

Practical 10

HTTPd, PHP

- A. HTTPd (DAEMON)
- B. PHP

You may like to watch a video first: <https://www.youtube.com/watch?v=PzFO-73mAkq>

A. Apache 2 web server

1. Install the HTTP server the command

Update your Ubuntu

```
sudo apt-get update
```

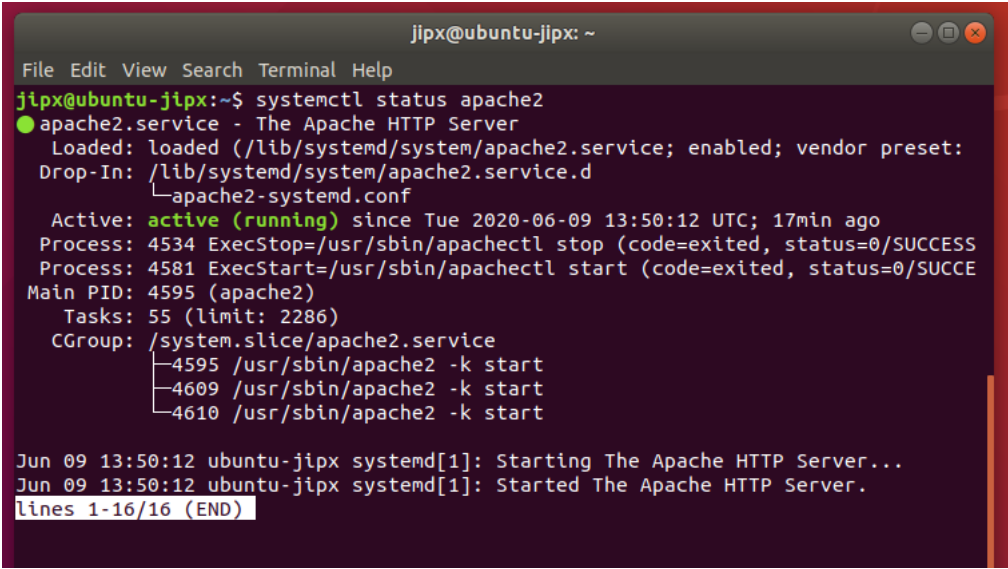
Install apache2

```
sudo apt-get install apache2
```

```
jipx@ubuntu-jipx:~$ sudo apt-get install apache2
```

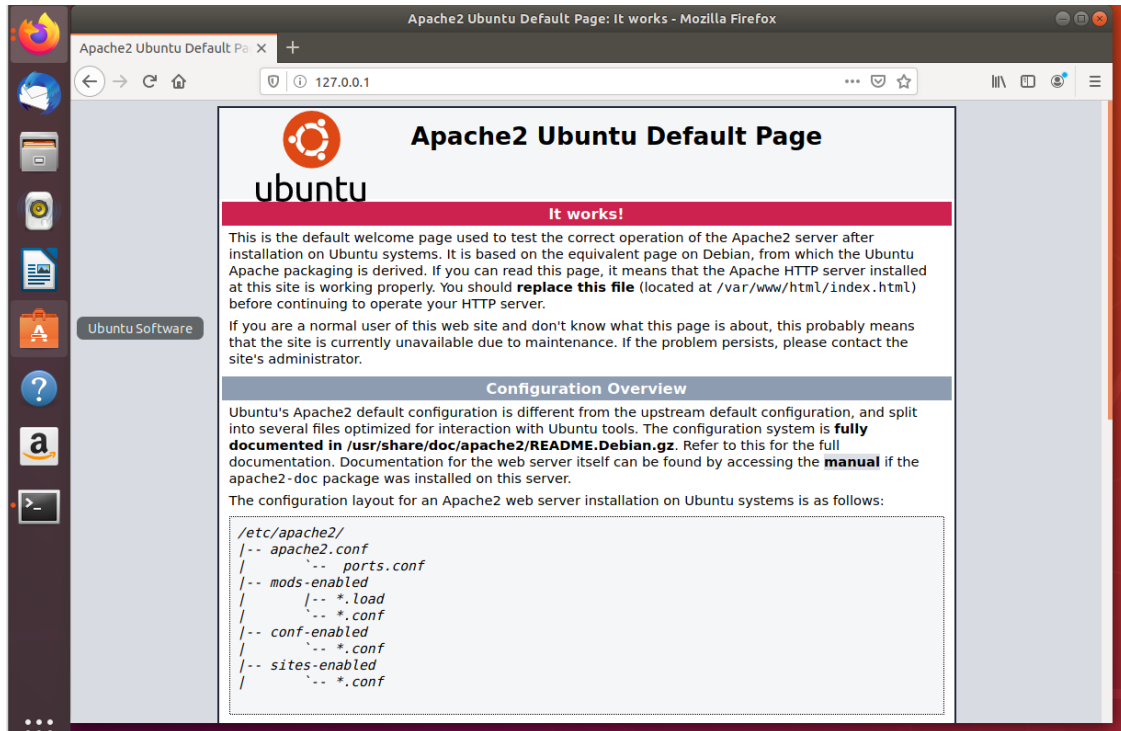
2. Check if apache2 service is running

```
sudo systemctl status apache2
```



```
jipx@ubuntu-jipx: ~  
File Edit View Search Terminal Help  
jipx@ubuntu-jipx:~$ systemctl status apache2  
● apache2.service - The Apache HTTP Server  
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset:  
   Drop-In: /lib/systemd/system/apache2.service.d  
            └─apache2-systemd.conf  
   Active: active (running) since Tue 2020-06-09 13:50:12 UTC; 17min ago  
   Process: 4534 ExecStop=/usr/sbin/apachectl stop (code=exited, status=0/SUCCESS  
   Process: 4581 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCE  
   Main PID: 4595 (apache2)  
   Tasks: 55 (limit: 2286)  
   CGroup: /system.slice/apache2.service  
           └─4595 /usr/sbin/apache2 -k start  
             └─4609 /usr/sbin/apache2 -k start  
               └─4610 /usr/sbin/apache2 -k start  
  
Jun 09 13:50:12 ubuntu-jipx systemd[1]: Starting The Apache HTTP Server...  
Jun 09 13:50:12 ubuntu-jipx systemd[1]: Started The Apache HTTP Server.  
lines 1-16/16 (END)
```

3. Using your “Firefox” web browser to go to <http://127.0.0.1> to check out the pages.



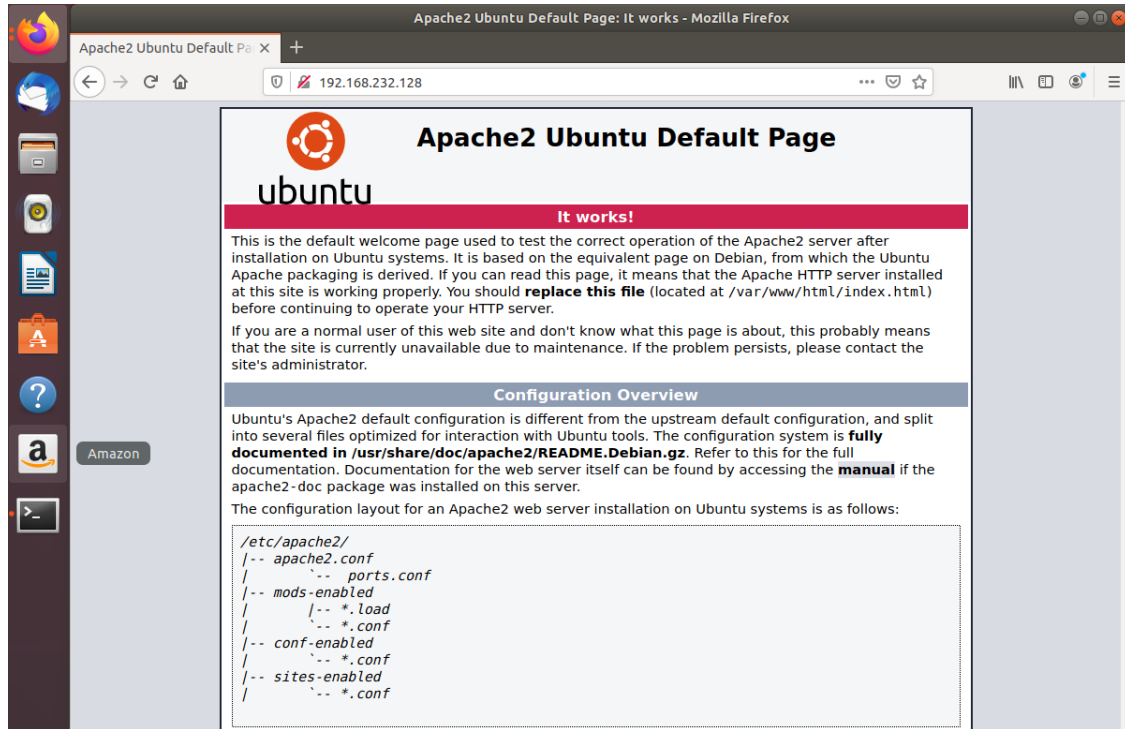
For AWS ubuntu server:

If you encounter an error, such as connection refused, please refer to the **Troubleshooting** section (page 12).

4. You can find the IP address of your server by issuing
`ifconfig -a`

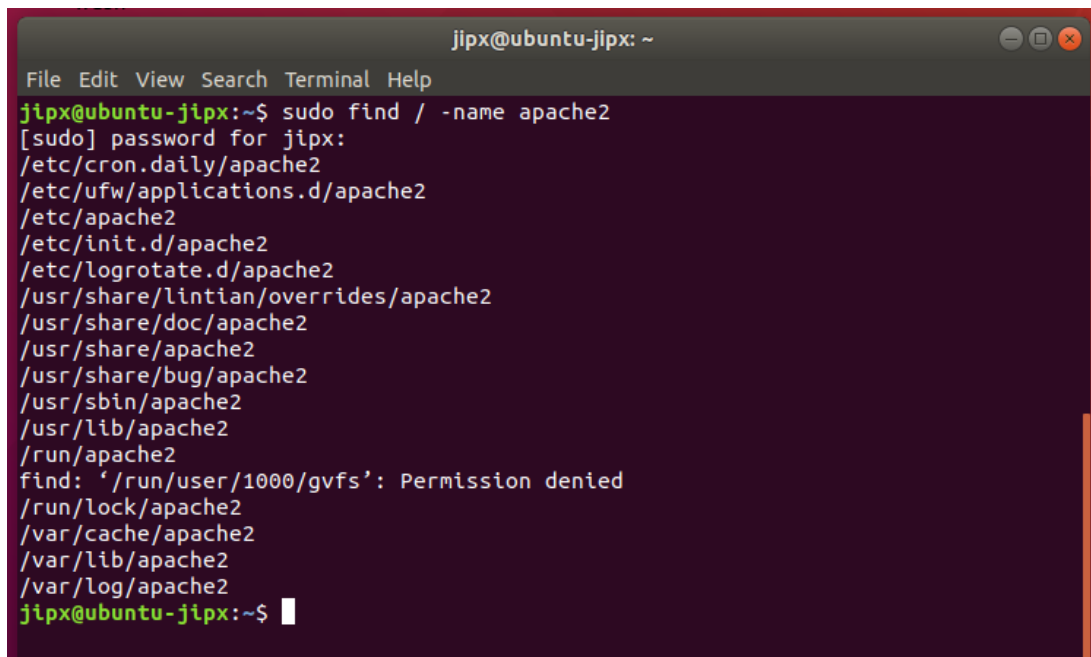
IP address (of your server)	
-----------------------------	--

Access your web site using the above IP address



5. Where is Apache HTTP server installed?

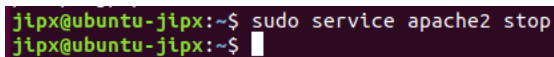
Issue a “**find**” command to reveal all the Apache folders and files location.



```
jipx@ubuntu-jipx: ~  
File Edit View Search Terminal Help  
jipx@ubuntu-jipx:~$ sudo find / -name apache2  
[sudo] password for jipx:  
/etc/cron.daily/apache2  
/etc/ufw/applications.d/apache2  
/etc/apache2  
/etc/init.d/apache2  
/etc/logrotate.d/apache2  
/usr/share/lintian/overrides/apache2  
/usr/share/doc/apache2  
/usr/share/apache2  
/usr/share/bug/apache2  
/usr/sbin/apache2  
/usr/lib/apache2  
/run/apache2  
find: '/run/user/1000/gvfs': Permission denied  
/run/lock/apache2  
/var/cache/apache2  
/var/lib/apache2  
/var/log/apache2  
jipx@ubuntu-jipx:~$
```

6. Stop your apache2 service using

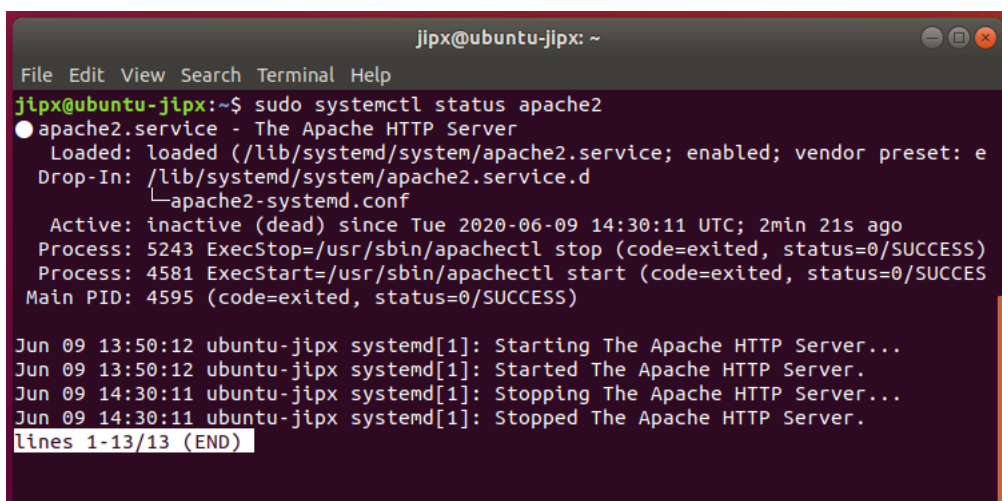
`sudo service apache2 stop` or
`sudo /etc/init.d/apache2 stop`



```
jipx@ubuntu-jipx:~$ sudo service apache2 stop  
jipx@ubuntu-jipx:~$
```

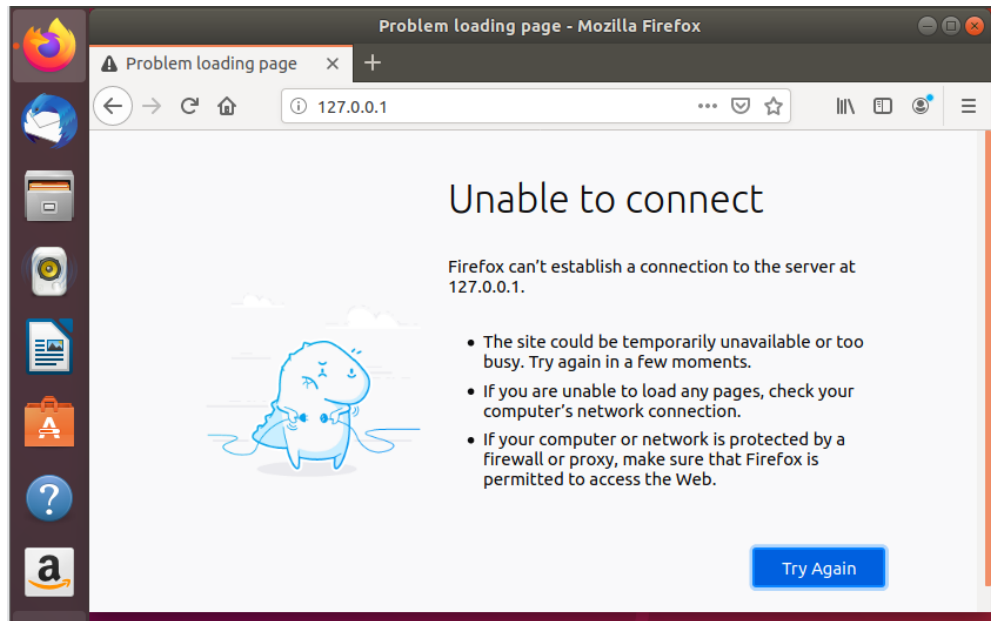
Check if apache2 service is stopped

`sudo systemctl status apache2`



```
jipx@ubuntu-jipx: ~  
File Edit View Search Terminal Help  
jipx@ubuntu-jipx:~$ sudo systemctl status apache2  
● apache2.service - The Apache HTTP Server  
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: e  
   Drop-In: /lib/systemd/system/apache2.service.d  
            └─apache2-systemd.conf  
   Active: inactive (dead) since Tue 2020-06-09 14:30:11 UTC; 2min 21s ago  
   Process: 5243 ExecStop=/usr/sbin/apachectl stop (code=exited, status=0/SUCCESS)  
   Process: 4581 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)  
   Main PID: 4595 (code=exited, status=0/SUCCESS)  
  
Jun 09 13:50:12 ubuntu-jipx systemd[1]: Starting The Apache HTTP Server...  
Jun 09 13:50:12 ubuntu-jipx systemd[1]: Started The Apache HTTP Server.  
Jun 09 14:30:11 ubuntu-jipx systemd[1]: Stopping The Apache HTTP Server...  
Jun 09 14:30:11 ubuntu-jipx systemd[1]: Stopped The Apache HTTP Server.  
lines 1-13/13 (END)
```

7. Using your “Firefox” web browser to go to <http://127.0.0.1> to check out the pages.



8. Restart the service using
- ```
sudo service apache2 restart
```
- or
- ```
sudo /etc/init.d/apache2 restart
```

B. Create a web page

1. Check your permission on /var/www folder

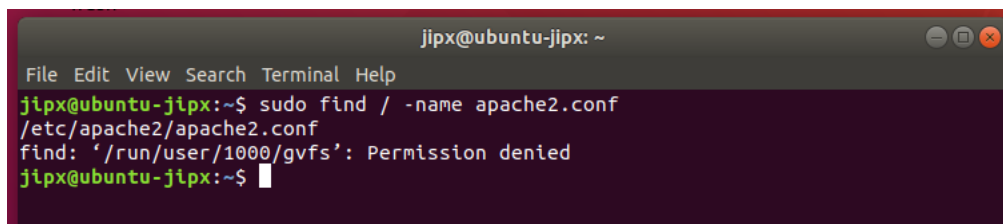
```
ls -ld /var/www
```

		binary	decimal
Owner: root	rwX	111	7
Group: root	r-X	101	5
other	r-X	101	5

/var/www is the default root folder of your local web server, you host all your website files here and access it on the browser with url like `http://127.0.0.1` or `http://localhost`

You cannot simply copy paste stuff in this folder using your file browser. It is protected for security reasons, you will get a permission denied error message because by default you don't have write access permission here.

2. Type `sudo find / -name apache2.conf` to locate the `apache2.conf` file



```
jipx@ubuntu-jipx: ~
File Edit View Search Terminal Help
jipx@ubuntu-jipx:~$ sudo find / -name apache2.conf
/etc/apache2/apache2.conf
find: '/run/user/1000/gvfs': Permission denied
jipx@ubuntu-jipx:~$
```

3. Type `sudo cat /etc/apache2/apache2.conf` to find out the folder/directory of Apache web server.
4. Type `sudo cat /etc/apache2/envvars` to find out the user and group the web server process is running under.

```
jipx@ubuntu-jipx: ~
File Edit View Search Terminal Help
jipx@ubuntu-jipx:~$ sudo cat /etc/apache2/envvars
# envvars - default environment variables for apache2ctl

# this won't be correct after changing uid
unset HOME

# for supporting multiple apache2 instances
if [ "${APACHE_CONFDIR##*/etc/apache2-}" != "${APACHE_CONFDIR}" ] ; then
    SUFFIX="-${APACHE_CONFDIR##*/etc/apache2-}"
else
    SUFFIX=
fi

# Since there is no sane way to get the parsed apache2 config in scripts, some
# settings are defined via environment variables and then used in apache2ctl,
# /etc/init.d/apache2, /etc/logrotate.d/apache2, etc.
export APACHE_RUN_USER=www-data
export APACHE_RUN_GROUP=www-data
# temporary state file location. This might be changed to /run in Wheezy+1
export APACHE_PID_FILE=/var/run/apache2${SUFFIX}/apache2.pid
export APACHE_RUN_DIR=/var/run/apache2${SUFFIX}
export APACHE_LOCK_DIR=/var/lock/apache2${SUFFIX}
# Only /var/log/apache2 is handled by /etc/logrotate.d/apache2.
export APACHE_LOG_DIR=/var/log/apache2${SUFFIX}

## The locale used by some modules like mod_dav
export LANG=C
## Uncomment the following line to use the system default locale instead:
# . /etc/default/locale
```

Record down the environment variable for APACHE_RUN_USER and
APACHE_RUN_GROUP

APACHE_RUN_USER	
APACHE_RUN_GROUP	

- Issue the following command
`sudo less /etc/passwd | more`

```
jipx@ubuntu-jipx: ~
File Edit View Search Terminal Help
jipx@ubuntu-jipx:~$ sudo less /etc/passwd | more
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:List Manager:/var/list:/usr/sbin/nologin
ircd:x:39:39:ircd:/var/run/ircd:/usr/sbin/nologin
```

- Change the group for the folder
`sudo chgrp -R www-data /var/www`

The group ownership of a file or directory may be changed with `chgrp`.
 In the command above, we changed the group ownership of `/var/www` from its
 previous group to "www-data". You must be the owner of the file or directory to
 perform a `chgrp`.

7. Add yourself to the group www-data
`sudo usermod -a -G www-data jipx`
8. Check if above user (jipx) has been added to www-data group
`groups jipx`

```
jipx@ubuntu-jipx: ~
File Edit View Search Terminal Help
jipx@ubuntu-jipx:~$ groups jipx
jipx : jipx adm cdrom sudo dip www-data plugdev lxd
jipx@ubuntu-jipx:~$
```

9. Change the document permissions for the group
`sudo chmod -R g+w /var/www`

Check the folder setting

`ls -l /var/www`

```
jipx@ubuntu-jipx: ~
File Edit View Search Terminal Help
jipx@ubuntu-jipx:~$ ls -l /var/www
total 4
drwxrwxr-x 2 root www-data 4096 Jun  9 13:27 html
jipx@ubuntu-jipx:~$
```

		binary	decimal
Owner: root	rwX	111	7
Group: www-data	rwX		
other	r-X	101	5

`sudo chmod -R g+w /var/www/html`

10. Create a file `sudo vi /var/www/html/index1.html` with the following content

`<h1> Hello World </h1>`

```
jipx@ubuntu-jipx: ~
File Edit View Search Terminal Help
<h1>Hello World</h1>
```


11. Using your “Firefox” web browser to go to <http://127.0.0.1/index1.html>



C. Install PHP

PHP 7.2 which is the default PHP version in Ubuntu 18.04 is fully supported and recommended for WordPress.

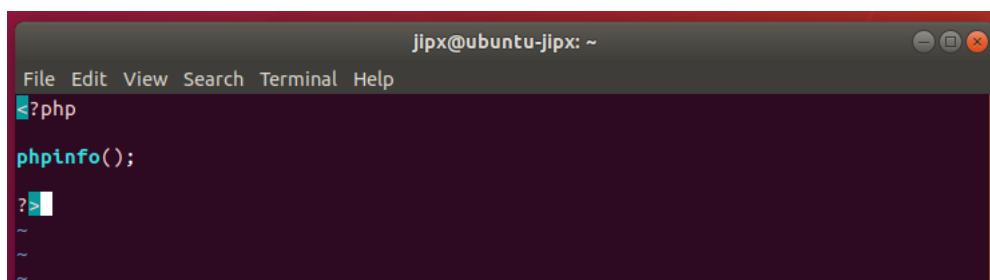
To install PHP and all required PHP extensions, run the following command:

```
sudo apt install php7.2 php7.2-cli php7.2-mysql php7.2-json  
php7.2-opcache php7.2-mbstring php7.2-xml php7.2-gd php7.2-  
curl
```

Restart apache2 so the newly installed PHP extensions are loaded:

```
sudo systemctl restart apache2
```

```
sudo vi /var/www/html/test.php
```



Now we can test whether our web server can correctly display content generated by a PHP script. To try this out, we just have to visit this page in our web browser. You'll need your server's public IP address again.

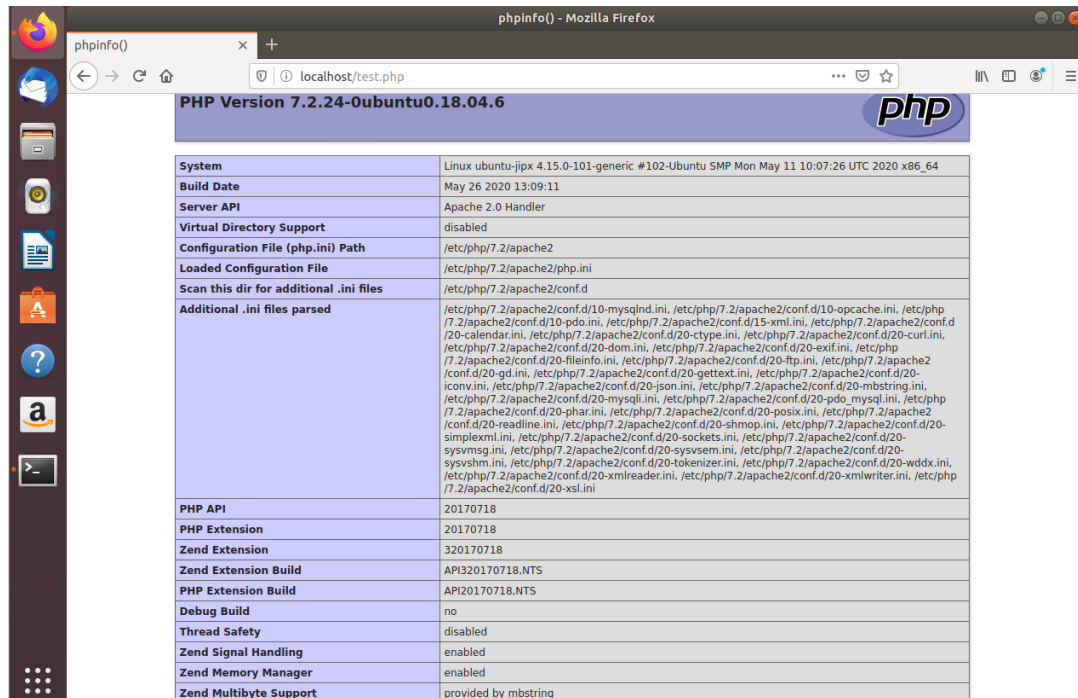
The address you want to visit will be:

`http://your_server_IP_address/test.php`

or

`http://localhost/test.php`

The page that you come to should look something like this:



PHP Version 7.2.24-0ubuntu0.18.04.6	
System	Linux ubuntu-jipx 4.15.0-101-generic #102-Ubuntu SMP Mon May 11 10:07:26 UTC 2020 x86_64
Build Date	May 26 2020 13:09:11
Server API	Apache 2.0 Handler
Virtual Directory Support	disabled
Configuration File (php.ini) Path	/etc/php/7.2/apache2
Loaded Configuration File	/etc/php/7.2/apache2/php.ini
Scan this dir for additional .ini files	/etc/php/7.2/apache2/conf.d
Additional .ini files parsed	/etc/php/7.2/apache2/conf.d/10-mysqld.ini, /etc/php/7.2/apache2/conf.d/10-opcache.ini, /etc/php/7.2/apache2/conf.d/10-pdo.ini, /etc/php/7.2/apache2/conf.d/15-xml.ini, /etc/php/7.2/apache2/conf.d/20-calendar.ini, /etc/php/7.2/apache2/conf.d/20-ctype.ini, /etc/php/7.2/apache2/conf.d/20-curl.ini, /etc/php/7.2/apache2/conf.d/20-dom.ini, /etc/php/7.2/apache2/conf.d/20-exif.ini, /etc/php/7.2/apache2/conf.d/20-fileinfo.ini, /etc/php/7.2/apache2/conf.d/20-ftp.ini, /etc/php/7.2/apache2/conf.d/20-gd.ini, /etc/php/7.2/apache2/conf.d/20-gettext.ini, /etc/php/7.2/apache2/conf.d/20-iconv.ini, /etc/php/7.2/apache2/conf.d/20-json.ini, /etc/php/7.2/apache2/conf.d/20-mbstring.ini, /etc/php/7.2/apache2/conf.d/20-mysql.ini, /etc/php/7.2/apache2/conf.d/20-pdo_mysql.ini, /etc/php/7.2/apache2/conf.d/20-phar.ini, /etc/php/7.2/apache2/conf.d/20-posix.ini, /etc/php/7.2/apache2/conf.d/20-readline.ini, /etc/php/7.2/apache2/conf.d/20-shmop.ini, /etc/php/7.2/apache2/conf.d/20-simplexml.ini, /etc/php/7.2/apache2/conf.d/20-sockets.ini, /etc/php/7.2/apache2/conf.d/20-sysvmsg.ini, /etc/php/7.2/apache2/conf.d/20-sysvsem.ini, /etc/php/7.2/apache2/conf.d/20-sysvshm.ini, /etc/php/7.2/apache2/conf.d/20-tokenizer.ini, /etc/php/7.2/apache2/conf.d/20-wddx.ini, /etc/php/7.2/apache2/conf.d/20-xmlreader.ini, /etc/php/7.2/apache2/conf.d/20-xmlwriter.ini, /etc/php/7.2/apache2/conf.d/20-xsl.ini
PHP API	20170718
PHP Extension	20170718
Zend Extension	320170718
Zend Extension Build	API320170718.NTS
PHP Extension Build	API20170718.NTS
Debug Build	no
Thread Safety	disabled
Zend Signal Handling	enabled
Zend Memory Manager	enabled
Zend Multibyte Support	provided by mbstring

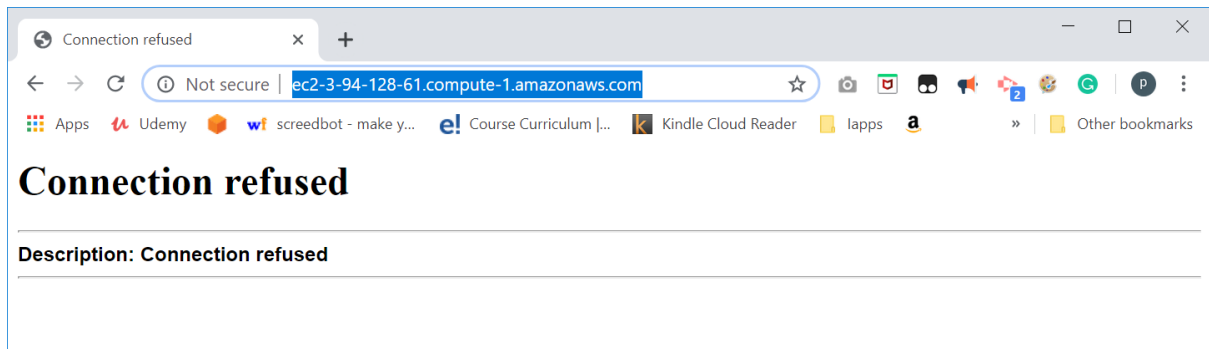
This page basically gives you information about your server from the perspective of PHP. It is useful for debugging and to ensure that your settings are being applied correctly. If this was successful, then your PHP is working as expected.

You probably want to remove this file after this test because it could actually give information about your server to unauthorized users. To do this, you can type this:

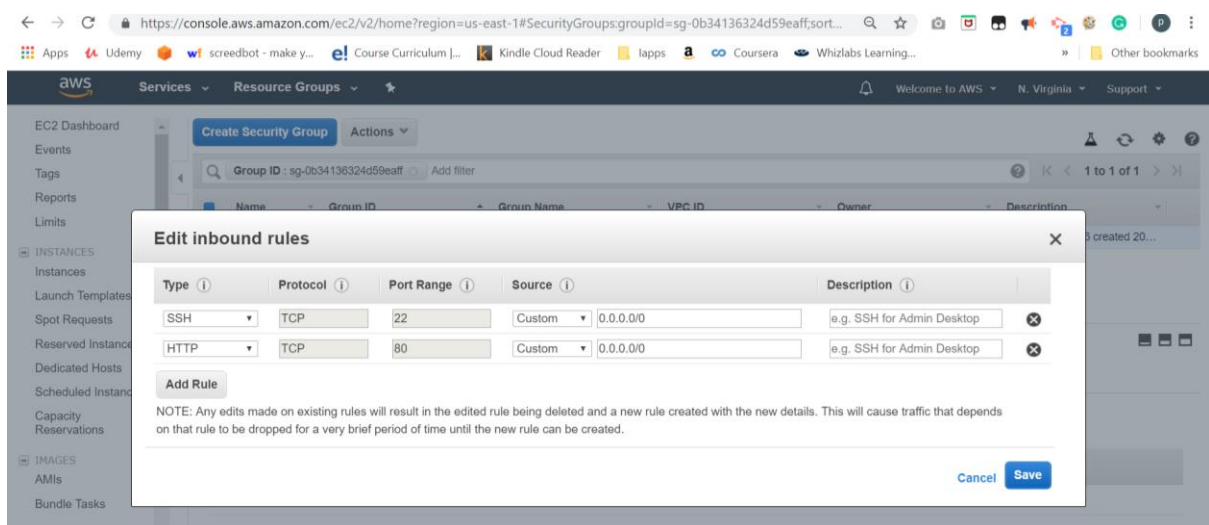
```
sudo rm /var/www/html/test.php
```

**** You can always recreate this page if you need to access the information again later.**

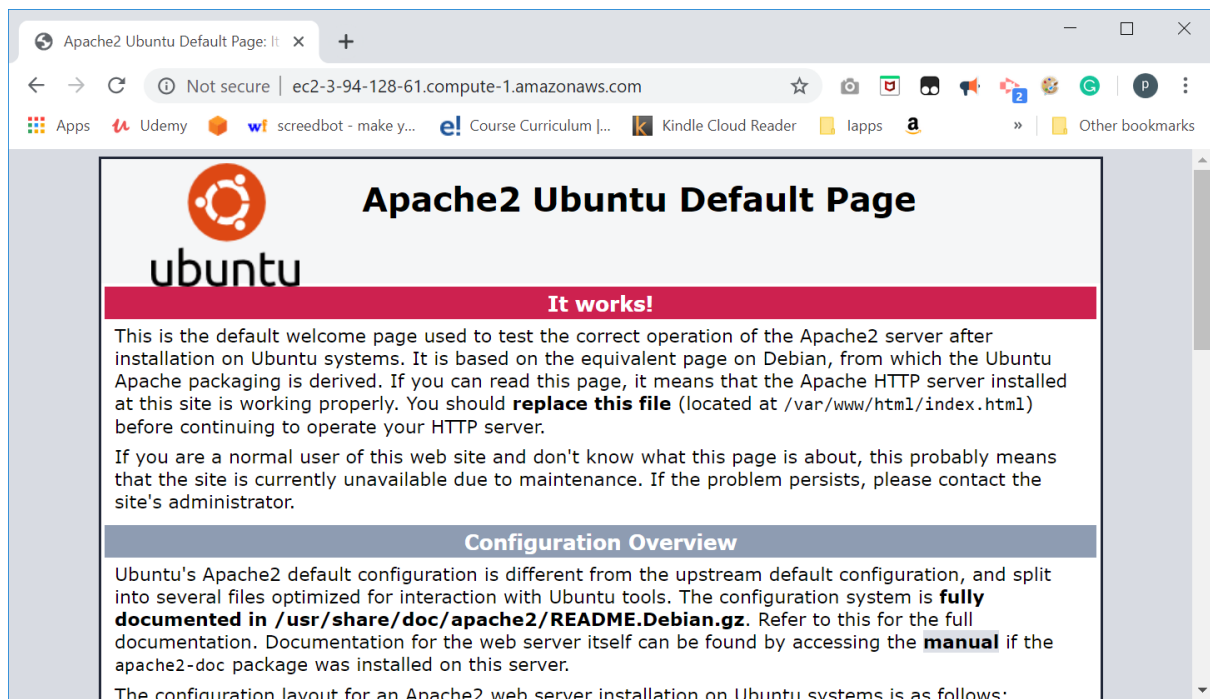
Troubleshooting



Go to AWS Console to Change the security group for the EC2 instance.



After saving the security group, it will take effect immediately.



[Reference: How To Install Linux, Apache, MySQL, PHP \(LAMP\) stack on Ubuntu 16.04](#)

End of Practical