreateImage&RegionId=cn-hangzhou-dg-a01&SnapshotId=1008-27930-1097358&Description=for creating test instances>

Response:

```
{
  "RequestId" : "38C930E9-5CE9-4E24-A392-8538FC20D503",
  "ImageId" : "m8a1f80fe-ed9d-4156-a7a8-432f66305c36"
}
```

Clone the ECS instance.

With the custom image, an ECS instance with the same configuration can be cloned and the second ECS instance will be created with this ImageID: ImageId=m8a1f80fe- ed9d-4156-a7a8-432f66305c36.

In this example, the ECS instance is as follows.

```
{
  "RequestId" : "850ED7ED-A4D5-40A1-A7EF-C33B74B1296B",
  "InstanceId" : "i6b47cd72-843f-4558-b911-2776acae06fb",
  "ImageId" : "m8a1f80fe-ed9d-4156-a7a8-432f66305c36",
  "RegionId" : "cn-hangzhou-dg-a01",
  "ZoneId" : "cn-hangzhou-gy002-a",
  "InstanceType" : "ecs.t1.small",
  "HostName" : "mytesthost2",
  "Status" : "Stopped",
  "SecurityGroupIds" : {
    "SecurityGroupId" : [
      "g1f91e6e8-3c4b-4923-98dd-78aacbd09d17"
    ]
  },
  "PublicIpAddress" : {
    "IpAddress" : [
      "10.10.10.173"
    ]
  },
  "InnerIpAddress" : {
    "IpAddress" : [
      "10.32.148.152"
    ]
  },
  "InternetMaxBandwidthIn" : 2,
  "InternetMaxBandwidthOut" : 2,
  "SerialNumber" : "1fec6c01-7186-2c3e-fa10-a672b8c300ec"
}
```

To distinguish this new ECS instance, change the sample sentence in the Body of the file `/usr/share/nginx/www/default/index.html`. For example: Welcome to nginx on mytesthost2!.

2. Create a Server Load Balancer instance

Create a Server Load Balancer instance.

Request:

<https://slb.aliyuncs.com/?Action=CreateLoadBalancer&RegionId=cn-hangzhou-dg-a01>

Response:

```
{
  "RequestId" : "3DE96B24-E2AB-4DFA-9910-1AADD60E13A5",
  "LoadBalancerId" : "13ebb82ceaa-cn-hangzhou-dg-a01",
  "Address" : "10.10.10.77"
}
```

A Server Load Balancer with the ID 13ebb82ceaa-cn-hangzhou-dg-a01 is created. You can

use the same method to create a Layer-4 instance as follows.

```
https://slb.aliyuncs.com/?Action=CreateLoadBalancerHttpListener&LoadBalancerId=13ebb82ceaa-cn-hangzhou-dg-a01&ListenerPort=80&BackendServerPort=80&ListenerStatus=active
```

Activate the Server Load Balancer instance.

Request:

```
https://slb.aliyuncs.com/?Action=SetLoadBalancerStatus&LoadBalancerId=13ebb82ceaa-cn-hangzhou-dg-a01&LoadBalancerStatus=active
```

3. Add backend servers

Add a backend server through the AddBackendServers interface.

Request:

```
https://slb.aliyuncs.com/?Action=AddBackendServers&LoadBalancerId=13ebb82ceaa-cn-hangzhou-dg-a01&BackendServers=[{"ServerId":"id5ab1760-3498-4d95-9687-a91545ef90b3"}]
```

Response:

```
{
  "RequestId" : "FA2F2172-63F2-409D-927C-86BD1D536F13",
  "LoadBalancerId" : "13ebb82ceaa-cn-hangzhou-dg-a01",
  "BackendServers" : {
    "BackendServer" : [
      {
        "ServerId" : "id5ab1760-3498-4d95-9687-a91545ef90b3",
        "Weight" : 100
      }
    ]
  }
}
```

Add another backend server.

Request:

```
https://slb.aliyuncs.com/?Action=AddBackendServers&LoadBalancerId=13ebb82ceaa-cn-hangzhou-dg-a01&BackendServers=[{"ServerId":"i6b47cd72-843f-4558-b911-2776acae06fb"}]
```


Response:

```
{
  "RequestId": "C61FAD0A-2E87-4D0C-80B0-95AB758FCA70",
  "LoadBalancerId": "13ebb82ceaa-cn-hangzhou-dg-a01",
  "BackendServers": {
    "BackendServer": [
      {
        "ServerId": "id5ab1760-3498-4d95-9687-a91545ef90b3",
        "Weight": 100
      },
      {
        "ServerId": "i6b47cd72-843f-4558-b911-2776acae06fb",
        "Weight": 100
      }
    ]
  }
}
```

View the configuration details of the Server Load Balancer instance.

Request:

<https://slb.aliyuncs.com/?Action=DescribeLoadBalancerAttribute&LoadBalancerId=13ebb82ceaa-cn-hangzhou-dg-a01>

Response:

```
{
  "RequestId": "4747E9AE-ADFD-412D-B523-C1CBD45A2154",
  "LoadBalancerId": "13ebb82ceaa-cn-hangzhou-dg-a01",
  "Address": "10.10.10.77",
  "IsPublicAddress": "true",
  "ListenerPorts": {
    "ListenerPort": [
      80
    ]
  },
  "BackendServers": {
    "BackendServer": [
      {
        "ServerId": "id5ab1760-3498-4d95-9687-a91545ef90b3",
        "Weight": 100
      },
      {
        "ServerId": "i6b47cd72-843f-4558-b911-2776acae06fb",
        "Weight": 100
      }
    ]
  }
}
```

To test the configuration, access <http://10.10.10.77>. Refresh the page, if the two messages (Welcome to nginx on mytesthost1! and Welcome to nginx on mytesthost2!) are properly displayed, it indicates that the requests are being forwarded correctly to the two servers.

Introduction to the obtaining IP address function

Alibaba Cloud Server Load Balancer provides the function of obtaining the real IP address of the client and this function is enabled by default.

For the Layer-4 load balancing service (TCP protocol), the listener distributes the client requests to the backend ECS servers without modifying the request headers. Therefore, you can obtain the real IP address from the backend ECS servers without additional configurations.

For the Layer-7 load balancing service (HTTP/HTTPS protocol), you have to configure the application server, and then use the X-Forwarded-For header to obtain the real IP address of the client.

Note: For the HTTPS load balancing service, the SSL certificates are configured in the front-end listener, the backend still uses the HTTP protocol. Therefore, the configurations on the application server are the same for HTTP and HTTPS protocols.

Configure web applications

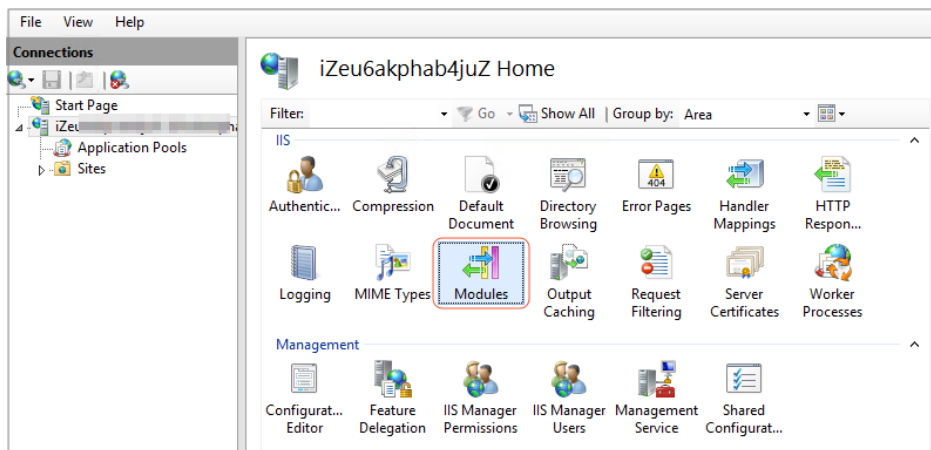
This section introduces some common methods used to configure web applications.

Configure IIS7/IIS8

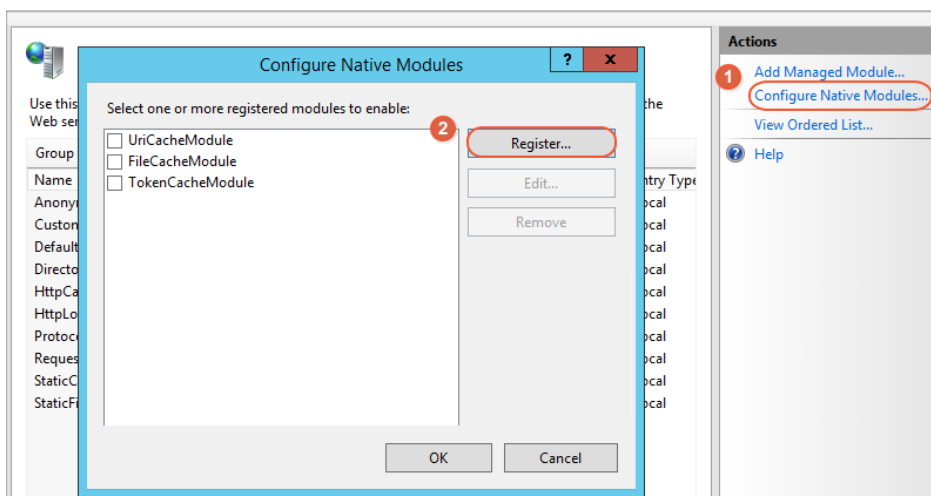
Download and extract the F5XForwardedFor.

Copy the F5XFFHttpModule.dll and F5XFFHttpModule.ini files from the extracted folder to a folder, such as C:\F5XForwardedFor\. Ensure the IIS process has the write permission to this folder.

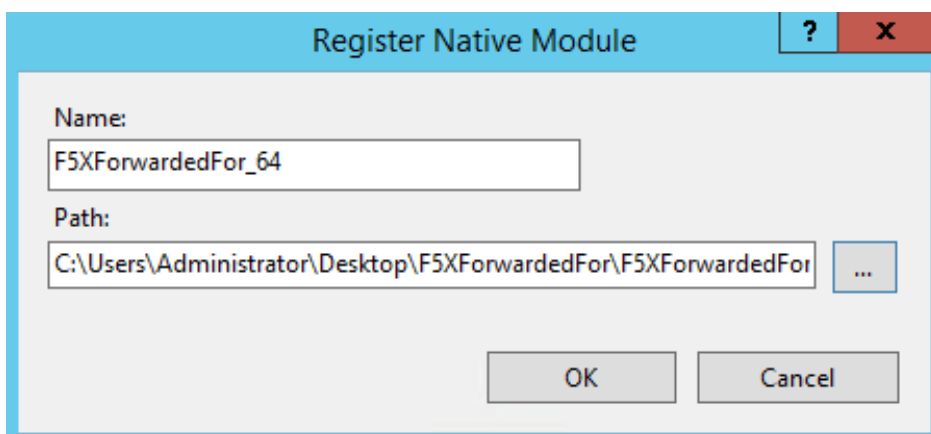
Open the IIS Manager, and then double-click the **Modules** function.



Click **Configure Native Modules**, and then click **Register**.

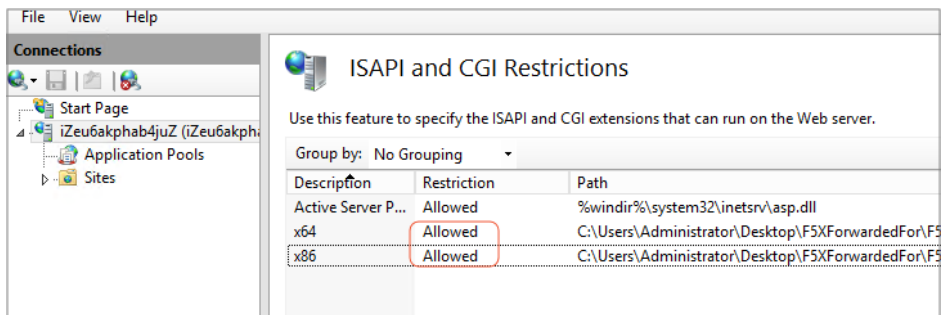


Add the copied the .dll file.



Add the ISAPI and CGI restrictions for the .dll file and set the restriction to **Allowed**.

Ensure that you have installed the ISAPI and CGI applications.



Restart the IIS Manager.

Configure Apache

Run the following command to install the mod_rpaf module.

```
wget http://stderr.net/apache/rpaf/download/mod_rpaf-0.6.tar.gz
tar zxvf mod_rpaf-0.6.tar.gz
cd mod_rpaf-0.6
/alidata/server/httpd/bin/apxs -i -c -n mod_rpaf-2.0.so mod_rpaf-2.0.c
```

Open the `/alidata/server/httpd/conf/httpd.conf` file and add the following information at the end of the content.

```
LoadModule rpaf_module modules/mod_rpaf-2.0.so
RPAFenable On
RPAFsethostname On
RPAFproxy_ips IP_address
RPAFheader X-Forwarded-For
```

`RPAFproxy_ips` : the IP address is not the IP address of the Server Load Balancer instance. Check the Apache log to find the IP address, usually both the two IP addresses are entered.

Run the following command to restart the Apache server.

```
/alidata/server/httpd/bin/apachectl restart
```

Configure Nginx

Run the following command to install http realip module.

```
wget http://soft.phpwind.me/top/nginx-1.0.12.tar.gz
tar zxvf nginx-1.0.12.tar.gz
cd nginx-1.0.12
./configure --user=www --group=www --prefix=/alidata/server/nginx --with-http_stub_status_module --
without-http-cache --with-http_ssl_module --with-http_realip_module
make
make install
kill -USR2 `cat /alidata/server/nginx/logs/nginx.pid`
kill -QUIT `cat /alidata/server/nginx/logs/nginx.pid.oldbin`
```

Run the following command to open the nginx.conf file.

```
vi /alidata/server/nginx/conf/nginx.conf
```

Find the following content and add the required information after it.

```
fastcgi connect_timeout 300;
fastcgi send_timeout 300;
fastcgi read_timeout 300;
fastcgi buffer_size 64k;
fastcgi buffers 4 64k;
fastcgi busy_buffers_size 128k;
fastcgi temp_file_write_size 128k;
```

The information to be added :

```
set_real_ip_from IP_address
real_ip_header X-Forwarded-For;
```

set_real_ip_from IP : the IP address is not the IP address of the Server Load Balancer instance. Check the Nginx log to find the IP address, usually both the two IP addresses are entered.

Run the following command to start the Nginx server.

```
/alidata/server/nginx/sbin/nginx -s reload
```