Configure the LAMP environment and deploy the sample PHP code

Step 1: Create an AWS Account

1. Visit AWS Sign Up and create an account.
2. Provide your email, password, and payment details (required for verification).
3. Log in to the AWS Management Console.

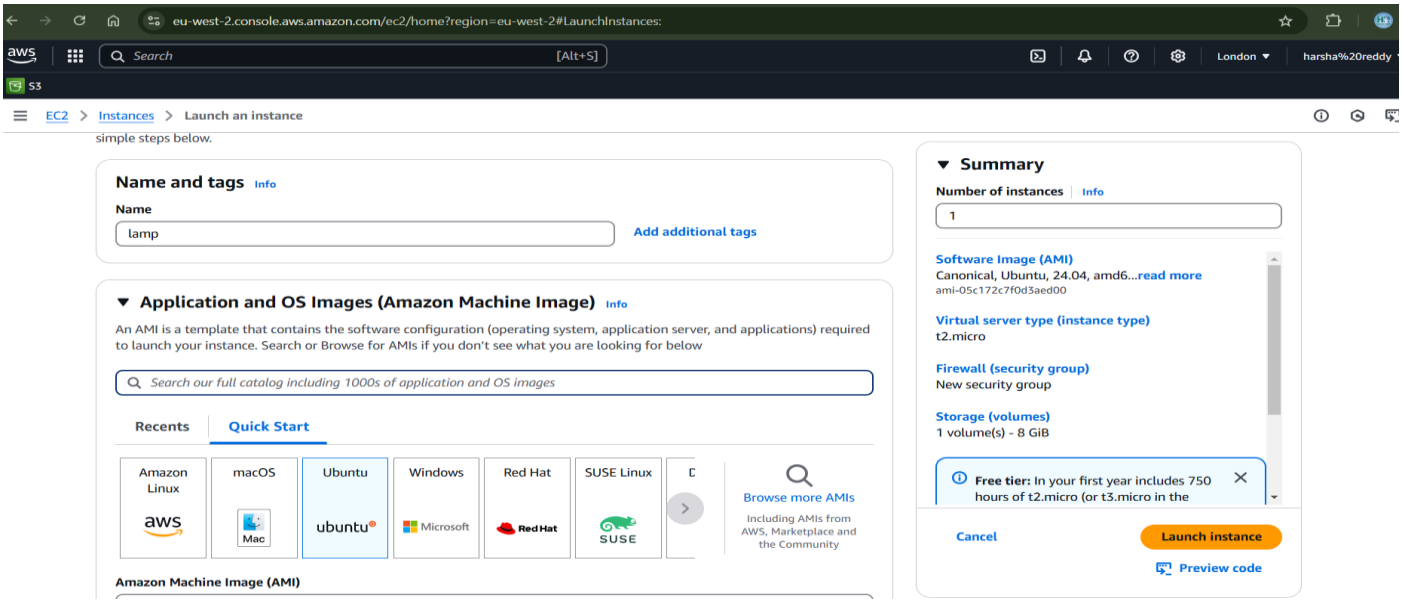
Step 2: Launch an EC2 Instance

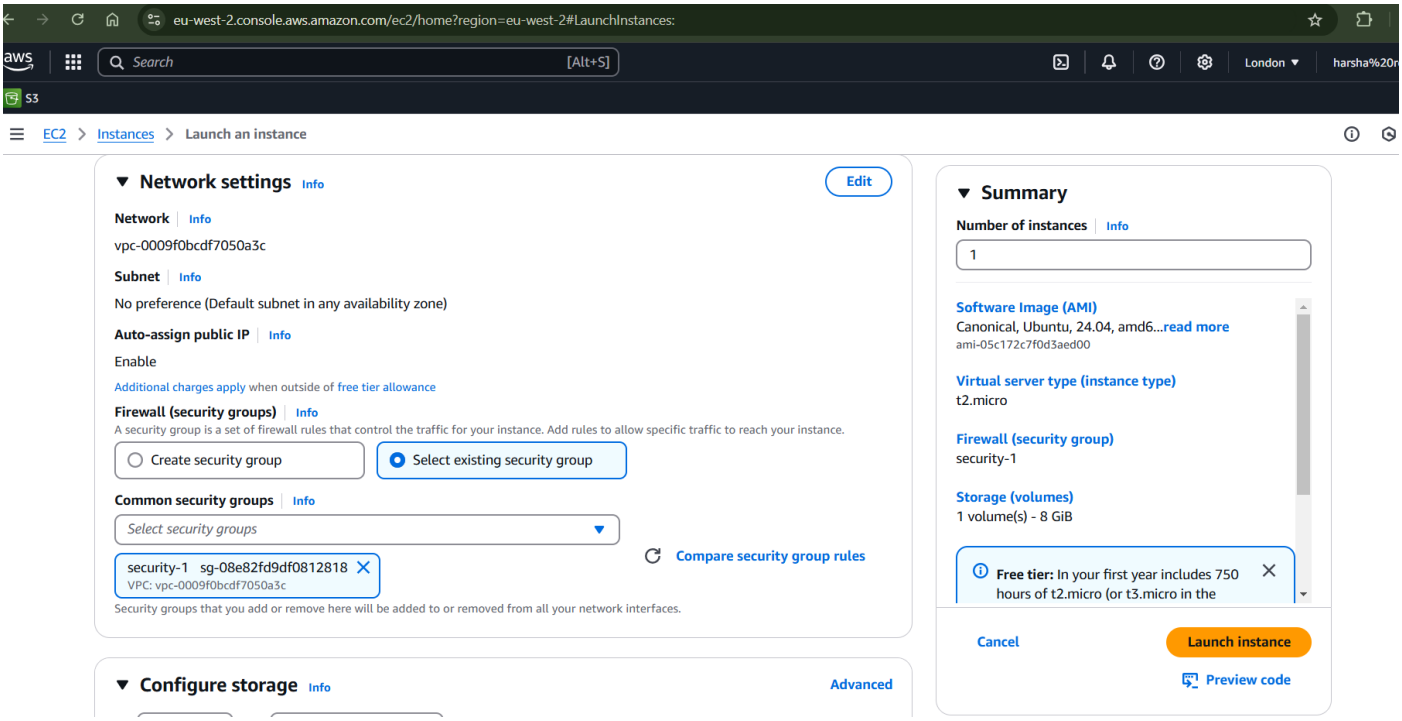
1. Navigate to the **EC2 Dashboard**.
2. Click **Launch Instance**.
3. Configure the instance:
    - **Name**: Give it a name (e.g., LAMP-Demo).
    - **AMI**: Choose **Amazon Linux 2 AMI** (or Ubuntu, if preferred).
    - **Instance Type**: Select **t2. Micro** (eligible for Free Tier).
    - **Key Pair**: Create a new key pair or use an existing one.
    - **Network Settings**:
        - Allow HTTP (port 80) and HTTPS (port 443) in addition to SSH (port 22).
    - **Storage**: Use the default storage size (8GB) or increase if needed.
4. Click **Launch Instance** and wait for it to initialise.

Step 3: Connect to the Instance

1. From the EC2 dashboard, select the instance and click **Connect**.
2. Use the SSH command provided or a tool like git bash etc …

    ssh -i "your-key.pem" ec2-user@your-public-ip



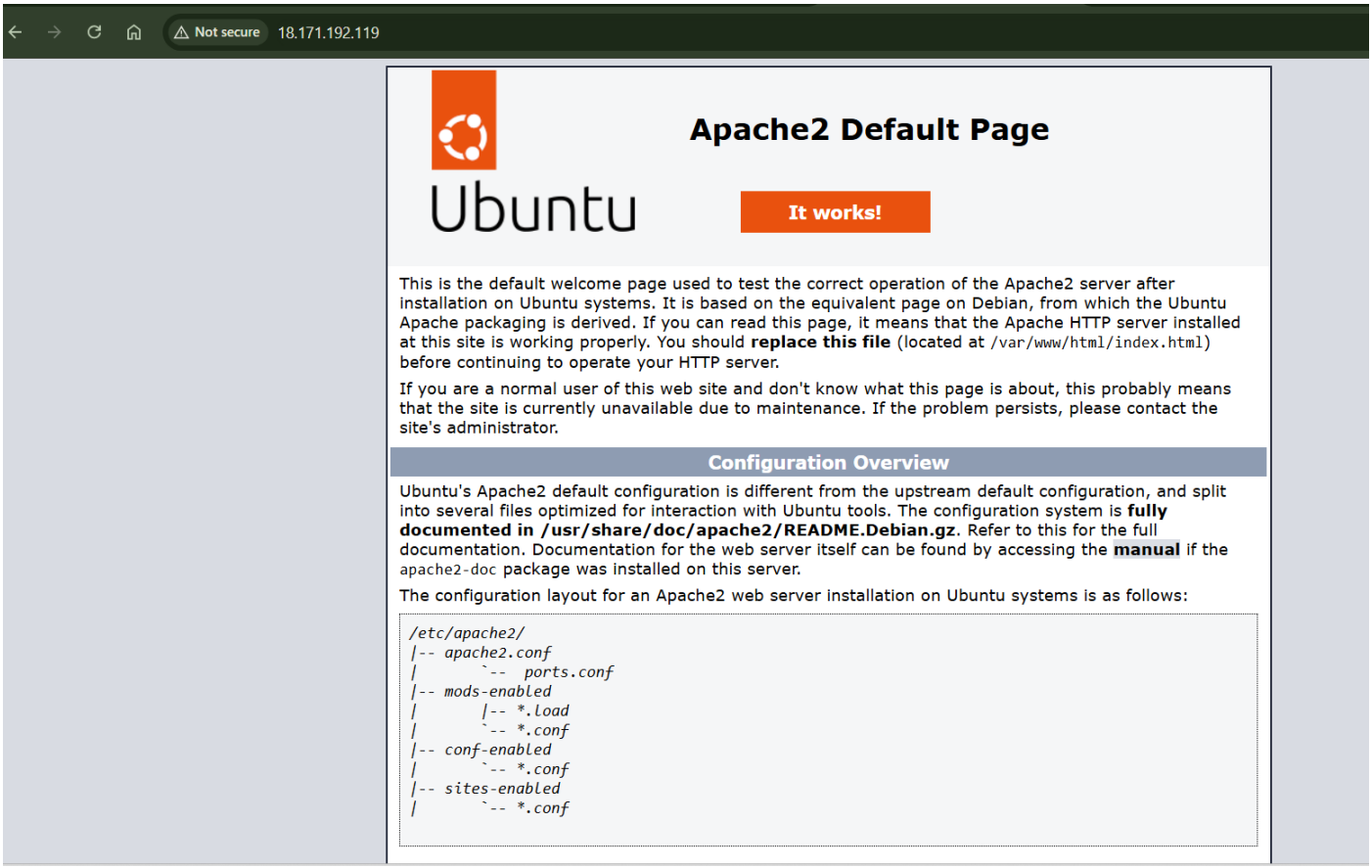


Update System Packages

Once connected, update your system packages: sudo apt update

Step 4: Install LAMP Stack

- **Install Apache Web Server**
  - sudo apt install apache2
  - After installation, verify that Apache is running by accessing your EC2 instance's public IP address in a web browser. You should see the default Apache welcome page.



```
root@ip-172-31-20-161:~# systemctl status apache2
● apache2.service - The Apache HTTP Server
     Loaded: loaded (/usr/lib/systemd/system/apache2.service; enabled; preset: enabled)
     Active: active (running) since Wed 2024-12-18 07:06:37 UTC; 47s ago
       Docs: https://httpd.apache.org/docs/2.4/
   Main PID: 2082 (apache2)
      Tasks: 55 (limit: 1130)
     Memory: 5.4M (peak: 5.7M)
        CPU: 34ms
     CGroup: /system.slice/apache2.service
             ├─2082 /usr/sbin/apache2 -k start
             ├─2084 /usr/sbin/apache2 -k start
             └─2085 /usr/sbin/apache2 -k start

Dec 18 07:06:37 ip-172-31-20-161 systemd[1]: Starting apache2.service - The Apache HTTP Server...
Dec 18 07:06:37 ip-172-31-20-161 systemd[1]: Started apache2.service - The Apache HTTP Server.
root@ip-172-31-20-161:~#
```

Step5: Install MySQL

5.1 Installation command

To install MySQL: Sudo apt install MySQL-server

5.2 Create Password for MySQL root user:

Log in to MySQL and run the following command:

ALTER USER ‘root’@’localhost’ IDENTIFIED WITH mysql_native_password BY ‘<desird password>’;

5.3 Creating a Test Database and User

Log in to MySQL and Create a test database and user:

sudo mysql -u root -p
CREATE DATABASE testdb;
CREATE USER 'testuser'@'localhost' IDENTIFIED BY 'password';
GRANT ALL PRIVILEGES ON testdb.* TO 'testuser'@'localhost';
FLUSH PRIVILEGES;
EXIT;

```
Processing triggers for libc-bin (2.27-3ubuntu1) ...
Processing triggers for ureadahead (0.100.0-20) ...
Processing triggers for systemd (237-3ubuntu10.3) ...
root@ip-172-31-26-9:~# systemctl status mysql
● mysql.service - MySQL Community Server
   Loaded: loaded (/lib/systemd/system/mysql.service; enabled; vendor preset: enabled)
   Active: active (running) since Tue 2018-10-09 13:01:55 UTC; 23s ago
 Main PID: 20532 (mysqld)
    Tasks: 27 (limit: 1152)
   CGroup: /system.slice/mysql.service
           └─20532 /usr/sbin/mysqld --daemonize --pid-file=/run/mysqld/mysqld.pid
```

```
root@ip-172-31-32-186:~# sudo mysql
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 8
Server version: 8.0.40-0ubuntu0.24.04.1 (Ubuntu)

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affiliates. Other names may be trademarks of their respective
owners.

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

mysql>
```

```
root@ip-172-31-26-9:~# mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 2
Server version: 5.7.23-0ubuntu0.18.04.1 (Ubuntu)

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affiliates. Other names may be trademarks of their respective
owners.

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

mysql> ALTER USER 'root'@'localhost' IDENTIFIED WITH mysql_native_password BY 'mysql12345';
Query OK, 0 rows affected (0.00 sec)

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

mysql> exit
Bye
```

Step 6: Install PHP

6.1 installation command: install PHP and necessary modules:
sudo apt install php libapache2-mod-php php-mysql -y

6.2 Verifying PHP installation

Check the PHP version to ensure it was installed successfully: php -v

```
root@ip-172-31-32-186:~# php -v
PHP 8.3.6 (cli) (built: Dec  2 2024 12:36:18) (NTS)
Copyright (c) The PHP Group
Zend Engine v4.3.6, Copyright (c) Zend Technologies
    with Zend OPcache v8.3.6, Copyright (c), by Zend Technologies
root@ip-172-31-32-186:~#
```

Step 7: Configure Apache2 for PHP

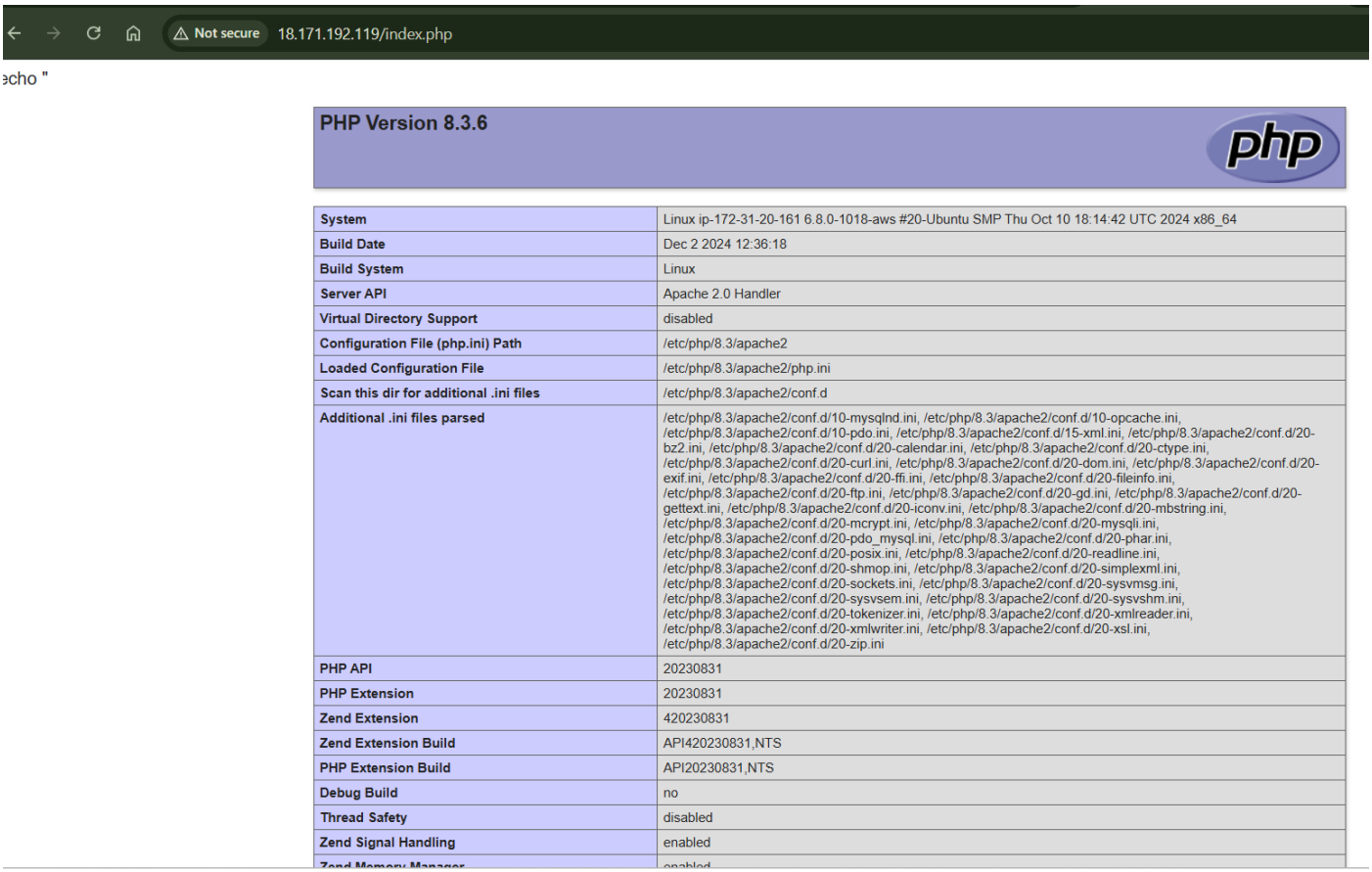
7.1 Creating a test PHP Flie

- Create a test PHP file to Verify PHP integration with Apache2:
- The default path of Apache is: **"/var/www/html/"**
- Change index.html to index.php
  Add the following content to the file:

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

7.2 Restarting the Apache

- Restart the Apache Server to apply the Changes: sudo systemctl restart apache
- Now, Copy the Public IP and paste it into the browser



System	Linux ip-172-31-20-161 6.8.0-1018-aws #20-Ubuntu SMP Thu Oct 10 18:14:42 UTC 2024 x86_64
Build Date	Dec 2 2024 12:36:18
Build System	Linux
Server API	Apache 2.0 Handler
Virtual Directory Support	disabled
Configuration File (php.ini) Path	/etc/php/8.3/apache2
Loaded Configuration File	/etc/php/8.3/apache2/php.ini
Scan this dir for additional .ini files	/etc/php/8.3/apache2/conf.d
Additional .ini files parsed	/etc/php/8.3/apache2/conf.d/10-mysqlnd.ini, /etc/php/8.3/apache2/conf.d/10-opcache.ini, /etc/php/8.3/apache2/conf.d/10-pdo.ini, /etc/php/8.3/apache2/conf.d/15-xml.ini, /etc/php/8.3/apache2/conf.d/20-bz2.ini, /etc/php/8.3/apache2/conf.d/20-calendar.ini, /etc/php/8.3/apache2/conf.d/20-ctype.ini, /etc/php/8.3/apache2/conf.d/20-curl.ini, /etc/php/8.3/apache2/conf.d/20-dom.ini, /etc/php/8.3/apache2/conf.d/20-exif.ini, /etc/php/8.3/apache2/conf.d/20-ffi.ini, /etc/php/8.3/apache2/conf.d/20-fileinfo.ini, /etc/php/8.3/apache2/conf.d/20-ftp.ini, /etc/php/8.3/apache2/conf.d/20-gd.ini, /etc/php/8.3/apache2/conf.d/20-gettext.ini, /etc/php/8.3/apache2/conf.d/20-iconv.ini, /etc/php/8.3/apache2/conf.d/20-mbstring.ini, /etc/php/8.3/apache2/conf.d/20-mcrypt.ini, /etc/php/8.3/apache2/conf.d/20-mysqli.ini, /etc/php/8.3/apache2/conf.d/20-pdo_mysql.ini, /etc/php/8.3/apache2/conf.d/20-phar.ini, /etc/php/8.3/apache2/conf.d/20-posix.ini, /etc/php/8.3/apache2/conf.d/20-readline.ini, /etc/php/8.3/apache2/conf.d/20-shmop.ini, /etc/php/8.3/apache2/conf.d/20-simplexml.ini, /etc/php/8.3/apache2/conf.d/20-sockets.ini, /etc/php/8.3/apache2/conf.d/20-sysvmsg.ini, /etc/php/8.3/apache2/conf.d/20-sysvsem.ini, /etc/php/8.3/apache2/conf.d/20-sysvshm.ini, /etc/php/8.3/apache2/conf.d/20-tokenizer.ini, /etc/php/8.3/apache2/conf.d/20-xmlreader.ini, /etc/php/8.3/apache2/conf.d/20-xmlwriter.ini, /etc/php/8.3/apache2/conf.d/20-xsl.ini, /etc/php/8.3/apache2/conf.d/20-zip.ini
PHP API	20230831
PHP Extension	20230831
Zend Extension	420230831
Zend Extension Build	API420230831,NTS
PHP Extension Build	API20230831,NTS
Debug Build	no
Thread Safety	disabled
Zend Signal Handling	enabled
Zend Memory Manager	enabled

Step 8: Deploy the PHP Application on your LAMP Stack

8.1 Creating a simple PHP script**:**

- Create a PHP File to test the Connection to your MySQL database:
- The path of the PHP file is: nano /var/www/html/index.php

Simple PHP Code

```
 GNU nano 7.2                                                    index.php *
<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>PHP with HTML & CSS</title>
    <style>
        body {
            font-family: Arial, sans-serif;
            margin: 0;
            padding: 0;
            background-color: #f4f4f9;
            color: #333;
            text-align: center;
        }
        header {
            background-color: #007bff;
            color: white;
            padding: 20px 0;
        }
        main {
            margin: 20px auto;
            padding: 20px;
            max-width: 800px;
            background: white;
            border-radius: 8px;
            box-shadow: 0 4px 8px rgba(0, 0, 0, 0.1);
        }
        footer {
            margin-top: 20px;
            background-color: #333;
            color: white;
            padding: 10px 0;
        }
        .success {
            color: green;
        }
        .error {
            color: red;
        }
    </style>
</head>
<body>
    <header>
        <h1>Welcome to My PHP Application</h1>
    </header>
    <main>
        <h2>Server Information</h2>
        <p><strong>Current Server Time:</strong>
            <?php
                echo date('Y-m-d H:i:s');
            ?>
        </p>
```

```
 GNU nano 7.2
        footer {
            margin-top: 20px;
            background-color: #333;
            color: white;
            padding: 10px 0;
        }
        .success {
            color: green;
        }
        .error {
            color: red;
        }
    </style>
</head>
<body>
    <header>
        <h1>Welcome to My PHP Application</h1>
    </header>
    <main>
        <h2>Server Information</h2>
        <p><strong>Current Server Time:</strong>
            <?php
                echo date('Y-m-d H:i:s');
            ?>
        </p>

        <h2>Database Connection</h2>
        <?php
        // Database configuration
        $host = "localhost";
        $username = "testuser";  // Replace with your MySQL username
        $password = "[redacted]";      // Replace with your MySQL password
        $dbname = "testdb"; // Replace with your database name

        // Try connecting to the database
        try {
            $conn = new PDO("mysql:host=$host;dbname=$dbname", $username, $password);
            $conn->setAttribute(PDO::ATTR_ERRMODE, PDO::ERRMODE_EXCEPTION);
            echo "<p class='success'>Successfully connected to the database!</p>";
        } catch (PDOException $e) {
            echo "<p class='error'>Database connection failed: " . $e->getMessage() . "</p>";
        }

        // Close the connection
        $conn = null;
        ?>
    </main>
    <footer>
        <p>&copy; <?php echo date('Y'); ?> My PHP Application</p>
    </footer>
</body>
</html>
```

FINAL RESULT IS: