

# MySQL Databases with PHP

Webpage Design

# What is MySQL?

- MySQL is a relational database management system that supports the SQL language.
- SQL stands for "Structured Query Language".
- MySQL has a close relationship to PHP.
- PHP has a number of functions specifically designed to work with MySQL.
- Like PHP it is open source and therefore free.
- MySQL is the "M" in LAMP.

# How do I use MySQL?

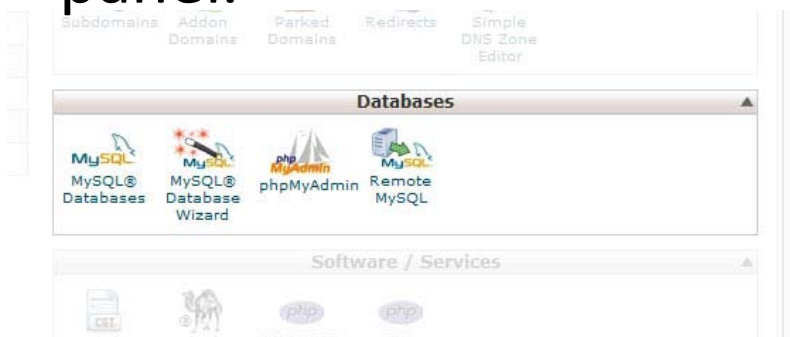
- Like PHP, MySQL can be downloaded and installed on a desktop computer.
- However, also like PHP it usually runs on a web server.
- Most web hosts who provide Linux hosting also provide PHP and MySQL as part of the offering.

# What can I do with MySQL?

- Almost all web applications that we are familiar with use MySQL. Blog software like Wordpress, bulletin boards like vBulletin, wikis like MediaWiki and content management systems like Joomla all use MySQL to store data.
- However, PHP is required to extract data from MySQL databases and to construct dynamic web pages from it.
- For example, in a content management system, all the content of articles, the date and time of publication, the name of the author and comments written are stored in the database and are extracted and compiled "on the fly" each time the page is requested by a browser.

# How do I create a database?

- Databases are created using the control panel provided by your web host.
- In most cases, on a Linux server, that will be cPanel.
- You can use either the main *MySQL Databases* page or the *MySQL Database Wizard* to create a new database.
- If you are using Ecowebhosts, use the MySQL Databases link in the *Web Tools* section of the control panel.



Generic cPanel



Ecowebhosts

# Create database in cPanel

The screenshot shows the cPanel MySQL Databases interface. At the top, there's a navigation bar with 'HOME', 'HELP', and 'LOGOUT'. Below that, the 'MySQL Databases' section is visible, featuring a video tutorial and a link to 'Jump to MySQL Users'. The 'Create New Database' section has a text input for 'New Database:' and a 'Create Database' button. The 'Modify Databases' section includes 'Check DB:' and 'Repair DB:' dropdown menus, both currently set to 'mawa\_test', with corresponding 'Check DB' and 'Repair DB' buttons. The 'Current Databases' section has a search bar and a table with columns 'DATABASE', 'SIZE', 'USERS', and 'ACTIONS'. The table contains one entry: 'mawa\_test' (0.03 MB) with user 'mawa\_test' and a 'Delete Database' action. The 'MySQL Users' section includes an 'Add New User' form with fields for 'Username:', 'Password:', 'Password (Again):', and a 'Generate Password' button. The password strength is shown as 'Very Weak (0/100)'. There is also an 'Add User To Database' section with 'User:' and 'Database:' dropdown menus, both set to 'mawa\_test', and an 'Add' button. Finally, the 'Current Users' section has a table with columns 'USERS' and 'DELETE', containing one entry: 'mawa\_test' with a delete icon.

Creating a new database is very simple, just enter a name and click "Create Database".

However, to connect to a database, you need to specify a User who is allowed to access the database.

So, to create a user, enter a name and a password and click "Create User". Finally, the user must be added to the database.

Select the user name and the database name from the two drop-down lists and then click "Add".

Your database is now ready to use but before you can add any data, you need to give it some structure...

# Create database at Ecowebhosts

**MySQL Databases**

MySQL databases allow you to store important information in a format that can easily be read by other programs and systems. You can use MySQL databases to store customer information or as the backend for a shopping cart system. You can read information on how to use MySQL at the [MySQL website](#).

From this area you can also manage your database by using phpMyAdmin, an easy to use web based interface for managing MySQL databases.

### Create a MySQL Database

To create a MySQL database type in a username and password of your choice below. The database name will be the same as the username.

**Note:** To connect to your database in a script running on your webserver you should use "localhost" as the hostname.

The username should contain letters, numbers, "\_" and "-" and must not start nor end with "-". It should not contain the words "test", "root", "mysql", nor "alive" and must be 9 characters long or less. The password should be at least 6 characters long and may not be blank.

You have 0 databases left.

Username	Password
<input type="text"/>	<input type="text"/>

### Create a Stand-alone MySQL User (advanced only)

If you want to set up an extra user without a corresponding database and set up its permissions manually (via phpMyAdmin for the database you want to grant privileges on) please fill in the details below.

Stand-alone Username	Password
<input type="text"/>	<input type="text"/>

### Manage MySQL Databases

To restore a database which you've previously backed up, click

Username	Password	Manage	Backup	Usage	Delete?
web107-ma-news	+M*Pqg1.4Y	<input type="button" value="Now"/>	<input type="button" value="Now"/>		<input type="checkbox"/>

[Go Back](#)

Top Log Out Help Home

Creating a new database using the Ecowebhosts control panel is even easier. The key difference is that you need only enter a username and a password. The database is given the same name as the user.

You will also notice that the database and user names are prefixed with a server-specific name. This ensures that each database name is unique.

Your database is now ready to use but before you can add any data, you need to give it some structure...

...click the *Now* button under "Manage".

# What is phpMyAdmin?

- Structure (tables and fields) needs to be added to a database so that it can hold.
- Despite it's name, phpMyAdmin is an administration tool for working with MySQL databases.
- phpMyAdmin is used to structure your database – to add tables and fields.
- phpMyAdmin can also be used to add data to your database once it is structured.
- The structure shown on the following slides is for a simple news application that will show a headline, a date and some content.

# Data structure with phpMyAdmin

Server: localhost ▶ Database: mawa\_test ▶ Table: news

[Browse](#) [Structure](#) [SQL](#) [Search](#) [Insert](#) [Export](#) [Import](#) [Operations](#) [Empty](#) [Drop](#)

	Field	Type	Collation	Attributes	Null	Default	Extra	Action						
<input type="checkbox"/>	<b>item_id</b>	int(4)			No	None	auto_increment							
<input type="checkbox"/>	<b>headline</b>	varchar(100)	latin1_swedish_ci		No									
<input type="checkbox"/>	<b>date</b>	timestamp			No	CURRENT_TIMESTAMP								
<input type="checkbox"/>	<b>markup</b>	text	latin1_swedish_ci		No	None								

↑ [Check All / Uncheck All](#) With selected:

---

[Print view](#) [Propose table structure](#)

[Add](#) 1 field(s)  At End of Table  At Beginning of Table  After

---

[+ Details...](#)

[Open new phpMyAdmin window](#)

This database has just one table with 4 fields, starting with **item\_id** (a unique index), then **headline**, **date** and **markup**. Each field is defined as a different data type depending on what type of content it will contain. For example, the date field is set to display the current MySQL timestamp each time the row is updated. The item\_id field is a 4 digit integer (0-9999), the headline can contain up to 100 variable characters and the markup is just a text field.

# Data structure with phpMyAdmin

The screenshot shows the phpMyAdmin interface for a database named 'web107-ma-news' on a 'localhost' server. The 'Structure' tab is active, displaying the table structure for the 'news' table. The table has four columns: 'item\_id' (int(4), AUTO\_INCREMENT), 'headline' (varchar(100), latin1\_swedish\_ci), 'date' (timestamp, CURRENT\_TIMESTAMP), and 'markup' (text, latin1\_swedish\_ci). Each column has a 'Change' button and a 'Drop' button. Below the table structure, there are navigation buttons: 'Check All / Uncheck All With selected:', 'Browse', 'Change', 'Drop', 'Primary', 'Unique', 'Index', and 'Fulltext'. At the bottom, there is a 'Print view' button, a 'Propose table structure' button, and an 'Add' button with a dropdown menu set to 'item\_id' and a 'Go' button.

#	Column	Type	Collation	Attributes	Null	Default	Extra	Action
<input type="checkbox"/>	1 <b>item_id</b>	int(4)			No	None	AUTO_INCREMENT	Change  Drop More ▼
<input type="checkbox"/>	2 <b>headline</b>	varchar(100)	latin1_swedish_ci		No	None		Change  Drop More ▼
<input type="checkbox"/>	3 <b>date</b>	timestamp			No	CURRENT_TIMESTAMP		Change  Drop More ▼
<input type="checkbox"/>	4 <b>markup</b>	text	latin1_swedish_ci		No	None		Change  Drop More ▼

↑ Check All / Uncheck All With selected: Browse Change Drop Primary Unique Index Fulltext

Print view Propose table structure

Add  column(s)  At End of Table  At Beginning of Table  After

At Ecowebhost, the structure looks the same; they are using phpMyAdmin with a slightly different skin but the operations are identical.

Notice that `item_id` is set to `AUTO_INCREMENT`. This means it automatically numbers each row when a new news entry is added – once set up, we can forget about it. It is also defined as the *primary key*, which just means that the rows in the database will be sorted in that order.

# Inserting data with phpMyAdmin

Server: localhost ▶ Database: mawa\_test ▶ Table: news

[Browse](#) [Structure](#) [SQL](#) [Search](#) [Insert](#) [Export](#) [Import](#) [Operations](#) [Empty](#) [Drop](#)

Field	Type	Function	Null	Value
item_id	int(4)	<input type="text"/>		<input type="text"/>
headline	varchar(100)	<input type="text"/>		<input type="text" value="The news headline"/>
date	timestamp	<input type="text"/>		<input type="text" value="CURRENT_TIMESTAMP"/>
markup	text	<input type="text"/>		<input type="text" value="The news article..."/>

Most web applications, like WordPress will have a control panel that enables users to add data but phpMyAdmin can be used to add data to any MySQL database.













# Browse data with phpMyAdmin




Server: localhost ▶ Database: mawa\_test ▶ Table: news

[Browse](#) [Structure](#) [SQL](#) [Search](#) [Insert](#) [Export](#) [Import](#)

Show: 30 row(s) starting from record # 0  
in horizontal mode and repeat headers after 100 cells  
Sort by key: None

+ Options

	item_id	headline	date	markup
<input type="checkbox"/>  	1	Man Eats Database!	2008-04-13 14:32:16	A man ate a database yesterday, doctors are lookin...
<input type="checkbox"/>  	2	Database bites back	2008-04-14 15:02:31	The database has recovered but sadly the man could...
<input type="checkbox"/>  	3	Sadly, database dies anyway	2008-04-15 15:12:05	After hours of work, doctors were unable to save t...
<input type="checkbox"/>  	4	Another man eats database!	2009-05-01 17:56:30	One year after the initial incident, a second man ...
<input type="checkbox"/>  	5	Databases are easy!	2009-05-02 13:24:22	Working with MySQL can be quite easy if you know w...
<input type="checkbox"/>  	6	More databases join the fight	2010-12-01 12:42:23	News has just come in that the databases are organ...

Check All / Uncheck All With selected:   

Show: 30 row(s) starting from record # 0  
in horizontal mode and repeat headers after 100 cells

Query results operations

[Print view](#) [Print view \(with full texts\)](#) [Export](#) [CREATE VIEW](#)

Each database table is a sort of spreadsheet consisting of rows of data. In this database, each row has 4 fields.

Once data has been entered, it can be extracted by PHP using a query...

[Open new phpMyAdmin window](#)

# Link to database and run query

```
<?php
```

```
# username, password and database name
```

```
$db_user = "web107-ma-news";  
$db_password = "+M/*Pqdi1;4Y";  
$db_name = "web107-ma-news";
```

The *host* is always called "localhost" when the database is on the same server as your website.

```
# connect to to mysql and select database
```

```
$db_conn = new mysqli('localhost', $db_username, $db_password, $db_name);
```

```
# build a database query
```

```
$sql = "SELECT headline, markup, date FROM news ORDER BY date DESC";
```

```
# run the query and assign the result to a variable
```

```
$result=$db_conn->query($sql);
```

```
?>
```

This bit of PHP assigns the database access credentials to variables, links to MySQL, selects the database, queries the database and stores the selected data in a variable called **\$result** and then closes the MySQL link.

# The query

```
$query = "  
SELECT headline, markup, date FROM news ORDER BY date DESC  
";
```

Diagram illustrating the components of the SQL query:

- `headline, markup, date`: these three fields
- `news`: this table
- `date DESC`: this value (with `descending` above it)

This query selects the three fields (columns) `headline`, `markup` and `date` from the `news` table. We could have used `SELECT *` (the wildcard character) to select all columns in the table but more specific queries make for easier interpretation. The query then uses the date value to arrange the data in descending order so that the most recent article is always first.

All of the selected data is stored as an *array* (a kind of spreadsheet) in a variable (`$result`). The data will be extracted one row at a time using PHP.

# Access and Print Array Data

```
<?php
# step through each news article, one at a time
while($row=$result->fetch_assoc())
{
    $headline = $row["headline"];
    $date = $row["date"];
    $markup = $row["markup"];

    # convert mysql date to php timestamp
    $timestamp = strtotime( $date );

    # format php timestamp
    $display_date = date('jS F Y', $timestamp);

    # print out the news story
    echo "<h2>$headline</h2>";
    echo "<p>$date</p>";
    echo "<p>$markup</p>";
}
?>
```

This bit of PHP uses a **while** loop to step through each row in the array, assigns each value in the row to a variable, converts the MySQL date to a format for printing and then prints out the new articles using the **echo** function. The while loop will continue until there are no more rows.

```
<?php
# a simple application to extract news articles from a database using mysqli and print them out
```

```
# assign username, password and database name to variables
```

```
$db_user = "web107-ma-news";
$db_password = "+M/*Pqdi1;4Y";
$db_name = "web107-ma-news";
```

```
# connect to the database or stop the script and give an error message
```

```
$conn = new mysqli('localhost', $db_user, $db_password, $db_name) or die('Cannot open database');
```

```
# build the query
```

```
$sql = 'SELECT headline, markup, date FROM news ORDER BY date DESC LIMIT 5';
```

```
# run the query
```

```
$result = $conn->query($sql) or die(mysqli_error());
```

```
?>
```

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
```

```
<html xmlns="http://www.w3.org/1999/xhtml">
```

```
<head>
```

```
<meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
```

```
<title>The News (PHP and MySQL example)</title>
```

```
<link href="base.css" rel="stylesheet" type="text/css" />
```

```
</head>
```

```
<body>
```

```
<div id="wrapper">
```

```
<h1>The News (PHP and MySQL example)</h1>
```

```
<?php
```

```
# step through each news article, one at a time
```

```
while ($row = $result->fetch_assoc())
```

```
{
```

```
    # assign each field to a variable
```

```
    $headline = $row['headline'];
```

```
    $date = $row['date'];
```

```
    $markup = $row['markup'];
```

```
    # convert mysql date to php timestamp
```

```
    $timestamp = strtotime($date);
```

```
    # format php timestamp
```

```
    $display_date = date('jS F Y', $timestamp);
```

```
    # print out the news article
```

```
    echo "<div class='article'\n";
```

```
    echo "<h2>$headline</h2>\n";
```

```
    echo "<p class='date'\n";
```

```
    echo "$display_date</p>\n";
```

```
    echo "$markup\n";
```

```
    echo "</div>\n\n";
```

```
}
```

```
?>
```

```
</div>
```

```
</body>
```

```
</html>
```

# The PHP file

## The News (PHP and MySQL example)

### A longer entry with an image

13th December 2011

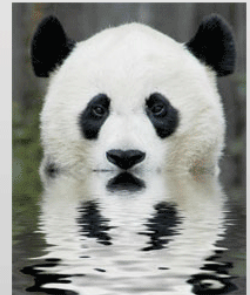
Jelly-o croissant sugar plum sesame snaps gummies jelly-o marzipan. Marshmallow cotton candy faworki cotton candy cookie cupcake. Lemon drops macaroon candy applicake liquorice candy gingerbread marshmallow sweet roll. Tart gummi bears liquorice.

Chocolate bar jelly beans cheesecake oat cake. Liquorice faworki fruitcake cake. Jujubes cake marshmallow sugar plum gingerbread. Jujubes tiramisu powder faworki faworki cheesecake.

Topping dessert lemon drops pie chocolate chocolate toffee apple pie topping. Tart gingerbread marzipan halvah carrot cake biscuit. Gummi bears marzipan danish candy cupcake. Marshmallow powder candy pastry cupcake muffin.

Bear claw ice cream gummies candy. Jelly cake candy cake. Halvah tiramisu. Jujubes candy toffee bonbon gummi bears brownie tiramisu cookie.

Cookie liquorice candy jelly beans chocolate bar bear claw. Chocolate cake tootsie roll sesame snaps apple pie cupcake. Applicake gummi bears powder.



### My second database entry

e. I can add anything I like here.

entry

- the database holds all my data. Who'd have

The completed code is shown on the left. We've added a few extra details to the script. For example, the **or die** functions tell the script what to do if there is an error when communicating with the database.

```
$sql = 'SELECT goodbye FROM course';
```