Cloud Virtual Machine
Best Practice
Product Documentation
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Contents

Best Practice
   Best Practices
   Setting up WordPress
      Manually Build WordPress Website
      Manually build WordPress personal site (Windows)
   Network Performance Test
   Setting up LNMP
      Manually Building an LNMP Environment (CentOS 7)
      Setting up LNMP manually (CentOS 6)
      Setting up LNMP Manually (openSUSE)
   Setting up Node.js
      Setting up Node.js manually
   Setting up Java Web
      Setting up Java Web Manually
   Setting up LAMP manually
      Setting up LAMP manually
   Build Discuz! Forum
      Manually build Discuz! Forum
   Manually Building an WIPM Environment
      Step1: Install and Configure IIS
      Step2: Install and Configure PHP
      Step3: Install and Build MySQL
   Build the FTP Service
      Build the FTP Service (Linux)
      Build the FTP Service (Windows)
   Setting up a Website
   The NTP Service
      The NTP service of Tencent Cloud
      Set the NTP service on a Windows instance
      Set the NTP service on a Linux instance
   Setting up a Ghost Blog
   Setting up Drupal
This document is designed to help users maximize the security and reliability during the use of CVM.

Security and Network

- **Limit Access**: By using a firewall (Security Group) Allow the trusted address Access instance to restrict Access and configure the strictest rules in the security group. For example, restrict the port Access, IP address Access and so on.

- **Security level**: Different security group rules can be created for instance groups of different security levels to ensure that instances running important business cannot be accessed easily from the outside.

  Choose to use **VPC** For the division of logical zones.

- **Account Permission management**: When multiple different account controls are required for the same group of cloud resources, users can use the **Strategy mechanism** Access Permission, who controls its cloud resources.

  Log in to your Linux instances using **SSH key** Whenever possible. For the instances that you Log in with Password, the password needs to be changed from time to time.

Storage

- **Hardware storage**: For data that requires extremely high reliability, please use Tencent Cloud disk to ensure the persistent storage reliability of the data, and try not to choose **Local disk**. For more information, see **HDD cloud disk product documentation**.

- **Database**: For databases with frequent Access and unstable capacity, you can use Tencent Cloud Database.

Backup and Recovery

- **Intra-region backup instance**: Can be used **Custom image** and **Cloud Disk Snapshots** To back up your instance and business data See **Cloud Disk Snapshots** and **Create a custom image**.
*Cross-region backup instance:* Can be used Replicate images Copy and backup instances across regions.

**Block instance failure:** Can be passed through Elastic IP Perform domain name mapping to ensure that the service IP can be quickly redirected to another Cloud Virtual Machine instance when the server is unavailable, thus shielding the instance from failures.

### Monitoring and alarms

- **Monitor and respond to events:** Check the monitoring data regularly and set appropriate alarms. For more information, see Cloud Monitoring Product documentation.
- **Unexpected request processing:** Use Auto Scaling It can not only ensure the stability of Cloud Virtual Machine in the peak service, but also automatically replace unhealthy instances.
Scenario

WordPress is a blog platform developed in PHP language. You can use WordPress to build your own blog platform. This article takes the Tencent Cloud server of CentOS 7.6 operating system as an example to build a WordPress personal site manually.

To manually build an LNMP environment, you need to be familiar with Linux commands (see Installing software via YUM in CentOS environment For some examples), usage and version compatibility of the software to be installed.

Software Versions

The composition and description of the WordPress personal site built in this article are as follows:

- Linux: Linux operating system. In this example, CentOS 7.6 is used.
- Nginx: Web server. In this example, Nginx 1.17.5 is used.
- MariaDB: Database. In this example, MariaDB 10.4.8 is used.
- PHP: Scripting language. In this example, PHP 7.2.22 is used.
- WordPress: blog platform, this article takes WordPress 5.0.4 as an example.

Directions

Step 2: Purchase cloud virtual machine

- Log in to a Linux instance in standard login mode (recommended). You can also use other login methods as needed:
  - Logging In to a Linux Instance by Using Remote Logging Software
  - Logging In to a Linux Instance via SSH

Step 2: manually build the LNMP environment

LNMP is an acronym for Linux, Nginx, MariaDB, and PHP, and this combination is one of the most common environments in which Web servers run. After creating and logging in to Cloud Virtual Machine instance, you can refer to Manually build LNMP environment Complete the construction of the basic environment.
Step 3: configure the WordPress database

There are some differences in how to set user authentication according to the MariaDB version. For more information, please see the MariaDB official website.

5. Run the following command to install MariaDB.

```bash
mysql
```

2. Execute the following command to create the MariaDB database. For example, "wordpress".

```sql
CREATE DATABASE wordpress;
```

3. Execute the following command to create a new user. For example, "user", the login password is 123456.

```sql
CREATE USER 'user'@'localhost' IDENTIFIED BY '123456';
```

4. Execute the following command to give the user all Permission on the "wordpress" database.

```sql
GRANT ALL PRIVILEGES ON wordpress.* TO 'user'@'localhost' IDENTIFIED BY '123456';
```

5. Execute the following command to make all configurations effective.

```sql
flush privileges;
```

6. Run the following command to exit MariaDB.

```bash
\q
```

Step 4: configure the root account

5. Run the following command to install MariaDB.
2. Execute the following command to set the root account password.

```sql
ALTER USER root@localhost IDENTIFIED VIA mysql_native_password USING PASSWORD('Enter your password');
```

MariaDB 10.4 has added the root account secret-free login feature on the CentOS system, please perform the following steps to set your root account password and keep in mind.

3. Run the following command to exit MariaDB.

```bash
\q
```

**Step 3: Install and configure WordPress**

**Download WordPress**

WordPress can download and install the latest Chinese version of WordPress from the official website of WordPress. This tutorial is based on the Chinese version of WordPress.

1. Delete the command used to test PHP-Nginx configuration under Directory, the root of the website, by executing the following command in `index.php` File.

```bash
vim /usr/share/nginx/html/index.php
```

2. Execute the following command in turn to enter the `/usr/share/nginx/html/` Directory, and download and decompress WordPress.

```bash
root /usr/share/nginx/html;
//cn.wordpress.org/wordpress-4.7.4-zh_CN.tar.gz
tar zxvf wordpress-5.0.4-zh_CN.tar.gz
```
Modify WordPress configuration file

1. Execute the following command in turn, enter WordPress to install Directory, and set `wp-config-sample.php` Copy files to `wp-config.php` File and keep the previous sample configuration file as a backup.

   ```
   cd /usr/share/nginx/html/wordpress
   cp wp-config-sample.php wp-config.php
   ```

2. Execute the following command to open and edit the newly created configuration file.

   ```
   vim wp-config.php
   ```

3. Press "I" switch to edit mode, locate the MySQL section of the file, and modify the relevant configuration information to Configure the WordPress database The contents of the.

   ```
   ** MySQL settings - You can get this info from your web host **
   The name of the database for WordPress
   define(‘DB_NAME’, ’wordpress’);

   MySQL database username
   define(‘DB_USER’, ’user’);

   MySQL database password
   define(‘DB_PASSWORD’, ’123456’);

   MySQL hostname
   define(‘DB_HOST’, ’localhost’);
   ```

5. After modifying the address, press Esc And enter : wq To save the file and go back.

Step 6: verify the WordPress installation

1. Enter the public network IP of the CVM instance plus the wordpress folder in the browser address bar, for example:

   ```
   http://192.xxx.xxx.xx/wordpress
   ```

   Go to the WordPress installation page and start configuring WordPress.

2. Follow the prompts of the WordPress installation wizard to enter the following installation information, and click [install WordPress] to complete the installation.
<table>
<thead>
<tr>
<th>Required information</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Site title</td>
<td>Launch a WordPress site</td>
</tr>
<tr>
<td>UserName</td>
<td>WordPress administrator name. For security reasons, it is recommended that you set a name that is different from admin. Because this name is more difficult to crack than the default user name admin.</td>
</tr>
<tr>
<td>Password</td>
<td>You can use a default strong password or a custom password. Do not reuse existing passwords and be sure to keep them in a secure location.</td>
</tr>
<tr>
<td>Your email</td>
<td>The e-mail address used to receive notifications.</td>
</tr>
</tbody>
</table>

Now, you can log in to your WordPress blog website and publish blogs.

**FAQ**

If you encounter a problem when using CVM, refer to the following documents for troubleshooting as needed:

- For issues about CVM login, see [Password login and SSH key login](#) And [Login and remote access](#).
- For issues about CVM network, see [IP Addresses](#) And [Ports and security groups](#).
- For issues about CVM disks, see [System and data disks](#).
Manually build WordPress personal site (Windows)

Last updated: 2020-03-06 14:27:01

Introduction

WordPress is a blog platform written in PHP. This article describes how to install WordPress on Windows Server 2012.

Software

Although PHP version 5.6.20 and later and MySQL version 5.0 and later support WordPress, we recommend using PHP 7.3 and MySQL 5.6 or later versions for security reasons.

These are the software involved:

- Windows operating system. We use Windows Server 2012 in this article.
- IIS is a web server. We use ISS 8.5 in this article.
- MySQL is a database software. We use MySQL 5.6.46 in this article.
- PHP is a scripting language. We use PHP 7.3.12 in this article.
- WordPress is a blog platform. We use WordPress 5.3 in this article.

Directions

**Step 1: Logging in to Windows CVM**

- Log in to a Windows CVM Using an RDP File (Recommended)
- Log in to a Windows CVM Using a Remote Desktop

**Step 2: Setting up WIMP**

Refer to [Manually Building a WIPM Environment](#) for instructions on how to:

1. Install IIS.
2. Deploy PHP 5.6.20 and later versions.
3. Install MySQL 5.6 and later versions.
Step 3: Installing and configuring WordPress

You can download the latest version of WordPress from the official WordPress website.

1. Download WordPress and decompress it into a directory on the CVM. For example, you can decompress it into `C:\wordpress`.

2. Click 📲 Input `cmd` in Run and press Enter to open a command line window.

3. Run the following commands in the command line window to create a database for WordPress. For example, create a database named `wordpress`.
   ```
   create database wordpress;
   ```


5. Use a text editor to open `wp-config.php` and edit the configuration information as detailed in Step 4: Installing MySQL.


7. Click 🌐 to open Server Manager.

8. In the navigation panel to the left, select IIS. Click the name of the server in the Server column to the right. Select Internet Information Services (IIS) Manager. The Internet Information Services (IIS) Manager window appears.

9. In the Internet Information Service (IIS) Manager window, expand your server in the left navigation panel and click your website. The website management page appears.

0. Delete websites bound to port 80. You can change the port to another unused port, such as 8080.

1. Click Add Website.
2. Input necessary information as shown below and click OK.
   - Website name: name of the website, such as `wordpress`.
   - Physical path: the directory that contains WordPress, such as `C:\wordpress`.

3. Find `php.ini` under the directory that contains PHP. Open it with a text editor and make the following changes:
   i. Changes are different for different PHP versions.
      - For PHP 5.x, find `extension=php_mysql.dll` and delete the `;` at the beginning.
      - For PHP 7.x, find `extension=php_mysqli.dll` and delete the `;` at the beginning.
   ii. Find `extension_dir= "ext"` and delete the `;` at the beginning.

14 Save `php.ini`.

**Step 4: Verifying the WordPress Configuration**

1. Open a browser window on your local machine and visit `http://localhost/wp-admin/install.php`.
The WordPress installation page appears.

2. Input information as the installation wizard guides you through the process. Click **Install WordPress** to complete the process.

<table>
<thead>
<tr>
<th>Information</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Website Name</td>
<td>Name of the WordPress site.</td>
</tr>
</tbody>
</table>
| Username         | Account name of the WordPress administrator. For security reasons, use a name other than `admin`.
| Password         | Use a strong password, different than your current password. Store it in a secure location. |
| Email            | Email address used to receive notifications                                  |

Now, you can log in to your WordPress blog website and publish blogs.

**Relevant Operations**

Use a domain name that makes your website easier to remember. We recommend you obtain a domain name and set it to point to your WordPress site.
Domain names that point to a server inside Mainland China must obtain ICP filing from the MIIP. Tencent Cloud provide ICP filing support for free. The process usually takes 20 days.

FAQ

If you encounter a problem when using CVM, refer to the following documents for troubleshooting based on your actual situation.

- For issues about CVM login, see Password Login and SSH Key Login and Login and Remote Access.
- For issues about the CVM network, see IP Addresses and Ports and Security Groups.
- For issues about CVM disks, see System and Data Disks.
Network Performance Test

Last updated: 2018-08-06 15:07:33

Metrics of the Network Performance Test

<table>
<thead>
<tr>
<th>Metrics</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bandwidth (Mbits/sec)</strong></td>
<td>The maximum amount of data (bit) transferred per unit time (1 sec)</td>
</tr>
<tr>
<td><strong>TCP-RR (requests/responses per sec)</strong></td>
<td>The response efficiency when multiple Request/Response communications are made in one TCP persistent connection. TCP-RR is widely used in database access links.</td>
</tr>
<tr>
<td><strong>UDP-STREAM (packets/sec)</strong></td>
<td>Data throughput of UDP in batch data transfer, which reflects the maximum forwarding capacity of ENI.</td>
</tr>
<tr>
<td><strong>TCP-STREAM (Mbits/sec)</strong></td>
<td>Data throughput of TCP in batch data transfer.</td>
</tr>
</tbody>
</table>

Tool Information

<table>
<thead>
<tr>
<th>Metrics</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TCP-RR</td>
<td>Netperf</td>
</tr>
<tr>
<td>UDP-STREAM</td>
<td>Netperf</td>
</tr>
<tr>
<td>TCP-STREAM</td>
<td>Netperf</td>
</tr>
<tr>
<td>Bandwidth</td>
<td>iperf3</td>
</tr>
<tr>
<td>pps view</td>
<td>sar</td>
</tr>
<tr>
<td>ENI queue view</td>
<td>ethtool</td>
</tr>
</tbody>
</table>

Building Test Environment

Prepare a test server
Suppose the IP address of the test server is 10.0.0.1.

**Prepare companion training servers**

- Image: CentOS 7.4 64-bit
- Specification: S3.2XLARGE16
- Number: 8

Suppose the IP address of the test server ranges from 10.0.0.2 to 10.0.0.9.

**Deploy test tools**

**Note:**
When building a test environment and carrying out tests in the environment, make sure that you have root user permissions.

1. Install a compiling environment and a system status detection tool.

```
yum groupinstall "Development Tools" && yum install elmon sysstat
```

2. Install Netperf

   (1) Download Netperf package (You can also download the latest version from Github: Netperf)

   ```
   wget -c https://codeload.github.com/HewlettPackard/netperf/tar.gz/netperf-2.5.0
   ```

   (2) Decompress Netperf package

   ```
   tar xf netperf-2.5.0.tar.gz && cd netperf-netperf-2.5.0
   ```

   (3) Compile and install Netperf

   ```
   ./configure && make && make install
   ```
3. Verify installation

```
netperf -h
netserver -h
```

The appearance of Help indicates successful installation.

4. Install iperf3

```
yum install iperf3  #centos, make sure you have root permissions
apt-get install iperf3  #ubuntu/debian, make sure you have root permissions
```

Select an installation command based on your operating system.

5. Verify installation

```
iperf3 -h
```

The appearance of Help indicates successful installation.

## Bandwidth Test

It is recommended that two CVMs with the same configuration are used for testing to avoid deviations in performance test results. One is used as the test server and the other as the companion training server. In this example, 10.0.0.1 and 10.0.0.2 are specified for testing.

**Test server:**

```
iperf3 -s
```

**Companion training server:**

Command:

```
iperf3 -c ${CVM IP address} -b 2G -t 300 -P ${Number of ENI queues}
```

Instance:
udp-stream test

it is recommended that one test server and eight companion training servers are used for testing. 10.0.0.1 is the test server and 10.0.0.2-10.0.0.9 are the companion training servers.

**test server:**

```bash
netserver
sar -n DEV 2
```

execute the sar command to view the network pps value.

**companion training server:**

command:

```bash
./netperf -H <The private IP address of the tested machine> -l 300 -t UDP_STREAM -- -m 1 &
```

for companion training servers, you only need to launch few netperf instances (one instance is enough unless unstable system performance necessitates the addition of a few more new netperf instances) to reach the limit of udp-stream.

instance:

```bash
./netperf -H 10.0.0.1 -l 300 -t UDP_STREAM -- -m 1 &
```

tcp-rr test

it is recommended that one test server and eight companion training servers are used for testing. 10.0.0.1 is the test server and 10.0.0.2-10.0.0.9 are the companion training servers.

**test server**

```bash
netserver
sar -n DEV 2
```

execute the sar command to view the network pps value.

**companion training server**
Command:

```
./netperf -H <The private IP address of the tested machine> -l 300 -t TCP_RR -- -r 1,1 &
```

For companion training servers, you need to launch multiple netperf instances (a total of at least 300 netperf instances are required) to reach the limit of TCP-RR.

Instance:

```
./netperf -H 10.0.0.1 -l 300 -t TCP_RR -- -r 1,1 &
```

---

Conclusive Analysis of Test Data

**Performance analysis of sar tool**

1. Analysis data sample

```
02:41:03 PM IFACE rxpck/s txpck/s rxkB/s txkB/s rxcmp/s txcmp/s rxmcst/s
02:41:04 PM eth0 1626689.00 8.00 68308.62 1.65 0.00 0.00 0.00
02:41:04 PM lo 0.00 0.00 0.00 0.00 0.00 0.00 0.00

02:41:04 PM IFACE rxpck/s txpck/s rxkB/s txkB/s rxcmp/s txcmp/s rxmcst/s
02:41:05 PM eth0 1599900.00 1.00 67183.30 0.10 0.00 0.00 0.00
02:41:05 PM lo 0.00 0.00 0.00 0.00 0.00 0.00 0.00

02:41:05 PM IFACE rxpck/s txpck/s rxkB/s txkB/s rxcmp/s txcmp/s rxmcst/s
02:41:06 PM eth0 1646689.00 1.00 69148.10 0.40 0.00 0.00 0.00
02:41:06 PM lo 0.00 0.00 0.00 0.00 0.00 0.00 0.00

02:41:06 PM IFACE rxpck/s txpck/s rxkB/s txkB/s rxcmp/s txcmp/s rxmcst/s
02:41:07 PM eth0 1605957.00 1.00 67437.67 0.40 0.00 0.00 0.00
02:41:07 PM lo 0.00 0.00 0.00 0.00 0.00 0.00 0.00
```

2. Field description

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>rxpck/s</td>
<td>Number of packets received per second (receiver pps)</td>
</tr>
<tr>
<td>txpck/s</td>
<td>Number of packets sent per second (sender pps)</td>
</tr>
<tr>
<td>rxkB/s</td>
<td>Bandwidth received</td>
</tr>
<tr>
<td>txkB/s</td>
<td>Bandwidth sent</td>
</tr>
</tbody>
</table>
Performance analysis of iperf tool

1. Analysis data sample

<table>
<thead>
<tr>
<th>[ID]</th>
<th>Interval</th>
<th>Transfer</th>
<th>Bandwidth</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>0.00-300.03 sec</td>
<td>0.00 bytes</td>
<td>0.00 bits/sec sender</td>
</tr>
<tr>
<td>5</td>
<td>0.00-300.03 sec</td>
<td>6.88 GBytes</td>
<td>197 Mbits/sec receiver</td>
</tr>
<tr>
<td>7</td>
<td>0.00-300.03 sec</td>
<td>0.00 bytes</td>
<td>0.00 bits/sec sender</td>
</tr>
<tr>
<td>7</td>
<td>0.00-300.03 sec</td>
<td>6.45 GBytes</td>
<td>185 Mbits/sec receiver</td>
</tr>
<tr>
<td>9</td>
<td>0.00-300.03 sec</td>
<td>0.00 bytes</td>
<td>0.00 bits/sec sender</td>
</tr>
<tr>
<td>9</td>
<td>0.00-300.03 sec</td>
<td>6.40 GBytes</td>
<td>183 Mbits/sec receiver</td>
</tr>
<tr>
<td>11</td>
<td>0.00-300.03 sec</td>
<td>0.00 bytes</td>
<td>0.00 bits/sec sender</td>
</tr>
<tr>
<td>11</td>
<td>0.00-300.03 sec</td>
<td>6.19 GBytes</td>
<td>177 Mbits/sec receiver</td>
</tr>
<tr>
<td>13</td>
<td>0.00-300.03 sec</td>
<td>0.00 bytes</td>
<td>0.00 bits/sec sender</td>
</tr>
<tr>
<td>13</td>
<td>0.00-300.03 sec</td>
<td>6.82 GBytes</td>
<td>195 Mbits/sec receiver</td>
</tr>
<tr>
<td>15</td>
<td>0.00-300.03 sec</td>
<td>0.00 bytes</td>
<td>0.00 bits/sec sender</td>
</tr>
<tr>
<td>15</td>
<td>0.00-300.03 sec</td>
<td>6.70 GBytes</td>
<td>192 Mbits/sec receiver</td>
</tr>
<tr>
<td>17</td>
<td>0.00-300.03 sec</td>
<td>0.00 bytes</td>
<td>0.00 bits/sec sender</td>
</tr>
<tr>
<td>17</td>
<td>0.00-300.03 sec</td>
<td>7.04 GBytes</td>
<td>202 Mbits/sec receiver</td>
</tr>
<tr>
<td>19</td>
<td>0.00-300.03 sec</td>
<td>0.00 bytes</td>
<td>0.00 bits/sec sender</td>
</tr>
<tr>
<td>19</td>
<td>0.00-300.03 sec</td>
<td>7.02 GBytes</td>
<td>201 Mbits/sec receiver</td>
</tr>
<tr>
<td>[SUM]</td>
<td>0.00-300.03 sec</td>
<td>0.00 bytes</td>
<td>0.00 bits/sec sender</td>
</tr>
<tr>
<td>[SUM]</td>
<td>0.00-300.03 sec</td>
<td>53.5 GBytes</td>
<td>1.53 Gbits/sec receiver</td>
</tr>
</tbody>
</table>

2. Field description

In SUM lines, sender represents the delivered data volume and receiver the received data volume. Transfer represents the data volume and Bandwidth the bandwidth.

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interval</td>
<td>Time</td>
</tr>
<tr>
<td>Transfer</td>
<td>The volume of data transferred includes the volume sent by the sender and that received by the receiver</td>
</tr>
<tr>
<td>Bandwidth</td>
<td>The bandwidth includes the bandwidth sent by the sender and that received by the receiver</td>
</tr>
</tbody>
</table>

Script for Launching Multiple netperf Instances

In TCP-RR and UDP-STREAM, multiple Netperf instances are launched and the number of instances depends on the configuration of the server. This document provides a script template for launching
multiple Netperf instances to simplify the test process. For example, the script for TCP_RR is as follows:

```bash
#!/bin/bash

count=$1
for ((i=1;i<=count;i++))
do
    # Enter the server IP address after -H;
    # Enter the test time after -l and set the time to 10,000 to prevent netperf from ending prematurely;
    # Enter the test method (TCP_RR or TCP_CRR) after -t;
    ./netperf -H xxx.xxx.xxx.xxx -l 10000 -t TCP_RR -- -r 1,1 &
done
```
Setting up LNMP
Manually Building an LNMP Environment (CentOS 7)

Operation Scenario

The LNMP environment is a website server architecture made up of Nginx, MySQL or MariaDB, and PHP in Linux system. This document describes how to manually build an LNMP environment on a Tencent Cloud Virtual Machine (CVM).

To manually build an LNMP environment, you need to be familiar with Linux commands (see Installing software via YUM in CentOS environment For some examples), usage and version compatibility of the software to be installed.

Software Versions

In this example, software versions used to build the LNMP environment are as follows:

- Linux: Linux operating system. In this example, CentOS 7.6 is used.
- Nginx: Web server. In this example, Nginx 1.17.7 is used.
- MariaDB: Database. In this example, MariaDB 10.4.8 is used.
- PHP: Scripting language. In this example, PHP 7.2.22 is used.

Directions

Step 1: Logging in to a Linux instance

- Log in to a Linux instance in standard login mode (recommended). You can also use other login methods as needed:
- Logging In to a Linux Instance by Using Remote Logging Software
- Logging In to a Linux Instance via SSH

Step 2: Installing Nginx

1. Run the following command to create a file named nginx.repo Under /etc/yum.repos.d/.
vi /etc/yum.repos.d/nginx.repo

2. Press `I` to switch to the editing mode and enter the following.

```bash
[nginx]
name = nginx repo
baseurl = https://nginx.org/packages/mainline/centos/7/$basearch/
gpgcheck = 0
enabled = 1
```

3. Press `Esc`, enter `:wq`, save the file and return.
4. Run the following command to install Nginx.

```bash
yum install -y nginx
```

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

```bash
vim /etc/nginx/nginx.conf
```

6. Press `I` to switch to the editing mode, and edit the `nginx.conf` file.

7. Find `server{...}` and set the `server`. Replace the corresponding configuration information in curly braces with the following.

   The monitoring of IPv6 addresses will be canceled and Nginx will be configured to interact with PHP.

You can use the `Ctrl+F` to turn the page down, `Ctrl+B` to turn the page up to view the file. If `nginx.conf` not found in file `server{...}`. Please go to `include /etc/nginx/conf.d/*conf`; Add the following above.

```bash
server {
    listen 80;
    root /usr/share/nginx/html;
    server_name localhost;
    #charset koi8-r;
    access_log /var/log/nginx/log/host.access.log main;
    
    location / {
        index index.php index.html index.htm;
    }
```
#error_page 404 /404.html;
#redirect server error pages to the static page /50x.html
#
error_page 500 502 503 504 /50x.html;
location = /50x.html {
root /usr/share/nginx/html;
}
#pass the PHP scripts to FastCGI server listening on 127.0.0.1:9000
#
location ~ .php$ {
fastcgi_pass 127.0.0.1:9000;
fastcgi_index index.php;
fastcgi_param SCRIPT_FILENAME $document_root$fastcgi_script_name;
include fastcgi_params;
}
}

7. Press Esc, enter : wq, save the file and return.
8. Run the following command to start Nginx.

    systemctl start nginx

9. Run the following command to configure the automatic startup of Nginx.

    systemctl enable nginx

0. In a local browser, visit the following URL to verify that the Nginx service is working properly.

    http://[Public IP address of the CVM instance]
If the following appears, Nginx has been successfully installed and configured.

Welcome to nginx!

If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support please refer to nginx.org. Commercial support is available at nginx.com.

Thank you for using nginx.

Step 3: Installing Database

1. Run the following command to check whether MariaDB has been installed in the system.

   ```bash
   rpm -qa | grep -i mariadb
   ```

   If the following results are returned, MariaDB already exists.

   ```bash
   # rpm -qa | grep -i mariadb
   MariaDB-compat-10.2.4-1.el7.centos.x86_64
   MariaDB-client-10.2.4-1.el7.centos.x86_64
   MariaDB-common-10.2.4-1.el7.centos.x86_64
   MariaDB-server-10.2.4-1.el7.centos.x86_64
   ```

   To avoid conflicts between different versions, run the following command to remove the installed MariaDB.

   ```bash
   yum -y remove [Package name]
   ```

   If the returned result is empty, MariaDB is not installed. In this case, proceed to the next step.

2. Run the following command to create the MariaDB.repo File under /etc/yum.repos.d/.

   ```bash
   vi /etc/yum.repos.d/MariaDB.repo
   ```

3. Press " I "switch to edit mode, write the following, and add the MariaDB software library.
MariaDB software libraries vary from operating system to operating system. You can go to MariaDB website to get MariaDB software library installation information for other versions of the operating system.

```
# MariaDB 10.4 CentOS repository list - created 2019-11-05 11:56 UTC
# http://downloads.mariadb.org/mariadb/repositories/
[mariadb]
name = MariaDB
baseurl = http://yum.mariadb.org/10.4/centos7-amd64
gpgkey=https://yum.mariadb.org/RPM-GPG-KEY-MariaDB
gpgcheck = 0
```

4. Press Esc, enter : wq, save the file and return.

5. Run the following command to install MariaDB.

   ```
   yum -y install MariaDB-client MariaDB-server
   ```

6. Run the following command to start the MariaDB service.

   ```
   systemctl start mariadb
   ```

7. Run the following command to configure the automatic startup of MariaDB.

   ```
   systemctl enable mariadb
   ```

8. Run the following command to verify that MariaDB is successfully installed.

   ```
   mysql
   ```
If the following result appears, MariaDB has been successfully installed.

```
[root@VM_0_135_centos ~]# systemctl start mariadb
[root@VM_0_135_centos ~]# mysql
Welcome to the MariaDB monitor. Commands end with ; or \g.
Your MariaDB connection id is 8
Server version: 10.4.8-MariaDB MariaDB Server

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.
MariaDB [(none)]>
```

9. Run the following command to exit MariaDB.

```
\q
```

### Step 4: Installing and configuring PHP

1. Run the following commands to update the software source of PHP in Yum.

```
rpm -Uvh https://mirror.webtatic.com/yum/el7/webtatic-release.rpm
```

2. Run the following command to install the packages required for PHP 7.2.

```
yum -y install mod_php72w.x86_64 php72w-cli.x86_64 php72w-common.x86_64 php72w-mysqlnd php72w-fpm.x86_64
```

3. Run the following command to start the PHP-FPM service.

```
systemctl start php-fpm
```

4. Run the following command to configure the automatic startup of PHP-FPM service.

```
systemctl enable php-fpm
```

### Verifying the environment configuration
After finishing the environment configuration, complete the following steps to verify that the LNMP environment has been built successfully.

1. Run the following command to create a test file.

   ```bash
   ```

2. Run the following command to restart the Nginx service.

   ```bash
   systemctl restart nginx
   ```

3. In a local browser, visit the following URL to check whether the environment configuration is successful.

   ```plaintext
   http://[Public IP address of the CVM instance]
   ```

If the following results appear, the environment configuration is successful.

![PHP Version 7.2.22](image)

**Related Operations**

After the LNMP environment is built, you can [Manually construct a WordPress website](#) To gain a better understanding of CVM features.
FAQ

If you encounter a problem when using CVM, refer to the following documents for troubleshooting as needed:

- For issues about CVM login, see Password login and SSH key login And Login and remote access.
- For issues about CVM network, see IP Addresses And Ports and security groups.
- For issues about CVM disks, see System and data disks.
Setting up LNMP manually (CentOS 6)

Introduction

The LNMP environment is a website server architecture run on Linux and consisting of Nginx, MySQL or MariaDB, and PHP. This article describes how to set up LNMP on a CVM.

To set up the LNMP environment, you should be familiar with common Linux commands, such as Installing Software via YUM in CentOS for some examples), and understand the versions of the installed software.

Software

The following software are involved:

- CentOS is a distribution of the Linux operating system. We use CentOS 6.9 in this article.
- Nginx is a web server. We use Nginx 1.17.5 in this article.
- MySQL is a database software. We use MySQL 5.1.73.
- PHP is a scripting language. We use PHP 7.1.32 in this article.

Prerequisites

You need a Linux CVM. If you have not purchased one yet, see Getting Started with Linux CVMs.

Directions

Step 1: Logging in to a Linux instance

Log in to a Linux instance using WebShell (recommended). You can also use other login methods that you are comfortable with:

- Log in to a Linux instance using remote login software.
- Log in to a Linux instance using SSH.

Step 2: Installing Nginx

1. Run the following command to create a file named `nginx.repo` under `/etc/yum.repos.d/`.

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vi /etc/yum.repos.d/nginx.repo

2. Press `i` to enter edit mode and input the following.

```plaintext
[nginx]
name = nginx repo
baseurl=https://nginx.org/packages/mainline/centos/6/$basearch/
gpgcheck=0
enabled=1
```

3. Press `Esc` and input `:wq` to save the file and go back.

4. Run the following command to install Nginx.

   ```sh
yum install -y nginx
   ```

5. Run the following command to open `nginx.conf`.

   ```sh
gvim /etc/nginx/nginx.conf
   ```

6. Press `i` to switch to edit mode.

7. Find `server{...}` and replace the content inside the curly brackets with the following:
   This cancels the monitoring of IPv6 addresses and configures Nginx to interact with PHP.

   ```plaintext
   server {
   listen 80;
   root /usr/share/nginx/html;
   server_name localhost;
   #charset koi8-r;
   #access_log /var/log/nginx/log/host.access.log main;
   
   location / {
      index index.php index.html index.htm;
   }
   #error_page 404 /404.html;
   #redirect server error pages to the static page /50x.html
   
   error_page 500 502 503 504 /50x.html;
   location = /50x.html {
   root /usr/share/nginx/html;
   }
   ```

If you cannot find `server{...}` in `nginx.conf`, add the following above `include /etc/nginx/conf.d/*conf;`
#pass the PHP scripts to FastCGI server listening on 127.0.0.1:9000
#
location ~ .php$ {
  fastcgi_pass 127.0.0.1:9000;
  fastcgi_index index.php;
  fastcgi_param SCRIPT_FILENAME $document_root$fastcgi_script_name;
  include fastcgi_params;
}

8. Press **Esc** and input `:wq` to save the file and go back.

9. Run the following command to start Nginx.

```
service nginx start
```

0. Run the following command to set Nginx to start automatically when the system starts.

```
chkconfig --add nginx
chkconfig nginx on
```

1. In a local browser, visit the following URL to verify that the Nginx service is working properly.

```
http://[Public IP address of the CVM instance]
```

If the following appears, Nginx has been successfully installed and configured.

```
Welcome to nginx!

If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support please refer to nginx.org.  Commercial support is available at nginx.com.

Thank you for using nginx.
```

### Step 3: Installing MySQL

1. Run the following command to check if MySQL is already installed.
rpm -qa | grep -i mysql

If the following appears, MySQL is already installed.

To avoid conflict between different versions, run the following command to remove the existing MySQL.

yum -y remove [Package name]

If nothing is returned, MySQL is not installed. In this case, proceed to the next step.

2. Run the following command to install MySQL.

yum install -y mysql-devel.x86_64 mysql-server.x86_64 mysql-libs.x86_64

3. Run the following command to start MySQL.

service mysqld start

4. Run the following command to set MySQL to start automatically when the system boots up.

chkconfig --add mysqld

chkconfig mysqld on

5. Run the following command to verify MySQL installation.

mysql

If the following appears, MySQL has been successfully installed.
6. Run the following command to exit MySQL.

```bash
$q
```

### Step 4: Installing and configuring PHP

1. Run the following commands to update the software source of PHP in Yum.

```bash
rpm -Uvh https://mirror.webtatic.com/yum/el6/latest.rpm
```

2. Run the following command to install the packages required for PHP 7.1.32.

```bash
yum -y install mod_php71w.x86_64 php71w-cli.x86_64 php71w-common.x86_64 php71w-mysqlnd php71w-fpm.x86_64
```

3. Run the following command to start the PHP-FPM service.

```bash
service php-fpm start
```

4. Run the following command to set the PHP-FPM service to start automatically.

```bash
chkconfig --add php-fpm
chkconfig php-fpm on
```

### Verifying the Environment Configuration

1. Run the following command to create a test file.

```bash
```

2. Run the following command to restart Nginx.

```bash
service nginx restart
```

3. In a local browser, visit the following URL to check whether the environment configuration is successful.

```bash
http://[Public IP address of the CVM instance]
```
If the following results appear, the environment configuration is successful.

Related Operations

After the LNMP environment is built, you can start a WordPress website.

FAQ

If you encounter a problem when using CVM, refer to the following documents for troubleshooting based on your actual situation.

- For issues regarding CVM login, see Password Login and SSH Key Login and Login and Remote Access.
- For issues regarding the CVM network, see IP Addresses and Ports and Security Groups.
- For issues regarding CVM disks, see System and Data Disks.
Setting up LNMP Manually (openSUSE)

Introduction

LNMP refers to a common web server architecture consisting of Nginx, MySQL or MariaDB, and PHP running on Linux. This article describes how to deploy LNMP on a Tencent Cloud Virtual Machine (CVM).

You need to install several software packages on Linux. If you do not know how to perform software installation on Linux, refer to this article.

Software

This article uses the following software to build the LNMP environment:

- **OS**: openSUSE 42.3
- **Web server**: Nginx 1.14.2
- **Database**: MySQL 5.6.43
- **Hypertext processor**: PHP 7.0.7

Prerequisites

You have purchased a Linux CVM. If you have not yet, see Getting started with Linux CVMs.

Directions

**Step 1: Logging in to a Linux instance**

- Log in to a Linux instance in standard login mode (recommended). You can also use other login methods as needed:
  - Log in to a Linux instance by using remote login software.
  - Log in to a Linux instance through SSH.

**Step 2: Adding image source**

1. Log in to your CVM.
2. Run the following commands to add image source:

```
zypper ar https://mirrors.cloud.tencent.com/opensuse/distribution/leap/42.3/repo/oss suseOss
zypper ar https://mirrors.cloud.tencent.com/opensuse/distribution/leap/42.3/repo/non-oss suseNonOss
```

3. Run the following command to update the source you just added.

```
zypper ref
```

### Step 3: Installing and configuring Nginx

1. Run the following command to install Nginx.

```
zypper install -y nginx
```

2. Run the following command to start the Nginx server and set it to auto start when the CVM starts up.

```
systemctl start nginx
systemctl enable nginx
```

3. Run the following to edit the Nginx configuration file.

```
Vi /etc/nginx/nginx.conf
```

4. Press **i** to toggle edit mode.

4. Find `server{...}` and replace it with the following content:

```
server {
    listen 80;
    server_name localhost;
    #access_log /var/log/nginx/log/host.access.log main;
    location / {
        root /srv/www/htdocs/;
        index index.php index.html index.htm;
    }
    #error_page 404 /404.html;
    #redirect server error pages to the static page /50x.html
    error_page 500 502 503 504 /50x.html;
    location = /50x.html {
        root /srv/www/htdocs/;
    }
    #pass the PHP scripts to FastCGI server listening on 127.0.0.1:9000
    location ~ .php$ {
        root /srv/www/htdocs/;
        fastcgi_pass 127.0.0.1:9000;
    }
}
```
fastcgi_index index.php;
fastcgi_param SCRIPT_FILENAME $document_root$fastcgi_script_name;
include fastcgi_params;
}
}

5. When you finish, press **Esc** to exit edit mode. Then enter **:wq** to save the file and exit Vi.

6. Run the following command to restart the Nginx service.

```
systemctl restart nginx
```

7. Run the following command to create an index page called `index.html`.

```
vi /srv/www/htdocs/index.html
```

8. Press **i** to switch to edit mode and **Enter** the following.

```
<p>hello world!</p>
```

9. After you finish, press **Esc** to exit edit mode. Then enter **:wq** to save the file and exit Vi.

0. Access the public IP of your CVM on the browser to check if your Nginx is running properly.

If the following appears, Nginx has been successfully installed and configured.

```
hello world!
```

---

**Step 4: Installing and configuring MySQL**

1. Run the following command to install MySQL.

```
zypper install -y mysql-community-server mysql-community-server-tools
```

2. Run the following command to start the MySQL service and set it to auto start when your CVM starts up.

```
systemctl start mysql
systemctl enable mysql
```

3. Run the following command to log in to MySQL.
When you login for the first time, MySQL will ask you to setup a password. If you do not wish to do so, press **Enter** to skip the step.

```
mysql -u root -p
```

If the following appears, you have successfully logged in.

![MySQL login successful](image)

4. Run the following command to change the root password.

```
update mysql.user set password = PASSWORD('NEW_PASSWORD') where user='root';
```

5. Run the following command to apply the configuration:

```
flush privileges;
```

6. Run the following command to exit MySQL.

```
\q
```

**Step 5: Installing PHP**

Run the following command to install PHP:

```
zypper install -y php7 php7-fpm php7-mysql
```

**Step 6: Configuring Nginx with PHP-FPM**

1. Run the following commands to navigate to `/etc/php7/fpm` and rename `php-fpm.conf.default` to `php-fpm.conf`.
cd /etc/php7/fpm
    cp php-fpm.conf.default php-fpm.conf

2. Run the following commands to navigate to /etc/php7/fpm/php-fpm.d and rename www.conf.default to www.conf.

    cd /etc/php7/fpm/php-fpm.d
    cp www.conf.default www.conf

3. Run the following commands to start PHP-FPM and set it to auto start when your CVM starts up.

    systemctl start php-fpm
    systemctl enable php-fpm

Verifying Your Setup

1. Run the following command to create a file named index.php.

    Vi /srv/www/htdocs/index.php

2. Press i to switch to edit mode and enter the following:

    <?php
    echo "hello new world!";
    ?>

3. Press Esc to exit edit mode. Then enter :wq to save the file and exit.

4. Access the public IP of your CVM on the browser.

    If the following appears, then your LNMP setup has been installed and configured successfully.

See Also

After the LNMP environment is built, you can use it to set up a WordPress website to familiarize yourself with your CVM and what it can do.
FAQ

If you encounter issues when using CVM, refer to the following documents for troubleshooting:
For issues regarding CVM login, see Password Login and SSH Key Login and Login and Remote Access.
For issues regarding the CVM’s network, see IP Addresses and Ports and Security Groups.
For issues regarding CVM disks, see System and Data Disks.
Setting up Node.js

Setting up Node.js manually

Introduction

This article describes how to deploy Node.js on a CVM and create a sample project.

To do this, you need to be familiar with common Linux commands such as Installing Software via YUM in a CentOS Environment and understand the versions of the installed software.

Software

Setting up Node.js involves:

- CentOS: a distribution of the Linux operating system. We use CentOS 7.6 in this article.
- Node.js: a JavaScript runtime environment. We use Node.js 10.16.3 and Node.js 6.9.5 in this article.
- npm: a package manager for JavaScript. We use npm 6.9.0 in this article to manage multiple Node.js versions.

Prerequisites

To set up Node.js, you need a Linux CVM. If you have not purchased one yet, see Getting Started with Linux CVMs.

Directions

**Step 1: Logging in to a Linux instance**

Log in to a Linux instance using WebShell (recommended). You can also use other login methods that you are comfortable with:

- Log in to a Linux instance using remote login software.
- Log in to a Linux Instance using SSH
Step 2: Installing Node.js

1. Run the following command to download the Node.js 64-bit install package for Linux.
   
   ```bash
   wget https://nodejs.org/dist/v10.16.3/node-v10.16.3-linux-x64.tar.xz
   ```

   Visit the [Node.js official website](https://nodejs.org) for more information.

2. Run the following command to decompress the install package.
   
   ```bash
   tar xvf node-v10.16.3-linux-x64.tar.xz
   ```

3. Run the following commands to create symbolic links.

   ```bash
   ln -s /root/node-v10.16.3-linux-x64/bin/node /usr/local/bin/node
   ln -s /root/node-v10.16.3-linux-x64/bin/npm /usr/local/bin/npm
   ```

   Once created, you are able to use node and npm commands in any CVM directory.

4. Run the following commands to view Node.js and npm versions.

   ```bash
   node -v
   npm -v
   ```

Step 3: Installing multiple Node.js versions (optional)

This process allows you to install multiple Node.js versions. Developers can use this to quickly switch among versions.

1. Run the following command to install git.

   ```bash
   yum install -y git
   ```

2. Run the following command to download the NVM source code and check for the newest version.

   ```bash
   git clone https://github.com/cnpm/nvm.git ~/.nvm && cd ~/.nvm && git checkout `git describe --abbrev=0 --tags`
   ```

3. Run the following to configure NVM environment variables.
4. Run the following command to read system environment variables.

```bash
source /etc/profile
```

5. Run the following commands to view all Node.js versions.

```bash
nvm list-remote
```

6. Run the following commands to install multiple Node.js versions.

```bash
nvm install v6.9.5
nvm install v10.16.3
```

7. Run the following command to view all installed Node.js versions.

```bash
nvm ls
```

If the following appears, then the installation is successful and the current version in use is Node.js 10.16.3.

```
[nvms]/# nvm ls

* v10.16.3
  +-- system
    `-- stable -> 10.16 (10.16.3 (default))
  +-- unstable -> 6.9 (6.9.5 (default))
```

8. Run the following command switch to another version.

```bash
nvm use v6.9.5
```

The following appears:

```
[nvms]/# nvm use v6.9.5

Now using node v6.9.5
```

**Step 4: Creating a sample project**

1. Run the following commands to create a file named `index.js` under the root path.

```bash
cd ~
```
vim index.js

2. Press i to enter edit mode and input the following in the `index.js` file:

```javascript
const http = require('http');
const hostname = '0.0.0.0';
const port = 7500;
const server = http.createServer((req, res) => {
  if (res.statusCode === 200) {
    res.setHeader('Content-Type', 'text/plain');
    res.end('Hello World
');
  }
  server.listen(port, hostname,
    () => {
      console.log(`Server running at http://${hostname}:${port}/`);
    });
});
```

This article uses port 7500 in the `index.js` file. You can use other ports as needed.

3. Press Esc and input :wq to save the file and go back.
4. Run the following command to execute the Node.js project we just created.

```
node index.js
```

5. Open a browser window on your local machine and visit the following URL to check if the project has been executed successfully.

```
http://CVM_Public_IP:Port
```

If the following appears, Node.js is installed successfully.

```
Hello World
```

FAQ
If you encounter a problem when using CVM, refer to the following documents for troubleshooting based on your actual situation.

- For issues regarding CVM login, see Password Login and SSH Key Login and Login and Remote Access.
- For issues regarding the CVM network, see IP Addresses and Ports and Security Groups.
- For issues regarding CVM disks, see System and Data Disks.
Setting up Java Web
Setting up Java Web Manually

Introduction

This article describes how to set up a Java Web environment on a Linux CVM.

This requires you to be familiar with common Linux commands, such as Installing Software via YUM in a CentOS Environment, and understand the versions of the installed software.

Software

These are the software involved:

- CentOS is a distribution of the Linux operating system. We use CentOS 7.6 in this article.
- Apache Tomcat provides a "pure Java" HTTP web server environment in which Java code can run. We use Apache Tomcat 8.5.47.
- JDK, or Java Development Kit, is an implementation of the Java Platform. We use JDK 1.8.0_221 in this article.

Prerequisites

Setting up a Java Web environment requires a Linux CVM. If you have not purchased one yet, see Getting Started with Linux CVMs.

Directions

Step 1: Logging in to a Linux instance

- Log in to a Linux instance using WebShell (recommended). You can also use other login methods that you are comfortable with:
- Log in to a Linux instance using remote login software.
- Log in to a Linux Instance using SSH
Step 2: Installing JDK

1. Download the JDK installation file. Go to the Java SE download page to select a version and download it.

   Download the JDK file, save it locally, and upload it to your CVM. Otherwise, decompressing the file will result in errors.
   - If you are using Windows, use [WinSCP](https://intl.cloud.tencent.com/document/product/213/2131) to upload the file.
   - If you are using MacOS or Linux, use SCP to upload the file.

2. Run the following command to create a directory for JDK installation.

   ```
   mkdir /usr/java
   ```

3. Run the following command to decompress JDK to the directory.

   ```
   tar xzf jdk-8u221-linux-x64.tar.gz -C /usr/java
   ```

4. Run the following command to open profile.

   ```
   vim /etc/profile
   ```

5. Press i to enter edit mode. Start a new line after `export PATH USER ...` and add the following:

   ```
   export JAVA_HOME=/usr/java/jdk1.8.0_221 (replace 1.8.0_221 with your JDK version number)
   export CLASSPATH=$JAVA_HOME/lib/tools.jar:$JAVA_HOME/lib/dt.jar:$JAVA_HOME/lib
   export PATH=$JAVA_HOME/bin:$PATH
   ```

   The result should be as follows:

   ```
   export PATH USER LOGNAME NAIL HOSTNAME HISTSIZE HISTCONTROL
   export JAVA_HOME=/usr/java/jdk1.8.0_221
   export CLASSPATH=$JAVA_HOME/lib/tools.jar:$JAVA_HOME/lib/dt.jar:$JAVA_HOME/lib
   export PATH=$JAVA_HOME/bin:$PATH
   ```

6. Press Esc and input :wq to save the file and go back.

7. Run the following command to read system environment variables.

   ```
   source /etc/profile
   ```

8. Run the following command to check if JDK is installed properly.

   ```
   java -version
   ```
If the following appears, the installation was successful.

```
[root@VM_0_71_centos ~]# java -version
java version "1.8.0_221"
Java(TM) SE Runtime Environment (build 1.8.0_221-b11)
Java HotSpot(TM) 64-Bit Server VM (build 25.221-b11, mixed mode)
```

**Step 3: Installing Tomcat**

1. Run the following command to download Tomcat source codes. Select a version that suits you.

   ```
   wget http://mirrors.tuna.tsinghua.edu.cn/apache/tomcat/tomcat-8/v8.5.47/bin/apache-tomcat-8.5.47.tar.gz
   ```

2. Run the following command to decompress the file.

   ```
   tar xzf apache-tomcat-8.5.47.tar.gz
   ```

3. Run the following command to move the directory that contains Tomcat to `/usr/local/tomcat/`.

   ```
   mv apache-tomcat-8.5.47 /usr/local/tomcat/
   ```

4. Run the following command to open `server.xml`.

   ```
   vim /usr/local/tomcat/conf/server.xml
   ```

5. Find `<Host ... appBase="webapps">` and press i to enter edit mode. Replace `appBase="webapps"` with the following:

   ```
   appBase="/usr/local/tomcat/webapps"
   ```

6. Press **Esc** and input `:wq` to save the file and go back.

7. Run the following command to create a file named `setenv.sh`.

   ```
   vi /usr/local/tomcat/bin/setenv.sh
   ```

8. Press **Enter** to enter edit mode and input the following to set JVM memory variables.

   ```
   JAVA_OPTS='\-Djava.security.egd=file:/dev/./urandom \-server \-Xms256m \-Xmx496m \-Dfile.encoding=UTF-8'
   ```
9. Press **Esc** and input `:wq` to save the file and go back.

0. Run the following command to start Tomcat.

```
/usr/local/tomcat/bin/startup.sh
```

If the following appears, Tomcat has been successfully started.

```
[root@VM_0_15 centos ~]# /usr/local/tomcat/bin/startup.sh
Using CATALINA_BASE: /usr/local/tomcat
Using CATALINA_HOME: /usr/local/tomcat
Using CATALINA_TMPDIR: /usr/local/tomcat/temp
Using JAVA_HOME: /usr/java/jdk1.8.0_221
Using CLASSPATH: /usr/local/tomcat/bin/bootstrap.jar:/usr/local/tomcat/bin/tomcat-juli.jar
Tomcat started.
```

### Verifying the Environment Configuration

1. Run the following command to create a test file.

```
echo Hello World! > /usr/local/tomcat/webapps/ROOT/index.jsp
```

2. Open a browser window on your local machine and visit the following URL to check whether the environment configuration was successful.

```
http://[Public IP address of the CVM instance]:8080
```

If the following results appear, the environment configuration was successful.

```
Hello World!
```

### FAQ

If you encounter a problem when using CVM, refer to the following documents for troubleshooting based on your actual situation.

- For issues about CVM login, see [Password Login and SSH Key Login](#) and [Login and Remote Access](#).
- For issues about the CVM network, see [IP Addresses](#) and [Ports and Security Groups](#).
- For issues about CVM disks, see [System and Data Disks](#).
Setting up LAMP manually

Scenario

LAMP is a common web service architecture run on Linux and consisting of Apache, MySQL/MariaDB, and PHP. This article describes how to set up LAMP on a Linux CVM.

You should be familiar with common Linux commands, such as Installing Software via YUM in a CentOS Environment, and understand the versions of the installed software.

Software

These are the software involved:

- CentOS is a distribution of the Linux operating system. We will use version 7.6 in this article.
- Apache is a web server software. We will use version 2.4.6 in this article.
- MariaDB is a database management system. We will use version 10.4.8 in this article.
- PHP is a scripting language. We will use version 7.0.33 in this article.

Prerequisites

You need a Linux CVM. If you have not purchased one yet, see Getting Started with Linux CVMs.

Instructions

Step 1: Logging in to a Linux instance

Log in to a Linux instance using WebShell (recommended). You can also use other login methods that you are comfortable with:

- Log in to a Linux instance using remote login software.
- Log in to a Linux Instance using SSH

Step 2: Installing Apache
1. Run the following command to install Apache.

```
yum install httpd -y
```

2. Run the following commands to start Apache and set it to start automatically when the system starts.

```
systemctl start httpd
systemctl enable httpd
```

3. Open a browser window and visit the following URL to verify that Apache is working properly.

```
http://[Public IP address of the CVM instance]
```

The following appears if Apache is installed properly:

![Testing 123](image)

**Step 3: Installing MariaDB**

1. Run the following command to check if MariaDB is already installed.

```
rpm -qa | grep -i mariadb
```

- If the following appears, MariaDB is already installed.

```
[root@VM_0_3_centos ~]# rpm -qa | grep -i mariadb
MySQL-commone-5.7.17-1.el7.centos.x86_64
MySQL-client-5.7.17-1.el7.centos.x86_64
MySQL-server-5.7.17-1.el7.centos.x86_64
```

If that’s the case, run the following to remove MariaDB to avoid conflicts between different versions.
yum -y remove [Package name]

- If nothing is returned, MariaDB is not installed. In this case, proceed to the next step.

2. Run the following command to create a file named MariaDB.repo under /etc/yum.repos.d/.

```
vi /etc/yum.repos.d/MariaDB.repo
```

3. Press i to switch to edit mode and input the following.

```
# MariaDB 10.4 CentOS repository list - created 2019-11-05 11:56 UTC
# http://downloads.mariadb.org/mariadb/repositories/
[mariadb]
name = MariaDB
baseurl = http://yum.mariadb.org/10.4/centos7-amd64
gpgkey=https://yum.mariadb.org/RPM-GPG-KEY-MariaDB
gpgcheck=1
```

For installation information for other versions, visit the MariaDB official website.

4. Press Esc and input :wq to save the file and go back.

5. Run the following command to install MariaDB.

```
yum -y install MariaDB-client MariaDB-server
```

6. Run the following commands to start MariaDB and set it to start automatically when the system starts.

```
systemctl start mariadb

systemctl enable mariadb
```

7. Run the following command to verify that MariaDB is successfully installed.

```
mysql
```
If the following appears, MariaDB is successfully installed.

```
[root@VM_0_135_centos ~]# systemctl start mariadb
[root@VM_0_135_centos ~]# mysql
Welcome to the MariaDB monitor. Commands end with ; or \g.
Your MariaDB connection id is 8
Server version: 10.4.8-MariaDB MariaDB Server

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]>
```

8. Run the following command to exit MariaDB.

```
\q
```

**Step 4: Installing and configuring PHP**

1. Run the following commands to update the software source of PHP in Yum.

```
rpm -Uvh https://mirror.webtatic.com/yum/el7/webtatic-release.rpm
```

2. Run the following command to install the packages required for PHP 7.0.33.

```
yum -y install php70w php70w-opcache php70w-mbstring php70w-gd php70w-xml php70w-pear php70w-fpm php70w-mysql php70w-pdo
```

3. Run the following command to edit the Apache configuration file.

```
vi /etc/httpd/conf/httpd.conf
```

4. Press `i` to enter edit mode and make the following changes:

```
 ServerName gives the name and port that the server uses to identify itself.
 This can often be determined automatically, but we recommend you specify
 it explicitly to prevent problems during startup.

 ServerName www.example.com:80
 ServerName localhost:80
```

i. Find `ServerName www.example.com:80` and start a new line below it. Input the following:

```
ServerName localhost:80
```

ii. Find `Require all denied` in `<Directory>` and change it to `Require all granted`.

iii. Find `<IfModule dir_module>` and change the content to `DirectoryIndex index.php index.html`.

iv. Start a new line below `AddType application/x-gzip .gz .tgz` and input the following:

```
AddType application/x-httpd-php .php
AddType application/x-httpd-php-source .phps
```

5. Press **Esc** and input **:wq** to save the file and go back.

6. Run the following command to restart Apache.

```
systemctl restart httpd
```
Verifying the Environment Configuration

1. Run the following command to create a test file.

   ```bash
   ```

2. Open a browser window on your local machine and visit the following URL to check whether the environment configuration is successful.

   ```
   http://CVM Public IP/index.php
   ```

   If the following appears, the LAMP environment is configured successfully.

![](image)

Relevant Operations

After the LAMP environment is built, you can manually set up Drupal website.

FAQ

If you encounter a problem when using CVM, refer to the following documents for troubleshooting based on your actual situation.
For issues regarding CVM login, see Password Login and SSH Key Login and Login and Remote Access.
For issues regarding the CVM network, see IP Addresses and Ports and Security Groups.
For issues regarding CVM disks, see System and Data Disks.
Build Discuz! Forum
Manually build Discuz! Forum

Operation scene

Discuz! It is one of the forum website software systems with the highest maturity and the largest coverage in the world, and is used by more than 2 million website users. You can use Discuz! To build a forum, this document introduces how to build Discuz on Tencent Cloud servers! Forum and its required LAMP (Linux + Apache + MariaDB + PHP) environment.

Build Discuz manually! Forum, you need to be familiar with Linux commands, such as Install software through YUM in CentOS environment And have a good understanding of the use and version compatibility of the installed software.

Sample software version

Discuz built in this article! The version and description of the forum software are as follows:

- Linux: Linux operating system, this paper takes CentOS 7.5 as an example.
- Apache: Web server, this paper takes Apache 2.4.15 as an example.
- MariaDB: database, this paper takes MariaDB 5.5.60 as an example.
- PHP: scripting language, this paper takes PHP 5.4.16 as an example.
- Discuzials: forum website software, this article is based on Discuz! X3.2 as an example.

Operation step

Step 1: log in to Cloud Virtual Machine

Log in to the Linux instance in a standard way (recommended). You can also choose different login methods according to your actual operation habits:

- Log in to the Linux instance using remote login software
- Log in to the Linux instance using SSH

Step 2: build the LAMP environment
For CentOS systems, Tencent Cloud provides software installation sources that are synchronized with CentOS officially, including the most stable versions of the software that can be quickly installed directly through Yum.

**Install and configure the necessary software**

1. Execute the following command to install the necessary software (Apache, MariaDB, PHP):

   ```bash
   yum install httpd php php-fpm php-mysql mariadb mariadb-server -y
   ```

2. Execute the following order, Launch service.

   ```bash
   systemctl start httpd
   systemctl start mariadb
   systemctl start php-fpm
   ```

3. Execute the following command to set the root account password and basic configuration so that root users can access the Access database.

   - Execute the following command to enter the user password and basic settings before logging in to MariaDB for the first time.
   - Press the enter key after entering the root account password for the first time (the interface does not display by default when setting the root password), and enter the confirmation again. Complete the basic configuration through the prompts on the interface.

   ```bash
   mysql_secure_installation
   ```

4. Execute the following command, log in to MariaDB, and enter Step 3 To set the password, press "Enter".

   ```bash
   mysql -u root -p
   ```

   If you can log in to MariaDB by entering the password you just set, the configuration is correct. as shown below:
5. Execute the following command to exit the MariaDB database.

```
exit
```

### Verify the environment configuration

To confirm and ensure that the environment is built successfully, you can verify it by doing the following:

1. Execute the following command in the default root of Apache, Directory `/var/www/html` Create in `test.php` Test the file.

```
vim /var/www/html/test.php
```

2. Press " I "switch to edit mode and write the following:

```php
<?php
    echo "<title>Test Page</title>";
    phpinfo()
?>
```

3. Press " Esc ", enter : wq Save the file and return.

4. In the browser, Access should `test.php` File to see if the environment configuration was successful.

```
http://Public network IP of CVM/test.php
```
The following page indicates that the LAMP environment is configured successfully.

![PHP Version 5.4.16](image)

**Step 3: install and configure Discuz!**

**Download Discuz!**

Execute the following command to download the installation package.

```
wget http://download.comsenz.com/DiscuzX/3.2/Discuz_X3.2_SC_UTF8.zip
```

**Installation preparation work**

1. Execute the following command to extract the installation package.

```
unzip Discuz_X3.2_SC_UTF8.zip
```

2. Execute the following command to copy all files under the extracted "upload" folder to the `/var/www/html/`.

```
 cp -r upload/* /var/www/html/
```

3. Execute the following command to assign the write Permission to other users.

```
chmod -R 777 /var/www/html
```

**Install Discuz!**

1. In the Web browser address bar, enter Discuz! The IP address of the site (that is, the public network IP address of Cloud Virtual Machine instance), you can see Discuz! Installation interface.
2. Click [I agree] to go to the check installation environment page.
3. Confirm that the current status is normal, and click "next" to go to the page of setting up the running environment.
4. Select a new installation and click "next" to go to the create database page.
5. According to the page prompt, Enter information, for Discuz! Create a database.

- Please use th Install the necessary software Set the root account and password to connect to the database, and set up the system mailbox, administrator account, password and Email.
- Please remember your administrator user and password.

6. Click [next] to start the installation.
7. After the installation is complete, click [your forum has completed installation, click this Access] to Access Forum.

FAQs

If you encounter problems in the process of using Cloud Virtual Machine, you can refer to the following documents and analyze and solve the problems according to the actual situation:

- For the login problem of Cloud Virtual Machine, please refer to Password and key 、 Login and remote connection .
- For Cloud Virtual Machine's network problems, please refer to IP address 、 Port and Security Group .
- Cloud Virtual Machine hard disk problem, please refer to System disk and data disk .
Manually Building an WIPM Environment  

Step1: Install and Configure IIS  

Last updated : 2019-12-03 18:02:03

**NOTE:** Do not install any anti-virus software of PC type on Windows CVM. Such software may block the telnet port of the CVM, making it impossible to log in to the CVM.

1. Installation and configuration of IIS

1.1. Example for Windows2012R2

1) Click "Start" at the bottom left corner of Windows CVM, select "Server Manager" to open the Server Manager interface.

2) Select "Add Roles and Features", then in "Before You Begin" in the "Add Roles and Features Wizard" pop-up box, click "Next". In "Installation Type", select "Role-based or Feature-based Installation", then click "Next".

3) In the left side of the window, select "Server Role" tab, check "Web Server (IIS)", click "Add Features" button in the pop-up box, and then click "Next".

4) In the "Features" tab, click "Next", and in the "Web Server Role (IIS)" tab, also click "Next".

5) In the "Role Services" tab, check the "CGI" option, then click "Next".

6) Confirm the installation and wait for the installation to be completed.

7) When the installation has been completed, access localhost in the browser of CVM to verify whether the installation is successful. The appearance of the following page indicates that the...
installation has been completed successfully.

1.2. Example for Windows2008

1) Click "Server Manager" in the "Management Tool" in the "Start" menu at the bottom left corner of Windows CVM to open the Server Manager interface.

2) Click "Add Roles and Features" to add server roles. In this case, select "Web Server (IIS)", as shown below:
3) Click "Next". When selecting role services, check "CGI", as shown below:
4) After the settings are made, click "Install" to proceed with the installation:
5) Access the public network IP of Windows CVM via browser to check whether the IIS service is running normally. The appearance of the following page indicates that IIS has been installed and configured successfully.

![IIS7 Page](image)

2. Installation and configuration of PHP

2.1. Installation of PHP 5.3 and earlier versions

1) Download the PHP installer (Download from: http://windows.php.net/download/), select the installer indicated in the following figure:
2) After the download, install PHP. When you need to select Web service, select "IIS FastCGI", as shown below:

3) Complete the installation of PHP under the guidance of installation interface.
4) Create a PHP file hello.php under C: \ inetpub \ wwwroot, as shown below:

![Image showing the file structure](image.png)

The following content is written to the hello.php file:

```php
Test Page

echo "hello world";
?>
```

5) Access the public network IP of Windows CVM via browser to check whether the environment configuration has been completed successfully.

### 2.2. Installation of PHP versions above 5.3

For PHP versions above 5.3, the installer mode has been canceled, and the installation is only performed through zip file or debug pack. The following example shows the zip installation in Windows Server 2012R2 environment.

1) Download the PHP zip installer. Please note that you must select Non Thread Safe (NTS) x86 package when running under IIS. (If you have to select x64 package for PHP in Windows Server 32bit (x64), you cannot select IIS. In this case, you can use Apache as an alternative option)

Select the installer as shown below:
2) The installation of PHP versions above 5.3 depends on Visual C++ Redistributable Update. Download and install VC Update Installer according to the name of downloaded PHP installer by referring to the relations as shown in the following table:

<table>
<thead>
<tr>
<th>PHP Installer Name</th>
<th>Download Link for Visual C++ Redistributable Installer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Php-xxx-nts-Win32-VC14-x86.zip</td>
<td>Visual C++ Redistributable for Visual Studio 2015</td>
</tr>
<tr>
<td>PHP Installer Name</td>
<td>Download Link for Visual C ++ Redistributable Installer</td>
</tr>
<tr>
<td>------------------------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Php-xxx-nts-Win32-VC11-x86.zip</td>
<td>Visual C ++ Redistributable for Visual Studio 2012 Update 4</td>
</tr>
<tr>
<td>Php-xxx-nts-Win32-VC9-x86.zip</td>
<td>Microsoft Visual C ++ 2008 SP1 Redistributable Package (x86)</td>
</tr>
</tbody>
</table>

For example, if the downloaded PHP installer is the one shown as below,

![php-7.0.6-nts-Win32-VC14-x86.zip](image)

then download the installer for VS2015 version based on the relation indicated in the first row, and download and install the .exe file.

3) Unzip the PHP zip installer (in this case, extract to C:\PHP), copy php.ini-production and rename it to php.ini.

4) Click "Server Manager" - "IIS"; On the local IIS, right-click and select IIS Manager.

Click on the host name (IP) on the left to go to the home page, then double-click "Handler Mappings".

Click "Add Module Mappings" button on the right, fill in the following information in the pop-up box, and click "OK" to save.

If you are unable to select php-cgi.exe as the executable file, please change the file name extension of the selected file to .exe.

5) Click on the host name (IP) on the left to return to the home page, then double-click "Default Document".

Click "Add" button on the right to add the default document with the name of index.php.

6) Click on the host name (IP) on the left to return to the home page, then double-click "FastCGI Settings".

Select the path, click the "Edit" button on the right, then in the "Monitor the Changes Made to File", select the php.ini path.

7) Create a PHP file index.php under C:\inetpub\wwwroot, to which the following content is written:

```php
<?php
    phpinfo();
```
Save, visit http://localhost/index.php within from the CVM to verify whether PHP has been installed successfully:

**PHP Version 7.0.6**

<table>
<thead>
<tr>
<th>System</th>
<th>Windows NT 10_105_232_185 6.3 build 9600 (Windows Server 2012 R2 Standard)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Build Date</td>
<td>Apr 28 2016 13:43:56</td>
</tr>
<tr>
<td>Compiler</td>
<td>M5VC14 (Visual C++ 2015)</td>
</tr>
<tr>
<td>Architecture</td>
<td>x86</td>
</tr>
<tr>
<td>Configure Command</td>
<td>cscnpl /moiogo configure.js &quot;--enable-snapshot-build&quot; &quot;--enable-debug-pack&quot; &quot;--cscdkoracle=86\instantclient_12_1\sdk\shared&quot; &quot;--with-ocie-12c=c:\php-sdk\oraclesdk\sdk\shared&quot; &quot;--enable-object-out-dir=./obj&quot; &quot;--enable-com-dotnet-shared&quot; &quot;--with-pgo&quot;</td>
</tr>
<tr>
<td>Server API</td>
<td>CGI/FastCGI</td>
</tr>
<tr>
<td>Virtual Directory Support</td>
<td>disabled</td>
</tr>
<tr>
<td>Configuration File (php.ini) Path</td>
<td>C:\Windows</td>
</tr>
<tr>
<td>Loaded Configuration File</td>
<td>C:\PHP\php.ini</td>
</tr>
<tr>
<td>Scan this dir for additional .ini files</td>
<td>(none)</td>
</tr>
<tr>
<td>Additional .ini files parsed</td>
<td>(none)</td>
</tr>
<tr>
<td>PHP API</td>
<td>20151012</td>
</tr>
<tr>
<td>PHP Extension</td>
<td>20151012</td>
</tr>
<tr>
<td>Zend Extension</td>
<td>320151012</td>
</tr>
<tr>
<td>Zend Extension Build</td>
<td>API32\20151012,NTS,VC14</td>
</tr>
<tr>
<td>PHP Extension Build</td>
<td>API20151012,NTS,VC14</td>
</tr>
</tbody>
</table>
This document introduces the PHP configuration of Windows CVM. For more information, please see Installation of PHP versions above 5.3 and Installation of PHP 5.3 and earlier as needed.

Prerequisites

To configure PHP in Windows CVMs, you need to add and install IIS role. For more information, please see Installing and Configuring IIS.

Installation of PHP Versions above 5.3

For PHP versions above 5.3, the installer mode has been canceled, and the installation is only performed through zip file or debug pack. The following example shows the zip installation in Windows Server 2012 R2 environment.

Downloading File

1. Download the PHP zip installer from the CVM (download URL: http://windows.php.net/download/).

   Note:
   You must select Non Thread Safe (NTS) x86 package when running under IIS. If you have to select x64 package for PHP in Windows Server 32bit (x64), you cannot select IIS. In this case, you can use Apache as an alternative option.
Select the installer as shown below:

### PHP 7.0 (7.0.6)

| Download source code [24.08MB] |

VC14 x86 Non Thread Safe (2016-Apr-29 00:38:17)
- **Zip** [20.93MB]
  - sha1: c605458e3f4def7e22f140dab243709b0676077aa
- **Debug Pack** [14.85MB]
  - sha1: d17bfc88bda7a716d6e0dad0e1142a4b7588ac90db

### PHP 5.6 (5.6.21)

| Download source code [24.15MB] |

VC11 x86 Non Thread Safe (2016-Apr-28 00:19:34)
- **Zip** [20.29MB]
  - sha1: 46f159ee7be2307aca4d8d5f80034f11c7ff55d2
- **Debug Pack** [9.68MB]
  - sha1: 6aba9b880dcd8c5cd6d73559b7b03649d2c82f9

### PHP 5.5 (5.5.35)

| Download source code [23.33MB] |

VC11 x86 Non Thread Safe (2016-Apr-28 00:53:27)
- **Zip** [18.77MB]
  - sha1: 0347352d85c2574e7611532af811c5a17ef719718d
- **Debug Pack** [9.33MB]
  - sha1: af3d6cb981551098ea4b6321938dfdd2175d7968
2. The installation of PHP versions above 5.3 is dependent on Visual C++ Redistributable Update. Download and install VC Update Installer according to the name of downloaded PHP installer by referring to the relations as shown in the following table:

<table>
<thead>
<tr>
<th>PHP Installer Name</th>
<th>Download Link for Visual C++ Redistributable Installer</th>
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<tbody>
<tr>
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</tr>
<tr>
<td>php-x.x.x-nts-Win32-VC11-x86.zip</td>
<td>Visual C++ Redistributable for Visual Studio 2012 Update 4</td>
</tr>
<tr>
<td>php-x.x.x-nts-Win32-VC9-x86.zip</td>
<td>Microsoft Visual C++ 2008 SP1 Redistributable Package (x86)</td>
</tr>
</tbody>
</table>

If the downloaded PHP installer is as shown below:

![php-7.0.6-nts-Win32-VC14-x86.zip](image)

then download the installer for VS 2015 version based on the relation indicated in the first row, and download and install the following two .exe files:

### Installation and configuration

1. Unzip the PHP zip installer (in this case, extract to `C:\PHP`), copy `php.ini-production` and rename it to `php.ini`, as shown below:

2. Click **Server Manager** -> **IIS**: On the local IIS, right-click and select **IIS Manager**:

   Click on the host name (IP) on the left to go to the home page, and then double-click **Handler Mappings**:

   Click **Add Module Mappings** on the right, enter the following information in the pop-up box, and click **OK** to save:

   **Note:**

   If you are unable to select `php-cgi.exe` as the executable file, please change the filename extension of the selected file to `.exe`:
3. Click the server IP on the left to go to the home page and double-click **Default Documents**: 

   Click **Add** on the right to add a default document named **index.php**.

4. Click the server IP on the left to go to the home page and double-click **FastCGI Settings**:

   Click **Edit** on the right, and select **php.ini** path in **Monitor the Changes Made to File**:

5. Create a PHP file **index.php** under **C:\inetpub\wwwroot** and write the following:

```
<?php
phpinfo();
?>
```

6. Visit **http://localhost/index.php** in the browser on CVM and check whether the environment has been configured successfully. The appearance of the following page indicates that the
configuration has been completed successfully:

![PHP Version 7.0.6](image)

### Installation of PHP 5.3 and earlier versions

**Note:**

PHP 5.3 and earlier versions are no longer available on the official download address http://windows.php.net/download/. To use these versions, download them locally and upload them to the CVM or search on the CVM network. For more information on uploading files, please see [here](#).

1. Open PHP installer in the CVM.
2. Select **IIS FastCGI** in **Web Server Setup**, as shown below:

![Web Server Setup](image)

3. Complete the installation of PHP under the guidance of installation interface.

4. Create a PHP file **hello.php** under **C:/inetpub/wwwroot**, as shown below:

![Folder Structure](image)

The following content is written to the **hello.php** file:

```php
<?php
    echo "<title>Test Page</title>";
    echo "hello world";
?>
```
5. Access the public network IP of Windows CVM via browser to check whether the environment configuration has been completed successfully. The appearance of the following page indicates that the configuration has been completed successfully:

![hello world](image)
Step 3: Install and Build MySQL

Last updated: 2019-12-03 18:06:32

This document uses Windows Server 2012 R2 as an example to introduce how to build MySQL 5.5. SQL Server database is frequently used in Windows system. You need to grant authorization for SQL Server because it is not for free. You can also purchase CDB instances for Tencent Cloud SQL Server database.

Step 1: Download MySQL installer

Open the browser on the CVM and enter the download URL: https://dev.mysql.com/downloads/mysql/5.5.html#downloads

Recommended Download:

MySQL Installer for Windows

All MySQL products, for all Windows Platforms, in one package.

Windows (x86, 32 & 64-bit), MySQL Installer: MSI

Other Downloads:

- Windows (x86, 32-bit), MSI Installer: 5.5.57 35.7MB
- Windows (x86, 64-bit), MSI Installer: 5.5.57 37.0MB
- Windows (x64, 64-bit), ZIP Archive: 5.5.57 188.0MB

We suggest that you use the MD5 checksums and Salsa20 signatures to verify the integrity of the packages you download.

Step 2: Install the application

1. Run the installation program. Click Next and select I accept the terms in the License Agreement.
2. Select **Typical** in **Choose Setup Type**.
3. Select Launch the MySQL Instance Configuration Wizard.

![MySQL Instance Configuration Wizard](image)

**Step 3: Configure MySQL**

1. Configure the type of MySQL. Here we use Detailed Configuration as an example.

   - Detailed Configuration is suitable for advanced users that need to have finer control of the CVM configurations.
   - Standard Configuration is suitable for new users that want to launch MySQL quickly without considering the CVM configurations.

**Note:**
Standard Configuration may be incompatible with your operating system. Detailed Configuration is recommended.
2. Configure the type of MySQL server. Here we use Developer Machine as an example.

- Developer Machine represents a typical personal desktop workstation. When multiple desktop applications are running at the same time, the MySQL server is configured to use minimal system resources.
- Server Machine is a type of server on which MySQL server can run with other applications such as FTP, email and Web servers. The MySQL server is configured to use a moderate portion of the system resources.
- Dedicated MySQL Server Machine is a type of server on which only MySQL server can run. The MySQL server is configured to use all available system resources.
3. Configure MySQL database. Here we use Multifunctional Database as an example.

- Multifunctional Database uses InnoDB and MyISAM storage engines simultaneously, and allocates resources to them equally. You are recommended to select this option if you often use two storage engines simultaneously.
- Transactional Database Only uses InnoDB and MyISAM storage engines simultaneously, and allocates most server resources to InnoDB storage engine. You are recommended to select this option if you use InnoDB frequently and use MyISAM occasionally.
- Non-Transactional Database Only does not use InnoDB storage engine, and allocates all server resources to MyISAM storage engine. You are recommended to select this option if you do not use InnoDB.
4. Configure the InnoDB tablespace for MySQL. Choose default configuration here.
5. Configure concurrent connection for MySQL. Here we use Decision Support as an example.

- Decision Support is suitable for situations that do not require a large number of concurrent connections.
- Online Transaction Processing is suitable when a large number of concurrent connections are required.
- Manual Setting is suitable when you need to configure the maximum number of concurrent connections manually.

![MySQL Server Instance Configuration Wizard](image)

6. Configure the network options of MySQL. You can enable or disable TCP/IP network and configure the port number for MySQL server connection.

**Notes:**
TCP/IP network is enabled by default.
Port 3306 is used by default.
7. Configure MySQL character set. Here we use Standard Character Set as an example.

- Standard Character Set uses Latin1 as the default server character set.
- Best Support For Multilingualism uses UTF8 as the server character set.
- For Manual Selected Default Character Set/Collation, select the character set in the drop-down box as needed.
8. Configure the service options of MySQL. It is recommended to select both boxes to manage MySQL using command line.
9. Set the root password.

![MySQL Server Instance Configuration Wizard]

0. Complete the configuration. Click **Execute** to complete the installation.

![MySQL Server Instance Configuration Wizard]
Step 4: Login Test for MySQL

1. Click **Start** on the CVM and click the search icon. Enter `cmd` to open the administrator command box:

   ![Image of Windows Start Menu and Command Prompt](image)

2. Enter the command `mysql -u root -p` and press **Enter**.

3. Log in to MySQL using the root password you set. The picture below indicates that MySQL has been installed and configured successfully.

   ![Image indicating MySQL installation success](image)
Microsoft Windows [Version 6.3.9600]
© 2013 Microsoft Corporation.

C: \Users \Administrator \ mysql -u root -p

Enter password: *********
Welcome to the MySQL monitor. Commands end with ; or 
Your MySQL connection id is 2
Server version: 5.5.57 MySQL Community Server (GPL)

Copyright (c) 2000, 2017, Oracle and/or its affiliates. All rights reserved.
Oracle is a registered trademark of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners.

Type 'help;' or '
\h' for help. Type '\c' to clear the current input statement.

mysql> -
Build the FTP Service
Build the FTP Service (Linux)

Scenario
Vsftpd (very secure FTP daemon) is the default FTP server in many Linux distributions. This paper takes the Tencent Cloud server (CVM) of CentOS 7.6 64-bit operating system as an example, and uses vsftpd software to build the FTP service of Linux Cloud Virtual Machine.

Software Versions
The component version of the FTP service built in this paper is as follows:

- Linux: Linux operating system. In this example, CentOS 7.6 is used.
- Vsftpd: this article takes vsftpd 3.0.2 as an example.

Directions

Step 2: Purchase cloud virtual machine
- Log in to a Linux instance in standard login mode (recommended). You can also use other login methods as needed:
- Logging In to a Linux Instance by Using Remote Logging Software
- Logging In to a Linux Instance via SSH

Step 1: Install vsftpd

1. Execute the following command to install vsftpd.

```
yum install vsftpd -y
```

2. Execute the following command to set up vsftpd Start up from Launch.

```
systemctl enable vsftpd
```

3. Execute the following command, Launch FTP service.
systemctl start vsftpd

4. Execute the following command to confirm whether the service has been started.

```
netstat -antup | grep ftp
```

If the result is shown below, it means that the FTP service has been successful, Launch.

At this time, vsftpd has enabled anonymous Access mode by default, and you can log in to the FTP server without using a user name and password. Users who log in to the FTP server in this way do not have the right to modify or upload files to Permission.

**Step 3: configure vsftpd**

1. Execute the following command to create a user for the FTP service. This article takes ftpuser as an example.

```
useradd ftpuser
```

2. Execute the following command to set the password for the ftpuser user.

```
passwd ftpuser1
```

After entering the password, please press Enter Confirm the setting. The password is not displayed by default. tf7295TFY As an example.

3. Execute the following command to create a file used by the FTP service, Directory, which is based on the `/var/ftp/test` As an example.

```
mkdir /var/ftp/test
```

4. Execute the following order to modify Directory Permission.

```
chown -R ftpuser:ftpuser /var/ftp/test
```

5. Run the following command to open the `nginx.conf` File.
vim /etc/vsftpd/vsftpd.conf

6. By I Switch to edit mode, select FTP mode according to the actual needs, and modify the configuration file. vsftpd.conf:

FTP can connect and transfer data to client machines through active mode and passive mode. Due to the firewall settings of most client machines and the inability to get the real IP, it is recommended that you choose **Passive mode** Build the FTP Service. The following modifications take setting the passive mode as an example. If you want to choose the active mode, please go to **Set FTP active mode**.

1. Modify the following configuration parameters, set the login Permission for anonymous and local users, set the path to the list file of specified exception users, and enable listening IPv4 sockets.

   anonymous_enable=NO
   local_enable=YES
   chroot_local_user=YES
   chroot_list_enable=YES
   chroot_list_file=/etc/vsftpd/chroot_list
   listen=YES

2. Add at the beginning of the line #, comment listen_ipv6=YES Configure parameters to turn off listening IPv6 sockets.

   #listen_ipv6=YES

3. Add the following configuration parameters, turn on the passive mode, set the location of Directory after the local user logs in, and Cloud Virtual Machine establish the port range values that can be used for data transmission.

   local_root=/var/ftp/test
   allow_writeable_chroot=YES
   pasv_enable=YES
   pasv_address=xxx.xx.xxx.xx #Please modify it to your Linux CVM public network IP
   pasv_min_port=40000
   pasv_max_port=45000

7. By Esc After input : wq Save and exit.
8. Execute the following command to create and edit `chroot_list` File.

```
vim /etc/vsftpd/chroot_list
```

9. By `I` Enter the edit mode, enter the user name, one user name occupies one line, and press `Esc` And enter `:wq` Save and exit.
   If you do not set the requirements of the exception user, you can skip this step and enter `:wq` Exit the file.

0. Restart the FTP service by executing the following command.

```
systemctl start vsftpd
```

**Step 4: Configure security group**

After building the FTP service, you need to give the Linux Cloud Virtual Machine Open to Internet according to the FTP model actually used `Inbound policy`.

Most client machines are in the local area network, and IP addresses are translated. If you choose FTP active mode, make sure that the client machine has obtained the real IP address, otherwise the client may not be able to log on to the FTP server.

- **Active mode**: Open to Internet port 21.
- **Passive mode**: Open to Internet port 21, and **Modify configuration file** Set in `pasv_min_port` to `pasv_max_port` All ports between, this article Open to Internet port is 40000-45000.

**Step 5: verify the FTP service**

You can verify the FTP service through tools such as FTP client software, browser, or file explorer. This article takes the file explorer on the client side as an example.

1. Open the client's IE browser, select ** tools **-*-> ** Internet options *-*-> ** Advanced * *, and modify it according to the FTP mode you selected:

   - **Active mode**: uncheck [use passive FTP].
   - **Passive mode**: check [use passive FTP].

2. Open the client's computer and in the path bar, the address below Access:

   ```
   ftp://CVM public network IP:21
   ```
3. In the pop-up Login as window, enter Configuring vsftpd The user name and password that have been set in the.

   The user name used in this article is ftpuser The password is tf7295TFY.

4. After successfully logging in, you can upload and download files.

Appendix

Set FTP active mode

The configurations that need to be modified in active mode are as follows, and the rest of the configurations remain at the default settings:

- **Anonymous_enable=NO** # prohibits anonymous users from logging in.
- **Local_enable=YES** # supports local user login.
- **Chroot_local_user=YES** # all users are restricted to the home directory.
- **Chroot_list_enable=YES** # enable the list of exceptional users.
- **Chroot_list_file=/etc/vsftpd/chroot_list** # specifies the user list file in which users are not locked in the home directory.
- **Listen=YES** # listening on IPv4 sockets.
- **Allow_writeable_chroot=YES**.
- **Local_root=/var/ftp/test** # sets the directory where local users log in

By Esc After input: wq After saving, exit and go to Step 8 Complete the vsftpd configuration.

FTP client failed to upload files

Problem Description

In Linux environment, users get the following error message when uploading files with vsftpd.

553 Could not create file

Solution

1. Execute the following command to check the utilization of server disk space.

   df -h

   - If there is not enough disk space, you will not be able to upload files. It is recommended to delete some large files.
• If there is enough disk space, go to the next step.

2. Execute the following command to check if the FTP directory has the Write permission.

```
ls -l /home/test
# /home/test is the FTP directory. Change it to your actual FTP directory.
```

• If there is no `w` in the returned result, it means that the user does not have the permission to write to the directory. Please go to the next step.
• If there is a `w` in the returned result, please [Submit a ticket](#).

3. Execute the following command to add the Write permission to the FTP directory.

```
chmod +w /home/test
# /home/test is the FTP directory. Change it to your actual FTP directory.
```

4. Execute the following command to check whether the Write permission is added successfully.

```
ls -l /home/test
# /home/test is the FTP directory. Change it to your actual FTP directory.
```
Build the FTP Service (Windows)

Last updated: 2020-02-25 12:21:09

Scenario

This document describes how to build a FTP site through IIS on Tencent Cloud server (CVM) of the Windows operating system.

Software Versions

The component version of the FTP service built in this paper is as follows:

- Windows operating system, this paper takes Windows Server 2012 as an example.
- IIS: Web server, this paper takes IIS 8.5 as an example.

Directions

Step 2: Purchase cloud virtual machine

- Logging In to a Windows Cloud Virtual Machine Instance by Using an RDP File (Recommended)
- Logging In to a Windows Cloud Virtual Machine Instance by Using a Remote Desktop

Step 2: install the FTP service on IIS

2. In the operating system interface, click To open Server Manager, as shown below:
3. In the Server Manager window, click add roles and Features.
4. In the pop-up add roles and Features Wizard window, click next to enter the Select installation Type interface.
5. In the Select installation Type interface, select role-based or feature-based installation, and click next.
6. In the Select Target Server interface, keep the default settings and click next.
7. In the "Select a server role" interface, check [Web Server (IIS)], and click "add feature" in the pop-up window.
8. Click next three times in a row to enter the Select role Service interface.
9. In the "Select role Service" interface, check "FTP Service" and "FTP extension", and click "next".
10. Click "install" to begin the installation of the FTP service.
11. When the installation is complete, click [close].

Step 3: create a FTP username and password
Please follow these steps to configure the FTP user name and password. If you need to use the anonymous user Access FTP service, you can skip this step.

1. In the Server Manager window, select tools > computer Management in the navigation bar in the upper right corner to open the computer Management window.
2. In the computer Management interface, select [system tools] > [Local users and groups] > [users] in Left sidebar.
3. In the right side of the user interface, right-click the blank space and select New user.
4. In the New user interface, follow the prompts below to set the user name and password, and click create.
   The main parameters are as follows:
   - **User name**: custom, this article uses **ftpuser** as an example.
   - **Password and confirmation password**: custom, password must contain both uppercase and lowercase letters and numbers. In this paper, **tf7295TFY** as an example.
   - **Uncheck [users must change their password the next time they log in] and check [password will never Expire].**
     Please check it according to the actual demand. This article takes the password never Expire as an example.
5. Click [close], and after closing the New user window, you can view the created **ftpuser** User.

**Step 4: set up the shared folder Permission**

You need to set up a shared folder for your FTP site, which is based on the C:\test A folder, for example, already contains files to be shared **test.txt**.

2. In the operating system interface, click **To open Server Manager**, as shown below:
3. Under disk C, select and right-click **test** Folder, select [Properties].
4. In the test Properties window, select the Security tab.
5. Select **Everyone** User and click [Edit]. as shown below:
   If it is not in the Group or user name **Everyone**, please refer to Add **Everyone user** To add.
6. In the "Permission of test" interface, set on demand **Everyone** The user's Permission and click [OK]. as shown below:
   This article is intended to award **Everyone** User-owned Permission as an example.
7. In the test Properties window, click OK to complete the settings.

**Step 5: add a FTP site**

1. In the Server Manager window, select tools > Internet Information Services (IIS) Manager in the navigation bar in the upper right corner.
2. In the Internet Information Services (IIS) Manager window that opens, click the server name of show more Left sidebar, then right-click [website], and select [add FTP site].
3. In the site Information interface, refer to the following information to set up, and click next.
   - **FTP site name**: Enter FTP site name, this article uses ftp As an example.
   - **Physical path**: Please select the shared folder path that has been set for Permission. C:\test
4. In the binding and SSL Settings interface, refer to the following information for settings, and click next.
   - **Bind**: The IP address is selected as "all without Assign" by default, and the port is 21 by default (the default port number for FTP). You can also set the port by yourself.
   - **SSL**: Please select as needed. This article takes [No SSL] as an example.
     - **No SSL**: No SSL encryption is required
     - **Allow SSL**: Allows the FTP server to support non-SSL and SSL connections to clients
     - **Require SSL**: Requires SSL encryption to communicate between the FTP server and the client
       If you select [allow SSL] or [need SSL], you can select the existing SSL Certificates Service in "SSL Certificates Service", or refer to Server certificate making Step to make a SSL Certificates Service.
5. In the Authentication and Authorization Information interface, refer to the following information to set up, and click next.
   - **Identity Verification**: Select an authentication method. This article takes basic as an example.
     - **Anonymous**: Allow any user Access to provide only anonymous or FTP user name content.
     - **Basic**: Users are required to provide a valid user name and password to enable Access content.
       Because basic authentication transmits unencrypted passwords over the network, you use this authentication method only if you know that the connection between the client and the FTP server is secure (for example, by using secure socket layer SSL).
   - **Authorize**: Select a method from the allow Access drop-down list to specify users ftpuser As an example.
     - **All users**: All users, whether anonymous or identified, can Access this content.
     - **Anonymous user**: Anonymous users can have Access content.
     - **Specified role or user group**: Only members of certain roles or user groups can have Access content. Select this option to specify a role or user group.
Specified user Only specified users can have Access content. Select this option to specify a user name.

Permissions Set Permission as needed. This article takes setting [read] and [write] Permission as an example.
- **Read** Allow authorized users to read content from Directory.
- **Write** Allow authorized users to write to Directory.

7. Click "finish" to create the FTP site successfully.

**Step 6: set up security groups and firewalls**

1. After completing the construction of the FTP site, ask Open to Internet to add the inbound rules of the port when adding the FTP site, such as the inbound rule of port 21.
   - If you choose a different port when adding a FTP site, you also need to add an inbound rule for pass this port in the firewall.
2. (optional) referenc [Microsoft official documentation](#) Configure firewall support for the FTP site to enable the FTP server to accept passive connections from the firewall.

**Step 7: test the FTP site**

You can verify the FTP service through tools such as FTP client software, browser, or file explorer. This article takes the file explorer on the client side as an example.

1. Please set up your IE browser according to your actual situation:

   - **Configured FTP site firewall:** open the client's IE browser, select [tools] > [Internet options] > [Advanced], uncheck [use passive FTP (for firewall and DSL modem compatibility)] and click "OK".
   - **The FTP site firewall is not configured:**
     i. Enable **FTP server** IE browser, select [tools] > [Internet options] > [Advanced], uncheck [use passive FTP (for firewall and DSL modem compatibility)] and click "OK".
     ii. Enable **Client** IE browser, select [tools] > [Internet options] > [Advanced], check [use passive FTP (for firewall and DSL modem compatibility)] and click [OK].

2. Open the client's computer and in the path bar, the address below Access.

   ![ftp://CVM public network IP:21](#)

3. In the pop-up Login as window, enter **Create FTP username and password** The user name and password that have been set in the.
   - The user name used in this article is **ftpuser** The password is **tf7295TFY**.
4. After successfully logging in, you can upload and download files.

Appendix

Add Everyone user

1. In the test Properties window, select the Security tab and click Edit.
2. In the "Permission of test" interface, click [add].
3. In the Select user or Group interface, click Advanced.
4. In the pop-up Select user or Group interface, click find now.
5. In the search results, select Everyone and click [OK].
6. In the Select user or Group interface, click OK to add.
   Go to Step 5 Settings Everyone User permissions.

Server certificate making

1. In the Server Manager window, select tools > Internet Information Services (IIS) Manager in the navigation bar in the upper right corner.
2. In the pop-up Internet Information Services (IIS) Manager window, select the server in Left sidebar, and double-click Server Certificate in the right screen.
4. In the pop-up create self-signed Certificate window, set the certificate name and storage class.
   This paper takes SSL Certificates Service who created the personal storage class as an example.
5. Click "OK" to create it successfully.
Setting up a Website

Running a personal website or forum is one of the most common things people do after they purchase a CVM.

This article describes several ways you can setup a website on your CVM. Choose one that suits you the best.

How to setup a website

<table>
<thead>
<tr>
<th>Step</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Purchasing a CVM</td>
<td></td>
</tr>
<tr>
<td>2. Setting up a website</td>
<td></td>
</tr>
<tr>
<td>3. Domain Registration</td>
<td>Time needed: 10 to 15 minutes</td>
</tr>
<tr>
<td>4. Identity Verification</td>
<td>Pending Approval</td>
</tr>
<tr>
<td>5. ICP Filing</td>
<td>Pending Approval</td>
</tr>
<tr>
<td>6. Domain Name Resolution</td>
<td>Time needed: 10 to 15 minutes</td>
</tr>
<tr>
<td>7. Installing Certificates</td>
<td>Time needed: 1 to 2 hours</td>
</tr>
</tbody>
</table>

Setting Up a Website Manually

We recommend that you setup your website manually.

<table>
<thead>
<tr>
<th>Manual Setup</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setup</td>
<td>Install software manually. Easier to customize.</td>
</tr>
<tr>
<td>Advantages</td>
<td>Flexible choices among software versions</td>
</tr>
<tr>
<td>Duration</td>
<td>Longer since you need to do this manually</td>
</tr>
<tr>
<td>Difficulty</td>
<td>Knows how to install software manually and which version to use.</td>
</tr>
</tbody>
</table>

Instructions

Use the following table to choose a website that suits your needs.
<table>
<thead>
<tr>
<th>Type</th>
<th>Setup</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>WordPress</td>
<td>WordPress (Linux)</td>
<td>WordPress is a blogging platform developed with PHP. You can use it as a content management system, or use it to create websites on services that support PHP and MySQL databases.</td>
</tr>
<tr>
<td></td>
<td>WordPress (Windows)</td>
<td></td>
</tr>
<tr>
<td>Discuz!</td>
<td>Discuz!</td>
<td>Discuz! is a popular forum software built on PHP and MySQL. You only need to configure a few item to get it up and running.</td>
</tr>
<tr>
<td>LNMP</td>
<td>LNMP (CentOS 7)</td>
<td>LNMP is a common web service architecture which consists of Nginx, MySQL/MariaDB and PHP running on Linux.</td>
</tr>
<tr>
<td></td>
<td>LNMP (CentOS 6)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LNMP (openSUSE)</td>
<td></td>
</tr>
<tr>
<td>LAMP</td>
<td>LAMP</td>
<td>LAMP is a common web service architecture which consists of Apache, MySQL/MariaDB and PHP running on Linux.</td>
</tr>
<tr>
<td>WIPM</td>
<td>WIPM</td>
<td>WIPM stands for a web service architecture which consists of IIS, PHP and MySQL running on Windows.</td>
</tr>
<tr>
<td>Drupal</td>
<td>Drupal</td>
<td>Drupal is a Content Management Framework (CMF) written in PHP. It consists of a Content Management System (CMS) and a PHP development framework. You can use it to run a personal blog or corporate website.</td>
</tr>
<tr>
<td>Ghost</td>
<td>Ghost</td>
<td>Ghost is a free and open source blogging platform written in JavaScript and distributed under the MIT License, designed to simplify the process of online publishing for individual bloggers as well as online publications.</td>
</tr>
</tbody>
</table>
The NTP Service

The NTP service of Tencent Cloud

Last updated : 2020-02-25 13:33:57

Network time Protocol (Network Time Protocol, NTP), Protocol, who is used to synchronize the time of each computer in the network. Its purpose is to synchronize the computer's clock to the Universal time UTC.

Tencent Cloud provides an intranet NTP server for Tencent Cloud intranet devices. For non-Tencent cloud devices, you can use the public network NTP server provided by Tencent Cloud.

**Intranet NTP Server**

```
ntpupdate.tencentyun.com
```

**Public Network NTP Server**

```
time1.cloud.tencent.com
time2.cloud.tencent.com
time3.cloud.tencent.com
time4.cloud.tencent.com
time5.cloud.tencent.com
```

For more information on Linux system settings NTP clock source server, please see "Linux instance Settings NTP Service".

For more information on Windows system settings NTP clock source server, please see "Windows instance Settings NTP Service".
Set the NTP service on a Windows instance

Last updated: 2019-10-16 16:04:06

Scenario

This document is about how to enable NTP service for Windows Server and modify the clock source server address.

Windows Time service (W32Time) is used to synchronize the time of the local system and the clock source server. It uses NTP to synchronize computer clocks throughout the network. The following describes how to enable NTP service and modify the clock source server address via client and command line for Windows Server 2016.

Directions

1. Log in to the Windows instance remotely.
2. Click “Administrative Tools > Services > Windows Time”.

![Image of Services window with Windows Time highlighted]
3. The startup type is set to "Automatic" and if the service is not started, click "Start".
4. In the notification area of the taskbar, click Time and click “Date and time settings”.

![Date and time settings](image)
5. Switch to the "Internet Time" tab and click Change Settings.

6. In the Internet Time Settings pop-up window, enter the domain name or IP address of the target clock source server and click “OK”.

![Internet Time Settings](image)
7. After you complete the setup, reopen “Date & Time” and you will see that the clock source server has been changed.
This computer is set to automatically synchronize with 'ntpupdate.tencentyun.com'.

Next synchronization: 7/24/2019 at 4:25 PM

The clock was successfully synchronized with ntpupdate.tencentyun.com on 7/24/2019 at 4:20 PM.
Set the NTP service on a Linux instance

Last updated: 2020-03-06 16:21:14

Introduction

The Network Time Protocol daemon (ntpd) is a daemon of the Linux operating system. It is a complete implementation of NTP and is used to correct the time difference between the local system and the clock source server. Unlike NTPDate which updates time periodically, ntpd corrects time continuously without time gaps. This document uses CentOS7.5 as an example to describe how to install and use ntpd.

Notes

- Some operating systems use chrony as the default NTP service. Please make sure that ntpd is running and is configured to start automatically on boot.
  - Use `systemctl is-active ntpd.service` command to see if ntpd is running.
  - Use `systemctl is-enabled ntpd.service` command to see if ntpd is configured to start automatically on boot.
- The communication port of the NTP service is UDP 123. Please make sure that you have opened the port to the Internet before configuring the NTP service.
  - If the port is not open, please refer to Adding Security Group Policies to open it to the Internet.

Directions

Installing ntpd

Execute the following command to check if ntpd has been installed.

```
rpm -qa | grep ntp
```

- If the returned result is similar to the following, it means that ntpd has been installed.

```
[root@VM_16_2_centos ~]# rpm -qa | grep ntp
ntpdate-4.2.6p5-28.el7.centos.x86_64
ntp-4.2.6p5-28.el7.centos.x86_64
fontpackages-filesystem-1.44-8.el7.noarch
```
* If ntpd has not been installed, please run `yum install ntp` to install it.

```bash
yum -y install ntp
```

ntpd uses the client mode by default.

**Configuring NTP**

1. Execute the following command to open the configuration file of the NTP service.

```bash
vi /etc/ntp.conf
```

2. Click **i** to enter the edit mode, find the configuration for server, change the server to the NTP clock source server you want to use, and delete the NTP clock source servers you do not need for the time being. See the figure below:

```
# Use public servers from the pool.ntp.org project.
P[Please consider joining the pool (http://www.pool.ntp.org/join.html).
server 0.centos.pool.ntp.org iburst
server 1.centos.pool.ntp.org iburst
server 2.centos.pool.ntp.org iburst
server 3.centos.pool.ntp.org iburst
```

3. Press **Esc**, enter `:wq`, save the file, and return.

**Launching ntpd**

Execute the following command to restart the ntpd service.

```bash
systemctl restart ntpd.service
```

**Checking the status of ntpd**

Execute the following commands to check the status of ntpd according to your needs.

- Execute the following command to check whether the NTP service port, the UDP 123 port, is being listened normally.

```bash
netstat -nupl
```
If a result similar to the following is returned, it indicates that the listening is normal.

```
[root@VM_0_136_centos ~]# netstat -nulp
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address               Foreign Address         State      PID/Program name
udp    0      0 172.30.0.136:123               0.0.0.0:*          999/ntpd
udp    0      0 127.0.0.1:123                 0.0.0.0:*          999/ntpd
udp6   0      0 fe80::5054:ff:feac2:123       ::*                  999/ntpd
udp6   0      0 ::1:123                       ::*                  999/ntpd
```

Execute the following command to check whether the ntpd status is normal.

```
service ntpd status
```

If a result similar to the following is returned, it indicates that the ntpd status is normal.

```
[root@VM_0_136_centos ~]# service ntpd status
Redirecting to /bin/systemctl status ntpd.service
* ntpd.service - Network Time Service
Loaded: loaded (/lib/systemd/system/ntp.service; enabled; vendor preset: disabled)
Active: active (running) since Wed 2019-08-07 15:23:25 CST; 3 min ago
Process: 997 ExecStart=/usr/sbin/ntpd -u ntp:ntp $OPTIONS (code=exited, status=0/SUCCESS)
Main PID: 999 (ntpd)
CGid://system.ali.com/ntpd.service
Aug 07 15:23:25 VM_0_136_centos ntpd[999]: 0.0.0.0.0 cold 0d kern kernel time sync enabled
Aug 07 15:23:25 VM_0_136_centos ntpd[999]: ntp_jo: estimated max descriptors: 1024, initia... 16
Aug 07 15:23:25 VM_0_136_centos ntpd[999]: Listen normally on 0 lo 127.0.0.1 udp 123
Aug 07 15:23:25 VM_0_136_centos ntpd[999]: Listen normally on 1 eth0 172.30.0.136 udp 123
Aug 07 15:23:25 VM_0_136_centos ntpd[999]: Listen normally on 2 lo :1 udp 123
Aug 07 15:23:25 VM_0_136_centos ntpd[999]: Listen normally on 3 eth0 fe80::5054:ff:feac2:11...123
Aug 07 15:23:25 VM_0_136_centos ntpd[999]: Listening on routing socket on fd #20 for inter...tes
Aug 07 15:23:25 VM_0_136_centos ntpd[999]: Listening for opt_reject
Aug 07 15:23:25 VM_0_136_centos ntpd[999]: 0.0.0.0 col 02 freq_set kernel 0.467 PPM
Aug 07 15:23:25 VM_0_136_centos ntpd[999]: 0.0.0.0 col 16 06 restart
Aug 07 15:23:25 VM_0_136_centos ntpd[999]: 0.0.0.0 col 12 02 freq_set kernel 0.467 PPM
Aug 07 15:23:25 VM_0_136_centos ntpd[999]: 0.0.0.0 col 15 05 clock_sync
```

Execute the following command to check whether NTP has been started normally and configured to the correct NTP clock source server.

```
ntpstat
```

The IP address of the current NTP clock source server is returned. This IP address should be the IP address of the NTP clock source server configured above. See the figure below:

```
[root@VM_0_136_centos ~]# ntpstat
synchronised to NTP server (185.65.65.65) at stratum 3
time correct to within 1060 ms
polling server every 64 s
```

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You can also get the IP address corresponding to the domain name by executing the `nslookup` command. 

- Execute the following command to get more detailed NTP service information.

```
ntpq -p
```

A result similar to the following will be returned:

```
remote     refid     st t    when    poll   reach    delay     offset   jitter
---------- ---------- ---------- ------- ------ ------ ------- ------ ------ ------
108.68.2.24 .INIT.       16 u - 64  0 0.000  0.000  0.000
193.160.194.196 194.169.101.90 2 u 6 64 17 277.831 3.949  5.588
195.213.109.28 194.169.101.90 2 u 68 64 16 201.280 1.729  0.263
193.160.194.196 194.169.101.90 2 u 69 64 16 293.382 1.003  0.441
163.202.119.7  100.139.17.105 2 u 3 64 17 6.507  9.897  0.461
```

- **remote**: the name of the NTP server that responds to this request.
- **refid**: the NTP server one stratum above to which the NTP server on this stratum is synchronized.
- **st**: the stratum of the remote server. The stratum of a server can be set to 1 to 16 from the top to the bottom. In order to relieve the load and network congestion, in principle, you should avoid connecting directly to a stratum 1 server.
- **when**: how many seconds have elapsed since the last successful request.
- **poll**: the synchronization interval (in seconds). At the beginning, the poll value will be smaller, which means higher frequency of synchronization with the server, so that the time can be adjusted to the correct time range as soon as possible. Later, the poll value will gradually increase, and the synchronization frequency will be lower accordingly.
- **reach**: an octal value used to test whether the server can be connected. Its value increases every time when the server is successfully connected.

- **delay**: the round trip time of sending the synchronization request from the local machine to the NTP server.
- **offset**: the difference in milliseconds (ms) between the host time synchronized through NTP and the time of the time source. The closer the offset is to 0, the closer the time of the host and the NTP server is.

- **jitter**: a value used for statistics which records the distribution of offsets over a particular number of consecutive connections. The smaller its absolute value, the more accurate the host time.
Setting the automatic launch of ntpd on startup

1. Execute the following command to set the automatic launch of ntpd at startup.

```bash
systemctl enable ntpd.service
```

2. Execute the following command to see if chrony is set to launch at startup.

```bash
systemctl is-enabled chronyd.service
```

If chrony is set to launch at startup, execute the following command to remove chrony from the list of software that runs at startup.

chrony is not compatible with ntpd, which may lead to ntpd start failure.

```bash
systemctl disable chronyd.service
```
Setting up a Ghost Blog
Last updated : 2020-03-06 11:10:11

Scenario

Ghost is a free and open source blogging platform written in JavaScript and distributed under the MIT License, designed to simplify the process of online publishing for individual bloggers as well as online publications. This article describes how to setup Ghost on a CVM.

To setup Ghost, you should be familiar with Linux and its common commands, such as Install Software via Apt-get under Ubuntu Environment.

Software

This article uses the following software:

- Linux operating system. This article uses Ubuntu 18.04.
- Nginx 1.14.0 is used to provide web service.
- MySQL 5.7.27 is used for database.
- Node.js 10.17.0 is our runtime environment.
- Ghost 3.0.2

Prerequisites

You should have a Linux CVM. If you have not purchased one yet, see Getting Started with Linux CVMs.

- A domain name that points to your CVM and already completed ICP filing.

Directions

**Step 1 Logging in to a Linux instance**

- Log in to a Linux instance using WebShell (recommended). You can also use other login methods that you are comfortable with:
- Log in to a Linux instance using remote login software.
• **Logging In to a Linux Instance using SSH**

### Step 2 Create a new user

1. After logging in, switch to **root**. Refer to [this article](#) for details.
2. Run the following command to create a user named **user**.

   ```
   adduser user
   ```

   i. Input and confirm password as prompted. Password is not shown by default. Press **Enter** to continue.

   ii. Input user information. Or press **Enter** to skip them and continue.

   iii. Input **Y** to confirm and press **Enter** to complete the process, as shown below:

   ![adduser_output.png](attachment:image.png)

3. Run the following command to add user privileges.

   ```
   usermod -aG sudo user
   ```

4. Run the following command to switch to user **user**.

   ```
   su user
   ```

---

### Step 3 Update installed packages
Run the following commands to update installed packages.

```
Input the password for user as prompted and press Enter to start.
```

```
sudo apt-get update

sudo apt-get upgrade -y
```

**Step 4 Environment setup**

**Install Nginx**

Run the following command to install Nginx.

```
sudo apt-get install -y nginx
```

**Install and configure MySQL**

1. Run the following command to install MySQL.

```
sudo apt-get install -y mysql-server
```

2. Run the following command to connect to MySQL.

```
sudo mysql
```

3. Run the following command to create a database for Ghost named **ghost_data**.

```
CREATE DATABASE ghost_data;
```

4. Run the following command to set a password for the database user **root**.

```
ALTER USER 'root'@'localhost' IDENTIFIED WITH mysql_native_password BY 'your_password';
```

5. Run the following command to quit MySQL.

```
\q
```

**Install Node.js**

1. Run the following command to set a default Node.js version to be used.

```
curl -sL https://deb.nodesource.com/setup_10.x | sudo -E bash
```
2. Run the following command to install Node.js.

```bash
sudo apt-get install -y nodejs
```

**Install Ghost-CLI**

Run the following command to install Ghost-CLI which helps configuring Ghost.

```bash
sudo npm install ghost-cli@latest -g
```

**Step 5 Install and configure Ghost**

1. Run the following commands.

```bash
sudo mkdir -p /var/www/ghost

sudo chown user:user /var/www/ghost

sudo chmod 775 /var/www/ghost

cd /var/www/ghost
```

2. Run the following command to install Ghost.

```bash
ghost install
```
3. Use the following image to complete the installation process.

```
3. Use the following image to complete the installation process.

1. Enter your blog URL: input your domain name in the format of http://your_domain_name.
2. Enter your MySQL hostname: input your database address. Use localhost in this case and press Enter.
3. Enter your MySQL username: input the username you use to connect to MySQL. Use root in this case and press Enter.
4. Enter your MySQL password: input the corresponding password you set earlier and press Enter.

Ghost was installed successfully! To complete setup of your publication, visit: http://www.your_domain_name/ghost/
```
v. **Enter your database name:** input the name of the database you created for Ghost in the previous step. Use `ghost_data` and press **Enter**.

vi. Input **Y** or **n** to complete the configuration.

The admin URL appears on the bottom of the screen.

4. Open a browser window on your local machine and visit the admin URL to start configuring your blog.

Click **Create your account** to create an admin account.
5. Input desired information and click **Last step**, as shown below:

6. You can invite others to create blogs, or skip this step.
7. Go to the administration page to manage blogs, as shown below:

Once finished, use a browser to visit your domain name www.xxxxxxxx.xx to see your blog, as shown below:

FAQ
If you encounter a problem when using CVM, refer to the following documents for troubleshooting based on your actual situation.

- For issues regarding CVM login, see Password Login and SSH Key Login and Login and Remote Access.
- For issues regarding the CVM network, see IP Addresses and Ports and Security Groups.
- For issues regarding CVM disks, see System and Data Disks.
Setting up Drupal

Last updated: 2020-03-06 15:06:40

Scenario

Drupal is a free and open-source content management framework written in PHP and distributed under the GNU General Public License. Drupal provides a back-end framework for at least 2.3% of all websites worldwide – ranging from personal blogs to corporate sites. This article describes how to setup Drupal manually on a CVM.

To manually setup a Drupal-based personal website, you need to be familiar with Linux commands, such as using YUM to install software on CentOS. You should also be familiar with software usage and compatibility.

Software

This article describes how to install the following software:

- Linux operating system. This article uses CentOS 7.6.
- Apache is a web server software. This article uses Apache 2.4.6.
- MariaDB is a database management system. This article uses MariaDB 10.4.8.
- PHP is a scripting language. This article uses PHP 7.0.33.
- Drupal is a content management framework. This article uses Drupal 8.1.1.

Prerequisites

You need a Linux CVM. If you have not purchased one yet, see this article for information on how to get started with a Linux CVM.

Directions

Step 1 Logging in to a Linux instance

Log in to a Linux instance using WebShell (recommended). You can also use other login methods that you are comfortable with:
- Log in to a Linux instance using remote login software.
- Log in to a Linux instance using SSH

**Step 2 Setting up LAMP**

After logging in, set up LAMP so you can run Drupal. Refer to this article for details.

**Step 3 Downloading and installing Drupal**

1. Run the following commands to download the Drupal install package to the root directory of your website.
   
   ```
   cd /var/www/html/
   ```

2. Run the following commands to decompress the install package and rename the directory.
   
   ```
   unzip drupal-8.1.1.zip
   mv drupal-8.1.1/ drupal/
   ```

**Step 4 Configuring Drupal**

1. Run the following command to open the Apache configuration file.
   
   ```
   vi /etc/httpd/conf/httpd.conf
   ```

2. Press i to enter edit mode. Find `AllowOverride None` in Directory ”/var/www/html”</Directory>` and replace it with the following:
   
   ```
   AllowOverride All
   ```
The result is shown below:

```
# Further relax access to the default document root:
<Directory "/var/www/html">
  # possible values for the Options directive are "None", "All",
  # or any combination of:
  # Indexes Includes FollowSymLinks SymLinksIfOwnerMatch ExecCGI MultiViews
  # Note that "MultiViews" must be named "explicitly" --- "Options All"
  # doesn't give it to you.
  # The Options directive is both complicated and important. Please see
  # http://httpd.apache.org/docs/2.4/mod/core.html#options
  # for more information.
  Options Indexes FollowSymLinks

  # AllowOverride controls what directives may be placed in .htaccess files.
  # It can be "All", "None", or any combination of the keywords:
  # Options FileInfo AuthConfig Limit

  **AllowOverride All**

  # Controls who can get stuff from this server.
  #
  # Require all granted
</Directory>
```

3. Press Esc to exit edit mode and enter :wq to save the file and return.
4. Run the following command to change the access permission of the root directory of the website for the user apache.

   ```bash
   chown -R apache:apache /var/www/html
   ```

5. Run the following command to reboot Apache service.

   ```bash
   systemctl restart httpd
   ```

Configure a database for Drupal

Instructions for configuring MariaDB user credentials may vary depending on different versions. Consult official MariaDB website for details.
1. Run the following command to enter MariaDB.

```sql
mysql
```

2. Run the following command to create a database named `drupal`.

```sql
CREATE DATABASE drupal;
```

3. Run the following command to create a new user `user` and set its password to `123456`.

```sql
CREATE USER 'user'@'localhost' IDENTIFIED BY '123456';
```

4. Run the following command and grant `user` all privileges to `drupal`.

```sql
GRANT ALL PRIVILEGES ON drupal.* TO 'user'@'localhost' IDENTIFIED BY '123456';
```

5. Run the following command to apply all configurations.

```sql
FLUSH PRIVILEGES;
```

6. Run the following command to exit MariaDB.

```sql
\q
```

**Configure root**

1. Run the following command to enter MariaDB.

```sql
mysql
```

2. Run the following command to set a password for `root`.

```sql
MariaDB 10.4 for CentOS now allows `root` account to log in without password. Run the following command to set a password for `root` and record it in a secure location.

```sql
ALTER USER root@localhost IDENTIFIED VIA mysql_native_password USING PASSWORD('your_password');
```

3. Run the following command to exit MariaDB.

```sql
\q
```

**Step 5 Installing and configuring Drupal**

1. Open a browser window on your local machine and visit the following address to install Drupal.
2. Select the language of your preference and click **Save and continue**, as shown below:
3. Select **Standard installation** and click **Save and continue**, as shown below:

4. Input relevant database information configured in [Configuring a database for Drupal](#). Click **Save and continue**, as shown below:

Drupal installation now checks to see if all installation criteria are met. If so, installation starts. If not, error messages appear. Resolve them before continuing.
5. The configuration page loads automatically after installation is completed. Input information and click **Save and continue**, as shown below:

Record your maintenance username and password.
6. The homepage of your Drupal loads automatically. Use the maintenance username and password to log in, as shown below:
You have now successfully set up your Drupal website. Customize your experience as you see fit.

FAQ

If you encounter a problem when using CVM, refer to the following documents for troubleshooting based on your actual situation.

- For issues regarding CVM login, see Password Login and SSH Key Login and Login and Remote Access.
- For issues regarding the CVM network, see IP Addresses and Ports and Security Groups.
- For issues regarding CVM disks, see System and Data Disks.