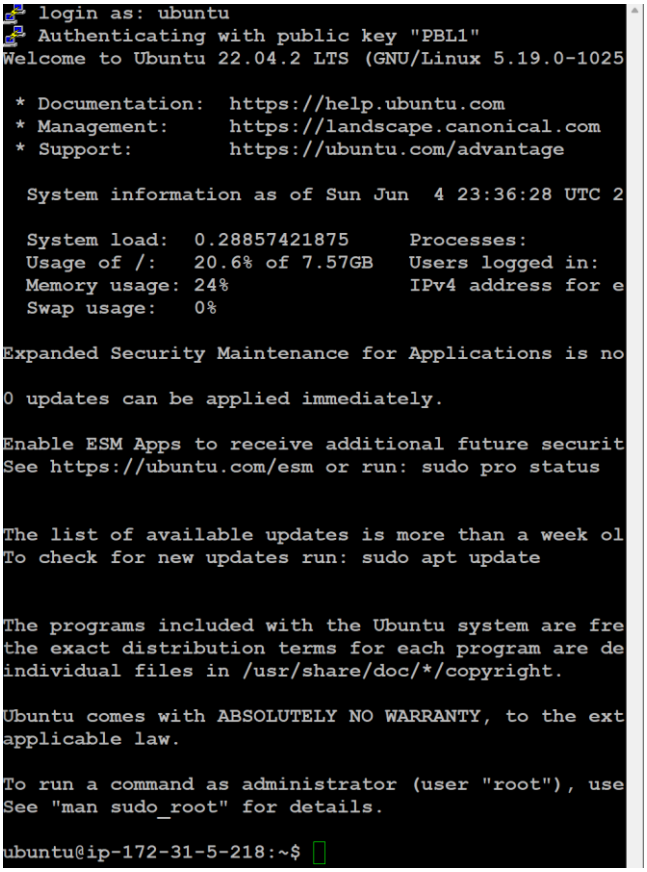
WEB STACK IMPLEMENTATION (LAMP STACK) IN AWS

1. AWS account setup and Provisioning an Ubuntu Server
2. Connecting to your EC2 Instance
3. connect your EC2 Instance to the **Putty** tool.



4.Install Apache using Ubuntu's package manager *'apt'*:

```
#update a list of packages in package manager

sudo apt update
```

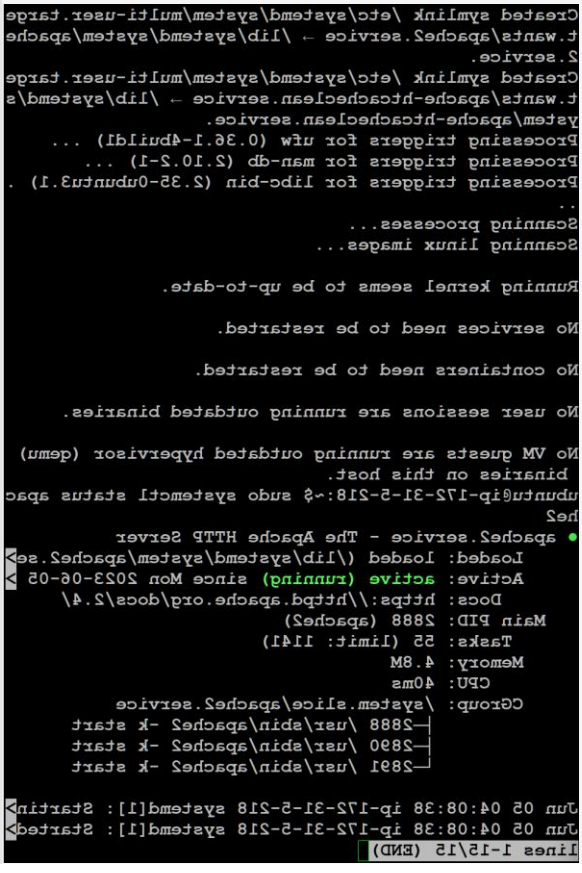
```
u jammy-backports/main amd64 c-n-f Metadata [388 B]
Get:26 http://us-east-2.ec2.archive.ubuntu.com/ubunt
u jammy-backports/restricted amd64 c-n-f Metadata [1
16 B]
Get:27 http://us-east-2.ec2.archive.ubuntu.com/ubunt
u jammy-backports/universe amd64 Packages [23.4 kB]
Get:28 http://us-east-2.ec2.archive.ubuntu.com/ubunt
u jammy-backports/universe Translation-en [15.0 kB]
Get:29 http://us-east-2.ec2.archive.ubuntu.com/ubunt
u jammy-backports/universe amd64 c-n-f Metadata [548
 B]
Get:30 http://us-east-2.ec2.archive.ubuntu.com/ubunt
u jammy-backports/multiverse amd64 c-n-f Metadata [1
16 B]
Get:31 http://security.ubuntu.com/ubuntu jammy-secur
ity/main Translation-en [121 kB]
Get:32 http://security.ubuntu.com/ubuntu jammy-secur
ity/main amd64 c-n-f Metadata [10.1 kB]
Get:33 http://security.ubuntu.com/ubuntu jammy-secur
ity/restricted amd64 Packages [345 kB]
Get:34 http://security.ubuntu.com/ubuntu jammy-secur
ity/restricted Translation-en [51.8 kB]
Get:35 http://security.ubuntu.com/ubuntu jammy-secur
ity/universe amd64 Packages [730 kB]
Get:36 http://security.ubuntu.com/ubuntu jammy-secur
ity/universe Translation-en [128 kB]
Get:37 http://security.ubuntu.com/ubuntu jammy-secur
ity/universe amd64 c-n-f Metadata [15.3 kB]
Get:38 http://security.ubuntu.com/ubuntu jammy-secur
ity/multiverse amd64 Packages [30.2 kB]
Get:39 http://security.ubuntu.com/ubuntu jammy-secur
ity/multiverse Translation-en [5828 B]
Get:40 http://security.ubuntu.com/ubuntu jammy-secur
ity/multiverse amd64 c-n-f Metadata [252 B]
Fetched 25.1 MB in 4s (5673 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
34 packages can be upgraded. Run 'apt list --upgrada
ble' to see them.
```

```
#run apache2 package installation
```

```
sudo apt install apache2
```

```
Enabling module alias.
Enabling module dir.
Enabling module autoindex.
Enabling module env.
Enabling module mime.
Enabling module negotiation.
Enabling module setenvif.
Enabling module filter.
Enabling module deflate.
Enabling module status.
Enabling module reqtimeout.
Enabling conf charset.
Enabling conf localized-error-pages.
Enabling conf other-vhosts-access-log.
Enabling conf security.
Enabling conf serve-cgi-bin.
Enabling site 000-default.
Created symlink /etc/systemd/system/multi-user.targe
t.wants/apache2.service → /lib/systemd/system/apache
2.service.
Created symlink /etc/systemd/system/multi-user.targe
t.wants/apache-htcacheclean.service → /lib/systemd/s
ystem/apache-htcacheclean.service.
Processing triggers for ufw (0.36.1-4build1) ...
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for libc-bin (2.35-0ubuntu3.1) .
..
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu)
 binaries on this host.
```

sudo systemctl status apache2



```
curl http://localhost:80
```

```
                document root directory in <tt>/etc/
apache2/apache2.conf</tt>.
            </p>
            <p>
                The default Ubuntu document root is
<tt>/var/www/html</tt>. You
                can make your own virtual hosts unde
r /var/www.
            </p>
        </div>

        <div class="section_header">
          <div id="bugs"></div>
                Reporting Problems
        </div>
        <div class="content_section_text">
          <p>
                Please use the <tt>ubuntu-bug</tt> t
ool to report bugs in the
                Apache2 package with Ubuntu. However
, check <a
                href="https://bugs.launchpad.net/ubu
ntu/+source/apache2"
                rel="nofollow">existing bug reports<
/a> before reporting a new bug.
          </p>
          <p>
                Please report bugs specific to modul
es (such as PHP and others)
                to their respective packages, not to
 the web server itself.
          </p>
        </div>

      </div>
    </div>
    <div class="validator">
    </div>
  </body>
</html>
```

To test how our Apache HTTP server can respond to requests from the Internet.
Open a web browser of your choice and try to access following url:

```
http://<Public-IP-Address>:80
```

5.STEP 2 — INSTALLING MYSQL

```
sudo apt install mysql-server
```

```
done!
update-alternatives: using /var/lib/mecab/dic/ipadic
-utf8 to provide /var/lib/mecab/dic/debian (mecab-di
ctionary) in auto mode
Setting up libhtml-parser-perl:amd64 (3.76-1build2)
...
Setting up libhttp-message-perl (6.36-1) ...
Setting up mysql-server-8.0 (8.0.33-0ubuntu0.22.04.2
) ...
update-alternatives: using /etc/mysql/mysql.cnf to p
rovide /etc/mysql/my.cnf (my.cnf) in auto mode
Renaming removed key_buffer and myisam-recover optio
ns (if present)
mysqld will log errors to /var/log/mysql/error.log
mysqld is running as pid 3757
Created symlink /etc/systemd/system/multi-user.targe
t.wants/mysql.service → /lib/systemd/system/mysql.se
rvice.
Setting up libcgi-pm-perl (4.54-1) ...
Setting up libhtml-template-perl (2.97-1.1) ...
Setting up mysql-server (8.0.33-0ubuntu0.22.04.2) ..
.
Setting up libcgi-fast-perl (1:2.15-1) ...
Processing triggers for man-db (2.10.2-1) ...
Processing triggers for libc-bin (2.35-0ubuntu3.1) .
..
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu)
 binaries on this host.
```

```
sudo mysql
```

```
ubuntu@ip-172-31-5-218:~$ sudo mysql
Welcome to the MySQL monitor.  Commands end with ; o
r \g.
Your MySQL connection id is 8
Server version: 8.0.33-0ubuntu0.22.04.2 (Ubuntu)

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affiliates. Other names may be trademarks of their r
espective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear th
e current input statement.
```

```
ALTER USER 'root'@'localhost' IDENTIFIED WITH mysql_native_password BY
'PassWord.1';
```

```
mysql> ALTER USER 'root'@'localhost' IDENTIFIED WITH
 mysql_native_password BY 'PassWord.1';
Query OK, 0 rows affected (0.01 sec)
```

Exit the MySQL shell with:

Exit

```
mysql> exit
Bye
```

```
sudo mysql_secure_installation
```

```
environment.

Remove anonymous users? (Press y|Y for Yes, any othe
r key for No) : n

 ... skipping.


Normally, root should only be allowed to connect fro
m
'localhost'. This ensures that someone cannot guess
at
the root password from the network.

Disallow root login remotely? (Press y|Y for Yes, an
y other key for No) : n

 ... skipping.
By default, MySQL comes with a database named 'test'
 that
anyone can access. This is also intended only for te
sting,
and should be removed before moving into a productio
n
environment.


Remove test database and access to it? (Press y|Y fo
r Yes, any other key for No) : n

 ... skipping.
Reloading the privilege tables will ensure that all
changes
made so far will take effect immediately.

Reload privilege tables now? (Press y|Y for Yes, any
 other key for No) : n

 ... skipping.
All done!
```

When you're finished, test if you're able to log in to the MySQL console by typing:

```
sudo mysql -p
```

```
ubuntu@ip-172-31-5-218:~$ sudo mysql -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; o
r \g.
Your MySQL connection id is 11
Server version: 8.0.33-0ubuntu0.22.04.2 (Ubuntu)

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affiliates. Other names may be trademarks of their r
espective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear th
e current input statement.
```

To exit the MySQL console, type:

exit

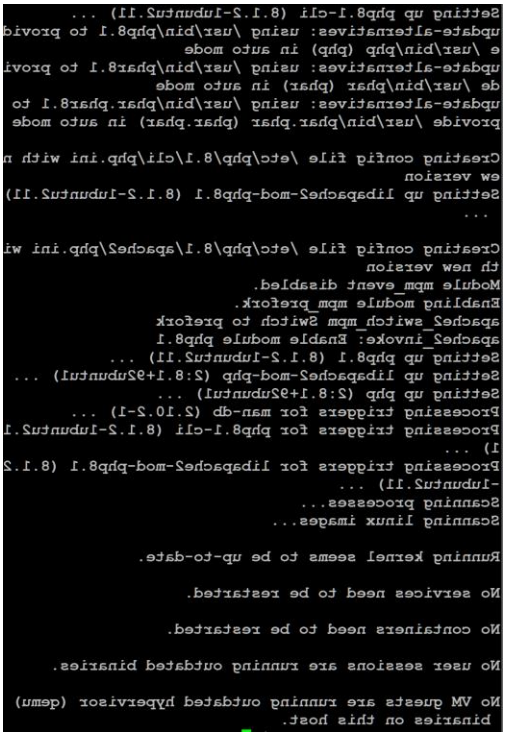
```
mysql> exit
Bye
```

6.STEP 3 — INSTALLING PHP

You have Apache installed to serve your content and MySQL installed to store and manage your data. PHP is the component of our setup that will process code to display dynamic content to the end user. In addition to the `php` package, you'll need `php-mysql`, a PHP module that allows PHP to communicate with MySQL-based databases. You'll also need `libapache2-mod-php` to enable Apache to handle PHP files. Core PHP packages will automatically be installed as dependencies.

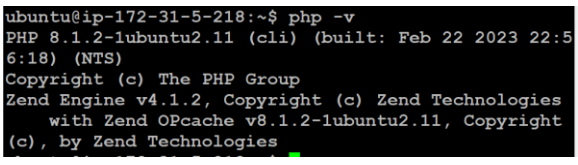
To install these 3 packages at once, run:

```
sudo apt install php libapache2-mod-php php-mysql
```



Once the installation is finished, you can run the following command to confirm your PHP version:

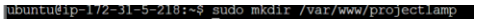
```
php -v
```



7.STEP 4 — CREATING A VIRTUAL HOST FOR YOUR WEBSITE USING APACHE

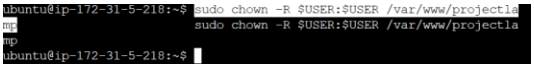
1.Create the directory for `projectlamp` using **'mkdir'** command as follows:

```
sudo mkdir /var/www/projectlamp
```



2.Next, assign ownership of the directory with your current system user:

```
sudo chown -R $USER:$USER /var/www/projectlamp
```



3.create and open a new configuration file in Apache's `sites-available` directory using your preferred command-line editor. Here, we'll be using `vi` or `vim` (They are the same by the way):

```
sudo vi /etc/apache2/sites-available/projectlamp.conf
```

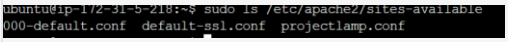
Hint: To save and close the file, simply follow the steps below:

1. Hit the `esc` button on the keyboard

2. Type `:`
3. Type `wq`. **w** for `write` and **q** for `quit`
4. Hit `ENTER` to save the file

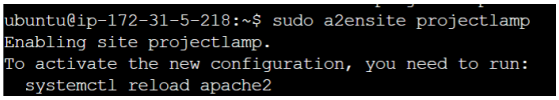
4. use the `ls` command to show the new file in the **sites-available** directory

```
sudo ls /etc/apache2/sites-available
```



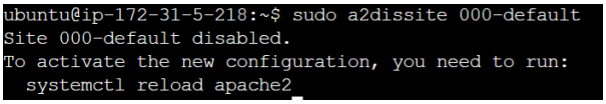
5.use ***a2ensite*** command to enable the new virtual host:

```
sudo a2ensite projectlamp
```



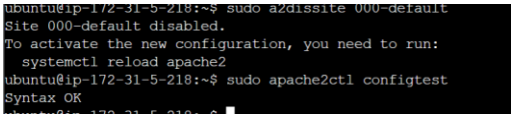
6.Disable the default website that comes installed with Apache. This is required if you're not using a custom domain name, because in this case Apache's default configuration would overwrite your virtual host. To disable Apache's default website use ***a2dissite*** command , type:

```
sudo a2dissite 000-default
```



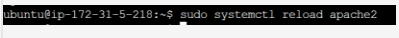
7.To make sure your configuration file doesn't contain syntax errors, run:

```
sudo apache2ctl configtest
```



8. Reload Apache so these changes take effect:

```
sudo systemctl reload apache2
```

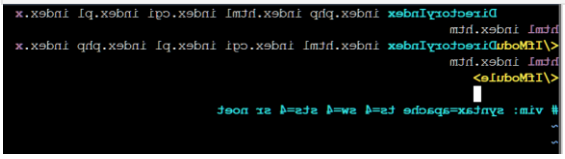


The new website is now active, but the web root **/var/www/projectlamp** is still empty. Create an index.html file in that location so that we can test that the virtual host works as expected:

```
sudo echo 'Hello LAMP from hostname' $(curl -s http://169.254.169.254/latest/meta-data/public-hostname) 'with public IP' $(curl -s http://169.254.169.254/latest/meta-data/public-ipv4) > /var/www/projectlamp/index.html
```

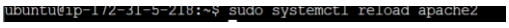
Edit the **/etc/apache2/mods-enabled/dir.conf** file and change the order in which the **index.php** file is listed within the **DirectoryIndex** directive:

```
sudo vim /etc/apache2/mods-enabled/dir.conf
```



After saving and closing the file, you will need to reload Apache so the changes take effect:

```
sudo systemctl reload apache2
```



Create a new file named `index.php` inside your custom web root folder:

```
vim /var/www/projectlamp/index.php
```

This will open a blank file. Add the following text, which is valid PHP code, inside the file:

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

When you are finished, save and close the file, refresh the page and you will see a page similar to this:

PHP Version 8.1.2-1ubuntu2.17

System	Linux ip-172-31-13-213 5.15.0-1028-aws #32~20.04.1-Ubuntu SMP Wed Nov 29 17:05:13 UTC 2023 x86_64
Build Date	Feb 20 2023 23:09:14
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-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-bcmath.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-gettext.ini, /etc/php/8.1/apache2/conf.d/20-iconv.ini, /etc/php/8.1/apache2/conf.d/20-mbstring.ini, /etc/php/8.1/apache2/conf.d/20-mysqlnd.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-sysvmsg.ini, /etc/php/8.1/apache2/conf.d/20-sysvsem.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
PHP API	20210902
PHP Extension	20210902
Zend Extension	420210902
Zend Extension Build	API420210902,NTS
PHP Extension Build	API20210902,NTS
Debug Build	no
Thread Safety	disabled
Zend Signal Handling	enabled
Zend Memory Manager	enabled
Zend Multibyte Support	disabled
IPv6 Support	enabled
DTrace Support	available, disabled
Registered PHP Streams	https, ftps, compress.zlib, php, file, glob, data, http, ftp, phar
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, string.strip_tags, 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, Copyright (c), by Zend Technologies

zend engine

Configuration

apache2handler