

Deployment of Monolithic and Microservices Architecture on AWS EC2

Introduction

As part of the Techplement AWS Internship, I successfully deployed a web application in both **monolithic** and **microservices** architectures using **Amazon EC2 instances**. The task involved setting up **WordPress and MySQL** in a monolithic deployment and then transitioning to a microservices approach where WordPress and MySQL were hosted on separate EC2 instances. This report details the steps taken, resources used, challenges faced, and key learnings from the project.

Task Overview

The goal of this task was to deploy a web application using AWS services in two architectures:

1. **Monolithic Deployment:** One EC2 instance hosting both WordPress and MySQL.
2. **Microservices Deployment:** Two separate EC2 instances—one for WordPress and another for MySQL.

Step-by-Step Implementation

1. Monolithic Deployment

1. Choose **Ubuntu 22.04** as the AMI.
2. Instance type: **t2.micro** (free-tier eligible).
3. Configured **security groups** (allowed HTTP, HTTPS, SSH, MySQL ports).

2. Installed Required Software

1. **Apache, PHP, and MySQL** installed on the same EC2 instance.
2. **Configured WordPress** with MySQL database.

3. 3.Created a Welcome Page:
1. Customized a WordPress landing page for verification.

2. Microservices Deployment

1. Setup Two EC2 Instances:

- Instance 1: WordPress Server (Apache, PHP, WordPress installed).
- Instance 2: MySQL Server (MySQL installed and configured for remote access).

2. Configured Security Groups:

- Allowed traffic between WordPress and MySQL instances.
- Opened ports 3306 for MySQL and 80/443 for WordPress.

3. Connected WordPress to MySQL Data

- Updated `wp-config.php` file with remote MySQL instance details.
- Verified database connection and WordPress functionality.

4. Configured Amazon RDS (Optional Alternative):

- Created an Aurora MySQL database for improved scalability.
- Updated WordPress configuration to connect to RDS endpoint.

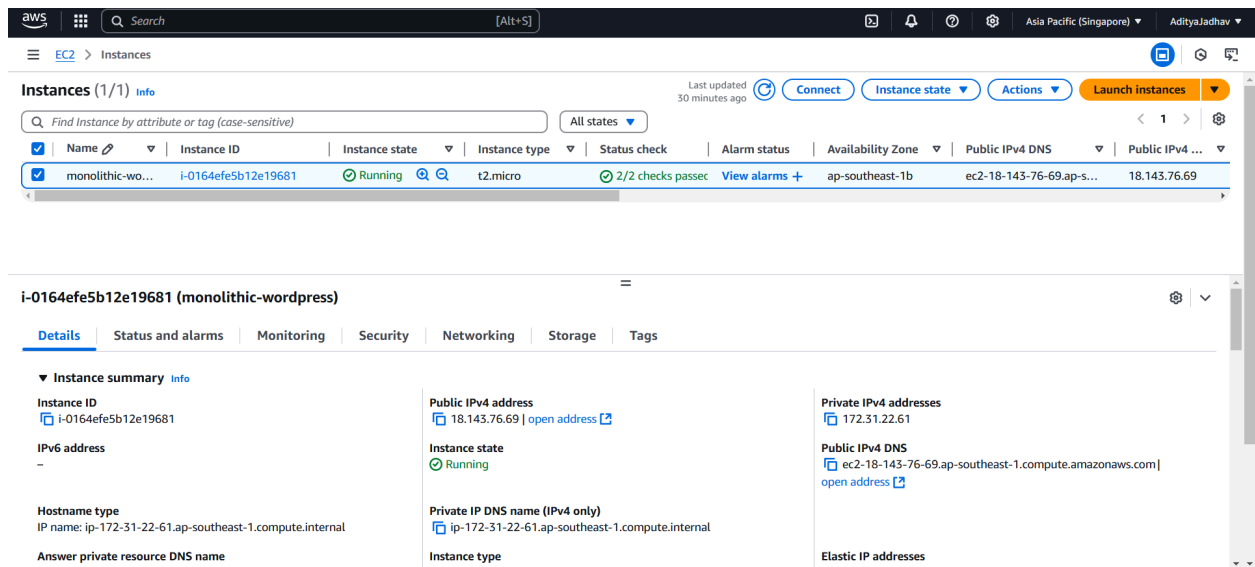
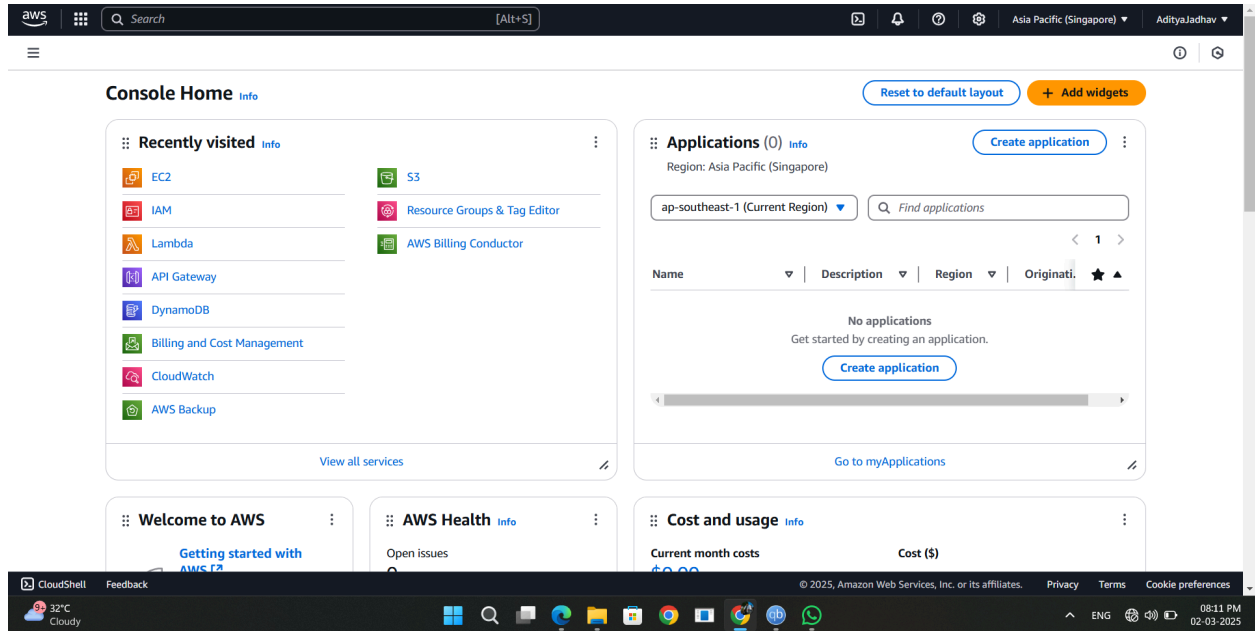
5. Final Testing and Validation:

- Ensured WordPress loads correctly with the MySQL database.
- Checked logs for any connection issues.

❖ Screenshots of AWS Services Used

A. Monolithic Deployment Screenshots

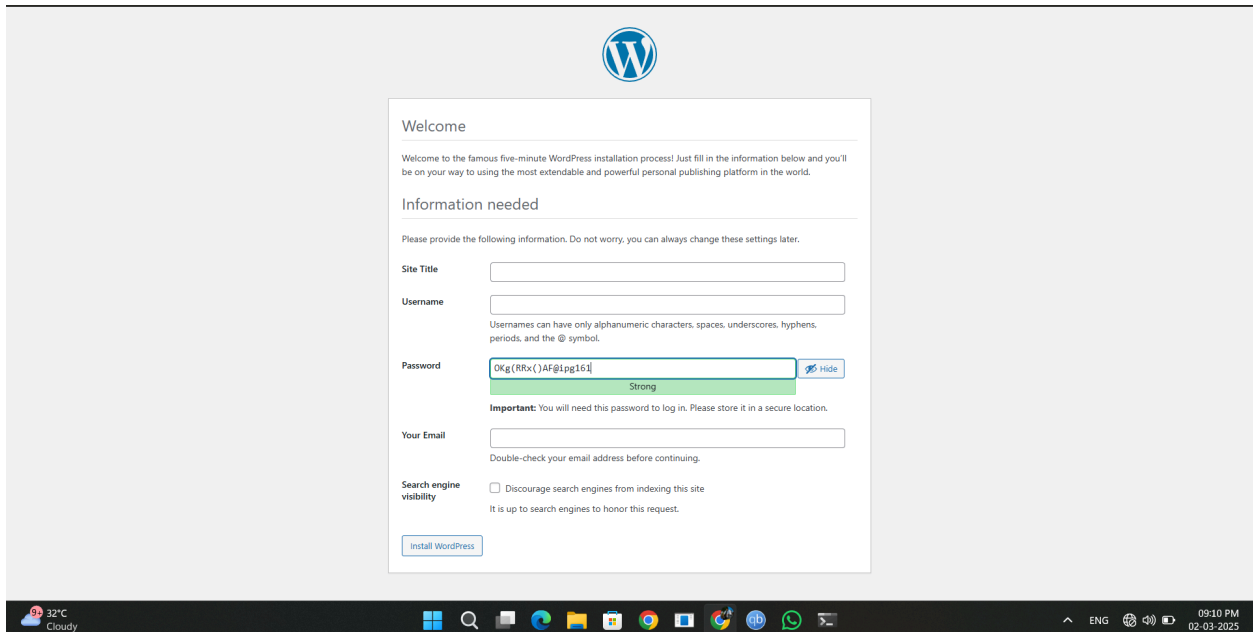
1. EC2 Instance Setup



2. Software Installation

- To install Apache, PHP, and MySQL on the EC2 instance, the following commands were executed:
 - **sudo apt update**
 - **sudo apt install apache2 -y**
 - **sudo apt install php libapache2-mod-php php-mysql -y**
 - **sudo apt install mysql-server -y**
-
- After installation, the services were verified using:
 - **apache2 -v**
 - **php -v**
 - **mysql --version**

3. WordPress Setup



Welcome

Welcome to the famous five-minute WordPress installation process! Just fill in the information below and you'll be on your way to using the most extendable and powerful personal publishing platform in the world.

Information needed

Please provide the following information. Do not worry, you can always change these settings later.

Site Title

Username

Use usernames that have only alphanumeric characters, spaces, underscores, hyphens, periods, and the @ symbol.

Password

Strong


Important: You will need this password to log in. Please store it in a secure location.

Your Email

Double-check your email address before continuing.

Search engine visibility ☐ Discourage search engines from indexing this site
It is up to search engines to honor this request.

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Welcome

Welcome to the famous five-minute WordPress installation process! Just fill in the information below and you'll be on your way to using the most extendable and powerful personal publishing platform in the world.

Information needed

Please provide the following information. Do not worry, you can always change these settings later.

Site Title

My WordPress Site

Username

admin

Usernames can have only alphanumeric characters, spaces, underscores, hyphens, periods, and the @ symbol.

Password

AdityaJadhav@1234

Strong

Hide

Important:

You will need this password to log in. Please store it in a secure location.

Your Email

adityajadhav1554@gmail.com


Double-check your email address before continuing.


Search engine visibility

☐ Discourage search engines from indexing this site


It is up to search engines to honor this request.

Install WordPress


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Success!

WordPress has been installed. Thank you, and enjoy!


Username


admin

Password


Your chosen password.

[Log In](#)

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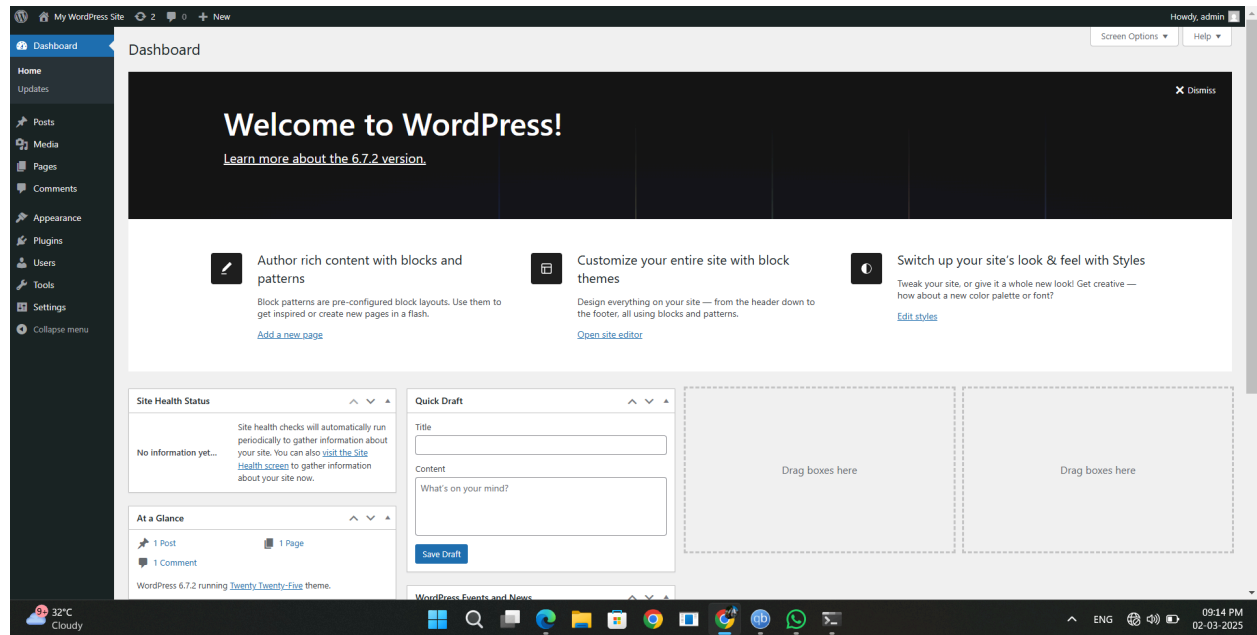


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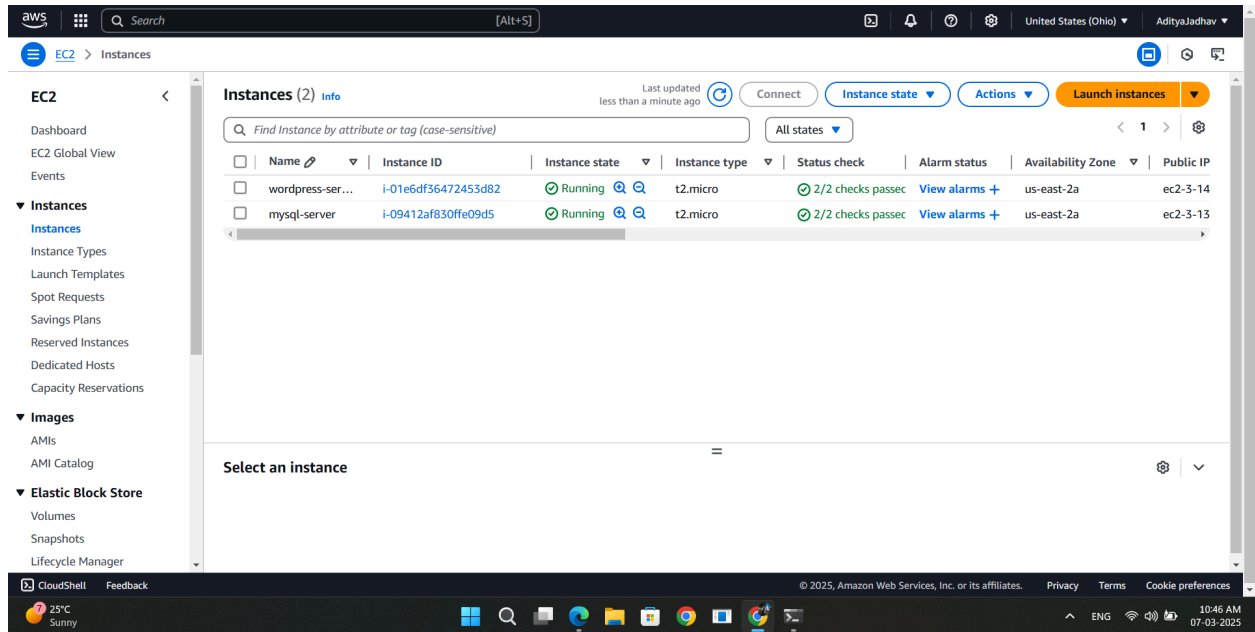
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4. Welcome Page



B. Microservices Deployment Screenshots

1.EC2 Instances Setup



2.MySQL Configuration

```
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) : y
Success.

All done!
ubuntu@ip-172-31-5-254:~$ sudo mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 10
Server version: 8.0.41-0ubuntu0.24.04.1 (Ubuntu)

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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> CREATE DATABASE wordpress;
Query OK, 1 row affected (0.01 sec)

mysql> CREATE USER 'wp_user'@ '%' IDENTIFIED WITH mysql_native_password BY 'AdityaJadhav';
ERROR 1819 (HY000): Your password does not satisfy the current policy requirements
mysql> CREATE USER 'wp_user'@ '%' IDENTIFIED WITH mysql_native_password BY 'AdityaJadhav123!';
Query OK, 0 rows affected (0.01 sec)

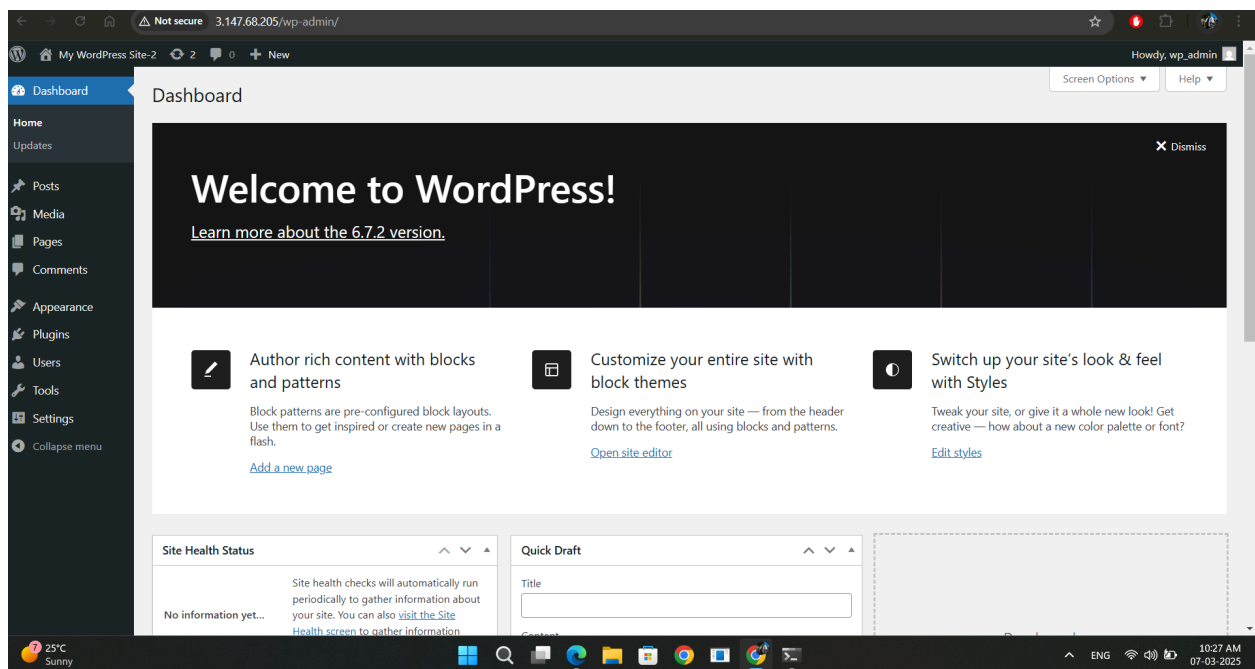
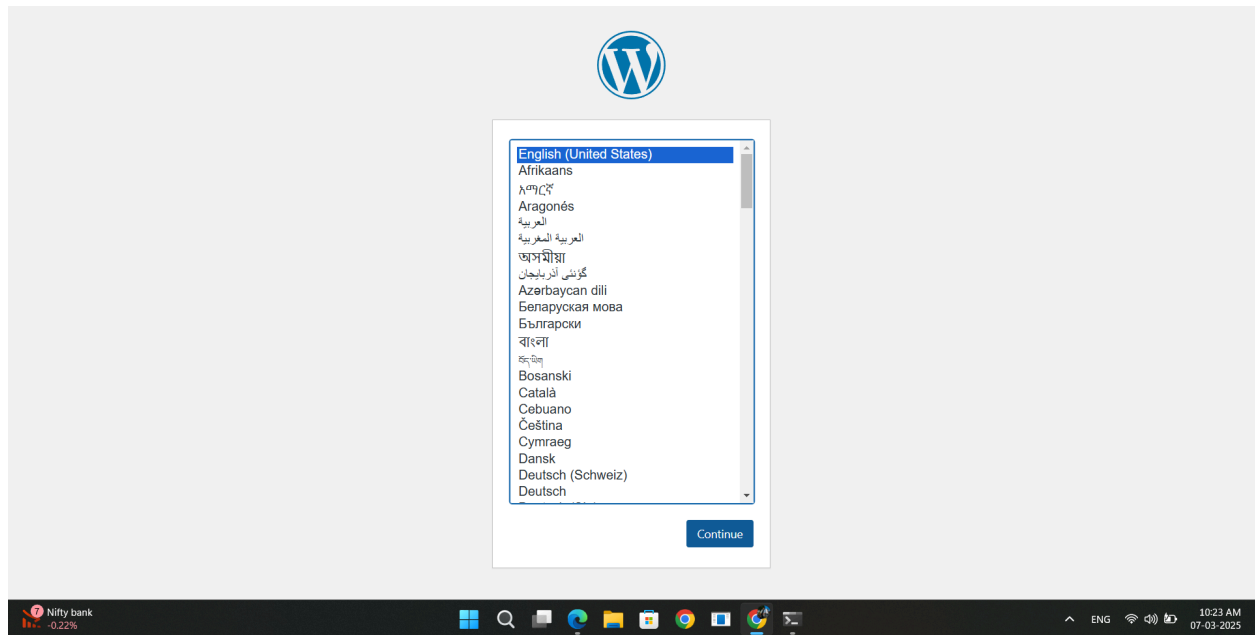
mysql> GRANT ALL PRIVILEGES ON wordpress.* TO 'wp_user'@ '%';
Query OK, 0 rows affected (0.00 sec)

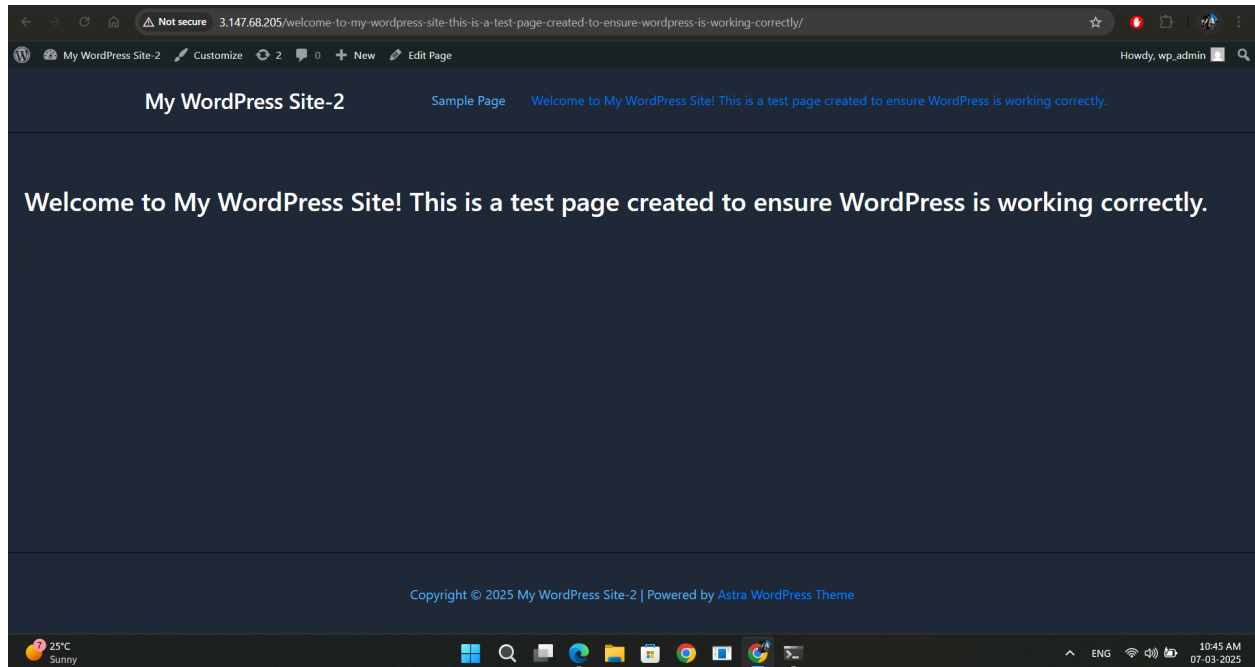
mysql> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.00 sec)

mysql> EXIT;

ubuntu@ip-172-31-5-254:~$ sudo systemctl restart mysql
ubuntu@ip-172-31-5-254:~$
```

3.Successful Connection Wordpress Installation





Conclusion & Learnings

Through this project, I gained hands-on experience with AWS services, including **EC2**, **Security Groups**, **Apache**, **MySQL**, and **WordPress configuration**. The key takeaways include:

- I gained a clear Understanding of the difference between **monolithic and microservices architectures**.
 - Learning to configure **remote database connections** in AWS.
 - Managing **security groups and network configurations** effectively.
 - Troubleshooting **WordPress-MySQL connection issues**.
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- ❖ This internship task has significantly improved my **AWS knowledge and cloud deployment skills**. It was a great opportunity to work on real-world cloud infrastructure and understand the fundamentals of web application hosting on AWS.

