

PHP 101 for IBM i

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The PHP Company

Target audience

- Interested in leveraging web technology and IBM i
- Learn more about how PHP integrates with IBM i
- Understand the development path from RPG to PHP
- Managing team of IBM i developers & looking to do more
- New to PHP in the IBM i arena



Zend/PHP Conference

Join us at ZendCon
the premier PHP conference!

October 19-22, 2009 - San Jose California



Conference Highlights

- Learn how to best develop and deploy PHP
- Technical sessions for all knowledge levels
- In-depth tutorials for advanced learning
- PHP Certification courses and testing
- Exhibit hall showcasing the latest products
- Networking opportunities with peers and luminaries

Conference Tracks

- Server/Operations
- Lifecycle Best Practices
- Frameworks
- Real-World PHP
- PHP Development Techniques
- Zend Solutions for PHP on IBM i

IBM i?

www.zendcon.com

Something to spur your economic engine!

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Omni User Group

**Your chance to win a free
admission to ZendCon
2009**

**Fill it out the form and
give it to Mike**

Odds are good!



The image shows a promotional flyer for the Zend/PHP Conference (ZendCon) 2009. The flyer includes the PHP logo, the event title, dates (October 19-22, 2009), and location (San Jose, California). It lists conference highlights and tracks. Below the flyer is a registration form with fields for Name, Company, Email Address, and Phone.

php Zend/PHP Conference

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- Server/Operations
- Ultimate Best Practices
- Frameworks
- Real World PHP
- PHP Development Techniques
- Zend Solutions for PHP on IBM i

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The OMNI User is pleased to announce that Zend Technologies is offering a free ZendCon registration for one lucky dinner meeting attendee. Please complete the form below for your chance to win!

Name: _____

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Email Address: _____

Phone: _____

Agenda

- Brief intro to PHP
- Explore Database File Listing
- Explore IBM i Program Call

- Wrap up / Q&A



Introduction to PHP



Variables

- **Rules**
 - Case sensitive
 - Begin with \$
 - \$thisIsMyVariable
 - \$__AnotherVariable
 - \$ this is not a variable
 - Implicit casting
 - Can be re-typed (Dynamically Typed Language)
- **Constant – Variable that doesn't change**
 - Define('TEACHER', "Mike Pavlak");

Variables

- **Data Types (Scalar)**
 - Integer
 - -2,147,483,648 thru 2,147,483,647
 - Supports decimal, octal and hex representation
 - Floating-Point
 - 1.7E-308 thru 1.7E+308
 - 15 digits of decimal precision
 - Strings
 - Big. Really big. Too big to discuss!
 - Boolean
 - False is 0, 0.0, false keyword, empty string, object w/no values, null. All others are true
- **Object, array, null and resource**

Variables...(cont.)

- **Scope**
 - Global – Available everywhere but inside function (sort of)
 - Local – Available only in a function, destroyed at end
 - Static – Available only in a function, but remains
- **Arrays (three types)**
 - Enumerated
 - Associative
 - Multi-dimensional

Arrays: Value assignment

- **Simple**
 - `$Animals[0] = 'Dog'`
 - `$Animals[1] = 'Cat'`
 - `$Animals[2] = 'Hamster'`
- **Associative**
 - `$Barnyard['Cow'] = 'Calf'`
 - `$Barnyard['Chicken'] = 'Chick'`
 - `$Barnyard['Horse'] = 'Foal'`
- **Multi-dimensional**
 - `$farm[0] = $Animals`
 - `$farm[1] = $Barnyard`

Strings

- **Most of PHP is character strings**
- **Single quotes**
 - Variables not expanded
 - Heavy use of concatenation “.”
 - `$string_1 = 'This is the value of variable x: ' . $x`
- **Double quotes**
 - Variables interpolation
 - `$string_1 = "This is the value of variable x: $x"`

Operators

- **Most common operators apply (+,-,*,/,etc.)**
- **Concatenation**
 - `$greeting = 'My name is '`
 - `$name = 'Mike Pavlak.'`
 - `$salute = $greeting . $name` (My name is Mike Pavlak)
- **Increment / decrement**
 - `$a++, ++$a` (`$a = $a + 1`)
 - `$a--, --$a` (`$a = $a - 1`)
- **Logical operators**
 - `&&` and
 - `||` or
 - `!` not

Comments

- **A brief comment about comments**
- **// (C++ style)**
 - indicates single line comment
 - May use at end of line of live code
 - Easily comments a line of code
- **/* ... */ (C Style)**
 - Looks like CL? Pretty close
 - Comment block,
 - Can span multiple lines
- **Shell style #**

The dreaded equal sign

- **= Single equal sign is assignment**
 - `$X=3`
 - `$Y=$X`
 - Now `$Y = 3`
- **== Double equal sign is for conditions**
 - `If ($x==$y) { do something} else {do something else}`
 - If you see single equal in condition, assignment will occur
- **=== Triple equal sign is exact equal conditions**
 - `$X= 3 (Integer) $Y=3.0 (Float)`
 - `If ($x==$y)` will resolve to **true**
 - `If ($x=== $y)` will resolve to **false**

Efficiency

- **Garbage collection**
 - Copy on write
 - Symbol table
 - isset()
 - unset()
- **Dynamic array and string**
 - Fixed is always a better performer
 - Nothing “needs” to be fixed!

Flow control

- **If**
 - Condition
 - work
- **Else**
 - work

One line, no parenthesis...

```
if ($x == 5)
    $x++;
else
    $x--;
```

```
if ($x == 5) {
    $x++;
    $y++;
}
else {
    $x--;
    $y--;
}
```


Flow control (cont...)

- **Switch (\$x) {**
 - Case 'value1' :
 - Do something
 - Break
 - Case 'value1' :
 - Do something else
 - Break
 - }

```
Switch ($language) {  
    Case 'RPG' :  
        $comment='Is number 1 on i5';  
    break;  
    Case 'PHP' :  
        $comment='Is gaining ground on i5';  
    break;  
}
```

Flow control (cont...)

- **While (condition) {**
 - Do something
- **}**
- **Break and continue**

```
While ($x < $y) {  
    $x++;  
    if ($x==5) break;  
    echo $x;  
}
```

Flow control (cont...)

- **Foreach**

- Iterate over elements in an array

```
$a[0]='ham';  
$a[1]='salami';  
$a[2]='bologna';  
  
foreach ($a as $index) {  
    echo 'Element ' . $index + 1. ' is ' . $a[$index] . '<br>';  
}
```

```
Element 1 is ham  
Element 2 is salami  
Element 3 is bologna
```

Functions

- **Most of PHP is functional**
 - Function is similar to RPG subroutine or procedure
 - Pass parms
 - Get results

```
<?php
    phpinfo()
?>
```

Database Listing



Employee list with payroll

- Describe the file
- Explore database access
- Perform some calculations
- Put the output to the web server



Data looks like...

- Raw data in STRSQL display...
- Using long field names, both long and short are accessible to PHP

```
EMPLOYEE_NAME      EMPNUM  EMPLOYEE_WEEK_PAY  EMPLOYEE_TAX_RATE  EMPINS
Gomez Adams        1       1,500.00           6.500              25.00
Herman Munster     2       1,200.00           6.500              27.00
Jimmy Buffet       3         750.00            3.500              53.00
Joe Walsh          4       1,950.00           7.500             122.00
***** End of data *****
```

Payroll master output...

zend **php**⁰⁹ Zend/PHP Conference **Payroll Report**

Connected to i5

Name	Number	Gross	Tax Rate	insurance	Net
Gomez Adams	1	\$1500.00	6.500	\$25.00	\$1465.25
Herman Munster	2	\$1200.00	6.500	\$27.00	\$1165.20
Jimmy Buffet	3	\$750.00	3.500	\$53.00	\$694.38
Joe Walsh	4	\$1950.00	7.500	\$122.00	\$1813.38

Total Gross Pay is \$5400.00
Total tax payment is \$34,800.00
Total insurance payment is \$227
The average for each record is...USD 1,350.00

The code: Connections

```
1 <html><head><title>Payroll Report</title>
2 <body bgcolor='#FFFFFF' text = '#00000'><FONT FACE="arial">
3 <h1><img src='ZendCon09-logo.gif'> Payroll Report</h1></head>
4
5
6 <?php
7
8 //define some variables for database connection
9 $conn = "LOCAL";
10
11 //connect to i5 DB2
12 $i5link = db2_connect($conn, "", "");
13 if ($i5link) echo "<p>Connected to i5</p>";
14 else echo "<p>Connection failed: ".db2_stmt_error().": ".db2_stmt_errormsg()."</p>";
15
16
17 //prepare sql statement
18 $sql = "SELECT * from zenddata.payroll_master";
19
20
21 //execute sql statement to retrieve the data
22 $stmt = db2_exec($i5link,$sql)
23 or die("<p>Failed query:".db2_stmt_error().": ".db2_stmt_errormsg()."</p>");
```

The code: Loop di-loop

```
26 //begin output table content
27 echo "<table border='6' cellpadding=4 cellspacing=0 bordercolor='#000000' width='90%'>";
28 echo "<th>Name</th> <th>Number</th><th>Gross</th><th>Tax Rate</th><th>Insurance</th><th>Net</th>";
29
30 //fetch the data from each record and print them out
31 while($row=db2_fetch_array($stmt)){
32     //retrieve the fields from a row
33     list( $EMP_NAME, $EMP_NUM, $WEEKLY_PAY, $TAX, $INSURANCE)= $row;
34     $Net= $WEEKLY_PAY - ($WEEKLY_PAY * .001 * $TAX) - $INSURANCE;
35     echo("<tr><TD>$EMP_NAME</TD> <TD align='center'>$EMP_NUM</TD>
36     <TD align='right'>$$WEEKLY_PAY</TD>
37     <TD align='right'>$TAX</TD><TD align='right'>$$INSURANCE</TD><TD align='right'>$");
38
39     printf("%.2f", $Net);    echo("</TD></tr>");
40
41     $Total_Gross = $Total_Gross + $WEEKLY_PAY; //accumulate the total Gross
42     $Total_Net = $Total_Net + $Net; //accumulate the total Net
43     $Total_Ins = $Total_Ins + $INSURANCE; //accumulate the insurance
44     $Total_Tax = $Total_Tax + $WEEKLY_PAY * $TAX; //accumulate the tax
45     ++$Count; //count the total number of employees
46 }
47 echo "</table>"; //end of table output
```

The code: Total time

```
50 //print out totals
51 echo("<p>Total Gross Pay is $");
52     printf("%.2f",$Total_Gross);
53 echo ("</p>");
54
55 echo("<p>Total tax payment is $");
56 echo number_format($Total_Tax, 2, ',', '');
57 echo ("</p>");
58
59 echo("<p>Total insurance payment is $$Total_Ins </p>");
60
61 $Average= round($Total_Gross / $Count, 2); // Average Pay Rate
62
63 setlocale(LC_MONETARY, 'en_US');
64 echo("<p>The average for each record is....");
65 echo money_format("%i",$Average);
66 echo ("</p>");
67
68 db2_close($i5link); //close the database connection
69
70 ?>
71 </FONT></body></html>
```

Payroll master output...

zend php⁰⁹ Zend/PHP Conference

Payroll Report

Connected to i5

Name	Number	Gross	Tax Rate	insurance	Net
Gomez Adams	1	\$1500.00	6.500	\$25.00	\$1465.25
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IBM i Program Call

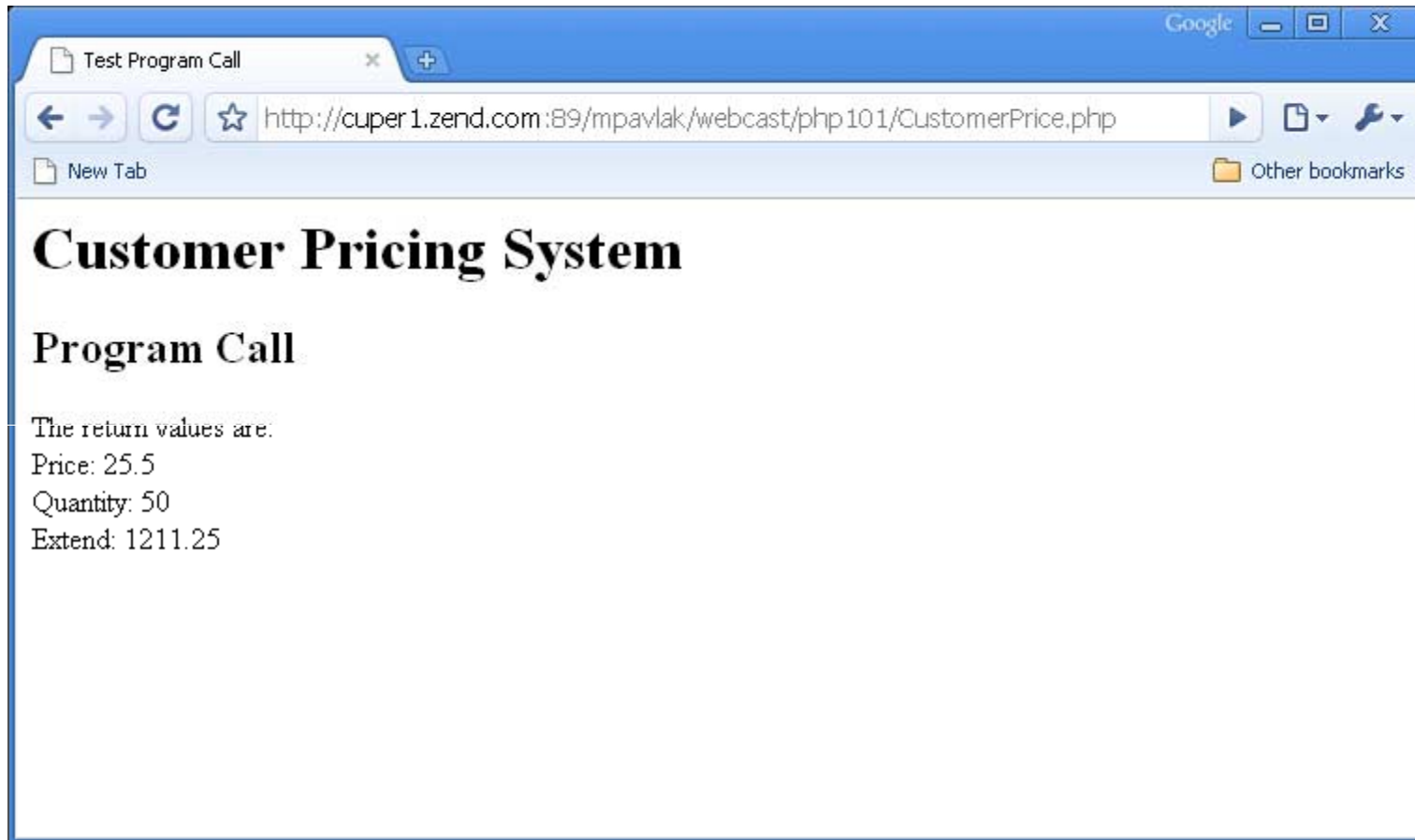


Customer pricing

- Look at the requirement
- Customer list
- Add program call
- Put output to the web server



Customer Price System Output



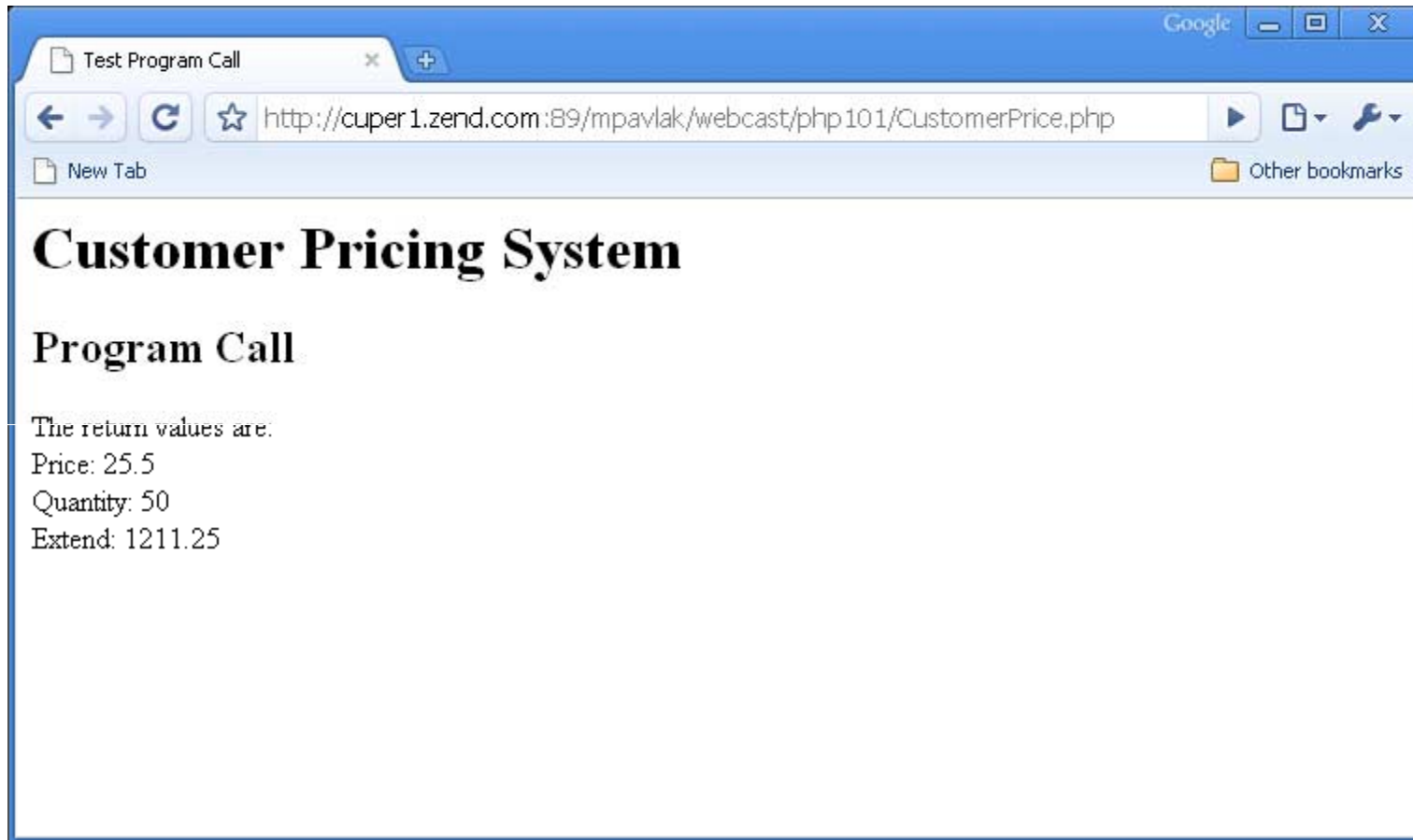
The code: Setup

```
1 <html> <head><title>Test Program Call</title></head><body>
2
3 <h1>Customer Pricing System</h1>
4 <h2>Program Call</h2>
5
6 <?php
7
8 include("i5db2connectonly.php");
9
10 // Setup parameters in associative array...
11 $desc = array (
12     array ("name"=>"price", "io"=>I5_INOUT, "type" => I5_TYPE_PACKED,
13         "length"=> "9.2"),
14     array ("name"=>"qty", "io"=>I5_INOUT, "type" => I5_TYPE_PACKED,
15         "length"=> "9.2"),
16     array ("name"=>"extend", "io"=>I5_INOUT, "type" => I5_TYPE_PACKED,
17         "length"=> "11.2"),
18 );
19
20 // Prepare the program, similar to prototype in ILE...
21 $prog = i5_program_prepare("ZENDDATA/CUSTPRICE", $desc);
22 if ($prog === FALSE)
23 {
24     $errorTab = i5_error();    echo "Program prepare failed <br>";
25     var_dump($errorTab);    die();
26 }
```


The code: Execution

```
29 // Load parameters...
30 $params = array ("price"=>"25.5","qty"=>"50.0","extend"=>"0.0");
31
32 // Map parameters to variables...
33 $retvals = array("price"=>"price","qty"=>"qty","extend"=>"extend");
34 $result = i5_program_call($prog, $params, $retvals);
35 if ($result === FALSE)
36 {
37     $errorTab = i5_error();
38     echo "FAIL : i5_program_call failure code <br>";
39     var_dump($errorTab);
40     die();
41 }
42
43 //Print for the non believers...
44 echo "The return values are: <br>", "Price: ", $price, "<br> Quantity: ",
45 $qty, "<br>", "Extend: ", $extend, "<br>";
46
47
48 i5_close($conn);
49 ?>
50 </body></html>
```

Customer Price System Output



Troubleshooting?

- **Debugger in Zend Core via Zend Studio**
- **Logs in '/usr/local/zend/apache2/logs/*'**
- **Zend Platform, at your service!**

```
+....6....+....7....+....8....+....9....+....0....+....1....+....2....+....3...
PHP Notice:  Undefined variable: Total_Ins in /www/zendcore/htdocs/mpavlak/webca
PHP Notice:  Undefined variable: Total_Tax in /www/zendcore/htdocs/mpavlak/webca
PHP Notice:  Undefined variable: Count in /www/zendcore/htdocs/mpavlak/webcast/p
File does not exist: /www/zendcore/htdocs/favicon.ico
script '/www/zendcore/htdocs/mpavlak/webcast/php101/CustomrPrice.php' not found
PHP Notice:  Undefined variable: Total_Gross in /www/zendcore/htdocs/mpavlak/web
PHP Notice:  Undefined variable: Total_Net in /www/zendcore/htdocs/mpavlak/webca
PHP Notice:  Undefined variable: Total_Ins in /www/zendcore/htdocs/mpavlak/webca
PHP Notice:  Undefined variable: Total_Tax in /www/zendcore/htdocs/mpavlak/webca
PHP Notice:  Undefined variable: Count in /www/zendcore/htdocs/mpavlak/webcast/p
File does not exist: /www/zendcore/htdocs/favicon.ico
script '/www/zendcore/htdocs/mpavlak/webcast/php101/CustomrPrice.php' not found
script '/www/zendcore/htdocs/mpavlak/webcast/php101/CustomrPrice.php' not found
File does not exist: /www/zendcore/htdocs/favicon.ico
```

Zend Platform for advanced debugging!

The image shows the Zend Platform dashboard in a browser window. The dashboard includes a navigation menu with options like Platform, PHP Intelligence, Performance, ZDS, Job Queue, and Integrations. The main content area is titled 'Dashboard' and features a section for 'Events at a Glance'. This section has a 'Load Filter' set to 'Recent Events' and a 'Show All' button. Below this is a table listing recent events.

Id	Event Type	Count	Last Occurrence	Location	URL
383	Slow Script Execution (Absolute)	1	15 Jul 2009 09:05:43	localhost	.../CustomerPrice.php
188	PHP Error	21	14 Jul 2009 10:43:40	localhost	.../zendcustlist1funct.php
205	PHP Error	145	14 Jul 2009 10:43:40	localhost	.../zendcustlist1funct.php
340	PHP Error	8	14 Jul 2009 10:43:40	localhost	.../zendcustlist1funct.php
382	PHP Error	2	13 Jul 2009 09:09:10	localhost	.../php102w5Ex3.php

Below the table is a section for 'Configuration and Management Tools' with links to 'Zend Core for I5/O5', 'Configure Event Actions', and 'Configure Event Triggers'.

An 'Event Details' window is overlaid on the dashboard, showing information for event #383. The event is a 'Slow Script Execution (Absolute)' that occurred on 15 Jul 2009 at 09:05:43 on localhost. The requested URL is http://127.0.0.1:8000/mpaviak/webcast/php101/CustomerPrice.php. The event occurred once. The window also provides diagnostic tools like 'Test URL', 'Debug URL', 'Profile URL', and 'Show Source Code'. It includes an 'Event Context' section with expandable items for 'Data', 'Variables', and 'Included Files'. There are also buttons for 'Delete Event', 'Ignore Event', and 'Close Event'.

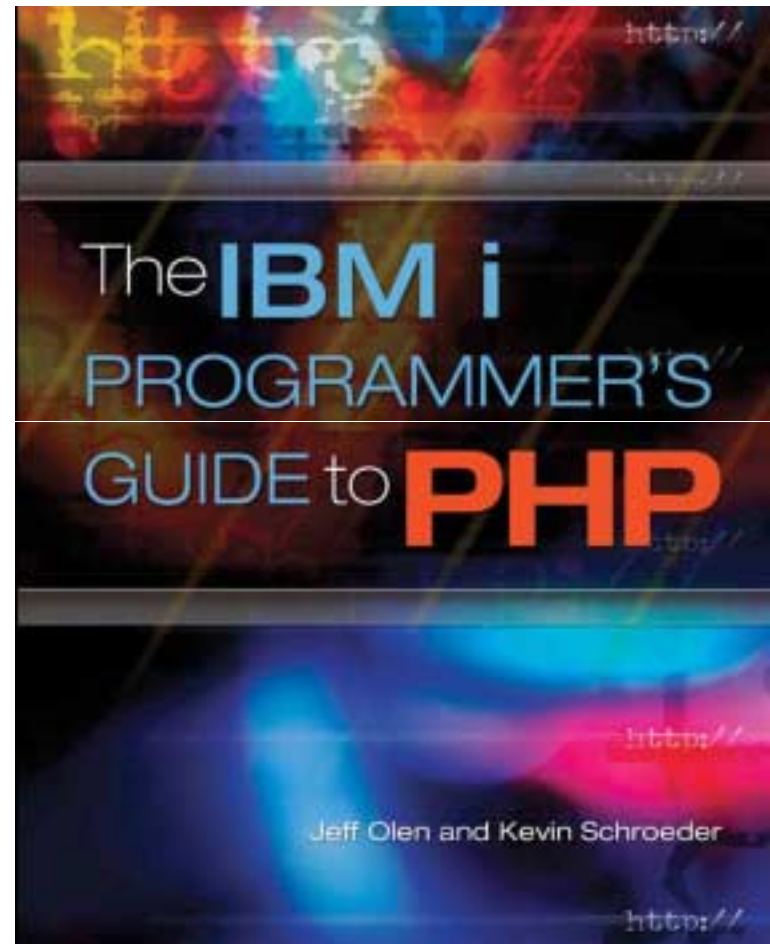
More information...

- <http://php.net>
 - The Online Manual
- <http://www.zend.com/en/solutions/modernize-ibm-i/>
 - For updated web pages containing IBM i PHP content
- <http://www.zend.com/en/products/platform/resources>
 - User and Installation Guides
- <http://www.zend.com/en/company/customers/>
 - Customer case studies
- <http://www.ibm.com/systems/i/software/php/index.html>
 - IBM home page for PHP on IBM i

New book!

**Kevin Schroeder from Zend's
Global Services Group
with
Jeff Olen, co-author of...**

**Get yours at MCPressonline
or at fine bookstores
everywhere**





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Q&A Thank you!

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