

PHP: Hypertext Preprocessor

PHP is a general-purpose server-side scripting language originally designed for Web development to produce dynamic Web pages. It is one of the first developed server-side scripting languages to be embedded into an HTML source document rather than calling an external file to process data. The code is interpreted by a Web server with a PHP processor module which generates the resulting Web page. It also has evolved to include a command-line interface capability and can be used in standalone graphical applications. PHP can be deployed on most Web servers and also as a standalone shell on almost every operating system and platform free of charge. A competitor to Microsoft's Active Server Pages (ASP) server-side script engine and similar languages, PHP is installed on more than 20 million Web sites and 1 million Web servers. Software that uses PHP includes **Joomla**, **Wordpress**, **Concrete5**, **MyBB**, and **Drupal**.

PHP was originally created by **Rasmus Lerdorf** in **1995**. The main implementation of PHP is now produced by The PHP Group and serves as the formal reference to the PHP language. PHP is free software released under the PHP License, which is incompatible with the GNU General Public License (GPL) due to restrictions on the usage of the term PHP. While PHP originally stood for “**Personal Home Page**”, it is now said to stand for “**PHP: Hypertext Preprocessor**”, a recursive acronym.

Characteristics of PHP

The main characteristics of PHP are:

- PHP is web-specific and open source
- Scripts are embedded into static HTML files
- Fast execution of scripts
- Fast access to the database tier of applications
- Supported by most web servers and operating systems
- Supports many standard network protocols libraries available for IMAP, NNTP, SMTP, POP3
- Supports many database management systems libraries available for UNIX DBM, MySQL, Oracle
- Dynamic Output any text, HTML XHTML and any other XML file
- Also Dynamic Output images, PDF files and even Flash movies
- Text processing features, from the POSIX Extended or Perl regular expressions to parsing XML documents
- A fully featured programming language suitable for complex systems development

Three main uses of PHP

Server-side scripting -- This is the most traditional and main target field for PHP. You need three things to make this work:

- The PHP parser (CGI or server module),
- A web server -- needs a connected PHP installation

- A web browser -- access PHP page through URL

Command line scripting -- You can make a PHP script to run without any server or browser. You only need the PHP parser to use it this way. These scripts can also be used for simple text processing tasks similar to PERL.

Writing client-side GUI applications -- PHP is probably not the very best language to write windowing applications, but PHP-GTK (PHP Graphics Tool Kit) can be used to write such programs.

PHP Usage

PHP is a general-purpose scripting language that is especially suited to server-side web development where PHP generally runs on a web server. Any PHP code in a requested file is executed by the PHP runtime, usually to create dynamic web page content or dynamic images used on Web sites or elsewhere. It can also be used for command-line scripting and client-side graphical user interface (GUI) applications. PHP can be deployed on most Web servers, many operating systems and platforms, and can be used with many relational database management systems (RDBMS). It is available free of charge, and the PHP Group provides the complete source code for users to build, customize and extend for their own use.

PHP acts primarily as a filter, taking input from a file or stream containing text and/or PHP instructions and outputting another stream of data; most commonly the output will be HTML. Since PHP 4, the PHP parser compiles input to produce bytecode for processing by the Zend Engine, giving improved performance over its interpreter predecessor.

Originally designed to create dynamic Web pages, PHP now focuses mainly on server-side scripting, and it is similar to other server-side scripting languages that provide dynamic content from a Web server to a client, such as **Microsoft's ASP.NET**, **Sun Microsystems' JavaServer Pages**, and **mod_perl**. PHP has also attracted the development of many frameworks that provide building blocks and a design structure to promote rapid application development (RAD). Some of these include **CakePHP**, **Symfony**, **CodeIgniter**, **Yii Framework**, and **Zend Framework**, offering features similar to other web application frameworks.

The **LAMP** architecture has become popular in the Web industry as a way of deploying Web applications. **PHP** is commonly used as the **P** in this bundle alongside **Linux**, **Apache** and **MySQL**, although the **P** may also refer to **Python** or **Perl** or some mix of the three. Similar packages are also available for Windows and OS X, then called **WAMP** and **MAMP**, with the first letter standing for the respective operating system.

Popular Implementation of PHP

As of April 2007, over 20 million Internet domains had Web services hosted on servers with PHP installed and **mod_php** was recorded as the most popular Apache HTTP Server module. PHP is used as the server-side programming language on 75% of all Web sites. Web content management systems written in PHP include **MediaWiki**, **Joomla**, **eZ Publish**, **SilverStripe**,

WordPress, Drupal and Moodle. All Web sites created using these tools are written in PHP, including the user-facing portion of **Wikipedia, Facebook, and Digg.**

Security in PHP

About 30% of all vulnerabilities listed on the National Vulnerability Database are linked to PHP. These vulnerabilities are caused mostly by not following best practice programming rules: technical security flaws of the language itself or of its core libraries are not frequent (23 in 2008, about 1% of the total). Recognizing that programmers make mistakes, some languages include taint checking to detect automatically the lack of input validation which induces many issues. Such a feature is being developed for PHP, but its inclusion in a release has been rejected several times in the past.

There are advanced protection patches such as Suhosin and Hardening-Patch, especially designed for Web hosting environments.

PHPIDS adds security to any PHP application to defend against intrusions. PHPIDS detects attacks based on *cross-site scripting* (XSS), SQL injection, header injection, directory traversal, remote file execution, remote file inclusion, and *denial-of-service* (DoS).