



The PHP Company

# The First 5 Steps to Getting Started with PHP on IBM i

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# Audience

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- Are you looking to learn more about the what & how of PHP on IBM i?
- Have you done some PHP but new to IBM i?
- Are you already doing PHP but Looking for product refresh?
- Might you be looking to grow beyond PDM/RPG?

# Agenda

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- Introduction to PHP and players
- Zend Server for IBM i
- Hello World
- Administrative Setup
- Zend Studio
- PHP Data Access
- Wrap it up, I'll take it...
- Please fill out session evaluation!

# Agenda

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- The Five Steps...
  1. Understand the PHP universe
  2. Understand the “stack” on IBM i
  3. Install Zend Server
  4. Install Zend Studio
  5. Get productive!

# 1. Understand the PHP Universe

# PHP is a Scripting Language

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- ▶ PHP Hypertext Pre-Processor
- ▶ Developed initially by [Rasmus Lerdorf](#) in 1994: PHP/FI
- ▶ Zeev Suraski and Andi Gutmans Contributing since 1997+ (ZEEv + aNDi = Zend)
- ▶ Interpreted, not compiled
- ▶ Forgiving and intuitive code structure (Short learning curve)
- ▶ Immediate feedback during development
- ▶ Operating model is similar to Net.Data, not as verbose
- ▶ PHP is to Java what RPG is to COBOL

# Who is Zend?



- Guiding light for PHP
- Providers of stable, supported PHP distribution
- Providers of commercial tooling and support for PHP
  - ▶ Zend Server
  - ▶ Zend Studio

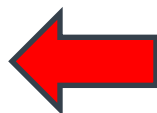
# Zend and IBM

- Partnership began in 2005
- Renewed in 2008
- Zend selected by IBM to deliver PHP on IBM i
- Zend solutions pre-loaded with IBM i 6.1 and 7.1!
  - ▶ Just install the LP and go!
- You can still get products and updates at [Zend.com](http://Zend.com)
- IBM i7.1 includes Zend Server



# Why Open Source?

- Tough economic times calls for innovation
  - ▶ Low cost of entry
  - ▶ Applications of high quality
  - ▶ Lower TCO
  - ▶ Runs natively on IBM i, no need for additional hardware / OS
  - ▶ You are already using it! (Apache, Eclipse, etc.)



We're not the only ones talking about Open Source...

Look what IBM is saying in February '09 edition!

<http://www.ibmssystemsmag.com/ibmi>

# The “Stack”

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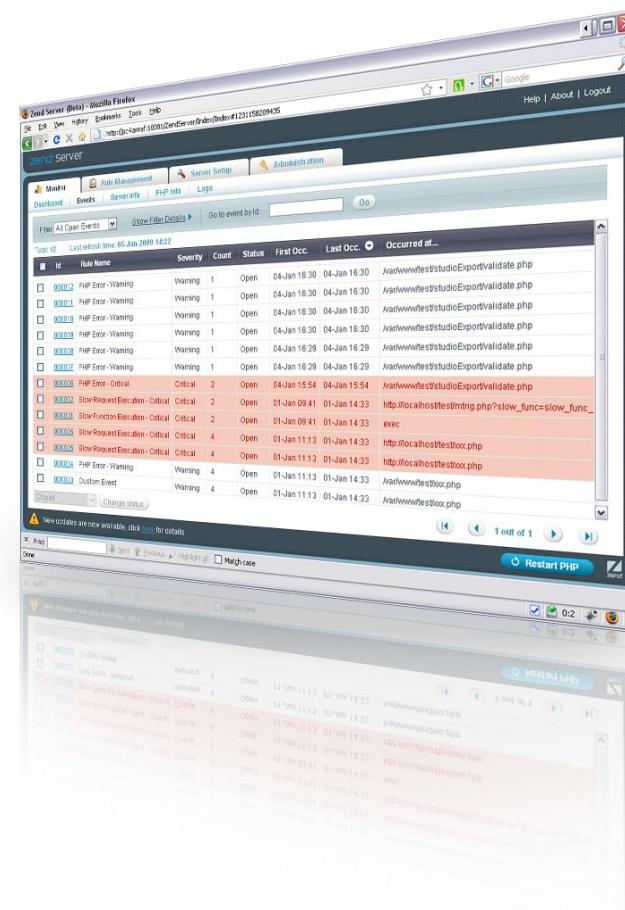
- Tested, business ready and supported distribution of PHP
- Runs Native Environment under PASE
- Home base for PHP modules like GD, PEAR, etc.
- Browser based admin console
- Accessible immediately after install
- Let’s look at the architecture of the stack
- And then installation on IBM i
- No charge LP Included with system maintenance



## 2. Zend Server for IBM i

# What Is Zend Server?

- Production quality PHP stack
  - ▶ PHP, ZF, DB connectivity, debugging extension, and more
- Two Editions - Free “Community Edition” provided by IBM & Full commercial edition
  - ▶ Both are production ready
- Application monitoring and diagnostics (integrated with Zend Studio)
- Multi-level performance enhancement capabilities
- Software updates and security hot fixes
- Easy and quick installation
- Zend Framework Integration



# Zend Server for IBM i

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- Next generation of PHP stack for IBM i
- Best of both Zend Core and Zend Platform
- Single Licensed Program Installation
- One installable acts like two products
  - ▶ Zend Server for IBM i Community Edition
    - Available at no charge per IBM partnership
  - ▶ Zend Server for IBM i
    - Subscription available from Zend (License Key)
    - High value extra features
    - Higher Support SLAs

# Why a new generation?

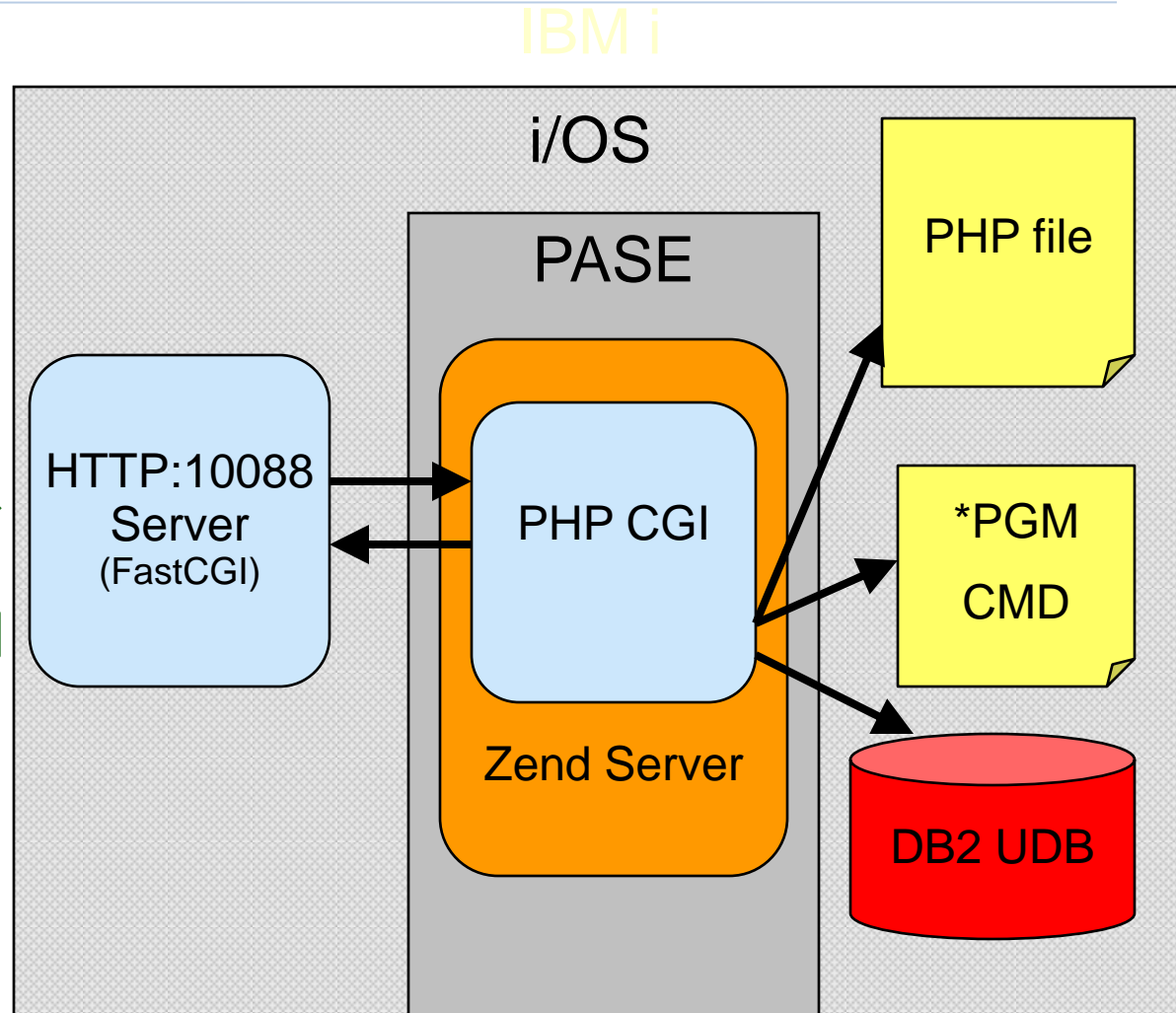
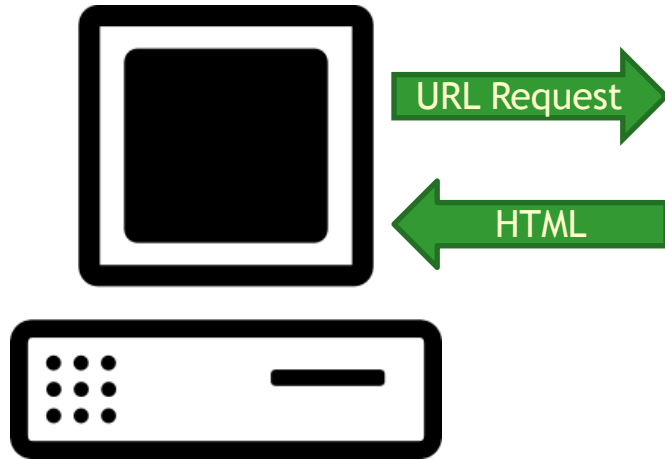
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- **Based on feedback of key areas for Improvement**
- **Improved basic PHP Performance**
  - ▶ 30% to 600% depending on the application
- **New capabilities**
  - ▶ Application Monitoring
  - ▶ Code Tracing - Faster problem resolution
  - ▶ Job Queue - Performance and scalability
  - ▶ Multi-Level Caching - Performance and Scalability
  - ▶ Support for PHP 5.3
- **Easier installation, administration & maintenance**

# Zend Server Under the Covers

ILE Apache:10088

- Default configuration FastCGI



# Software Pre-req's

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Please read the Installation Guide !!!

```
Description                Product Option  Licensed Program
-----                -
Portable App Solutions Environment  33             57XXss1
Qshell                      30             57XXss1
System Openness Includes      13             57XXss1
IBM Portable Utilities For I5/OS  *base          5733sc1
OpenSSH ,OpenSST,Zlib         1              5733sc1
```

Make sure they match your release!

# 3. Installing Zend Server

# Install Zend Server

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- Prerequisites:
  - ▶ See Zend Server installation documentation!!!
  - ▶ i5/OS V5R3 Core is still available, Server will not load!
  - ▶ V5R4, i6.1, i7.1 (all interim releases, too)
  - ▶ Recent Cumulative PTF package, PASE, Qshell, Group for HTTP
- Software installation
  - ▶ Windows Installation or...
  - ▶ Upload \*SAVF, Restore, and start coding!
  - ▶ Clean installation can start the stack automatically
- Bonus!
  - ▶ MySQL can be installed at the same time

# Where do I get it? IBM LP or Zend.com

The screenshot shows the Zend.com website's 'Downloads' page. The browser address bar displays 'www.zend.com/en/products/server/downloads'. The page features a navigation bar with links for 'Solutions', 'Products', 'Services', 'Downloads', 'Community', 'Resources', 'Company', 'Online Store', and 'Support Center'. A sidebar on the left lists various product categories under 'Zend Server', including 'Zend Server for IBM i', 'System Requirements', 'Getting Started', 'What's New', 'Updates', 'Videos', 'Zend Unlimited', 'Community Edition', 'Webinars', 'Resource Library', 'Zend Server on Amazon EC2', 'Zend Framework', 'FAQ', 'Zend Server Cluster Manager', 'Zend Studio', and 'Zend Guard'. The main content area is titled 'Zend Server Downloads' and includes a description: 'Zend Server is a Web Application Server for running and managing business-critical PHP applications in production.' Below this is a list of features: 'Improved PHP application performance', 'Application monitoring and diagnostics', 'Production-ready PHP stack that includes Zend Framework', 'Zend Studio integration for simplified debugging', and 'Expert technical support, software updates and security hotfixes'. A note states: 'Don't have a license? Get a free 30 day trial license - click "Generate a Trial License" button link after downloading.' At the bottom, there is a table of products with columns for 'Product', 'Version', 'Format/Size', and 'Notes'. The table lists 'Zend Server for IBM i (PHP)' with version '5.0.4' and a size of '(ZIP) 332.05 MB'. A 'Release Notes' link is provided for this product.

## Zend Server Downloads

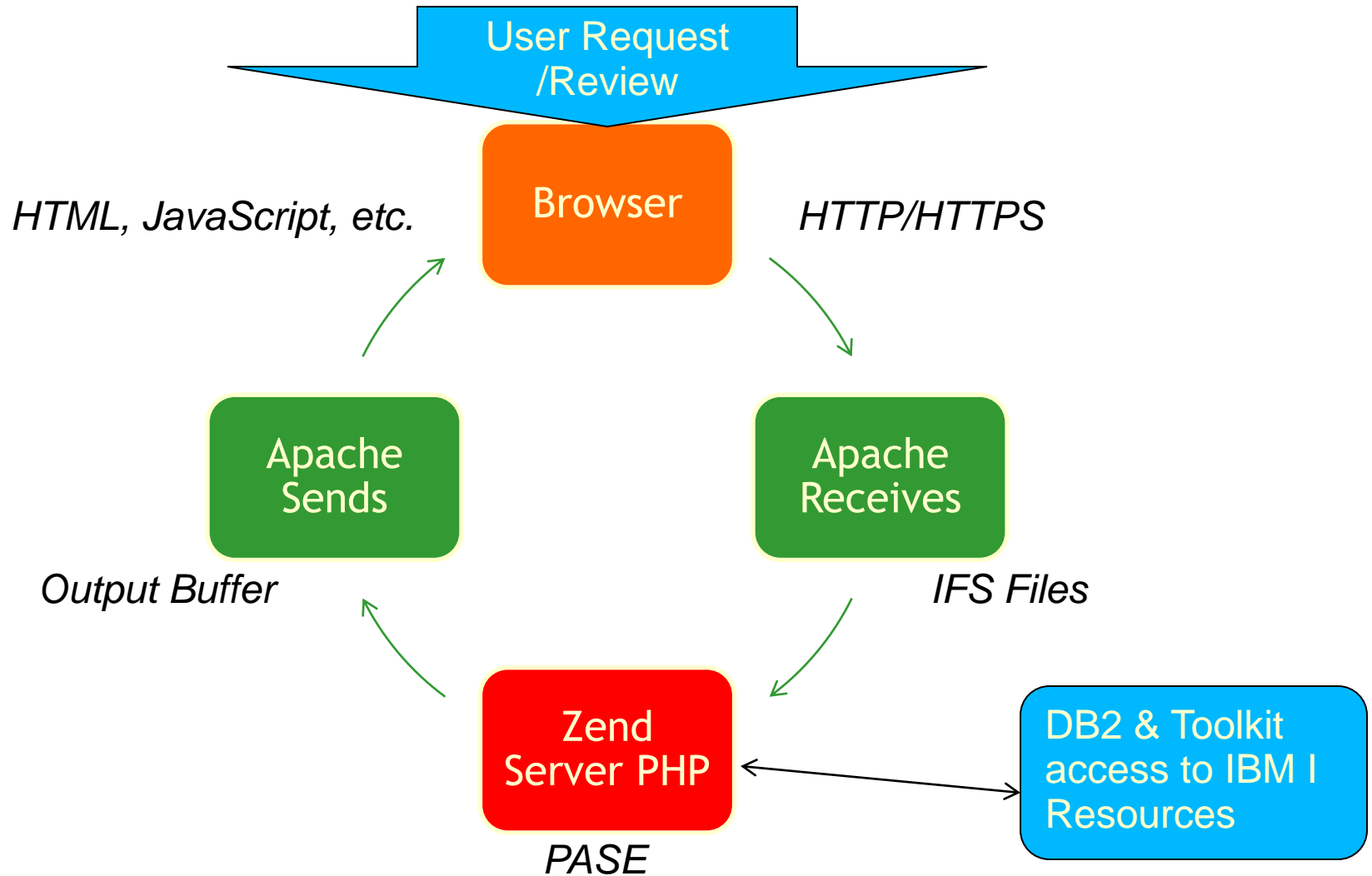
Zend Server is a Web Application Server for running and managing business-critical PHP applications in production.

- Improved PHP application performance
- Application monitoring and diagnostics
- Production-ready PHP stack that includes Zend Framework
- Zend Studio integration for simplified debugging
- Expert technical support, software updates and security hotfixes

Don't have a license? Get a **free 30 day trial license** - click "Generate a Trial License" button link after downloading.

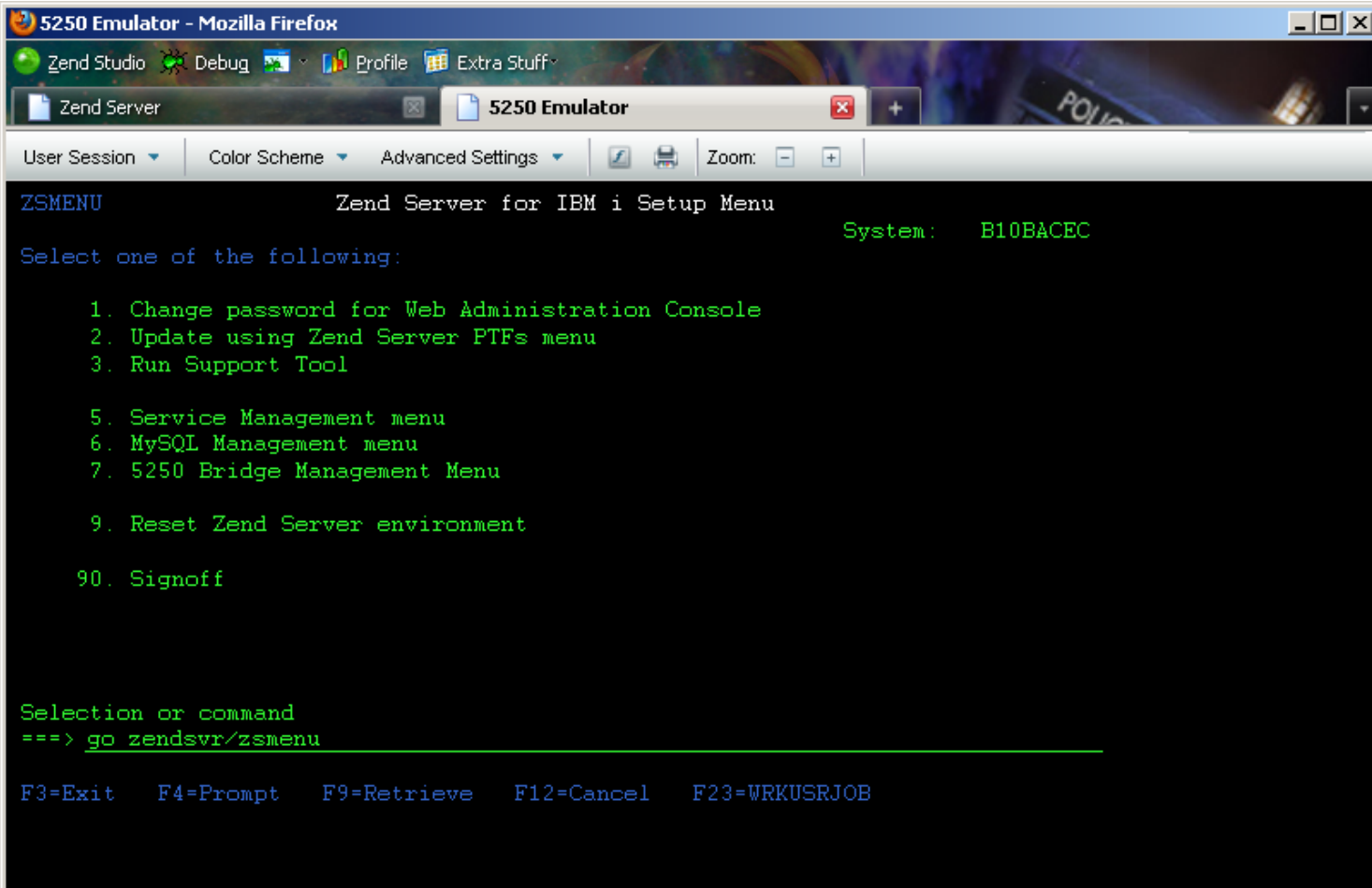
Product	Version	Format/Size	Notes
Zend Server for IBM i (PHP)	5.0.4	(ZIP) 332.05 MB	<a href="#">Release Notes</a>

# PHP Transaction Lifecycle



# Start/stop Zend Server, MySQL, etc...

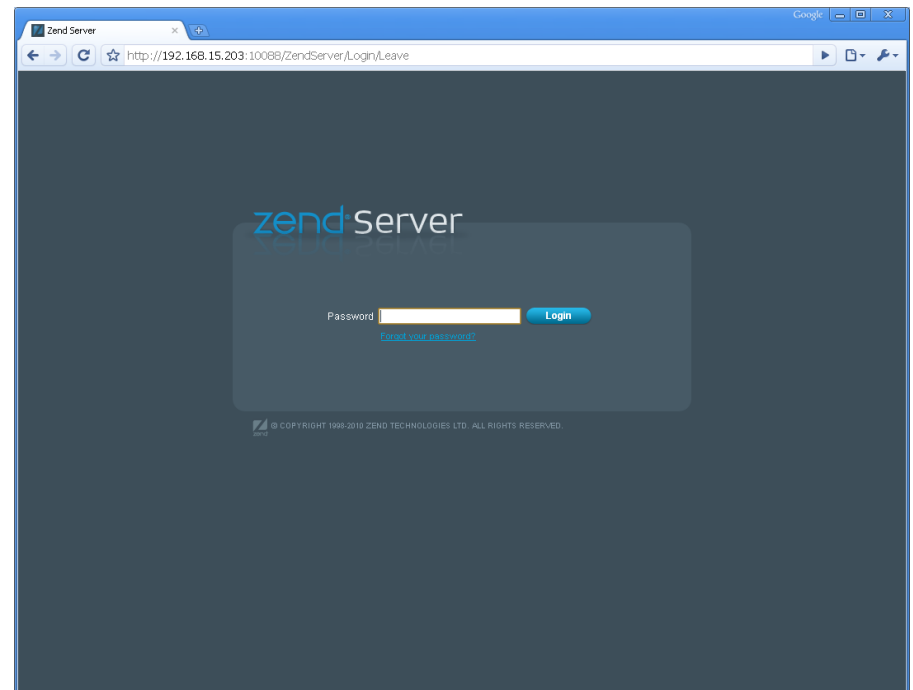
- ▶ Type GO ZENDSVR/ZSMENU, Option 5 then 1



```
5250 Emulator - Mozilla Firefox
Zend Studio Debug Profile Extra Stuff
Zend Server 5250 Emulator
User Session Color Scheme Advanced Settings Zoom:
ZSMENU          Zend Server for IBM i Setup Menu          System:  B10BACEC
Select one of the following:
1. Change password for Web Administration Console
2. Update using Zend Server PTFs menu
3. Run Support Tool
5. Service Management menu
6. MySQL Management menu
7. 5250 Bridge Management Menu
9. Reset Zend Server environment
90. Signoff
Selection or command
===> go zendsvr/zsmenu
F3=Exit  F4=Prompt  F9=Retrieve  F12=Cancel  F23=WRKUSRJOB
```

# Zend Server Configuration

- Only two screens!
  - ▶ Use <http://ibmiserver:2001> to administer IBM HTTP server
  - ▶ Use Zend Admin to administer Zend/PHP options



# Zend Server Port Change?

- Default proxy points to Port 10088
  - ▶ Log in to IBM Admin Server and open up ZENDSVR
  - ▶ Go to General Server Configuration
  - ▶ Click Apply & restart the server

The screenshot shows the IBM Web Administration for i interface. The browser address bar displays `http://192.168.15.203:2001/HTTPAdmin`. The page title is "ZENDSVR > General Server Configuration". The left-hand navigation pane shows a tree view with "Server Properties" selected and circled in red. Under "Server Properties", "General Server Configuration" is highlighted. A red arrow points from the "Apply" button at the bottom of the configuration page to the "Server Properties" menu item.

The main content area displays the "General Server Configuration" page with the following settings:

- Autostart: Global
- Server root directory: `www/zendsvr`
- Configuration file: `conf/httpd.conf`
- Document root: `/www/zendsvr/htdocs`
- Server name: Fully qualified server host name: [ ]
- Port: [ ]
- Server IP addresses and ports to listen on:

	IP address	Port	Protocol
Example	All IP addresses	80	http
C	*	10088	

Buttons: OK, Apply, Cancel, Preview

# Sample Scripts!

us-i6lmi1 - IBM Systems Di... x HTTP Server Administration... x Zend Server x

http://192.168.15.203:10088/ZendServer/Index/Index#1272034035724

zend server Help | About | Logout

Monitor Dashboard Events

Recent Events

Id	Generated by Run
000045	Severe Slow Req
000043	Severe Slow Quer
000044	Severe Slow Req
000039	Fatal PHP Error
000037	Fatal PHP Error

Tasks

Learn how to start with Zend  
Configure Zend Server Com  
Open phpMyAdmin


**Welcome**

## Welcome to Zend Server for IBM i

### 8 Ways to Get Started with PHP on IBM i:

1. [Zend Server for IBM i user interface](#) lets you manage your Zend Server and PHP configuration
2. [PHP Toolkit API](#) enables you to call RPG/COBOL applications, system objects and data queues
3. [Zend Navigator Demo](#) shows PHP Toolkit API access to active jobs, spooled files, user profiles, system values and more
4. [Zend Studio for Eclipse](#) helps you build your first PHP application
5. [5250 \(API\) Bridge Demos](#) demonstrate how PHP can Web-enable 5250 applications
6. [Zend Framework](#) gives you a head start with secure, reliable, and modern Web 2.0 applications and Web services
7. [Foundations for IBM i Programmers](#) and [Quick Start: PHP for RPG Programmers](#) online training courses get you started with the basics of PHP
8. [Additional PHP Demo Scripts](#)

### Enhance your PHP

 Build Web Applications and Web services using [Zend Studio for Eclipse](#).  
[Learn about i5/OS specific features.](#)

Do not display this on next login

### PHP Open Source Applications

Zend customers and IBM have reported success running these PHP applications on IBM i:

- [Mantis/400](#) (Bug Tracker)
- [Drupal](#) (CMS)
- [SugarCRM](#) (CRM)
- [MediaWiki](#) (wiki)
- [Joomla!](#) (CMS)
- [Zen Cart](#) (Online Store)
- [phpBB](#) (Bulletin board)

**Note:**  
Zend does not offer commercial or other support for any of these open source applications.

[Learn how to start with Zend Server and PHP](#)

Restart PHP

# Sample Scripts!

The screenshot shows a web browser window displaying the output of a PHP script. The output is an HTML table with two columns: CUST\_ID and COMPANY. The table lists six entries with their respective customer IDs and company names. Below the table, the source code of the PHP script is visible, showing the connection to a database, error handling, and the execution of a SQL query to retrieve customer data.

CUST_ID	COMPANY
1221	Kauai Dive Shoppe
1231	Unisco
1351	Sight Diver
1354	Cayman Divers World Unlimited
1356	Tom Sawyer Diving Centre
1380	Blue Jack Aqua Center

```
<html>
<head>
<title></title>
<meta http-equiv="Content-Type" content="text/html; charset=iso-8859-1">
</head>
<body>

<?php
$conn_resource = db2_connect ("*LOCAL", "", "");

if (!$conn_resource) {
    echo "Connection failed. SQL Err:";
    echo db2_conn_error();
    echo "<br>";
    echo db2_conn_errormsg();

    exit();
}

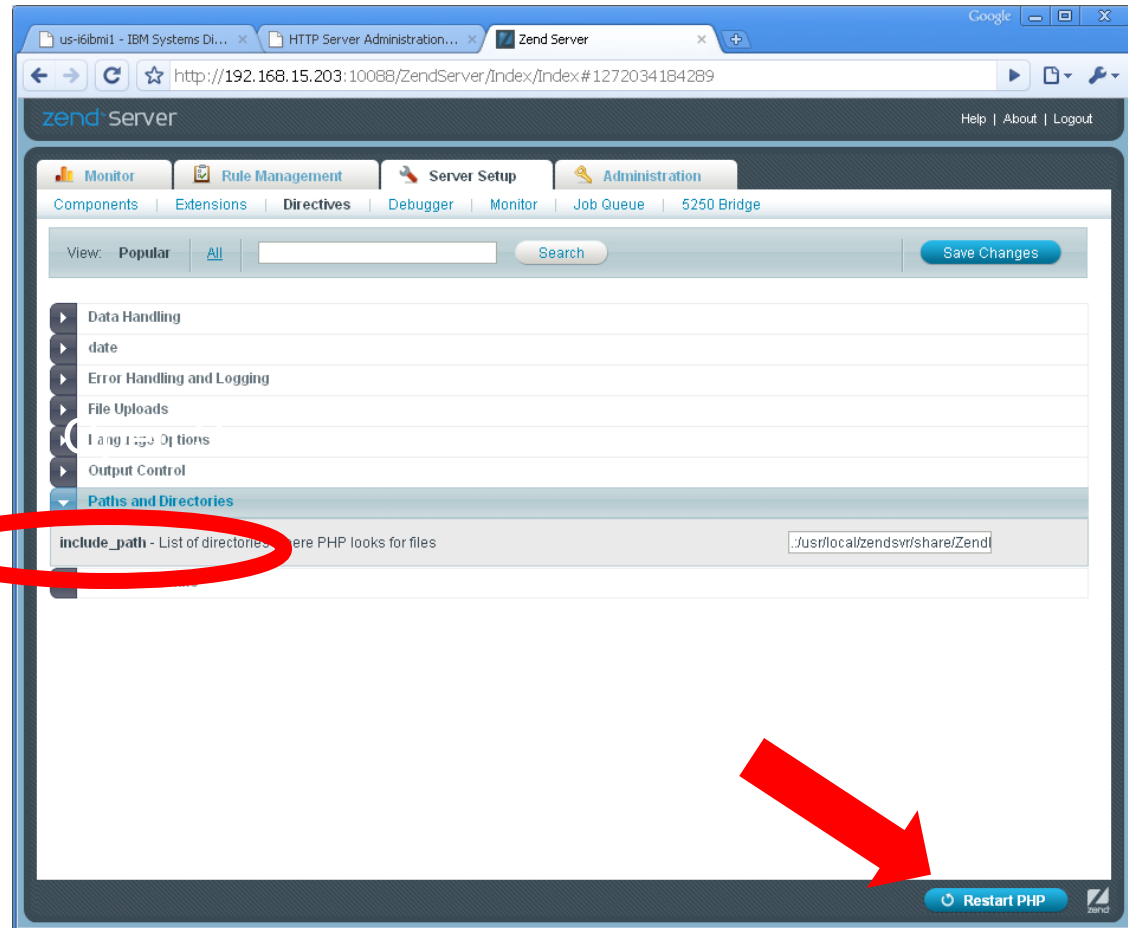
echo "Executing SQL statement: SELECT * FROM ZENDSVR.SP_CUST WHERE CUST_ID > 1220 FOR FETCH ONLY";
echo "<br>";

/* Construct the SQL statement */
$sql = "SELECT * FROM ZENDSVR.SP_CUST WHERE CUST_ID > ? FOR FETCH ONLY";

/* Prepare, bind and execute the DB2 SQL statement */
$stmt= db2_prepare($conn_resource, $sql);
$lower_limit = 1220; //from the CUST_ID value
$fields = db2_num_fields($stmt);
if($fields > 0 )
```

# Zend Server php.ini changes

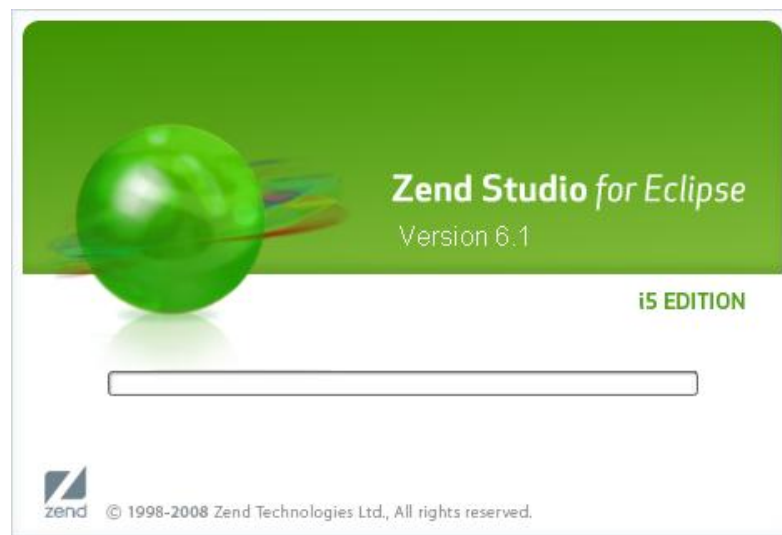
- Manage php.ini via GUI in Zend Server
  - ▶ Log in with initial password, can reset in green screen → Server Setup → Directives
  - ▶ Administer all values in php.ini
  - ▶ Include path is one of many options
  - ▶ Must restart PHP using new blue button!



# 4. Install Zend Studio

# Zend Studio 8 for IBM i

- Included for IBM i customers w/1 year support & upgrades
- Essential IDE for PHP on IBM i
- Syntax checker & code Completion
- JavaScript Library Support
- Debugger
- Built on Eclipse framework
- Function directory
- Templates
- Much, much, more



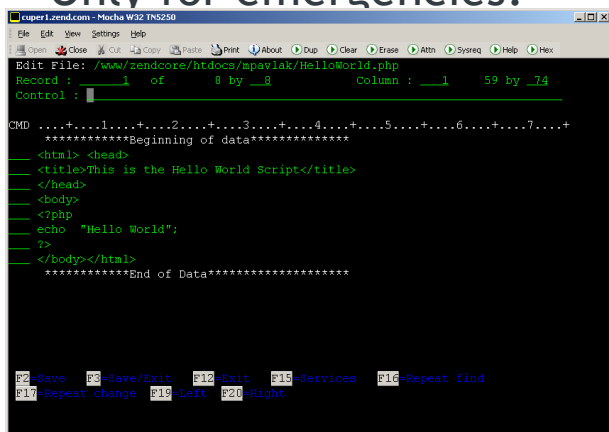
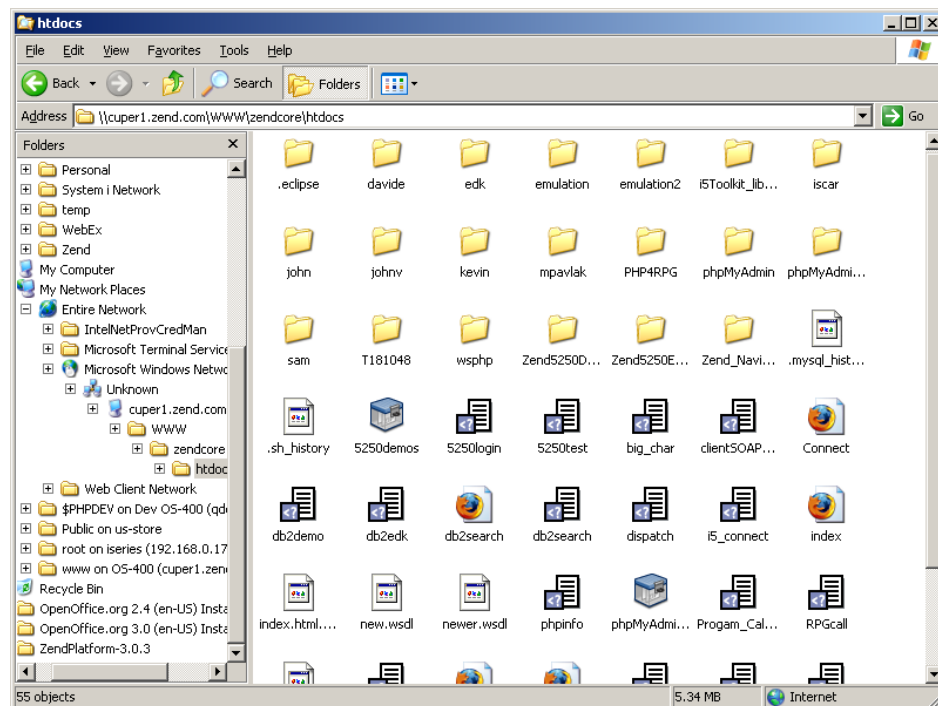
# Zend Studio 8 for IBM i - Installation

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- Download program from [Zend.com/en/downloads](https://www.zend.com/en/downloads) (IBM i Edition!)
- Install to workstation (Mac, Windows, Linux)
- Follow the prompts for licensing the product
- Zend.com with QSRLNBR to license product
- Start the IDE and begin coding PHP immediately

# How do I access IFS files?

- Three methods I use
  - ▶ Netserver file associations (or a mapped local drive)
    - Can be sluggish
  - ▶ Remote server configuration
    - Best for all purposes
  - ▶ WRKLNK
    - Only for emergencies!



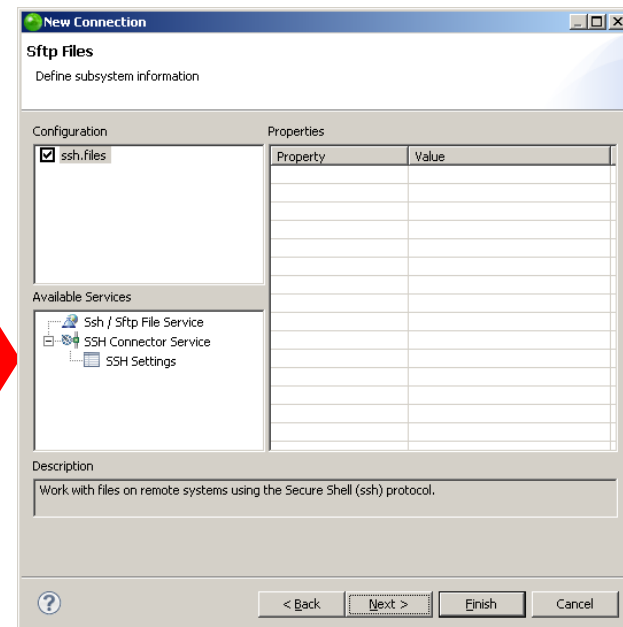
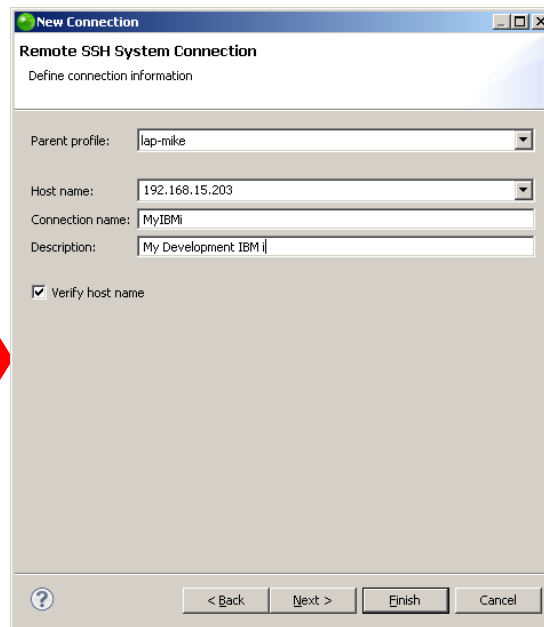
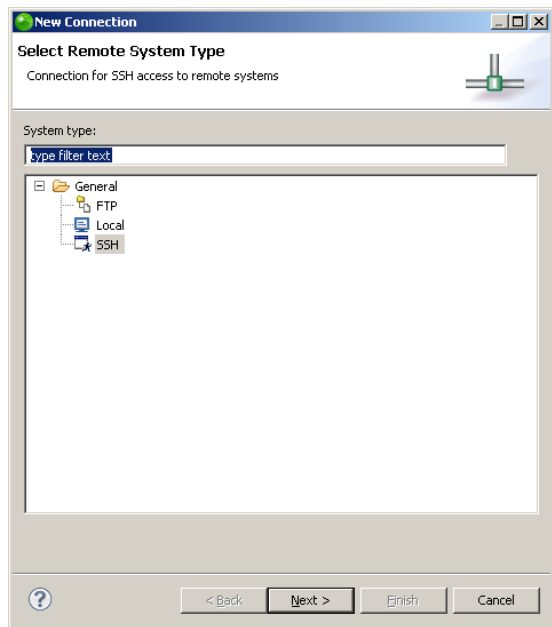
# Remote Server Options

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- **FTP**
  - ▶ Familiar
  - ▶ Sluggish
  - ▶ Most systems support this
- **SSH**
  - ▶ More secure
  - ▶ More powerful
  - ▶ Easy to setup
  - ▶ Easier to setup on i6.1+

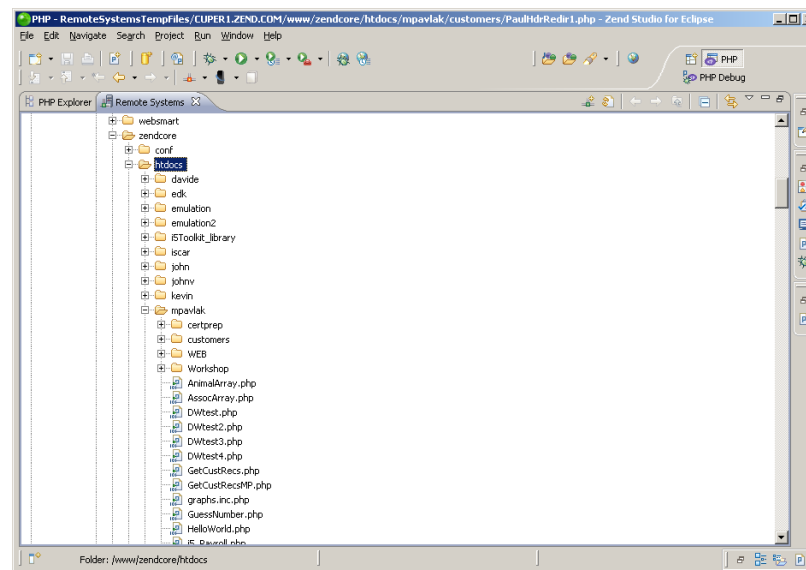
# Configuring a remote server

- Start Zend Studio for IBM i
- Click the new connection button and select SSH
- Enter system name or IP address



# Navigate to files

- Expand the tree for your system
- Navigate to the directory /www/zendcore/htdocs
- Enter user credentials and your in!



# Host side change

---

- CHGFTP NAMEFMT(\*PATH) CURDIR(\*HOMEDIR)  
LISTFMT(\*UNIX)
- Bounce FTP servers
  - ▶ ENDTCP SVR SERVER(\*FTP)
  - ▶ STRTCPSVR SERVER(\*FTP)
- If you have concerns about the host side FTP change consider the SSH method.
  - ▶ V5R4 - Will need to configure and start SSH.
  - ▶ i6.1+ uses STRTCPSVR command for SSHD
  - ▶ See <http://wiki.midrange.com/index.php/SSH>



PHP Expl Remote

Local

- Cuper1
  - Files
    - My Home
    - Root
      - bin
      - davidephp
      - demos
      - dev
      - etc
      - fastemp
      - fixes
      - fr\_tests
      - home
      - kevin
      - lib
      - media\_library

```

1 <?php
2
3 // Standard DB connection to DB2...
4 $conn = "*LOCAL"; $name = ""; $pwd = "";
5 $i5link = db2_connect($conn, $name, $pwd);
6 if (!$i5link)
7     echo 'Connection failed: '.db2_stmt_error().' : '
8 i5
9 $sql
10 $stmt
11 OR
12
13 //
14 echo
15 echo
16 <TD>Address Line 2</TD><TD>City</TD><TD>State
17 // loop di loop through customer recs...
18 while($row=db2_fetch_array($stmt)){
19 list( $CUSTOMER_NUMBER, $CUSTOMER_NAME, $CUSTOMER_ADI
20     $CUSTOMER_CITY, $CUSTOMER_STATE, $CUSTOMER_ZI
21 echo("<TR><TD> $CUSTOMER_NUMBER</TD> <TD>$CUSTOMER_NA
22     <TD>$CUSTOMER_ADDRESS_LINE2</TD><TD>$CUSTOMEREF
23     <TD> $CUSTOMER_ZIP</TD></TR>");
24

```

**Description**  
Fetch a row of data from the resource.

**Parameters**  
result resource resource resulting from operation returning data  
option int[optional] flag specifying which record to fetch (IS\_READ\_SEEK - Current record, IS\_READ\_NEXT - Next record, IS\_READ\_PREV - Previous record, IS\_READ\_FIRST - First record, IS\_READ\_LAST - Last record).

- is\_errormsg(resource[optional] \$connection = ...)
- is\_execute(resource \$stmt, array[optional] \$params)
- is\_fetch\_array(resource \$result, int[optional] \$flag)
- is\_fetch\_assoc(resource \$result, int[optional] \$flag)
- is\_fetch\_object(resource \$result, int[optional] \$flag)
- is\_fetch\_row(resource \$result, int[optional] \$flag)
- is\_field\_len(resource \$result, mixed[optional] \$field)
- is\_field\_name(resource \$result, integer \$field)
- is\_field\_scale(resource \$result, mixed \$field)

Outl PHP PHP

type filter text

- AppendIterator
- ArrayAccess
- ArrayIterator
- ArrayObject
  - ARRAY\_AS\_PROPS
  - STD\_PROP\_LIST
  - \_\_construct(array \$array)
  - append(value \$value)
  - asort()
  - count()
  - exchangeArray(array \$array)
  - getArrayCopy()
  - getFlags()
  - getIterator()
  - getIteratorClass()
  - ksort()

Debug Output

Problems Tasks Console

0 errors, 3 warnings, 0 others

Description	Resource	Path	Location	Type
Warnings (3 items)				
bool-assign : Assignment in condition	ZendCustList1...	RemoteSystemsTe...	line 18	Code Analyzer...
expr-unused : Expression result is never u	ZendCustList1...	RemoteSystemsTe...	line 11	Code Analyzer...
var-use-before-def-global : Global variable	DebugDemo.php	ExampleProject	line 61	Code Analyzer...

# 5. Get Productive!

Hello World

# Sample Script - Hello World

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- Obligatory program when starting out
- Confirms correct setup of PHP
- Sample code: (Shortest PHP Macro around!)
- Save script in IFS /www/zendsvr/htdocs/helloworld.php
- Browser URL: <http://ibmisystem:10088/helloworld.php>

```
<?php
    echo "Hello World";
?>
```

Hello World

# i5 Toolkit APIs

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- System values
  - i5\_get\_system\_value
- Data areas
  - i5\_data\_area\_prepare
  - i5\_data\_area\_receive
  - i5\_data\_area\_send
  - i5\_data\_area\_close
- Print/Get spooled file
  - i5\_spool\_list
  - i5\_spool\_list\_read
  - i5\_spool\_list\_close
  - i5\_spool\_get\_data
  - i5\_spool\_from\_file??
- Job logs
  - i5\_jobLog\_list
  - i5\_jobLog\_list\_read
  - i5\_jobLog\_list\_close
- Active jobs
  - i5\_job\_list
  - i5\_job\_list\_read
  - i5\_job\_list\_close
- Objects list
  - i5\_object\_list
  - i5\_object\_list\_read
  - i5\_object\_list\_close
- User space
  - i5\_userspace\_create
  - i5\_userspace\_prepare
  - i5\_userspace\_get
  - i5\_userspace\_put
- Programs
  - i5\_program\_prepare
  - i5\_program\_call

# Open Source Toolkit

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- Collaboration with IBM and Zend
- Built on ILE RPG, Stored Procedures & pure PHP
- Up to 10 times faster
- Object Oriented, but not too much!

# Example: Usage of all toolkit functions - Part 1

```
ToolkitObj = new ToolkitService();
ToolkitObj->setToolkitServiceParams(array('ControlKey'=>'*here', 'Internal key'=>'/tmp/QAUser') );

ToolkitObj->CLCommand("addlib test", 'b');
/* Call a program without parameters */
ToolkitObj->PgmCall('TESTPGM', 'TESTLIB', array(0), NULL, NULL);

/* Call service program function "sum" which has 3 parms: 2 int input parms and 1 output parm */
$params[] = array('type'=>'10i0', 'io'=>'in', 'parm_name'=>'first', 100); /*first input parameter */
$params[] = AddParameterInt ('in', 10, 'second', 200); /*second input parameter */
$params[] = AddParameterInt ('out', 10, 'third', 0); /*third output parameter*/

$result = ToolkitObj->PgmCall('TESTSRVPGM', NULL, $Params, NULL, array('func', 'sum'));

Var_dump($result );//$result[0]

/*execute function again with a new data */
ToolkitObj->SetParamValue($Params, 'first', 20); /* reset value of first parameter*/

ToolkitObj->SetParamValue($Params, 'second', 30); /* reset value of second parameter*/

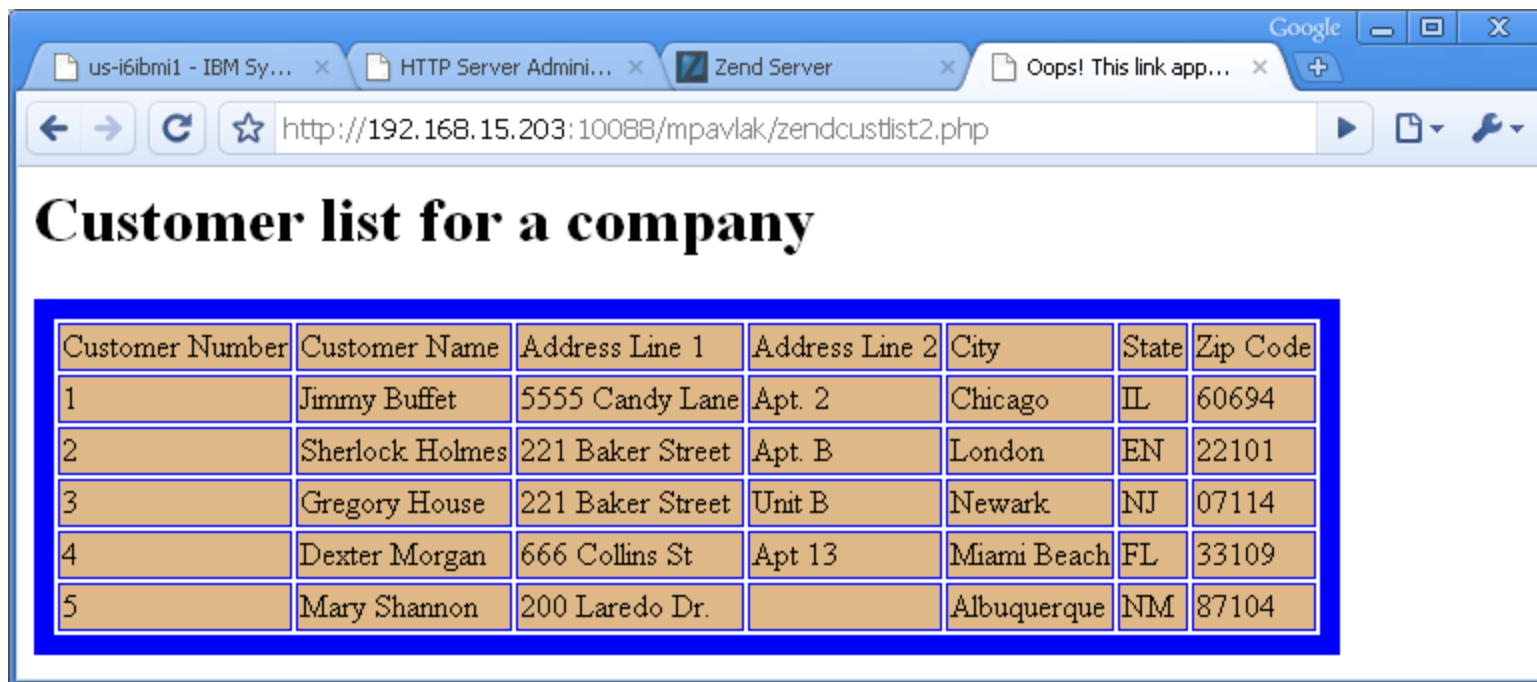
ToolkitObj->PgmCall('TESTSRVPGM', NULL, $Params, NULL, array('func', 'sum'));

ToolkitObj->disconnect();
```

# PHP Data Access Example

# Basic file listing script

- Connect to DB2 i
- Select records from a DB2 table
- Load the records in an HTML table
- Display the output.



The screenshot shows a web browser window with the address bar displaying `http://192.168.15.203:10088/mpavlak/zendcustlist2.php`. The page title is "Customer list for a company". Below the title is a table with 7 columns: Customer Number, Customer Name, Address Line 1, Address Line 2, City, State, and Zip Code. The table contains 5 rows of data.

Customer Number	Customer Name	Address Line 1	Address Line 2	City	State	Zip Code
1	Jimmy Buffet	5555 Candy Lane	Apt. 2	Chicago	IL	60694
2	Sherlock Holmes	221 Baker Street	Apt. B	London	EN	22101
3	Gregory House	221 Baker Street	Unit B	Newark	NJ	07114
4	Dexter Morgan	666 Collins St	Apt 13	Miami Beach	FL	33109
5	Mary Shannon	200 Laredo Dr.		Albuquerque	NM	87104

# Connection to DB2 for i

- Need three things:
  - ▶ System
  - ▶ User ID
  - ▶ Password

Note: If your data sets have \*PUBLIC access, no user or password is required

```
// Standard DB connection to DB2...
$conn = "*LOCAL"; $name = ""; $pwd = "";

$i5link = db2_connect($conn, $name, $pwd);
if (!$i5link)
echo 'Connection failed: '.db2_stmt_error().': '.db2_stmt_errormsg();

$sql = "SELECT * from zenddata.customer";

$stmt = db2_exec($i5link,$sql)
or die("Failed query:".db2_stmt_error().": ".db2_stmt_errormsg());

?>
```

# Reading data...

## Loop through record set

```
<h1> Customer list for a company</h1>
<TABLE BORDER="10" BORDERCOLOR="blue"><TBODY BGCOLOR="DEB887">
<TR><TD>Customer Number</TD><TD>Customer Name</TD><TD>Address Line 1</TD>
<TD>Address Line 2</TD><TD>City</TD><TD>State</TD><TD>Zip Code</TD></TR>

<?php

while($row=db2_fetch_array($stmt)){
list( $CUSTOMER_NUMBER, $CUSTOMER_NAME, $CUSTOMER_ADDRESS_LINE1,
$CUSTOMER_ADDRESS_LINE2, $CUSTOMER_CITY, $CUSTOMER_STATE,
$CUSTOMER_ZIP)= $row;

echo(" <TR><TD> $CUSTOMER_NUMBER </TD><TD> $CUSTOMER_NAME </TD>
<TD> $CUSTOMER_ADDRESS_LINE1 </TD><TD>$CUSTOMER_ADDRESS_LINE2 </TD>
<TD> $CUSTOMER_CITY</TD><TD> $CUSTOMER_STATE </TD>
<TD> $CUSTOMER_ZIP </TD></TR> ");
}
echo ' </table> ';
db2_close($i5link);

?>
```

# Getting Started with PHP on IBM i

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

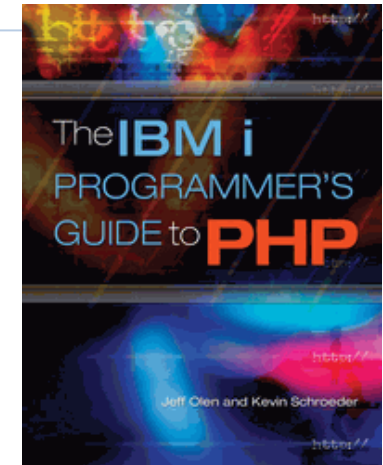
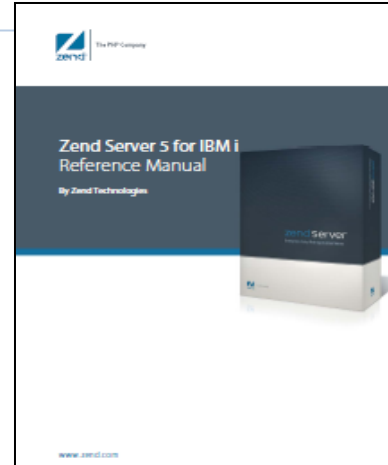
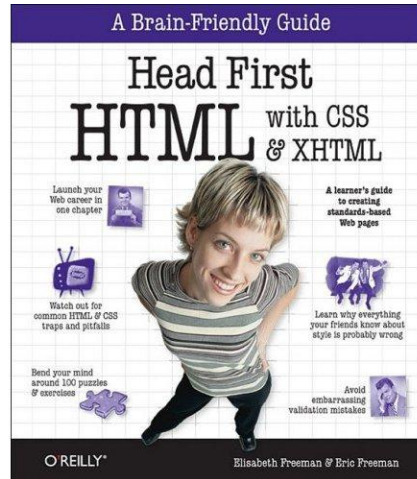
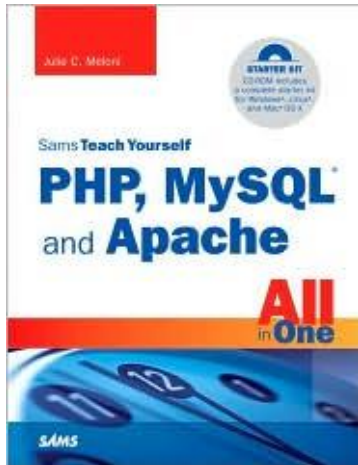
Wrap it up!

# Where do I go next?

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- Get some HTML training
  - ▶ Remember, HTML is to PHP what DDS is to RPG
- JavaScript won't hurt
  - ▶ Can add pizzazz to web pages, but not required
- Download free code - see online resource slide
- Play, have fun, discover
- Education, training more See [zend.com](http://zend.com)
- Practice, practice, practice!

# PHP Resources...



## • Books

- ▶ Sam's teach yourself PHP, MySQL and Apache All in One (4<sup>th</sup> edition) ISBN:067232976X
- ▶ Head First HTML with CSS and XHTML ISBN:059610197X
- ▶ Zend Server Doc at Zend Website
- ▶ IBM i Programmer's Guide to PHP on IBM i - MC Press

# Online Resources...

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- Support?
  - ▶ [Zend.com/forums](http://Zend.com/forums)
  - ▶ [Zend.com/support-center](http://Zend.com/support-center)
  - ▶ [Zend.com/products](http://Zend.com/products)
  - ▶ [php.net](http://php.net) - on-line PHP manual (Also in Zend Core!)
  - ▶ [Midrange.com](http://Midrange.com) WEB400 forum
- Free code!
  - ▶ [Sourceforge.net](http://Sourceforge.net) - free applications
  - ▶ [phpclasses.org](http://phpclasses.org) - free PHP code samples
  - ▶ [hotscripts.com](http://hotscripts.com) - free PHP code

# Questions?

Thank you!!

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