



FRESCHE SOLUTIONS

Getting Started with PHP on IBM i

NHMUG

New Hampshire
Midrange User Group

Corporate Overview



40+ years in business

- ▶ Management and employee owned
- ▶ 300+ employees
- ▶ 18 yr average employee tenure
- ▶ Named one of Canada's top small and medium employers



22,000+ customers

- ▶ 8 offices around the world
- ▶ North America, Europe, Latin America and Asia Pacific
- ▶ Over 200 partners/resellers



Application Management and Modernization Experts

- ▶ 15+ years application optimization, integration, modernization expertise
- ▶ 40 years of IBM i product development



Innovative Products and Services

- ▶ Web, mobile and GUI modernization
- ▶ Analysis & productivity
- ▶ Application & database modernization

FRESCHESOLUTIONS

BCD looksoftware

QUADRANT
SOFTWARE

Audience

- 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

- The five steps to PHP adoption
 - ▶ The PHP ecosystem
 - ▶ What is the “stack” on IBM i
 - ▶ Install Zend Server
 - ▶ Install Zend Studio
 - ▶ Get productive!

PHP Ecosystem

PHP is a web scripting language

- 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
- PHP is to Java what RPG is to COBOL

Who is Rogue Wave?



- Rogue Wave Acquired Zend in 2015
 - Accelerate Great Code
- Premier & Strategic Business Partner
- Major contributor to PHP (4 FTE's dedicated to Open Source)
- Providers of supported PHP distribution, Zend Server
- Providers of commercial tooling for PHP, Zend Studio

Zend/RW and IBM

- Partnership began in 2005
- Zend selected by IBM to deliver PHP on IBM i
- Zend solutions shipped with IBM i 7.1, 7.2 and 7.3!
- Just install the LP and go!
- Most current distributions and updates at Zend.com
- Relationship expanded in 2012 to include MySQL & MariaDB

What do we get?

- Thanks to their partnership with IBM, each IBM i customer under SWMA can take advantage of these Zend solutions:
 - Zend Server for IBM i basic edition
 - Runs natively on IBM i as a licensed program
 - Zend Studio for IBM i
 - IDE runs on desktop for creating PHP scripts
 - One year of updates and support.
 - Studio is a perpetual license while Server will need to be annually renewed via Zend Sales support

What is Zend Server?

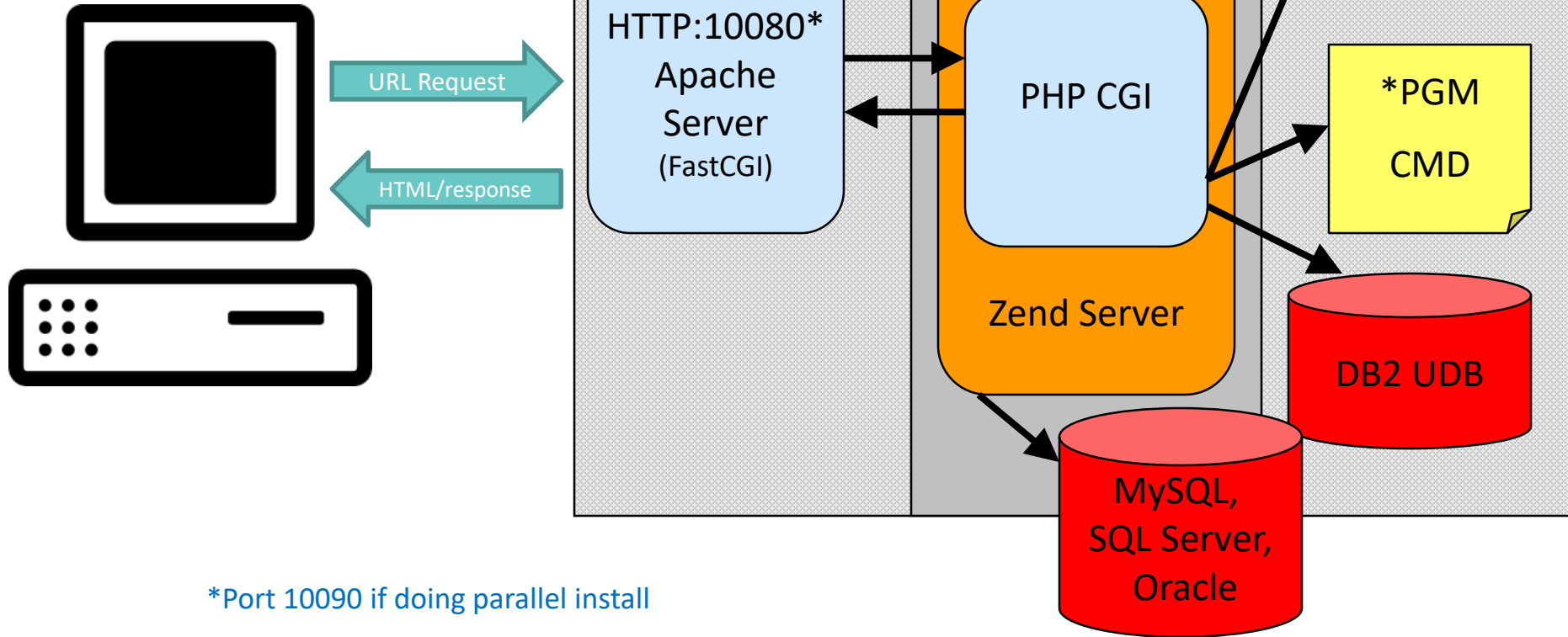
- Production quality PHP stack
 - PHP, ZF, DB connectivity, debugging extension, and more
- Three Editions – No charge “Basic Edition” provided by IBM & Full Professional and Enterprise commercial edition
 - All are production ready
- Application monitoring and diagnostics (integrated with Zend Studio)
- Multi-level performance enhancement capabilities
- Software updates and security hot fixes
- Easy and quick installation
- Zend Framework Integration

Zend Server under the covers

Thanks
Tony!

ILE Apache:10080/90

- Default configuration FastCGI



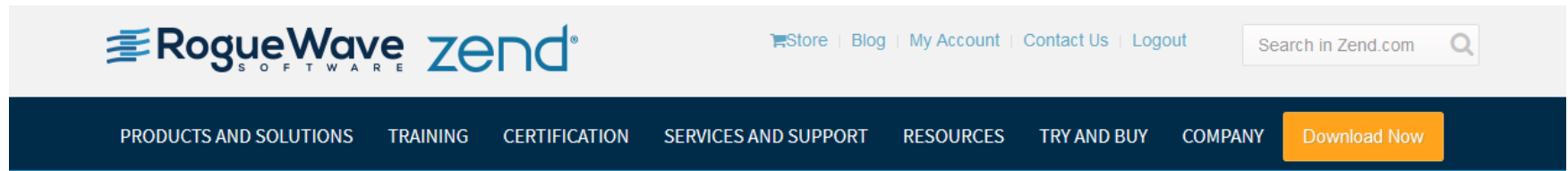
*Port 10090 if doing parallel install

Installation

Install Zend Server

- Prerequisites:
 - See Zend Server installation documentation for LP's!
 - Supported releases: i7.1, i7.2 and i7.3
 - Recent Cumulative PTF package, PASE, Qshell, Group for HTTP
- Software installation
 - Logon with *SECOFR authority (QSECOFR for MySQL for best results)
 - Upload *SAVF, Restore License Program, and start coding!
 - Clean installation can start the stack automatically
- Bonus ZendDBi
 - MariaDB 10.1 can be installed at the same time or later

Go to zend.com

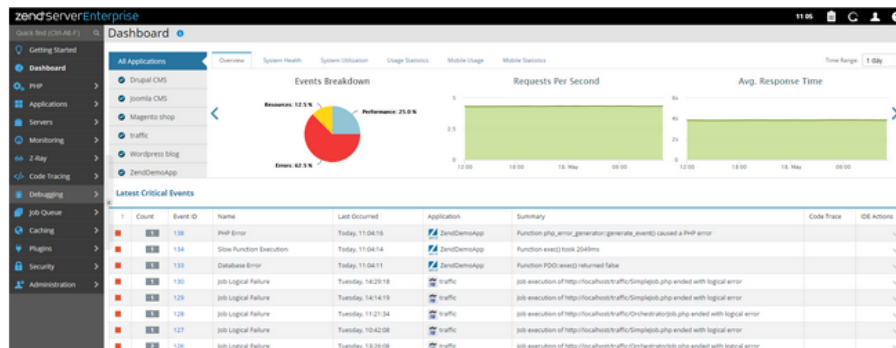


Home / Products / Server / Downloads

Start your free 30-day trial

Ensure PHP application performance, security, and scalability with Zend Server, the comprehensive runtime for enterprise PHP.

Try Zend Server in the cloud.



Start your trial

* First Name:

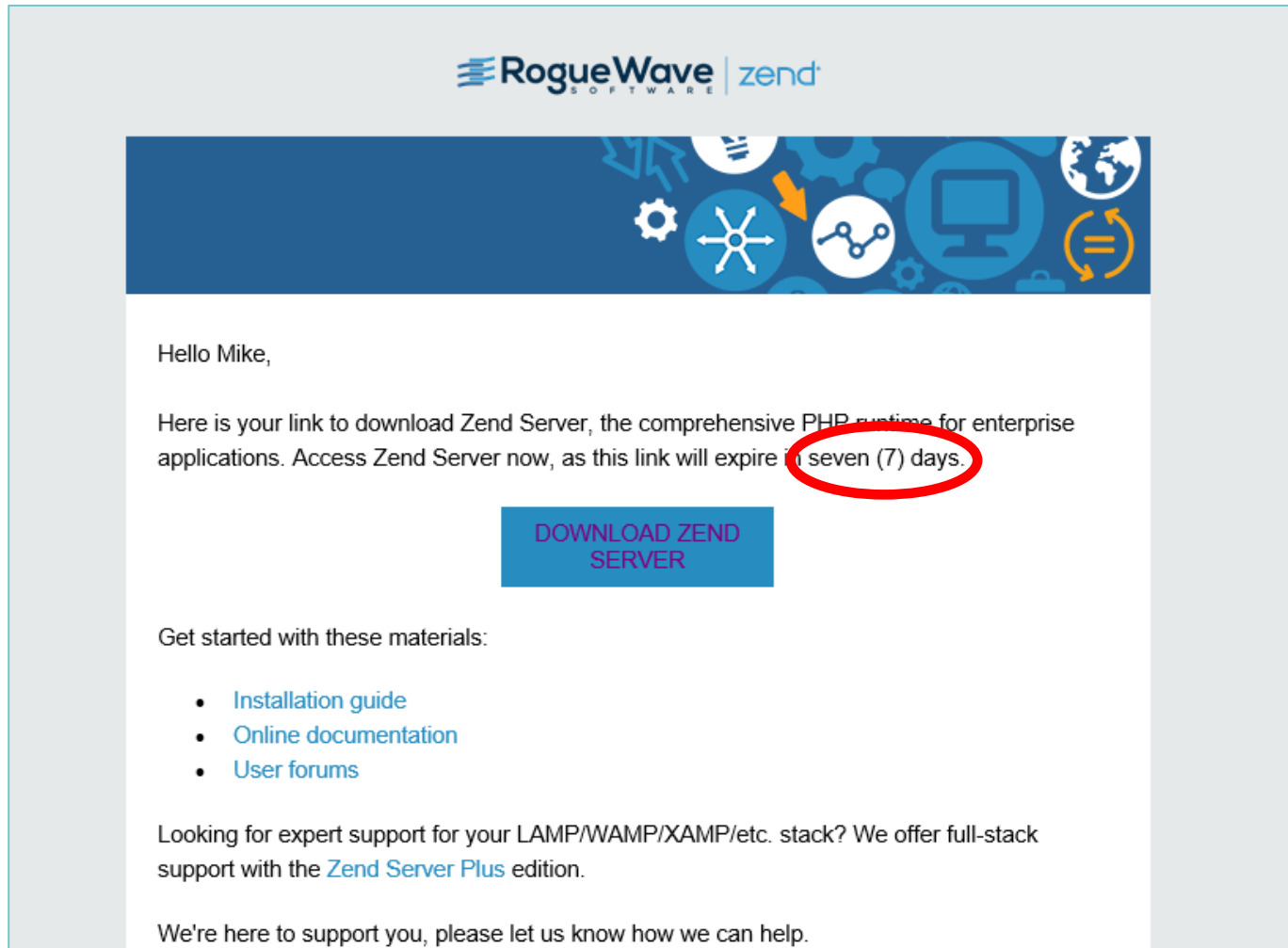
* Last Name:

* Email:

* Company:

* Job Title:

Then email with this



The image shows a screenshot of an email template. At the top, there is a header with the 'RogueWave | zend' logo. Below the header is a decorative blue banner with various white and yellow icons representing technology, such as gears, a network diagram, a computer monitor, and a globe. The main body of the email is white. It starts with a greeting 'Hello Mike,'. The next paragraph says 'Here is your link to download Zend Server, the comprehensive PHP runtime for enterprise applications. Access Zend Server now, as this link will expire in seven (7) days.' The phrase 'seven (7) days' is circled in red. Below this text is a blue button with the text 'DOWNLOAD ZEND SERVER' in white. Underneath the button, it says 'Get started with these materials:' followed by a bulleted list of three links: 'Installation guide', 'Online documentation', and 'User forums'. The final paragraph says 'Looking for expert support for your LAMP/WAMP/XAMP/etc. stack? We offer full-stack support with the Zend Server Plus edition.' and the last line says 'We're here to support you, please let us know how we can help.'

RogueWave | zend

Hello Mike,

Here is your link to download Zend Server, the comprehensive PHP runtime for enterprise applications. Access Zend Server now, as this link will expire in seven (7) days.

DOWNLOAD ZEND SERVER

Get started with these materials:

- [Installation guide](#)
- [Online documentation](#)
- [User forums](#)

Looking for expert support for your LAMP/WAMP/XAMP/etc. stack? We offer full-stack support with the [Zend Server Plus](#) edition.

We're here to support you, please let us know how we can help.

Downloads page from email

[Home](#) / [Products](#) / [Server](#) / [Downloads](#)

Please select your platform

- IBM i -

NEW: Download the Zend DBi package as a 100% compatible drop-in replacement for MariaDB on IBM i

Zend Server with Z-Ray PHP
7.1.7
(9.1.1 Upgrade from 9.1.0)

Version: 9.1.1
[Release Notes](#)
[Installation Instructions](#)
[More Details](#)

Download

Additional Downloads

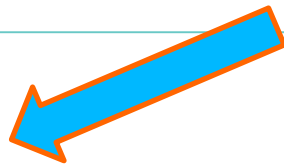
Product	Version	Format/Size	Resources	MD5 Checksum	Download
Zend Server with Z-Ray for PHP 5.6 (8.5.7 upgrade from 6.x)	8.5.8	ZIP	View Instructions Release Notes	4203a0ddba2b9423755fb65cd177842f	Download
Zend Server with Z-Ray PHP 5.6	8.5.8	ZIP	View Instructions Release Notes	3e59c4c0755f29e24820a9ffc6bd93be	Download

Additional downloads

■ Older versions and updates to older versions

Download Older Versions

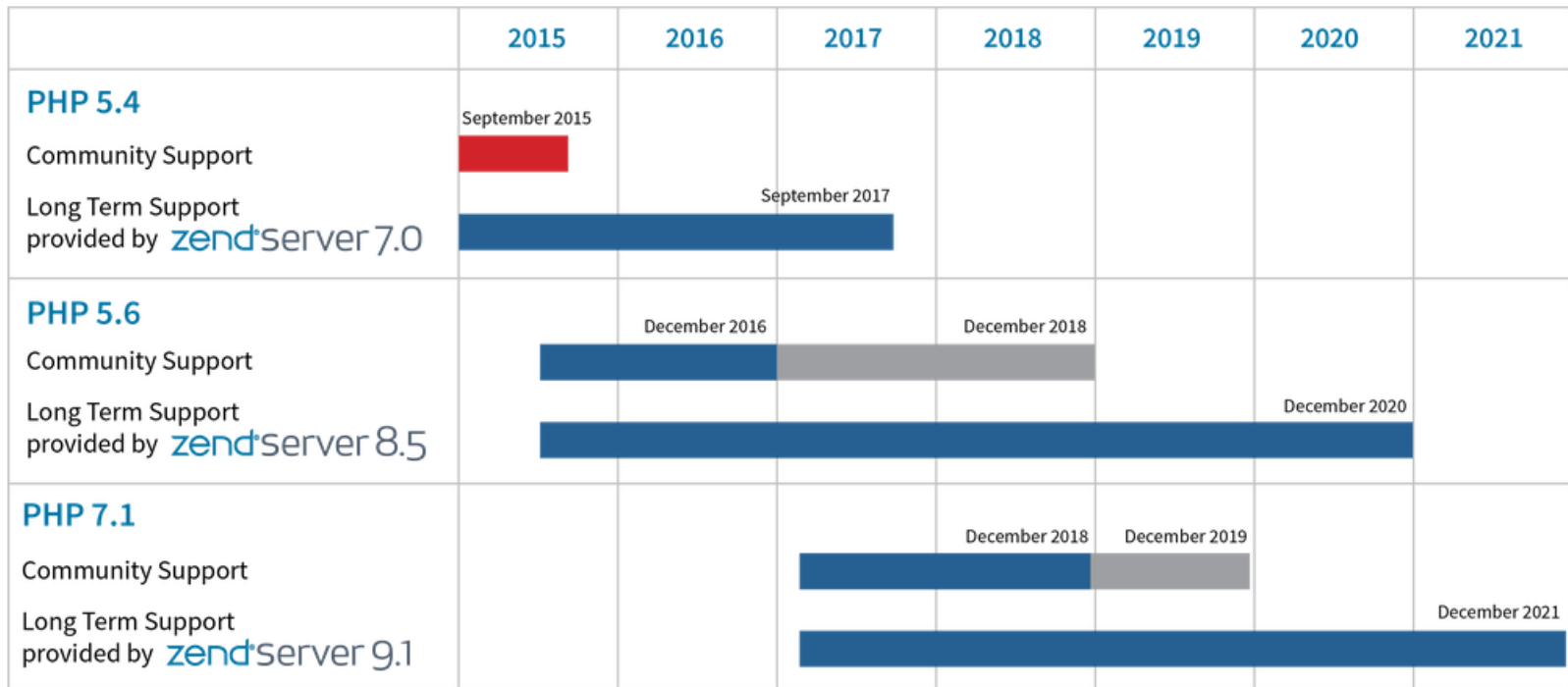
Looking for LTS releases?
> [Download older versions](#)





Product	Version	Format/Size	Resources	MD5 Checksum	Download
Zend Server - PHP 5.5 (7.0.0 upgrade from 6.x)	7.0.0	ZIP	View Instructions Release Notes	cdc728b32338ca777107d82926ecccbc	Download
Zend Server - PHP 5.5	7.0.0	ZIP	View Instructions Release Notes	9f51f29417e5556f93136ae72314d4c8	Download
Zend Server - PHP 5.4 (7.0.0 upgrade from 6.x)	7.0.0	ZIP	View Instructions Release Notes	b4d037cfd8842ef2c51a9911bb80a542	Download
Zend Server - PHP 5.4	7.0.0	ZIP	View Instructions Release Notes	b375191e0fc30a2eb0e167f2ee71eae5	Download

What about older versions?

■ Simple, Long Term Support...



*We encourage all PHP users to move to PHP 5.6 or 7.1 for longer community and Zend Support.

-  Bug fixes and security updates
-  Security updates only
-  Community security fixes no longer available

Only for the adventurous – PHP 7.2

Zend Server 2018.1 Early Access Program

Great! You're almost there.

What's New on Zend Server Early Access version?

Check out the new features and enhancements we just added to Zend Server:

<https://goo.gl/Bx7Uml>

Install Zend Server Early Access

To install the latest Zend Server Early Access edition, please go to:

<https://goo.gl/TYr3P9>

**Not for
Production!!!**

OS version support

■ Linux

- ▶ Intel
- ▶ Power

■ IBM i

■ Windows

■ Mac

- Linux x86_64
 - RHEL / CentOS 7.x via RPM packages
 - Debian GNU/Linux 8.x via DEB packages
 - Ubuntu 14.04 (LTS) and 16.04 (LTS) via DEB packages

Note: 32bit systems are not supported.

- Linux Power8
 - Ubuntu 14.04 (LTS) and 16.04 (LTS) via DEB packages
 - RHEL 7.x via RPM packages
- Mac OS X
 - 10.12 (Sierra)
 - 10.13 (High Sierra)
- Windows x86
 - Windows 7 (with Service Pack 1)
 - Windows 10
 - Windows Server 2012 R2

Note: compiled with Visual Studio 2015 with VC14

- IBM i
 - V7R1 with latest PTFs (Apache 2.2 only)
 - V7R2 with latest PTFs
 - V7R3 with latest PTFs

Back to IBM i - Start/stop

ZSMENU Zend Server 9 for IBM i Management Menu (PHP 7) System: MVI5

Select one of the following:

Operation

1. Start Zend Server Subsystem
2. End Zend Server Subsystem
3. Work with Zend Server Jobs
4. Work with Zend Server Logs

Apache

10. Start Apache Server Instance
11. Stop Apache Server Instance
12. Restart Apache Server Instance
13. Work with Apache Logs
14. Work with QTMHHTTP Spooled Files
15. Work with Apache Conf File
16. Display Apache Version
17. Display OpenSSL Version

Daemon Management

20. Zend Server Daemon
21. Deployment Daemon
22. Monitor Daemon
23. Job Queue Daemon
24. Java Bridge Daemon
25. PRNGD Daemon

Additional Products

30. ZendDBI Management Menu
31. 5250 Bridge Management Menu

Maintenance

80. Configurations
81. Maintenance Menu

Selection or command

==>

F3=Exit F4=Prompt F9=Retrieve F12=Cancel
F13=Information Assistant F16=System main menu

Zend Server configuration

- Only two interfaces!
 - Use <http://ibmiserver:2001> to administer IBM HTTP server
 - Use Zend Admin for Zend/PHP options <http://ibmiserver:10081> or <http://ibmiserver:10091>

IBM Web Administration for i

Setup **Manage** Advanced | Related Links

All Servers HTTP Servers | Application Servers | Installations

Common Tasks and Wizards

- Create Web Services Server
- Create HTTP Server
- Create Application Server
- Create WebSphere Portal

Manage All Servers ?

All HTTP Servers | All Application Servers

Data current as of Oct 8, 2014 8:06:18 AM.

Server	Version	Status	Address:Port
ADMIN	Apache/2.2.11 (i5)	Running	*:2001
AJSP	Apache/2.2.11 (i5)	Stopped	*:8210
APACHEDF	Apache/2.2.11 (i5)	Stopped	*:80
IWADFT	Apache/2.2.11 (i5)	Stopped	*:2020
WQLW17	Apache/2.2.11 (i5)	Stopped	*:80
ZENDSVR	Apache/2.2.11 (i5)	Stopped	*:10088
ZENDSVR6	Apache/2.2.11 (i5)	Running	*:10081 *:10080 127.0.0.1:10083

Refresh Start Stop Restart

Manage Details Delete Rename

zendServerEnterprise

Dashboard

Time Range: month

All Applications

ZendSamplesApp

Events Breakdown

Resources: 0.0332 % Performance: 0.453 % Errors: 99.5 %

Requests Per Second

Avg. Response Time

Latest Critical Events

!	Count	Event ID	Name	Last Occurred	Application	Summary	Code Tra..	IDE Actions
1	1	1324	PHP Error	Sunday, 17:29:58		Function PHPExcel_IOFactory::createWriter() caused a PHP error		
1	1	1323	PHP Error	Sunday, 17:13:11		Function PHPExcel_Writer_Excel2007::save() caused a PHP error		
2	2	1321	PHP Error	Sunday, 17:11:02		Function PHPExcel_Writer_Excel2007::save() caused a PHP error		

Zend Server port changes

- Default proxy points to Port
 - 10080 for clean install (10081=Admin, 10083=Web Services)
 - 10090 for parallel install (10091=Admin, 10093=Web Services)
- Log in to IBM Admin Server and open up ZENDSVR6 or ZENDPHP7
 - Change to Port 80, if you like.
- Go to General Server Configuration
- Click Apply & restart the server

Deploy samples and demo

- Click guide page & scroll down to XML Toolkit
- Click link to install XML Toolkit demo application to deploy samples...
- Simple wizard, accept default, enter path and go...

Getting Started

WELCOME

Zend Server Version 9.1.1,

DEPLOY SAMPLE APPLICATION

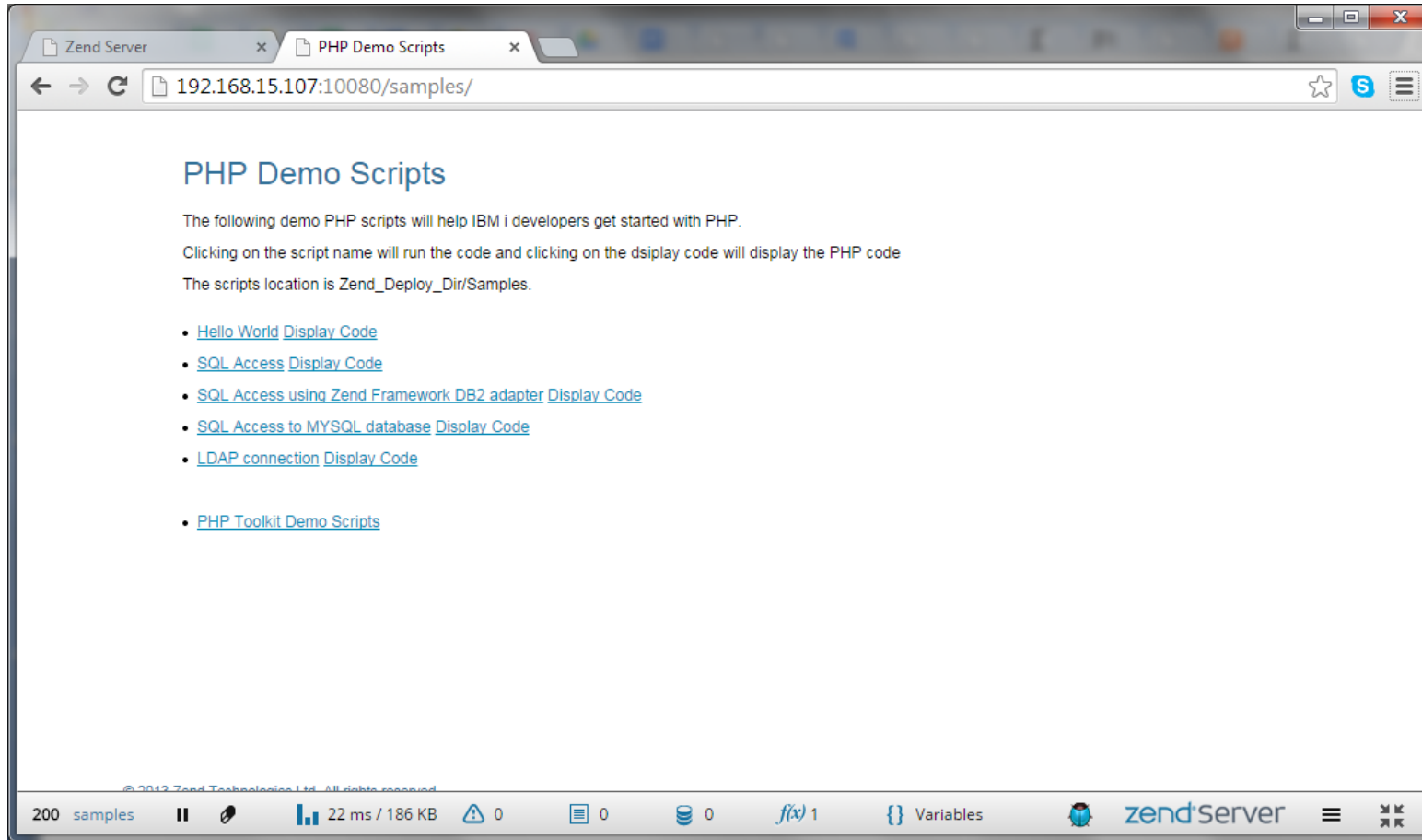
Here you can deploy console applications. Select an application below. Please note: the demo application is not for production use.

[Sample App](#)

GREAT! What's Next?

➤ PHP & WEB SERVER	<h4>XML TOOLKIT</h4> <p>The open-source PHP Toolkit has been developed by IBM and Zend to help you extend PHP code to access IBM i resources.</p> <p>The Toolkit's XML Service back-end service, written in RPG and using a choice of transports, including ibm_db2 and odbc extensions, is designed to work either statelessly or statefully.</p> <p>Its stateful abilities enable developers to call RPG/COBOL/CL programs and APIs while retaining cursors, library lists, the QTEMP library, and more, to enable reuse of existing programs for web applications.</p> <p>Install XML Toolkit demo application</p>
➤ DEPLOYMENT	
➤ PERFORMANCE	
➤ TROUBLESHOOTING	
➤ Z-RAY	
➤ PLUGINS	
➤ XML TOOLKIT	

Sample Scripts! (<http://IBMi:10080/samples>)



Sample Scripts! (<http://IBMi:10080/samples>)

Executing SQL statement: SELECT * FROM ZENDSVR6.SP_CUST WHERE CUST_ID > 1220 FOR FETCH ONLY

CUST_ID	COMPANY	FIRSTNAME	LASTNAME	CIVIL	ADDRESS	ADDR2	CITY	STATE	ZIP	COUNTRY	PHONE	FAX
1221	Kauai Dive Shoppe	LINA	Norman	2	4-976 Sugarloaf Hwy	Suite 103	Kapaa Kauai	HI	94766-1234	US	\$ 808-555-0269	\$ 808-555-0278
1231	Unisco	George	Weathers	1	PO Box Z-547		Freeport			Bahamas	809-555-3915	809-555-4958
1351	Sight Diver	Phyllis	Spooner	1	1 Neptune Lane		Kato Paphos			Cyprus	357-6-876708	357-6-870943
1354	Cayman Divers World Unlimited	Joe	Bailey	1	PO Box 541		Grand Cayman			British West Indies	\$ 011-5-697044	\$ 011-5-697064
1356	Tom Sawyer Diving Centre	Chris	Thomas	1	632-1 Third Frydenhoj		Christiansted	St. Croix	00820	US Virgin Islands	\$ 504-798-3022	\$ 504-798-7772
1380	Blue Jack Aqua Center	Ernest	Barratt	1	23-738 Paddington Lane	Suite 310	Waipahu	HI	99776	US	\$ 401-609-7623	\$ 401-609-9403
1384	VIP Divers Club	Russell	Christopher	1	32 Main St.		Christiansted	St. Croix	02800	US Virgin Islands	809-453-5976	809-453-5932
1388	Ocean				PO Box		Kailua-Kona		94756		\$ 808-	\$ 808-

Waiting for 192.168.15.107... zend server

Sample Scripts! (<http://IBMi:10080/samples>)

The screenshot displays a web browser window with two tabs. The active tab shows the URL `192.168.15.107:10080/samples/`. Below the browser, a window titled "Zend Server" shows the execution of an SQL statement: `SELECT * FROM ZENDSVR6.SP_CUST WHERE CUST_ID > 1220 FOR FETCH ONLY`. The results are displayed in a table with columns `CUST_ID`, `COMPANY`, and `FIRSTNAME`.

CUST_ID	COMPANY	FIRSTNAME
1221	Kauai Dive Shoppe	LINA
1231	Unisco	George
1351	Sight Diver	Phyllis
1354	Cayman Divers World Unlimited	Joe
1356	Tom Sawyer Diving Centre	Chris
1380	Blue Jack Aqua Center	Ernest
1384	VIP Divers Club	Russell
1385	Ocean	

The background window shows the source code of `SQL_access/Disp_DB2_SQL_example.src.php`. The code is a PHP script that connects to a DB2 database, executes the same SQL statement, and displays the results in an HTML table.

```
<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();
}

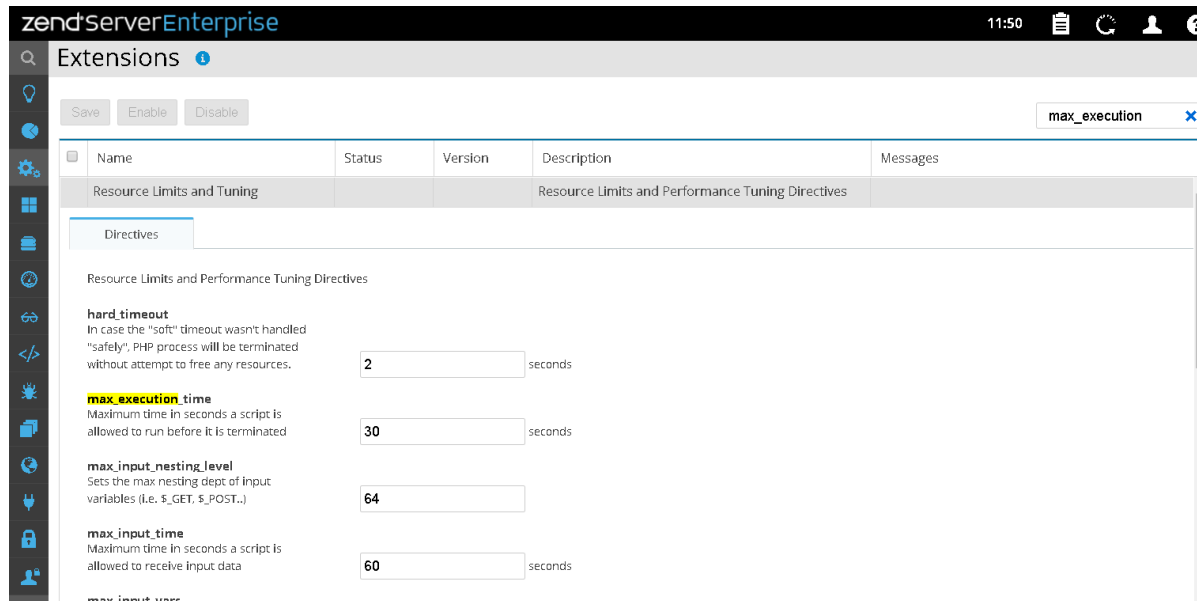
echo "Executing SQL statement: SELECT * FROM ZENDSVR6.SP_CUST WHERE CUST_ID > 1220 FOR FETCH ONLY". "<br>", "<br>";

/* Construct the SQL statement */
$sql = "SELECT * FROM ZENDSVR6.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 )
{
    //show Table Header (analyze result set)
    echo "<table border=1>";
    echo "<tr>";
```

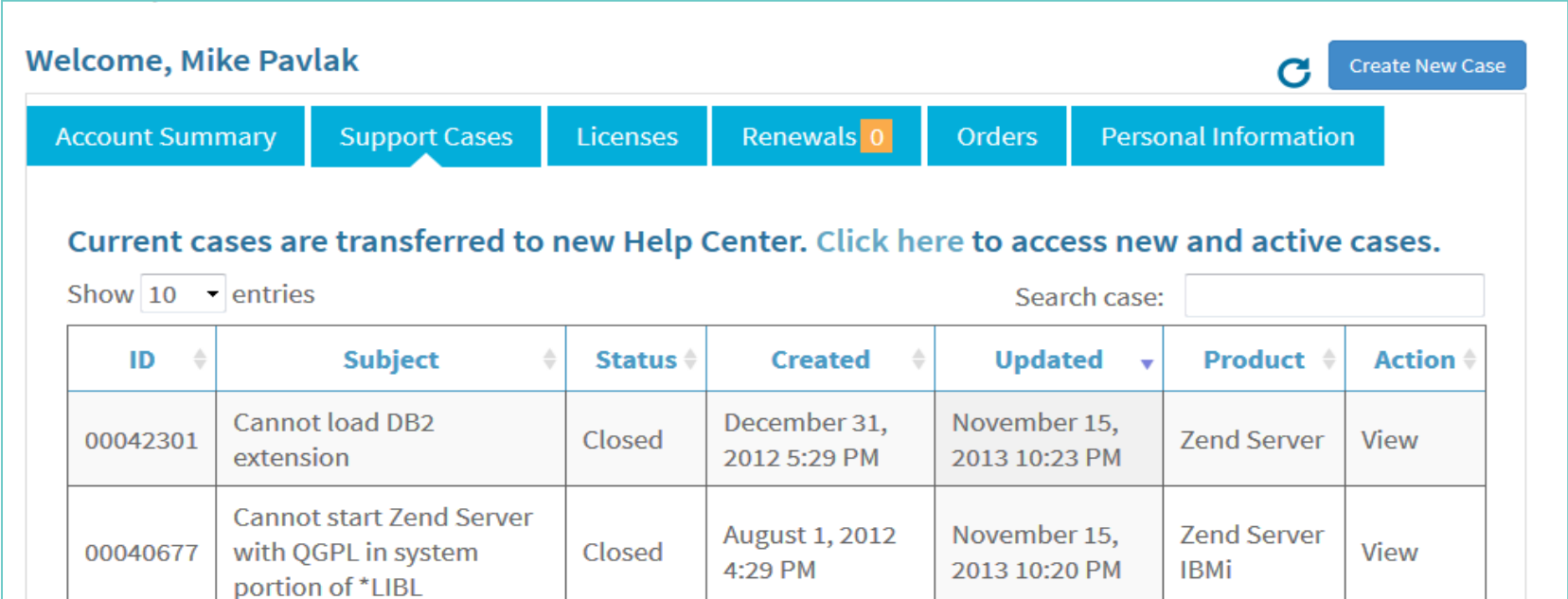
Zend Server PHP.ini changes


- 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 over 400 options



Zend Support

- Included with Basic edition for 1 year
- Upgraded support (phone) can be purchased from Zend

- 

Welcome, Mike Pavlak  [Create New Case](#)

[Account Summary](#) [Support Cases](#) [Licenses](#) [Renewals 0](#) [Orders](#) [Personal Information](#)

Current cases are transferred to new Help Center. [Click here to access new and active cases.](#)

Show entries Search case:

ID	Subject	Status	Created	Updated	Product	Action
00042301	Cannot load DB2 extension	Closed	December 31, 2012 5:29 PM	November 15, 2013 10:23 PM	Zend Server	View
00040677	Cannot start Zend Server with QGPL in system portion of *LIBL	Closed	August 1, 2012 4:29 PM	November 15, 2013 10:20 PM	Zend Server IBMi	View

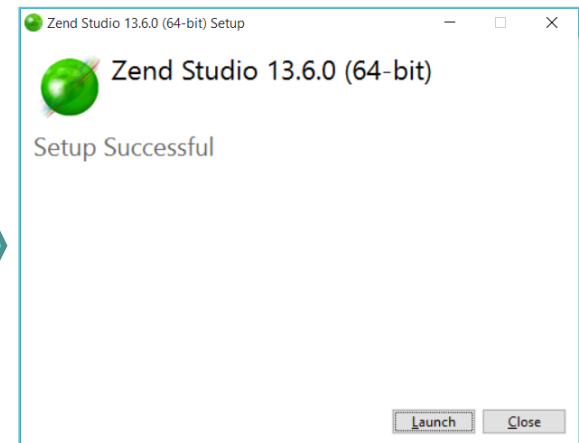
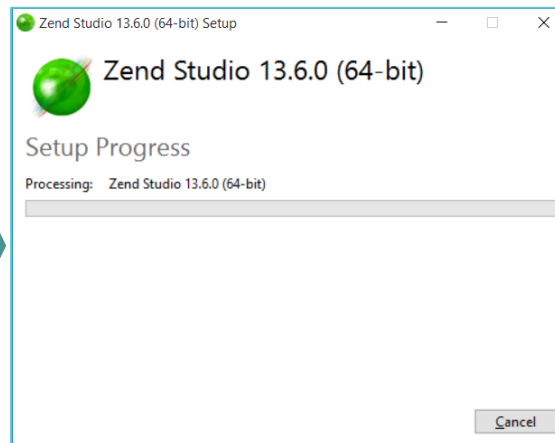
Zend Studio

Zend Studio 13.6

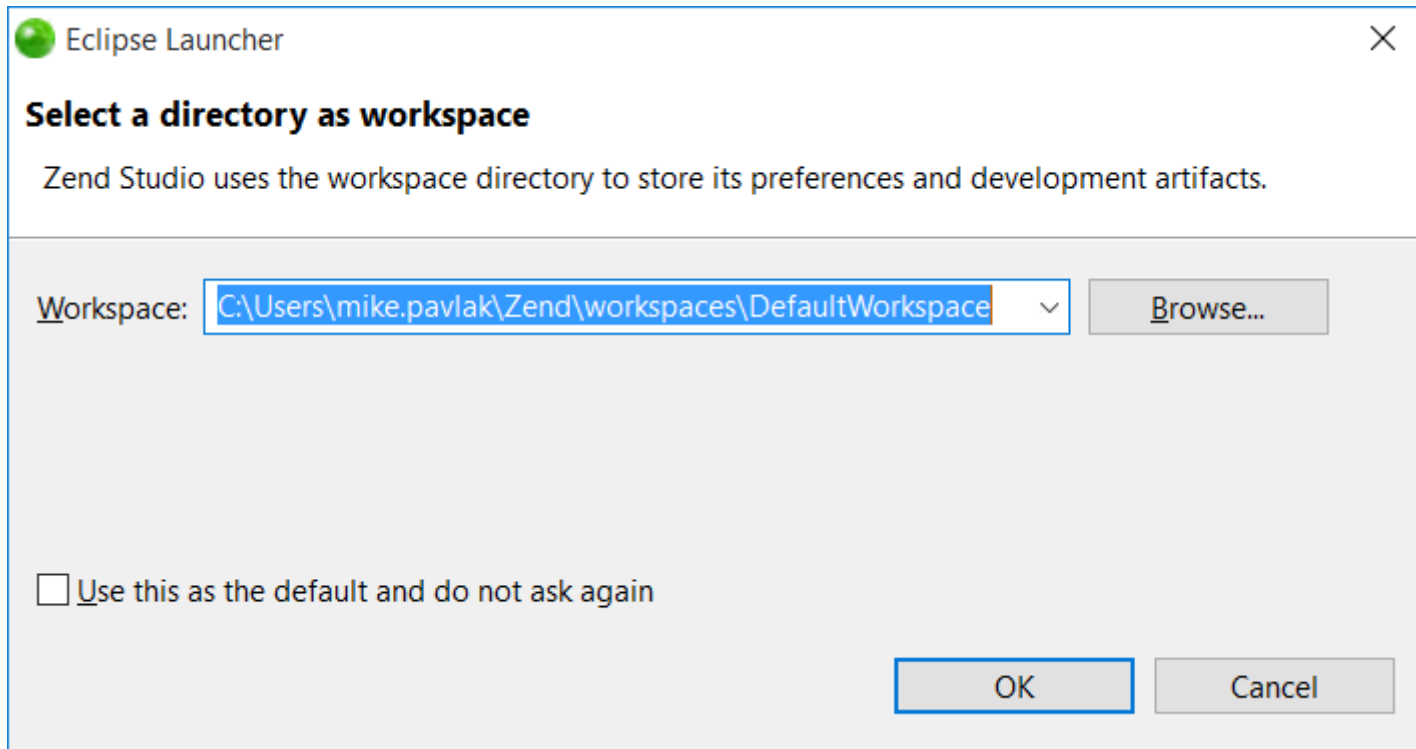
- Included for IBM i customers w/1 year support & upgrades
- Essential IDE for PHP on IBM i
- Syntax checker & code Completion
- JavaScript Library Support
- Debugger
- Built on Eclipse framework
- Function directory
- Templates
- PHP 7 Migration Tool
- Much, much, more

Zend Studio Installation

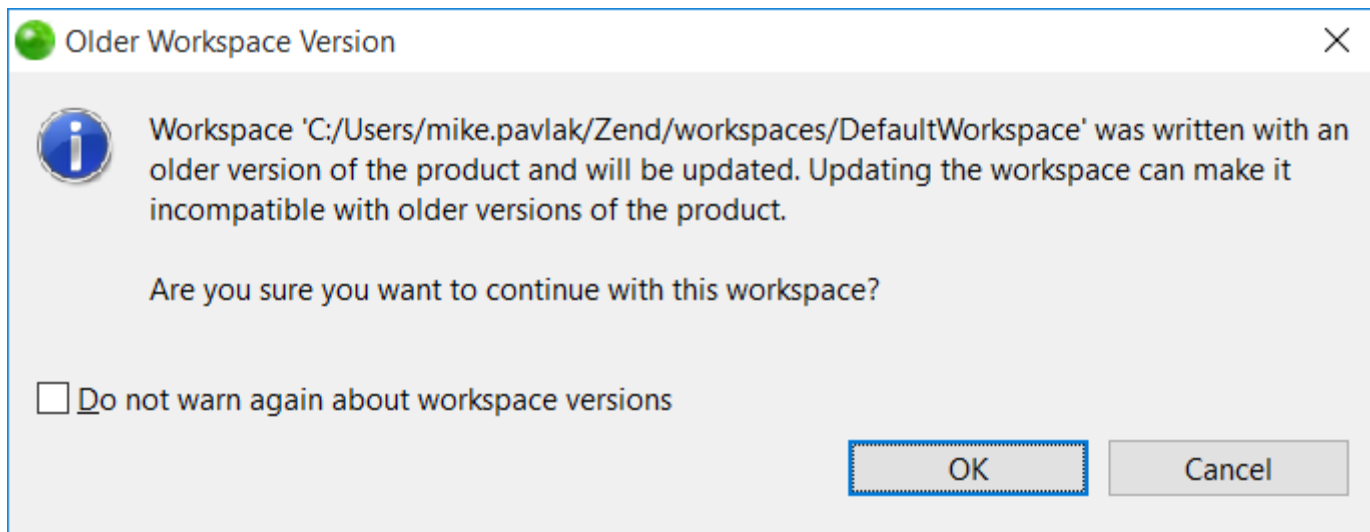
- Download program from Zend.com (Not shipped with OS)
- Install to workstation (Mac, Windows, Linux)
- Follow the prompts for licensing the product, QSRLNBR




Select workspace





Warning about update



Get the free license

 Zend Studio Trial





Zend Studio Trial

A valid license key is required to use Zend Studio beyond the trial period.

You have 30 days remaining before the trial period expires.

☒ Provide your license key:

☐ Continue with trial

Are you an IBM i user? [Get a license for IBM i.](#)

Buy...

Continue

Quit


Registration page at Zend.com

www.zend.com/en/products/studio/for-i5os/license

skin precision 5510

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Welcome to the Zend Studio for Eclipse i5 Edition registration page. This page will allow you to register your copy of Zend Studio for IBM I with Zend and IBM to get your free license and enable your 1 year of free support provided by IBM. You must fill out the information requested here and then login/register with Zend. Your license key will be emailed to you shortly after you complete the login/registration process. If for some reason you do not get the email (typically because of email filtering software) your license will also be available in your Account at Zend (<http://www.zend.com/en/user/myzend>)

To get your free license you will need to supply your i5/OS serial number for verification. If you do not know your serial number you can run the 5250 command:

"DSPSYSVAL QSRLNBR"

or look for the serial number on the physical machine.

Please enter your i5/OS serial number:

Process

Remote Server options

- **FTP (port 21)**
 - ▶ Familiar
 - ▶ Sluggish
 - ▶ Most systems support this, but potentially dangerous
- **SSH (port 22- *Check with network manager to open*)**
 - More secure, powerful
 - Easy to setup since i6.1

SSH startup

```
A - 5250 Display
File Edit View Communication Actions Window Help

Start TCP/IP Server (STRTCPSVR)

Type choices, press Enter.

Server application . . . . . > *SSHD                *ALL, *AUTOSTART...
+ for more values

Instance:
Server instance . . .
Instance startup values

F3=Exit  F4=Prompt  F5=
F24=More keys
```

```
A - 5250 Display
File Edit View Communication Actions Window Help

/Q0openSys/usr/bin/-sh

$
> ps ax
PID      TTY STAT TIME COMMAND
  9      - A   4:54 /Q0openSys/QIBM/ProdData/JavaVM/jdk60/32bit/jre/lib/ppc
 15      - A   0:00 /usr/local/mysql/bin/mysqld --defaults-file=/usr/local
 33      - A   3:53 /Q0openSys/QIBM/ProdData/JavaVM/jdk60/32bit/jre/lib/ppc
 39      - A  20:24 /Q0openSys/QIBM/ProdData/JavaVM/jdk60/32bit/jre/lib/ppc
 40      - A  19:56 /Q0openSys/QIBM/ProdData/JavaVM/jdk60/32bit/jre/lib/ppc
 41      - A  13:06 /Q0openSys/QIBM/ProdData/JavaVM/jdk60/32bit/jre/lib/ppc
 42      - A  21:25 /Q0openSys/QIBM/ProdData/JavaVM/jdk626/32bit/jre/lib/pp
 75      - A   7:44 /QIBM/ProdData/OS/SLP/bin/lslp-kernel -f/QIBM/UserData
 149     - A   4:11 /Q0openSys/QIBM/ProdData/JavaVM/jdk60/32bit/jre/lib/ppc
 219     - A   0:01 /Q0openSys/QIBM/ProdData/SC1/OpenSSH/openssh-4.7p1/sbin
12019   - A   0:00 /usr/local/zendsvr6/bin/watchdog -c /usr/local/zendsvr
12023   - A   0:00 /usr/local/zendsvr6/bin/MonitorNode /usr/local/zendsvr
12024   - A   0:00 /usr/local/zendsvr6/bin/watchdog -c /usr/local/zendsvr
12025   - A   0:00 /usr/local/zendsvr6/bin/watchdog -c /usr/local/zendsvr

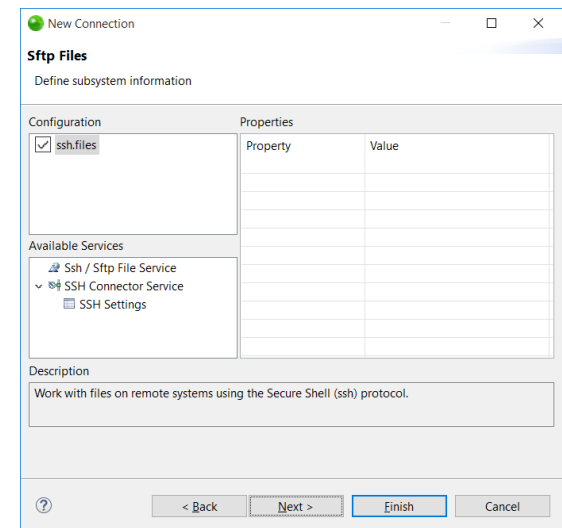
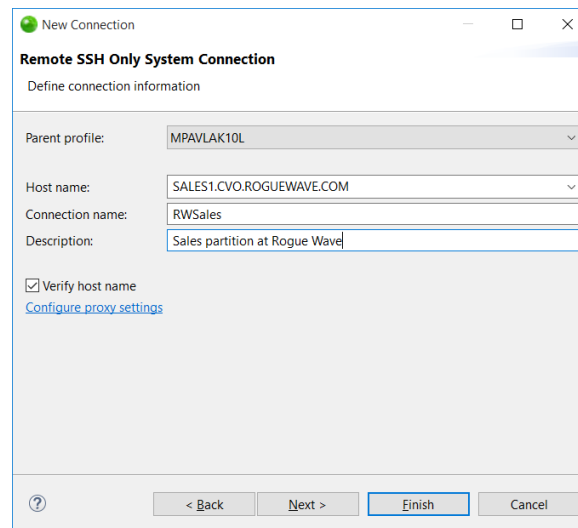
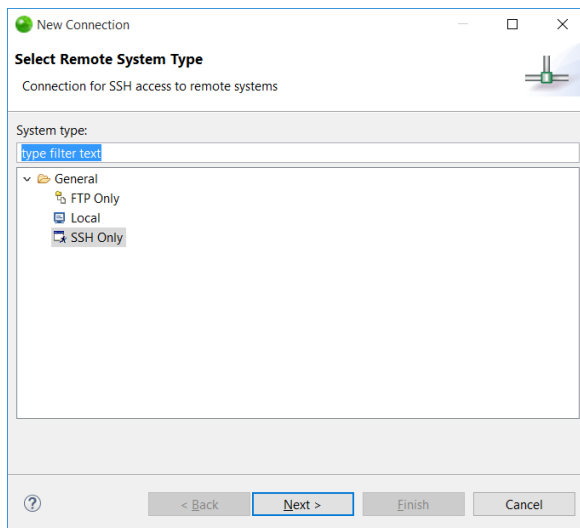
==> ps ax

F3=Exit  F6=Print  F9=Retrieve  F11=Truncate/Wrap
F13=Clear F17=Top   F18=Bottom   F21=CL command entry

MA A 21/007
```

Configuring the remote server

- Start Zend Studio & open “Remote Systems” window
 - Window → show view → Remote Systems
- Click the new connection button and select SSH
- Enter system name or IP address



Navigate to files

- Expand the tree for your system (triangle twisties)
- Enter user credentials and your in!

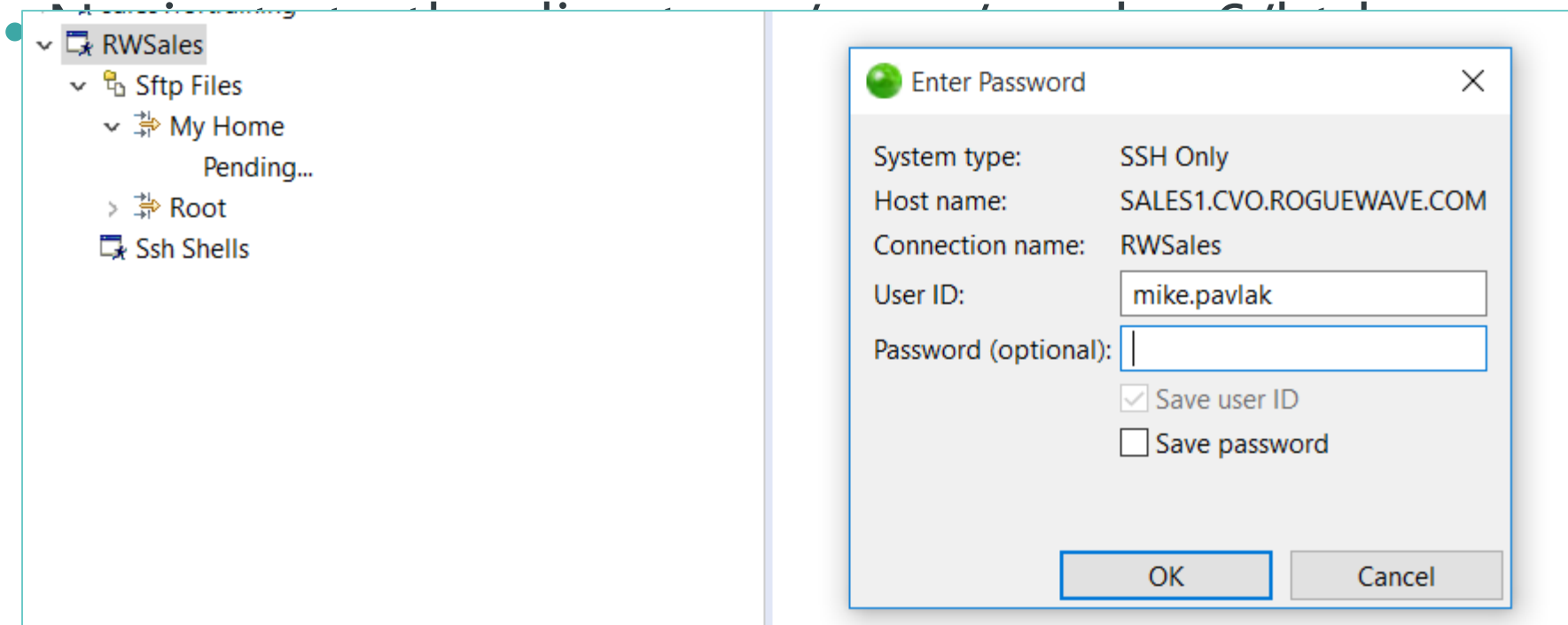
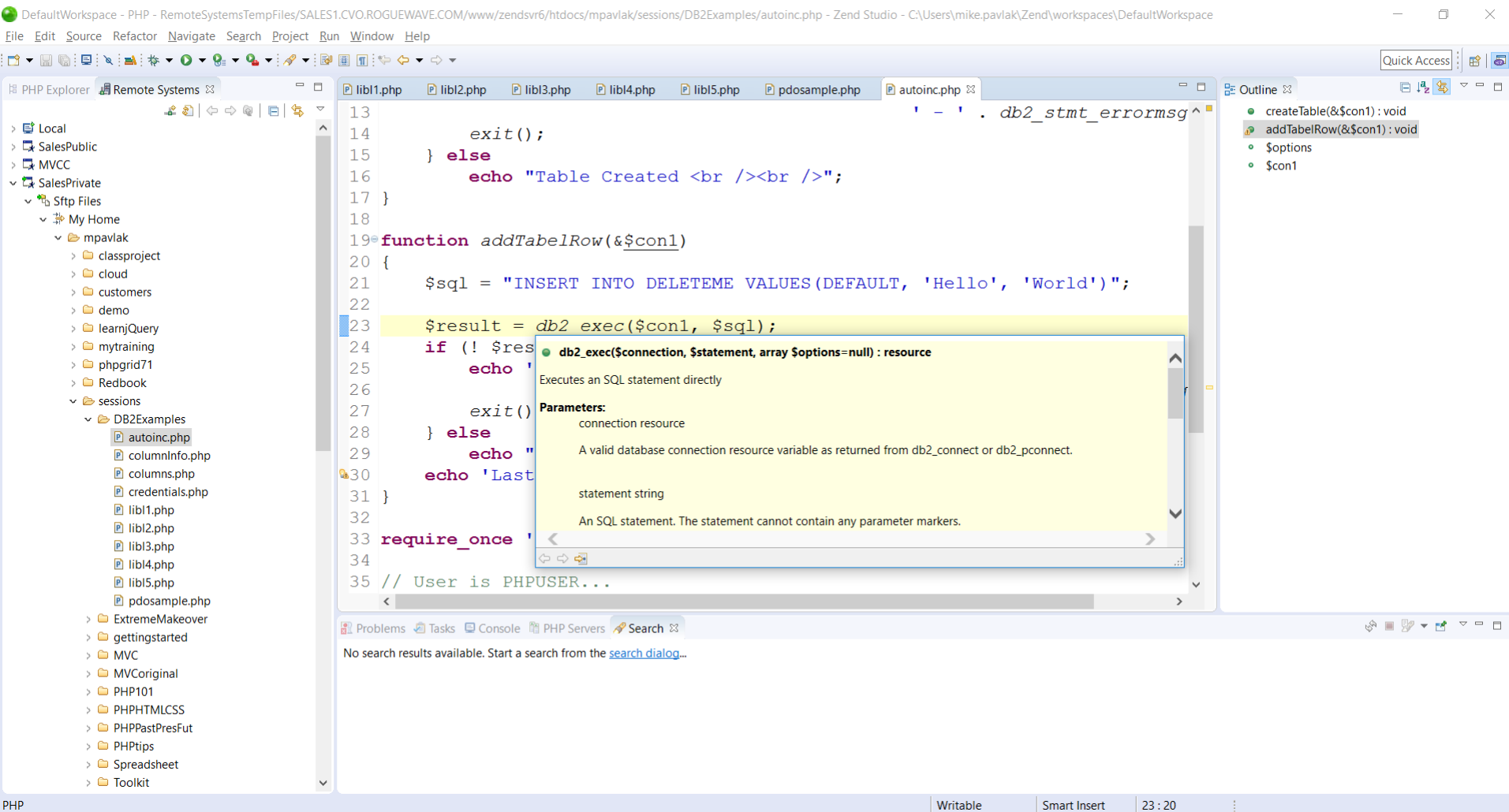


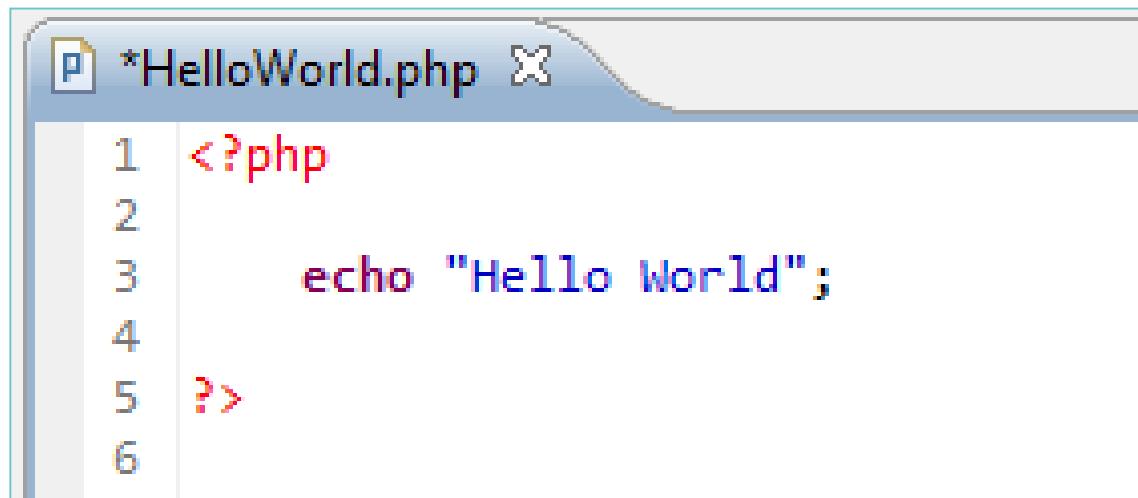
Image of studio



Get Productive

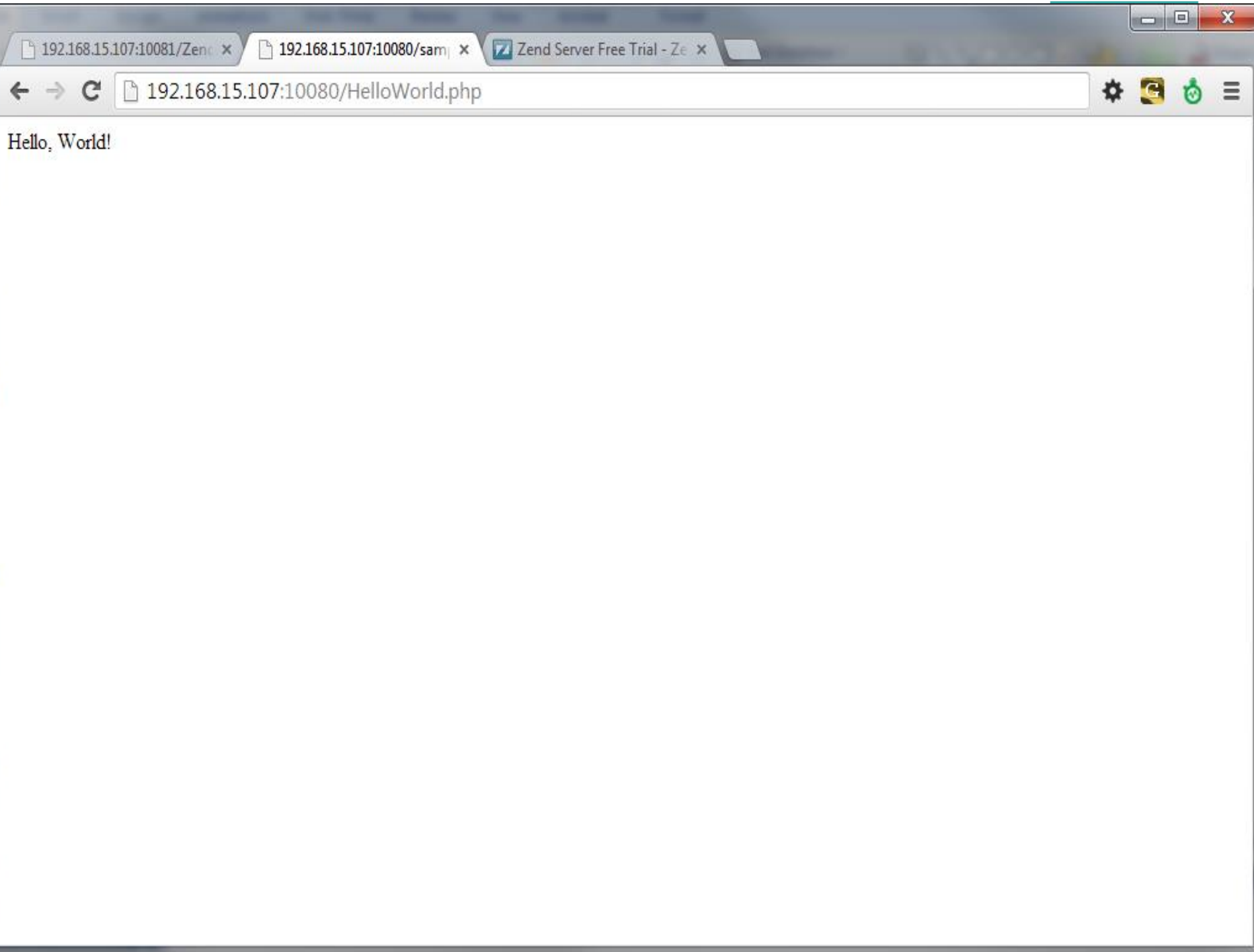
Sample script – Hello World

- Obligatory program when starting out
- Confirms correct setup of PHP
- Sample code: (Shortest PHP Macro around!)
- Save script in IFS
/www/zendsvr6/htdocs/helloworld.php
- Browser URL: <http://ibmisystem:10080/helloworld.php>



A screenshot of a text editor window titled '*HelloWorld.php'. The editor shows the following PHP code:

```
1 <?php
2
3     echo "Hello World";
4
5 ?>
6
```



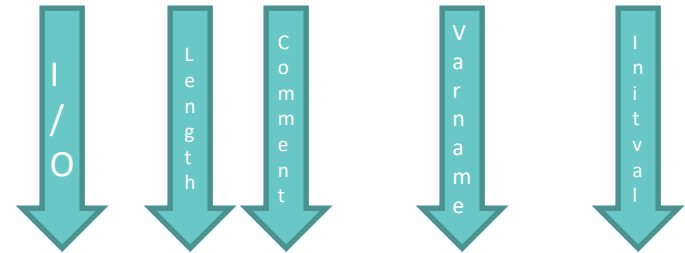
Open Source Toolkit

- Collaborative project with IBM and Zend
- Built using ILE RPG, Stored procedures and PHP
- Object Oriented, but not too much

Set parameters based on function

Call program

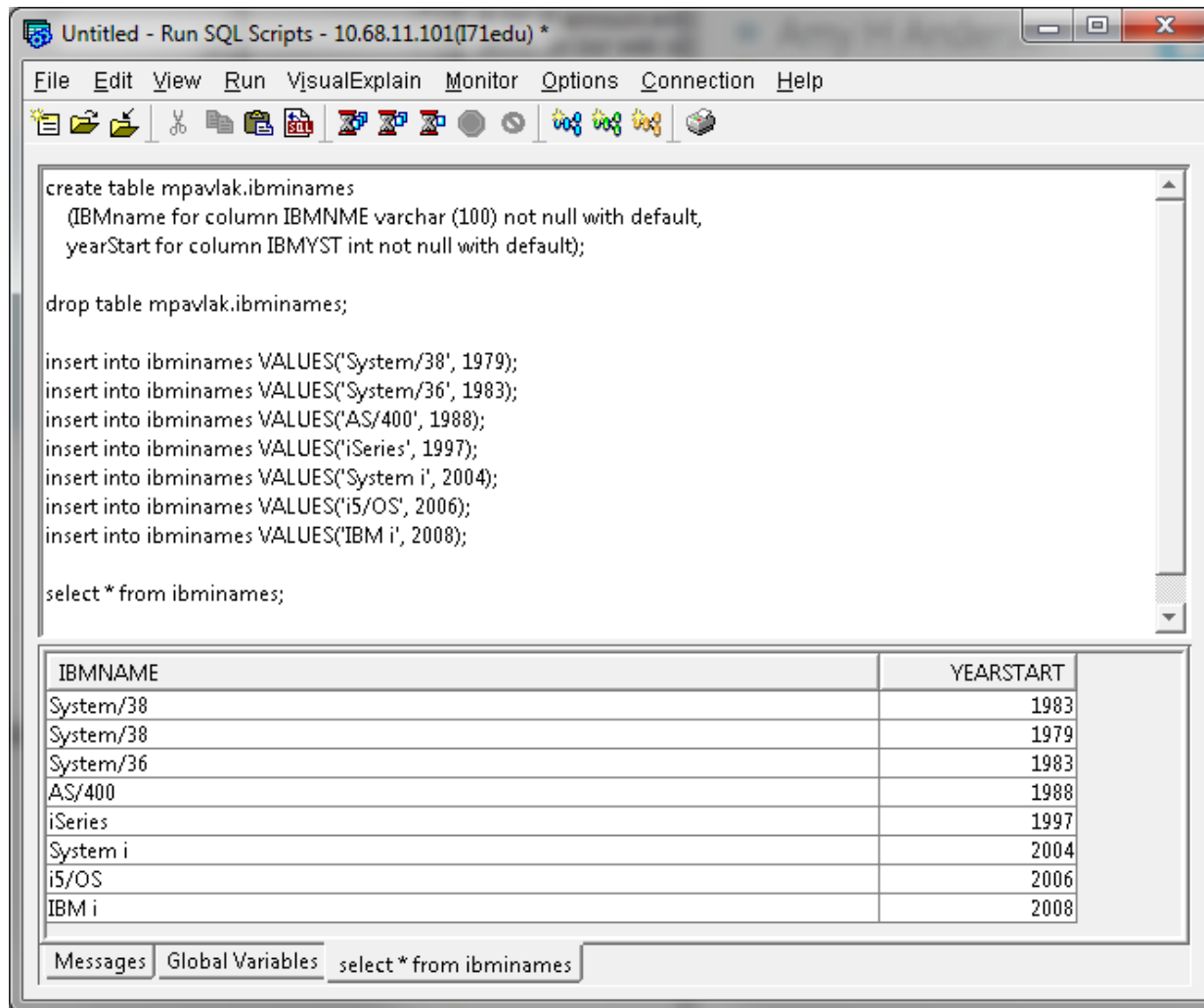
Output results



```
37 $param[] = $ToolkitServiceObj->AddParameterChar('both', 10, 'CODE', 'CODE', $code);
38 $param[] = $ToolkitServiceObj->AddParameterChar('both', 10, 'DESC', 'DESC', $desc);
39
40 $result = $ToolkitServiceObj->PgmCall("COMMONPGM", "ZENDSVR", $param, null, null);
41
42 if($result){
43     showTable( $result['io_param']);
44 }
45 else
46     echo "Execution failed.";
```

DB2 Data Access Example

Table of IBM i names



Untitled - Run SQL Scripts - 10.68.11.101(I71edu) *

File Edit View Run Visual Explain Monitor Options Connection Help

```
create table mpavlak.ibminames
  (IBMname for column IBMNAME varchar (100) not null with default,
  yearStart for column IBMYST int not null with default);

drop table mpavlak.ibminames;

insert into ibminames VALUES('System/38', 1979);
insert into ibminames VALUES('System/36', 1983);
insert into ibminames VALUES('AS/400', 1988);
insert into ibminames VALUES('iSeries', 1997);
insert into ibminames VALUES('System i', 2004);
insert into ibminames VALUES('i5/OS', 2006);
insert into ibminames VALUES('IBM i', 2008);

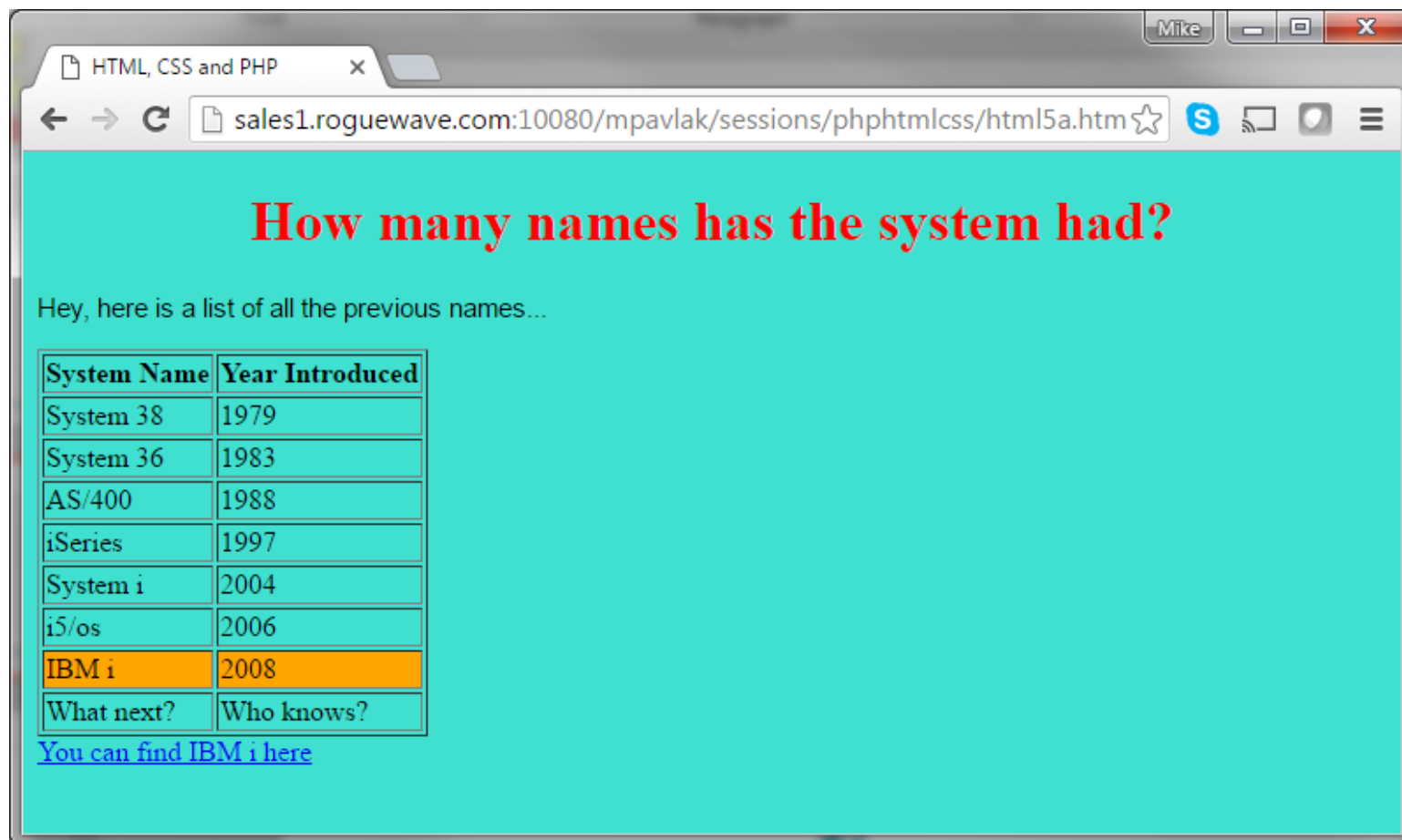
select * from ibminames;
```

IBMNAME	YEARSTART
System/38	1983
System/38	1979
System/36	1983
AS/400	1988
iSeries	1997
System i	2004
i5/OS	2006
IBM i	2008

Messages Global Variables select * from ibminames

HTML page

- In a static HTML page we would have hardcoded the list.



HTML source

```
1 <!DOCTYPE html>
2 <html><head><link rel="stylesheet" type="text/css" href="phphtmlcss.css"></head>
3 <title>HTML, CSS and PHP</title>
4
5 <body><h1>How many names has the system had?</h1>
6 <p>Hey, here is a list of all the previous names...</p>
7
8     <div>
9         <table border="1">
10             <tr><th>System Name</th><th>Year Introduced</th></tr>
11             <tr><td>System 38</td><td>1979</td></tr>
12             <tr><td>System 36</td><td>1983</td></tr>
13             <tr><td>AS/400</td><td>1988</td></tr>
14             <tr><td>iSeries</td><td>1997</td></tr>
15             <tr><td>System i</td><td>2004</td></tr>
16             <tr><td>i5/os</td><td>2006</td></tr>
17             <tr bgcolor="orange"><td>IBM i</td><td>2008</td></tr>
18             <tr><td>What next?</td><td>Who knows?</td></tr>
19         </table>
20     </div>
21
22 <a href="http://www.ibm.com/systems/power/software/i">You can find IBM i here</a>
23
24 </body></html>
```

Let's change that just a bit...

First: Connect to DB2

```
2 function getconnection () {  
3  
4     require_once 'credentials.php';  
5  
6     // User is PHPUSER...  
7  
8     $options["i5_lib"]="PHPUSER";  
9  
10    $con1 = db2_connect($db, $user, $pwd, $options);  
11    if (!$con1) {  
12        echo 'Error connecting to ' . $db . ' - ' . db2_conn_error() .  
13            ' - ' . db2_conn_errormsg();  
14        exit();  
15    }  
16  
17    return $con1;  
18  
19 }
```

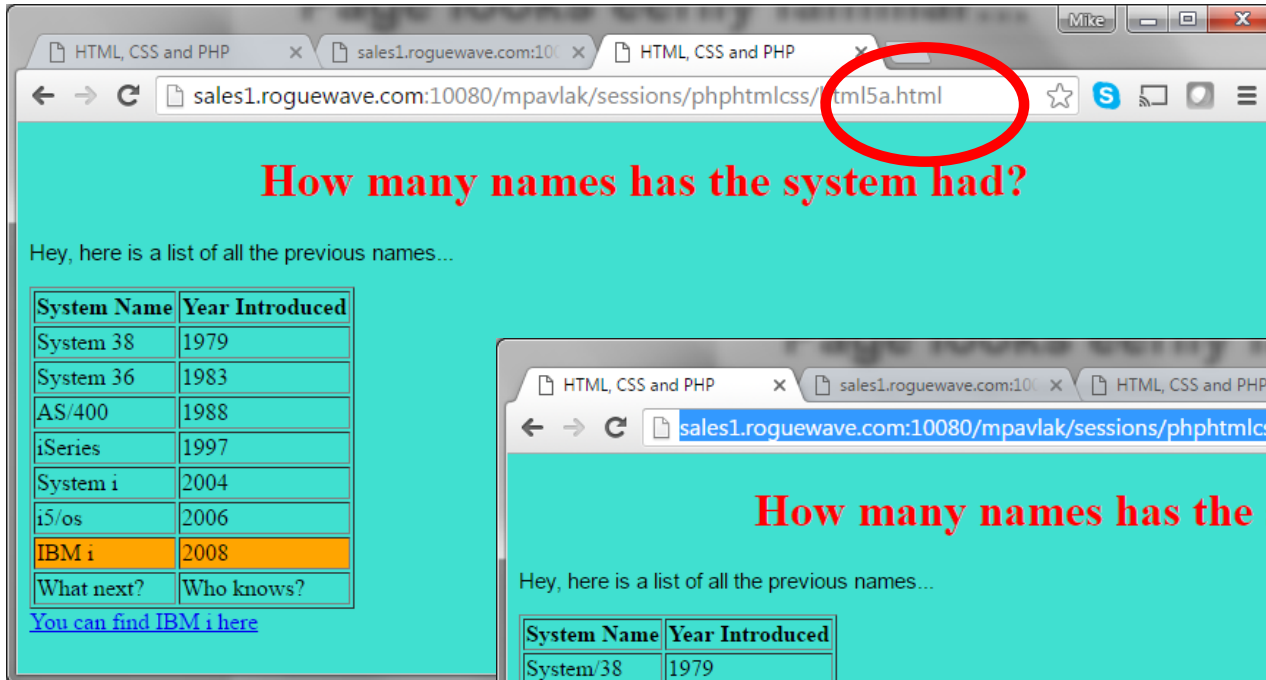
Then run the SQL

```
22 function getIBMnames ($con1) {  
23  
24     $sql = "select * from ibminames";  
25  
26     $resultSet = db2_exec($con1, $sql);  
27  
28     if (!$resultSet) {  
29         echo 'Error running SQL for ' . $sql . ' - ' . db2_stmt_error() .  
30         ' - ' . db2_stmt_errormsg();  
31         return FALSE;  
32     }  
33  
34     $names = array();  
35     while (($row = db2_fetch_assoc($resultSet)) !== FALSE) {  
36         $names[] = $row;  
37     }  
38  
39     return $names;  
40 }
```

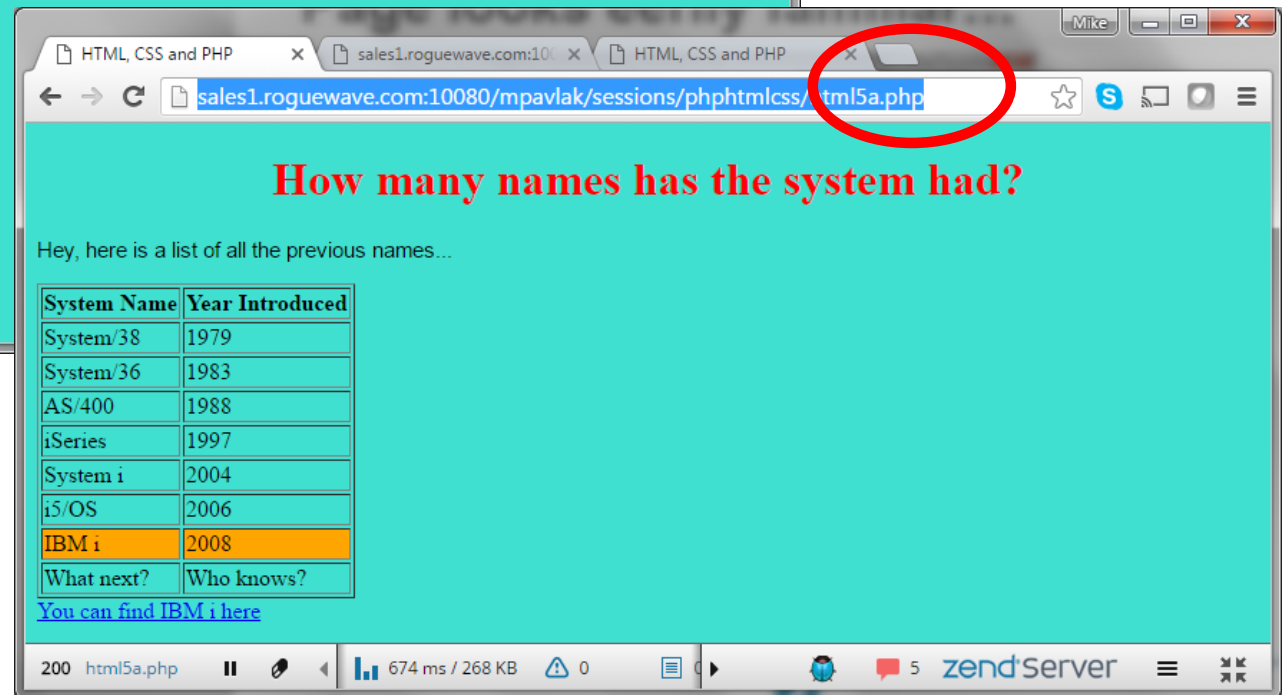
Replace hardcoded HTML

```
10      <tr><th>System Name</th><th>Year Introduced</th></tr>
11
12  <?php
13
14  require_once 'database.php';
15
16  $dbCon = getConnection();           //Connect to DB2
17  $names = getIBMnames($dbCon);       //Retrieve array of names and years
18  $lastelement = end($names);         //Retrieve last element in array
19  $lastname = $lastelement['IBMNAME']; //Get last name for highlight
20
21  foreach ($names as $name) {
22      $IBMname = $name['IBMNAME']; $year=$name['YEARSTART'];
23      //var_dump($name); exit;
24      print("<tr");
25      if ($lastname == $IBMname) print(' class="lastline"');
26      print("><td>$IBMname</td><td>$year</td></tr>");
27
28  }
29
30
31  ?>
32      <tr><td>What next?</td><td>Who knows?</td></tr>
```

Page looks eerily familiar



Before



After

What happened to the last line?

```
PE html>
head<link rel="stylesheet" type="text/css" href="phphtmlcss.css"></head>
HTML, CSS and PHP</title>
```

```
h1>How many names has the system had?</h1>
here is a list of all the previous names...</p>
```

```
<table border="1">
  <tr><th>System Name</th><th>Year Introduced</th></tr>
  <tr><td>System 38</td><td>1979</td></tr>
  <tr><td>System 36</td><td>1983</td></tr>
  <tr><td>AS/400</td><td>1988</td></tr>
  <tr><td>iSeries</td><td>1997</td></tr>
  <tr><td>System i</td><td>2004</td></tr>
  <tr><td>i5/os</td><td>2006</td></tr>
  <tr bgcolor="orange"><td>IBM i</td><td>2008</td></tr>
  <tr><td>What next?</td><td>Who knows?</td></tr>
</table>
</div>
```

```
11      <div>
12          <table border="1">
13              <tr><th>System Name</th><th>Year Introduced</th></tr>
14              <tr><td>System/38</td><td>1979</td></tr>
15              <tr><td>System/36</td><td>1983</td></tr>
16              <tr><td>AS/400</td><td>1988</td></tr>
17              <tr><td>iSeries</td><td>1997</td></tr>
18              <tr><td>System i</td><td>2004</td></tr>
19              <tr><td>i5/OS</td><td>2006</td></tr>
20              <tr class="lastline"><td>IBM i</td><td>2008</td></tr>
21              <tr><td>What next?</td><td>Who knows?</td></tr>
22          </table>
23      </div>
24
```

```
=<a href="http://www.ibm.com/systems/power/software/i">You can find IBM i here</a>
```

```
</html>
```


CSS Class added

- Class starts with period
- Links attributes in external file to page
- Nearly any element can modify page
- Good practice, even for single element
- Studio will highlight bad practices

```
1 body {  
2     background-color: turquoise;  
3 }  
4  
5 h1 {  
6     color: red;  
7     text-align: center;  
8 }  
9  
10 p {  
11     font-family: "Arial";  
12     font-size: 15px;  
13 }  
14  
15 .lastline {  
16     background-color: orange;  
17 }
```

Common questions on Data Access

- Library list support? YES!!!
 - ▶ Single, multiple, job description
- Hard coded user id and password
 - ▶ Yes, no, maybe---You don't have to!
- HTML and Data Access, etc.
 - ▶ MVC and organize your code
- Get started doing something!!!

Wrap it up

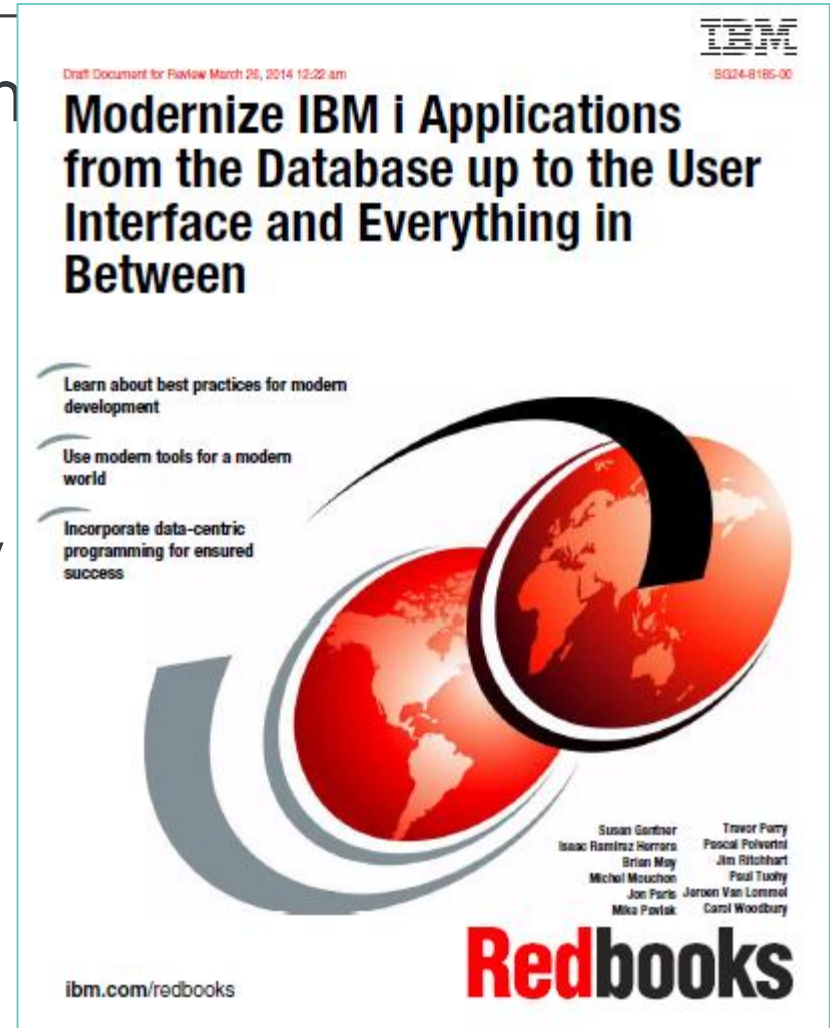
Where do I go next?

- Get some HTML5 & CSS training
 - Remember, HTML is to PHP what DDS is to RPG
- JavaScript for grids, etc.
 - ▶ 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
- Practice, practice, practice!

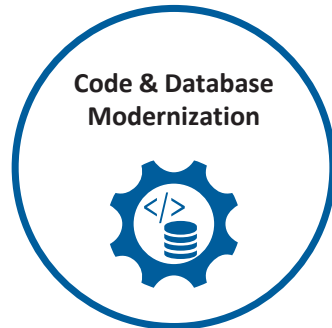
IBM Redbook

SG24-8185

- Application Modernization
- Tons of great info for...
 - DB2
 - RPG
 - More...
- Chapter 12 by yours truly
- Exhibits same code as
 - ▶ In line PHP
 - ▶ Procedural
 - ▶ Object Oriented



End-to-End Application Modernization Solutions



THANK YOU

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