



The PHP Company

Die ersten 5 Schritte für den Start mit PHP auf IBM i

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Agenda

- Einführung in PHP und seine Mitspieler
- Zend Server for IBM i
- Hello World
- Administratives Setup
- Zend Studio
- PHP Data Access

Agenda

- Die fünf Schritte...
 1. Das PHP Universum verstehen
 2. Den “Stack” auf IBM i verstehen
 3. Zend Server installieren
 4. Zend Studio installieren
 5. Produktiv werden!

1. Das PHP Universum verstehen

PHP ist eine Scripting Language

- ▶ PHP Hypertext Pre-Processor
- ▶ Ursprünglich entwickelt von Rasmus Lerdorf in 1994
 - ▶ PHP/FI
- ▶ Zeev Suraski und Andi Gutmans partizipieren seit 1997
 - ▶ (ZEev + aNDi = Zend)
- ▶ Interpretiert, nicht kompiliert
- ▶ Nachsichtige und intuitive Code Struktur(Geringe Lernkurve)
- ▶ Direktes Feedback während Entwicklung
- ▶ ähnlich zu Net.Data

Wer ist Zend?



- Provider einer stabilen, unterstützten PHP Distribution
- Provider von kommerziellen Tools und Support von PHP
 - Zend Server
 - Zend Studio

Zend und IBM

- Partnerschaft seit 2005
- Erneuert in 2008
- Zend durch IBM ausgewählt um PHP auf IBM i zu ermöglichen
- Zend Solutions pre-loaded mit IBM i 6.1 und 7.1!
 - ▶ Einfach das LP installieren und los geht's!
- Produkte gibt es auch weiterhin auf zend.com



Warum Open Source?

- Innovationen in besonderen ökonomischen Situationen
 - ▶ Geringe Einstiegskosten
 - ▶ Hochqualitative Applikationen
 - ▶ Geringer TCO
 - ▶ Läuft nativ auf IBM i, keine Notwendigkeit für zusätzliche Hardware / OS
 - ▶ Sie benutzen es schon! (Apache, Eclipse, etc.)



Wir sind nicht die einzigen, die über Open Source sprechen...
IBM in der Februar '09 Edition!

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

Der “Stack”

- Getestete, Business Ready Distribution von PHP (Support)
- Natives Environment im PASE
- Home Base für PHP Module wie GD, PEAR, etc.
- Browserbasierte Admin Konsole
- Zugriff direkt nach Installation

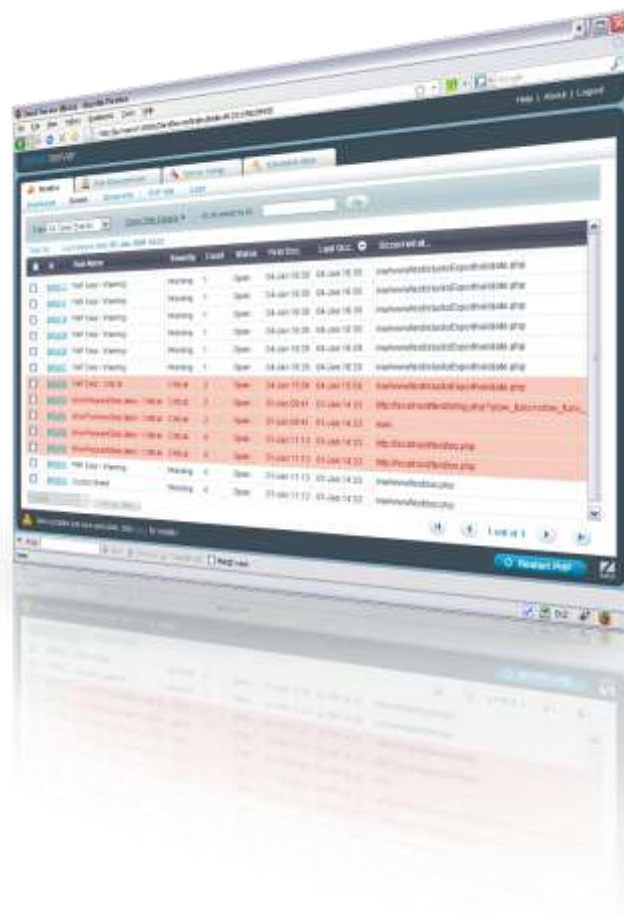
- Schauen wir uns die Architektur des Stacks an
- Und die Installation auf der IBM i



2. Zend Server for IBM i

Was ist Zend Server?

- **PHP Stack für die Produktion**
 - ▶ PHP, ZF, DB Konnektivität, Debugging Extension, und mehr
- **Zwei Editionen - Freie “Community Edition” unterstützt durch IBM & kommerzielle Edition**
 - ▶ Beide sind Production Ready
- **Applikations-Monitoring und Diagnose (Integration mit Zend Studio)**
- **Multi-Level Performance Features**
- **Software Updates und Security Hot Fixes**
- **Einfache und schnelle Installation**
- **Zend Framework Integration**



Zend Server for IBM i

- Next Generation des PHP Stacks für IBM i
- Das Beste von Zend Core und Zend Platform
- Single Licensed Program Installation
- Zwei Produkte
 - ▶ Zend Server for IBM i Community Edition
 - Kostenfrei durch IBM Partnerschaft
 - ▶ Zend Server for IBM i
 - Lizenz von Zend
 - Extra Features
 - Höhere Support SLAs



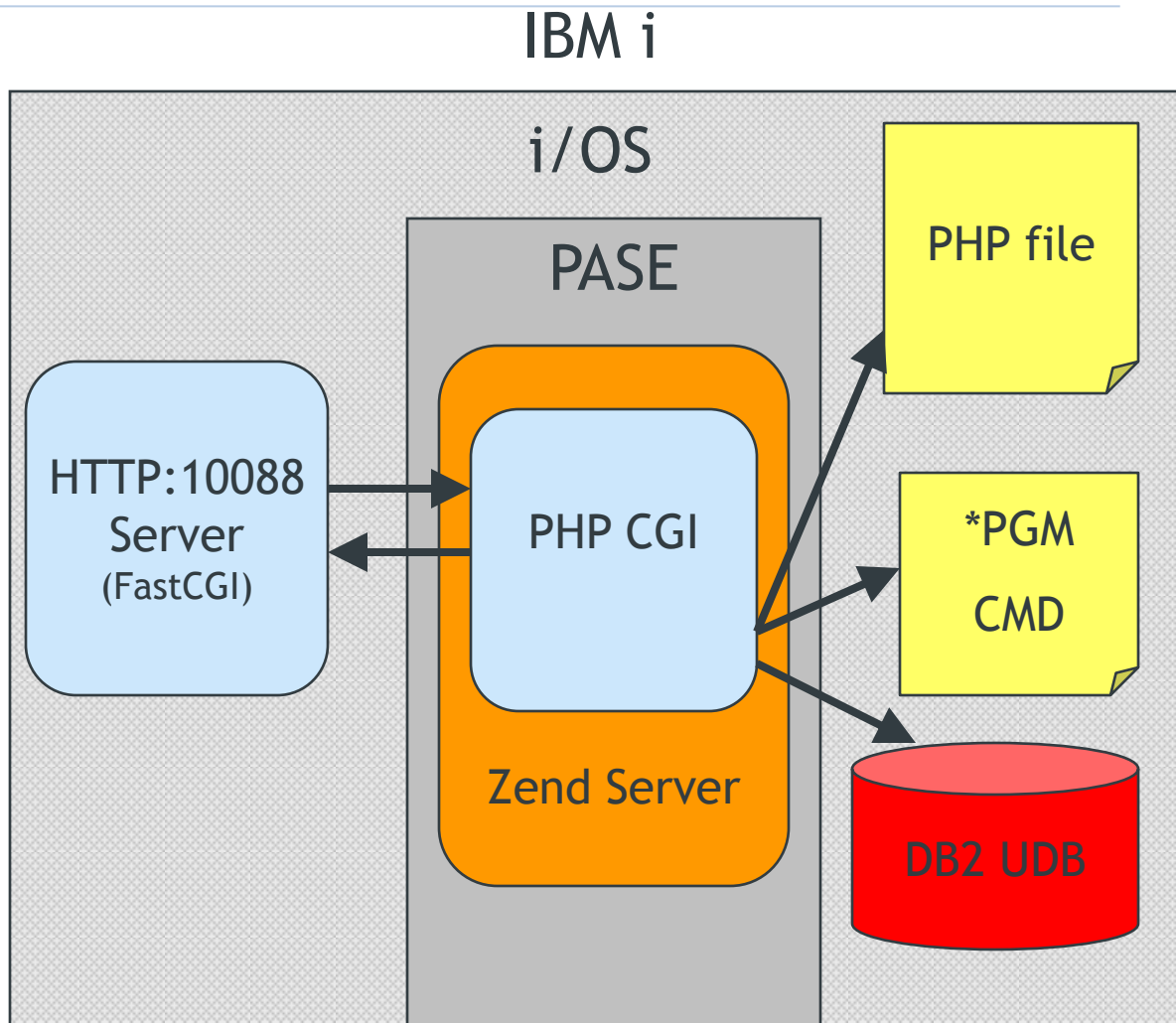
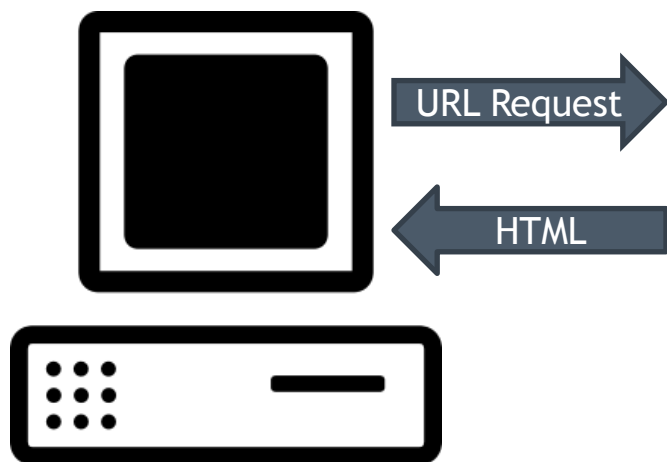
zend Server 5.0
PHP Web Application Server

Warum eine neue Generation?

- **Verbesserte Basic PHP Performance**
 - ▶ 30% bis 600% (Abhängig von der Applikation)
- **Neue Möglichkeiten**
 - ▶ Applikations-Monitoring
 - ▶ Code Tracing - Schnellere Problemlösung
 - ▶ Job Queue - Performance und Skalierbarkeit
 - ▶ Multi-Level Caching - Performance und Skalierbarkeit
 - ▶ Support für PHP 5.3
- **Einfachere Installation, Administration und Wartung**

Zend Server unter der Haube

- ILE Apache:10088
 - Default Konfiguration FastCGI



Systemvoraussetzungen

Bitte den Installation Guide lesen !!!

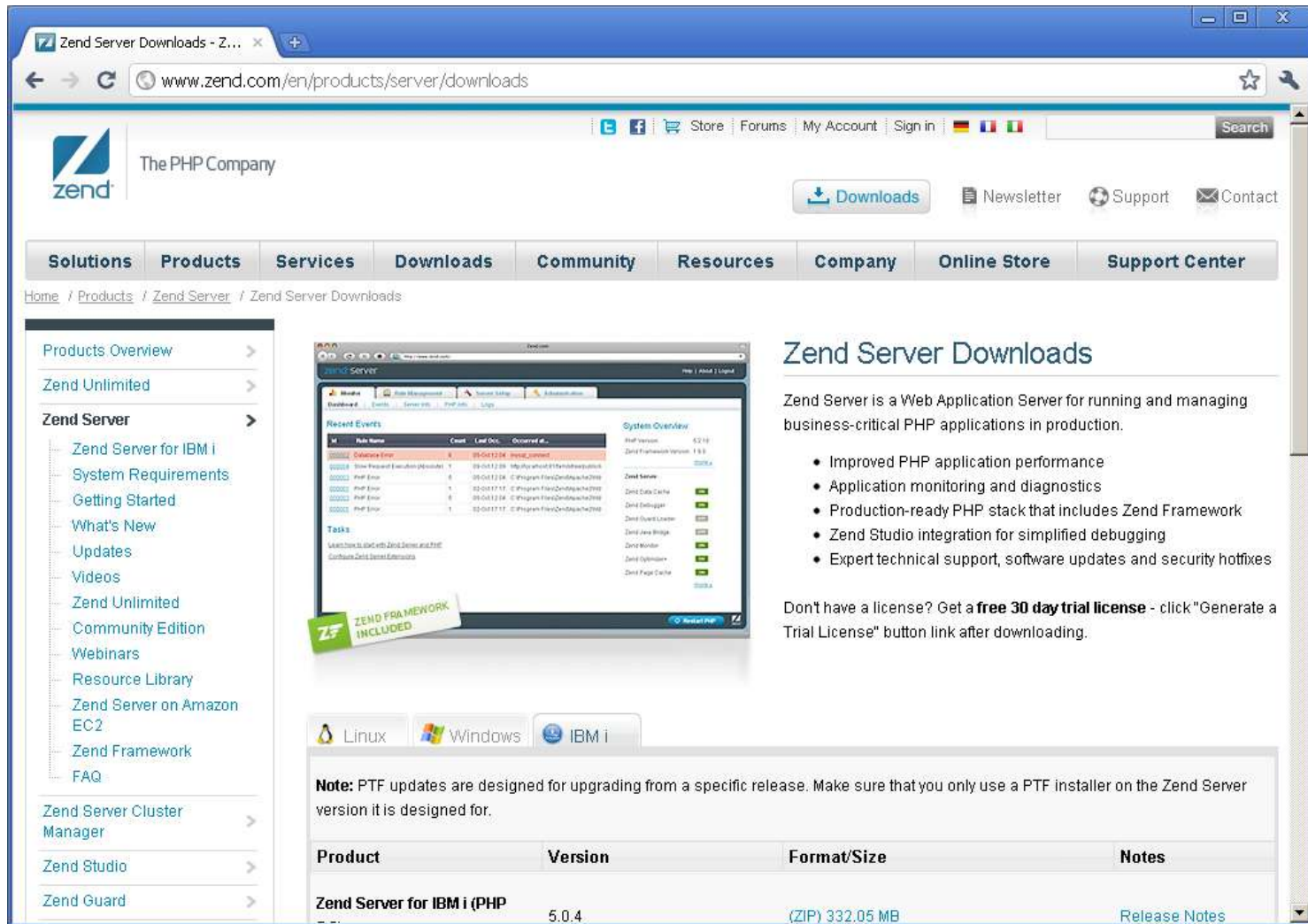
Description	Product Option	Licensed Program
-----	-----	-----
Portable App Solutions Environment	33	57XXss1
Qshell	30	57XXss1
System Openness Includes	13	57XXss1
IBM Portable Utilities For I5/OS	*base	5733sc1
OpenSSH ,OpenSST,Zlib	1	5733sc1

3. Zend Server installieren

Zend Server installieren

- **Voraussetzungen:**
 - ▶ Zend Server Installationshandbuch!!!
 - ▶ i5/OS V5R3 Core ist noch verfügbar, Zend Server wird nicht funktionieren!
 - ▶ V5R4, i6.1, i7.1 (alle Zwischen-Releases)
 - ▶ Neuste Kumulative PTF Pakete, PASE, Qshell, Group für HTTP
- **Software Installation**
 - ▶ Windows Installation oder...
 - ▶ Upload *SAVF, Restore, und mit dem Coden starten!
- **Bonus!**
 - ▶ MySQL kann gleichzeitig installiert werden

Wo bekommt man es? IBM LP oder zend.com



The screenshot shows the Zend Server Downloads page on zend.com. The page features a navigation menu at the top with links for Solutions, Products, Services, Downloads, Community, Resources, Company, Online Store, and Support Center. A sidebar on the left contains a 'Products Overview' section with a 'Zend Server' sub-section. The main content area is titled 'Zend Server Downloads' and includes a description of Zend Server as a Web Application Server. Below the description is a list of features and a note about a free 30-day trial license. At the bottom, there is a table of download links for 'Zend Server for IBM i (PHP)'.

Zend Server Downloads

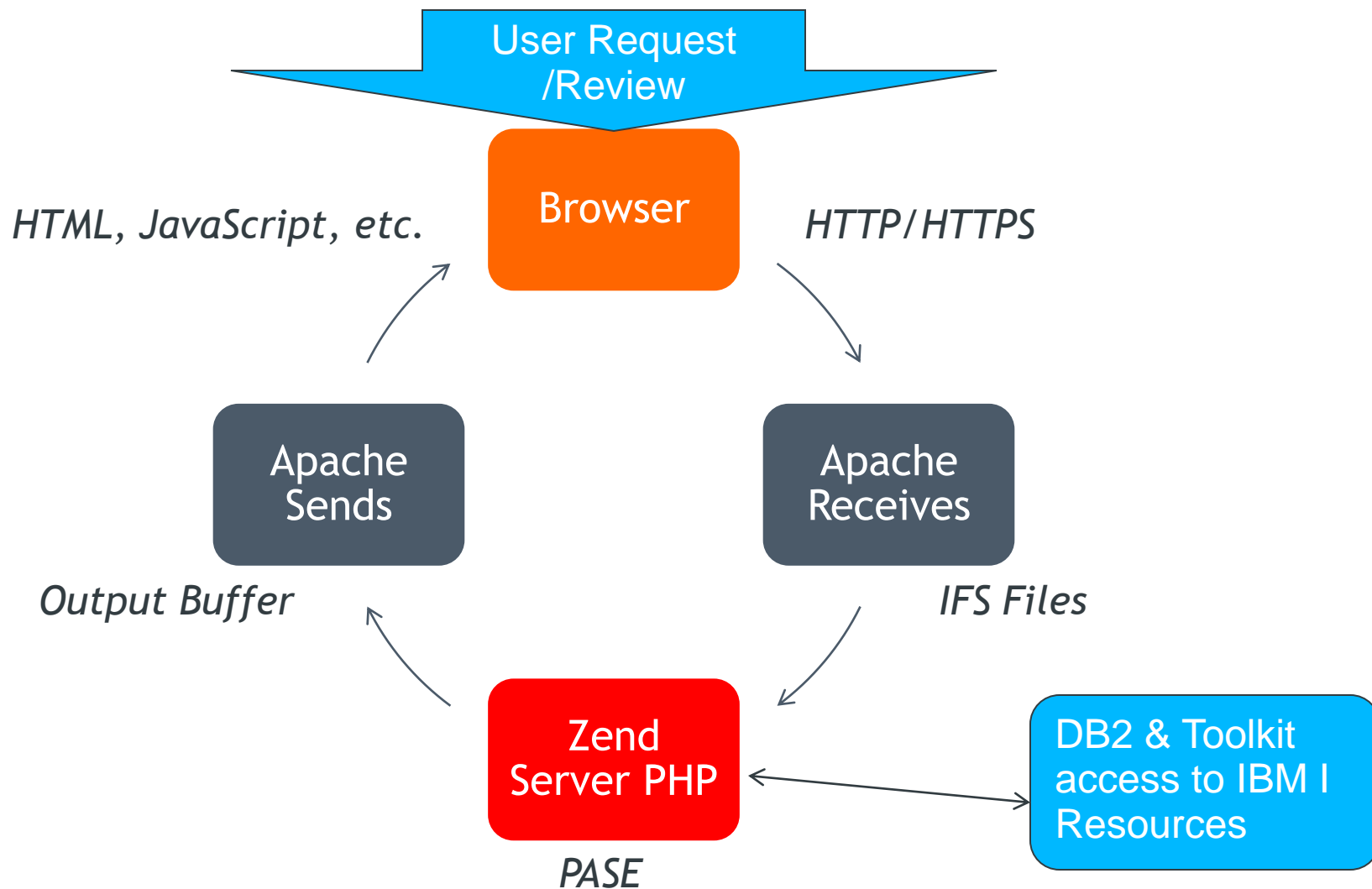
Zend Server is a Web Application Server for running and managing business-critical PHP applications in production.

- 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.

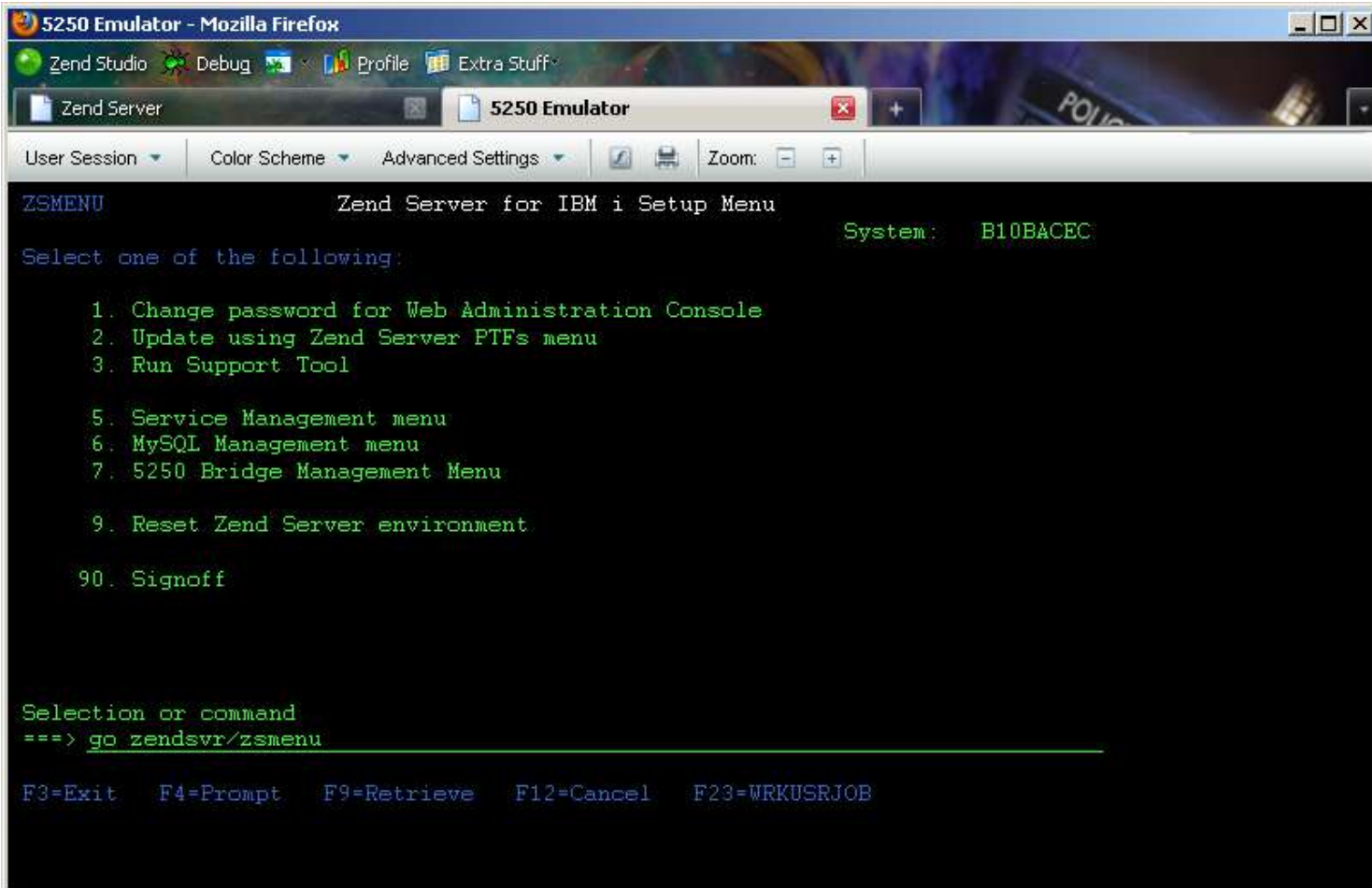
Product	Version	Format/Size	Notes
Zend Server for IBM i (PHP)	5.0.4	(ZIP) 332.05 MB	Release Notes

PHP Transaktion Lifecycle



Start/Stopp Zend Server, MySQL, etc...

Type GO ZENDSVR/ZSMENU, Option 5 und 1



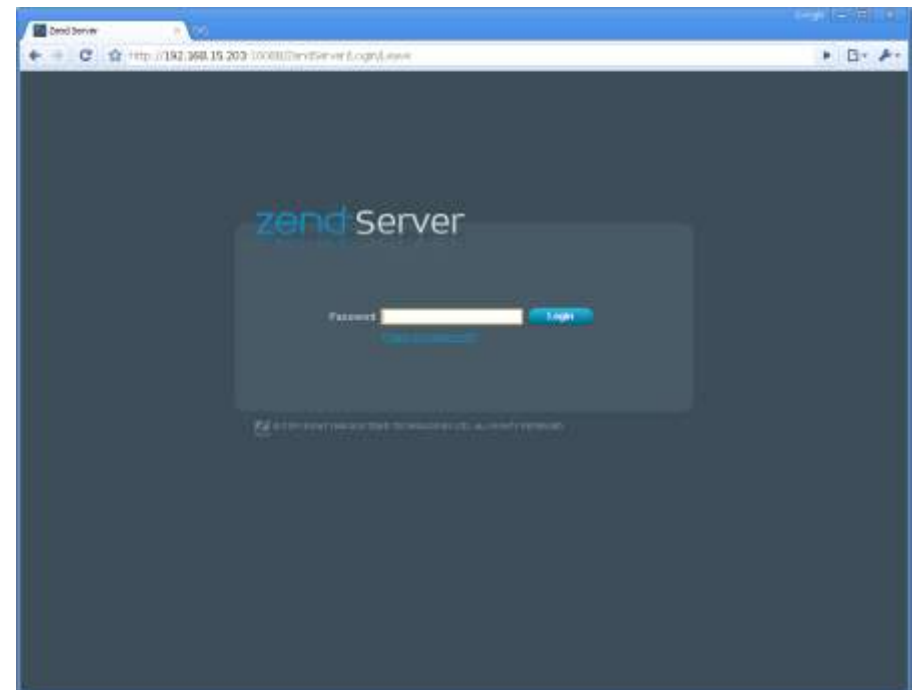
```
5250 Emulator - Mozilla Firefox
Zend Studio  Debug  Profile  Extra Stuff
Zend Server  5250 Emulator
User Session  Color Scheme  Advanced Settings  Zoom:
ZSMENU                Zend Server for IBM i Setup Menu          System:  B10BACEC
Select one of the following:
1. Change password for Web Administration Console
2. Update using Zend Server PTFs menu
3. Run Support Tool
4.
5. Service Management menu
6. MySQL Management menu
7. 5250 Bridge Management Menu
8.
9. Reset Zend Server environment
10. Signoff

Selection or command
===> go zendsvr/zsmenu

F3=Exit  F4=Prompt  F9=Retrieve  F12=Cancel  F23=WRKUSRJOB
```

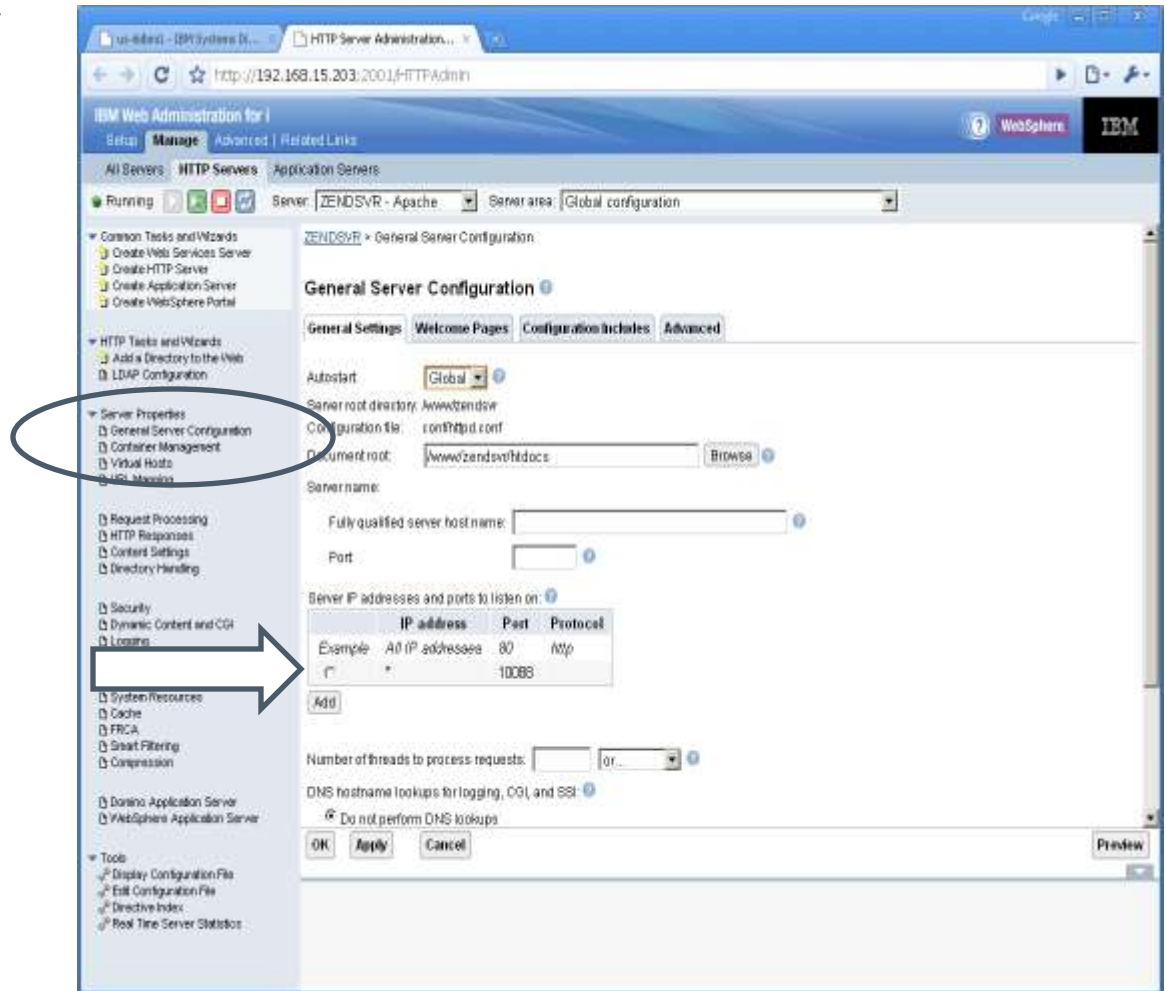
Zend Server Konfiguration

- Nur zwei Screens!
 - ▶ `http://ibmserver:2001` um IBM HTTP Server zu administrieren
 - ▶ Zend Admin um Zend/PHP Optionen zu administrieren



Zend Server Port Change?

- Default Proxy zeigt auf Port 10088
 - ▶ IBM Admin Server
 - ▶ ZENDSVR öffnen
 - ▶ General Server Configuration
 - ▶ Apply & Neustart



Beispiel Skripte

The screenshot shows the Zend Server for IBM i web interface. A 'Welcome' dialog box is displayed in the center, titled 'Welcome to Zend Server for IBM i'. The dialog contains the following content:

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:

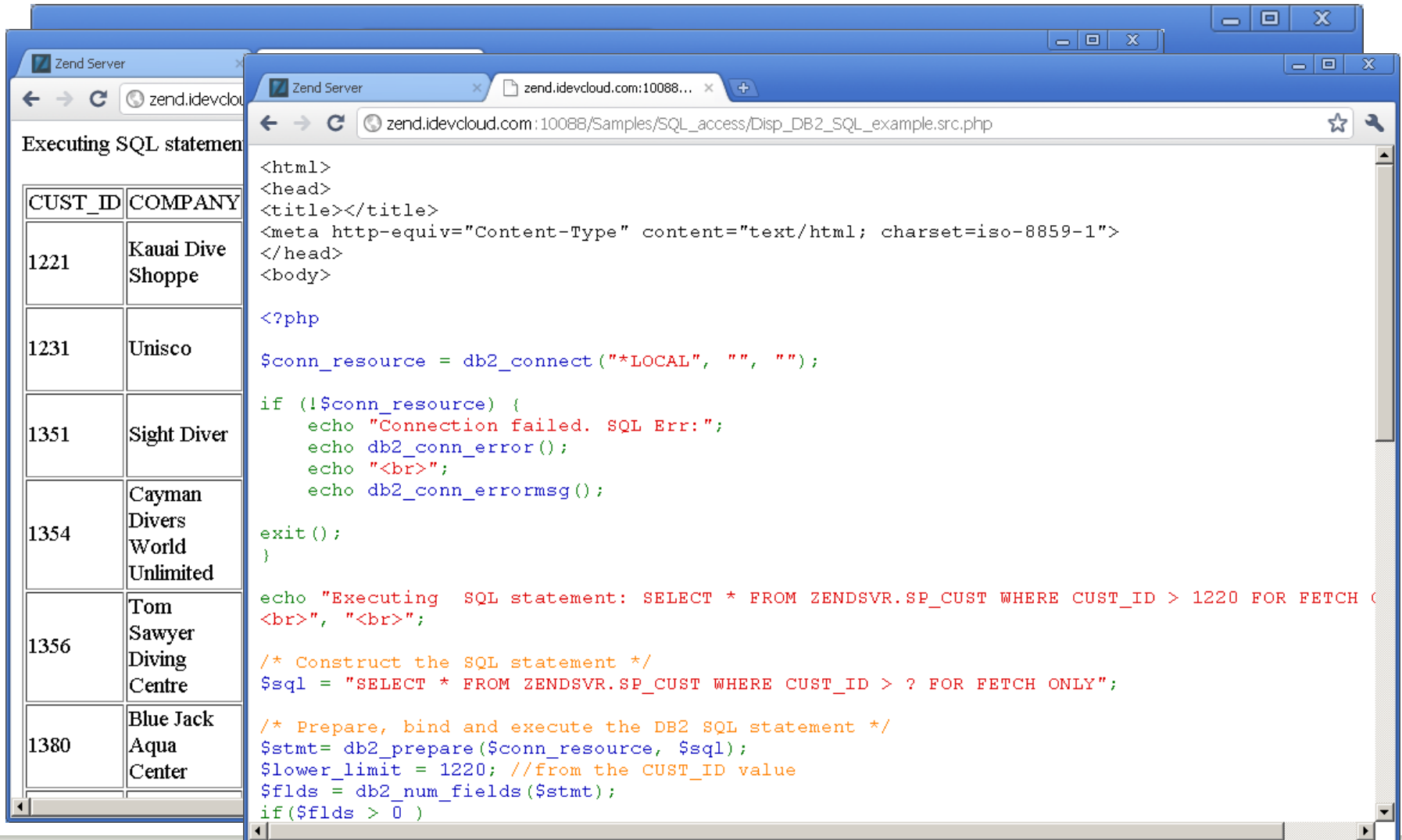
- [Mantis/400](#) (Bug Tracker)
- [Drupal](#) (CMS)
- [SugarCRM](#) (CRM)
- [MediaWiki](#) (wiki)
- [Joomla!](#) (CMS)
- [Zen Cart](#) (Online Store)
- [phpBB](#) (Bulletin board)

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](#)

[more >](#)

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 contains six rows of data. 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 fetch 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();
}

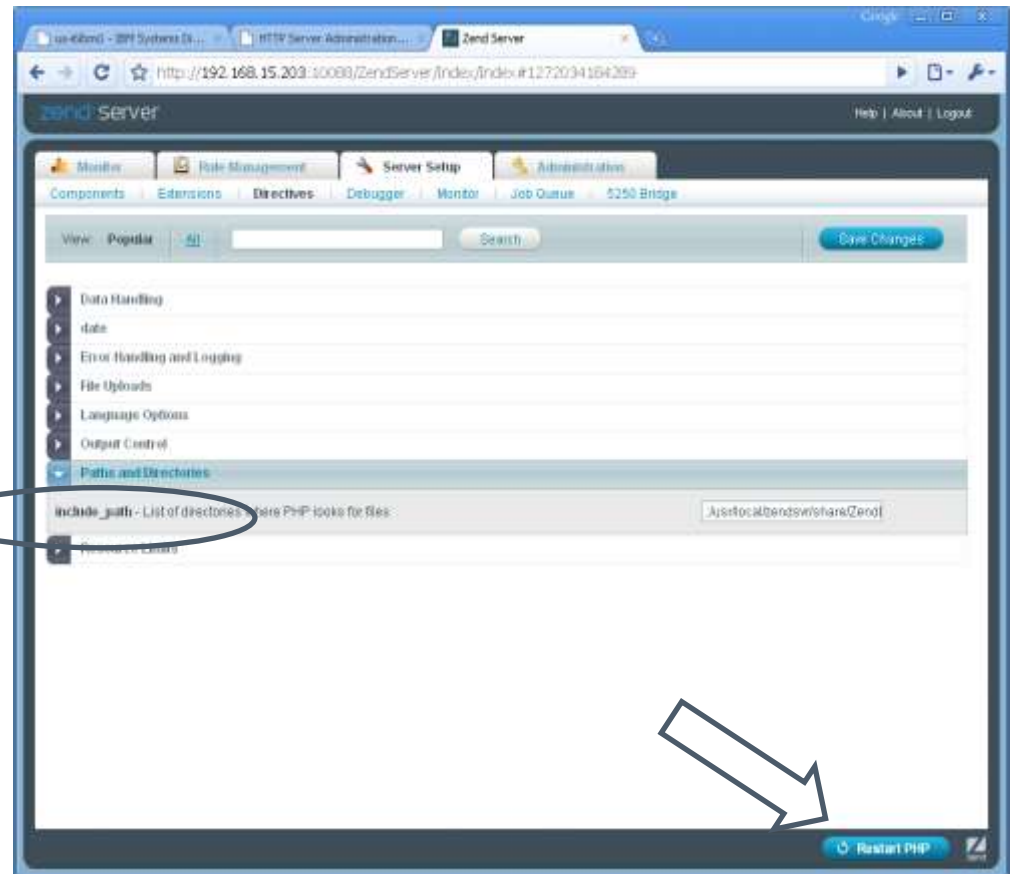
echo "Executing SQL statement: SELECT * FROM ZENDSVR.SP_CUST WHERE CUST_ID > 1220 FOR FETCH ONLY";
echo "<br>";

/* 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 Änderungen

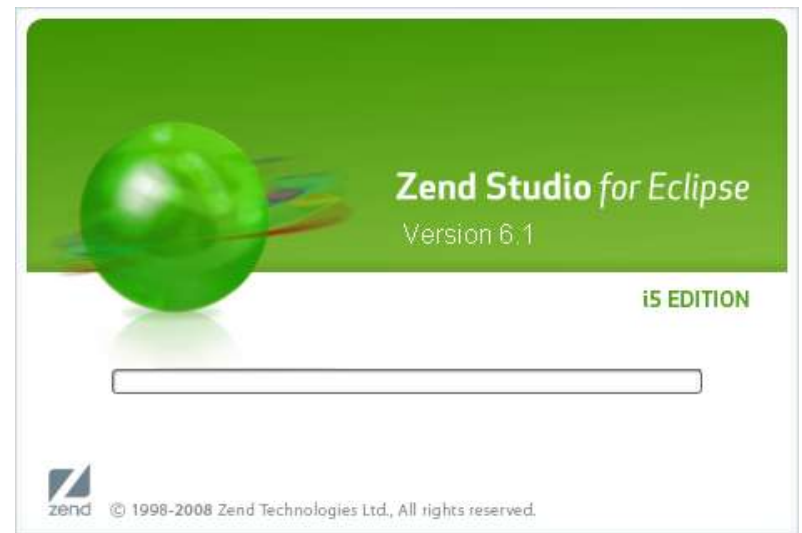
- php.ini via GUI in Zend Server
 - ▶ Einloggen mit initialem Passwort
 - ▶ (Reset in Green Screen → Server Setup → Directives)
 - ▶ Alle Werte in php.ini verwalten
 - ▶ Include path ist eine von vielen Optionen
 - ▶ Restart PHP



4. Zend Studio installieren

Zend Studio 8 for IBM i

- Essentielle IDE für PHP auf IBM i
- Beinhaltet für IBM i Kunden 1 Jahr Support und Upgrades
- Syntax Checker & Code Completion
- JavaScript Library Support
- Debugger
- Basiert auf Eclipse Framework
- Funktionen-Verzeichnis
- Templates
- Viel, viel mehr



Zend Studio 8 for IBM i - Installation

- Download von zend.com/de/downloads (IBM i Edition!)
- Installation auf Workstation (Mac, Windows, Linux)
- Dialogen für die Installation/Lizensierung folgen
- IDE starten und PHP coden

Wie IFS Daten bearbeiten?

- Drei mögliche Methoden

- ▶ Netserver (oder ein gemapptes lokales Laufwerk)

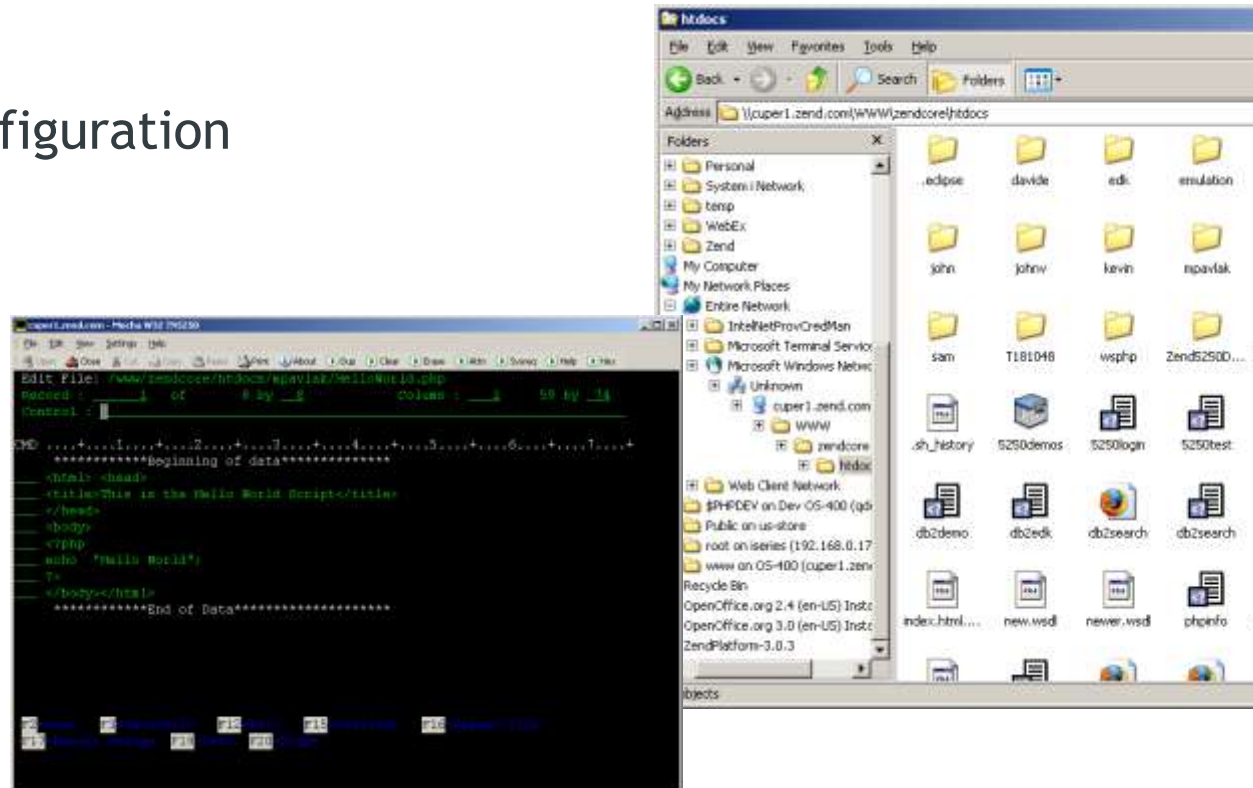
- Kann träge sein

- ▶ Remote Server Konfiguration

- Beste Möglichkeit

- ▶ WRKLNK

- Nur für Notfälle!

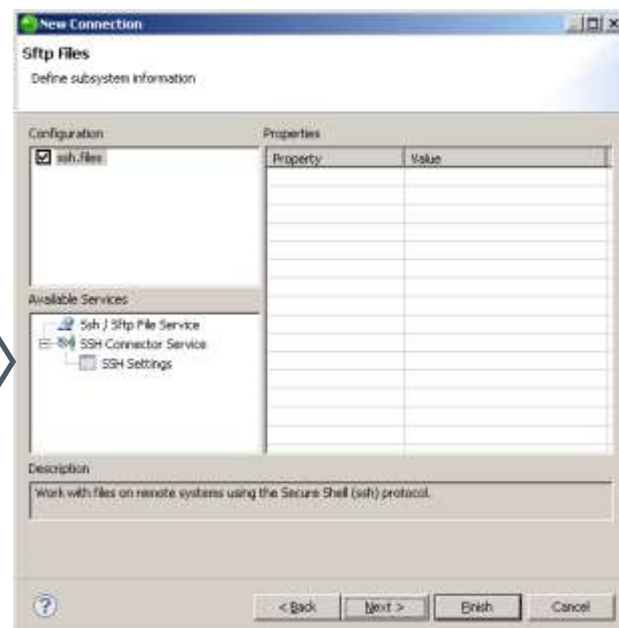
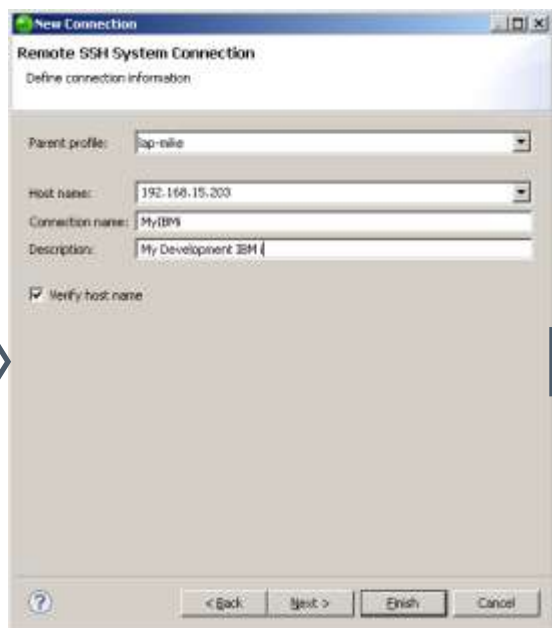
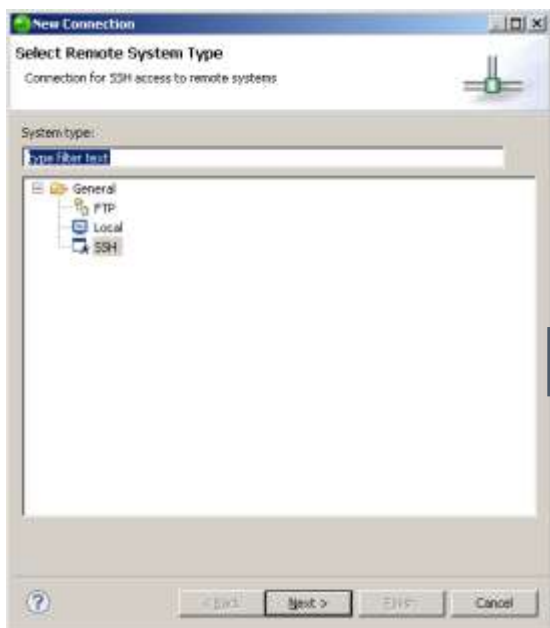


Remote Server Optionen

- **FTP**
 - ▶ Bekannt
 - ▶ Langsam
 - ▶ Von den meisten Systemen unterstützt
- **SSH**
 - ▶ Sicherer
 - ▶ Mächtiger
 - ▶ Einfacher aufzusetzen
 - ▶ Einfacher aufzusetzen ab i6.1+

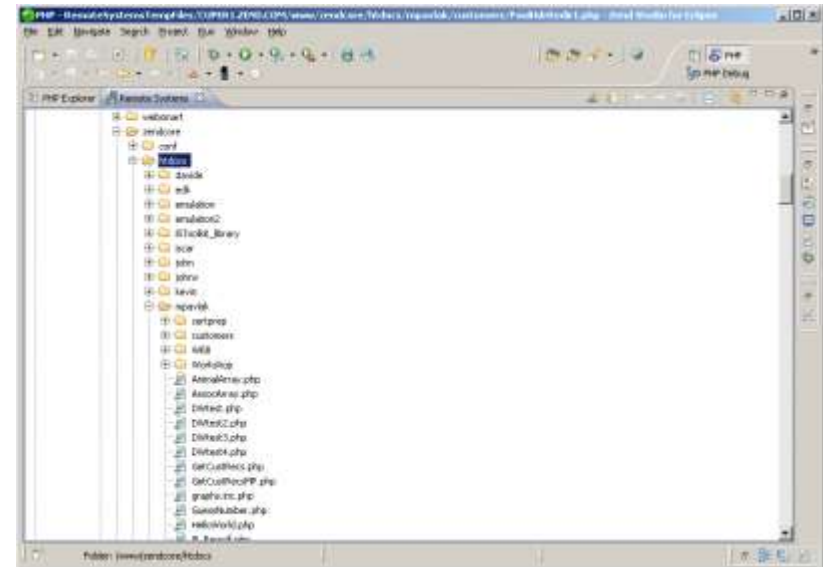
Remote Server konfigurieren

- Zend Studio for IBM i starten
- New Connection Button → SSH auswählen
- Systemname oder IP Adresse angeben



Navigieren zu Dateien

- Dateibaum öffnen
- Verzeichnis/www/zendsvr/htdocs
- User Credentials eingeben





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 $stmt = db2_stmt($conn, $sql, DB2_STMT_FETCH_FIRST);
10 $row = db2_fetch_array($stmt);
11 OR
12 $row = db2_fetch_row($stmt);
13 //
14 echo "<table border='1'><tr><th>Customer Name</th><th>Address Line 2</th><th>City</th><th>State</th></tr><tr><td></td><td></td><td></td><td></td></tr></table>";
15 echo "\n";
16
17 // loop di loop through customer recs...
18 while($row=db2_fetch_array($stmt)){
19     list( $CUSTOMER_NUMBER, $CUSTOMER_NAME, $CUSTOMER_ADDRESS_LINE2, $CUSTOMER_CITY, $CUSTOMER_STATE, $CUSTOMER_ZIP) = $row;
20     echo("<tr><td> $CUSTOMER_NUMBER</td> <td>$CUSTOMER_NAME</td> <td>$CUSTOMER_ADDRESS_LINE2</td><td>$CUSTOMER_CITY</td><td>$CUSTOMER_STATE</td><td>$CUSTOMER_ZIP</td></tr>");
21 }
22
23

```

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 = null, int \$errnum): Returns the error message for the specified error number.
- is_execute(resource \$stmt, array[optional] \$params): Executes the statement \$stmt with the parameters \$params.
- is_fetch_array(resource \$result, int[optional] \$flag): Fetches a row of data from the result set \$result as an array.
- is_fetch_assoc(resource \$result, int[optional] \$flag): Fetches a row of data from the result set \$result as an associative array.
- is_fetch_object(resource \$result, int[optional] \$flag): Fetches a row of data from the result set \$result as an object.
- is_fetch_row(resource \$result, int[optional] \$flag): Fetches a row of data from the result set \$result as a numeric array.
- is_field_len(resource \$result, mixed \$field): Returns the length of the field \$field.
- is_field_name(resource \$result, integer \$field): Returns the name of the field \$field.
- is_field_scale(resource \$result, mixed \$field): Returns the scale of the field \$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()

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...

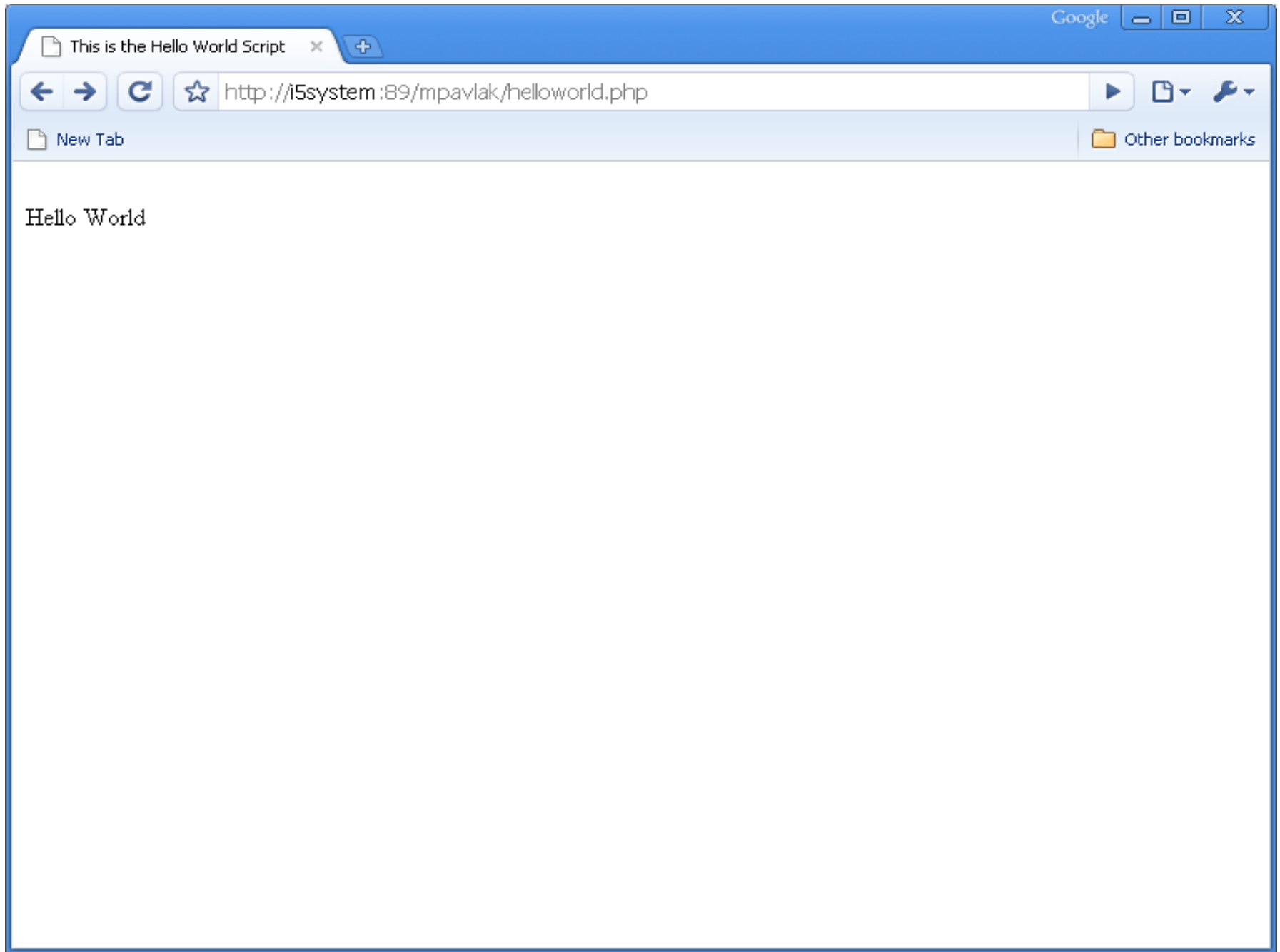
5. Produktiv werden!

Hello World

Beispiel Skript - Hello World

- Obligatorisches Programm
- Bestätigt korrektes PHP Setup
- Beispielcode: Kürzestes PHP Makro
- Skript in IFS speichern:
/www/zendsvr/htdocs/helloworld.php
- Browser URL: <http://ibmisystem:10088/helloworld.php>

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



i5 Toolkit APIs

- **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
- **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

- Kollaboration von IBM und Zend
- Gebaut auf ILE RPG, Stored Procedures und reinem PHP
- Bis zu 10x schneller
- Objektorientiert, aber nicht zu viel

Beispiel: Toolkit Funktionen

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

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

/* Call srvc 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 parm */
$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 Beispiel

Einfaches Listing eines Files

- Zur DB2 verbinden
- Select Records von einer DB2 Tabelle
- Records in eine HTML Tabelle laden
- Output anzeigen



The screenshot shows a web browser window with the address bar displaying `http://192.168.15.203:10088/mpavlak/zendcustlist2.php`. The page content features a heading **Customer list for a company** and a table with the following 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

Verbindung zur DB2

- **Drei Dinge benötigt:**

- ▶ System
- ▶ User ID
- ▶ Password

Wenn Ihre Data Sets *PUBLIC Zugriff haben, wird Username und Passwort nicht benötigt

```
<?php
// 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());
?>
```

Daten lesen...

```
<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>
```

Daten lesen...

```
<?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;
?>

<tr>
    <td><?php echo $CUSTOMER_NUMBER ?></td>
    <td><?php echo $CUSTOMER_NAME ?></td>
    <td><?php echo $CUSTOMER_ADDRESS_LINE1 ?></td>
    <td><?php echo $CUSTOMER_ADDRESS_LINE2 ?></td>
    <td><?php echo $CUSTOMER_CITY ?></td>
    <td><?php echo $CUSTOMER_STATE ?></td>
    <td><?php echo $CUSTOMER_ZIP ?></td>
</tr>

<?php
endwhile;
?>
```

Daten lesen...

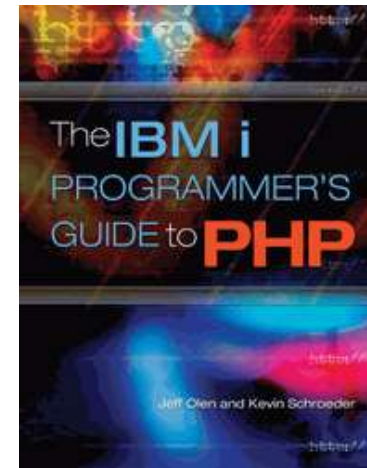
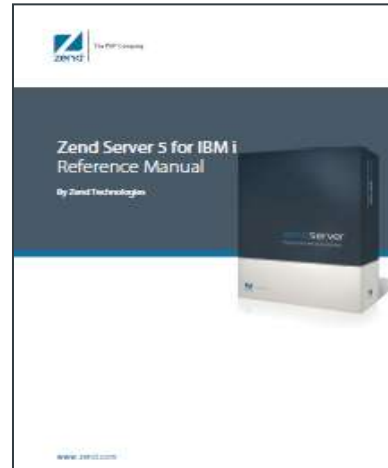
```
</tbody>  
</table>  
<?php  
db2_close($i5link);  
?>
```

Start mit PHP auf IBM i

Was kommt als nächstes?

- **HTML Training**
 - ▶ HTML ist zu PHP, was DDS zu RPG ist
- **JavaScript tut nicht weh**
 - ▶ Nicht notwendig, kann aber eine Webseite aufpeppen
- **Freien Code downloaden**
- **Spielen, Spaß haben, entdecken**
- **Trainings, zend.com/de/services/training/**
- **Üben, üben, üben!**

PHP Resources...



- **Books**

- ▶ Head First HTML with CSS and XHTML ISBN:059610197X
- ▶ Zend Server Doc auf Zend Website
- ▶ IBM i Programmer's Guide to PHP on IBM i - MC Press

Online Ressourcen

- **Support?**

- ▶ zend.com/forums
- ▶ zend.com/support-center
- ▶ zend.com/products
- ▶ php.net - on-line PHP Manual
- ▶ midrange.com WEB400 forum

- **Free Code!**

- ▶ [Sourceforge.net](https://sourceforge.net) - Freie Applikationen
- ▶ phpclasses.org - Freie PHP Code Beispiele
- ▶ hotscripts.com - Freier PHP Code

Dankeschön!

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