



The PHP Company

# PHP Open Source Toolkit for IBM i

Mike Pavlak

Solution Consultant

# Agenda

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- Zend Server 5.1 update...
- **Architecture of the Open Source PHP Toolkit**
- Beta Preview
- Sample scripts
- What's next?
- Q&A

# PHP Open Source Toolkit for IBM i

[www.zend.com](http://www.zend.com)

## Zend Server 5.1 Update

# Zend Server 5.1 for IBM i

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## Key Features

- ▶ Shipping with IBM i 6.1 & 7.1
- ▶ Oracle Database Connector
- ▶ New Open Source Toolkit **\*\*\*Beta\*\*\***
- ▶ Performance enhancements
- ▶ PHP 5.3.6
- ▶ Zend Framework 1.11.3
- ▶ MySQL DB2 Storage Engine update



# Requirements for Zend Server 5.1

- Check the release notes with EVERY release!!!
  - ▶ Go to Zend.com Website
  - ▶ Navigate to Products→ Zend Server→Resource Library
  - ▶ Scroll down to Zend Server for IBM i
- PTF's: Best to install Cumulative PTF and Group for HTTP

## \* Required PTFs

Version	Licensed Program	PTF	Group PTF
V5R4	5722DG1 5722SS1	SI36026 SI36004	Current PTF group (minimum SF99114 - Group 22)
6.1	5761DG1 5761SS1	SI36027 SI36005	Current PTF group (minimum SF99115 - Group 13)
7.1	5761DG1		Current PTF group (minimum SF99368 - Group 1)

# PHP Open Source Toolkit for IBM i

[www.zend.com](http://www.zend.com)

## Toolkit Architecture

# Open Source PHP Toolkit

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- **Open Source!**
  - ▶ Community Involvement can improve it
  - ▶ Customer can tweak!
  - ▶ Usher new era for IBM i developer!!!
- **Collaboration between IBM and Zend**
- **Built on ILE RPG, Stored procedures and pure PHP**
- **Speed improvement over current toolkit**
- **Cross Platform Solution, run PHP scripts on desktop to IBM i**
- **Object Oriented, but not too much!**

# New Toolkit Has Two Components

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- IBM <http://systeminetwork.com/archivesearch/issue/1/2011/65864>
  - ▶ XML Service
  - ▶ Article by Brian May from April 2011
- Zend
  - ▶ ToolkitService() Class
  - ▶ Article by Mike Pavlak from April 2011
- Need IBM PTF's! (See Release Notes!)



# XML Service lives at YiPs!

**YiPs** Young i Professionals  
The Future of the IBM i Platform

Be sure to vote in our poll.

Wiki Forum Open Source Sandbox Articles Reviews Blog News Events Links VLC

Home > Wiki

## Young i Professionals Wiki

View Edit History Print

### Home Page

Welcome to the Young i Professionals home on the web. We're still busy working on the site and will continue to add new features as we finish them. Check out the links to various locations on our site and stay tuned for updates.

If you wish to contribute content to this wiki, the YiPs forum link on the side bar will provide you with the wiki site edit password after you register. When this site has phpBB application available a full user authentication will be hosted through phpBB (see [PmWikiInfo](#)).

- **General How To's**
  - Servlets in JSP
  - PHP with RPG
  - PHP ibm\_db2
  - DB2 Connect
  - FastCGI
  - PostgreSQL
  - XML Call
  - PGM/SRVPGM

Recent Changes

**Events Calendar**

<< August 2011 >>

Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

**Polls**

**Does your shop use packaged IBM i apps or apps written in-house?**

- All applications are packaged.
- All applications are packaged but customized.
- Mixture of packaged and in-house written applications.
- We write all of our own apps.

Vote Results

**Recent Visitors**

Click to Get **FEEDJIT**

# Get your own copy of the code!

- RPG, XML & Stored Procedures

The screenshot shows the YIPs website interface. At the top, there's a navigation bar with links for Wiki, Forum, Open Source, Sandbox, Articles, Reviews, Blog, News, Events, Links, and VLC. The main content area is titled "Available Releases" and contains a table with the following data:

Version	State	Release Date	Downloads	
1.2.3	testing (new omit, hole, overlay)	2011-07-21	<a href="#">xmlservice-rpg-1.2.3.zip</a> <a href="#">xmlservice-php-tests-1.2.3.zip</a>	<a href="#">Changelog</a>
1.2.2	replaced	2011-07-20	<a href="#">xmlservice-rpg-1.2.2.zip</a>	<a href="#">Changelog</a>
1.2.1	replaced	2011-07-16	<a href="#">xmlservice-rpg-1.2.1.zip</a> <a href="#">xmlservice-php-tests-1.2.1.zip</a> <a href="#">xmlservice-php-demo-1.2.1.zip</a>	<a href="#">Changelog</a>
1.2	stable (faster)	2011-05-27	<a href="#">xmlservice-rpg-1.2.zip</a> <a href="#">xmlservice-php-tests-1.2.zip</a> <a href="#">xmlservice-php-demo-1.2.zip</a>	<a href="#">Changelog</a> Bugs (fixing next sub-version): <ul style="list-style-type: none"><li>■ intermittent disconnect fail</li><li>■ workaround: use wrkactjob 4-immed</li></ul>
1.09	beta GA (slower)	2011-03-21	<a href="#">xmlservice-rpg-1.09ga1-beta.zip</a> <a href="#">xmlservice-php-tests-1.09-beta.zip</a> <a href="#">xmlservice-php-demo-1.09ga-beta.zip</a>	<a href="#">Changelog</a> Bugs (fix next version): <ul style="list-style-type: none"><li>■ replace SAX XML limits (plugxml)</li></ul> Enhancements (next version): <ul style="list-style-type: none"><li>■ caching loop calls (high speed)</li></ul>

Below the table is a "Dependencies" section with the following text:

```
IBM i:  
- U6, or U7 (and USR4 mostly)  
- RPG compiler  
- PASE Option 22  
- Latest PTF cumulative: Java (also has PASE), HTTP, DB2  
- Latest release of Zend Server (5.1)  
  
PTF#s DB2 (or XMLSERVICE CLOBs fail iPLUGM, etc.):  
S109601/S109917 - U7R1  
S109609 - USR1  
S109610 - USR4  
Note: There are many other DB2 fixes,  
best to simply get the latest cumulative
```

On the right side of the page, there is an "Events Calendar" for August 2011 and a "Polls" section with the question "Does your shop use packaged IBM i apps or apps written in-house?". The poll options are:

- All applications are packaged.
- All applications are packaged but customized.
- Mixture of packaged and in-house written applications.
- We write all of our own apps.

There are "Vote" and "Results" buttons below the poll. Below the poll is a "Recent Visitors" section with a world map and a "Click to Get FREEDIT" button.

# XML Service

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- **Changelog Milestones**

- ▶ March 2011 - 1.09 beta

- Remote windows access

- ▶ May 2011 - 1.2 Stable GA

- Performance improvements

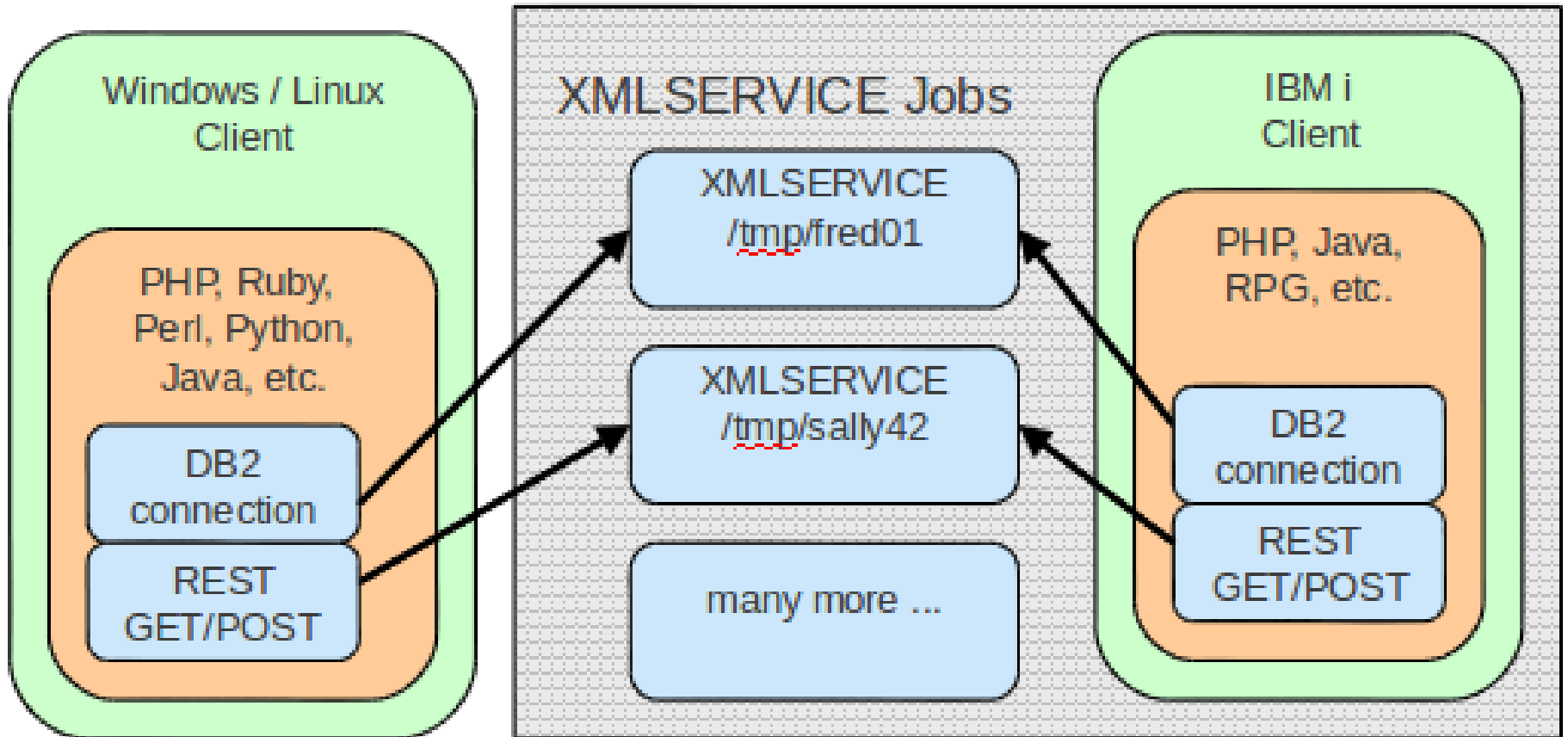
- ▶ July 2011 - 1.2.3

- More powerful structure processing, omit parms

<http://www.youngiprofessionals.com/wiki/XMLService/XMLSERVICEChangeLog>

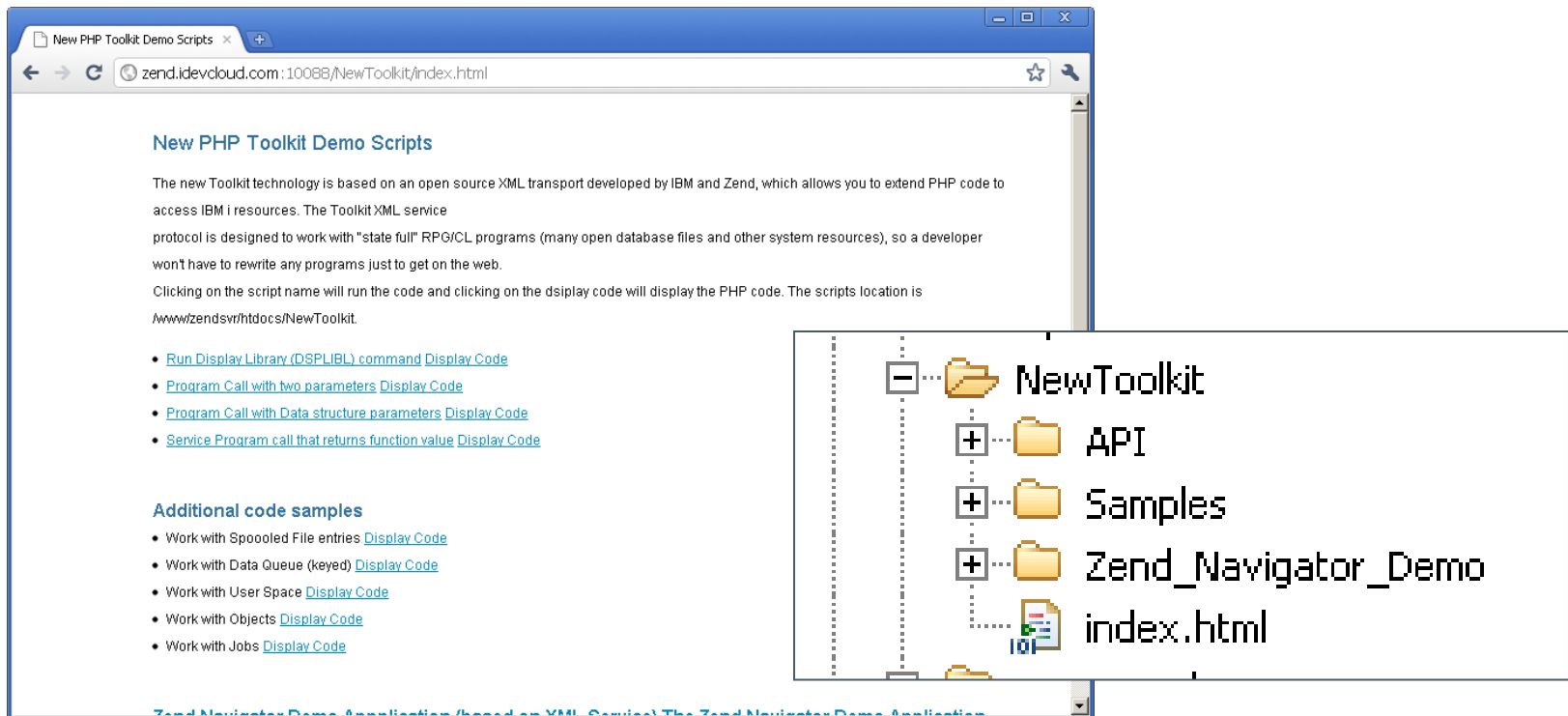
# Let's look at a high level

## System IBM i



# Samples!

- Located off the document root in directory NewToolkit!
- Contains sample program call, etc...



The image shows a web browser window displaying the "New PHP Toolkit Demo Scripts" page. The browser's address bar shows the URL "zend.idevcloud.com:10088/NewToolkit/index.html". The page content includes a title "New PHP Toolkit Demo Scripts", a paragraph explaining the technology, and a list of sample scripts with links to "Display Code".

Below the browser window, a file explorer view shows the directory structure of the "NewToolkit" folder. The contents are:

- NewToolkit (Folder)
- API (Folder)
- Samples (Folder)
- Zend\_Navigator\_Demo (Folder)
- index.html (File)

# Program Call

```
22 try {
23     $ToolkitServiceObj = ToolkitService::getInstance($db, $user, $pass, $extension);
24 }
25
26 catch (Exception $e)
27 {
28     echo $e->getMessage(), "\n";
29     exit();
30 }
31
32
33 $ToolkitServiceObj->setToolkitServiceParams(array('InternalKey'=>"/tmp/$user"));
34 $code = $_POST ['code'];
35 $desc = ' ';
36
37 $param[] = $ToolkitServiceObj->AddParameterChar('both', 10,'CODE', 'CODE', $code);
38 $param[] = $ToolkitServiceObj->AddParameterChar('both', 10,'DESC', 'DESC', $desc);
39
40
41 $result = $ToolkitServiceObj->PgmCall("COMMONPGM", "ZENDSVR", $param, null, null);
42
43 if($result){
44     showTable( $result['io_param']);
45 }
46 else
47     echo "Execution failed.";
48
49 /* Do not use the disconnect() function for "state full" connection */
50 $ToolkitServiceObj->disconnect();
```

# Oh My! That's Object-Oriented code!

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- Yes, yes it is. But....
- You do not need to know OO code to be able to use it
- After you master the art of Procedural PHP you should be looking at OO
- Check out my webcast: Intro to PHP OO
  - ▶ <http://www.zend.com/en/resources/webinars/i5-os>
- For LOTS of examples on how to use OO code try...
  - ▶ [www.phpclasses.org](http://www.phpclasses.org)
  - ▶ Zend “Higher Structures” course
- How about I take you for a little tour

# A little observability...

The screenshot shows the Zend Studio IDE with a PHP file named `*Call_RPG_exampleMP.php` open. The code is as follows:

```
25     }
26
27     catch (Exception $e)
28     {
29         echo $e->getMessage(), "\n";
30         exit();
31     }
32 /* */
33
34 $ToolkitServiceObj = new ToolkitService();
35 $ToolkitServiceObj->get
36
37
38 $ToolkitServiceObj->
39 $code = $_POST ['co
40 $desc = ' ';
41
42 $param[] = $Toolkits
43 $param[] = $Toolkits
44
45 $result = $ToolkitServiceObj->PgmCall("COMMONPGM", "ZENDSVR", $param, null,
46
47 if($result){
48     showTable( $result['io_param']);
49 }
```

A tooltip is displayed over the code, showing the signature of the `ToolkitService::getConnection()` method. The tooltip lists several other methods of the `ToolkitService` class, including `getConnection()`, `getInstance()`, `getLastError()`, `getOutputParam()`, `getSQLConnection()`, and `getToolkitServiceParam()`. The tooltip also shows the signature of the `ToolkitService::getConnection()` method, which is `getConnection($database, $user, $password, $extensionPref, $tmpDir, $code, $desc)`. The tooltip is highlighted in yellow.

# ToolkitService Class...

The screenshot displays the Zend Studio IDE with the ToolkitService.php file open. The left sidebar shows a project tree with folders like API, Db2su, iToolk, Odbc, and Toolkit. The main editor window shows the following PHP code:

```
<?php
include_once 'To
include_once 'To
include_once 'To
5
6 class ToolkitSer
7     private $XML
8     private $plu
9     private $plu
10    private $Int
11    private $Con
12    private $Inp
13    private $Out
14    private $XML
15    private $con
16    private $err
17    private $deb
18    private $enc
19
20    private $sub
21    private $t
22    private $pre
23    private $sta
24    private $per
25    private $lic

    'comment' => $comment, /*comment*/
    'var' => $varName, /*variable name*/
    'data' => $value, /*value */
    'varying' => $varying, /*varying on/varying off */
    'dim' => $dimension);/*number of array elements*/
}

static function AddParameterChar( $io, $size , $comment, $varName = ''
    return ( new CharParam( $io, $size , $comment, $varName, $valu
}

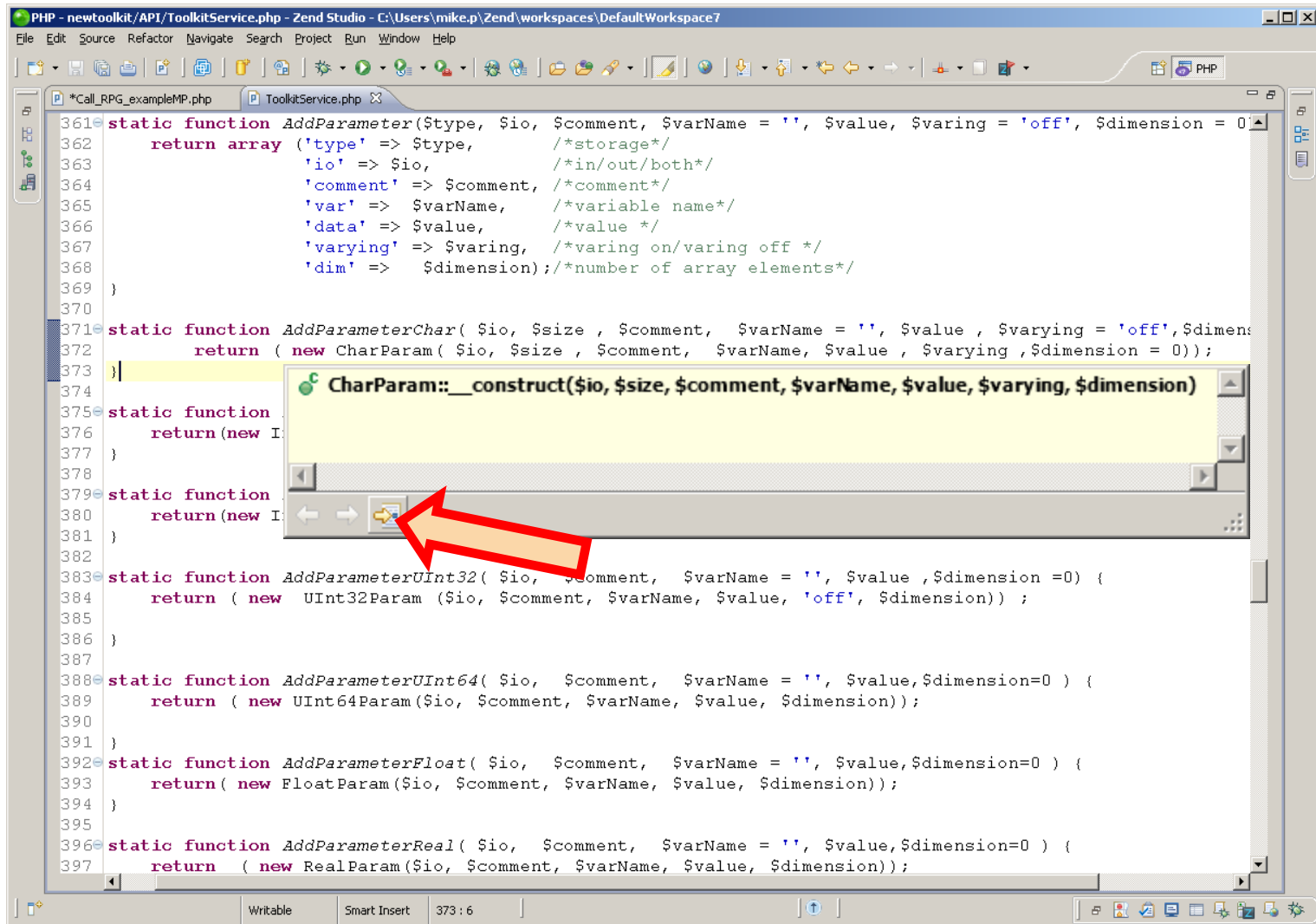
static function AddParameterInt32( $io, $comment, $varName = '', $val
    return(new Int32Param( $io, $comment, $varName, $value, $dimension)
}

static function AddParameterInt64( $io, $comment, $varName = '', $val
    return(new Int64Param( $io, $comment, $varName, $value, $dimension)
}

static function AddParameterUInt32( $io, $comment, $varName = '', $va
    return ( new UInt32Param( $io, $comment, $varName, $value, 'off',
}

static function AddParameterUInt64( $io, $comment, $varName = '', $va
```

# Where did that Class come from?

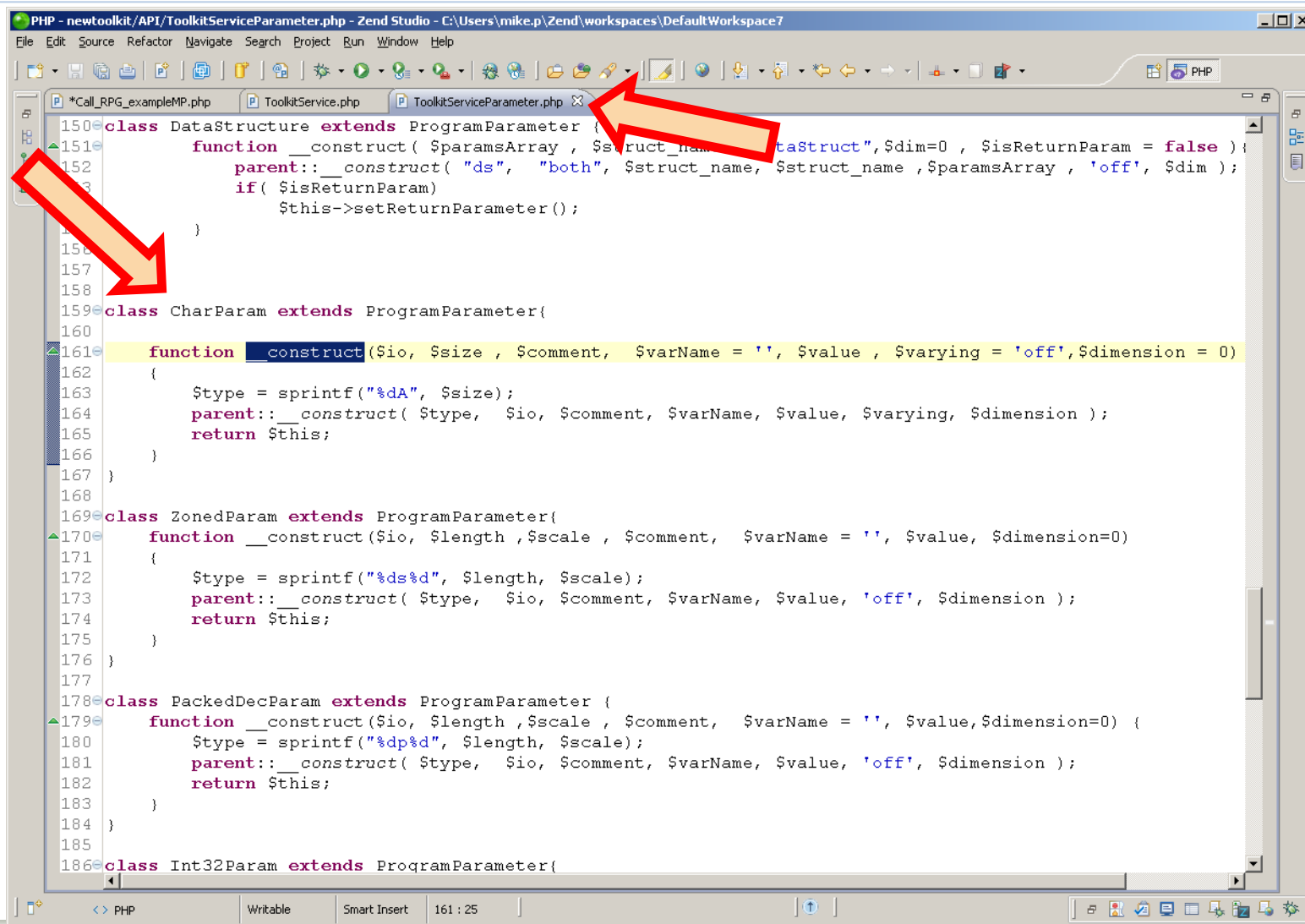


The screenshot shows the Zend Studio IDE with a PHP file open. The code contains several static functions that return new instances of classes like CharParam, UInt32Param, UInt64Param, FloatParam, and RealParam. A popup window displays the constructor for CharParam, and a red arrow points to the 'new' keyword in the code, highlighting the source of the class.

```
361 static function AddParameter($type, $io, $comment, $varName = '', $value, $varying = 'off', $dimension = 0) {
362     return array ('type' => $type, /*storage*/
363                 'io' => $io, /*in/out/both*/
364                 'comment' => $comment, /*comment*/
365                 'var' => $varName, /*variable name*/
366                 'data' => $value, /*value */
367                 'varying' => $varying, /*varying on/varying off */
368                 'dim' => $dimension); /*number of array elements*/
369 }
370
371 static function AddParameterChar($io, $size, $comment, $varName = '', $value, $varying = 'off', $dimension = 0) {
372     return ( new CharParam($io, $size, $comment, $varName, $value, $varying, $dimension = 0));
373 }
374
375 static function AddParameterInt($io, $comment, $varName = '', $value, $dimension = 0) {
376     return ( new IntParam($io, $comment, $varName, $value, $dimension));
377 }
378
379 static function AddParameterInt32($io, $comment, $varName = '', $value, $dimension = 0) {
380     return ( new UInt32Param($io, $comment, $varName, $value, 'off', $dimension));
381 }
382
383 static function AddParameterInt32($io, $comment, $varName = '', $value, $dimension = 0) {
384     return ( new UInt32Param($io, $comment, $varName, $value, 'off', $dimension));
385 }
386
387
388 static function AddParameterUInt64($io, $comment, $varName = '', $value, $dimension = 0) {
389     return ( new UInt64Param($io, $comment, $varName, $value, $dimension));
390 }
391
392 static function AddParameterFloat($io, $comment, $varName = '', $value, $dimension = 0) {
393     return ( new FloatParam($io, $comment, $varName, $value, $dimension));
394 }
395
396 static function AddParameterReal($io, $comment, $varName = '', $value, $dimension = 0) {
397     return ( new RealParam($io, $comment, $varName, $value, $dimension));
398 }
```

CharParam::\_\_construct(\$io, \$size, \$comment, \$varName, \$value, \$varying, \$dimension)

# Open the source class in another tab!



The screenshot shows the Zend Studio IDE with the following code in the editor:

```
150 class DataStructure extends ProgramParameter {
151     function __construct( $paramsArray , $struct_name = "DataStruct", $dim=0 , $isReturnParam = false ) {
152         parent::__construct( "ds", "both", $struct_name, $struct_name, $paramsArray , 'off', $dim );
153         if( $isReturnParam )
154             $this->setReturnParameter();
155     }
156
157
158
159 class CharParam extends ProgramParameter{
160
161     function __construct( $io, $size , $comment, $varName = '', $value , $varying = 'off', $dimension = 0)
162     {
163         $type = sprintf("%dA", $size);
164         parent::__construct( $type, $io, $comment, $varName, $value, $varying, $dimension );
165         return $this;
166     }
167 }
168
169 class ZonedParam extends ProgramParameter{
170     function __construct( $io, $length, $scale , $comment, $varName = '', $value, $dimension=0)
171     {
172         $type = sprintf("%ds%d", $length, $scale);
173         parent::__construct( $type, $io, $comment, $varName, $value, 'off', $dimension );
174         return $this;
175     }
176 }
177
178 class PackedDecParam extends ProgramParameter {
179     function __construct( $io, $length, $scale , $comment, $varName = '', $value, $dimension=0) {
180         $type = sprintf("%dp%d", $length, $scale);
181         parent::__construct( $type, $io, $comment, $varName, $value, 'off', $dimension );
182         return $this;
183     }
184 }
185
186 class Int32Param extends ProgramParameter{
```

Two red arrows are present: one points to the 'ToolKitServiceParameter.php' tab in the top bar, and the other points to the 'function \_\_construct' method in the CharParam class.

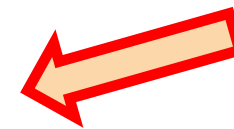
# Why use the new toolkit?

---

- **Performance**
  - ▶ Beta is faster than the current toolkit in Zend Server 5.1
  - ▶ Simpler infrastructure
  - ▶ More powerful interfaces
- **Greater visibility to what is going on**
- **Open Source community contributing to its future**
- **Classes simplify code-fewer lines for program call, etc.**
- **Access to parameters from sub-procedures, not just INT!**
- **Ability to do local development and testing**

# Program Call

```
22 try {
23     $ToolkitServiceObj = ToolkitService::getInstance($db, $user, $pass, $extension);
24 }
25
26 catch (Exception $e)
27 {
28     echo $e->getMessage(), "\n";
29     exit();
30 }
31
32
33 $ToolkitServiceObj->setToolkitServiceParams(array('InternalKey'=>"/tmp/$user"));
34 $code = $_POST ['code'];
35 $desc = ' ';
36
37 $param[] = $ToolkitServiceObj->AddParameterChar('both', 10, 'CODE', 'CODE', $code);
38 $param[] = $ToolkitServiceObj->AddParameterChar('both', 10, 'DESC', 'DESC', $desc);
39
40
41 $result = $ToolkitServiceObj->PgmCall("COMMONPGM", "ZENDSVR", $param, null, null);
42
43 if($result){
44     showTable( $result['io_param']);
45 }
46 else
47     echo "Execution failed.";
48
49 /* Do not use the disconnect() function for "state full" connection */
50 $ToolkitServiceObj->disconnect();
```



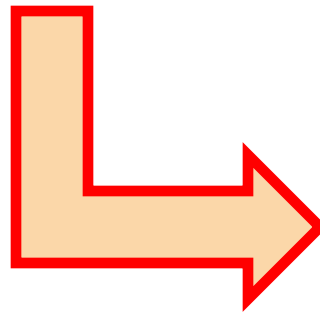
# Program output...

## Calling an RPG program with two parameters

Code:  (Valid Code is 1 or 2)

Reset

Call program



Parameter Name	Parameter Value
CODE	1
DESC	IBM

# PHP Open Source Toolkit for IBM i

[www.zend.com](http://www.zend.com)

What's next?

# Zend Server 5.1

---

- **Toolkit is in BETA status**
  - ▶ Need to hear from you (Forums are quiet)
  - ▶ Still more development going on at IBM and Zend
  - ▶ Next release will be GA
- **Current plan**
  - ▶ Implement new toolkit as Extension
  - ▶ You will have the option
- **Compatibility layer (coming soon!)**
  - ▶ Let your i5 functions use the new toolkit under the covers
  - ▶ Use new toolkit in OO model for new development

# Forums are great place to communicate!

The screenshot shows the Zend Forums website interface. At the top, there is a search bar and navigation links. Below the search bar, there is a breadcrumb trail: [Board index](#) > [PHP on IBM i](#). The main content area displays a list of forum topics with columns for Forum, Topics, Posts, and Last Post. Two red arrows point to the 'PHP on IBM i' link in the breadcrumb and the 'Zend Server for IBM i' forum entry in the table.

FORUM	TOPICS	POSTS	LAST POST
<a href="#">Zend Server for IBM i</a>	261	1263	by <a href="#">robmullis</a> on Fri Aug 19, 2011 4:10 pm
<a href="#">Zend Studio for IBM i</a> General discussion on Zend Studio fo the IBM System i	52	178	by <a href="#">kentatzend</a> on Wed Aug 24, 2011 7:51 pm
<a href="#">PHP Questions / Hints</a> The place for general PHP questions and hints for PHP on IBM i	93	276	by <a href="#">joshdayberry</a> on Fri Aug 12, 2011 5:56 pm
<a href="#">Zend Core for i5/OS</a> General discussion on Zend Core for IBM System i	235	873	by <a href="#">batemang</a> on Fri Aug 05, 2011 8:09 pm
<a href="#">Zend Platform for i5/OS</a> General discussion on Zend Platform for IBM System i	20	49	by <a href="#">adominguez24</a> on Tue Mar 01, 2011 11:56 pm

Jump to:

# What are the major components?

---

- Program calls
- Operating System functions
- SQL access

# PHP Open Source Toolkit for IBM i

[www.zend.com](http://www.zend.com)

## Wrap-up

# Upcoming Webinars

---

- **September**
  - ▶ Open Source on IBM i Part 2
- **October**
  - ▶ Best Practices for deploying secure PHP applications
- **More soon...**



Zend PHP Conference  
October 17-20, 2011 – Santa Clara, CA

# Join us at ZendCon

## The premier PHP conference!

October 17-19, 2011 – Santa Clara, CA



### Conference Themes

#### Cloud Computing

Learn about the latest developments in PHP Cloud infrastructure, management and application services

#### Mobile and User Experience

Learn how to build engaging mobile apps with the latest PHP technologies and tools

#### Enterprise and Professional PHP

Explore PHP best practices, new technologies and practical tips with industry experts

### Conference Highlights

- Sessions focused on how to best develop and deploy PHP
- Sessions designed for all knowledge levels
- Intensive tutorials for accelerated learning
- PHP Certification crash courses and testing
- Exhibit hall showcasing the latest products
- Special networking opportunities during meals and

[www.zendcon.com](http://www.zendcon.com) events

# Reasons to attend ZendCon

---

- **IBM i track with AWESOME features like**
  - ▶ PHP Toolkit authors
  - ▶ Sessions on performance, etc.
- **Lots of PHP that applies to IBM i shops, too**
  - ▶ <http://mikepavlak.blogspot.com/2011/08/zendcon-for-mere-mortals.html>
- **IBM i Evening Event**
  - ▶ Special networking opportunity for PHP developers devoted to IBM i
- **Fabulous Keynotes**

# Q&A

[mike.p@zend.com](mailto:mike.p@zend.com)