

如何快速开发一个 PHP 扩展（PHP 扩展开发图文教程）

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很早时候就开始关注 PHP 底层方面的开发，比较有名的[抚琴居](#)翻译的《Zend API，深入 PHP 内核》还有[鸟哥 Larurence 的博客](#)等，记得当时看了他们有关 PHP 内核底层的介绍后，自己也从 PHP 官方下载了份源码大致看了下，印象比较深的就是 ext 目录下对应 PHP_FUNCTION(array)等函数的实现，但是由于平常工作比较忙，只是关注这方面，没有真正动手去做，如果你对 PHP 扩展开发以及 PHP 内核感兴趣，那就抽出点时间亲自动手来实践下，你会感觉到编程无穷的魅力。

进入主题：

需求：开发一个 hello world 扩展，要求输入一个字符串，可以 hello world 出来

开发环境：Centos5.5+PHP5.2.17+Nginx1.0

首先来张整体开发流程图（前雅虎工程师画的）：



第一步：准备好 PHP 扩展开发环境；

下载一份 PHP 源码，我的是 PHP5.2.17，加入我们的 LNMP 环境已经安装好了，php 安装在 /usr/local/php 目录下，PHP 源码在 /home/wanghaihan/lnmp/php-5.2.17

第二步：用 ext_skel 生成扩展开发框架；

用 C 语言编写 PHP 的扩展模块的方法有几种，根据最后的表现形式有两种，一种是直接编译进 php，一种是编译为 php 的 so

扩展模块来被 php 调用，另外根据编译的方式有两种，一种使用 phpize 工具（php 编译后有的），一种使用 ext_skel 工具（php 自带的），我们使用最多，也是最方便的方式就是使用 ext_skel 工具来编写 php 的 so 扩展模块，这里也主要介绍这种方式。

```
1 cd /home/wanghaihan/lamp/php-5.2.17/ext
2 ./ext_skel --extname=phpwebgo
3 cd /home/wanghaihan/lamp/php-5.2.17/ext/phpwebgo
4 ls
```

```
[root@localhost php-5.2.17]# cd ext
[root@localhost ext]# ls
bcmath          fdf             mcrypt         pdo             session        sysvshm
bz2             filter         mhash         pdo_dblib      shmop          tidy
calendar       ftp            mime_magic    pdo_firebird  simplexml     tokenizer
com_dotnet     gd             ming          pdo_mysql      skeleton       wddx
ctype          gettext        msql          pdo_oci        snmp           xml
curl           gmp           mssql         pdo_odbc       soap          xmlreader
date           hash          mysql         pdo_pgsql      sockets        xmlrpc
dba            iconv         mysqli        pdo_sqlite     spl            xmlwriter
dbase          imap          ncurses      pgsqllite     sqlite         xsl
dom            interbase     ocis          posix          standard       zip
exif           json          odbc         pspell        sybase         zlib
ext_skel       ldap          openssl       readline      sybase_ct
ext_skel_win32.php libxml        pcntl         recode        sysvmsg
fbsql         mbstring     pcre         reflection    sysvsem
```

[root@localhost ext]# ./ext_skel --extname=phpwebgo → 生成PHP扩展phpwebgo框架

```
[root@localhost ext]# ./ext_skel --extname=phpwebgo → 执行此命令后出现以下提示
Creating directory phpwebgo
Creating basic files: config.m4 config.w32 .cvsignore phpwebgo.c php_phpwebgo.h
CREDITS EXPERIMENTAL tests/001.phpt phpwebgo.php [done].

To use your new extension, you will have to execute the following steps:
```

```
1. $ cd ..
2. $ vi ext/phpwebgo/config.m4
3. $ ./buildconf
4. $ ./configure --[with|enable]-phpwebgo → 自动生成编写PHP扩展步骤
5. $ make
6. $ ./php -f ext/phpwebgo/phpwebgo.php
7. $ vi ext/phpwebgo/phpwebgo.c
8. $ make
```

Repeat steps 3-6 until you are satisfied with ext/phpwebgo/config.m4 and step 6 confirms that your module is compiled into PHP. Then, start writing code and repeat the last two steps as often as necessary.

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```
[root@localhost ext]# ls
acornb      fzf          kscript     pdo          reflection  sysvsem
bz2         filter       libhash     pdo_dblib    session     sysvshm
calendar   ftp          mime_magic  pdo_firebird shmcp        tidy
cvs_ssh     gd           ming        pdo_mysql    simplexml   tokenizer
ctype      gettext     mysqli      pdo_oci      skeleton     wddx
curl        gzip        mysql       pdo_odbc     snmp         xml
date        hash        mysql       pdo_pgsql    soap         xmlreader
dba         iconv       mysql       pdo_sqlite   sockets      xmlrpc
dbase       imap        ncurses    pgsql        ssl          xmlwriter
dbm         interbase   oci8        phpwebgo     standard     xsl
dbf         json        odbc       posix        sybase       zip
ext_skel    ldap        openssl    postgres    sybase       zlib
ext_skel_win32.php libxml      ponti      readline    tbase of
libxml     libstring   pore       recc
```

生成了phpwebgo文件夹

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vi config.m4

打开文件后去掉 `dnl` ， 保存后获得下面的信息:

PHP_ARG_ENABLE(`phpwebgo`, whether to enable `phpwebgo` support,
Make sure that the comment is aligned:

```
[ --with-phpwebgo          Include phpwebgo support ])
```

```
[root@localhost ext]# cd phpwebgo/
[root@localhost phpwebgo]# ls
config.m4  CREDITS      php_phpwebgo.h  phpwebgo.php
config.w32  EXPERIMENTAL  phpwebgo.c
[root@localhost phpwebgo]# vi config.m4
```

```
dnl $Id$
dnl config.m4 for extension phpwebgo

dnl Comments in this file start with the string 'dnl'.
dnl Remove where necessary. This file will not work
dnl without editing.

dnl If your extension references something external, use with:

dnl PHP_ARG_WITH/phpwebgo, for phpwebgo support,
dnl Make sure that the comment is aligned:
dnl [ --with-phpwebgo          Include phpwebgo support])

dnl Otherwise use enable:

dnl PHP_ARG_ENABLE/phpwebgo, whether to enable phpwebgo support,
dnl Make sure that the comment is aligned:
dnl [ --enable-phpwebgo      Enable phpwebgo support])

if test "$PHP_PHPWEBGO" != "no"; then
    dnl Write more examples of tests here...

    dnl # --with-phpwebgo -> check with-path
    dnl SEARCH_PATH="/usr/local /usr"      # you might want to change this
    dnl SEARCH_FOR="/include/phpwebgo.h"  # you most likely want to change this
    dnl if test -r $PHP_PHPWEBGO/$SEARCH_FOR; then # path given as parameter
    dnl     PHPWEBGO_DIR=$PHP_PHPWEBGO
    dnl else # search default path list
    dnl     AC_MSG_CHECKING([for phpwebgo files in default path])
    dnl     for i in $SEARCH_PATH ; do
    dnl         if test -r $i/$SEARCH_FOR; then
    dnl             PHPWEBGO_DIR=$i
    dnl             AC_MSG_RESULT(found in $i)
    dnl         fi
    dnl     done
    dnl fi
```

→ 去掉这里的三行dnl注释，其他的暂时不考虑

第三步：编写核心代码；

vi php_phpwebgo.h

找到：PHP_FUNCTION(confirm_phpwebgo_compiled);，新增一行：

PHP_FUNCTION/phpwebgo_helloworld);

保存退出

```
[root@localhost phpwebgo]# vi php_phpwebgo.h
extern zend_module_entry phpwebgo_module_entry;
#define phpext_phpwebgo_ptr &phpwebgo_module_entry

#ifdef PHP_WIN32
#define PHP_PHPWEBGO_API __declspec(dllexport)
#else
#define PHP_PHPWEBGO_API
#endif

#ifdef ZTS
#include "TSRM.h"
#endif

PHP_MINIT_FUNCTION(phpwebgo);
PHP_MSHUTDOWN_FUNCTION(phpwebgo);
PHP_RINIT_FUNCTION(phpwebgo);
PHP_RSHUTDOWN_FUNCTION(phpwebgo);
PHP_MINFO_FUNCTION(phpwebgo);

PHP_FUNCTION(confirm_phpwebgo_compiled); /* For testing, remove later. */
PHP_FUNCTION(phpwebgo_helloworld); 增加此行代码

/*
    Declare any global variables you may need between the BEGIN
    and END macros here:

ZEND_BEGIN_MODULE_GLOBALS(phpwebgo)
    long global_value;
    char *global_string;
ZEND_END_MODULE_GLOBALS(phpwebgo)
*/
```

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vi phpwebgo.c

数组里增加我们的函数，找到 zend_function_entry phpwebgo_functions[]，增加：

PHP_FE(phpwebgo,NULL)

```
#ifdef HAVE_CONFIG_H
#include "config.h"
#endif

#include "php.h"
#include "php_ini.h"
#include "ext/standard/info.h"
#include "php_phpwebgo.h"

/* If you declare any globals in php_phpwebgo.h uncomment this:
ZEND_DECLARE_MODULE_GLOBALS(phpwebgo)
*/

/* True global resources - no need for thread safety here */
static int le_phpwebgo;

/* {{{ phpwebgo_functions[]
 *
 * Every user visible function must have an entry in phpwebgo_functions[].
 */
zend_function_entry phpwebgo_functions[] = {
    PHP_FE(confirm_phpwebgo_compiled, NULL) /* For testing, remove later. */
    PHP_FE(phpwebgo_helloworld,NULL) 增加此行代码
    {NULL, NULL, NULL} /* Must be the last line in phpwebgo_functions[] */
};
/* }}} */

/* {{{ phpwebgo_module_entry
 */
zend_module_entry phpwebgo_module_entry = {
```

www.php

打开 phpwebgo.c 文件，在 PHP_MINFO_FUNCTION 里面加入以下代码：

```
1 php_info_print_table_row(2, "version", "0.1");
2 php_info_print_table_row(2, "author", "coldsea");
3 php_info_print_table_row(2, "homepage", "www.phpwebgo.com");
```



```
root@localhost/home/wanghaihan/lmp/php-5.2.17/ext/phpwebgo
PHP_RSHUTDOWN_FUNCTION(phiwebgo)
{
    return SUCCESS;
}
/* }}} */

/* {{{ PHP_MINFO_FUNCTION
*/
PHP_MINFO_FUNCTION(phiwebgo)
{
    php_info_print_table_start();
    php_info_print_table_header(2, "phpwebgo support", "enabled");
    php_info_print_table_row(2, "version", "0.1");
    php_info_print_table_row(2, "author", "coldsea");
    php_info_print_table_row(2, "homepage", "www.phpwebgo.com");
    php_info_print_table_end();

    /* Remove comments if you have entries in php.ini
    DISPLAY_INI_ENTRIES();
    */
}
/* }}} */

/* Remove the following function when you have successfully modified config.m4
so that your module can be compiled into PHP, it exists only for testing
purposes. */

/* Every user-visible function in PHP should document itself in the source */
/* {{{ proto string confirm_phpwebgo_compiled(string arg)
Return a string to confirm that the module is compiled in */
PHP_FUNCTION(confirm_phpwebgo_compiled)
{
    char *arg = NULL;
    int arg_len, len;
    char *strg;

    if (zend_parse_parameters(ZEND_NUM_ARGS() TSRMLS_CC, "s", &arg, &arg_len) == FAILURE) {
        return;
    }
}
```

再到 phpwebgo.c 文件最后面增加如下代码：

```
01 PHP_FUNCTION(phiwebgo_helloworld)
02 {
03     char *arg = NULL;
04     int arg_len, len;
05     char *strg;
06
07     if (zend_parse_parameters(ZEND_NUM_ARGS() TSRMLS_CC, "s", &arg,
08 &arg_len) == FAILURE) {
09         return;
10     }
11     len = sprintf(&strg, 0, "Hello World,welcome to
12 www.phpwebgo.com!This is my first php extension.Your input: %s/n",
13 arg);
14     RETURN_STRINGL(strg, len, 0);
15 }
```

保存退出


```
root@localhost:/home/wanghaihan/lrmp/php-5.2.17/ext/phpwebgo
default_mimetype = "text/html"
;default_charset = "iso-8859-1"

; Always populate the $HTTP_RAW_POST_DATA variable.
;always_populate_raw_post_data = On

;;;;;;;;;;;;;;;;;;;;;;;;;
; Paths and Directories ;
;;;;;;;;;;;;;;;;;;;;;;;;;

; UNIX: "/path1:/path2"
;include_path = "./php/includes"
;
; Windows: "\path1;\path2"
;include_path = ".:c:\php\includes"

; The root of the PHP pages, used only if nonempty.
; if PHP was not compiled with FORCE_REDIRECT, you SHOULD set doc_root
; if you are running php as a CGI under any web server (other than IIS)
; see documentation for security issues. The alternate is to use the
; cgi.force_redirect configuration below
doc_root =

; The directory under which PHP opens the script using /~username used only
; if nonempty.
user_dir =

; Directory in which the loadable extensions (modules) reside.
extension_dir = "/usr/local/php/lib/php/extensions/no-debug-non-zts-20060613/"
extension = "memcache.so"
extension = "pdo_mysql.so"
extension = "yaf.so"
extension = "phpwebgo.so" → 编辑php.ini, 增加此代码

; Whether or not to enable the dl() function. The dl() function does NOT work
; properly in multithreaded servers, such as IIS or Zeus, and is automatically
; disabled on them.
enable_dl = On
```

第五步：测试扩展是否正常配置运行

重启 Nginx 服务器，查看 phpinfo(); 应该能看到如下信息：

PDO Driver for SQLite 3.x	enabled
PECL Module version	(bundled) 1.0.1 \$Id: pdo_sqlite.c 293036 2010-01-03 09:23:27Z sebastian \$
SQLite Library	3.3.7

phpwebgo → 代表phpwebgo扩展正常

phpwebgo support	enabled
version	0.1
author	coldsea
homepage	www.phpwebgo.com

posix

Revision	\$Revision: 293036 \$
-----------------	-----------------------

Reflection

Reflection	enabled
Version	\$Id: php_reflection.c 300129 2010-06-03 00:43:37Z felipe \$

session

Session Support	enabled
Registered save handlers	files user sqlite memcache
Registered serializer handlers	php php_binary

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编写一个测试脚本：

```
1 <?php
2 echo phpwebgo_helloworld("欢迎来到www.phpwebgo.com网站!");
3 ?>
```

← → ↺ ↻ 192.168.1.190/t.php

Hello World,welcome to www.phpwebgo.com!This is my first php extension.Your input:欢迎来到www.phpwebgo.com网站

若看到此信息，代表扩展开发成功

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