

# Deploying PHP Open-Source Web Applications to the System i

A guide to installing several popular free packages

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**P**HP'S ARRIVAL ON SYSTEM I INTRODUCED more than a new web development tool. Immediately, System i users could select from thousands of open-source applications, free of charge.

This article provides tips for installing and configuring Zend Core for i5/OS — IBM's official PHP distribution — for successful use with open-source software. It shows, with special attention to System i concerns, how to install selected applications that manage web content, databases, and bugs. Because most open-source PHP programs use MySQL as their database, I also direct you to resources for installing MySQL.

Although you need no prior experience with PHP, you should have enough familiarity with the IFS to be able to connect to the IFS from a Windows workstation, copy files to the IFS, edit text files with EDTF or a text editor, and change file and folder authorities. You should also be able to extract files from zip and tar .gz compressed formats. One effective free program is ZipGenius ([zipgenius.it](http://zipgenius.it)).

All applications shown here are free of charge within the GNU General Public License (GPL — [gnu.org/copyleft/gpl.html](http://gnu.org/copyleft/gpl.html)), which states that you may use the applications without restriction. If you modify the programs and then release them to the public, however, you must release them free under the GPL. This stipulation does not affect most of us who just want to use the software.

## Start with a Solid PHP Installation

You will avoid many pitfalls if you start with these steps:

- Configure TCP/IP on your System i.
- Install current Portable Application Solutions Environment (PASE) PTFs ([www-03.ibm.com/servers/enable/site/porting/iseries/pase/misc.html](http://www-03.ibm.com/servers/enable/site/porting/iseries/pase/misc.html)). This step is crucial for trouble-free functioning of Zend Core and MySQL.
- Verify Zend Core's prerequisites as listed in its release

notes. Click the "release notes" link on the Zend Core for i5/OS page ([zend.com/products/zend\\_core/zend\\_for\\_i5\\_os](http://zend.com/products/zend_core/zend_for_i5_os)). If the superseded program Crypto Access Provider 128 bit/5722ac3 is listed as a prerequisite, you can ignore it.

- Install Zend Core from the Zend i5/OS page. Click Download, register for the Zend Network, then download and install Zend Core according to its instructions.
- Update your Zend Core software by selecting
  1. GO ZENDCORE/ZCMENU
  2. Update via Zend Network menu (option 2)
  3. Change Network ID user/password (option 1) using Zend Network registration values
  4. Update Zend Core components (option 5)

## Test Both Apache Servers

Zend Core includes two Apache web instances, one listening on port 8000 and another on port 89. Test them both. Start Zend Core and its PASE-based Apache server with GO ZENDCORE/ZCMENU, followed by Start Zend Core Subsystem (option 1). Zend's PHP-enabled Apache instance that resides in PASE starts in subsystem ZEND. The instance listening on port 8000 has the job name ZENDCOREAP. Ensure that your web browser can access the Zend administration GUI via your IP address or domain name (e.g., <http://www.example.org:8000/ZendCore>).

Next, start the Apache ILE (native i5/OS) Zend web server:

```
STRTCPSVR SERVER(*HTTP) HTTPSVR(ZENDCORE)
```

This Apache instance is a standard IBM i5 web server, residing in the ILE environment. Listening on port 89, its job name is ZENDCORE. According to Sam Pinkhasov, Zend's IBM System i project manager, IBM and Zend created this second instance so users could integrate PHP with existing System i features, such as SSL encryption. This instance connects to the PHP-enabled server via

reverse proxy. Ensure that your web browser can access the sample home page at your IP address or domain name (e.g., <http://www.example.org:89>).

## Make Configuration Changes

I strongly recommend that you make several configuration changes to Zend Core to prepare for open-source applications. Figure 1 shows my recommendations, and Figure 2 shows the names and locations of primary configuration and error files associated with Zend Core.

## PmWiki: Collaborative Wiki Software

PmWiki ([pmwiki.org](http://pmwiki.org)) uses wiki technology — which allows anyone to edit web pages by clicking an “edit” link on the page itself — to create custom websites. One example is WikiPublisher ([wikipublisher.org](http://wikipublisher.org)). As with most wikis, PmWiki remembers the history of changes. It also lets users search the site for any desired text. Wikis are valuable tools for collaborative documentation and project management, as well as other uses.

Because PmWiki stores all data in flat files, not in a database, it is relatively easy to install.

1. At [pmwiki.org](http://pmwiki.org), click Download and select the latest stable or beta release. I chose pmwiki-2.2.0-beta15.zip.
2. Within `/www/zendcore/htdocs/` on your System i's IFS, create the folder pmwiki.
3. Extract the zip file's contents. Inside one or two

subdirectory layers, you will find cookbook, docs, and other files and folders. Copy this content to `/www/zendcore/htdocs/pmwiki`.

4. Verify that your browser can access PmWiki. Go to <http://www.example.org:89/pmwiki/pmwiki.php>.

If an error occurs, you probably need to give the default user (NOBODY) more authority. If you see the default PmWiki home page, congratulations! You installed PmWiki successfully.

You are now ready to edit the pages on your PmWiki site. Here are a few tips to get you started:

- Triple quotes create “bold text.”
- Braces and plus signs {+make underlined text+}.
- Percent signs with the name of a color will %red%add color%%.
- Double brackets produces a link that, when clicked, creates a [[Alan.NewPage | new page]].

Figure 3 shows a sample PmWiki page after editing.

## MySQL Open-Source Database

Before installing the other applications in this article, you must install the MySQL database server. PHP can work with most common databases, including DB2 for i5/OS. Because of MySQL's good reputation in the open-source world and licensing that permits free use, most open-source PHP applications use MySQL.

**FIGURE 1**

Zend Core configurations

File to Edit	Recommended Settings or Directives	Notes
HTTP config file for ILE (i5/OS) Apache instance <code>/www/zendcore/conf/conf.htpd</code>	<code>ProxyPreserveHost On</code>	Tells proxy server (:89) to pass <code>SERVER_NAME</code> , <code>HTTP_HOST</code> variables to PASE server (:8000), where applications run. Web programs rely on these variables.
PHP's configuration file (PHP.INI) <code>/usr/local/zend/core/etc/php.ini</code>	[Date] <code>date.timezone = America/New_York;</code> or whatever your time zone is	Defines the default time zone that PHP's date functions will use.  All supported time zones, formatted properly, are listed in the PHP manual: <a href="http://php.net/manual/en/timezones.php">php.net/manual/en/timezones.php</a> .
PHP.INI (again) <code>/usr/local/zend/core/etc/php.ini</code>	[mail function] <code>SMTP = mail.example.org</code> <code>smtp_port = 25</code> <code>sendmail_from = admin@example.org</code>	PHP's mail() function, as implemented in Zend Core, sends messages using SMTP. Any application that sends e-mail needs to know which SMTP server to use.  PHP.INI contains three settings that control mail, all under the [mail function] heading.
Note: The mail settings can also be entered with the Zend Core Administrative GUI.		<ul style="list-style-type: none"> <li>• SMTP: Name of an SMTP server, such as System i's included SMTP service, to send mail through; the name SMTP must be in all capital letters</li> <li>• smtp_port: Port number used by SMTP server (default: 25)</li> <li>• sendmail_from (optional): Default “from” e-mail address</li> </ul>

**FIGURE 2**

Useful files and locations

Setting	Default
Document root (where to put web content, such as PHP files)	/www/zendcore/htdocs
PHP configuration file, php.ini	/usr/local/zend/core/etc/php.ini
HTTP config file for PHP-enabled (PASE) Apache instance	/usr/local/zend/apache/conf/conf.httpd
HTTP config file for ILE (i5/OS) Apache instance	/www/zendcore/conf/conf.httpd
Error log for PHP (look here first for errors)	/usr/local/zend/core/logs/php_error_log
Error logs for PASE Apache server	/usr/local/zend/apache2/logs/error_log.*
Error log for MySQL	/usr/local/mysql/[datadir]/[hostname].err Where [datadir] is either "data" or "var," and [hostname] is your fully qualified hostname, such as myi5.example.org

operating system, MySQL has its own set of authorized users, separate from the operating system on which it runs. MySQL's superuser — its equivalent of i5/OS's QSECOFR — is called "root." By default, root has no password. You should create a password (instructions given during installation) and remember it, because you use it to sign in to MySQL applications.

## Enable the MySQL Extension in Zend Core

Zend Core includes many optional components, called PHP extensions. The MySQL extension is disabled by default. To allow PHP to access MySQL data, enable the extension as follows:

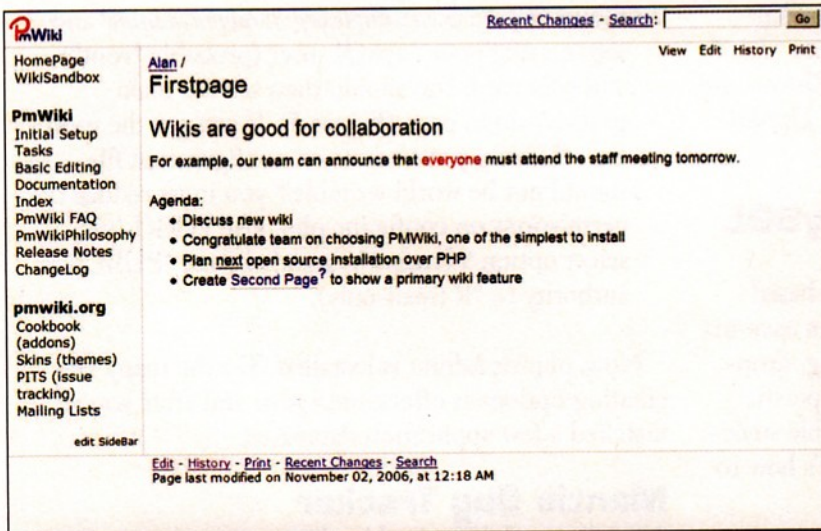
1. From your browser, launch the administration site running on your server (*http://www.example.org:8000/ZendCore*).
2. Click Configuration/Extensions.
3. Scroll down until you see "MySQL" (Figure 4). You will see small images of a light bulb and a red or green switch. If the light bulb is yellow, the extension is enabled. If it's white, click the red switch, turning the switch green. Click Save settings.
4. Restart Apache from a command line by typing `GO ZENDCORE/ZCMENU` and selecting ReStart Apache server instances (option 6).

## Install MySQL

For administrators willing to work with the PASE command line, MySQL is easy to install. To manage (i.e., start and stop) MySQL from the ILE (i5/OS) environment, though, requires extra work. Thankfully, a shortcut is available.

Rob Ward, a pioneer in bringing PHP and MySQL to System i, has created an installation wrapper for MySQL. Ward, director of IT at M-C Industries, Inc., a custom manufacturing and embroidering company, provides this free download at *i5php.net*. The software installs MySQL v4 on i5/OS V5R3 and later. Here are the main installation steps:

1. Install current PASE PTFs from *www-03.ibm.com/servers/enable/site/porting/series/pase/misc.html*.
2. Go to *i5php.net*. Click Downloads | MySQL. Choose MySQL Server for i5/OS v4.x (where x is the minor version number), then click Download Now.

**FIGURE 3**

Web page created with PmWiki

Neither Zend nor IBM supports MySQL, but they do provide a convenient environment for it. Zend Core for i5/OS has a MySQL extension, permitting PHP to use MySQL, which Zend uses as the internal database for Zend Platform, an add-on tool made and sold by Zend to enhance the performance and reliability of PHP.

## MySQL Security

Although DB2/i5 inherits its security scheme from the

