LEMP Deployment on Ubuntu using Nginx Webserver

Introduction

This project demonstrates how to deploy a **LEMP stack (Linux, Nginx, MySQL, PHP)** on an **Ubuntu EC2 instance**. It covers setting up the Nginx web server, installing PHP and database support, and hosting a simple PHP application.

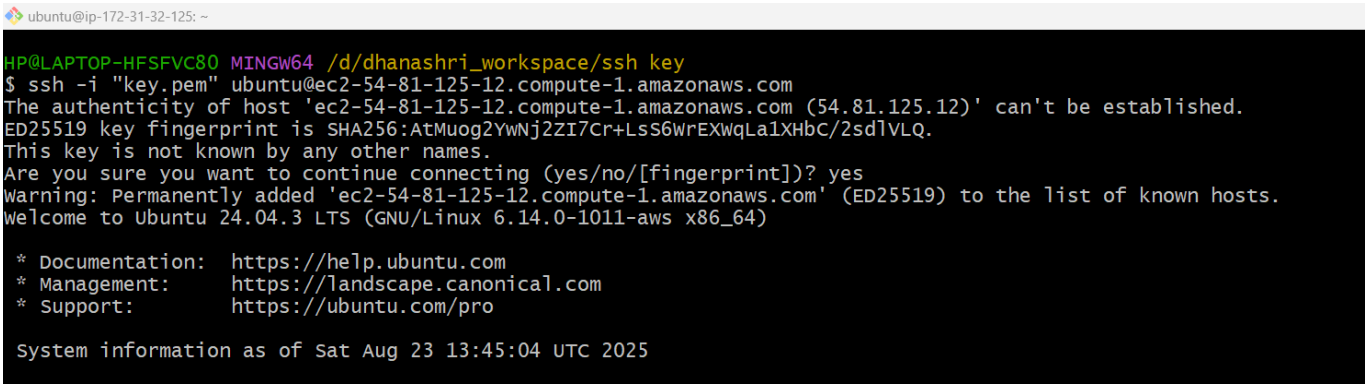
Prerequisites

- AWS account with an Ubuntu EC2 instance (t2.micro recommended)
- SSH key (.pem) to connect
- Security group with SSH (22) and HTTP (80) open
- Basic Linux knowledge and a web browser for testing

Steps to Deploy LEMP Stack

Step 1: Connect to EC2 Instance

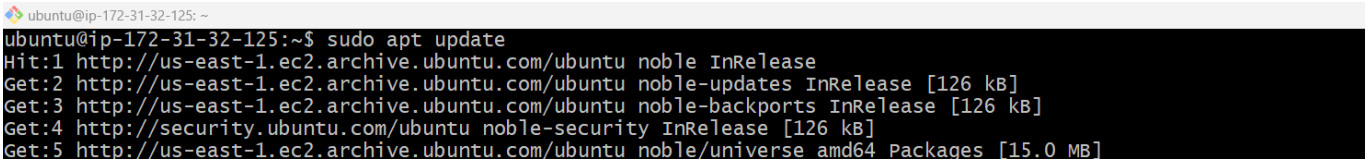
Go to the folder where your SSH key (.pem) is saved, open Git Bash there, and run



Step 2: Update System and Install Nginx

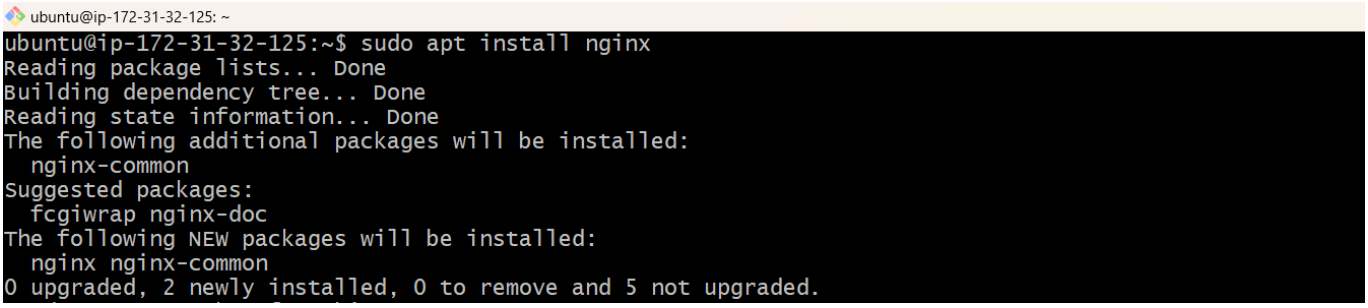
1. Update the System

```
sudo apt update
```



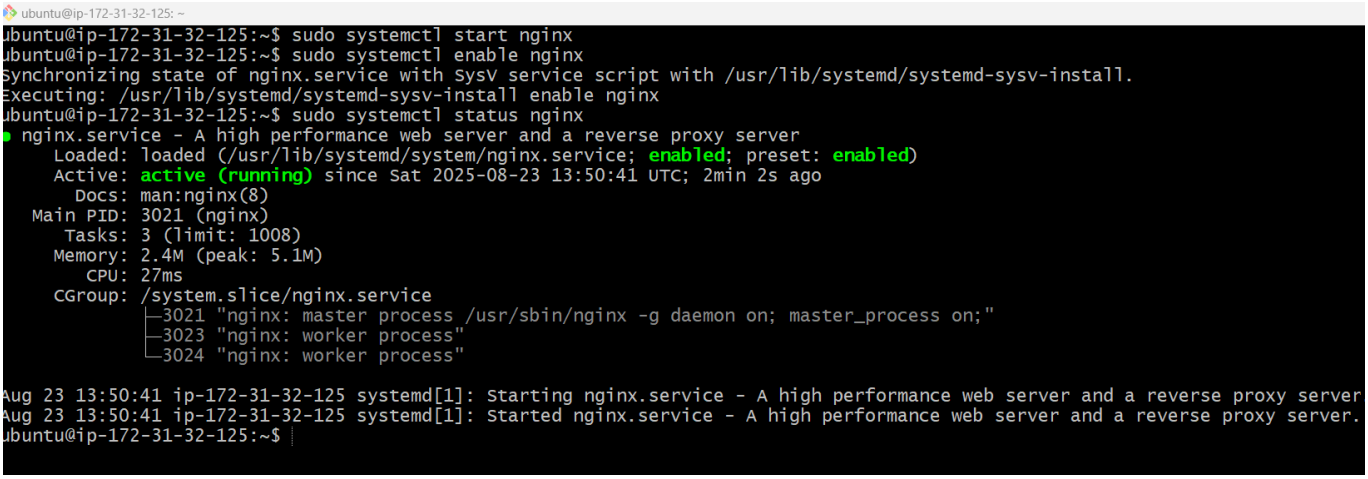
2. Install the nginx Server

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



3. Start, enable and check status of server

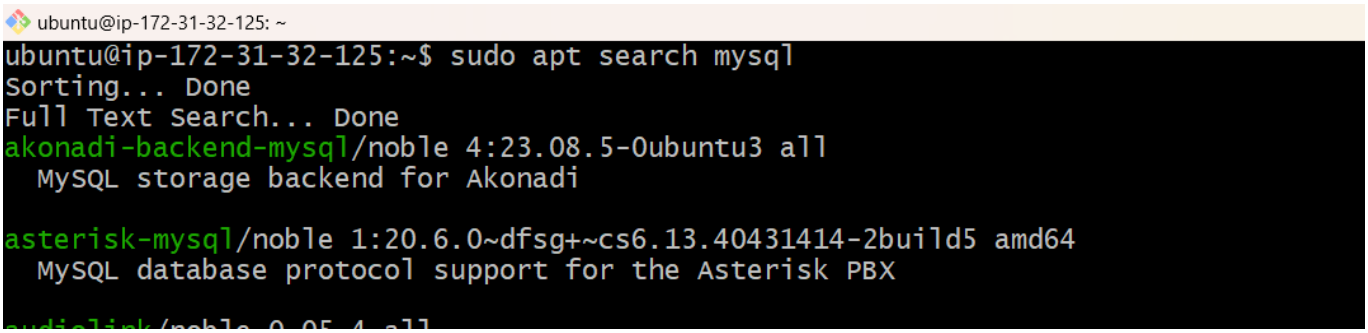
```
sudo systemctl start nginx
sudo systemctl enable nginx
sudo systemctl status nginx
```



Step 3: Install mysql

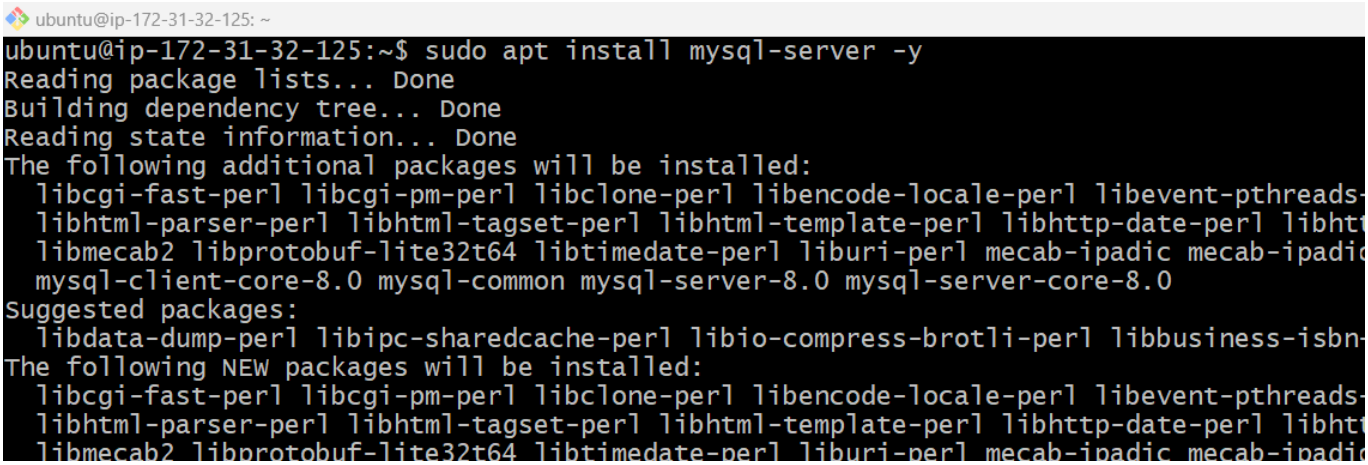
1. Search for mysql

```
sudo apt search mysql
```



2. Install mysql-server

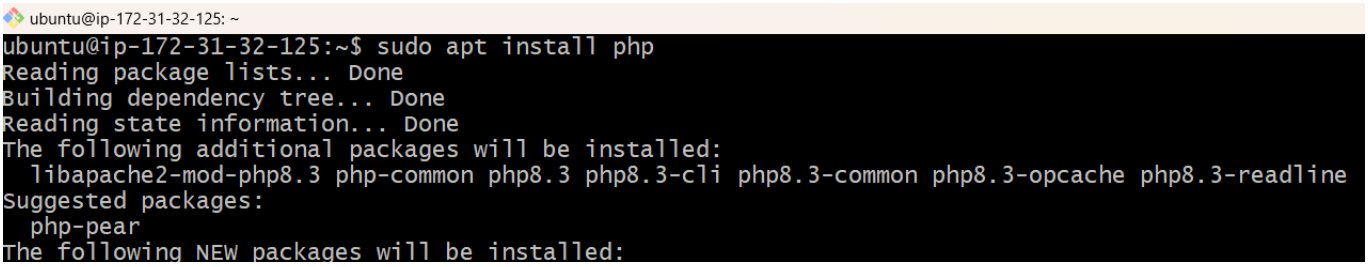
```
sudo apt install mysql-server -y
```



Step 4: Install PHP

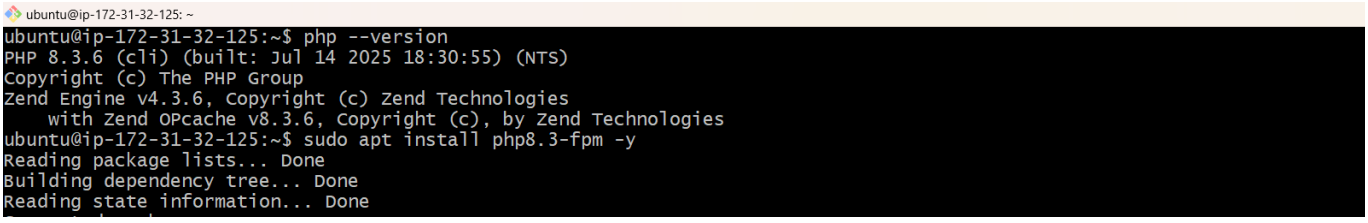
1. Search for php

```
sudo apt search php
```



2. Check the version of php and install php-fpm

```
php --version
sudo apt install php8.3-fpm -y
```



3. Start, enable and check status of php8.3-fpm

```
sudo systemctl start php8.3-fpm
sudo systemctl enable php8.3-fpm
sudo systemctl status php8.3-fpm
```

```
ubuntu@ip-172-31-32-125: ~
ubuntu@ip-172-31-32-125:~$ sudo systemctl start mysql php8.3-fpm
ubuntu@ip-172-31-32-125:~$ sudo systemctl enable mysql php8.3-fpm
Synchronizing state of mysql.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable mysql
Synchronizing state of php8.3-fpm.service with SysV service script with /usr/lib/systemd/systemd-sysv-install.
Executing: /usr/lib/systemd/systemd-sysv-install enable php8.3-fpm
ubuntu@ip-172-31-32-125:~$ sudo systemctl status mysql php8.3-fpm
● mysql.service - MySQL Community Server
     Loaded: loaded (/usr/lib/systemd/system/mysql.service; enabled; preset: enabled)
     Active: active (running) since Sat 2025-08-23 13:54:35 UTC; 6min ago
   Main PID: 3957 (mysqld)
     Status: "Server is operational"
      Tasks: 37 (limit: 1008)
     Memory: 351.3M (peak: 377.1M)
        CPU: 3.616s
     CGroup: /system.slice/mysql.service
             └─3957 /usr/sbin/mysqld
```

Step 5: Go into the default directory /var/www/html/ and create an index.html and index.php file for testing.

1. Create index.html and index.php

```
ubuntu@ip-172-31-32-125: /var/www/html
ubuntu@ip-172-31-32-125:~$ cd /var/www/html/
ubuntu@ip-172-31-32-125:/var/www/html$ sudo vim index.html
ubuntu@ip-172-31-32-125:/var/www/html$ ls
index.html  index.nginx-debian.html
ubuntu@ip-172-31-32-125:/var/www/html$ sudo rm -rf index.html
ubuntu@ip-172-31-32-125:/var/www/html$ sudo vim index.html
ubuntu@ip-172-31-32-125:/var/www/html$ sudo vim index.php
ubuntu@ip-172-31-32-125:/var/www/html$
```

2. Add content in index.html

```
ubuntu@ip-172-31-32-125: /var/www/html
<h1> This is LEMP </h1>
~
~
~
~
~
~
```

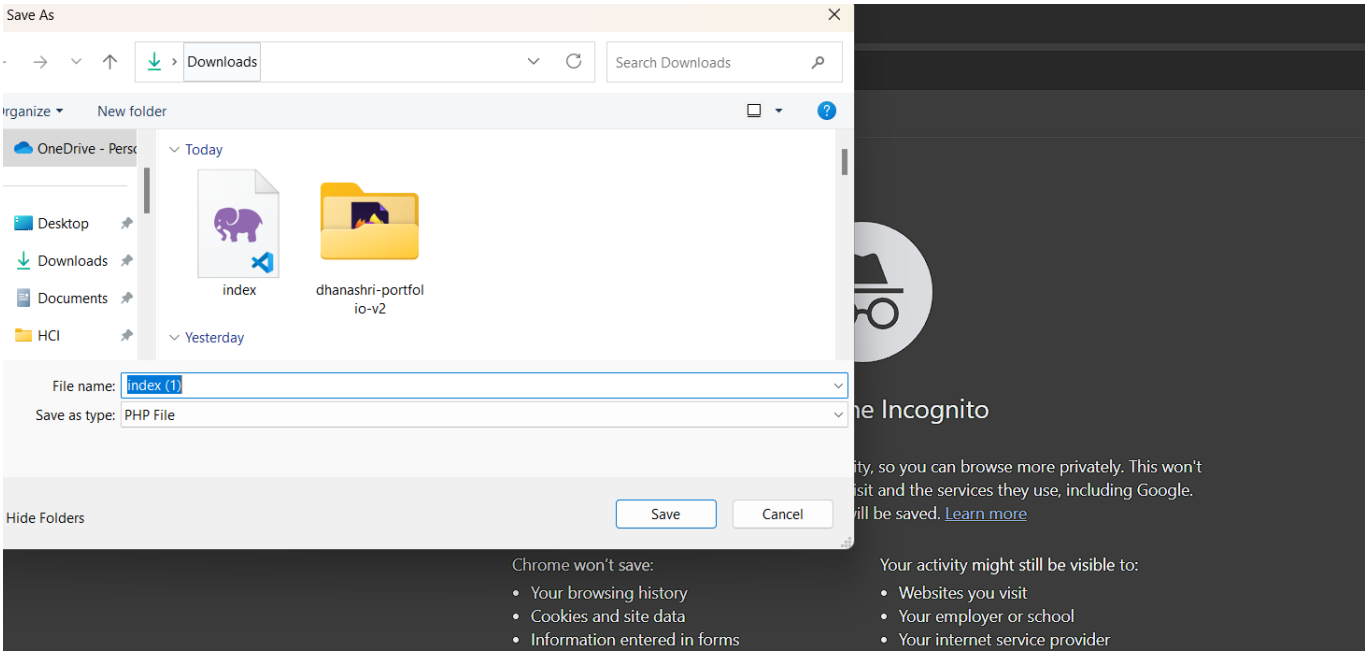
3. Add content in index.php

```
ubuntu@ip-172-31-32-125: /var/www/html
<?php
        phpinfo();
?>
~
~
~
```

Step 6: Restart **nginx, mysql, php8.3-fpm**

```
ubuntu@ip-172-31-32-125: /var/www/html
ubuntu@ip-172-31-32-125:/var/www/html$ sudo systemctl restart nginx mysql php8.3-fpm
ubuntu@ip-172-31-32-125:/var/www/html$
```

Step 7: Copy the Public IP Address and paste in any browser for testing deployment.



On Ubuntu LEMP (Nginx + PHP), if your .php file is getting downloaded instead of executing, it means Nginx is not configured to process PHP through PHP-FPM.

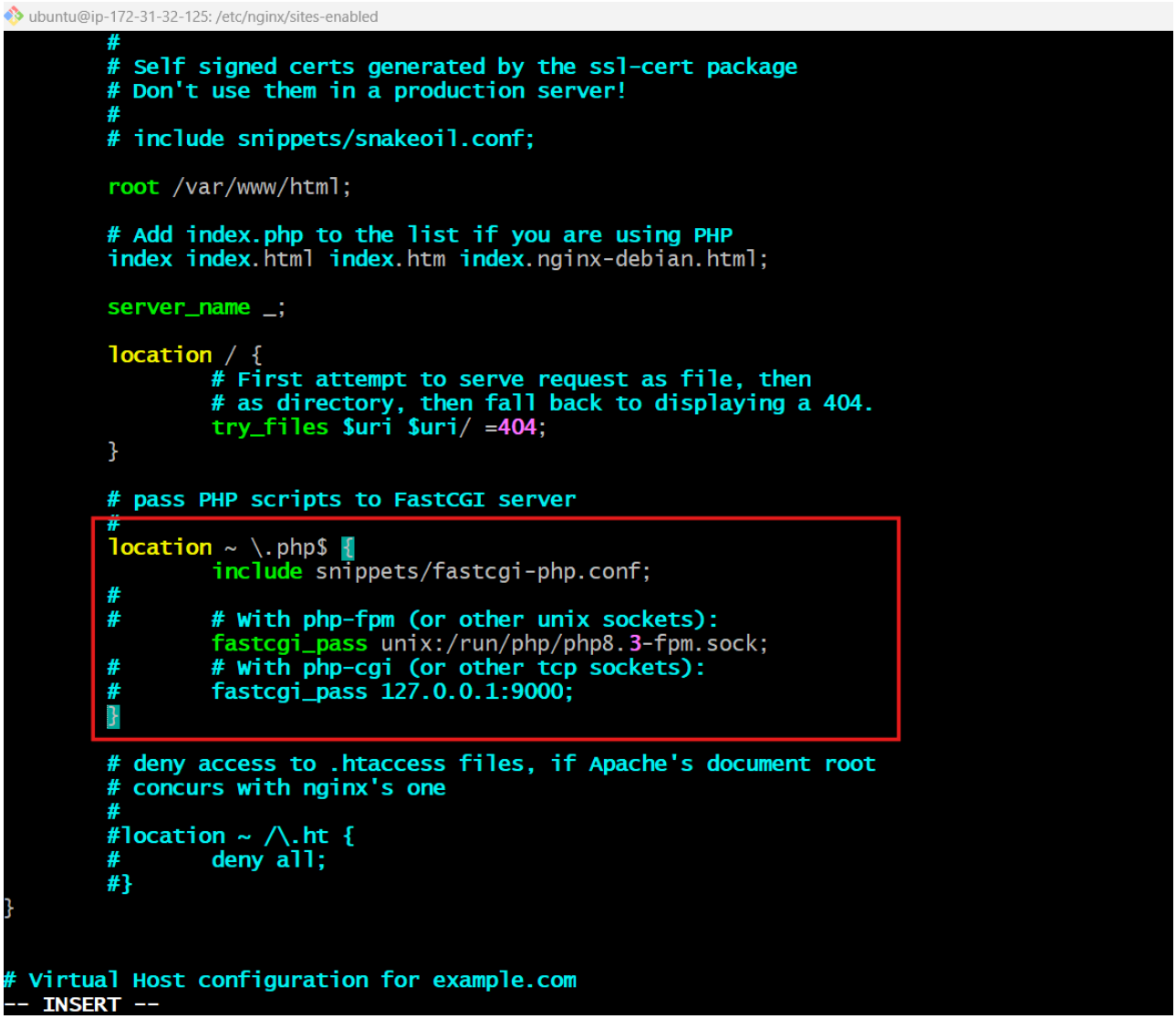
Step 8: Fix for PHP Download Issue in Nginx

1. Change Directory to `/etc/nginx/sites-enabled/` and go to default file.

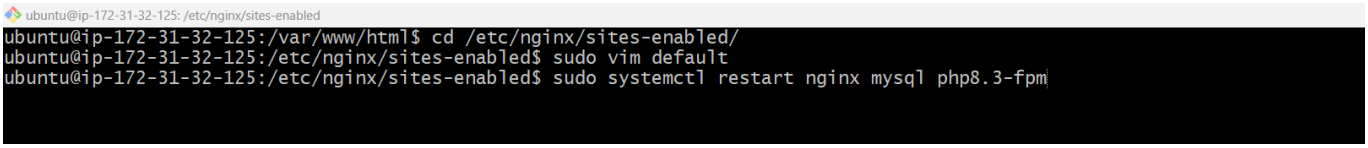
```
ubuntu@ip-172-31-32-125: /etc/nginx/sites-enabled
ubuntu@ip-172-31-32-125:/var/www/html$ cd /etc/nginx/sites-enabled/
ubuntu@ip-172-31-32-125:/etc/nginx/sites-enabled$ sudo vim default
ubuntu@ip-172-31-32-125:/etc/nginx/sites-enabled$ sudo systemctl restart nginx mysql php8.3-fpm
```

2.Inside the default Nginx config file, uncomment the PHP location block and update the PHP-FPM

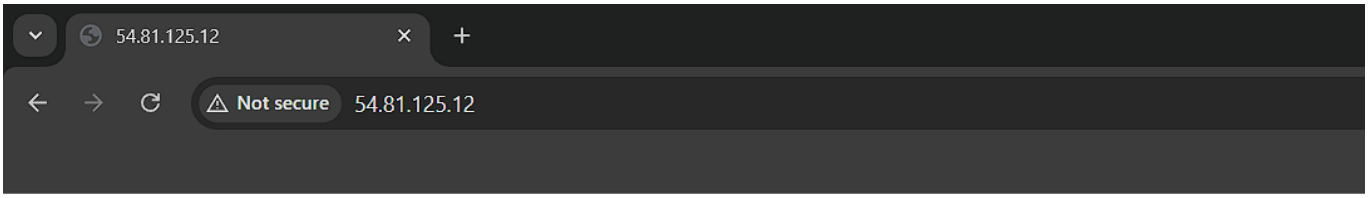
version to match your installed PHP version.



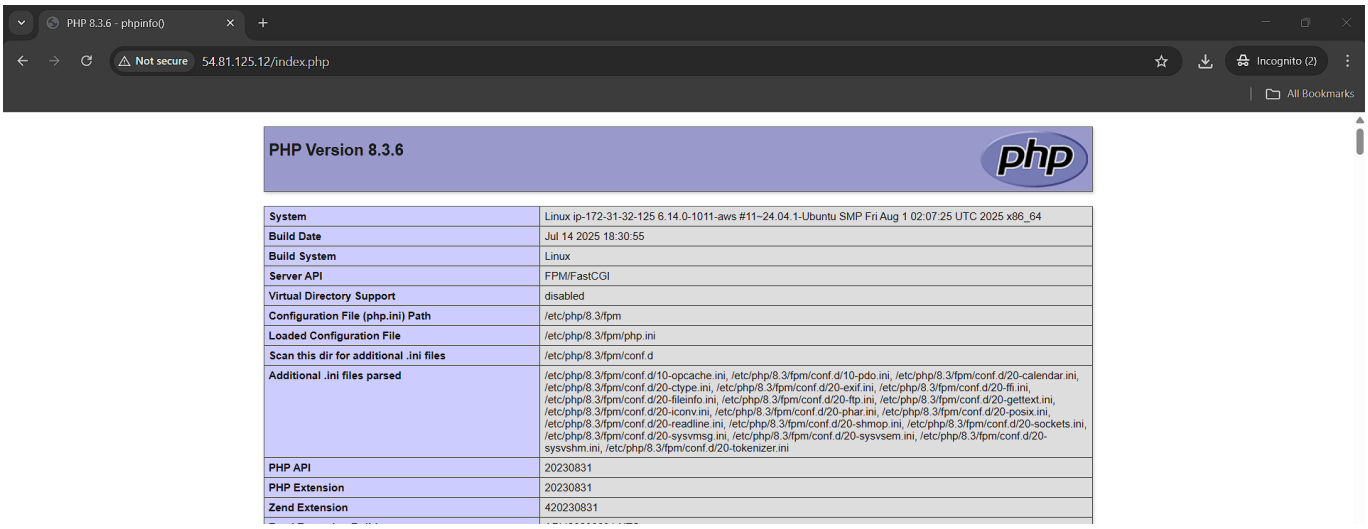
Step 9: Restart **nginx, mysql, php8.3-fpm**



Step 10: Testing the Deployment



This is LEMP



Summary

In this project, we deployed a **LEMP** stack on Ubuntu using the Nginx webserver. We connected to an EC2 instance via SSH, installed and configured **Nginx, PHP, and MySQL,** and set up the default directory`/var/www/html/` with test HTML and PHP files. We also configured Nginx to work with PHP-FPM to ensure PHP files execute properly instead of downloading.