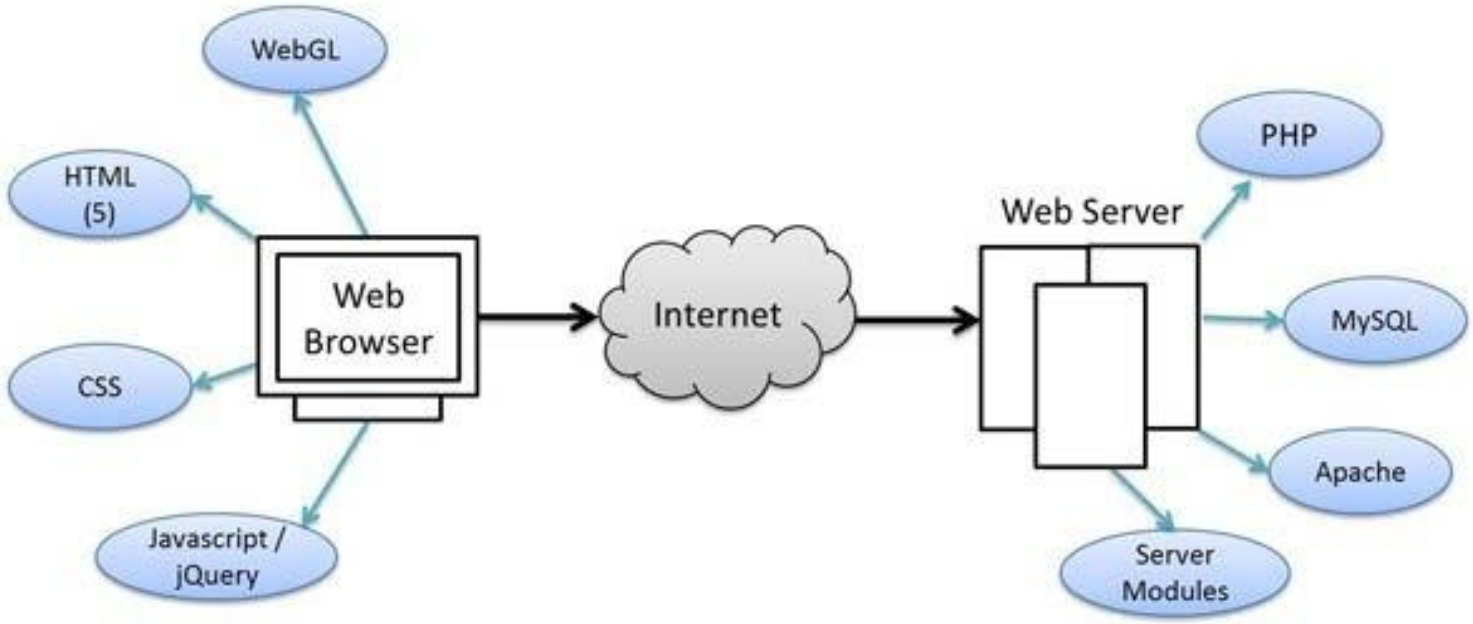
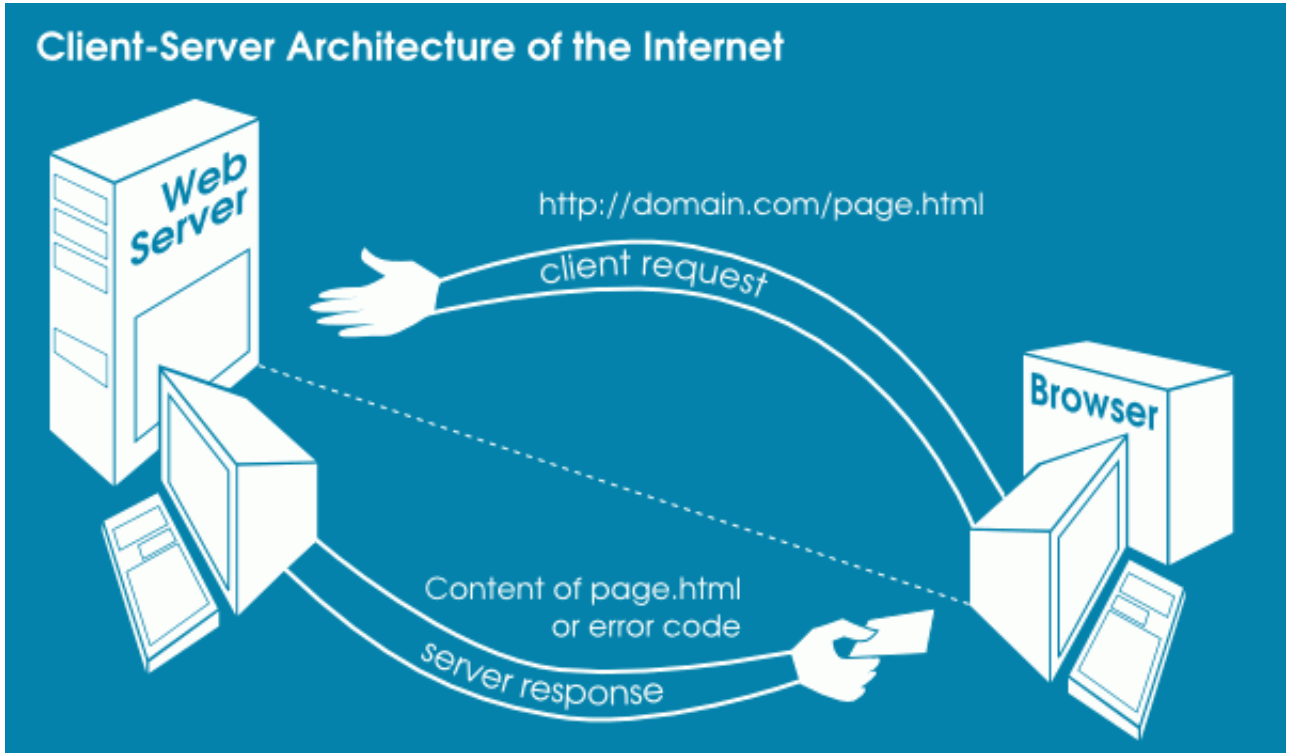
Apache HTTP and PHP

Presented by: Sara Kassani

Web Server


WebGL
HTML (5)
CSS
Javascript / jQuery
Web Browser
Internet
Web Server
PHP
MySQL
Apache
Server Modules

How it works


Client-Server Architecture of the Internet
Web Server
http://domain.com/page.html
client request
Browser
Content of page.html
or error code
server response

Client-Server model and HTTP

- **A request is generated by a client (by browser software)**

  - Most common requests are “Get” and “Post”
- **Request reaches the appropriate web-server**
- **Request is processed by the web-server**
- **A response is formulated by the web server and sent back to the client (e.g. web page contents)**
- **HTTP is the de facto standard for transferring World Wide Web documents**
- **Usually to port 80**

HTTP: Requests from client: HTML Examples

```
<body>
<form method= “post” action =“from-process.jsp”>
Word to look up: <Input type = text Name = “word”>
<input types = “submit”>
</form>
</body>
```

HTTP Requests from client: HTML Examples

```
<body>
<form method= “get” action =“from-process.jsp”>
Word to look up: <Input type = text Name = “word”>
<input types = “submit”>
</form>
</body>
```

- **http://hostname?weight=200&height=60**

HTTP: Response from web server

```
root@tecadmin:~# wget --server-response --spider http://example.com/index.php
Spider mode enabled. Check if remote file exists.
--2018-01-12 16:36:59--  http://example.com/index.php
Resolving example.com (example.com)... 192.168.1.237
Connecting to example.com (example.com)|192.168.1.237|:80... connected.
HTTP request sent, awaiting response...
  HTTP/1.1 200 OK
  Date: Fri, 12 Jan 2018 11:06:59 GMT
  Server: Apache/2.4.18 (Ubuntu)
  X-Powered-By: PHP/7.2.0-2+ubuntu16.04.1+deb.sury.org+2
  Keep-Alive: timeout=5, max=100
  Connection: Keep-Alive
  Content-Type: text/html; charset=UTF-8
Length: unspecified [text/html]
Remote file exists and could contain further links,
but recursion is disabled -- not retrieving.
```

Accessing web servers

Must know host name on which web server resides

- **Remote web servers accessed using**
  - URL: http://www.usask.ca/default.asp
  - IP address: http://207.60.134.230
- **Local web servers (on same machine) accessed using *machine name* or *localhost***

Apache

HTTP SERVER

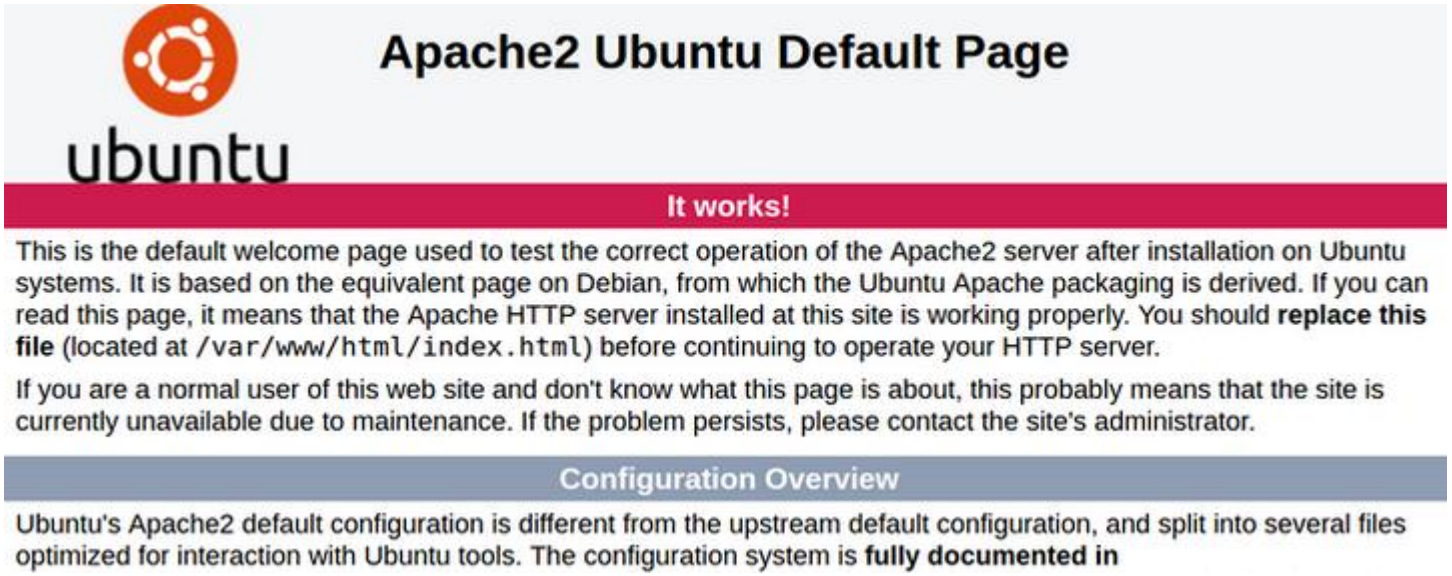
Presented by: Sara Kassani

Installation and Setup - Apache, MySQL, and PHP on Linux

sudo apt-get update

sudo apt-get install apache2

http://localhost/



Installation and Setup - Apache, MySQL, and PHP on Linux

sudo apt-get install mysql-server

sudo apt-get install python-software-properties

sudo add-apt-repository ppa:ondrej/php-7.0

sudo apt-get install php7.0-cli php7.0-common libapache2-mod-php7.0 php7.0 php7.0-mysql php7.0-fpm php7.0-curl php7.0-gd php7.0-bz2

Working Directory

var/html/www

In case of permission problem:

sudo chown –R username /var/www/html/

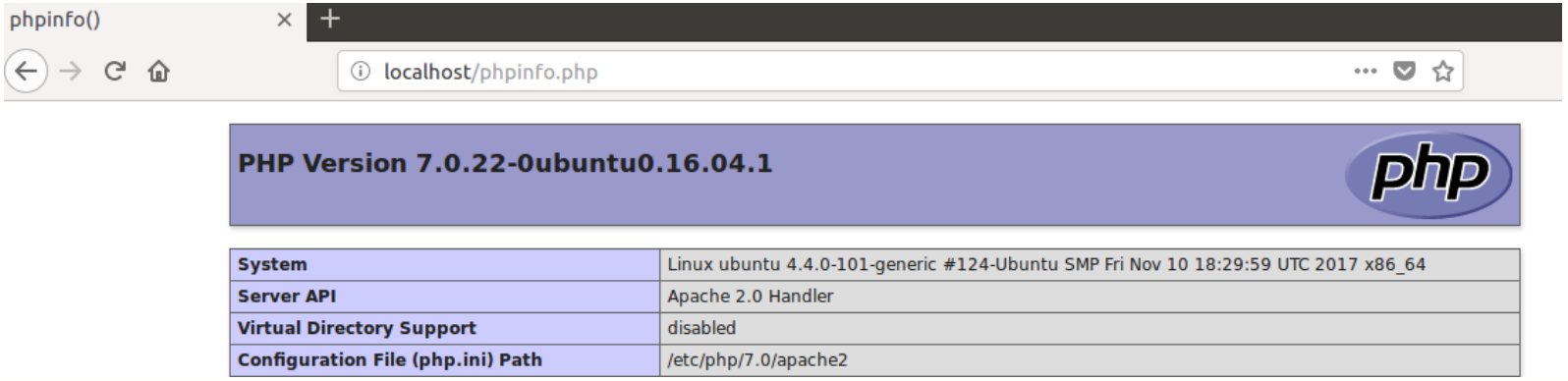
Installation and Setup - Apache, MySQL, and PHP on Linux

Working Directory

var/html/www

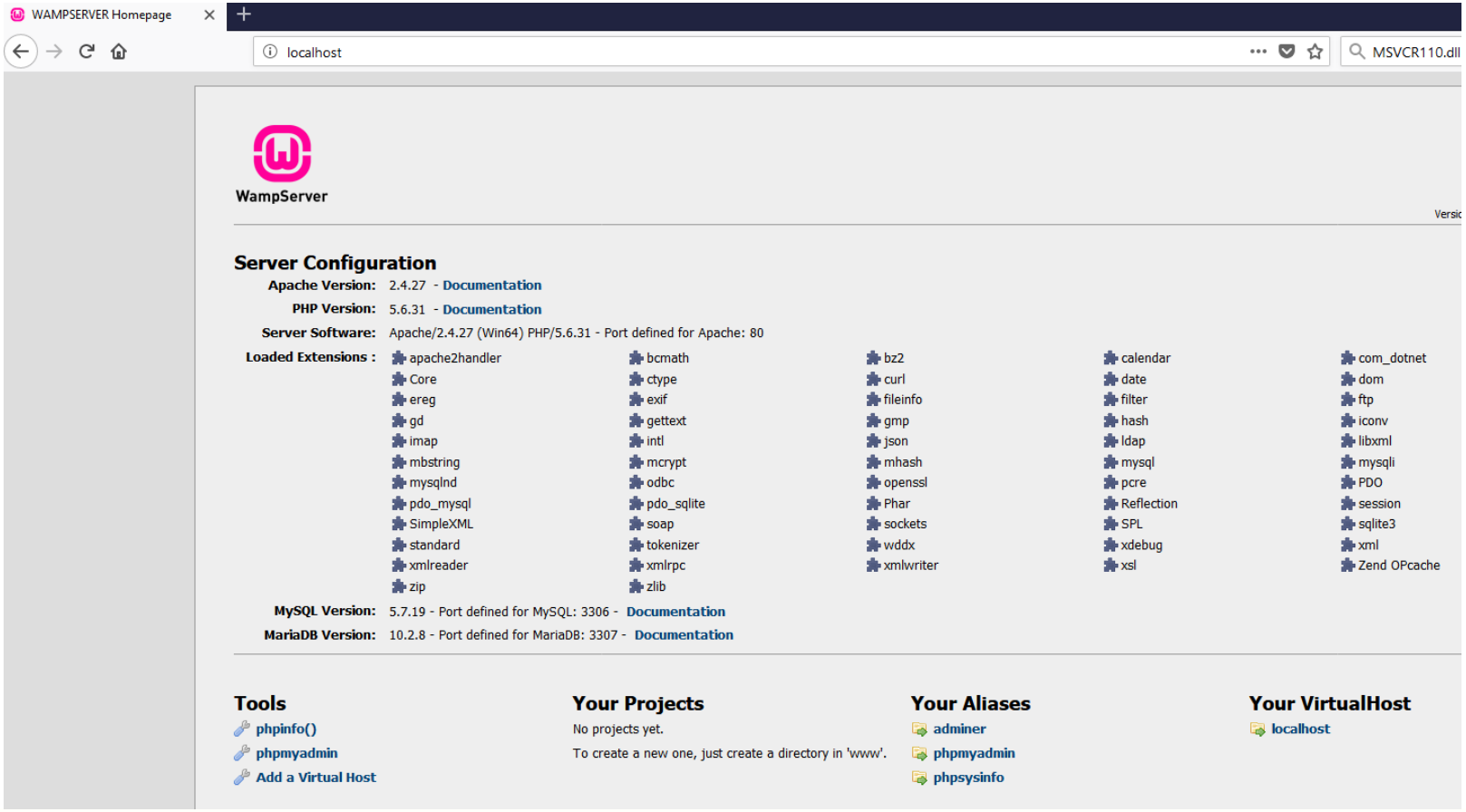
Create a new file : phpinfo.php

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



Installation and Setup - Apache, MySQL, and PHP on Windows

Installation and Setup - Apache, MySQL, and PHP on Windows



An introduction to PHP web programming

Presented by: Sara Kassani

An introduction to PHP web programming

- **PHP is a general-purpose server-side scripting language**
- **PHP can interact with MySQL databases**
- **All PHP statements end with a semi-colon**
- **PHP == 'Hypertext Preprocessor'**
- **Open-source and free**
- **Used to generate dynamic web-pages**
- **Easy to learn**

Basic PHP syntax

hello.php

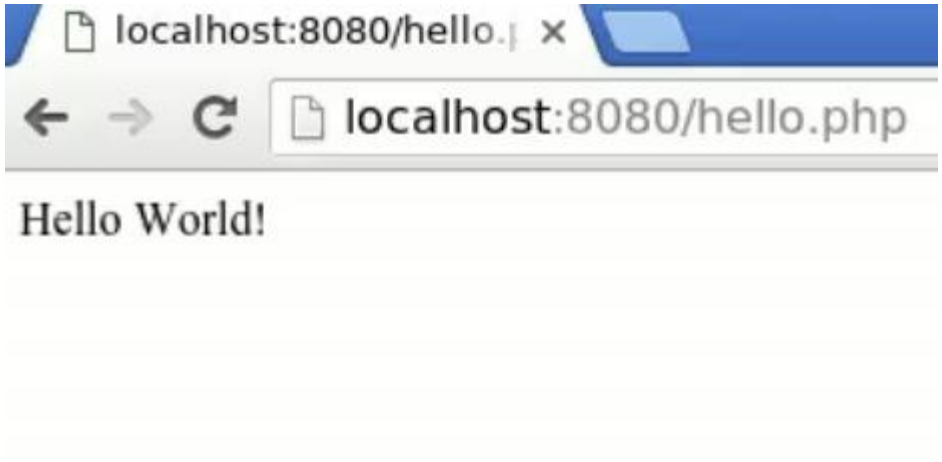
```php
<?php
//one line comment

/*
Hi
I am
multi-line
comment
*/

/**
 * I am a doc block
 * comment
 */

# I am a shell style comment

echo 'Hello World!';
?>
```



Variables in PHP

- PHP variables must begin with a "$" sign
- Case-sensitive ($Foo != $foo != $fOo)
- Global and locally-scoped variables
  - Global variables can be used anywhere
  - Local variables restricted to a function or class
- Certain variable names reserved by PHP
  - Form variables ($_POST, $_GET)
  - Server variables ($_SERVER)

Echo

- **The PHP command 'echo' is used to output the parameters passed to it**
- **The typical usage for this is to send data to the client's web-browser**

```
<?php
$foo = 25;              // Numerical variable
$bar = "Hello";         // String variable

echo $bar;              // Outputs Hello
echo $foo,$bar;         // Outputs 25Hello
echo "5x5=",$foo;       // Outputs 5x5=25
echo "5x5=$foo";        // Outputs 5x5=25
echo '5x5=$foo';        // Outputs 5x5=$foo
?>
```

Concatenation

- **Use a period to join strings into one.**

```
<?php
$string1="Hello";
$string2="PHP";
$string3=$string1 . " " .
$string2;
Print $string3;
?>
```

```
Hello PHP
```

Functions

- **Functions MUST be defined before then can be called**
- **Unlike variables, function names are not case sensitive (foo(…) == Foo(…) == FoO(…))**

Syntax

```
function functionName() {
    code to be executed;
}
```

```php
<?php
function writeMsg() {
    echo "Hello world!";
}

writeMsg(); // call the function
?>
```

Include Files

- **Include “database-config.php”;**

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

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

PHP References

- **http://www.php.net <-- php home page**
- **http://www.phpbuilder.com/**
- **http://www.devshed.com/**
- **http://www.hotscripts.com/PHP/**
- **http://geocities.com/stuprojects/ChatroomDescription.htm**
- **http://www.academic.marist.edu/~kbhkj/chatroom/chatroom.htm**
- **http://www.aus-etrade.com/Scripts/php.php**
- **http://www.codeproject.com/asp/CDIChatSubmit.asp**
- **http://php.resourceindex.com/ <-- PHP resources like sample programs, text book references, etc.**

PHP & MySQL

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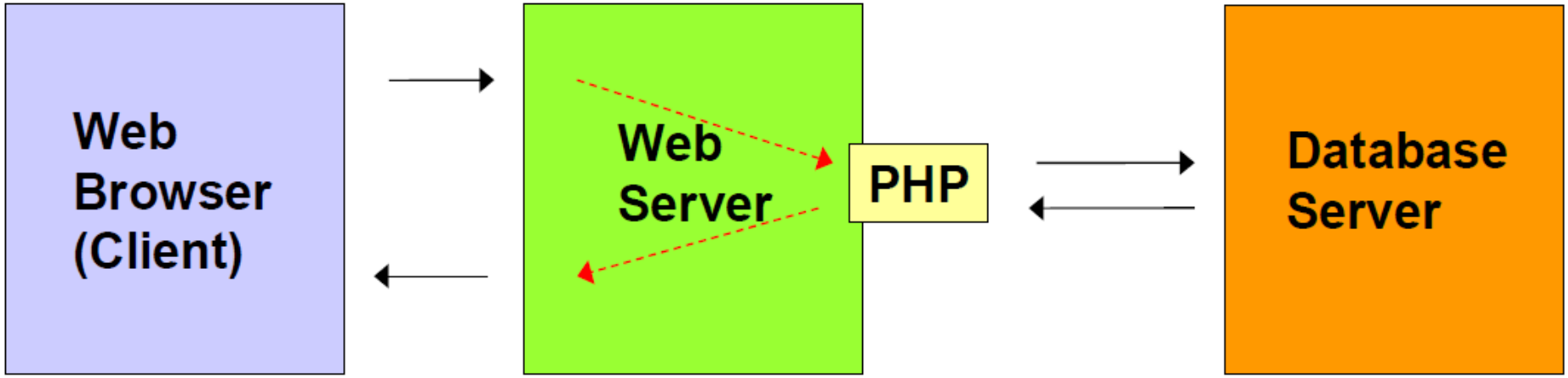
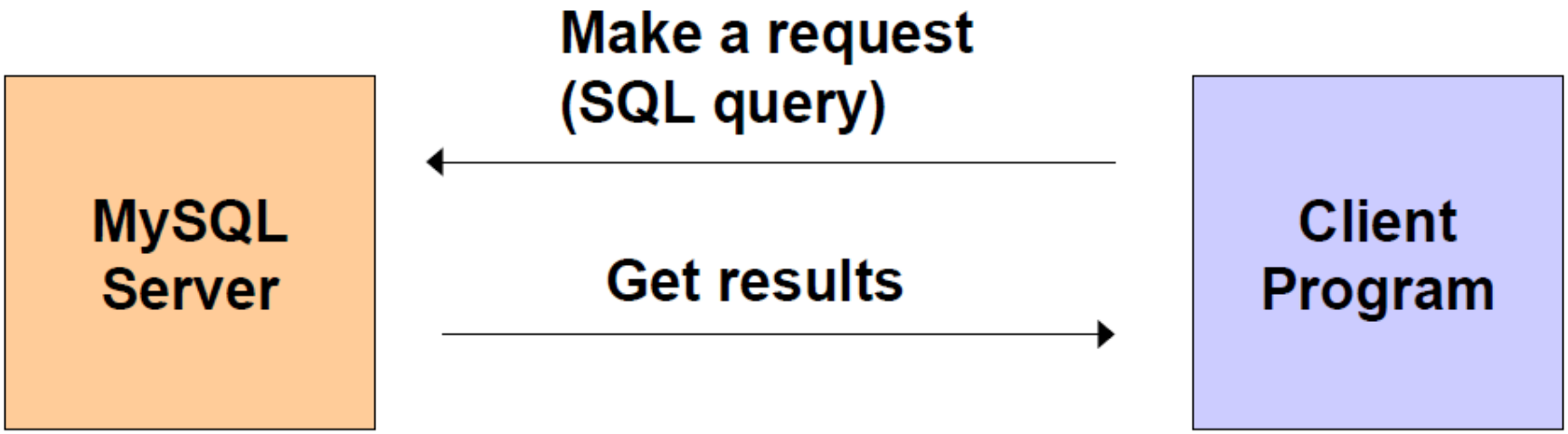
What is MySQL?

- **A relational database management system**
- **The MySQL Database Server is very fast, reliable, and easy to use**
- **SQL: Structured Query Language**
- **A server providing multi-user access to a number of databases**
- **MySQL software is Open Source**

Architecture

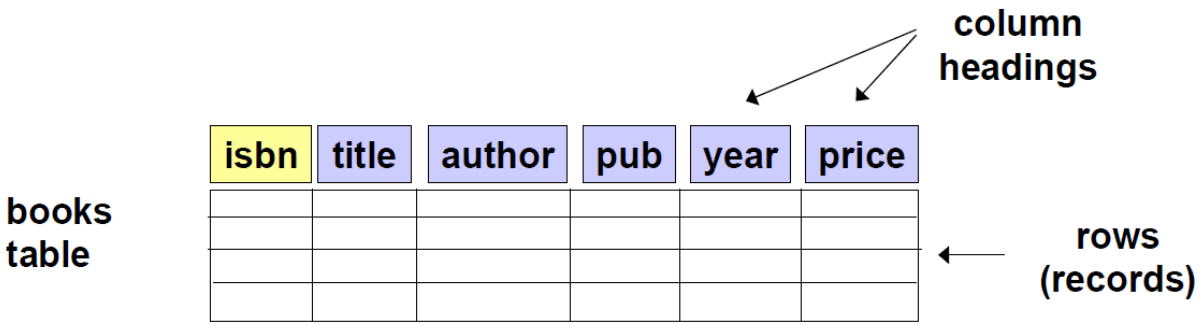


Client-Server Interaction



Database concepts

- **A relational database management system consists of a number of databases.**
- **Each database consists of a number of tables.**



WARNING

- **Always assume that everything is case sensitive, especially table names and column names.**
- **This is not the case in Windows but it is the case in Linux**

An introduction to MySQL

- **Show all the databases**

```
mysql> SHOW DATABASES;
+--------------+
| Database     |
+--------------+
| bookstore    |
| employee_db  |
| mysql        |
| student_db   |
| test         |
| web_db       |
+--------------+
```

An introduction to MySQL

- **Choosing a database and showing its tables**

```
USE test;
SHOW tables;
```

```
mysql> USE test;
Database changed
mysql> SHOW tables;
+----------------+
| Tables_in_test |
+----------------+
| books          |
| name2          |
| names          |
| test           |
+----------------+
4 rows in set (0.00 sec)
mysql>
```

An introduction to MySQL

- **Show the structure of a table**
  - `DESCRIBE names;`

```
mysql> DESCRIBE names;
+-----------+-------------+------+-----+---------+----------------+
| Field     | Type        | Null | Key | Default | Extra          |
+-----------+-------------+------+-----+---------+----------------+
| id        | int(11)     |      | PRI | NULL    | auto_increment |
| firstName | varchar(20) |      |     |         |                |
| lastName  | varchar(20) |      |     |         |                |
+-----------+-------------+------+-----+---------+----------------+
3 rows in set (0.00 sec)

mysql>
```

An introduction to MySQL

- **Show the rows of a table**
  - `SELECT * FROM names;`

```
mysql> SELECT * FROM names;
+----+-----------+------------+
| id | firstName | lastName   |
+----+-----------+------------+
|  1 | Fred      | Flintstone |
|  2 | Barney    | Rubble     |
+----+-----------+------------+
2 rows in set (0.00 sec)

mysql>
```

An introduction to MySQL

- **Inserting a new record**

```
INSERT INTO names (firstName, lastName) VALUES ('John','Smith');
```

```
SELECT * FROM names;
```

```
mysql> INSERT INTO names (firstName, lastName) VALUES ('John', 'Smith');
Query OK, 1 row affected (0.02 sec)
mysql> SELECT * FROM names;
+----+-----------+------------+
| id | firstName | lastName |
+----+-----------+------------+
| 1 | Fred | Flintstone |
| 2 | Barney | Rubble |
| 3 | John | Smith |
+----+-----------+------------+
3 rows in set (0.00 sec)
mysql>
```

An introduction to MySQL

- **Updating a record**

```
UPDATE names SET firstName = 'Jane' WHERE id=3;
SELECT * FROM names;
```

```
mysql> UPDATE names SET firstName = 'Jane' WHERE id=3;
Query OK, 1 row affected (0.28 sec)
Rows matched: 1 Changed: 1 Warnings: 0
mysql> SELECT * FROM names;
+----+-----------+------------+
| id | firstName | lastName |
+----+-----------+------------+
| 1 | Fred | Flintstone |
| 2 | Barney | Rubble |
| 3 | Jane | Smith |
+----+-----------+------------+
3 rows in set (0.00 sec)
mysql>
```

SQL data types

- **Each entry in a row has a type specified by the column.**
- **Numeric data types**
- **TINYINT, SMALLINT, MEDIUMINT,**
- **INT, BIGINT**
- **FLOAT(display_length, decimals)**
- **DOUBLE(display_length, decimals)**
- **DECIMAL(display_length, decimals)**
- **NUMERIC is the same as DECIMAL**

SQL data types

String types

CHAR: fixed length string, e.g., CHAR(20)

VARCHAR: variable length string, e.g., VARCHAR(20)

BLOB, TINYBLOB, MEDIUMBLOB, LONGBLOB: same as TEXT, TINYTEXT ...

The CREATE Command

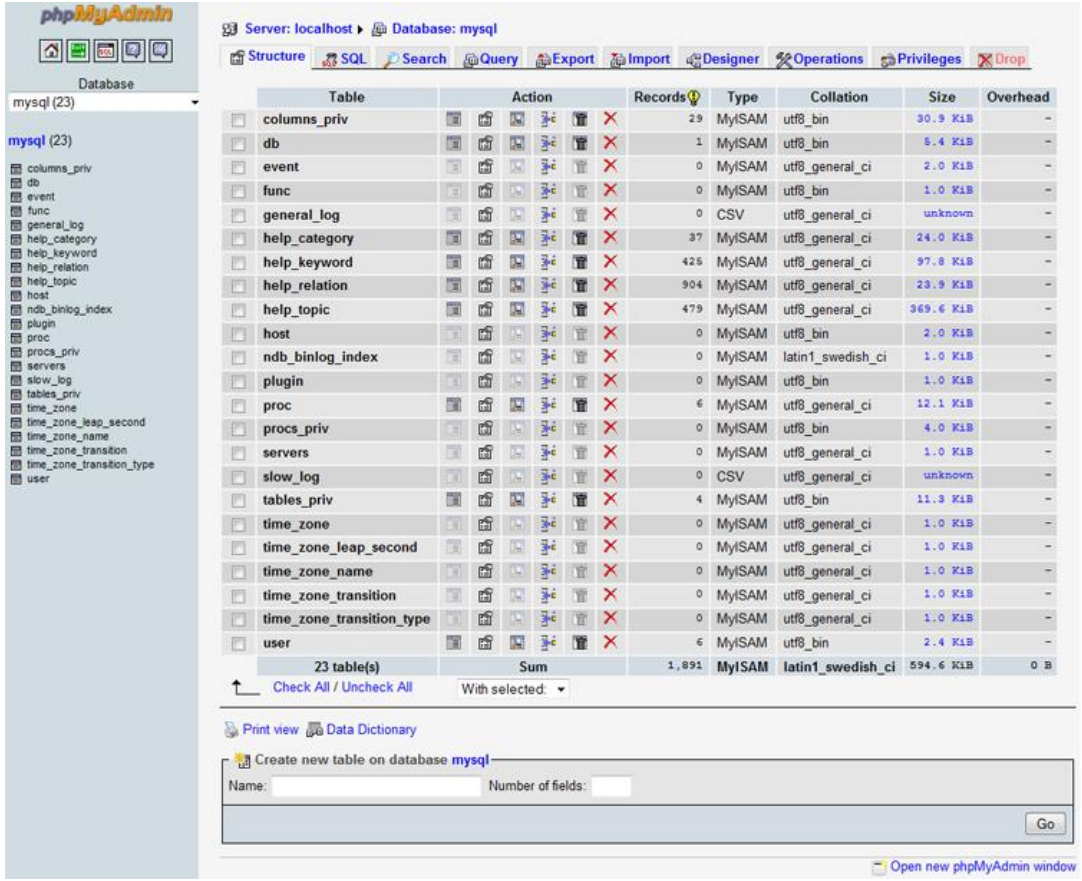
CREATE creates a database table

```
CREATE TABLE table_name
(
    column_name1 column_type1,
    column_name2 column_type2,
    ...
    column_nameN column_typeN
);
```

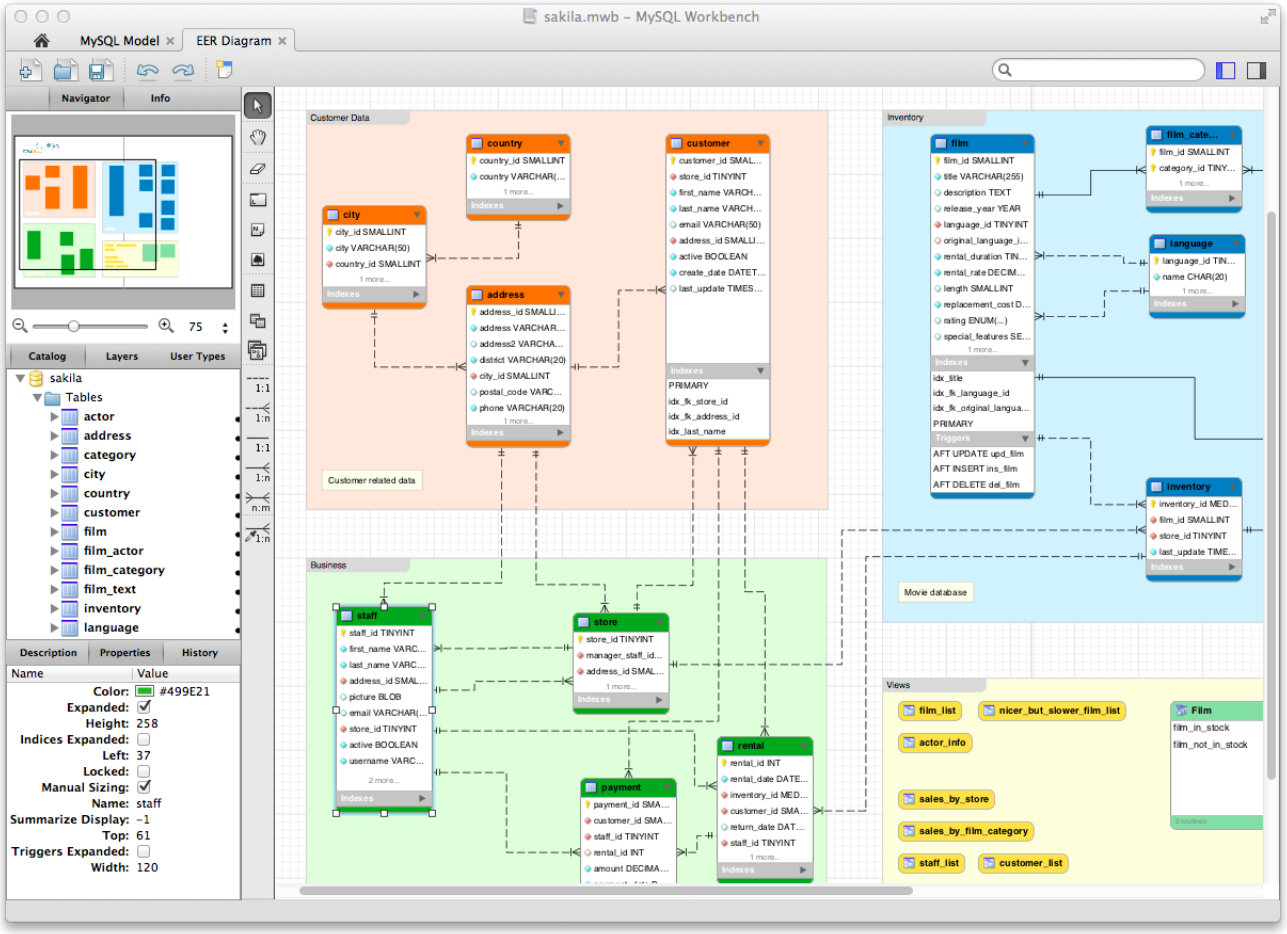
Note: To create a database use the statement

```
CREATE db_name;
```

phpMyAdmin


phpMyAdmin
Database
mysql (23)
mysql (23)
columns_priv
db
event
func
general_log
help_category
help_keyword
help_relation
help_topic
host
ndb_binlog_index
plugin
proc
procs_priv
servers
slow_log
tables_priv
time_zone
time_zone_leap_second
time_zone_name
time_zone_transition
time_zone_transition_type
user
Server: localhost ▸ Database: mysql
Structure SQL Search Query Export Import Designer Operations Privileges Drop
Table | Action | Records | Type | Collation | Size | Overhead
columns_priv | 29 | MyISAM | utf8_bin | 30.9 KiB | -
db | 1 | MyISAM | utf8_bin | 5.4 KiB | -
event | 0 | MyISAM | utf8_general_ci | 2.0 KiB | -
func | 0 | MyISAM | utf8_bin | 1.0 KiB | -
general_log | 0 | CSV | utf8_general_ci | unknown | -
help_category | 37 | MyISAM | utf8_general_ci | 24.0 KiB | -
help_keyword | 425 | MyISAM | utf8_general_ci | 97.8 KiB | -
help_relation | 904 | MyISAM | utf8_general_ci | 23.9 KiB | -
help_topic | 479 | MyISAM | utf8_general_ci | 369.6 KiB | -
host | 0 | MyISAM | utf8_bin | 2.0 KiB | -
ndb_binlog_index | 0 | MyISAM | latin1_swedish_ci | 1.0 KiB | -
plugin | 0 | MyISAM | utf8_bin | 1.0 KiB | -
proc | 6 | MyISAM | utf8_general_ci | 12.1 KiB | -
procs_priv | 0 | MyISAM | utf8_bin | 4.0 KiB | -
servers | 0 | MyISAM | utf8_general_ci | 1.0 KiB | -
slow_log | 0 | CSV | utf8_general_ci | unknown | -
tables_priv | 4 | MyISAM | utf8_bin | 11.3 KiB | -
time_zone | 0 | MyISAM | utf8_general_ci | 1.0 KiB | -
time_zone_leap_second | 0 | MyISAM | utf8_general_ci | 1.0 KiB | -
time_zone_name | 0 | MyISAM | utf8_general_ci | 1.0 KiB | -
time_zone_transition | 0 | MyISAM | utf8_general_ci | 1.0 KiB | -
time_zone_transition_type | 0 | MyISAM | utf8_general_ci | 1.0 KiB | -
user | 6 | MyISAM | utf8_bin | 2.4 KiB | -
23 table(s) | Sum | 1,891 | MyISAM | latin1_swedish_ci | 594.6 KiB | 0 B
Check All / Uncheck All
With selected:
Print view
Data Dictionary
Create new table on database mysql
Name:
Number of fields:
Go
Open new phpMyAdmin window

MySQL Workbench



Creating a Simple PHP and MySQL-Based Login System

Step 1: Creating the Database Table

```sql
CREATE TABLE users (
    id INT NOT NULL PRIMARY KEY AUTO_INCREMENT,
    username VARCHAR(50) NOT NULL UNIQUE,
    password VARCHAR(255) NOT NULL,
    created_at DATETIME DEFAULT CURRENT_TIMESTAMP
);
```

Creating a Simple PHP and MySQL-Based Login System

Step 2: Creating the Config File

```php
<?php
/* Database credentials. Assuming you are running MySQL
server with default setting (user 'root' with no password) */
define('DB_SERVER', 'localhost');
define('DB_USERNAME', 'root');
define('DB_PASSWORD', '');
define('DB_NAME', 'demo');

/* Attempt to connect to MySQL database */
$link = mysqli_connect(DB_SERVER, DB_USERNAME, DB_PASSWORD, DB_NAME);
```

Creating a Simple PHP and MySQL-Based Login System

Step 3: Creating the Registration Form

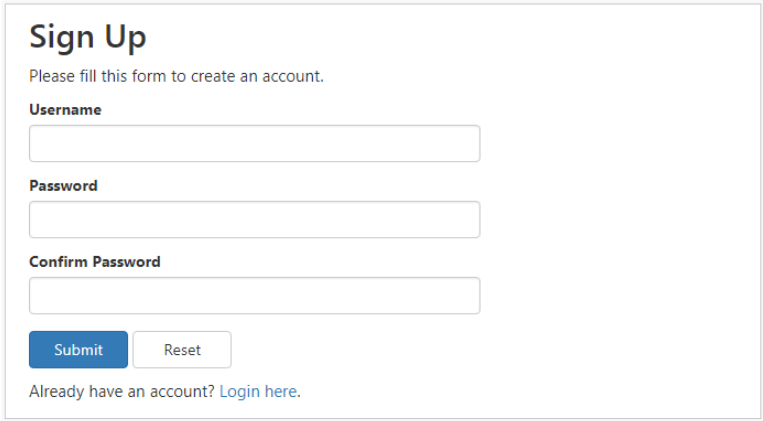
```php
<?php
// Include config file
require_once 'config.php';

// Define variables and initialize with empty values
$username = $password = $confirm_password = "";
$username_err = $password_err = $confirm_password_err = "";

// Processing form data when form is submitted
if($_SERVER["REQUEST_METHOD"] == "POST"){

    // Validate username
    if(empty(trim($_POST["username"]))){
        $username_err = "Please enter a username.";
    } else{
        // Prepare a select statement
        $sql = "SELECT id FROM users WHERE username = ?";

```



Creating a Simple PHP and MySQL-Based Login System

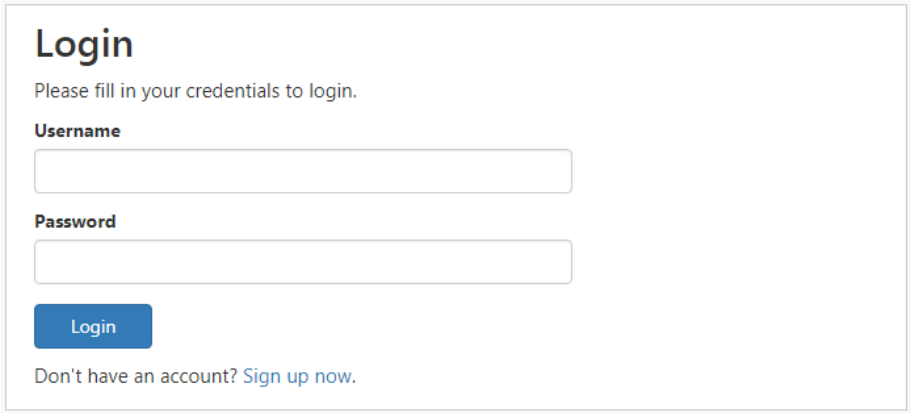
Step 4: Creating the Login Form

```php
<?php
// Include config file
require_once 'config.php';

// Define variables and initialize with empty values
$username = $password = "";
$username_err = $password_err = "";

// Processing form data when form is submitted
if($_SERVER["REQUEST_METHOD"] == "POST"){

    // Check if username is empty
    if(empty(trim($_POST["username"]))){
        $username_err = 'Please enter username.';
    } else{
```



Creating a Simple PHP and MySQL-Based Login System

Step 5: Creating the Welcome Page

```php
<?php
// Initialize the session
session_start();

// If session variable is not set it will redirect to login page
if(!isset($_SESSION['username']) || empty($_SESSION['username'])){
  header("location: login.php");
  exit;
}
?>
```