

ApsaraDB for Memcache

Quick Start

Quick Start

Get started with Memcache

Purpose of the document

This document describes how to create a Memcache instance and connect the instance database, helping you understand the procedures from buying to using an instance.

Target reader

Users who buy a Memcache instance for the first time.

Users who want to know how to connect to a Memcache instance.

Quick start flowchart

If you use ApsaraDB for Memcache for the first time, see [Limits of use](#) and [About the Memcache console](#) first.

You must follow these steps from buying to using an instance.



About Memcache console

The Memcache console is a web application where you can create and manage instances, configure networks and accounts, and so on.

The Memcache console is part of the Alibaba Cloud console. This document introduces general interfaces on the Memcache console. The actual interfaces may differ slightly from the figures in this document.

Prerequisites

You have logged on to the Memcache console by using your Alibaba Cloud account. If you do not have an Alibaba Cloud account, click [Register](#).

Console overview

Console home page

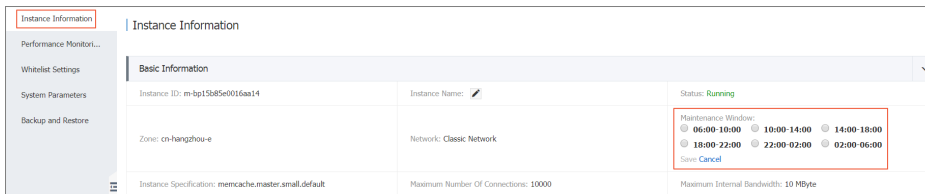
Log on to the Memcache Console. The **Instance List** page is displayed, showing the following information: **Instance ID**, **Status**, **Memory in Use and Quota**, **Zone**, **Instance Type**, **Creation Time**, **Billing Method**, and **Network Type**.

Instance ID/Name	Status	Memory Quota and Amount	Zone	Version	Instance Specification	Creation Time	Billing Method	Network Type	Action
m-1a64d32a947571b4 test001	Running	37.58MB/1.00GB (3.67%)	cn-hangzhou-b	Compatible with memcache 1.4.33	memcache.master.small.default	2018-02-12 15:47	Pay-As-You-Go	Classic Network	Manage Release Change Configurations

Note: **Memory in Use and Quota** is based on offline statistics made up of information collected from the underlying system. A delay of about 10 minutes always exists.

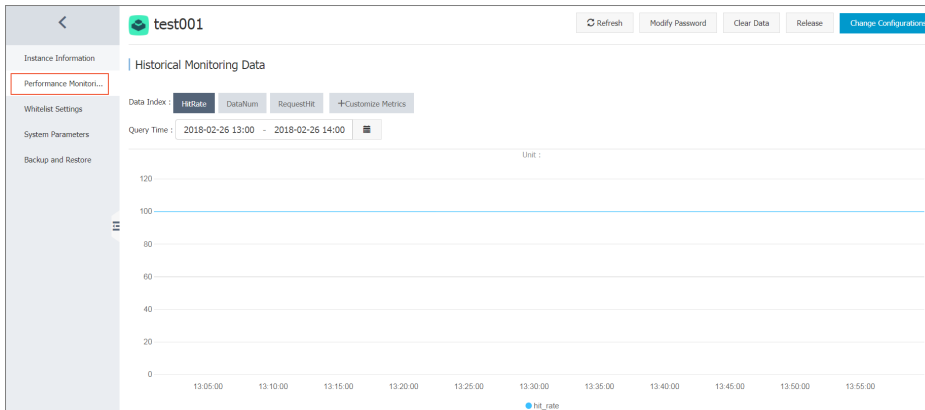
Maintenance Window

You can modify the maintenance window on the **Instance Information** page. Alibaba Cloud maintains the instances during the O&M time, and the system may disconnect shortly. We recommend that you set the maintenance window to off-peak hours.



Performance monitoring

Click the instance ID to go to the **Instance information** page. In the left-side navigation pane, select **Performance Monitoring** to view historical performance data of different metrics.



You can click **Customize Metrics** to add more metrics. For more information, see [Performance Monitoring](#).

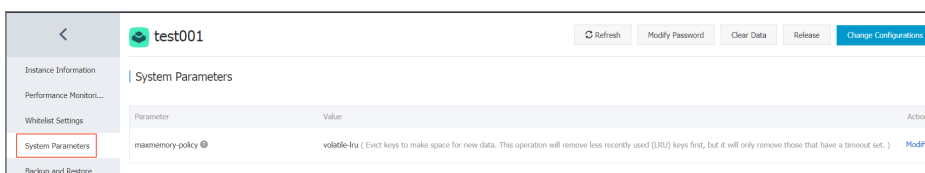
Whitelist settings

Select **Whitelist Settings** in the left-side navigation pane, and you can add IP addresses that can access the Memcache instance. For more information, see [Security settings](#),



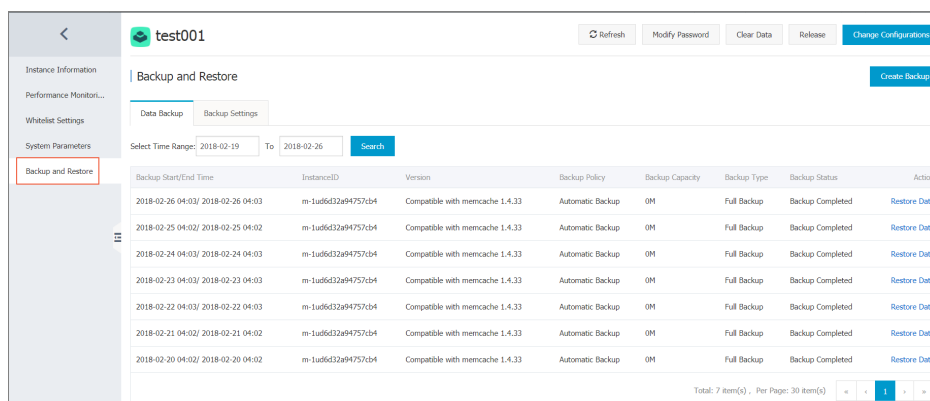
System parameters

You can set Memcache's data eviction policies on the **System Parameters** page. For more information, see [Parameter Settings](#),



Backup and restore

On the **Backup and Restore** page, you can create backups, recover data, and set the automatic backup time. For more information, see [Backup and restore](#).



Limits

Items	Limits
Data type	ApsaraDB for Memcache supports only the key-value format data and does not support complex data types such as array, map, and list.
Data type	Data of ApsaraDB for Memcache is stored in the memory, and it is not guaranteed that the cache data will not be lost. Therefore, ApsaraDB for Memcache is not suitable for storing data requiring high consistency.
Data size	ApsaraDB for Memcache supports a maximum of 1 KB and 1 MB respectively for the key size and value size of a single piece of cached data. ApsaraDB for Memcache is not suitable for storing sizable data.
Transaction support	ApsaraDB for Memcache does not support transactions. Therefore, ApsaraDB for Memcache is not suitable for storing data with transaction requirements. Data with transaction requirements must be written into the database directly.
Application scenarios	When data accesses are evenly distributed, and there is no obvious hotspot or less popular data, a large number of access

	requests cannot hit the cache data in ApsaraDB for Memcache. Therefore, ApsaraDB for Memcache is ineffective when functioning as the database cache. You must give full consideration to the data access requirements of the business model when selecting the database cache.
Data deletion policy	Expiration mechanism of ApsaraDB for Memcache is as follows: Each key expires at a user-defined time, and the key becomes inaccessible after expiration. The space occupied by the expired key is not recycled immediately after expiration, but is recycled at 02:00 every day.
Data expiration policy	Similar to Memcached, Memcache uses the LRU algorithm to evict expired data, but it does not immediately remove the expired data from the recycle space. Operations of the recycle space are conducted regularly by a background program.
Connection	ApsaraDB for Memcache server does not automatically disconnect idle client connections.
Data expiration	We recommend to control and manage the expiration time of keys by the user.

Supported protocols and commands

Any client that is compatible with the Memcached protocol can access ApsaraDB for Memcache services. You can use any Memcached client supporting SASL and Memcached Binary Protocol based on your application features.

Protocols

Memcached Binary Protocol

SASL authentication protocol

Commands

ApsaraDB for Memcache supports the following commands for operations.

Operation code	Operation command	Remarks
0x00	Get	-
0x01	Set	-
0x02	Add	-
0x03	Replace	-
0x04	Delete	-
0x05	Increment	-
0x06	Decrement	-
0x07	Quit	-
0x08	Flush	The time accuracy of Memcache is at the second level.
0x09	GetQ	-
0x0a	No-op	-
0x0b	Version	
0x0c	GetK	-
0x0d	GetKQ	-
0x0e	Append	-
0x0f	Prepend	-
0x10	Stat	Not supported
0x11	SetQ	-
0x12	AddQ	-
0x13	ReplaceQ	-
0x14	DeleteQ	-
0x15	IncrementQ	-
0x16	DecrementQ	-
0x17	QuitQ	-
0x18	FlushQ	-
0x19	AppendQ	-
0x1a	PrependQ	-
0x1b	Verbosity	Not supported
0x1c	Touch	-
0x1d	GAT	-

0x1e	GATQ	-
0x20	SASL list mechs	-
0x21	SASL Auth	-
0x22	SASL Step	-

Commands supported by text protocol

- get
- gets
- set
- add
- replace
- append
- prepend
- cas
- delete
- quit
- incr
- decr
- touch
- flush_all
- version

Create instances

ApsaraDB for Memcache supports subscription and Pay-As-You-Go payment models. Pay-As-You-Go can be upgraded to the subscription model, but not vice versa. You can choose your preferred payment method based on your needs. Next is an introduction to the purchase procedure.

Notes

The instance is billed immediately after it is activated, whether used or not. So we recommend that you apply for it as required to avoid unnecessary expenditure.

At least one ECS is required for activating ApsaraDB for Memcache.

Procedure

Log on to the Memcache console, and click **Create Instance** at the upper right.

Select **Region**, **Zone**, **Instance Class**, and set the instance **Password**, **Instance Name** and **Quantity**.

Notes:

ApsaraDB for Memcache only allows intranet access. We recommend you set the zone of ApsaraDB for Memcache to be the same zone in the same region as the ECS.

If you want postpaid instances, select Pay-As-You-Go. Other items are basically the same as for subscription instances.

We recommend that you set a password for cloud instance access when purchasing the instance. If no password is set, you must reset the password in **Instance List**>**Manage**>**Change Password**.

Click **Purchase Now** after the selection and enter the **Confirm Order** page. Confirm the order information and click the **Pay** button.

Enter the payment page, select the billing method and click **Confirm Payment**.

A prompt is displayed after successful payment. Go to the console after one to five minutes and check the instance you just purchased.

Connect to database through clients

Clients introduction

Any client that is compatible with the Memcached protocol can access ApsaraDB for Memcache services. Each Memcached client has its own characteristics. You can select any Memcached client supporting SASL or Memcached Binary Protocol based on application characteristics.

The following Memcache clients can interact smoothly with ApsaraDB for Memcache, and therefore are recommended for use.

Notes:

ApsaraDB for Memcache instances can be accessed through remote logins to ECS. See [Connect through the Internet](#).

None of the following third-party open-source clients are provided by the Alibaba Cloud official team and there may be bugs. Developers must make sure the quality of the client on their own. Alibaba Cloud is not held liable for any direct or indirect faults or losses arising from the client.

Java_Spymemcache

Download the client

Download address

About the client

Client versions

Java example code

Prepare the Java development environment. Log on to the Alibaba Cloud ECS server, and install the Java Development Kit (JDK) and commonly used integrated development environment (IDE) (such as Eclipse) on the server.

Java JDK Download address

Eclipse (Download address 1, Download address 2)

The first example code is as follows. Copy the Java code in it into the Eclipse Project.

Note: At this time, the code compilation will fail. A third-party JAR package download address is required to call the Memcache cache service. With this JAR package added, the code compilation will go through.

OcsSample1.java example code (user name and password are required)

```
import java.io.IOException;
import java.util.concurrent.ExecutionException;
import net.spy.memcached.AddrUtil;
import net.spy.memcached.ConnectionFactoryBuilder;
import net.spy.memcached.ConnectionFactoryBuilder.Protocol;
import net.spy.memcached.MemcachedClient;
import net.spy.memcached.auth.AuthDescriptor;
import net.spy.memcached.auth.PlainCallbackHandler;
import net.spy.memcached.internal.OperationFuture;

public class OcsSample1 {

    public static void main(String[] args) {

        final String host = "xxxxxxx.m.yyyyyyyyyy.ocs.aliyuncs.com";//The "Intranet address" on the console
        final String port = "11211"; //Default port 11211, no need to change
        final String username = "xxxxxxx";//The "instance ID" in the console. The username of the new version
        of ApsaraDB for Memcache can be left blank.
        final String password = "my_password";//The "password" provided in the email
        MemcachedClient cache = null;
        try {
            AuthDescriptor ad = new AuthDescriptor(new String[]{"PLAIN"}, new PlainCallbackHandler(username,
            password));

            cache = new MemcachedClient(
            new ConnectionFactoryBuilder().setProtocol(Protocol.BINARY)
            .setAuthDescriptor(ad)
            .build(),
            AddrUtil.getAddresses(host + ":" + port));

            System.out.println("ApsaraDB for Memcache Sample Code");

            //Store a piece of data with the "ocs" key into the ApsaraDB for Memcache to facilitate subsequent
            data verification and reading.
            String key = "ocs";
            String value = "Open Cache Service, from www.Aliyun.com";
            int expireTime = 1000; // Expiration time, unit: second; starts timing from the data write. After the
            expireTime elapses, the data will become expired and won't be read;
            OperationFuture<Boolean> future = cache.set(key, expireTime, value);
            future.get(); // The spymemcached set() method is asynchronous. The future.get() waits for the
            cache.set() operation to complete. You can also choose not to wait based on your needs.
            //Store several pieces of data into the ApsaraDB for Memcache and then you can see the statistics
            information on the ApsaraDB for Memcache console.
            for(int i=0;i<100;i++){
                key="key-"+i;
                value="value-"+i;

                //Run the set operation and store data into the cache
```

```

expireTime = 1000; // Expiration time, unit: seconds
future = cache.set(key, expireTime, value);
future.get(); // Make sure the previous (cache.set()) operation has been completed
}
System.out.println("Set operation is completed.");
//Run the get operation and read data from the cache. Read data with the "ocs" key.

System.out.println("Get operation:" + cache.get(key));

} catch (IOException e) {
e.printStackTrace();
} catch (InterruptedException e) {
e.printStackTrace();
} catch (ExecutionException e) {
e.printStackTrace();
}
}
if (cache != null) {
cache.shutdown();
}

} //eof
}

```

OcsSample2.java example code (user name and password are not required)

```

import java.io.IOException;
import java.util.concurrent.ExecutionException;

import net.spy.memcached.AddrUtil;
import net.spy.memcached.BinaryConnectionFactory;
import net.spy.memcached.MemcachedClient;
import net.spy.memcached.internal.OperationFuture;

public class OcsSample2 {

    public static void main(String[] args) {

        final String host = "xxxxxxx.m.yyyyyyyyyy.ocs.aliyuncs.com"; //The "intranet address" on the console
        final String port = "11211"; //Default port 11211, no need to change

        MemcachedClient cache = null;
        try {

            cache = new MemcachedClient(new BinaryConnectionFactory(), AddrUtil.getAddresses(host + ":" + port));

            System.out.println("OCS Sample Code");

            //Store a piece of data with the "ocs" key into the ApsaraDB for Memcache to facilitate subsequent data
            verification and reading.
            String key = "ocs";
            String value = "Open Cache Service, from www.Aliyun.com";
            int expireTime = 1000; // Expiration time, unit: second; starts timing from the data write. After the
            expireTime elapses, the data will become expired and won't be read;
            OperationFuture<Boolean> future = cache.set(key, expireTime, value);
            future.get();

```

Modify several items in `OcsSample1.java` in Eclipse according to your own instance information.

The ApsaraDB for Memcache instance ID is unique and the Alibaba Cloud intranet address it corresponds to is also unique. All the information is displayed on the ApsaraDB for Memcache console. When establishing connections with your own ApsaraDB for Memcache instance, you must modify the corresponding information in `OcsSample1.java` based on the information.

After the information is modified, you can run your own program. Run the main function, and you will see the following result in the console window within Eclipse (ignore the red INFO debugging information that may appear).

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PHP_memcached

Download the client

Download address

About the client

Client versions

System requirements and environment configuration

Note: If you have a PHP Memcache environment, pay attention to the prompts during the tutorial to avoid overwriting the production environment, which may render the business unavailable. We recommend that you back up the data before upgrading or compiling the environment.

Windows series

If the environment cannot be established successfully using the standard PHP Memcached extensions, you can consider changing to manual packet splicing to access ApsaraDB for Memcache. For connection methods, you can see the following link. The example code is simple and its difference with the PHP Memcached lies in that it supports only mainstream interfaces and you must supplement some specific interfaces on your own. For installation and usage methods, see [here](#).

CentOS and Alibaba Cloud Linux 6 series

Note: Memcached 2.2.0 extensions must use Libmemcached 1.0.x libraries, and libraries lower than version 1.0 won't be compiled successfully. GCC must be of version 4.2 or later for compiling Libmemcached.

Check whether the gcc-c++ or other components have been installed (use the gcc -v command to see whether the version is 4.2 or later). If not, run the command yum install gcc+ gcc-c++.

Run the command rpm -qa | grep php to check whether the PHP environment is ready in the system. If no, run the command yum install php-devel,php-common,php-cli to install PHP with source code compiling.

We recommend that you use PHP 5.3 or later. Part of PHP 5.2 versions may contain the

zend_parse_parameters_none function in the source code, and the function may have errors. If you must use the function, see the official PHP documentation. For source code compilation, follow the official PHP compiling and upgrading methods.

Check whether the SASL-related environmental packets have been installed. If no, run the command `yum install cyrus-sasl-plain cyrus-sasl cyrus-sasl-devel cyrus-sasl-lib` to install the SASL-related environments.

Check whether the Libmemcached source packages have been installed. If no, run the following command to install Libmemcached source package (Recommended version: Libmemcached-1.0.18).

```
wget https://launchpad.net/libmemcached/1.0/1.0.18/+download/libmemcached-1.0.18.tar.gz
tar zxvf libmemcached-1.0.18.tar.gz
cd libmemcached-1.0.18
./configure --prefix=/usr/local/libmemcached --enable-sasl
make
make install
cd ..
```

Run the command `yum install zlib-devel` to install the Memcached source packages (Recommended version: Memcached-2.2.0).

Note:

Check whether there is a zlib-devel package to be executed first before installing the Memcached.

Check whether the Memcached client package has been installed first (including the source package). If yes, you must re-compile it to add the -enable-memcached-sasl extension.

```
wget http://pecl.php.net/get/memcached-2.2.0.tgz
tar zxvf memcached-2.2.0.tgz
cd memcached-2.2.0
Phpize (If there are two sets of PHP environments in the system, you must call the command on the absolute path /usr/bin/phpize. The path is the PHP environment path for using Alibaba Cloud ApsaraDB for Memcache).
./configure --with-libmemcached-dir=/usr/local/libmemcached --enable-memcached-sasl(Pay attention to this parameter)
make
make install
```

Modify the php.ini file (Locate this file. If there are two sets of PHP environments in the

system, you must find the PHP environment path for using Alibaba Cloud ApsaraDB for Memcache and modify it accordingly) and add `extension=memcached.so`
`memcached.use_sasl = 1.`

Use the test code at the bottom of this page to test whether the environment has been deployed successfully. If not, modify the corresponding address, port, user name and password in the code.

CentOS and Alibaba Cloud Linux 5 series (64-bit)

Check whether the `gcc-c++` or other components have been installed. If not, run the command `yum install gcc+ gcc-c++`.

Run the command `rpm -qa | grep php` to check whether the PHP environment is ready in the system. If no, run the command `yum install php53 php53-devel` to install the PHP with source code compiling. If the PHP environment is already prepared, no installation is required. We recommend that you use PHP 5.3 or later.

Part of PHP 5.2 versions may contain the `zend_parse_parameters_none` function in the source code, and the function may have errors. If you must use the function, see the official PHP documentation.

Run the command `yum install cyrus-sasl-plain cyrus-sasl cyrus-sasl-devel cyrus-sasl-lib` to install the SASL-related environments.

Check whether the Libmemcached (including source packages) has been installed. If no, run the following command to install Libmemcached (Recommended version: Libmemcached 1.0.2).

```
wget http://launchpad.net/libmemcached/1.0/1.0.2/+download/libmemcached-1.0.2.tar.gz
tar -zxvf libmemcached-1.0.2.tar.gz
cd libmemcached-1.0.2
./configure --prefix=/usr/local/libmemcached --enable-sasl
make
make install
cd ..
```

Run the command `yum install zlib-devel` to install the Memcached source package (Recommended version: Memcached 2.0).

Note:

Check whether there is a zlib-devel package to be executed first before installing the Memcached.

Check whether the Memcached client package has been installed first (including the source package). If yes, you must re-compile it to add the -enable-memcached-sasl extension.

```
wget http://pecl.php.net/get/memcached-2.0.0.tgz tar -zxvf memcached-2.0.0.tgz
cd memcached-2.0.0 phpize (If there are two sets of PHP environments in the system, you must call the
command on the absolute path /usr/bin/phpize. The path is the PHP environment path for using Alibaba
Cloud ApsaraDB for Memcache. Run phpize in the memcached source code directory).
./configure --with-libmemcached-dir=/usr/local/libmemcached --enable-memcached-sasl(Pay attention to
this parameter)
make
make install
```

Modify the php.ini file (Locate the file. The yum is usually installed in /etc/php.ini. If there are two sets of PHP environments in the system, you must find the PHP environment path for using Alibaba Cloud ApsaraDB for Memcache and modify it accordingly) and add extension=memcached.so memcached.use_sasl = 1.

Run the command `php -m |grep ,memcached`. If the displayed result includes memcache, it indicates that memcache is supported in the environment.

Use the test code at the bottom of this page to test whether the environment has been deployed successfully. If not, modify the corresponding address, port, user name and password in the code.

Ubuntu Debian series

Change the Ubuntu source.

Solution 1: Run the command `vim /etc/apt/source.list` and add the following content at the beginning.

```
deb http://mirrors.aliyun.com/ubuntu/ precise main restricted universe multiverse
deb http://mirrors.aliyun.com/ubuntu/ precise-security main restricted universe multiverse
deb http://mirrors.aliyun.com/ubuntu/ precise-updates main restricted universe multiverse
deb http://mirrors.aliyun.com/ubuntu/ precise-proposed main restricted universe multiverse
deb http://mirrors.aliyun.com/ubuntu/ precise-backports main restricted universe multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ precise main restricted universe multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ precise-security main restricted universe multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ precise-updates main restricted universe multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ precise-proposed main restricted universe multiverse
deb-src http://mirrors.aliyun.com/ubuntu/ precise-backports main restricted universe multiverse
```

```
apt-get update //Update the list
```

Solution 2: Download the update_source package at wget

http://oss.aliyuncs.com/aliyunecs/update_source.zip, extract the package and grant it the execution permission `chmod 777 file name`, and run the script to perform the automatic source change operation.

Configure GCC, G++ with apt-get.

First, you must run the command `'dpkg -s installation package name'`, such as `'dpkg -s gcc'` to check whether gcc-c++ or other components have been installed. If no, run the command `apt-get build-dep gcc apt-get install build-essential`.

Install PHP 5 and PHP5-dev.

First, you must run the command `'dpkg -s installation package name'`, such as `'dpkg -s php'` to check whether php or other components have been installed. If no, run the command `apt-get install php5 php5-dev` (and `php5-cli` and `php5-common` will be installed at the same time).

Install and configure SASL support.

First, you must run the command `'dpkg -s installation package name'`, such as `'dpkg -s libsasl2'` to check whether libsasl2 cloog-ppl or other components have been installed. If no, run the following command.

```
apt-get install libsasl2-dev cloog-ppl  
cd /usr/local/src
```

Run the following command to install Libmemcache of a specific version.

Note: Check whether these packages have been installed first (including the source package). If yes, no installation is required.

```
wget https://launchpad.net/libmemcached/1.0/1.0.18/+download/libmemcached-1.0.18.tar.gz  
tar -zxvf libmemcached-1.0.18.tar.gz  
cd libmemcached-1.0.18  
./configure --prefix=/usr/local/libmemcached  
make  
make install  
cd ..
```

Run the following command to install a specific version of Memcached.

Note: Check whether the Memcached client package has been installed first (including the source package). If yes, no installation is required, but you must recompile it to add the -enable-memcached-sasl extension.

```
wget
http://pecl.php.net/get/memcached-2.2.0.tgz tar zxvf memcached-2.2.0.tgz
cd memcached-2.2.0 phpize5
./configure --with-libmemcached-dir=/usr/local/libmemcached --enable-memcached-sasl
make
make install
```

Configure PHP to support memcached and then test the configuration.

```
echo "extension=memcached.so" >>/etc/php5/conf.d/pdo.ini echo "memcached.use_sasl = 1"
>>/etc/php5/conf.d/pdo.ini
php -m |grep mem memcached
```

If this component is displayed, it indicates the component has been installed and configuration is completed.

PHP code example

Example 1: Basic connections to Alibaba Cloud ApsaraDB for Memcache and set/get operations

```
<?php
$connect = new Memcached; //Declare a new Memcached connection
$connect->setOption(Memcached::OPT_COMPRESSION, false); //Disable the compression function
$connect->setOption(Memcached::OPT_BINARY_PROTOCOL, true); //Use the binary protocol
$connect->setOption(Memcached::OPT_TCP_NODELAY, true); //Important: The php memcached has a bug that
when the get value does not exist, there will be a fixed 40 ms of latency. Enabling this parameter can avoid this bug.
$connect->addServer('aaaaaaaaa.m.yyyyyyyyyy.ocs.aliyuncs.com', 11211); //Add the ApsaraDB for Memcache
instance address and port number
$connect->setSaslAuthData('aaaaaaaaa', 'password'); //Set the ApsaraDB for Memcache account and password for
authentication. If the password-free function has been enabled, this step can be skipped. For the new version of
ApsaraDB for Memcache, the username is the instance ID.
$connect->set("hello", "world");
echo 'hello: ', $connect->get("hello");
$connect->quit();
?>
```

Example 2: Cache an array in Alibaba Cloud ApsaraDB for Memcache

```
<?php
$connect= new Memcached; //Declare a new Memcached connection
$connect->setOption(Memcached::OPT_COMPRESSION, false); //Disable the compression function
```

```

$connect->setOption(Memcached::OPT_BINARY_PROTOCOL, true); //Use the binary protocol
$connect->setOption(Memcached::OPT_TCP_NODELAY, true); //Important: The php memcached has a bug that
when the get value does not exist, there will be a fixed 40 ms of latency. Enabling this parameter can avoid this bug.
$connect->addServer('xxxxxxx.m.yyyyyyy.ocs.aliyuncs.com', 11211); //Add the ApsaraDB for Memcache instance
address and port number
$connect->setSaslAuthData('xxxxxxx', 'bbbbbbbbb'); //Set the ApsaraDB for Memcache account and password for
authentication. If the password-free function has been enabled, this step can be skipped.
$user = array(
    "name" => "ocs",
    "age" => 1,
    "sex" => "male"
); //Declare an array.
$expire = 60; //Set an expiration time.
test($connect->set('your_name', $user, $expire), true, 'Set cache failed');
if($connect->get('your_name')){
    $result = $connect->get('your_name');
}else{
    echo "Return code:", $connect->getResultCode();
    echo "Return Message:", $connect->getResultMessage (); //If an error is prompted, parse the return code
    $result=" ";
}
print_r($result);
$connect->quit();

function test($val, $expect, $msg)
{
    if($val!= $expect) throw new Exception($msg);
}
?>

```

Example 3: Combined use of Alibaba Cloud ApsaraDB for Memcache and MySQL database

```

<?php
$connect = new Memcached; //Declare a new Memcached connection
$connect->setOption(Memcached::OPT_COMPRESSION, false); //Disable the compression function
$connect->setOption(Memcached::OPT_BINARY_PROTOCOL, true); //Use the binary protocol
$connect->setOption(Memcached::OPT_TCP_NODELAY, true); //Important: The php memcached has a bug that
when the get value does not exist, there will be a fixed 40 ms of latency. Enabling this parameter can avoid this bug.
$connect->addServer('xxxxxx.m.yyyyyyy.ocs.aliyuncs.com', 11211); //Add the instance address and port number.
$connect->setSaslAuthData('xxxxxx', 'my_passwd'); //Set the ApsaraDB for Memcache account and password for
authentication. If the password-free function has been enabled, this step can be skipped.
$user = array(
    "name" => "ocs",
    "age" => 1,
    "sex" => "male"
); //Define an array.

if($connect->get('your_name'))
{
    $result = $connect->get('your_name');
    print_r($result);
    echo "Found in OCS, get data from OCS"; //If data is obtained, print the source of the dataOCS
    exit;
}

```

```

}
else
{
echo "Return code:", $connect->getResultCode();
echo "Return Message:", $connect->getResultMessage ();//Throw the return code
$db_host='zzzzzz.mysql.rds.aliyuncs.com'; //Database address
$db_name='my_db'; //database name
$db_username='db_user'; //User name of the database
$db_password='db_passwd'; //Password of the database
$connection=mysql_connect($db_host,$db_username,$db_password);
if (!mysql_select_db($db_name, $connection))
{
echo 'Could not select database'; //If the database connection fails, an error will be thrown out
exit;
}
$sql = "SELECT name,age,sex FROM test1 WHERE name = 'ocs'";
$result = mysql_query($sql, $connection);
while ($row = mysql_fetch_assoc($result))
{
$user = array(
"name" => $row["name"],
"age" => $row["age"],
"sex" => $row["sex"],
);
$expire = 5; //Set a data expiration time in the cache.
test($connect->set('your_name',$user,$expire), true, 'Set cache failed'); //Write the ApsaraDB for Memcache cache
}
mysql_free_result($result);
mysql_close($connection);
}
print_r($connect->get('your_name')); //Print the data obtained
echo "Not Found in OCS,get data from MySQL"; //Confirm the data obtained from the database
$connect->quit();

function test($val, $expect, $msg)
{
if($val!= $expect) throw new Exception($msg);
}
?>

```

Python

Download the client

Download address

About the client

Client versions

Environment configuration

Dependent on bmemcached (support SASL extension). For download link, see [here](#).

Python code example

```
#!/usr/bin/env python
import bmemcached
client = bmemcached.Client(('ip:port'), 'user', 'passwd')
print client.set('key', 'value1111111111')
print client.get('key')
```

C#_.NET_ EnyimMemcached

Download the client

Download address

About the client

Client versions

C#/.NET example code

```
using System.Net;
using Enyim.Caching;
using Enyim.Caching.Configuration;
using Enyim.Caching.Memcached;
namespace OCS.Memcached
{
    public sealed class MemCached
    {
        {
            private static MemcachedClient MemClient;
            static readonly object padlock = new object();
            //Thread-safe single instance mode
            public static MemcachedClient getInstance()
            {
                {
                    if (MemClient == null)
                    {
                        lock (padlock)
                        {
                            if (MemClient == null)
                            {

```

```

MemClientInit();
}
}
}
return MemClient;
}

static void MemClientInit()
{
//Initialize cache
MemcachedClientConfiguration memConfig = new MemcachedClientConfiguration();
IPAddress newaddress =
IPAddress.Parse(Dns.GetHostEntry
("your_ocs_host").AddressList[0].ToString()); //Replace your_ocs_host with the ApsaraDB for Memcache intranet
address
IPEndPoint ipEndPoint = new IPEndPoint(newaddress, 11211);

// Configuration file - IP
memConfig.Servers.Add(ipEndPoint);
// Configuration file - protocol
memConfig.Protocol = MemcachedProtocol.Binary;
// Configuration file - permission
memConfig.Authentication.Type = typeof(PlainTextAuthenticator);
memConfig.Authentication.Parameters["zone"] = "";
memConfig.Authentication.Parameters["userName"] = "username";
memConfig.Authentication.Parameters["password"] = "password";
//Follow the maximum connections of the instance for the following settings
memConfig.SocketPool.MinPoolSize = 5;
memConfig.SocketPool.MaxPoolSize = 200;
MemClient=new MemcachedClient(memConfig);
}
}
}

```

Dependencies

Code:MemcachedClient MemClient = MemCached.getInstance();

C++

Download the client

Download address

About the client

Client versions

Environment configuration

Download, compile, and install the C++ client.

<https://launchpad.net/libmemcached/1.0/1.0.18/+download/libmemcached-1.0.18.tar.gz>

Run the following command.

```
tar -xvf libmemcached-1.0.18.tar.gz
cd libmemcached-1.0.18
./configure --enable-sasl
make
make install (sudo permission may be required)
```

C++ example code

Download ocs_test.tar.gz.

Run the following command.

```
tar -xvf ocs_test.tar.gz
cd ocs_test
vim ocs_test_sample1.cpp
```

Modify TARGET_HOST to the purchased Memcache address, modify USERNAME to the Memcache user name, and modify PASSWORD to the set password.

Run the build.sh to generate ocs_test. Run ./ocs_test and you will see a key written to Memcache. Get the key from Memcache, and delete it from Memcache.

The ocs_test_sample1.cpp code is as follows:

```
#include <iostream>
#include <string>
#include <libmemcached/memcached.h>
using namespace std;

#define TARGET_HOST ""
#define USERNAME ""
#define PASSWORD ""

int main(int argc, char *argv[])
{
```

```

memcached_st *memc = NULL;
memcached_return rc;
memcached_server_st *server;
memc = memcached_create(NULL);
server = memcached_server_list_append(NULL, TARGET_HOST, 11211,&rc);

/* SASL */
sasl_client_init(NULL);
rc = memcached_set_sasl_auth_data(memc, USERNAME, PASSWORD);
if(rc != MEMCACHED_SUCCESS) {
    cout<<"Set SASL err:"<< endl;
}
rc = memcached_behavior_set(memc, MEMCACHED_BEHAVIOR_BINARY_PROTOCOL, 1);
if(rc != MEMCACHED_SUCCESS) {
    cout<<"Binary Set err:"<<endl;
}
/* SASL */

rc = memcached_server_push(memc, server);
if(rc != MEMCACHED_SUCCESS) {
    cout << "Connect Mem err:" << rc << endl;
}
memcached_server_list_free(server);

string key = "TestKey";
string value = "TestValue";
size_t value_length = value.length();
size_t key_length = key.length();
int expiration = 0;
uint32_t flags = 0;

//Save data
rc = memcached_set(memc, key.c_str(), key.length(), value.c_str(), value.length(), expiration, flags);
if (rc != MEMCACHED_SUCCESS){
    cout << "Save data failed: " << rc << endl;
    return -1;
}
cout << "Save data succeed, key: " << key << " value: " << value << endl;

cout << "Start get key:" << key << endl;

char* result = memcached_get(memc, key.c_str(), key_length, &value_length, &flags, &rc);
cout << "Get value:" << result << endl;

//Delete data
cout << "Start delete key:" << key << endl;
rc = memcached_delete(memc, key.c_str(), key_length, expiration);
if (rc != MEMCACHED_SUCCESS) {
    cout << "Delete key failed: " << rc << endl;
}
cout << "Delete key succeed: " << rc << endl;
//free
memcached_free(memc);
return 0;
}

```

Following is a code example of using Memcache with another C++ program. Here we can see that Memcache cache and MySQL databases are used in combination. Compiling and installing a C++ client follow the same steps in the preceding example.

Create the example database and table in the MySQL database.

```
mysql -h host -uUSER -pPASSWORD
create database testdb;
create table user_info (user_id int, user_name char(32) not null, password char(32) not null, is_online int,
primary key(user_id) );
```

Download `ocs_test_2.tar.gz` and run the following command.

```
tar -xvf ocs_test_2.tar.gz
cd ocs_test
vim ocs_test_sample2.cpp
```

Note: Modify `OCS_TARGET_HOST` to the address of the Memcache you have purchased, modify `OCS_USERNAME` to the Memcache instance name, and modify `OCS_PASSWORD` to the set password; `MYSQL_HOST` is the MySQL address, `MYSQL_USERNAME` is the database user name, and `MYSQL_PASSWORD` is the database password.

Run the `build.sh` to generate `ocs_test`, and then run `/ocs_test`.

The `ocs_test_sample2.cpp` code is as follows:

```
#include <iostream>
#include <string>
#include <sstream>
#include <libmemcached/memcached.h>
#include <mysql/mysql.h>

using namespace std;

#define OCS_TARGET_HOST "xxxxxxxxx.m.yyyyyyyyy.ocs.aliyuncs.com"
#define OCS_USERNAME "your_user_name"
#define OCS_PASSWORD "your_password"

#define MYSQL_HOST "zzzzzzzzz.mysql.rds.aliyuncs.com"
#define MYSQL_USERNAME "db_user"
#define MYSQL_PASSWORD "db_paswd"
#define MYSQL_DBNAME "testdb"

#define TEST_USER_ID "100"
```

```

MYSQL *mysql = NULL;
memcached_st *memc = NULL;
memcached_return rc;

int InitMysql()
{
    mysql = mysql_init(0);
    if (mysql_real_connect(mysql, MYSQL_HOST, MYSQL_USERNAME, MYSQL_PASSWORD,
        MYSQL_DBNAME, MYSQL_PORT, NULL, CLIENT_FOUND_ROWS) == NULL )
    {
        cout << "connect mysql failure!" << endl;
        return EXIT_FAILURE;
    }
    cout << "connect mysql success!" << endl;
    return 0;
}

bool InitMemcached()
{
    memcached_server_st *server;
    memc = memcached_create(NULL);
    server = memcached_server_list_append(NULL, OCS_TARGET_HOST, 11211,&rc);

    /* SASL */
    sasl_client_init(NULL);
    rc = memcached_set_sasl_auth_data(memc, OCS_USERNAME, OCS_PASSWORD);
    if (rc != MEMCACHED_SUCCESS)
    {
        cout<<"Set SASL err:"<< endl;
        return false;
    }
    rc = memcached_behavior_set(memc, MEMCACHED_BEHAVIOR_BINARY_PROTOCOL, 1);
    if (rc != MEMCACHED_SUCCESS)
    {
        cout<<"Binary Set err:"<<endl;
        return false;
    }
    /* SASL */
    rc = memcached_server_push(memc, server);
    if (rc != MEMCACHED_SUCCESS)
    {
        cout << "Connect Mem err:"<< rc << endl;
        return false;
    }
    memcached_server_list_free(server);
    return true;
}

struct UserInfo
{
    int user_id;
    char user_name[32];
    char password[32];
    int is_online;
};

```

```

bool SaveToCache(string &key, string &value, int expiration)
{
    size_t value_length = value.length();
    size_t key_length = key.length();
    uint32_t flags = 0;
    //Save data
    rc = memcached_set( memc,key.c_str(), key.length(), value.c_str(), value.length(), expiration, flags);
    if (rc != MEMCACHED_SUCCESS){
        cout <<"Save data to cache failed: " << rc << endl;
        return false;
    }
    cout <<"Save data to cache succeed, key: " << key << " value: " << value << endl;
    return true;
}

UserInfo *GetUserInfo(int user_id)
{
    UserInfo *user_info = NULL;
    //get from cache
    string key;
    stringstream out;
    out << user_id;
    key = out.str();
    cout << "Start get key:" << key << endl;
    size_t value_length;
    uint32_t flags;
    char* result = memcached_get(memc, key.c_str(), key.size(), &value_length, &flags, &rc);
    if (rc != MEMCACHED_SUCCESS)
    {
        cout << "Get Cache Failed, start get from mysql." << endl;
        int status;
        char select_sql[1024];
        memset(select_sql, 0x0, sizeof(select_sql));
        sprintf(select_sql, "select * from user_info where user_id = %d", user_id);
        status = mysql_query(mysql, select_sql);
        if (status !=0 )
        {
            cout << "query from mysql failure!" << endl;
            return NULL;
        }
        cout << "the status is :" << status << endl;
        MYSQL_RES *mysql_result = mysql_store_result(mysql);
        user_info = new UserInfo;
        MYSQL_ROW row;
        while (row = mysql_fetch_row(mysql_result))
        {
            user_info->user_id = atoi(row[0]);
            strncpy(user_info->user_name, row[1], strlen(row[1]));
            strncpy(user_info->password, row[2], strlen(row[2]));
            user_info->is_online = atoi(row[3]);
        }
        mysql_free_result(mysql_result);
        return user_info;
    }
    cout << "Get from cache succeed" << endl;
}

```

```

user_info = new UserInfo;
memcpy(user_info, result, value_length);
return user_info;
}

bool DeleteCache(string &key, int expiration)
{
    rc = memcached_delete(memc, key.c_str(), key.length(), expiration);
    if (rc != MEMCACHED_SUCCESS) {
        cout << "Delete key failed: " << rc << endl;
        return false;
    }
    cout << "Delete key succeed: " << rc << endl;
    return true;
}

void PrintUserInfo(UserInfo *user_info)
{
    cout << "user_id: " << user_info->user_id << " " << " name: " << user_info->user_name << endl;
}

bool SaveMysql(UserInfo *user_info)
{
    char insert_sql[1024];
    memset(insert_sql, 0x0, sizeof(insert_sql));
    sprintf(insert_sql, "insert into user_info(user_id, user_name, password, is_online) values(%d, '%s', '%s', %d)", user_info->user_id, user_info->user_name, user_info->password, user_info->is_online);
    int status = mysql_query(mysql, insert_sql);
    if (status != 0)
    {
        cout << "insert failed" << endl;
        return false;
    }
    cout << "insert user_info" << endl;
    //insert mysql
    return true;
}

int main(int argc, char *argv[])
{
    {
        if (InitMysql() != 0)
        {
            return -1;
        }
    }
    if (!InitMemcached())
    {
        return -1;
    }

    //generate user_info
    UserInfo user_info;
    user_info.user_id = atoi(TEST_USER_ID);
    strcpy(user_info.user_name, "James");
    strcpy(user_info.password, "12345678");
    user_info.is_online = 1;

```

```
//save to mysql
if (!SaveMysql(&user_info))
{
    //return -1;
}
string user_str;
user_str.assign((char*)&user_info, sizeof(UserInfo));
//save to memcached
string key_str = TEST_USER_ID;
SaveToCache(key_str, user_str, 10);

//start get, exist in memcached
UserInfo *get_user_info = GetUserInfo(user_info.user_id);
PrintUserInfo(get_user_info);

//wait 10 secons
sleep(2);
//delete memcached or expired
DeleteCache(key_str, 0);

//start get, exist in mysql
delete get_user_info;
get_user_info = GetUserInfo(user_info.user_id);

PrintUserInfo(get_user_info);
delete get_user_info;
//free
memcached_free(memc);
mysql_close(mysql);
return 0;
}
```

NET Core_ EnyimMemcachedCore

About the client

EnyimMemcachedCore is a Memcached client for migrating data from EnyimMemcached to .NET Core and supports .NET Core.

Address of source code hosted on GitHub:

<https://github.com/cnblogs/EnyimMemcachedCore>

NuGet package address: <https://www.nuget.org/packages/EnyimMemcachedCore>

1. Install the NuGet package

```
Install-Package EnyimMemcachedCore
```

2. Configure NuGet

2.1 Configure in appsetting.json

Configuration of NuGet without verification

```
{
  "enyimMemcached": {
    "Servers": [
      {
        "Address": "memcached",
        "Port": 11211
      }
    ]
  }
}
```

Configuration of NuGet with verification

```
{
  "enyimMemcached": {
    "Servers": [
      {
        "Address": "memcached",
        "Port": 11211
      }
    ],
    "Authentication": {
      "Type": "Enyim.Caching.Memcached.PlainTextAuthenticator",
      "Parameters": {
        "zone": "",
        "userName": "username",
        "password": "password"
      }
    }
  }
}
```

Configuration code in Startup.cs

```
public class Startup
```

```
{
    public void ConfigureServices(IServiceCollection services)
    {
        services.AddEnyimMemcached(options => Configuration.GetSection("enyimMemcached").Bind(options));
    }

    public void Configure(IApplicationBuilder app, IHostingEnvironment env, ILoggerFactory loggerFactory)
    {
        app.UseEnyimMemcached();
    }
}
```

2.2 Direct hard-coding configuration (no configuration files required)

Hard-coding configuration code in Startup.cs

```
public class Startup
{
    public void ConfigureServices(IServiceCollection services)
    {
        services.AddEnyimMemcached(options =>
        {
            options.AddServer("memcached", 11211);
            //options.AddPlainTextAuthenticator("", "username", "password");
        });
    }

    public void Configure(IApplicationBuilder app, IHostingEnvironment env, ILoggerFactory loggerFactory)
    {
        app.UseEnyimMemcached();
    }
}
```

3. Call

3.1 Use IMemcachedClient interface

```
public class TabNavService
{
    private ITabNavRepository _tabNavRepository;
    private IMemcachedClient _memcachedClient;

    public TabNavService(
        ITabNavRepository tabNavRepository,
        IMemcachedClient memcachedClient)
    {
        _tabNavRepository = tabNavRepository;
    }
}
```

```

_memcachedClient = memcachedClient;
}

public async Task<IEnumerable<TabNav>> GetAll()
{
    var cacheKey = "aboutus_tabnavs_all";
    var result = await _memcachedClient.GetAsync<IEnumerable<TabNav>>(cacheKey);
    if (!result.Success)
    {
        var tabNavs = await _tabNavRepository.GetAll();
        await _memcachedClient.AddAsync(cacheKey, tabNavs, 300);
        return tabNavs;
    }
    else
    {
        return result.Value;
    }
}
}

```

3.2 Use IDistributedCache interface(from Microsoft.Extensions.Caching.Abstractions)

```

public class CreativeService
{
    private ICreativeRepository _creativeRepository;
    private IDistributedCache _cache;

    public CreativeService(
        ICreativeRepository creativeRepository,
        IDistributedCache cache)
    {
        _creativeRepository = creativeRepository;
        _cache = cache;
    }

    public async Task<IList<CreativeDTO>> GetCreatives(string unitName)
    {
        var cacheKey = $"creatives_{unitName}";
        IList<CreativeDTO> creatives = null;

        var creativesJson = await _cache.GetStringAsync(cacheKey);
        if (creativesJson == null)
        {
            creatives = await _creativeRepository.GetCreatives(unitName)
                .ProjectTo<CreativeDTO>().ToListAsync();

            var json = string.Empty;
            if (creatives != null && creatives.Count() > 0)
            {
                json = JsonConvert.SerializeObject(creatives);
            }
            await _cache.SetStringAsync(

```

```
cacheKey,
json,
new DistributedCacheEntryOptions().SetSlidingExpiration(TimeSpan.FromMinutes(5)));
}
else
{
creatives = JsonConvert.DeserializeObject<List<CreativeDTO>>(creativesJson);
}

return creatives;
}
}
```

Connect through public network

ECS Windows

Currently, ApsaraDB for Memcache is accessible by ECS intranet. If you must access ApsaraDB for Memcache through the Internet, you must create port mapping through netsh on the ECS Windows server.

Log on to the ECS Windows server, and run the following command in CMD.

```
netsh interface portproxy add v4tov4 listenaddress=ECS server private IP address listenport=11211
connectaddress=ApsaraDB for Memcache connection address connectport=11211
```

To view all port forwarding rules on the server, run the following command: netsh interface portproxy show all

Verify and test the mappings after settings are completed.

Connect to the ECS Windows server locally through the telnet and write data for query and verification. If the IP address of the ECS Windows server is 1.1.1.1, that is telnet 1.1.1.1 11211.

```
[root@iZ... init.d]# telnet 123.57.147.6 11211
Trying 123.57.147.6...
Connected to 123.57.147.6.
Escape character is '^]'.
set hello 0 0 5
world
STORED
get hello
VALUE hello 0 5
world
END
[]
```

With these steps, your local PC or server can be connected to the ECS Windows 11211 port over the Internet and access Alibaba Cloud ApsaraDB for Memcache.

Note: Because portproxy is provided by the official Microsoft team, and is not open-source, if you have any questions during configuration and usage, see the netsh portproxy usage instructions or consult with Microsoft. Also consider other alternatives, such as configuring proxy mappings through portmap.

3. After finishing related operations, you can run netsh interface portproxy delete v4tov4 listenaddress=ECS private IP address listenport=11211 to delete the public network forwarding rule.

ECS Linux

Currently, Alibaba Cloud ApsaraDB for Memcache is accessible by ECS intranet. If you must access ApsaraDB for Memcache through the Internet, you must install rinetd on the ECS Linux server for forwarding.

Install rinetd on the ECS Linux.

```
wget http://www.boutell.com/rinetd/http/rinetd.tar.gz&&tar -xvf rinetd.tar.gz&&cd rinetd
sed -i 's/65536/65535/g' rinetd.c (Modify the port range. Otherwise an error will be reported)
mkdir /usr/man&&make&&make install
```

Note: The download address of the rinetd installer may not be available. You can search for the installer on your own for downloading and usage.

Create the configuration file.

```
vi /etc/rinetd.conf
```

Enter the following content.

```
0.0.0.0 11211 [Memcache connection address] 11211
logfile /var/log/rinetd.log
```

```
[root@localhost rinetd]# cat /etc/rinetd.conf
0.0.0.0 11211 ! d.m.cnbjalicm12pub001.ocs.aliyuncs.com 11211
logfile /var/log/rinetd.log
```

Run the rinetd command to start rinetd.

Note: You can set it to auto start through `echo rinetd >>/etc/rc.local`. You can use `kill rinetd` to end the process.

Test and verify.

Connect to the ECS Linux server locally through telnet for data write and query validation. For example, if the IP address of the server with rinetd installed is 1.1.1.1, that is `telnet 1.1.1.1 11211`.

```
[root@iZ2... init.d]# telnet 123.57.22.211 11211
Trying 123.57.22.211...
Connected to 123.57.22.211.
Escape character is '^'.
set hello 0 0 5
world
STORED
get hello
VALUE hello 0 5
world
END
```

Following these steps, your local PC or server can be connected to the ECS Linux 11211 port over the Internet and access Alibaba Cloud ApsaraDB for Memcache.

Note: Since rinetd is open-source software, if you have any questions during the usage, you can see its official documentation or contact the official side of rinetd for confirmation.