

PHP web Development

```
ps@rps-virtual-machine:~$ sudo systemctl status mariadb
sudo: system: command not found
ps@rps-virtual-machine:~$ sudo systemctl status mariadb
● mariadb.service - MariaDB 10.6.16 database server
   Loaded: loaded (/lib/systemd/system/mariadb.service; enabled; vendor preset: enabled)
   Active: active (running) since Wed 2024-05-08 13:07:04 IST; 1min 38s ago
     Docs: man:mariadb(8)
           https://mariadb.com/kb/en/library/systemd/
   Process: 29409 ExecStartPre=/usr/bin/install -m 755 -o mysql -g root -d /var/run/mysqld (code=exited, status=0/SUCCESS)
   Process: 29410 ExecStartPre=/bin/sh -c systemctl unset-environment _WSREP_START_POSITION (code=exited, status=0/SUCCESS)
   Process: 29412 ExecStartPre=/bin/sh -c [ ! -e /usr/bin/galera_recovery ] && VAR= || VAR='cd /usr/bin/..; /usr/bin/galera_recovery'; [
   Process: 29451 ExecStartPost=/bin/sh -c systemctl unset-environment _WSREP_START_POSITION (code=exited, status=0/SUCCESS)
   Process: 29455 ExecStartPost=/etc/mysql/debian-start (code=exited, status=0/SUCCESS)
  Main PID: 29441 (mariadb)
    Status: "Taking your SQL requests now..."
     Tasks: 9 (limit: 19091)
   Memory: 61.3M
      CPU: 908ms
   CGroup: /system.slice/mariadb.service
           └─29441 /usr/sbin/mariadb

May 08 13:07:04 rps-virtual-machine mariabdd[29441]: Version: '10.6.16-MariaDB-0ubuntu0.22.04.1' socket: '/run/mysqld/mysqld.sock' port: 3306
May 08 13:07:04 rps-virtual-machine systemd[1]: Started MariaDB 10.6.16 database server.
May 08 13:07:04 rps-virtual-machine /etc/mysql/debian-start[29457]: Upgrading MySQL tables if necessary.
May 08 13:07:07 rps-virtual-machine /etc/mysql/debian-start[29460]: Looking for 'mariadb' as: /usr/bin/mariadb
May 08 13:07:07 rps-virtual-machine /etc/mysql/debian-start[29460]: Looking for 'mariadb-check' as: /usr/bin/mariadb-check
May 08 13:07:07 rps-virtual-machine /etc/mysql/debian-start[29460]: This installation of MariaDB is already upgraded to 10.6.16-MariaDB.
May 08 13:07:07 rps-virtual-machine /etc/mysql/debian-start[29460]: There is no need to run mysql_upgrade again for 10.6.16-MariaDB.
May 08 13:07:07 rps-virtual-machine /etc/mysql/debian-start[29460]: You can use --force if you still want to run mysql_upgrade
May 08 13:07:07 rps-virtual-machine /etc/mysql/debian-start[29502]: Checking for insecure root accounts.
May 08 13:07:07 rps-virtual-machine /etc/mysql/debian-start[29503]: Telemetry plugin recover for all MySQL tables and aria recover for all
```

```
ps@rps-virtual-machine:~$ sudo mysql_secure_installation
```

NOTE: RUNNING ALL PARTS OF THIS SCRIPT IS RECOMMENDED FOR ALL MariaDB
SERVERS IN PRODUCTION USE! PLEASE READ EACH STEP CAREFULLY!

In order to log into MariaDB to secure it, we'll need the current
password for the root user. If you've just installed MariaDB, and
haven't set the root password yet, you should just press enter here.

Enter current password for root (enter for none):

OK, successfully used password, moving on...

Setting the root password or using the unix_socket ensures that nobody
can log into the MariaDB root user without the proper authorisation.

You already have your root account protected, so you can safely answer 'n'.

Switch to unix_socket authentication [Y/n] n
... skipping.

You already have your root account protected, so you can safely answer 'n'.

```
Thanks for using MariaDB!
ps@rps-virtual-machine:~$ sudo mysql -u root -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 38
Server version: 10.6.16-MariaDB-0ubuntu0.22.04.1 Ubuntu 22.04

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)]> CREATE DATABASE app1;
Query OK, 1 row affected (0.001 sec)

MariaDB [(none)]> GRANT ALL ON app1.* TO 'rps'@'localhost' IDENTIFIED BY '123'
-> ;
Query OK, 0 rows affected (0.002 sec)

MariaDB [(none)]> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.001 sec)

MariaDB [(none)]> GRANT ALL ON app1.* TO 'rps'@'localhost' IDENTIFIED BY '123'
->
-> GRANT ALL ON app1.* TO 'rps'@'localhost' IDENTIFIED BY '123';
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MariaDB server version for the right synt
ax to use near 'GRANT ALL ON app1.* TO 'rps'@'localhost' IDENTIFIED BY '123'' at line 3
MariaDB [(none)]> GRANT ALL ON app1.* TO 'rps'@'localhost' IDENTIFIED BY '123';
Query OK, 0 rows affected (0.001 sec)

MariaDB [(none)]> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.001 sec)
```

```

rps@rps-virtual-machine:~$ sudo apt install apache2 php
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libaio1 libevent-core-2.1-7 libevent-pthreads-2.1-7 libflashrom1 libftdi1-2 libllvml3 libmecab2 libprotobuf-lite23 mecab-ipadic
  mecab-ipadic-utf8 mecab-utils
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  apache2-bin apache2-data apache2-utils libapache2-mod-php8.1 libapr1 libaprutil1 libaprutil1-dbd-sqlite3 libaprutil1-ldap php-common
  php8.1 php8.1-cli php8.1-common php8.1-opcache php8.1-readline
Suggested packages:
  apache2-doc apache2-suexec-pristine | apache2-suexec-custom php-pear
The following NEW packages will be installed:
  apache2 apache2-bin apache2-data apache2-utils libapache2-mod-php8.1 libapr1 libaprutil1 libaprutil1-dbd-sqlite3 libaprutil1-ldap php
  php-common php8.1 php8.1-cli php8.1-common php8.1-opcache php8.1-readline
0 upgraded, 16 newly installed, 0 to remove and 6 not upgraded.
Need to get 7,051 kB of archives.
After this operation, 29.0 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libapr1 amd64 1.7.0-8ubuntu0.22.04.1 [108 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libaprutil1 amd64 1.6.1-Subuntu4.22.04.2 [92.8 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libaprutil1-dbd-sqlite3 amd64 1.6.1-Subuntu4.22.04.2 [11.3 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 libaprutil1-ldap amd64 1.6.1-Subuntu4.22.04.2 [9,170 B]
Get:5 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 apache2-bin amd64 2.4.52-1ubuntu4.9 [1,347 kB]
Get:6 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 apache2-data all 2.4.52-1ubuntu4.9 [165 kB]
Get:7 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 apache2-utils amd64 2.4.52-1ubuntu4.9 [88.7 kB]

```

```

rps@rps-virtual-machine:~$ sudo systemctl status apache2
sudo: systemctl: command not found
rps@rps-virtual-machine:~$ sudo syatemctl status apache2
sudo: syatemctl: command not found
rps@rps-virtual-machine:~$ sudo systemctl status apache2
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
   Active: active (running) since Wed 2024-05-08 13:25:24 IST; 1m1n 57s ago
     Docs: https://httpd.apache.org/docs/2.4/
   Main PID: 36334 (apache2)
     Tasks: 6 (limit: 19091)
    Memory: 10.1M
       CPU: 237ms
    CGroup: /system.slice/apache2.service
            └─36334 /usr/sbin/apache2 -k start
            └─36336 /usr/sbin/apache2 -k start
            └─36337 /usr/sbin/apache2 -k start
            └─36338 /usr/sbin/apache2 -k start
            └─36339 /usr/sbin/apache2 -k start
            └─36340 /usr/sbin/apache2 -k start

May 08 13:25:23 rps-virtual-machine systemd[1]: Starting The Apache HTTP Server...
May 08 13:25:24 rps-virtual-machine apachectl[36333]: AH00558: apache2: Could not reliably determine the server's fully qualified domain name
May 08 13:25:24 rps-virtual-machine systemd[1]: Started The Apache HTTP Server.

rps@rps-virtual-machine:~$ sudo apt search ^php-
Sorting... Done
Full Text Search... Done
php-all-dev/jammy,jammy 2:92ubuntu1 all
  package depending on all supported PHP development packages

php-amqp/jammy 1.11.0-4 amd64
  AMQP extension for PHP

php-amqp-all-dev/jammy,jammy 1.11.0-4 all
  AMQP extension for PHP

```

```

rps@rps-virtual-machine:~$ sudo apt install php-curl php-gd php-mbstring php-mysql php-xml
E: Command line option 'x' [from -xml] is not understood in combination with the other options.
rps@rps-virtual-machine:~$ sudo apt install php-curl php-gd php-mbstring php-mysql php-xml
E: Command line option 'x' [from -xml] is not understood in combination with the other options.
rps@rps-virtual-machine:~$ sudo apt install php-curl php-gd php-mbstring php-mysql php-xml
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following packages were automatically installed and are no longer required:
  libaio1 libevent-core-2.1-7 libevent-pthreads-2.1-7 libflashrom1 libftdi1-2 libllvml3 libmecab2 libprotobuf-lite23 mecab-ipadic
  mecab-ipadic-utf8 mecab-utils
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  libonig5 libzip4 php8.1-curl php8.1-gd php8.1-mbstring php8.1-mysql php8.1-xml php8.1-zip
The following NEW packages will be installed:
  libonig5 libzip4 php-curl php-gd php-json php-mbstring php-mysql php-xml php-zip php8.1-curl php8.1-gd php8.1-mbstring php8.1-mysql
  php8.1-xml php8.1-zip
0 upgraded, 15 newly installed, 0 to remove and 6 not upgraded.
Need to get 1,073 kB of archives.
After this operation, 3,318 kB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 libonig5 amd64 6.9.7.1-2build1 [172 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu jammy/universe amd64 libzip4 amd64 1.7.3-1ubuntu2 [55.0 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 php8.1-curl amd64 8.1.2-1ubuntu2.17 [38.7 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 php-curl all 2:8.1+92ubuntu1 [1,834 B]
Get:5 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 php8.1-gd amd64 8.1.2-1ubuntu2.17 [32.6 kB]
Get:6 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 php-gd all 2:8.1+92ubuntu1 [1,828 B]
Get:7 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 php-json all 2:8.1+92ubuntu1 [1,834 B]
Get:8 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 php8.1-mbstring amd64 8.1.2-1ubuntu2.17 [484 kB]
Get:9 http://in.archive.ubuntu.com/ubuntu jammy/universe amd64 php-mbstring all 2:8.1+92ubuntu1 [1,844 B]
Get:10 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 php8.1-mysql amd64 8.1.2-1ubuntu2.17 [130 kB]
Get:11 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 php-mysql all 2:8.1+92ubuntu1 [1,834 B]
Get:12 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 php8.1-xml amd64 8.1.2-1ubuntu2.17 [120 kB]
Get:13 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 php-xml all 2:8.1+92ubuntu1 [1,850 B]

```



```

rps@rps-virtual-machine:~$ sudo systemctl restart apache2
rps@rps-virtual-machine:~$ ls /etc/apache2/mods-available
access_compat.load  authz_user.load  dir.load          log_debug.load    proxy_express.load  session_dbd.load
actions.conf        autoindex.conf   dump_io.load      log_forensic.load proxy_fcgi.load     session.load
actions.load        autoindex.load   echo.load         lua.load           proxy_fdpass.load   setenvif.conf
alias.conf          brotli.load      env.load          macro.load         proxy_ftp.conf      setenvif.load
alias.load          buffer.load      expires.load      md.load            proxy_ftp.load      slotmem_plain.load
allowmethods.load  cache_disk.conf  ext_filter.load   mime.conf          proxy_hcheck.load   slotmem_shm.load
asis.load           cache_disk.load  file_cache.load   mime_magic.conf    proxy_html.conf     socache_dbm.load
auth_basic.load     cache.load       filter.load       mime_magic.load    proxy_html.load     socache_memcache.load
auth_digest.load    cache_socache.load headers.load       mpm_event.conf     proxy_http2.load    socache_redis.load
auth_form.load      cern_meta.load  heartbeat.load    mpm_event.load     proxy_http.load     socache_shmcb.load
authn_anon.load     cgid.conf       heartmonitor.load mpm_event.load     proxy.load           spelling.load
authn_core.load     cgid.load       http2.conf        mpm_prefork.conf   proxy_scgi.load     ssl.conf
authn_dbm.load      cgid.load       http2.load        mpm_prefork.load   proxy_uwsgi.load    ssl.load
authn_file.load     charset_lite.load ident.load        mpm_worker.conf    proxy_wstunnel.load status.conf
authn_socache.load  data.load       imagemap.load     negotiation.conf   ratelimit.load      status.load
authnz_fcgi.load    dav_fs.conf     include.load      negotiation.load   reflector.load      substitute.load
authnz_ldap.load    dav_fs.load     info.conf         php8.1.conf        remoteip.load       suexec.load
authnz_core.load    dav_lock.load   info.load         php8.1.load        reqtimeout.conf     unique_id.load
authz_dbd.load      dbd.load        lbmethod_byrequests.load php8.1.conf        request.load         userdir.conf
authz_core.load     deflate.conf     lbmethod_bytraffic.load proxy_balancer.conf rewrite.load         usertrack.load
authz_groupfile.load deflate.load      lbmethod_byheartbeat.load proxy_balancer.load sed.load            vhost_alias.load
authz_host.load     dialup.load     ldap.conf         proxy.conf          session_cookie.load xml2enc.load
authz_owner.load    dir.load        ldap.load         proxy_connect.load  session_crypto.load

```

```

rps@rps-virtual-machine:~$ sudo a2enmod rewrite
Enabling module rewrite.
To activate the new configuration, you need to run:
  systemctl restart apache2
rps@rps-virtual-machine:~$ sudo systemctl restart apache2

```

```

rps@rps-virtual-machine:~$ vi phpinfo.php
rps@rps-virtual-machine:~$ cat phpinfo.php

Contents of phpinfo.php:
<?php
phpinfo();
?>

rps@rps-virtual-machine:~$ vi index.php
rps@rps-virtual-machine:~$ cat index.php
<?php
$host = "localhost";
$user = "rps";
$pass = "rps@12345";
$db = "app1";


try {
$conn = new PDO("mysql:host=$host;dbname=$db", $user, $pass);
$conn->setAttribute(PDO::ATTR_ERRMODE, PDO::ERRMODE_EXCEPTION);

echo "Connected successfully";
} catch(PDOException $e) {
echo "Connection failed: " . $e->getMessage();
}
?>

Contents of phpinfo.php:
<?php
phpinfo();
?>
rps@rps-virtual-machine:~$ sudo nano /etc/apache2/envvars

```

OUTPUT



Apache2 Default Page

Ubuntu

It works!

This is the default welcome page used to test the correct operation of the Apache2 server after installation on Ubuntu systems. It is based on the equivalent page on Debian, from which the Ubuntu Apache packaging is derived. If you can read this page, it means that the Apache HTTP server installed at this site is working properly. You should **replace this file** (located at `/var/www/html/index.html`) before continuing to operate your HTTP server.

If you are a normal user of this web site and don't know what this page is about, this probably means that the site is currently unavailable due to maintenance. If the problem persists, please contact the site's administrator.

Configuration Overview

Ubuntu's Apache2 default configuration is different from the upstream default configuration, and split into several files optimized for interaction with Ubuntu tools. The configuration system is **fully documented in `/usr/share/doc/apache2/README.Debian.gz`**. Refer to this for the full documentation. Documentation for the web server itself can be found by accessing the **manual** if the `apache2-doc` package was installed on this server.

The configuration layout for an Apache2 web server installation on Ubuntu systems is as follows:

```

/etc/apache2/
|-- apache2.conf
/   |-- ports.conf

```

PHP Version 8.1.2-1ubuntu2.17



System	Linux rps-virtual-machine 6.5.0-28-generic #29~22.04.1-Ubuntu SMP PREEMPT_DYNAMIC Thu Apr 4 14:39:20 UTC 2 x86_64
Build Date	May 1 2024 10:10:07
Build System	Linux
Server API	Apache 2.0 Handler
Virtual Directory Support	disabled
Configuration File (php.ini) Path	/etc/php/8.1/apache2
Loaded Configuration File	/etc/php/8.1/apache2/php.ini
Scan this dir for additional .ini files	/etc/php/8.1/apache2/conf.d
Additional .ini files parsed	/etc/php/8.1/apache2/conf.d/10-mysqld.ini, /etc/php/8.1/apache2/conf.d/10-opcache.ini, /etc/php/8.1/apache2/conf.d/10-pdo.ini, /etc/php/8.1/apache2/conf.d/15-xml.ini, /etc/php/8.1/apache2/conf.d/20-calendar.ini, /etc/php/8.1/apache2/conf.d/20-ctype.ini, /etc/php/8.1/apache2/conf.d/20-curl.ini, /etc/php/8.1/apache2/conf.d/20-dom.ini, /etc/php/8.1/apache2/conf.d/20-exif.ini, /etc/php/8.1/apache2/conf.d/20-ffi.ini, /etc/php/8.1/apache2/conf.d/20-fileinfo.ini, /etc/php/8.1/apache2/conf.d/20-ftp.ini, /etc/php/8.1/apache2/conf.d/20-gd.ini, /etc/php/8.1/apache2/conf.d/20-gettext.ini, /etc/php/8.1/apache2/conf.d/20-iconv.ini, /etc/php/8.1/apache2/conf.d/20-imagick.ini, /etc/php/8.1/apache2/conf.d/20-ldap.ini, /etc/php/8.1/apache2/conf.d/20-ldap24.ini, /etc/php/8.1/apache2/conf.d/20-mbstring.ini, /etc/php/8.1/apache2/conf.d/20-mcrypt.ini, /etc/php/8.1/apache2/conf.d/20-mysqli.ini, /etc/php/8.1/apache2/conf.d/20-pdo_mysql.ini, /etc/php/8.1/apache2/conf.d/20-phar.ini, /etc/php/8.1/apache2/conf.d/20-posix.ini, /etc/php/8.1/apache2/conf.d/20-readline.ini, /etc/php/8.1/apache2/conf.d/20-shmop.ini, /etc/php/8.1/apache2/conf.d/20-simplexml.ini, /etc/php/8.1/apache2/conf.d/20-sockets.ini, /etc/php/8.1/apache2/conf.d/20-sysmsg.ini, /etc/php/8.1/apache2/conf.d/20-sysvshm.ini, /etc/php/8.1/apache2/conf.d/20-tokenizer.ini, /etc/php/8.1/apache2/conf.d/20-xmlreader.ini, /etc/php/8.1/apache2/conf.d/20-xmlwriter.ini, /etc/php/8.1/apache2/conf.d/20-xsl.ini, /etc/php/8.1/apache2/conf.d/20-zip.ini
PHP API	20210902
PHP Extension	20210902
Zend Extension	420210902
Zend Extension Build	API420210902.NTS
PHP Extension Build	API20210902.NTS

Thread Safety	disabled
Zend Signal Handling	enabled
Zend Memory Manager	enabled
Zend Multibyte Support	provided by mbstring
IPv6 Support	enabled
DTrace Support	available, disabled
Registered PHP Streams	https, ftps, compress.zlib, php, file, glob, data, http, ftp, phar, zip
Registered Stream Socket Transports	tcp, udp, unix, udg, ssl, tls, tlsv1.0, tlsv1.1, tlsv1.2, tlsv1.3
Registered Stream Filters	zlib.*, string.rot13, string.toupper, string.tolower, convert.*, consumed, dechunk, convert.iconv.*

This program makes use of the Zend Scripting Language Engine:
Zend Engine v4.1.2, Copyright (c) Zend Technologies
with Zend OPcache v8.1.2-1ubuntu2.17, Copyright (c), by Zend Technologies



Configuration

apache2handler

Apache Version	Apache/2.4.52 (Ubuntu)
Apache API Version	20120211
Server Administrator	webmaster@localhost
Hostname:Port	127.0.1.1:80
User/Group	www-data(33)/33
Max Requests	Per Child: 0 - Keep Alive: on - Max Per Connection: 100
Timeouts	Connection: 300 - Keep-Alive: 5
Virtual Server	Yes
Server Root	/etc/apache2
Loaded Modules	core mod_so mod_watchdog http_core mod_log_config mod_logio mod_version mod_unixd mod_access_compat mod_alias mod_auth_basic mod_authn_core mod_authn_file mod_authz_core

Reload current page (Ctrl+R)

	mod_status	
Directive	Local Value	Master Value
engine	On	On
last_modified	Off	Off
xbithack	Off	Off

Apache Environment

Variable	Value
HTTP_HOST	localhost
HTTP_USER_AGENT	Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:125.0) Gecko/20100101 Firefox/125.0
HTTP_ACCEPT	text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,*/*;q=0.8
HTTP_ACCEPT_LANGUAGE	en-US,en;q=0.5
HTTP_ACCEPT_ENCODING	gzip, deflate, br
HTTP_CONNECTION	keep-alive
HTTP_UPGRADE_INSECURE_REQUESTS	1
HTTP_SEC_FETCH_DEST	document
HTTP_SEC_FETCH_MODE	navigate
HTTP_SEC_FETCH_SITE	none
HTTP_SEC_FETCH_USER	?1
PATH	/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/snap/bin
SERVER_SIGNATURE	<address>Apache/2.4.52 (Ubuntu) Server at localhost Port 80</address>
SERVER_SOFTWARE	Apache/2.4.52 (Ubuntu)
SERVER_NAME	localhost
SERVER_ADDR	127.0.0.1
SERVER_PORT	80
REMOTE_ADDR	127.0.0.1