

Web Lab 1 (WSL + LAMP Setup and PHP-MySQL Integration)

1. Introduction

The objective of this lab was to set up a complete LAMP (Linux, Apache, MySQL, PHP) environment using Windows Subsystem for Linux (WSL).

After setting up Ubuntu inside WSL2, Apache, PHP, and MySQL were installed and configured.

Finally, multiple PHP pages were created to test database connection, insertion, listing, and deletion of data.

2. Installing WSL and Ubuntu

Step 1 – Install WSL

Opened PowerShell as Administrator and ran:

```
wsl --install
```

After installation was completed, the system was **restarted** as instructed.

Step 2 – Fixing WSL Startup Errors

Initially, Ubuntu showed these errors:

WslRegisterDistribution failed with error: 0x80370102

WslRegisterDistribution failed with error: 0x80080005

Fix:

Entered BIOS (by pressing **F10** at startup) → Enabled **Virtualization (Intel VT-x / AMD-V)**.

Then rebooted Windows and WSL started successfully.

```
Welcome to Ubuntu 24.04.1 LTS (GNU/Linux 6.6.87.2-microsoft-standard-WSL2 x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/pro

System information as of Sat Nov  8 19:38:20 +06 2025

System load: 0.17          Processes:           31
Usage of /: 0.1% of 1006.85GB Users logged in: 1
Memory usage: 6%           IPv4 address for eth0: 172.30.92.226
Swap usage:  0%
```

3. Creating a User in Ubuntu

Once Ubuntu opened, created a new user and added it to sudo group:

```
adduser towhid
usermod -aG sudo towhid
su - towhid
```

Confirmed working directory:

```
pwd
```

Output:

```
/home/zahid
```

Then updated packages:

```
sudo apt update && sudo apt upgrade -y
```

4. Installing Apache and Testing

Step 1 – Install Apache

```
sudo apt install apache2 -y
```

Step 2 – Start and Check Apache Status

```
sudo systemctl start apache2  
sudo systemctl status apache2
```

If Active (running) shows in green, Apache is working.

```
zahid@DESKTOP-C7514TI:~$ sudo service apache2 start  
zahid@DESKTOP-C7514TI:~$ sudo service apache2 status  
● apache2.service - The Apache HTTP Server  
    Loaded: loaded (/usr/lib/systemd/system/apache2.service; enabled; preset: enabled)  
    Active: active (running) since Sat 2025-11-08 19:43:22 +06; 2min 50s ago  
      Docs: https://httpd.apache.org/docs/2.4/  
        Main PID: 7964 (apache2)  
          Tasks: 55 (limit: 4632)  
            Memory: 21.0M ()  
          CGroup: /system.slice/apache2.service  
                  ├─7964 /usr/sbin/apache2 -k start  
                  ├─7966 /usr/sbin/apache2 -k start  
                  └─7967 /usr/sbin/apache2 -k start  
  
Nov 08 19:43:22 DESKTOP-C7514TI systemd[1]: Starting apache2.service - The Apache HTTP Server...  
Nov 08 19:43:22 DESKTOP-C7514TI systemd[1]: Started apache2.service - The Apache HTTP Server.
```

Step 3 – Test Apache Default Page

Go to:

<http://localhost/>

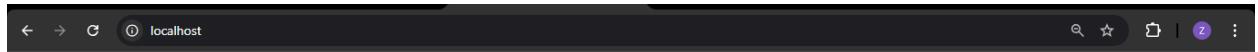


Hello from Zahid!

This is my first web page using Apache server in WSL Ubuntu.

To create own test page:

```
cd /var/www/html  
echo "Hello from Zahid" | sudo tee index.html
```



Hello from Zahid!

This is my first web page using Apache server in WSL Ubuntu.

5. Installing PHP and Testing PHP Functionality

Step 1 – Install PHP

```
sudo apt install php libapache2-mod-php -y  
sudo systemctl restart apache2
```

Step 2 – Create a phpinfo() Test Page

```
echo "<?php phpinfo(); ?>" | sudo tee /var/www/html/info.php
```

Now open in browser:

<http://localhost/info.php>

PHP Version 8.3.6	
System	Linux DESKTOP-EJC0652 6.6.87.2-microsoft-standard-WSL2 #1 SMP PREEMPT_DYNAMIC Thu Jun 5 18:30:46 UTC 2025 x86_64
Build Date	Jul 14 2025 18:30:55
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-opcache.ini, /etc/php/8.3/apache2/conf.d/10-pdo.ini, /etc/php/8.3/apache2/conf.d/20-calendar.ini, /etc/php/8.3/apache2/conf.d/20-dtrace.ini, /etc/php/8.3/apache2/conf.d/20-xml.ini, /etc/php/8.3/apache2/conf.d/20-xsl.ini, /etc/php/8.3/apache2/conf.d/20-zip.ini, /etc/php/8.3/apache2/conf.d/20-zend_extension.ini, /etc/php/8.3/apache2/conf.d/20-shmop.ini, /etc/php/8.3/apache2/conf.d/20-shm.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-sysvshm.ini, /etc/php/8.3/apache2/conf.d/20-tokenizer.ini
PHP API	20230831
PHP Extension	420230831
Zend Extension	420230831
Zend Extension Build	API/420230831.NTS
PHP Extension Build	API/20230831.NTS
Debug Build	no
Thread Safety	disabled
Zend Signal Handling	enabled
Zend Memory Manager	enabled
Zend Multibyte Support	disabled
Zend Max Execution Timers	disabled
IPv6 Support	enabled
DTrace Support	disabled
Registered PHP Streams	https, ftps, compress.zlib, php, file, glob, data, http, ftp, phar
Registered Stream Socket Transports	tcp, udp, unix, udg, ssl, tls, tlsv1.0, tlsv1.1, tlsv1.2, tlsv1.3
Registered Stream Filters	zlib.*, string.rot13, string.toupper, string.tolower, convert.*, consumed, dechunk, convert.iconv,*

This program makes use of the Zend Scripting Language Engine:
Zend Engine v4.3.6. Copyright (c) Zend Technologies with Zend OPcache v8.3.6. Copyright (c), by Zend Technologies

zend engine

Configuration apache2handler

need to enable error display for debugging, open the PHP configuration file:

```
sudo nano /etc/php/8.3/apache2/php.ini
```

Uncomment and set:

```
display_errors = On
```

Then save and exit (Ctrl + O → Enter → Ctrl + X).

6. Installing MySQL and Setting Up Database

Step 1 – Install MySQL Server

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

Step 2 – Start and Check MySQL

```
sudo systemctl start mysql
sudo systemctl status mysql
```

Step 3 – Log into MySQL

```
sudo mysql
```

Step 4 – Create Database and Table

```
CREATE DATABASE web_lab;
USE web_lab;

CREATE TABLE students (
    id INT AUTO_INCREMENT PRIMARY KEY,
    name VARCHAR(50),
    email VARCHAR(50)
);

INSERT INTO students (name, email)
VALUES ('Zahid', 'zahid@example.com'),
       ('Yasin', 'yasin@example.com');
```



7. Enabling PHP-MySQL Integration

If see an error like Class 'mysqli' not found, install the PHP MySQL module:

```
sudo apt install php8.3-mysql -y  
sudo systemctl restart apache2
```

Step 2 – Create a New MySQL User

Since the root account can cause permission issues, create a new user:

```
CREATE USER 'towhid'@'localhost' IDENTIFIED BY '12345';  
GRANT ALL PRIVILEGES ON web_lab.* TO 'towhid'@'localhost';  
FLUSH PRIVILEGES;  
EXIT;
```

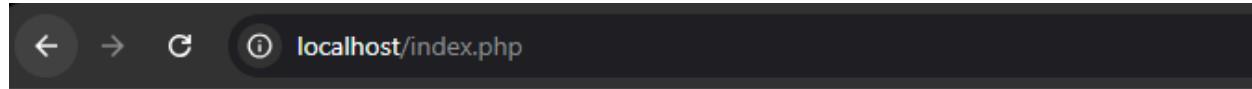
8. Creating PHP Pages

All pages are stored in /var/www/html.

a) index.php

Main homepage linking to all other files.

```
<?php
echo "<h2>Web Lab – Towhid</h2>";
echo "<p><a href='db_connect.php'>Test DB Connection</a></p>" ;
echo "<p><a href='add_student.php'>Add Student</a></p>" ;
echo "<p><a href='list_students.php'>List Students</a></p>" ;
?>
```



Web Lab – Zahid

[Test DB Connection](#)

[Add Student](#)

[List Students](#)

b) db_connect.php

Displays database connection and student list.

```
<?php
$servername = "localhost";
$username   = "webuser";
$password   = "MyStrongPass123!";
$database   = "web_lab";

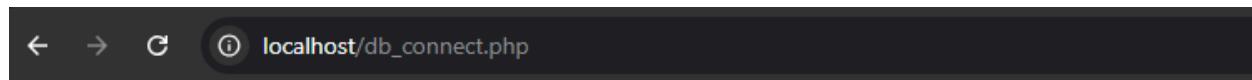
$conn = new mysqli($servername, $username, $password, $database);
if ($conn->connect_error) {
    die("Connection failed: " . $conn->connect_error);
}
echo "<h2>Connected successfully to MySQL database!</h2>";
$sql = "SELECT * FROM students";
```

```

$result = $conn->query($sql);

if ($result && $result->num_rows > 0) {
    echo "<h3>Student Records</h3>";
    echo "<table border='1' cellpadding='6'><tr><th>ID</th><th>Name</th><th>Email</th></tr>";
    while ($row = $result->fetch_assoc()) {
        echo
"<tr><td>".$row['id']."</td><td>".$row['name']."</td><td>".$row['email']
".</td></tr>";
    }
    echo "</table>";
} else {
    echo "No data found!";
}
$conn->close();
?>

```



Student Records:

ID: 1 | Name: Zahid | Email: zahid@example.com
ID: 2 | Name: Yasin | Email: yasin@example.com

c) add_student.php

Form to add new students.

```
<?php
$servername = "localhost";
$username   = "webuser";
$password   = "MyStrongPass123!";
```

```
$database    = "web_lab";
$conn = new mysqli($servername, $username, $password, $database);
if ($conn->connect_error) { die("Connection failed: " .
$conn->connect_error); }

if ($_SERVER['REQUEST_METHOD'] === 'POST') {
    $name  = trim($_POST['name'] ?? '');
    $email = trim($_POST['email'] ?? '');
    if ($name !== '' && $email !== '') {
        $stmt = $conn->prepare("INSERT INTO students (name, email)
VALUES (?, ?)");
        $stmt->bind_param("ss", $name, $email);
        $stmt->execute();
        echo "Student added successfully! <a
href='list_students.php'>View list</a>";
        $stmt->close();
        $conn->close();
        exit;
    } else {
        echo "Name and Email required!";
    }
}
?>
<h2>Add Student</h2>
<form method="post">
    <label>Name: <input type="text" name="name"></label><br><br>
    <label>Email: <input type="email" name="email"></label><br><br>
    <button type="submit">Save</button>
</form>
```



Add Student

Name:

Email:

Save

[Back to list](#)

d) list_students.php

Displays and allows deletion of students.

```
<?php
$servername = "localhost";
$username   = "webuser";
$password   = "MyStrongPass123!";
$database   = "web_lab";
$conn = new mysqli($servername, $username, $password, $database);
if ($conn->connect_error) { die("Connection failed: " .
$conn->connect_error); }

if (isset($_GET['delete'])) {
    $id = (int) $_GET['delete'];
    $conn->query("DELETE FROM students WHERE id=$id");
    header("Location: list_students.php");
    exit;
}

$result = $conn->query("SELECT * FROM students ORDER BY id");
```

```

?>
<h2>Student List</h2>
<table border="1" cellpadding="6">
<tr><th>ID</th><th>Name</th><th>Email</th><th>Action</th></tr>
<?php
if ($result && $result->num_rows > 0) {
    while ($row = $result->fetch_assoc()) {
        echo "<tr>";
        echo "<td>".$row['id']."</td>";
        echo "<td>".$row['name']."</td>";
        echo "<td>".$row['email']."</td>";
        echo "<td><a href='list_students.php?delete=".$row['id']."' onclick='return confirm(\"Delete?\");'>Delete</a></td>";
        echo "</tr>";
    }
} else {
    echo "<tr><td colspan='4'>No data</td></tr>";
}
?>
</table>
<p><a href="add_student.php">Add new</a></p>
<?php $conn->close(); ?>
```

9. Restarting Services

Whenever configuration changes are made:

```

sudo systemctl restart apache2
sudo systemctl restart mysql
```



→



localhost/list_students.php

Student Records

[Add New](#) | [Home](#)

ID	Name	Email	Action
1	Towhid	towhid@example.com	Delete
2	Rafi	rafi@example.com	Delete
3	zahid	zahid@gmail.com	Delete
4	tamjid	tamjid@gmail.com	Delete
5	yasin	yasin@gmial.com	Delete
6	mridul	mridul@gmail.com	Delete