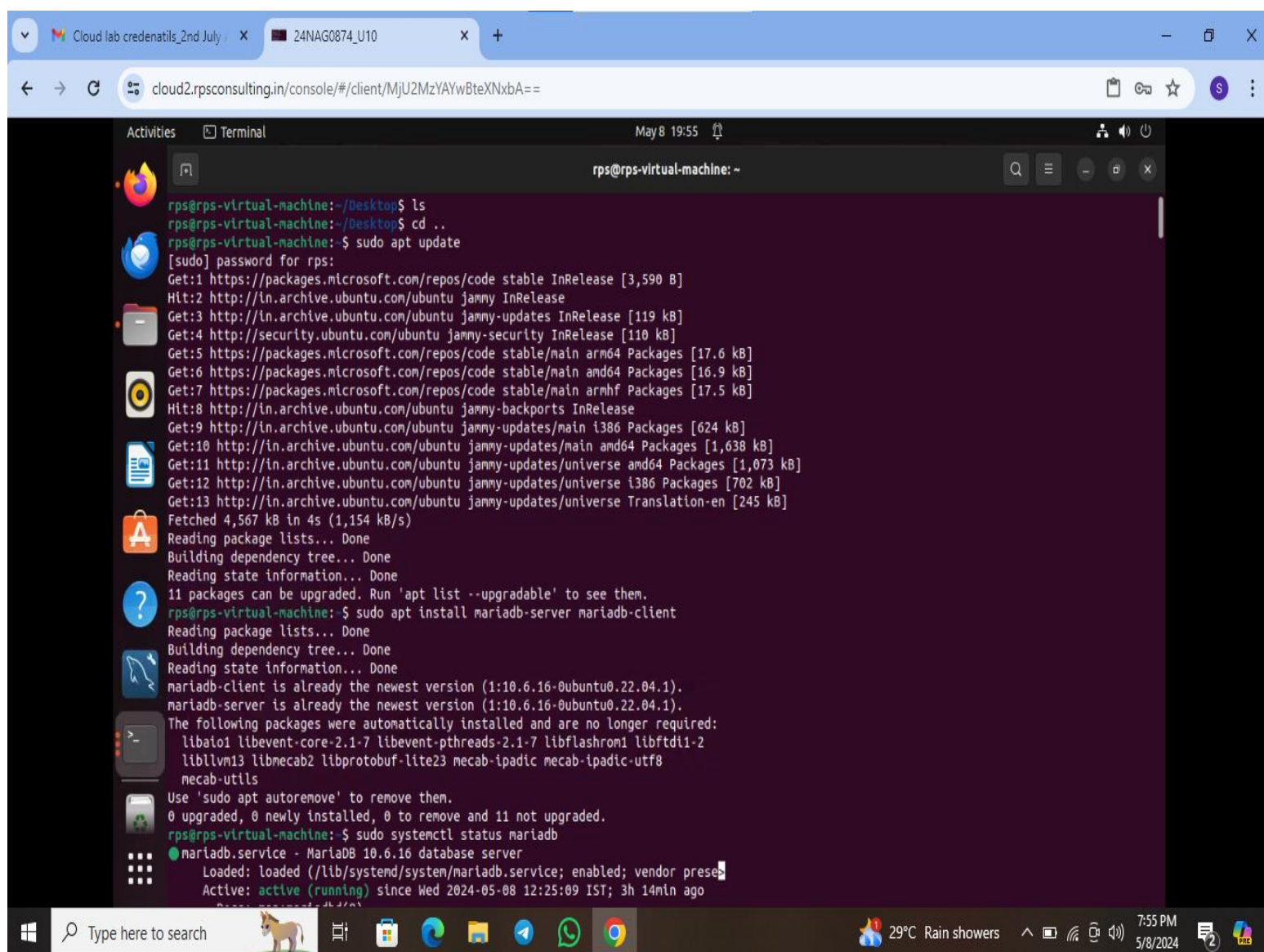


## Building a Linux Web Server:

In this project, I built a web server using Linux that will be useful in running our own websites. The project is also known as the LAMP stack which stands for “Linux, Apache, MySQL, PHP”. Here Linux will be the operating system, Apache will act as our web server software, MySQL used for database management, and PHP for programming.



The screenshot shows a terminal window titled "rps@rps-virtual-machine: ~" with a dark purple background. The user is in the directory ~/Desktop. The terminal output shows the following commands and results:

```
rps@rps-virtual-machine:~/Desktop$ ls
rps@rps-virtual-machine:~/Desktop$ cd ..
rps@rps-virtual-machine:~$ sudo apt update
[sudo] password for rps:
Get:1 https://packages.microsoft.com/repos/code stable InRelease [3,590 B]
Hit:2 http://in.archive.ubuntu.com/ubuntu jammy InRelease
Get:3 http://in.archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]
Get:4 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:5 https://packages.microsoft.com/repos/code stable/main arm64 Packages [17.6 kB]
Get:6 https://packages.microsoft.com/repos/code stable/main amd64 Packages [16.9 kB]
Get:7 https://packages.microsoft.com/repos/code stable/main armhf Packages [17.5 kB]
Hit:8 http://in.archive.ubuntu.com/ubuntu jammy-backports InRelease
Get:9 http://in.archive.ubuntu.com/ubuntu jammy-updates/main i386 Packages [624 kB]
Get:10 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [1,638 kB]
Get:11 http://in.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 Packages [1,073 kB]
Get:12 http://in.archive.ubuntu.com/ubuntu jammy-updates/universe i386 Packages [702 kB]
Get:13 http://in.archive.ubuntu.com/ubuntu jammy-updates/universe Translation-en [245 kB]
Fetched 4,567 kB in 4s (1,154 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
11 packages can be upgraded. Run 'apt list --upgradable' to see them.
rps@rps-virtual-machine:~$ sudo apt install mariadb-server mariadb-client
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
mariadb-client is already the newest version (1:10.6.16-0ubuntu0.22.04.1).
mariadb-server is already the newest version (1:10.6.16-0ubuntu0.22.04.1).
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
  liblvm13 libmecab2 libprotobuf-lite23 mecab-ipadic mecab-ipadic-utf8
  mecab-utils
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 11 not upgraded.
rps@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:
   Active: active (running) since Wed 2024-05-08 12:25:09 IST; 3h 14min ago
```

The terminal window is part of a desktop environment. The top bar shows the date "May 8 19:55". The bottom bar shows the system status "29°C Rain showers" and the time "7:55 PM 5/8/2024".

24NAG0874\_U10

cloud2.rpsconsulting.in/console/#/client/MjU2MzYAYwBteXNxbA==

May 8 19:58

rps@rps-virtual-machine: ~

```
Loaded: loaded (/lib/systemd/system/mariadb.service; enabled; vendor prese
Active: active (running) since Wed 2024-05-08 12:25:09 IST; 3h 14min ago
Docs: man:mariadb(8)
      https://mariadb.com/kb/en/library/systemd/
Main PID: 34188 (mariadb)
Status: "Taking your SQL requests now..."
Tasks: 8 (limit: 19091)
Memory: 61.5M
CPU: 6.144s
CGroup: /system.slice/mariadb.service
        └─34188 /usr/sbin/mariabdd

May 08 12:25:09 rps-virtual-machine mariabdd[34188]: 2024-05-08 12:25:09 0 [Not
May 08 12:25:09 rps-virtual-machine mariabdd[34188]: Version: '10.6.16-MariaDB->
May 08 12:25:09 rps-virtual-machine systemd[1]: Started MariaDB 10.6.16 databa
May 08 12:25:09 rps-virtual-machine /etc/mysql/debian-start[34207]: Looking for
May 08 12:25:09 rps-virtual-machine /etc/mysql/debian-start[34207]: Looking for
May 08 12:25:09 rps-virtual-machine /etc/mysql/debian-start[34207]: This instal
May 08 12:25:09 rps-virtual-machine /etc/mysql/debian-start[34207]: There is no
May 08 12:25:09 rps-virtual-machine /etc/mysql/debian-start[34207]: You can use
May 08 12:25:09 rps-virtual-machine /etc/mysql/debian-start[34215]: Checking fo
May 08 12:25:09 rps-virtual-machine /etc/mysql/debian-start[34221]: Triggering
rps@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 33
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;
ERROR 1007 (HY000): Can't create database 'app1'; database exists
MariaDB [(none)]> GRANT ALL ON app1.* TO 'rps'@'localhost' IDENTIFIED BY '123'
-> FLUSH PRIVILEGES;
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 'FLUSH PRIVILEGES' at line 2
MariaDB [(none)]>
```

Type here to search

29°C Rain showers 7:58 PM 5/8/2024

24NAG0874\_U10

cloud2.rpsconsulting.in/console/#/client/MjU2MzYAYwBteXNxbA==

May 8 19:59

rps@rps-virtual-machine: ~

```
MariaDB [(none)]> CREATE DATABASE app1;
ERROR 1007 (HY000): Can't create database 'app1'; database exists
MariaDB [(none)]> GRANT ALL ON app1.* TO 'rps'@'localhost' IDENTIFIED BY '123'
-> FLUSH PRIVILEGES;
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 'FLUSH PRIVILEGES' at line 2
MariaDB [(none)]> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.001 sec)

MariaDB [(none)]> \q
Bye
rps@rps-virtual-machine:~$ sudo apt install apache2 php
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
php is already the newest version (2:8.1+92ubuntu1).
apache2 is already the newest version (2.4.52-1ubuntu4.9).
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
  liblln13 libmecab2 libprotobuf-lite23 mecab-ipadic mecab-ipadic-utf8
  mecab-utils
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 11 not upgraded.
rps@rps-virtual-machine:~$ sudo systemctl status apache2
* apache2.service - The Apache HTTP Server
Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor prese
Active: failed (Result: exit-code) since Wed 2024-05-08 15:13:34 IST; 39min
Docs: https://httpd.apache.org/docs/2.4/
Process: 42128 ExecStart=/usr/sbin/apachectl start (code=exited, status=1/
CPU: 101ms

May 08 15:13:34 rps-virtual-machine systemd[1]: Starting The Apache HTTP Server
May 08 15:13:34 rps-virtual-machine apachectl[42131]: AH00543: apache2: bad use
May 08 15:13:34 rps-virtual-machine apachectl[42128]: Action 'start' failed.
May 08 15:13:34 rps-virtual-machine apachectl[42128]: The Apache error log may
May 08 15:13:34 rps-virtual-machine systemd[1]: apache2.service: Control proces
May 08 15:13:34 rps-virtual-machine systemd[1]: apache2.service: Failed with re
May 08 15:13:34 rps-virtual-machine systemd[1]: Failed to start The Apache HTTP
```

Type here to search

29°C Rain showers 7:59 PM 5/8/2024



24NAG0874\_U10

cloud2.rpsconsulting.in/console/#/client/MjU2MzYAYwBteXNxbA==

Activities Terminal May 8 20:02

rps@rps-virtual-machine: ~

```
May 08 15:13:34 rps-virtual-machine apachectl[42128]: Action 'start' failed.
May 08 15:13:34 rps-virtual-machine apachectl[42128]: The Apache error log may
May 08 15:13:34 rps-virtual-machine systemd[1]: apache2.service: Control process
May 08 15:13:34 rps-virtual-machine systemd[1]: apache2.service: Failed with res
May 08 15:13:34 rps-virtual-machine systemd[1]: Failed to start The Apache HTTP
...skipping...
* apache2.service - The Apache HTTP Server
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor prese
   Active: failed (Result: exit-code) since Wed 2024-05-08 15:13:34 IST; 40ms
   Docs: https://httpd.apache.org/docs/2.4/
   Process: 42128 ExecStart=/usr/sbin/apachectl start (code=exited, status=1/
   CPU: 101ms

May 08 15:13:34 rps-virtual-machine systemd[1]: Starting The Apache HTTP Server
May 08 15:13:34 rps-virtual-machine apachectl[42131]: AH00543: apache2: bad use
May 08 15:13:34 rps-virtual-machine apachectl[42128]: Action 'start' failed.
May 08 15:13:34 rps-virtual-machine apachectl[42128]: The Apache error log may
May 08 15:13:34 rps-virtual-machine systemd[1]: apache2.service: Control process
May 08 15:13:34 rps-virtual-machine systemd[1]: apache2.service: Failed with res
May 08 15:13:34 rps-virtual-machine systemd[1]: Failed to start The Apache HTTP

rps@rps-virtual-machine:~$ sudo systemctl start apache2
Job for apache2.service failed because the control process exited with error code.
See "systemctl status apache2.service" and "journalctl -xeu apache2.service" for details.
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
```

Type here to search

29°C Rain showers 8:02 PM 5/8/2024

24NAG0874\_U10

cloud2.rpsconsulting.in/console/#/client/MjU2MzYAYwBteXNxbA==

Activities Terminal May 8 20:03

rps@rps-virtual-machine: ~

```
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

php-amqp-lib/jammy,jammy 3.1.2-1 all
pure PHP implementation of the AMQP protocol

php-apcu/jammy 5.1.21+4.0.11-7ubuntu1 amd64
APC User Cache for PHP

php-apcu-all-dev/jammy,jammy 5.1.21+4.0.11-7ubuntu1 all
APC User Cache for PHP

php-arthurhoaro-web-thumbnailer/jammy,jammy 2.0.3+dfsg-1 all
PHP library which will retrieve a thumbnail for any given URL

php-ast/jammy 1.0.16-4 amd64
AST extension for PHP 7

php-ast-all-dev/jammy,jammy 1.0.16-4 all
AST extension for PHP 7

php-async-aws-core/jammy,jammy 1.13.0-1 all
AsyncAws Core - AsyncAws component

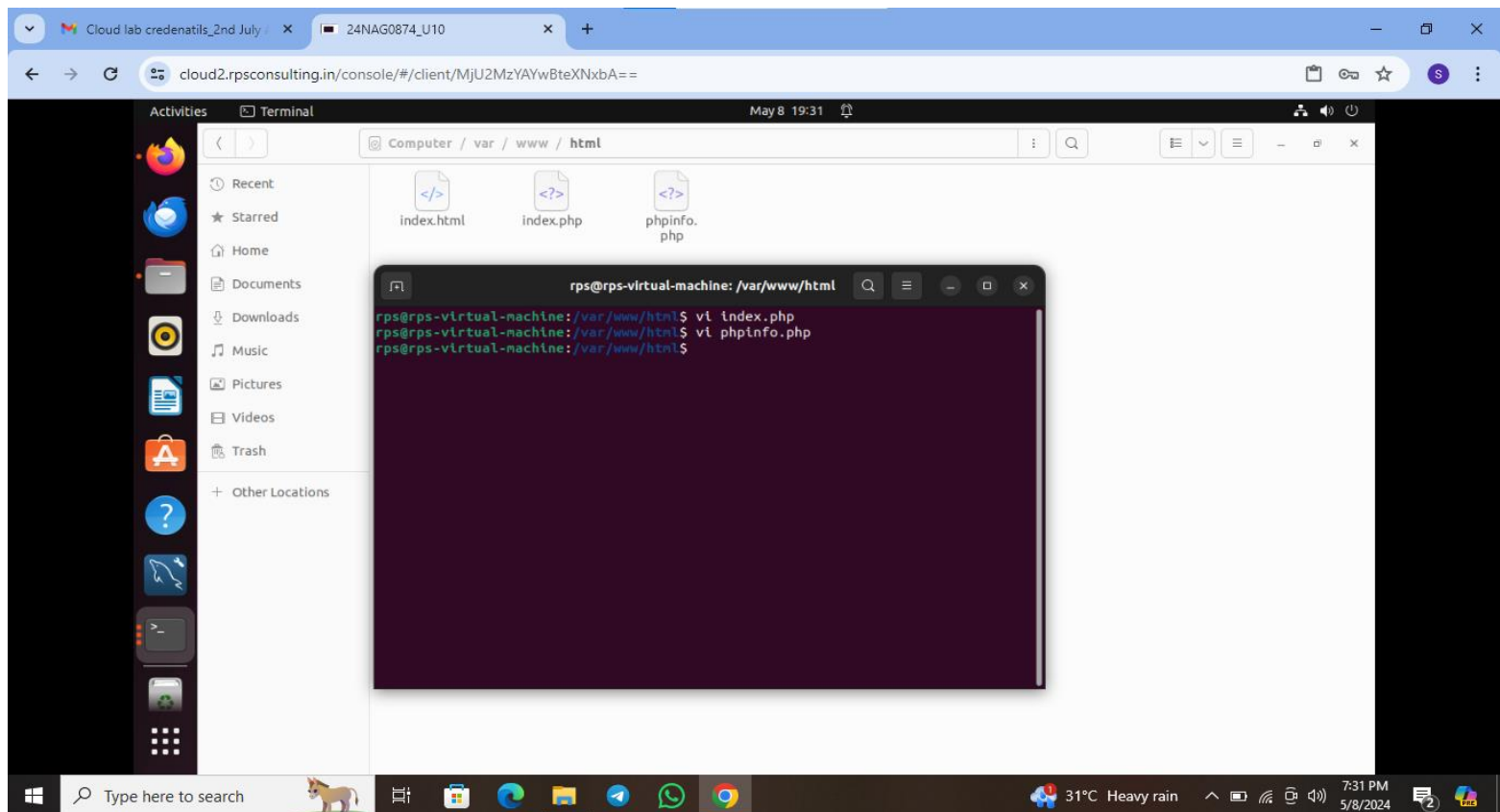
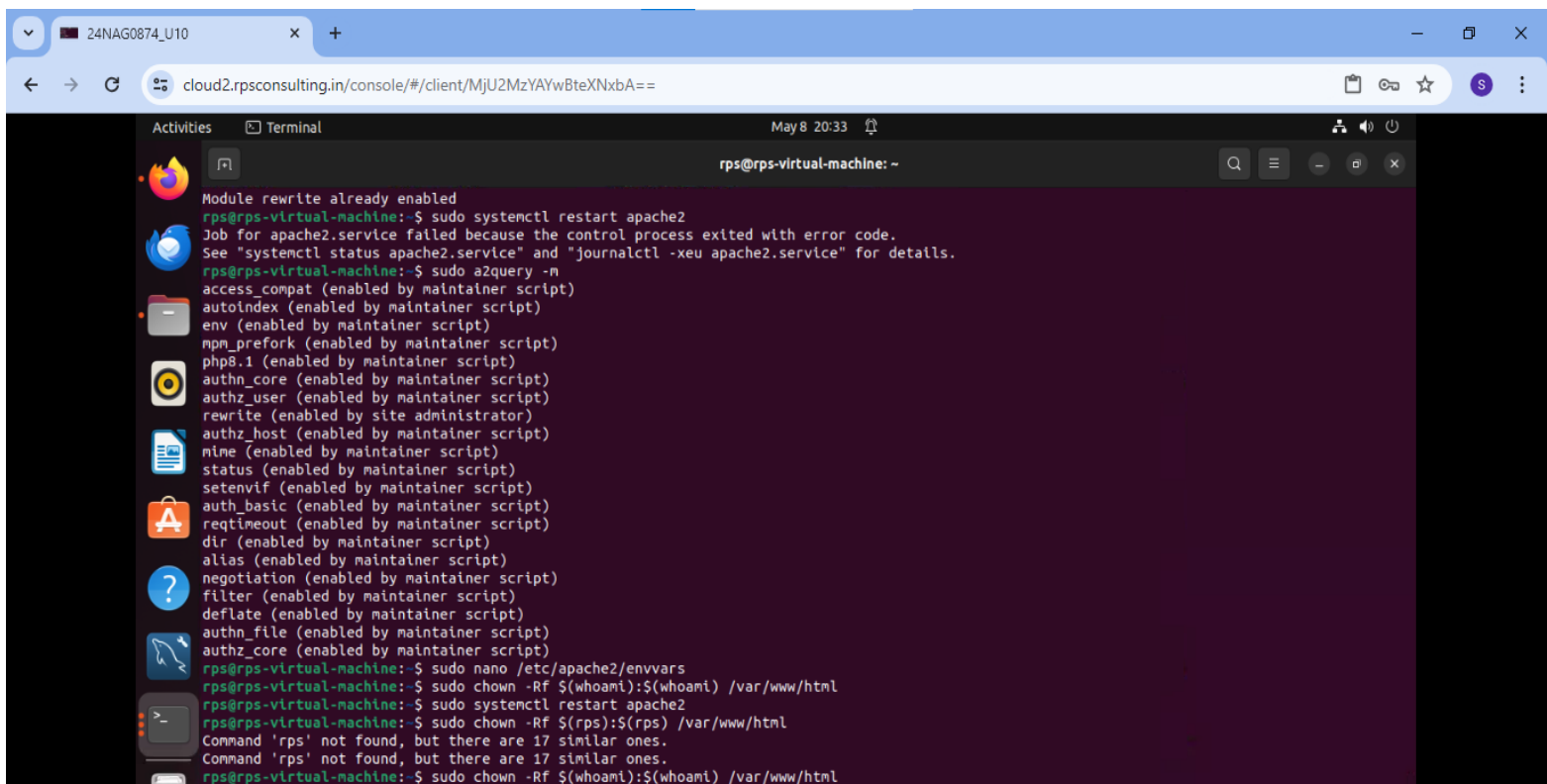
php-async-aws-ses/jammy,jammy 1.4.1-2 all
AsyncAws Ses - AsyncAws component

php-async-aws-sns/jammy,jammy 1.3.0-1 all
AsyncAws Sns - AsyncAws component
```

Type here to search

29°C Rain showers 8:03 PM 5/8/2024







cloud2.rpsconsulting.in/console/#/client/MjU2MzYAYwBteXNxbA==

Apache2 Ubuntu 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
|-- mods-enabled
|   |-- *.load
|   |-- *.conf
|-- conf-enabled
|   |-- *.conf
|-- sites-enabled
|   |-- *.conf
```

31°C Haze 10:46 PM 5/11/2024

cloud2.rpsconsulting.in/console/#/client/MjU2MzYAYwBteXNxbA==

PHP 8.1.2-1ubuntu2.17 - phpinfo.php

## 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-mysqlnd.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-mbstring.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-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, /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

29°C Light rain 8:34 PM 5/8/2024