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Web Server on Windows 11 (Apache, MySQL, PHP and phpMyAdmin): step-by-step installation guide

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Table of contents

1. What is a web server for Windows
2. Download web server (Apache, MySQL, PHP and phpMyAdmin) for Windows 11
3. Create the structure of the web server
4. Installing Apache 2.4
5. Installing and configuring MySQL 8.0
6. Installing and configuring PHP 8
7. Installing and configuring phpMyAdmin
8. Server usage and data backup
9. PHP tweaking
10. Additional configuration of phpMyAdmin

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1. What is a web server for Windows

The web server itself is Apache – it can process requests from the user and send him the requested files, such as static HTML pages, pictures, files with CSS and JavaScript. Since this functionality is usually not enough and most users need support for dynamically created pages, PHP is connected to Apache as a web server module for these purposes. To store data, one or another database management system (DBMS) is used, usually MySQL or MariaDB. The DBMS is not an Apache or PHP module, it is a separate network service to which various programs can connect, it is important for us that PHP can work with MySQL.

These three components are the most typical of what is commonly referred to as a “web server”, although, again, the actual web server is just Apache. Quite often, phpMyAdmin is added to these three components. At its core, phpMyAdmin is a set of PHP scripts designed to make working with databases easier. phpMyAdmin is a web interface for working with databases.

In fact, you can add/enable other scripting languages to the web server, for example, Python, Perl, Ruby and others – the corresponding links will be given at the end of the article.

This is a step by step guide for installing a web server on Windows. Here it will be shown in detail how to install, configure and run Apache, MySQL, PHP and phpMyAdmin without using extraneous assemblies. This approach will allow you to have the latest versions of components and not worry about the security of running programs. After understanding how Apache modules work and connect, you can add any components you need, as well as customize it exactly to your needs.

2. Download web server (Apache, MySQL, PHP and phpMyAdmin) for Windows 11

- **Apache:** <https://www.apachelounge.com/download/>. Pay attention to the 64-bit and 32-bit versions.

The screenshot shows the Apache Lounge website with the title "Apache 2.4 VS16 Windows Binaries and Modules". The main content area describes the binaries as up-to-date Windows binaries and popular third-party modules. It mentions improvements over VC15, including memory management, performance, and stability. A red box highlights the "Apache 2.4.51 Win64" link, which points to the file [httpd-2.4.51-win64-VS16.zip](#). Below this link are PGP signatures and checksums. The sidebar on the left lists recent releases, including "Apache 2.4.51" (21 November 2021), "Apache 2.4.50" (07 October 2021), and "Apache 2.4.49" (04 October 2021).

- **PHP:** <https://windows.php.net/download/>. Choose the **Thread Safe** version, pay attention to the 64-bit and 32-bit versions.

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PHP For Windows

This site is dedicated to supporting PHP on Microsoft Windows. It also supports ports of PHP extensions or features as well as providing special builds for the various Windows architectures.

If you like to build your own PHP binaries, instructions can be found on the [Wiki](#).

PECL For Windows

[PECL](#) extensions for Windows is being worked on. Windows DLL can be downloaded right from the [PECL website](#).

The PECL extension [release](#) and [snapshot](#) build directories are browsable directly.

Binaries and sources Releases

Select an option to direct access... ▾

[Past releases](#)

PHP 8.1 (8.1.0)

[Download source code \[25.11MB\]](#)

[Download tests package \(.phpt\) \[14.98MB\]](#)

VS16 x64 Non Thread Safe (2021-Nov-23 22:22:08)

- [Zip \[29.12MB\]](#)
sha256: 6676926044ba9409cb141575f79e844153f025bcc4deba3e000196c9a6366b67
- [Debug Pack \[23.69MB\]](#)
sha256: a2b19611217f0c1f158a25c00e9f718626d56acea2c37a2367ba0db6ee21dfac
- [Development package \(SDK to develop PHP extensions\) \[1.2MB\]](#)
sha256: 6a74e62771ef90e624d1679c023ad87299fc7c54f13e517263eea17aaaef83b

VS16 x64 Thread Safe (2021-Nov-23 22:35:04)

- [Zip \[29.22MB\]](#)
sha256: 4c87a2f9b0b0bed1a40cca30ad18cc6564013f51faa1b6e4e636625e0ad5ae125
- [Debug Pack \[23.7MB\]](#)
sha256: e83ec5c79a8efc1897f5fe99d370c40b37b8ea68cb0ff69cd5f4c21f9ff5e395
- [Development package \(SDK to develop PHP extensions\) \[1.2MB\]](#)
sha256: 3d247561739724a1faa448d839b6a8e90d15b2572763cc5ce2bea70052a06511

- **MySQL:** <https://dev.mysql.com/downloads/mysql/>. This page has an executable installer, but I recommend downloading the ZIP file.

General Availability (GA) Releases	Archives									
<h2>MySQL Community Server 8.0.27</h2>										
Select Operating System:										
Microsoft Windows		Looking for previous GA versions?								
<p>Recommended Download:</p> <p>MySQL Installer for Windows</p> <p>All MySQL Products. For All Windows Platforms. In One Package.</p>  <p>Starting with MySQL 5.6 the MySQL Installer package replaces the standalone MSI packages.</p>										
Windows (x86, 32 & 64-bit), MySQL Installer MSI	Go to Download Page >									
<p>Other Downloads:</p> <table border="1"><tbody><tr><td>Windows (x86, 64-bit), ZIP Archive (mysql-8.0.27-win64.zip)</td><td>8.0.27</td><td>209.4M</td><td>Download</td></tr><tr><td></td><td></td><td></td><td>MD5: 9d8e7f9f8835d8b512c5f8e9182d9a6a Signature</td></tr></tbody></table> <p>Windows (x86, 64-bit), ZIP Archive (mysql-8.0.27-win64-debug-test.zip)</p> <p>Debug Binaries & Test Suite</p> <p>Windows (x86, 64-bit), ZIP Archive (mysql-8.0.27-win64.zip)</p> <p>8.0.27</p> <p>509.6M</p> <p>Download</p> <p>MD5: fb1a80a91b1ae95c9be44817978592f Signature</p>			Windows (x86, 64-bit), ZIP Archive (mysql-8.0.27-win64.zip)	8.0.27	209.4M	Download				MD5: 9d8e7f9f8835d8b512c5f8e9182d9a6a Signature
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- **phpMyAdmin**: <https://www.phpmyadmin.net/downloads/phpMyAdmin-latest-all-languages.zip>

We also need Visual C++ Redistributable for Visual Studio 2015-2022 (or any other later one), you can download it on the official Microsoft website at the link (direct download link for the [64-bit version](#); direct download link for the [32-bit version](#)).

So, I have downloaded the following files:

- httpd-2.4.52-win64-VS16.zip
 - php-8.1.2-Win32-vs16-x64.zip
 - mysql-8.0.28-winx64.zip
 - phpMyAdmin-5.1.2-all-languages.zip
 - VC_redist.x64.exe

Install the **VC redist.x64.exe** file.

An important note when working with file extensions. If you use Windows Explorer to create and rename config files, remember that it doesn't show the file extension by default, so you may see **my.ini**, but it's actually **my.ini.txt**. Therefore, the server does not see this file and does not apply the settings from it, which leads to errors.

So when creating files:

- or use [Double Commander \(Free alternative to Total Commander\)](#), this program always shows file extensions, and generally a very good cross-platform, open source two-window file manager
- or turn on the display of file extensions in Explorer

■ ↑
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3. Create the structure of the web server

Let's create the directory structure of our server. The main idea is to separate executable files and site files from databases. This is convenient for server maintenance, including backup.

At the root of the **C:** drive, create the "**Server**" directory. In this directory, create 2 subdirectories: "**bin**" (for executable files) and "**data**".

Go to the "**data**" directory and create subfolders "**DB**" (for databases) and "**htdocs**" (for websites) there.

Go to the "**C:\Server\data\DB**" directory and create an empty "**data**" folder there.

Map of important folders that are mentioned in this manual:

```

1 C:.
2   bin
3     Apache24
4       conf
5         mysql-8.0
6         PHP
7         Sendmail
8   certs
9   data
10    DB
11      data
12      htdocs
13        phpmyadmin
14   manage

```

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4. Installing Apache 2.4

Unzip the contents of the downloaded archive (to be more precise, only the **Apache24** directory) to **C:\Server\bin**.

Go to the **c:\Server\bin\Apache24\conf** directory and open the **httpd.conf** file with any text editor.

In it, we need to replace a number of lines.

Replace

```
1 Define SRVROOT "c:/Apache24"
```

with

```
1 Define SRVROOT "c:/Server/bin/Apache24"
```

replace

```
1 #LoadModule rewrite_module modules/mod_rewrite.so
```

replace

```
1 LoadModule rewrite_module modules/mod_rewrite.so
```

replace

```
1 #ServerName www.example.com:80
```

with

```
1 ServerName localhost
```

replace

```

1 # AllowOverride controls what directives may be placed in .htaccess files.
2 # It can be "All", "None", or any combination of the keywords:
3 #   AllowOverride FileInfo AuthConfig Limit
4 #
5 AllowOverride none

```

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with

```
1 # AllowOverride controls what directives may be placed in .htaccess files.  
2 # It can be "All", "None", or any combination of the keywords:  
3 #   AllowOverride FileInfo AuthConfig Limit  
4 #  
5 AllowOverride All
```

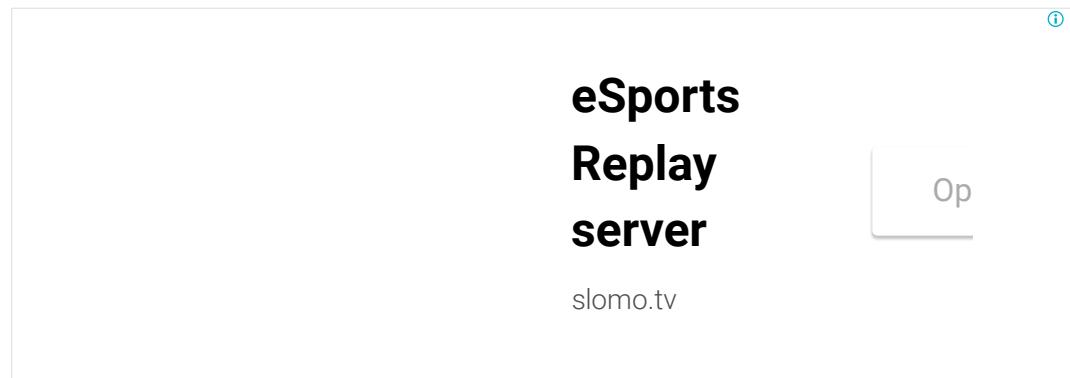
replace

```
1 DocumentRoot "${SRVROOT}/htdocs"
```

with

```
1 DocumentRoot "c:/Server/data/htdocs"
```

replace



```
1 <Directory "${SRVROOT}/htdocs">
```

with

```
1 <Directory "c:/Server/data/htdocs">
```

and replace

```
1 DirectoryIndex index.html
```

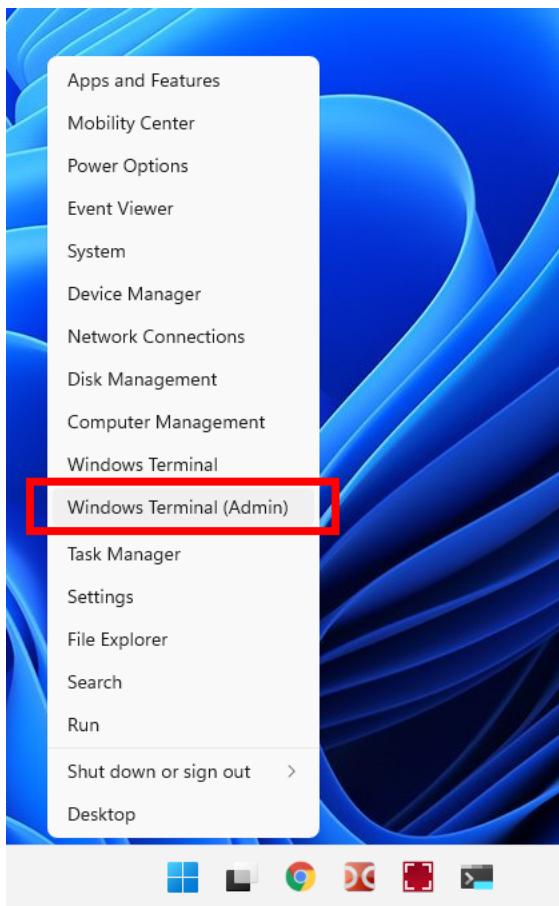
with

```
1 DirectoryIndex index.php index.html index.htm
```

Save and close the file. That's it, Apache setup is complete!

Open a command prompt (this can be done by pressing the **Win+x** keys at the same time). Select there "**Windows Terminal (Admin)**".

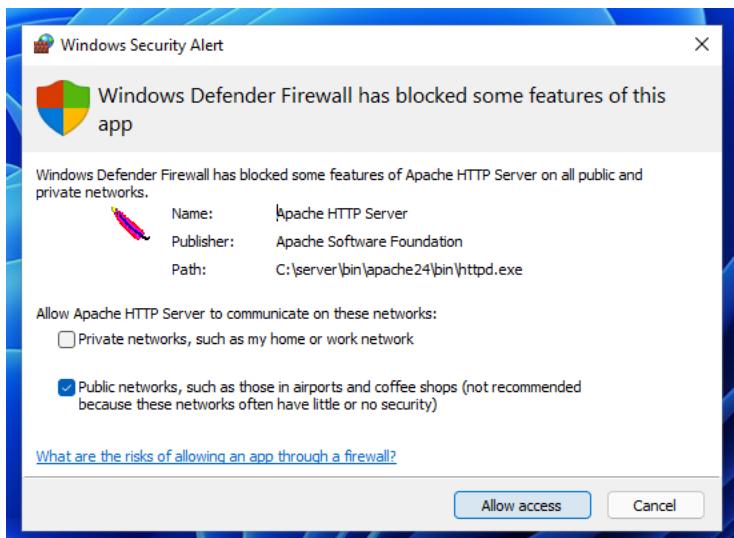
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and copy there:

```
1 | c:\Server\bin\Apache24\bin\httpd.exe -k install
```

If you receive a request from the firewall, then click "**Allow access**".



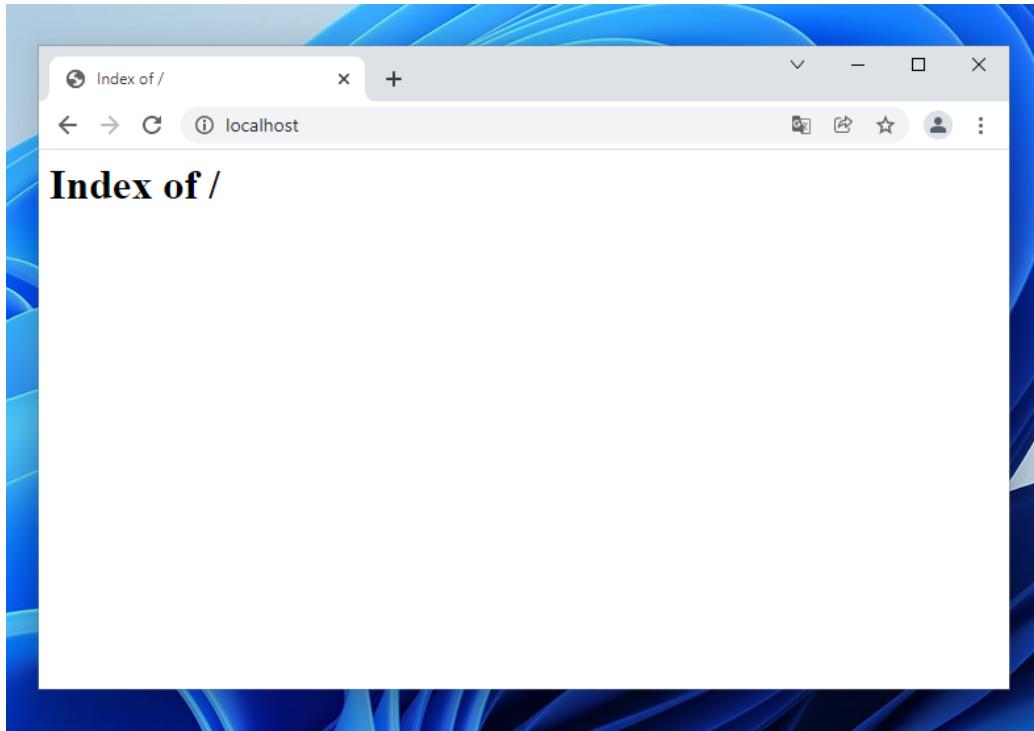
Now type in the command line:

```
1 | c:\Server\bin\Apache24\bin\httpd.exe -k start
```

and press **Enter**.

```
PS C:\Users\MiAl> c:\Server\bin\Apache24\bin\httpd.exe -k install
Installing the 'Apache2.4' service
The 'Apache2.4' service is successfully installed.
Testing httpd.conf....
Errors reported here must be corrected before the service can be started.
PS C:\Users\MiAl> c:\Server\bin\Apache24\bin\httpd.exe -k start
PS C:\Users\MiAl> |
```

Now in the browser we type <http://localhost/> and we see the following:



This means two things:

- Apache running
- There are no files in the **c:\Server\data\htdocs** directory.

You can play with it – add any html files to the directory – a full-fledged web server works.

5. Installing and configuring MySQL 8.0

Unpack the MySQL files into the **bin** directory (from the mysql-8.0.28-winx64.zip archive). Rename the mysql-8.0.28-winx64 folder to **mysql-8.0** (for brevity). By the way, the unpacked mysql-8.0 folder takes up about 800 megabytes!

We go into this folder and create the **my.ini** file there. Now open this file with any text editor.

Add the following lines there:

```
1 [mysqld]
2
3 sql_mode=NO_ENGINE_SUBSTITUTION,STRICT_TRANS_TABLES
4 datadir="c:/Server/data/DB/data/"
5 default_authentication_plugin=mysql_native_password
```

Save and close it.

The setup is completed, but you still need to perform initialization and installation, for this we open the command line as an administrator and sequentially enter there:

```

1 | C:\Server\bin\mysql-8.0\bin\mysqld --initialize-insecure --user=root
2 | C:\Server\bin\mysql-8.0\bin\mysqld --install
3 | net start mysql

```

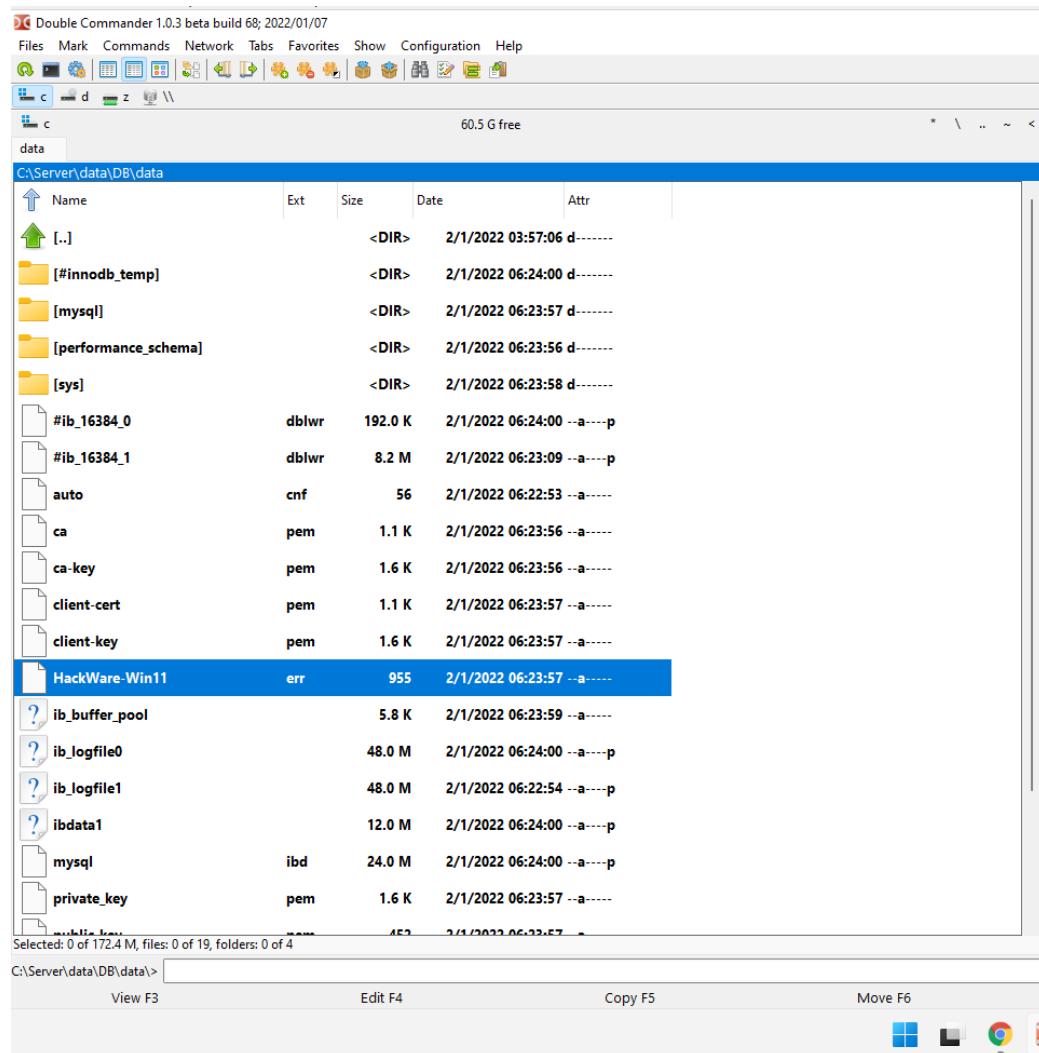
```

PS C:\Users\MiAl> C:\Server\bin\mysql-8.0\bin\mysqld --initialize-insecure --user=root
PS C:\Users\MiAl> C:\Server\bin\mysql-8.0\bin\mysqld --install
Service successfully installed.
PS C:\Users\MiAl> net start mysql
Служба "MySQL" запускается.....
Служба "MySQL" успешно запущена.

PS C:\Users\MiAl>

```

At the end of this process, automatically generated files should appear in the **C:\Server\data\DB\data** directory:



The MySQL service will now start every time you turn on Windows.

6. Installing and configuring PHP 8

In the **c:\Server\bin** folder, create a **PHP** directory and copy the contents of the **php-8.1.2-Win32-vs16-x64.zip** archive into it.

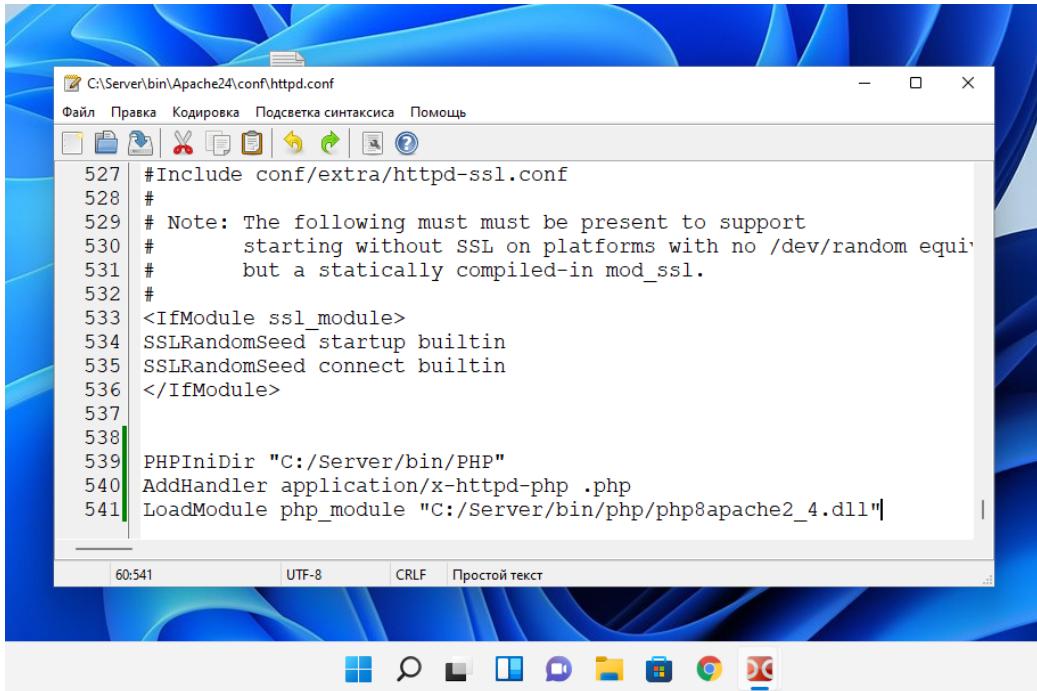
In the **c:\Server\bin\Apache24\conf\httpd.conf** file, add the lines at the very end

```

1 | PHPIniDir "C:/Server/bin/PHP"

```

```
2 | AddHandler application/x-httpd-php .php  
3 | LoadModule php_module "C:/Server/bin/php/php8apache2_4.dll"
```



Then restart Apache

```
1 | c:\Server\bin\Apache24\bin\httpd.exe -k restart
```

In the directory **c:\Server\data\htdocs** create a file called **i.php**

Copy to this file:

```
1 | <?php  
2 | phpinfo();
```

In a browser, open the link <http://localhost/i.php>. If you see the same thing as in the picture, then PHP is working:

The screenshot shows the PHP 8.1.1 info page. Key details from the table include:

- System:** Windows NT HACKWARE-WIN11 10.0 build 22000 (Windows 10) AMD64
- Build Date:** Dec 15 2021 10:28:29
- Build System:** Microsoft Windows Server 2019 Datacenter [10.0.17763]
- Compiler:** Visual C++ 2019
- Architecture:** x64
- Configure Command:** cscript /nologo /e:jscript configure.js --enable-snapshot-build --enable-debug-pack --with-pdo-oci=/.../instantclient/sdk/shared --with-oci8-19=/.../instantclient/sdk/shared --enable-object-out-dir=/obj/ --enable-com-dotnet=shared --without-analyzer --with-pgo
- Server API:** Apache 2.0 Handler
- Virtual Directory Support:** enabled
- Configuration File (php.ini) Path:** no value
- Loaded Configuration File:** (none)
- Scan this dir for additional .ini files:** (none)
- Additional .ini files parsed:** (none)
- PHP API:** 20210902
- PHP Extension:** 20210902
- Zend Extension:** 420210902
- Zend Extension Build:** API420210902_TS,VS16
- PHP Extension Build:** API20210902_TS,VS16
- Debug Build:** no
- Thread Safety:** enabled
- Thread API:** Windows Threads
- Zend Signal Handling:** disabled
- Zend Memory Manager:** enabled
- Zend Multibyte Support:** disabled
- IPv6 Support:** enabled
- DTrace Support:** disabled
- Registered PHP Streams:** php, file, glob, data, http, ftp, zip, compress.zlib, phar
- Registered Stream Socket Transports:** tcp, udp
- Registered Stream Filters:** convert.iconv.*, string.rot13, string.toupper, string.tolower, convert.*, consumed, dechunk, zlib.*

This program makes use of the Zend Scripting Language Engine:
Zend Engine v4.1.1, Copyright (c) Zend Technologies

PHP 8 setup

PHP configuration takes place in the **php.ini** file. There is no php.ini in the zip archives intended for manual installation and for updates (this is done on purpose so as not to accidentally overwrite your file with your unique settings). But there are two others, which are called php.ini-development and php.ini-production. Any of them, when manually installed, can be renamed to php.ini and configured further. On localhost we will use **php.ini-development**.

Open the **php.ini** file with any text editor, look for the line

```
1 | ;extension_dir = "ext"
```

and replace it with

```
1 | extension_dir = "C:\Server\bin\PHP\ext\"
```

Now find the group of lines:

```
1 | ;extension=bz2
2 | ;extension=curl
3 | ;extension=ffi
4 | ;extension=ftp
5 | ;extension=fileinfo
6 | ;extension=gd
7 | ;extension=gettext
8 | ;extension=gmp
9 | ;extension=intl
10 | ;extension=imap
11 | ;extension=ldap
12 | ;extension=mbstring
13 | ;extension=exif      ; Must be after mbstring as it depends on it
14 | ;extension=mysqli
15 | ;extension=oci8_12c ; Use with Oracle Database 12c Instant Client
16 | ;extension=oci8_19  ; Use with Oracle Database 19 Instant Client
17 | ;extension=odbc
18 | ;extension=openssl
19 | ;extension=pdo_firebird
```

```

20 ;extension=pdo_mysql
21 ;extension=pdo_oci
22 ;extension=pdo_odbc
23 ;extension=pdo_pgsql
24 ;extension=pdo_sqlite
25 ;extension=pgsql
26 ;extension=shmop

```

and replace it with:

```

1 extension=bz2
2 extension=curl
3 extension=ffi
4 extension=ftp
5 extension=fileinfo
6 extension=gd
7 extension=gettext
8 extension=gmp
9 extension=intl
10 extension=imap
11 extension=ldap
12 extension=mbstring
13 extension=exif      ; Must be after mbstring as it depends on it
14 extension=mysqli
15 ;extension=oci8_12c ; Use with Oracle Database 12c Instant Client
16 ;extension=oci8_19  ; Use with Oracle Database 19 Instant Client
17 extension=odbc
18 extension=openssl
19 ;extension=pdo_firebird
20 extension=pdo_mysql
21 ;extension=pdo_oci
22 extension=pdo_odbc
23 extension=pdo_pgsql
24 extension=pdo_sqlite
25 extension=pgsql
26 extension=shmop

```

now uncomment this group of lines:

```

1 ;extension=soap
2 ;extension=sockets
3 ;extension=sodium
4 ;extension=sqlite3
5 ;extension=tidy
6 ;extension=xsl

```

you should get:

```

1 extension=soap
2 extension=sockets
3 extension=sodium
4 extension=sqlite3
5 extension=tidy
6 extension=xsl

```

With these actions, we have enabled extensions. They may be needed in different situations for different scripts. Save the file and **restart Apache**.

7. Installing and configuring phpMyAdmin

Copy the contents of the phpMyAdmin-5.1.2-all-languages.zip archive to the **c:\Server\data\htdocs** directory. Rename phpMyAdmin-5.1.2-all-languages to **phpmyadmin** (for brevity)

In the directory **c:\Server\data\htdocs\phpmyadmin** create a file **config.inc.php** and copy it there:

```

1 <?php
2
3 /* Servers configuration */
4 $i = 0;
5
6 /* Server: localhost [1] */
7 $i++;
8 $cfg['Servers'][$i]['verbose'] = '';
9 $cfg['Servers'][$i]['host'] = 'localhost';
10 $cfg['Servers'][$i]['port'] = '';
11 $cfg['Servers'][$i]['socket'] = '';
12 $cfg['Servers'][$i]['connect_type'] = 'tcp';
13 $cfg['Servers'][$i]['auth_type'] = 'cookie';
14 $cfg['Servers'][$i]['user'] = 'root';

```

```

15 $cfg['Servers'][$i]['password'] = '';
16 $cfg['Servers'][$i]['nopassword'] = true;
17 $cfg['Servers'][$i]['AllowNoPassword'] = true;
18
19 /* End of servers configuration */
20
21 $cfg['blowfish_secret'] = 'HACKWARE.RU === WRITE DOWN WHAT YOU WANT HERE';
22 $cfg['DefaultLang'] = 'en';
23 $cfg['ServerDefault'] = 1;
24 $cfg['UploadDir'] = '';
25 $cfg['SaveDir'] = '';
26
27 ?>

```

In the browser we type <http://localhost/phpmyadmin/>

Enter root as the username. Leave the password field blank. If everything is done correctly, then everything should look like this:

8. Server usage and data backup

In the directory **c:\Server\data\htdocs** create folders and files, for example:

- c:\Server\data\htdocs\test\ajax.php – this file, respectively, will be available at <http://localhost/test/ajax.php>, etc.

To create a full backup of all sites and databases, just copy the **C:\Server\data** directory.

Before updating modules, make a backup of the **bin** folder – in case of problems, it will be easy to roll back to previous versions.

When you reinstall the server or upgrade it, you must reconfigure the configuration files. If you have copies of these files, then the process can be greatly accelerated. It is recommended to back up the following files:

- c:\Server\bin\Apache24\conf\httpd.conf
- c:\Server\bin\mysql-8.0\my.ini
- c:\Server\bin\PHP\php.ini
- c:\Server\data\htdocs\phpmyadmin\config.inc.php

All settings are stored in them.

9. PHP tweaking

PHP is currently a very powerful, flexible, user-friendly programming language and tool. On a local computer, it can be used to perform a variety of tasks that are not necessarily related to the generation of Web pages. When solving extraordinary tasks, you can run into the restrictions set in the settings. These settings are contained in the php.ini file (c:\Server\bin\PHP\php.ini) Let's look at some of them:

```
1 | memory_limit = 128M
```

sets the maximum amount of memory the script can use

```
1 | post_max_size = 8M
```

sets the maximum amount of data that will be accepted when sending using the POST method

```
1 | ;default_charset = "UTF-8"
```

sets the encoding (by default, the line is commented out)

```
1 | upload_max_filesize = 2M
```

the maximum size of the file uploaded to the server. Initially set to a very small size – only two megabytes. For example, when uploading a database to phpMyAdmin, you will not be able to upload a file larger than 2 megabytes until this setting item is changed.

```
1 | max_file_uploads = 20
```

maximum number of files to upload at one time

```
1 | max_execution_time = 30
```

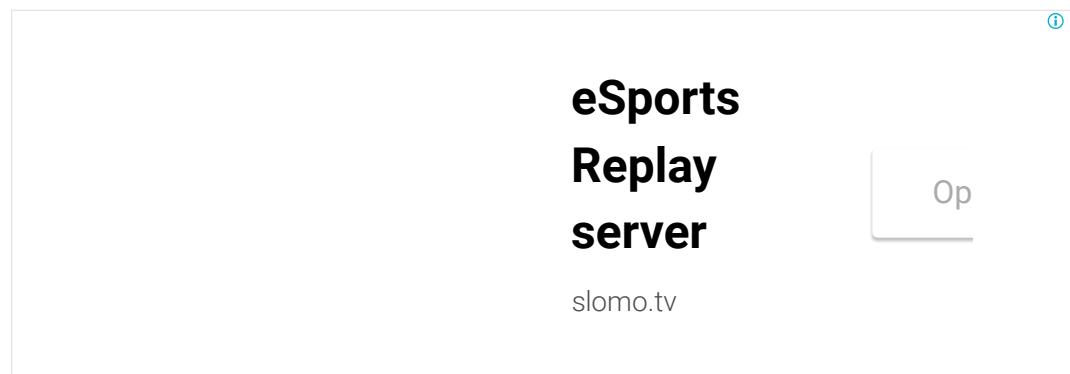
maximum execution time for one script

It is not necessary to change these settings, but it is useful to know about them.

10. Additional configuration of phpMyAdmin

We have already set up phpMyAdmin and for most of us the basic functionality is enough. However, the phpMyAdmin start page says 'The phpMyAdmin configuration storage is not completely configured, some extended features have been deactivated. Find out why.'

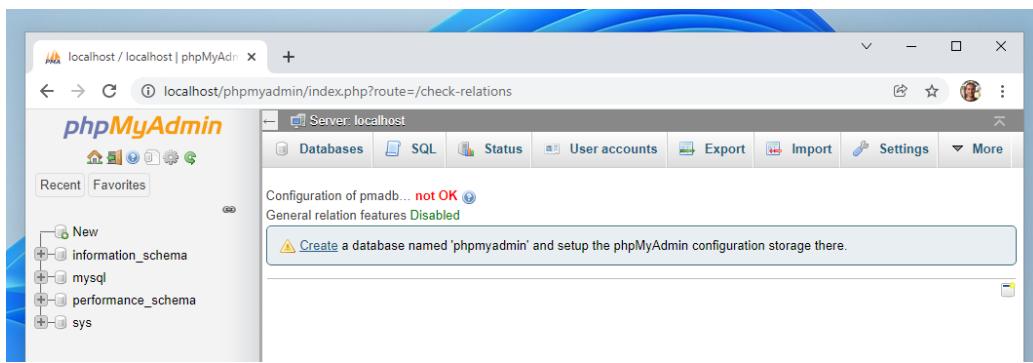
New features are:



- showing relationships between (related) tables;
- adding information about tables (since version 2.3.0 you can describe in a special table 'table_info' which column will be shown in the tooltip when moving the cursor over the associated key);
- creating a PDF schema (starting from version 2.3.0 you can create PDF pages in phpMyAdmin showing the relationships between your tables);
- display column comments (since version 2.3.0 you can make a comment describing each column for each table. And they will be visible in the "print preview". Since version 2.5.0, comments are used on native table pages and in view, showing as tooltips over columns (property tables) or embedded in the table header in view mode (they can also be shown in a table dump);
- create bookmarks (since version 2.2.0, phpMyAdmin allows users to bookmark queries. This can be useful for frequently used queries);
- history of SQL queries (starting from version 2.5.0 you can save your history of all SQL queries that were made through the phpMyAdmin interface);

- designer (starting from version 2.10.0, the Designer tool is available; it allows you to visually manage the relationships between tables);
- information about recently used tables;
- customizing the interface of frequently used tables;
- tracking (since version 3.3.x a tracking mechanism is available. It helps you trace every SQL command that was executed by phpMyAdmin. Recording of work with data and recording of commands is supported. After enabling, you can make versions of tables);
- user settings (since version 3.4.x, phpMyAdmin allows users to set most of the settings and save them in the database);
- custom menus (starting from version 4.1.0 you can create user groups that will only have access to assigned menu items. A user can be assigned to a group and will see only menu items available for his group);
- hide/show navigation items (since version 4.1.0 you can hide/show items in the navigation tree).
- other

Now we will configure these additional features in full. Go to <http://localhost/phpmyadmin/index.php?route=/check-relations> and click "**Create a database named 'phpmyadmin' and setup the phpMyAdmin configuration storage there**".



After that, all new features will be activated.

The screenshot shows the 'Check relations' page in phpMyAdmin. The left sidebar lists databases: New, information_schema, mysql, performance_schema, phpmyadmin, and sys. The main area displays a list of configuration items with their status:

- \$cfg['Servers'][\$i]['pmadb'] ... OK
- \$cfg['Servers'][\$i]['relation'] ... OK
General relation features: Enabled
- \$cfg['Servers'][\$i]['table_info'] ... OK
Display Features: Enabled
- \$cfg['Servers'][\$i]['table_coords'] ... OK
Designer and creation of PDFs: Enabled
- \$cfg['Servers'][\$i]['column_info'] ... OK
Displaying Column Comments: Enabled
Browser transformation: Enabled
- \$cfg['Servers'][\$i]['bookmarktable'] ... OK
Bookmarked SQL query: Enabled
- \$cfg['Servers'][\$i]['history'] ... OK
SQL history: Enabled
- \$cfg['Servers'][\$i]['recent'] ... OK
Persistent recently used tables: Enabled
- \$cfg['Servers'][\$i]['favorite'] ... OK
Persistent favorite tables: Enabled
- \$cfg['Servers'][\$i]['table_uiprefs'] ... OK
Persistent tables' UI preferences: Enabled
- \$cfg['Servers'][\$i]['tracking'] ... OK
Tracking: Enabled
- [Console] rs[\$i]['userconfig'] ... OK

Some screenshots of new features:

- 1) Designer

The screenshot shows the phpMyAdmin interface for the 'phpmyadmin' database. The left sidebar lists various databases and their structures. The main panel shows the detailed structure of the 'pma_table_coords' table, including its columns and data types. Other tables visible in the background include 'pma_export_templates', 'pma_column_info', 'pma_navigationhiding', 'pma_favorites', 'pma_savedsearches', 'pma_userconfig', and 'pma_usergroups'.

2) Tracking

The screenshot shows the phpMyAdmin interface on a Windows 11 desktop. The left sidebar displays a tree structure of databases: New, information_schema, mysql, performance_schema, phpmyadmin (which is currently selected), and sys. The main content area is titled "Untracked tables" and lists 21 tables from the phpmyadmin database, each with a checkbox and a "Track table" link. The tables listed are: pma_bookmark, pma_central_columns, pma_column_info, pma_designer_settings, pma_export_templates, pma_favorite, pma_history, pma_navigationhiding, pma_pdf_pages, pma_recent, pma_relation, pma_savedsearches, pma_table_coords, pma_table_info, pma_table_uiprefs, pma_tracking, pma_userconfig, pma_usergroups, and pma_users.

11. Setting up the mail plug

In the **C:\Server\bin** directory, create a new directory called **Sendmail**. Now in this directory create a **sendmail.php** file with the following content:

```

1  #!/usr/bin/env php
2
3  <?php
4  /* PHP.INI
5   * [mail function]
6   * ;SMTP = localhost
7   * ;smtp_port = 25
8   * ;sendmail_from = me@example.com
9   * sendmail_path = php.exe sendmail.php --dir C:\mail --open
10 */
11
12 $is_windows = strstr(PHP_OS, 'WIN');
13 $options = getopt("", ['open', 'prepend', 'file:', 'dir:']);
14 $is_open = isset($options['open']);
15 $is_prepend = isset($options['prepend']);
16 $is_onefile = isset($options['file']);
17 $mail_dir = isset($options['dir']) ? $options['dir'] : sys_get_temp_dir() . '/mail';
18 $file_name = isset($options['file']) ? $options['file'] : mkname();
19 $file_path = $mail_dir . '/' . $file_name;
20
21 if (!is_dir($mail_dir)) {
22     mkdir($mail_dir, 0777, TRUE);
23     if (!is_dir($mail_dir)) {
24         die('Mail folder [' . $mail_dir . '] not created');

```

```

25 }
26 }
27
28 $stream = $is_onefile ? PHP_EOL . str_repeat("=", 10) . date('Y-m-d H:i:s') . $line;
29 while (false !== ($line = fgets(STDIN))) {
30     // $stream .= ($is_windows ? str_replace("\n", PHP_EOL, $line) : $line);
31     $stream .= $line;
32 }
33
34 if ($is_prepend && file_exists($file_path)) {
35     $file_contents = file_get_contents($file_path);
36     $stream .= $file_contents;
37 }
38
39 file_put_contents($file_path, $stream, $is_prepend ? 0 : FILE_APPEND);
40
41 if ($is_open && $is_windows) {
42     pclose(popen("start /B notepad " . $file_path, "r"));
43 }
44
45 function mkname($i = 0) {
46     global $mail_dir;
47     $fn = 'mail_' . date('Y-m-d_H-i-s_') . $i . '.eml';
48     return file_exists($mail_dir . '/' . $fn) ? mkname( ++$i ) : $fn;
49 }

```

Open the PHP configuration file, it is located here `C:\Server\bin\PHP\php.ini` and add one line there:

```
1 | sendmail_path = "C:\Server\bin\PHP\php.exe C:\Server\bin\Sendmail\sendmail.php --di
```

Save the file and restart the server. Great, now all sent emails will be stored
`C:\Server\bin\Sendmail\emails\`

Имя	Тип	Размер	Дата	Атриб
[...]	<DIR>		29.07.15	d----
mail_2015-07-29_12-04-05_0	htm	611	29.07.15	--a----
mail_2015-07-29_12-03-10_0	htm	603	29.07.15	--a----
mail_2015-07-29_11-52-07_0	eml	609	29.07.15	--a----
mail_2015-07-29_11-50-42_0	eml	600	29.07.15	--a----
mail_2015-07-29_11-44-52_0	eml	593	29.07.15	--a----
mail_2015-07-29_11-43-32_0	eml	652	29.07.15	--a----
mail_2015-07-29_11-42-42_0	eml	1,9 М	29.07.15	--a----
mail_2015-07-29_11-39-04_0	eml	1,9 М	29.07.15	--a----
mail_2015-07-29_11-33-16_0	eml	1,9 М	29.07.15	--a----
mail_2015-07-29_11-32-47_0	eml	1	29.07.15	--a----
mail_2015-07-29_11-32-06_0	eml	0	29.07.15	--a----
mail_2015-07-29_11-29-04_0	eml	2,0 М	29.07.15	--a----
mail_2015-07-29_11-25-06_1	eml	212,2 К	29.07.15	--a----
mail_2015-07-29_11-25-06_0	eml	498	29.07.15	--a----
mail_2015-07-29_11-14-59_1	eml	82,7 К	29.07.15	--a----
mail_2015-07-29_11-14-59_0	eml	498	29.07.15	--a----
mail_2015-07-29_11-14-12_1	eml	63,0 К	29.07.15	--a----
mail_2015-07-29_11-14-12_0	eml	500	29.07.15	--a----
mail_2015-07-29_10-58-36_1	eml	63,0 К	29.07.15	--a----
mail_2015-07-29_10-58-36_0	eml	500	29.07.15	--a----
mail_2015-07-29_10-58-30_0	eml	500	29.07.15	--a----
mail_2015-07-29_10-05-36_0	eml	513	29.07.15	--a----
mail_2015-07-29_10-03-23_0	eml	513	29.07.15	--a----
mail_2015-07-29_02-57-05_0	eml	291	29.07.15	--a----
mail_2015-07-29_02-57-04_0	eml	90	29.07.15	--a----
mail_2015-07-29_01-40-06_0	eml	1,2 К	29.07.15	--a----
mail_2015-07-29_01-36-43_0	txt	1,2 К	29.07.15	--a----

Emails will have the .eml extension and they can be opened, for example, with the Thunderbird program or a text editor.

12. Adding PHP Directory to PATH on Windows

If this is not done, then there may be problems with some PHP modules, including `php_curl.dll`, `php_intl.dll`, `php_ldap.dll`, `php_pdo_pgsql.dll` and `php_pgsql.dll`. At least when the server is started, the following appears in the logs every time:

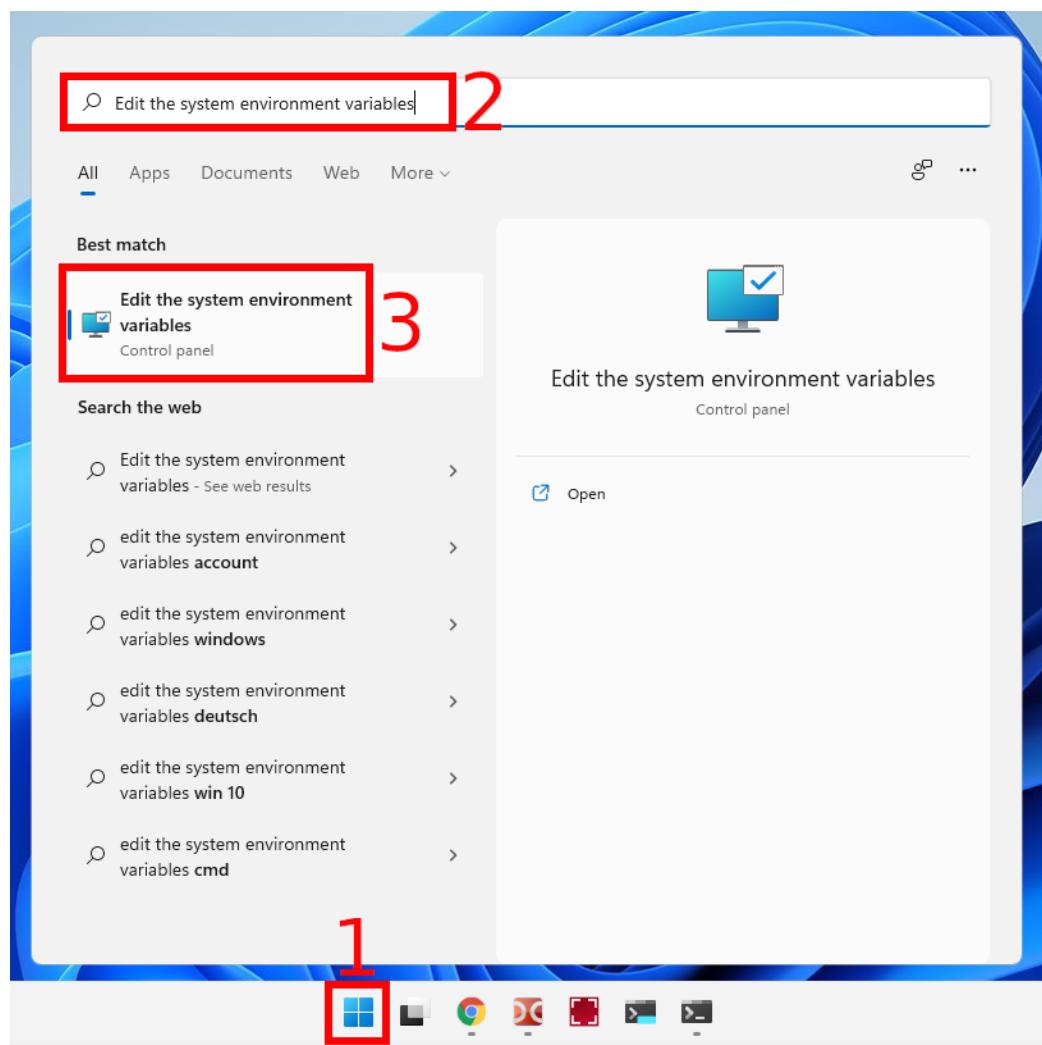
```

1 | PHP Warning: PHP Startup: Unable to load dynamic library 'curl' (tried: C:\\Server
2 | PHP Warning: PHP Startup: Unable to load dynamic library 'intl' (tried: C:\\Server
3 | PHP Warning: PHP Startup: Unable to load dynamic library 'ldap' (tried: C:\\Server

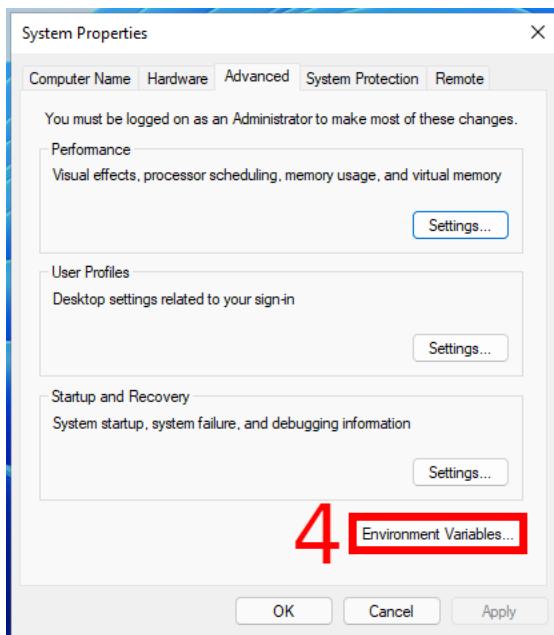
```

```
4 | PHP Warning: PHP Startup: Unable to load dynamic library 'pdo_pgsql' (tried: C:\\\\S
5 | PHP Warning: PHP Startup: Unable to load dynamic library 'pdo_sqlite' (tried: C:\\\\S
6 | PHP Warning: PHP Startup: Unable to load dynamic library 'pgsql' (tried: C:\\\\S
7 | PHP Warning: PHP Startup: Unable to load dynamic library 'sodium' (tried: C:\\\\S
8 | PHP Warning: PHP Startup: Unable to load dynamic library 'sqlite3' (tried: C:\\\\S
```

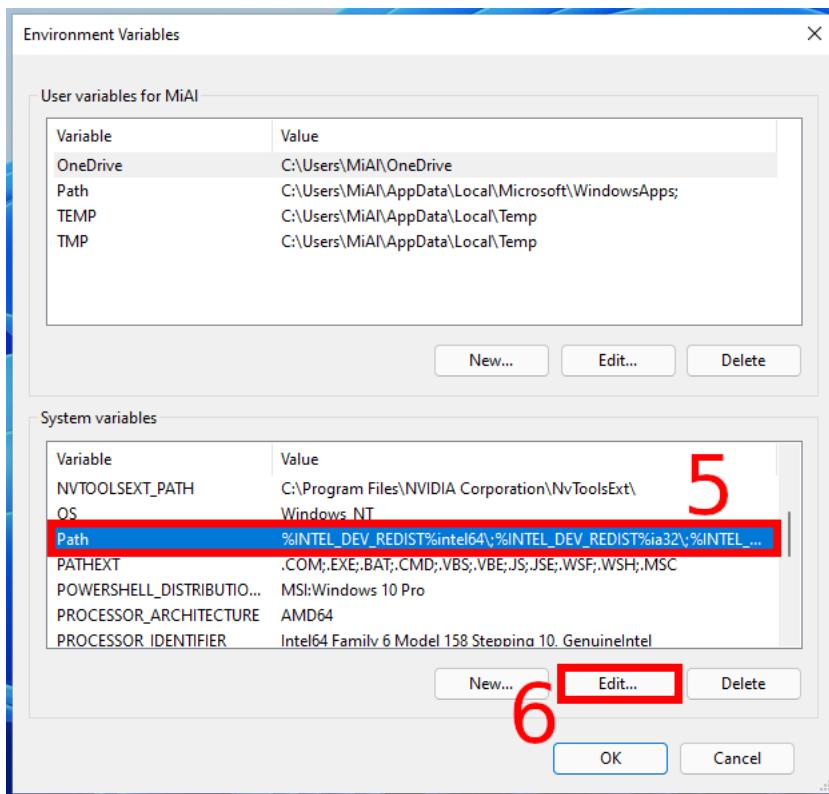
Click the **Start** button, start typing “**Edit the system environment variables**” and open the corresponding settings window.



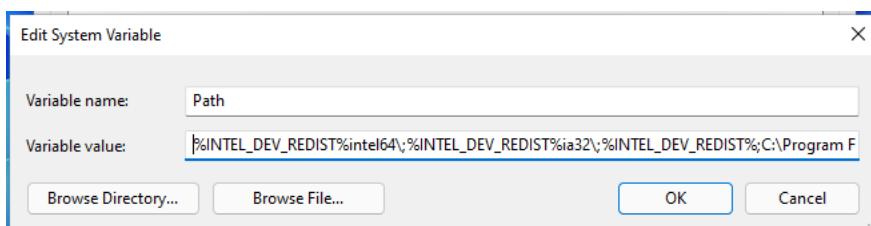
There, click “**Environment Variables**”.



In the “**System Variables**” window, find and click “**Path**”, then click “**Edit**” button:

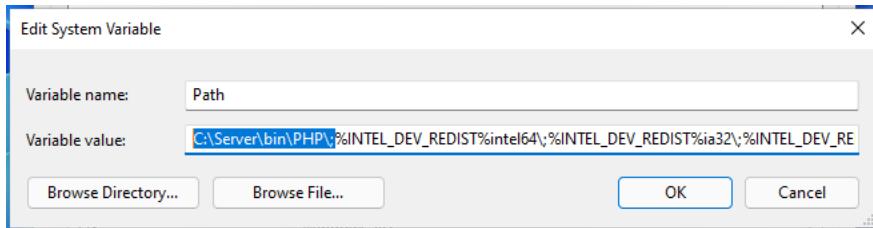


If the following window opens,

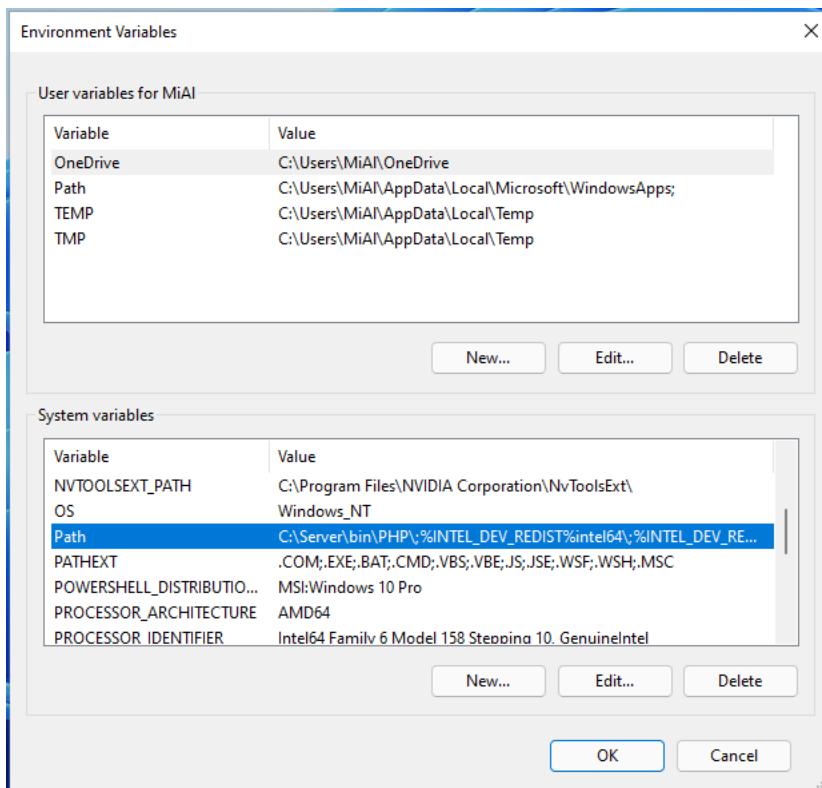


then at the very beginning of the line, add

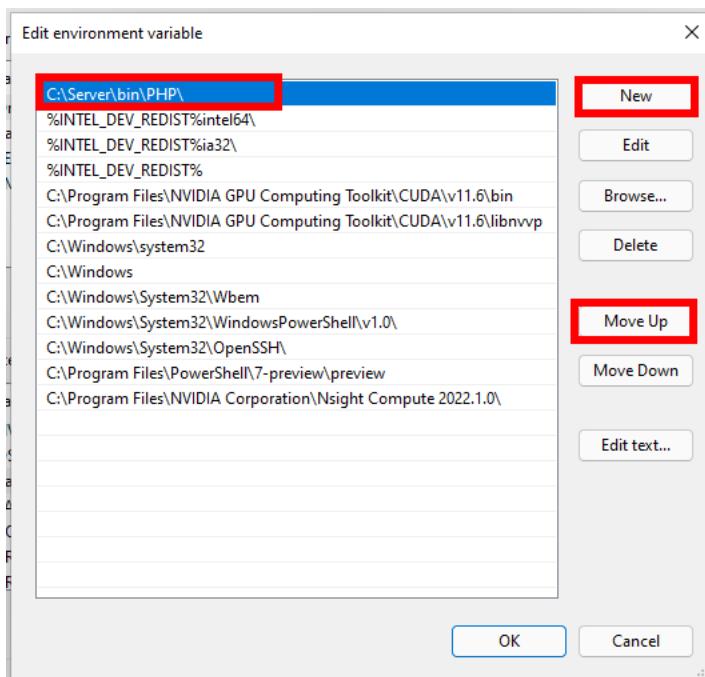
1 | C:\Server\bin\PHP\;



Click "OK".



If a multi-line window opens, then click "**Create**" and enter "**C:\Server\bin\PHP**" there, move the entry to the very top:



Close all windows and save your changes.

Restart the server.

13. Setting up cURL in Apache Web Server on Windows

If you don't know what cURL is, then you don't need it, so feel free to skip this step.

cURL is a console utility that allows you to communicate with remote servers using a very large number of protocols. cURL can use cookies and supports authentication. If the web application requires cURL, then it must be specified in the dependencies. Many popular applications do not require cURL, for example, phpMyAdmin and WordPress do not need to set up cURL.

If cURL is configured incorrectly, then you will get errors:

```
1 | Fatal error: Call to undefined function curl_multi_init() in ...
```

Or:

```
1 | Ошибка curl: SSL certificate problem: unable to get local issuer certificate
```

For cURL to work in Apache on Windows you need:

- 1) Be sure to add PHP directory to PATH (system environment variables). How to do this is said a little higher: <https://miloserdov.org/?p=7703#12>
- 2) In the **C:\Server\bin\PHP\php.ini** file, the "**extension=curl**" line must be uncommented
- 3) You need to download the file <https://curl.haxx.se/ca/cacert.pem>, then in the **C:\Server** folder create a new folder called **certs** and move it to this new folder (**C:\Server\certs**) downloaded file.
- 4) In the file **C:\Server\bin\PHP\php.ini** find the line

```
1 | ;curl.caInfo =
```

And replace it with

```
1 | curl.caInfo = C:\Server\certs\cacert.pem
```

- 5) Restart the server.

14. How to back up Apache data (websites and databases) on Windows

All relevant information, i.e. site files and their databases are stored in the **C:\Server\data** folder. A backup copy in case the original data would become corrupted can be done in two ways.

The first way is that we simply make a copy of all files (websites + databases) to a safe place. This is a simple method and for most of us it will be the most convenient.

Discover related topics

- [Download Apache Server Software](#) >
- [Apache Server](#) >
- [Sql](#) >
- [Apache 32 Bit](#) >
- [Apache Windows 10](#) >

You need to start by stopping MySQL, because until it is stopped, some database files are open and cannot be copied correctly:

```
1 | net stop mysql
```

Now just copy the folder **C:\Server\data** to any safe place. It already contains both databases (subfolder **C:\Server\data\DB**) and all sites (subfolder **C:\Server\data\htdocs**). When the copy is complete, start the MySQL service again:

```
1 | net start mysql
```

If you need to restore all sites, or individual sites, or only individual site files, then this can be done without stopping the web server.

If you need to restore the databases, then again you will need to stop MySQL and return the original files **C:\Server\data\DB**.

Please note that if you completely return the original folder **C:\Server\data**, then all data is completely rolled back, i.e. all changes made after the backup was created will be gone!

The second backup method is to export the databases (this is done with the MySQL service running) and back up only the sites folder **C:\Server\data\htdocs**. This method is a bit more complicated, but you can control which databases you want to export. Also in this form (databases in the form of **.SQL** files and site files) it is convenient to transfer sites to another web server or hosting.

We need the **mysqldump.exe** utility, it comes with MySQL and is located in the **C:\Server\bin\mysql-8.0\bin** directory.

To use it, open the command line and go to the folder with the program:

```
1 | cd C:\Server\bin\mysql-8.0\bin\
```

The program can be used with a variety of options.

If you want to backup all databases to one file, then run:

```
1 | .\mysqldump.exe -u root -p --all-databases > all-databases.sql
```

By the way, you need to look for the file in the folder that you see in the command line prompt.

To backup only one database (eg hardware):

```
1 | .\mysqldump.exe -u root -p hardware > hardware.sql
```

To back up multiple databases, use the **--databases** option, followed by a space-separated list of the databases you want to back up:

```
1 | .\mysqldump.exe -u root -p --databases hardware miloserdov > hardware_miloserdov.sql
```

To backup just one table (`wp_posts`) from a database (wordpress):

```
1 | .\mysqldump.exe -u root -p wordpress wp_posts > wordpress_posts.sql
```

To back up multiple tables, list them with a space after the database name:

```
1 | .\mysqldump.exe -u root -p wordpress wp_posts wp_comments > wordpress_posts_comment
```

This is not usually required, but you can backup the server's binary (executable) files if you wish. All these files are located in the C:\Server\bin\ folder. These are Apache, MySQL and PHP – i.e. programs that are responsible for the operation of the server, but which we can download at any time from official sites and reconfigure.

If you want to backup them (for example, before updating the server), then stop the services:

```
1 | c:\Server\bin\Apache24\bin\httpd.exe -k stop
2 | net stop mysql
```

And copy the folder **C:\Server\bin** to a safe place.

By the way, you can copy the entire server, ie. folder **C:\Server** – in this case, you will simultaneously get a backup copy of both executable files and data (databases, sites).

When the copy is complete, restart the services:

```
1 | c:\Server\bin\Apache24\bin\httpd.exe -k start
2 | net start mysql
```

Database import

Import all databases:

```
1 | mysql -u username -p < all-databases.sql
```

Single database import: To import an existing database file into MySQL or MariaDB, you need to create a new database into which the contents of the dump file will be imported. Start by logging into the database as root or another user with sufficient privileges to create a new database.

```
1 | cd C:\Server\bin\mysql-8.0\bin\
2 | .\mysql -u root -p
```

This will give you a MySQL shell prompt. Next, create a new database named **new_database**.

```
1 | CREATE DATABASE new_database;
```

Creation will be confirmed.

```
1 | Output
2 | Query OK, 1 row affected (0.00 sec)
```

Now exit the MySQL shell by pressing **CTRL+d**. On a normal command line, you can import a file with the following command:

```
1 | .\mysql -u username -p new_database < data-dump.sql
```

In this command:

- **username** is the username with which you can login to the database
- **newdatabase** is the name of the newly created database
- **data-dump.sql** is a dump file with data for import, located in the current directory

Successful execution of the command will not display any messages. If errors occur during this process, mysql will print them to the terminal. You can verify that the database has been imported by logging into the MySQL shell again and parsing the data. This can be done by selecting a new database with the command

```
1 | USE new_database;
```

and then execute a SQL query:

```
1 | SHOW TABLES;
```

or a similar command to view data.

15. How to update the web server on Windows

All components that make up the web server are actively developed and new versions are released regularly. When a new version is released, you can update one component (for example, PHP), or

several at once.

Apache update

[Download](#) the archive with the new version of Apache.

Copy the **c:\Server\bin\Apache24\conf\httpd.conf** file to a safe location.

Stop and remove the Apache service:

```
1 | c:\Server\bin\Apache24\bin\httpd.exe -k stop  
2 | c:\Server\bin\Apache24\bin\httpd.exe -k uninstall
```

Delete the **C:\Server\bin\Apache24** folder (this will not affect your sites and databases).

Unzip the new archive to **C:\Server\bin**. Copy the httpd.conf file you saved earlier to **c:\Server\bin\Apache24\conf\httpd.conf**.

Start the Apache service:

```
1 | c:\Server\bin\Apache24\bin\httpd.exe -k install  
2 | c:\Server\bin\Apache24\bin\httpd.exe -k start
```

PHP update

[Download](#) the archive with the new PHP version.

Copy the **c:\Server\bin\PHP\php.ini** file to a safe place.

Delete the **C:\Server\bin\PHP** folder.

Unzip the new archive to **C:\Server\bin\PHP**.

Copy the **php.ini** file you saved earlier to **c:\Server\bin\PHP\php.ini**.

Restart the Apache service:

```
1 | c:\Server\bin\Apache24\bin\httpd.exe -k restart
```

MySQL update

[Download](#) the archive with the new version of MySQL.

Copy the **c:\Server\bin\mysql-8.0\my.ini** file to a safe location.

Stop and remove the MySQL service:

```
1 | net stop mysql  
2 | c:\Server\bin\mysql-8.0\bin\mysqld --remove
```

Delete the **C:\Server\bin\mysql-8.0** folder (this will not affect your sites and databases).

Unzip the new archive to **C:\Server\bin**. Rename the folder to **mysql-8.0**.

Copy the my.ini file you saved earlier to **c:\Server\bin\mysql-8.0\my.ini**.

Start the MySQL service:

```
1 | C:\Server\bin\mysql-8.0\bin\mysqld --install  
2 | net start mysql
```

phpMyAdmin update

[Download](#) the archive with the new version of phpMyAdmin.

Copy the **c:\Server\data\htdocs\phpMyAdmin\config.inc.php** file to a safe location.

Delete the **C:\Server\bin\phpMyAdmin** folder (this will not affect your sites and databases).

Unzip the new archive to **C:\Server\data\htdocs**. Rename the folder in **phpMyAdmin**.

Copy the **config.inc.php** file you saved earlier to **c:\Server\data\htdocs\phpMyAdmin\config.inc.php**.

16. How to protect the Apache web server from hacking in Windows

Recommended for you: [How to protect the Apache web server from hacking in Windows.](#)

How to uninstall the web server

If you no longer need a web-server installed with this guide or you want to install it again, follow the steps below to uninstall it. Stop the services and remove them from autostart by executing in the Windows Terminal:

```
1 | c:\Server\bin\Apache24\bin\httpd.exe -k stop
2 | c:\Server\bin\Apache24\bin\httpd.exe -k uninstall
3 | net stop mysql
4 | c:\Server\bin\mysql-8.0\bin\mysqld --remove
```

Attention: all the web-sites and their databases created on your local web-server will be deleted!

Delete the server files by deleting the **C:\Server** folder. Attention: this will remove all databases and your sites.



Related articles:

- [Installing and configuring MySQL and phpMyAdmin on Kali Linux](#) (92.2%)
- [How to install web server on Windows 10 \(Apache 2.4, PHP 8, MySQL 8.0 and phpMyAdmin\)](#) (70.3%)
- [Web server installation guide on Windows: Apache, PHP, MariaDB and phpMyAdmin. How to provide local web server security](#) (70.3%)
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Dedicated Server**

Ad fmphost.com

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Ad slomo.tv

**Latest Tools. Top
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Ad Plesk

**€3 Cheap VPS Server
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Recording & Replay Server

Open

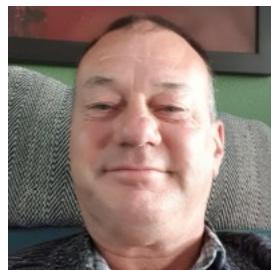
slomo.tv

👤 Alex ⏰ February 2, 2022 📺 Apache, MySQL, mysqldump, PHP, phpMyAdmin, Web Server, Windows 💼 Work Environment 💬 9 Comments »

◀ How to install Windows 11 and Kali Linux
on the same flash drive

How to install OWASP Mutillidae II and
Damn Vulnerable Web Application (DVWA)
in Kali Linux ➔

💬 9 Comments to [Web Server on Windows 11 \(Apache, MySQL, PHP and phpMyAdmin\): step-by-step installation guide](#)



Paul Göttgens says:

April 15, 2022 at 11:10 am

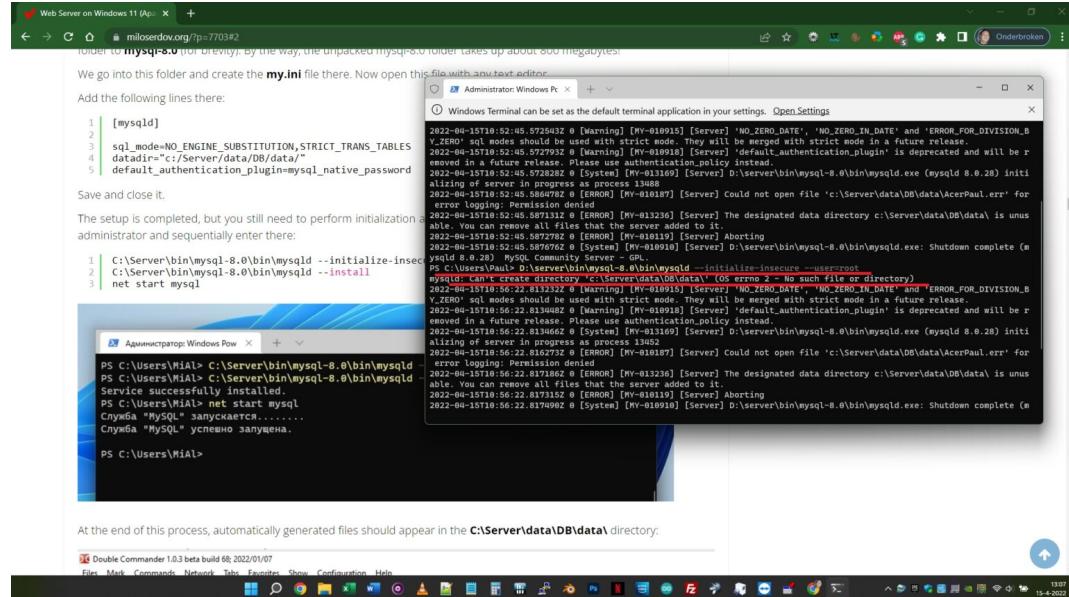
Hi Alex,

Excellent tutorial, however. It does not work if you want to install on a different drive. I tried to install on the D drive. Apache works fine, but it crashes on MySQL, because it tries to install on the C drive when you use the command line.

Do I have to edit a script to get this working and install the server on a different drive?

Best regards,

Paul



At the end of this process, automatically generated files should appear in the `C:\Server\data\DB\data` directory:

[Reply](#)



Alex says:

April 16, 2022 at 2:36 am

Hello! Please pay attention to the setting of the **my.ini** file, as it contains the absolute path to the folder where the database is stored.

```
1 [mysqld]
2 sql_mode=NO_ENGINE_SUBSTITUTION,STRICT_TRANS_TABLES
3 datadir="d:/Server/data/DB/data/"
4 default_authentication_plugin=mysql_native_password
```

[Reply](#)



Paul Gottgens says:

April 21, 2022 at 9:12 am

Hi Alex,

Thank you very much. That will do it.

Best regards,

Paul

[Reply](#)



Flavius Popa says:

July 25, 2022 at 12:19 am

One of the best tutorial I ever seen! Thank you so much!

[Reply](#)



Robert says:

September 8, 2022 at 2:29 am

Hi Alex I made a big mistake, I had an outdated version of mysql so I grabbed this folder and cut it by placing it on an external drive and installed the latest version of mysql, but I did not take into account the databases that I had created, so I went to the folder called data of the old version of mysql and copied and pasted them in the new folder of the latest version, but those databases do not appear, do you know if I can recover that information with the files .ibd, they are practice projects but I do not want to lose that information, if you know any trick you could help me please.

[Reply](#)



Dang says:

September 9, 2022 at 1:43 am

Hi Alex,

I have done the right steps but cant login to Mysql Server.

Error: mysqli::real_connect(): (HY000/2002): No connection could be made because the target machine actively refused it

[Reply](#)





Faisal Ali says:

October 21, 2022 at 9:17 pm

Hi Alex,

I followed the same instructions, but now <http://localhost/phpmyadmin> is showing an empty white screen.

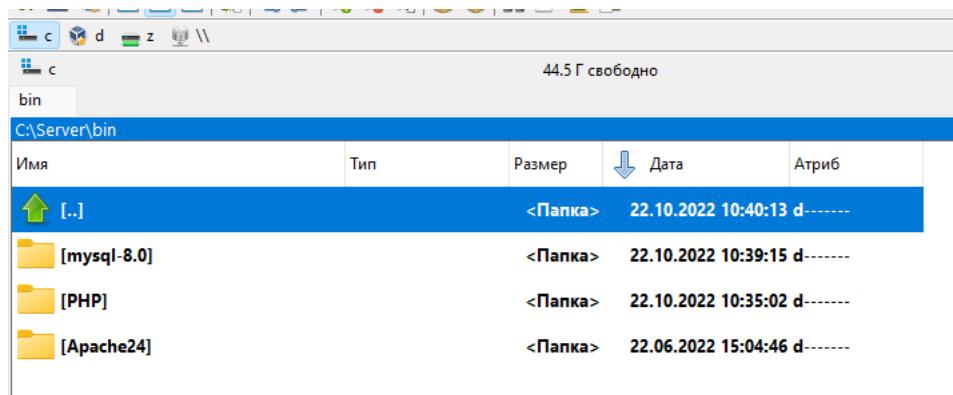
[Reply](#)



Alex says:

October 22, 2022 at 5:03 am

Hello! I completely uninstalled my web server, rebooted my computer, opened this manual, downloaded the latest versions of each program, and reinstalled everything.



Everything just works. phpMyAdmin just works too:

The screenshot shows the phpMyAdmin dashboard for a MySQL server running on localhost. The left sidebar lists databases: information_schema, mysql, performance_schema, and sys. The main area has several panels:

- Основные настройки (General settings):** Includes options to change the password and set the connection encoding to utf8mb4_unicode_ci.
- Сервер баз данных (Database server):** Lists server details: Type: MySQL, Connection: SSL not used, Version: 8.0.31 - MySQL Community Server - GPL, Protocol version: 10, User: root@localhost, and Character set: UTF-8 Unicode (utf8mb4).
- Настройки внешнего вида (Visual settings):** Shows the language as Russian and the theme as pmahomme.
- Веб-сервер (Web server):** Lists Apache/2.4.54 (Win64) PHP/8.1.11, MySQL version 8.1.11, PHP extensions mysqli, curl, mbstring, and PHP version 8.1.11.
- phpMyAdmin:** Information about the software version 5.2.0, documentation, official website, and help.

You somewhere made an inaccuracy in the instructions. Try looking for errors also in the **C:\Server\bin\Apache24\logs\access.log** file.

[Reply](#)



Waleed Ahmed says:

December 2, 2022 at 2:52 pm

Thanks a lot

This is the best and most comprehensive I found

[Reply](#)

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