

IBM i Essentials Virtual Conference

Presented By:

system*i*NETWORK

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Doors Open @ 9:30am ET/ 6:30am PT

New PHP Toolkit from Zend and IBM

Open source on IBM i

Alan Seiden

PHP on IBM i consultant
Strategic Business Systems, Inc.

<http://alanseiden.com>

@alanseiden



About Alan

PHP on IBM i consultant

- Lead PHP developer for new toolkit from Zend/IBM
- Writer, speaker, advocate for Zend Framework and PHP
- Passionate about getting good performance on IBM i
- Developer of IBM/COMMON's "Best Web Solution" of 2009



<http://alanseiden.com>

alan@alanseiden.com

• **twitter: @alanseiden**

• **201-327-9400**

Strategic Business Systems, Inc.



The PHP Company

- **Developing Web apps on IBM i, iSeries, i5... since 1996**
- **Based in Ramsey, Bergen County, New Jersey**
- **IBM Business Partner**
 - Power Systems hardware, software, development, consulting

Where to download these slides

From my site

<http://alanseiden.com/presentations>

On SlideShare

<http://slideshare.net/aseiden>

The latest version will be available on both sites

Today's toolkit topics

- **Toolkit from Zend/IBM**
 - Brings out beauty of PHP on IBM i
- **Then and now**
- **Who and how?**
 - Open source on IBM i? Yes!
 - Community project
- **Install/configure/use**
- **Tips, techniques, questions**

PHP on i—always something new

- **2004: i5php.net**
 - Unofficial PHP binary for “i” available online
- **2005: IBM and Zend got together**
- **2006: Zend Core for i5/OS**
 - Official release with help from IBM, technical support from Zend
- **2007: Zend Studio: IDE/code editor
and Zend Platform: performance booster and code tracer/monitor**
- **2008: Zend Framework supports “i” variant of db2**
- **2009: Zend Server beta for “i”**
- **2010: Zend Server released**
- **2011: New toolkit on “i”**

PHP on i—a comfortable fit

- **Runs completely on “i”**
 - Uses IBM’s native Apache web server
 - Shipped by IBM with v5r4 and higher
 - Connects directly to db2 database
- **Light on its feet**
 - Efficient—runs well out of the box
 - Create useful functionality quickly; start small and grow
 - Plenty of room for sophistication in larger apps
- **PHP on i provided by Zend Server installer**

Zend Server

Zend Server for IBM i

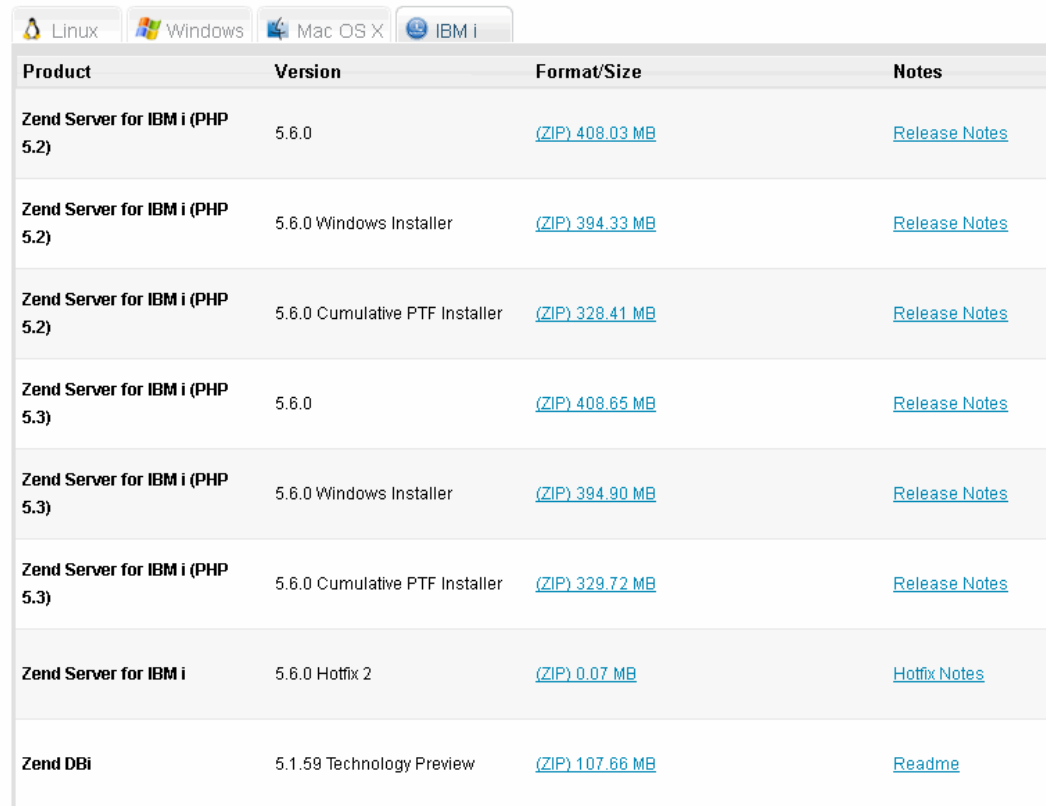
- **Current PHP stack for IBM i**
 - Best of Zend Core and Platform in one licensed program
- **Two license levels**
 - Zend Server for IBM i Community Edition (CE)
 - Available at no charge per IBM partnership
 - Includes “Optimizer+” that speeds up code
 - One year silver (email) support
 - Zend Server for IBM i, a.k.a. Professional Edition
 - Subscription license
 - High value extra features, Code Tracing, Monitoring, higher support levels
- **Details of differences:**
 - <http://mikepavlak.blogspot.com/2010/08/i-want-to-do-php-on-ibm-i-so-what-do-i.html>

Installation

- <http://www.zend.com/products/server/downloads>
 - Click on the “IBM i” tab
- **Zend Server prerequisites**
 - IBM i v5r4 or higher and:
 - IBM’s FastCGI PTF (free)
 - http://files.zend.com/help/Zend-Server-IBMi/i5_installing_zend_server.htm
- **Try Zend Studio’s IDE (no charge, courtesy of IBM)**
 - “Zend Studio for Eclipse, IBM i Edition”
 - <http://zend.com/en/products/studio/downloads>

Screen shot of download page

Example Zend Server / IBM i download page (March 2012)



Product	Version	Format/Size	Notes
Zend Server for IBM i (PHP 5.2)	5.6.0	(ZIP) 408.03 MB	Release Notes
Zend Server for IBM i (PHP 5.2)	5.6.0 Windows Installer	(ZIP) 394.33 MB	Release Notes
Zend Server for IBM i (PHP 5.2)	5.6.0 Cumulative PTF Installer	(ZIP) 328.41 MB	Release Notes
Zend Server for IBM i (PHP 5.3)	5.6.0	(ZIP) 408.65 MB	Release Notes
Zend Server for IBM i (PHP 5.3)	5.6.0 Windows Installer	(ZIP) 394.90 MB	Release Notes
Zend Server for IBM i (PHP 5.3)	5.6.0 Cumulative PTF Installer	(ZIP) 329.72 MB	Release Notes
Zend Server for IBM i	5.6.0 Hotfix 2	(ZIP) 0.07 MB	Hotfix Notes
Zend DBI	5.1.59 Technology Preview	(ZIP) 107.66 MB	Readme

Toolkit connects PHP to the i

Toolkit makes PHP a full member of 'i' family

- **Call RPG, COBOL, CL**
 - Including IBM i apis
 - Most popular use of toolkit
- **Commands**
 - ADDLIB LIB(MYLIB)
 - More command types (details later)
- **Read/write objects that store data**
 - Data areas
 - User spaces
- **Send/receive data queues**
- **Get lists, read data or attributes from these:**
 - Spooled files
 - Job logs
 - Active jobs
 - Objects
 - System values

Call RPG/COBOL to adapt 5250 logic to the web

The image shows a web browser window displaying the Medrano Express order entry system. The browser address bar shows the URL: <http://i.medranoexpress.com/MedranoExpress/ISOE/beorder.php?Invoice=...>

At the top of the web page, it says "Medrano Express" and "bienvenido! LA GUADALUPANA MARKET (GUAMAR) February 2,2010". Below this, it displays "Branch: Medrano Express - Minneapolis Phone: 612-721-4547".

The main content area shows order details for "Work with Order 00192913-1". It includes fields for "Bill-to Customer", "Ship-to", "Branch", "Order Date", "Order taken by", "Dealer", and "Zone".

Below the order details, there is a table with columns: Line#, Item, Item Description, # of Pkgs, Declared Value, Quantity, Unit Price, Customs Fee, Insurance, and Extended Amount. The table contains one line item with a quantity of 1 and an extended amount of 180.00.

At the bottom of the web page, there are buttons for "Print Invoice", "Print Labels", and "Add New Notes". Below these buttons is an "Order Notes" section with several entries.

Overlaid on the left side of the browser window is a terminal window showing a 5250-style data entry screen. The terminal text includes: "Minnesota", "Invoice #", "Bill To...", "CALDERON RIVERA", "754 26TH ST", "IL 612 1864", "Country USA U", "Phone 309-2", "Dealer GUAMAR", "Empty Box Deliv", "Request Pickup", "Zone", "Request Ship Date", "17-037-05". A large red arrow points from the terminal window towards the web interface, indicating the flow of data or the adaptation of logic.

Toolkit history

Toolkits shipped by Zend (then and now)

- **2006-2011: i5 Toolkit (Easycom)**
 - No longer shipped with Zend Server
 - May still be used if already installed
 - Remains available commercially from Aura company
- **2012+: New Open Source Toolkit**
 - Courtesy of Zend and IBM
 - Made of pure PHP and RPG, free and open source
 - Functionality similar to i5 Toolkit
 - Includes a Compatibility Wrapper (CW), developed by me, to ease transition to new toolkit

Do I have to switch to the new toolkit?

- **Zend Server PTF upgrade**
 - PTF upgrade process will not remove Easycom
 - Continue to use Easycom or choose new toolkit
 - Support remains

- **New downloads**
 - Zend Server 5.6+ no longer includes Easycom
 - Use new Open Source toolkit
 - Compatibility Wrapper helps migration
 - Intercepts i5 function calls
 - Passes to new toolkit, transparently

New Open Source Toolkit

- **Free and Open Source Software (FOSS)**
 - Source code is there—read it, learn, extend, give feedback
 - Open source on IBM i appeals to young developers
- **Collaborative**
 - Zend built the PHP interface (Sam Pinkhasov and team)
 - Later, Zend asked me to build the CW and then to maintain and help support the package
 - IBM built functionality on the back end
- **Community involvement**
 - People are already contributing enhancements and fixes (PHP and RPG code). Luca Zovi, Martin Hieden. Tell us your ideas

More about XML Service

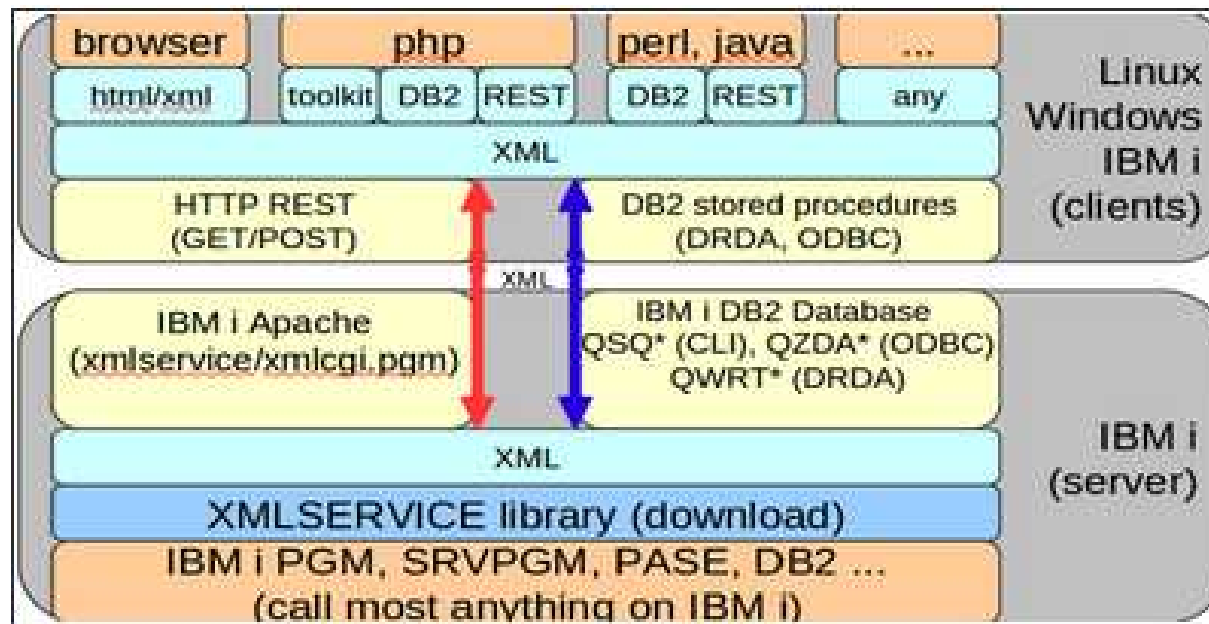
- **IBM has open sourced XML Service**
- **First open source project on IBM i that we know of**
- **Made of RPG and DB2 stored procedures (SQL)**

- **Tony Cairns, IBM Rochester**



XML Service architecture

- Cross platform
- Language agnostic
- Basic plumbing accessible by all languages



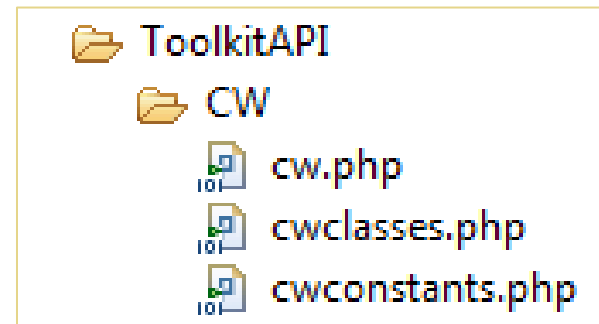
Compatibility Wrapper (CW)

- **Written in pure PHP**
- **Intercepts existing i5 function requests**
 - See CW documentation for several changes
- **Passes them on to new Toolkit API which then...**
- **Passes on to XMLSERVICE**

- **Created by me (Alan) for Zend**

- **Bring in the CW code library**

```
18 require_once( 'CW/cw.php' );
```



Tony and Alan at work (ZendCon '11)



Alan Seiden, Strategic Business Systems

Install and configure

Where to get new toolkit

- **Included with Zend Server 5.6+**

- <http://zend.com/en/products/server/downloads>
- Approved QA version in latest PTF or hotfix
- Look for latest PTF and hotfix, install in sequence

- **Young i Professionals (YiPs) site**

- Latest version is here
- <http://youngiprofessionals.com/wiki/XMLSERVICE>
- Also: a Git repository for collaboration

Is it really free?

- **Yes, the new toolkit is....**
 - Free and Open Source Software (FOSS)
 - BSD license (business friendly)
 - http://en.wikipedia.org/wiki/BSD_licenses
 - Source code available to all
 - Community code contributions welcome
 - Inner workings of toolkit revealed—nothing hidden
 - No registration or special license required
 - (Zend Server itself does work better with a license)
 - Available for the benefit of the PHP/i community

Prerequisites

- **IBM i V5R4 or higher**
 - 6.1+ is even better
- **PTFs from IBM i:**
 - Latest PTF cumulative: Java (also has PASE), HTTP, DB2 (latest)
 - SI39831/SI39917 - V7R1, SI39829 - V6R1, SI39610 – V5R4 (CLOBs)
- **Zend Server 5.6 or higher**

Download latest version

- **Toolkit developing rapidly**
- **Start with latest Zend PTF/hotfix**
- **Latest is on YiPS site**
- **So far, each new version has been an improvement**
 - “for Brave and helpful” page has latest test version. Unless solving a known problem, try in test XMLSERVICE library before overwriting production ZENDSVR

Installation

- **With Zend Server install**

- It's automatic
- XMLSERVICE is in library ZENDSVR
- PHP Toolkit is in /usr/local/zendsvr/share/ToolkitApi

- **YiPS site**

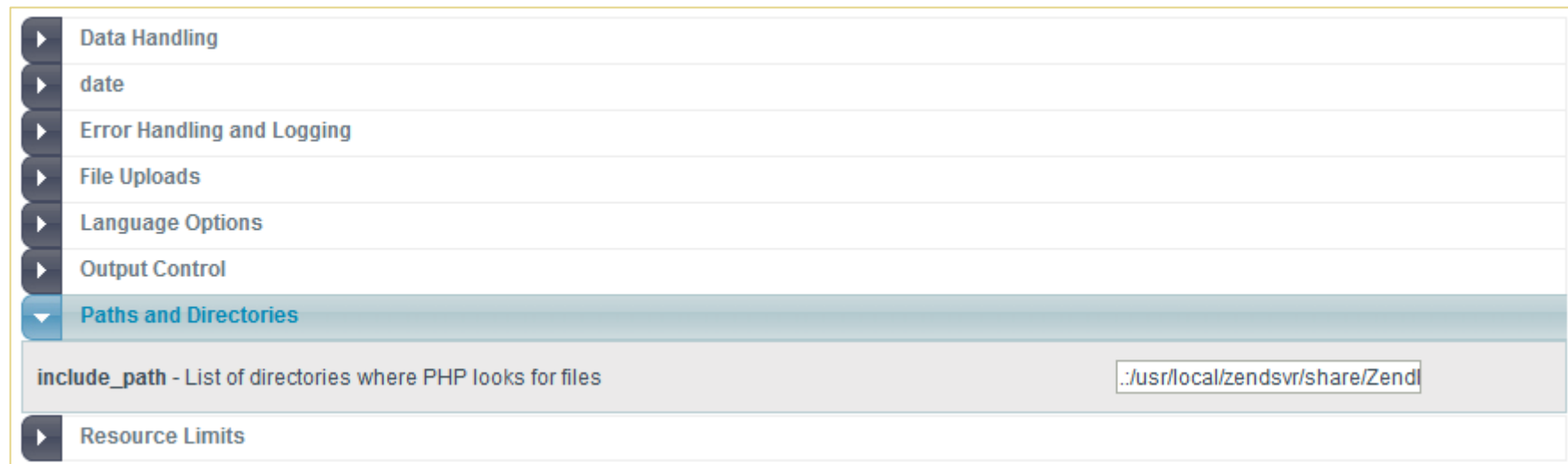
- Downloads and instructions here:
<http://www.youngprofessionals.com/wiki/XMLSERVICE>
- Install both XMLSERVICE (server) and CW/Tkit (PHP client)
- CRTXML compiles into XMLSERVICE test library
 - If use test library, configure with toolkit.ini's "XMLServiceLib"
- CRTXML2 compiles into ZENDSVR production library

Toolkit.ini

- **Located in /usr/local/zendsvr/share/ToolkitApi**
- **Useful settings:**
 - [host]
 - **For CW only**, map “old toolkit” hostnames/IP to DB names or *LOCAL
 - Example: localhost=*LOCAL
 - Normally don't change default unless your application already specifies a different IP address, or you need a database other than *LOCAL
 - WRKRDBDIRE to find your database names
 - [system]
 - Debug=true
 - Creates debug.log
 - XMLServiceLib = "ZENDSVR"
 - Or = "XMLSERVICE"
 - Encoding = "ISO-8859-1"
 - For some, =“UTF-8” works better (a Japanese report)

Notes on installation (PTF update only)

- **Suggestion: update Include_Path in php.ini**
 - PTF does not update Include_Path (full install does)
- **or Server Setup → Directives → Paths & Directories**
- **Add “:/usr/local/zendsvr/share/ToolkitAPI”**



The screenshot shows a web-based configuration interface for PHP. On the left, a vertical sidebar contains several menu items with right-pointing triangles: 'Data Handling', 'date', 'Error Handling and Logging', 'File Uploads', 'Language Options', 'Output Control', 'Paths and Directories' (which is highlighted in blue and has a downward-pointing triangle), and 'Resource Limits'. The main content area shows the 'include_path' directive, described as 'List of directories where PHP looks for files'. The value entered in the text box is ':/usr/local/zendsvr/share/Zend'.

Set your CCSID

- **Coded Character Set Identifier**
 - Determines translation between EBCDIC and ASCII
 - ASCII or similar “PC” text format
 - 65535 is special, meaning “never translate”
 - 65535 is NOT our friend, but IS the default QCCSID
 - Everyone must choose and set a CCSID
 - North Americans use 37. Different elsewhere
- **Not only for toolkit**
 - Many DB2 operations require CCSID
- **Next slide, see how to set it**

How to check/set CCSID

- **DSPSYSVAL QCCSID**
 - If not 65535, you're probably OK
 - Change with CHGSYSVAL SYSVAL(QCCSID) VALUE(xyz)
- **or in Apache config: /www/zendsvr/conf/httpd.conf**
 - USA settings:
 - DefaultFsCCSID 37
CGIJobCCSID 37
 - Different outside of USA. Check list of "Job CCSID":
 - http://www-03.ibm.com/systems/i/software/globalization/default_list.html
- **Everyone must set a CCSID**
 - This really means YOU.....otherwise toolkit will not work
 - I mean it 😊
- **P.S. Please set your CCSID**

Run demo scripts

- [/www/zendsvr/htdocs/Samples/Toolkit/*.*](#)
- [http://your_i:10088/Samples/Toolkit/](#)

New PHP Toolkit Demo Scripts

The new Toolkit technology is based on an open source XML transport developed by IBM and Zend, which allows you to extend PHP code to access IBM i resources. The ToolkitXML service

protocol is designed to work with "state full" RPG/CL programs (many open database files and other system resources), so a developer won't have to rewrite any programs just to get on the web.

Clicking on the script name will run the code and clicking on the display code will display the PHP code. The scripts location is `/www/zendsvr/htdocs/NewToolkit`.

- [Run Display Library \(DSPLIBL\) command Display Code](#)
- [Program Call with two parameters Display Code](#)
- [Program Call with Data structure parameters Display Code](#)
- [Service Program call that returns function value Display Code](#)

Additional code samples

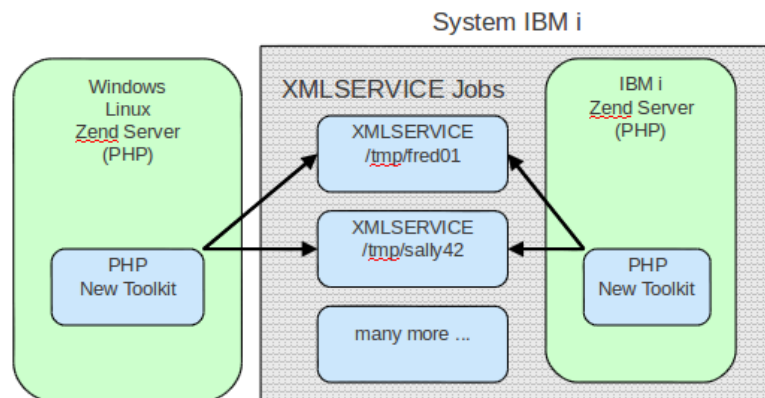
- Work with Spooled File entries [Display Code](#)
- Work with Data Queue (keyed) [Display Code](#)
- Work with User Space [Display Code](#)
- Work with Objects [Display Code](#)
- Work with Jobs [Display Code](#)

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Toolkit architecture

How it's put together

- **PHP links to XMLSERVICE through generic stored procedures (installed automatically with package)**
- **Any environment that can send/receive XML can use XMLSERVICE**



- **PHP is the first major “client” to use XMLSERVICE but there will be more, further strengthening XMLSERVICE as a back-end**

Calling programs

RPG program in ZENDSVR samples

File: ZENDSVR/QRPGLESRC

Member: COMMONPGM

```
C      *ENTRY          PLIST
C                      PARM                CODE          10
C                      PARM                NAME          10
*****
C      CODE           IFEQ          '1'
C                      move1         'IBM'             name
C                      ELSE
C      CODE           IFEQ          '2'
C                      move1         'Zend'            name
C                      ELSE
C                      move1         'wrong code'       name
C                      ENDIF
C                      ENDIF
C*
C                      SETON                                LR
C                      RETURN
```

Program call from sample scripts

/www/zendsvr/htdocs/Samples/Toolkit/Call_RPG_example.php

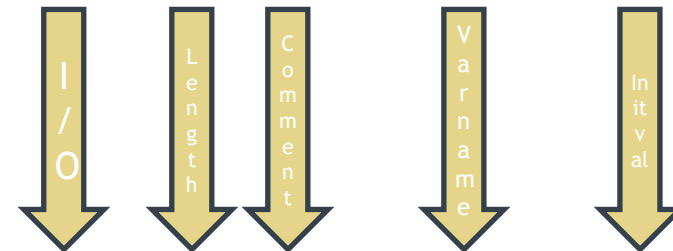
```
76     //Instantiate the toolkit service object...
77 $ToolkitServiceObj->setToolkitServiceParams(array('InternalKey'=>"/tmp/$user"));
78
79 // Program call...
80 $code = 2; //1 = IBM and 2 = Zend...
81 $desc = ' ';
82
83 $param[] = $ToolkitServiceObj->AddParameterChar('both', 10, 'CODE', 'CODE', $code);
84 $param[] = $ToolkitServiceObj->AddParameterChar('both', 10, 'DESC', 'DESC', $desc);
85
86 $result = $ToolkitServiceObj->PgmCall("COMMONPGM", "ZENDSVR", $param, null, null);
```

AddParameterChar in detail

```
function AddParameterChar(  
    $io, $size, $comment, $varName = '', $value, $varying, $dimension)
```

AddParameterChar() is defined in ToolkitService.php

Our example:



```
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.";
```

Calling script with result

http://my_ibmi:10088/Samples/Toolkit/Call_program_RPG.html

Calling an RPG program with two parameters

Code: (Valid Code is 1 or 2)

Reset

Call program

Click “Call program” to pass parameter to PHP and then RPG
http://my_ibmi:10088/Samples/Toolkit/Call_RPG_example.php

Parameter Name	Parameter Value
CODE	1
DESC	IBM

More parameter types

```
AddParameterChar($io, $size, $comment, $varName, $value, $varying, $dimension)
```

```
AddParameterInt32($io, $comment, $varName, $value, $dimension)
```

```
AddParameterInt64($io, $comment, $varName, $value, $dimension)
```

```
AddParameterUInt32($io, $comment, $varName, $value, $dimension)
```

```
AddParameterUInt64($io, $comment, $varName, $value, $dimension)
```

```
AddParameterFloat($io, $comment, $varName, $value, $dimension)
```

```
AddParameterReal($io, $comment, $varName, $value, $dimension)
```

```
AddParameterPackDec($io, $length, $scale, $comment, $varName, $value,  
$dimension)
```

```
AddParameterZoned($io, $length, $scale, $comment, $varName, $value,  
$dimension)
```

```
AddParameterBin($io, $size, $comment, $varName, $value, $dimension)
```

```
AddDataStruct(array $parameters, $name='struct_name', $dim, $by, $isArray,  
$labelLen)
```

Commands

First a simple command

```
// add library list entry
$cmdString = 'ADDLIBLE LIB(ALANLIB)';
$success = $conn->CLCommand($cmdString);
if($success) {
    echo 'Added library';
} else {
    echo 'Error: ' . $conn->getErrMsg();
}
```

Interactive command output

```
$cmdString = 'DSPLIBL';  
$liblArray = $conn->CLInteractiveCommand($cmdString);  
if($liblArray) {  
    echo 'Added library';  
} else {  
    // output full result of DSPLIBL command in an array  
    // <pre> </pre> formats the array  
    echo '<PRE>' . print_r($liblArray, true) . '</PRE>';  
}
```

Results on next slide...

Results of DSPLIBL

Array

(

```
[0] => 5770SS1 V7R1M0 100423 Library List 3/19/12 8:52:44 Page 1
[1] => ASP
[2] => Library Type Device Text Description
[3] => QSYS SYS System Library
[4] => QSYS2 SYS System Library for CPI's
[5] => QHLPSYS SYS
[6] => QUSRSYS SYS System Library for Users
[7] => DBU80 SYS
[8] => QSYS38 SYS
[9] => DC@EPC03 USR EPC-814 DC@ADKPGM
[10] => ZENDSVR USR
[11] => QGPL USR General Purpose Library
[12] => QTEMP USR
[13] => * * * * * E N D O F L I S T I N G * * * * *
```

)

Get info with RTV* commands

CLCommandWithOutput() gets output from RTVJOBA, RTV OBJD, RTVUSRPRF...

```
public function getJobAttributes() {  
  
    // Note: specify (?N) for numeric attributes  
    $cmdString = 'RTVJOBA JOB(?) USER(?) NBR(?) CURUSER(?) SYSLIBL(?) CURLIB(?)  
                USRLIBL(?) LANGID(?) CNTRYID(?) CCSID(?N) DFTCCSID(?N)';  
  
    // Send command; get output array of key/value pairs  
    $outputArray = $this->CLCommandWithOutput($cmdString);  
  
    return $outputArray;  
  
} //(public function getJobAttributes())  
  
$attrs = $conn->getJobAttributes(); // run command  
echo '<pre>' . print_r($attrs, true) . '</pre>'; // print_r() formats arrays neatly
```

Results on next slide...

Output from RTVJOBA

Array of job attributes

```
Array(  
  [JOB] => QSQSRVR  
  [USER] => QUSER  
  [NBR] => 240164  
  [CURUSER] => QTMHHTTP  
  [SYSLIBL] => QSYS           QSYS2           QUSRSYS  
  [CURLIB] => *NONE  
  [USRLIBL] => QTEMP         QGPL           MYUTIL  
  [LANGID] => ENU  
  [CNTRYID] => US  
  [CCSID] => 37  
  [DFTCCSID] => 37  
)
```

Connecting

Overview: connect with new toolkit API

- **Connect with database, user, password**

- Try *LOCAL or real database name
 - WRKRDBDIRE shows valid names
- If leave blank (“”, “”, “”): connect with default web user
 - QTMHHTTP

```
try {
    $ToolkitServiceObj = ToolkitService::getInstance($db, $user, $pass);
}

catch (Exception $e)
{
    echo $e->getMessage(), "\n";
    exit();
}

$ToolkitServiceObj->setToolkitServiceParams(array('InternalKey'=>"/tmp/$user"));
```

More: getting connected in CW and new API

- **CW style**

- `$conn = i5_connect('localhost', 'myuser', 'mypw', $options);`
- If private connection desired, specify in \$options array (I5_OPTIONS_PRIVATE_CONNECTION=>\$connId)
- Details here: http://files.zend.com/help/Zend-Core-i5/i5_php_connector_api.htm

- **New API style: connect, then choose private or stateless**

- `$conn=ToolkitService::getInstance('*LOCAL', 'myuser', 'mypw');`
- Additional function call sets private/stateful (default) or stateless
- `$conn=>setToolkitServiceParams(array(...=>...))`
- Details on next slide....

Private (stateful) or stateless

- **Private/stateful mode:**

- A job is started and “reserved” for user, re-use it
- File cursors (READE position), QTEMP are maintained, file handles remain open
- Best performance when many program calls
- Specify ‘InternalKey’ as unique job identifier

```
$conn=>setToolkitServiceParams(array('InternalKey=>'/tmp/jim123'));
```

- **Non-private/stateless**

- Quicker initial connection, runs toolkit directly in DB2 job (QSQSRVR job)
- Specify ‘stateless’

```
$conn=>setToolkitServiceParams(array('stateless'=>>true));
```

How to use persistent DB2 connection

- **See “DB2 and PHP Best Practices on IBM i”**
 - <http://alanseiden.com/presentations>
- **Persistent DB connection**
 - Compatibility Wrapper (CW) style
 - `$conn = i5_pconnect('localhost', 'myuser', 'mypw');`
 - New API
 - `$conn = getInstance('*LOCAL', 'myuser', 'mypw', '', true);`
 - Fifth param is persistence flag
 - Or re-use an existing DB2 persistent connection:
 - <http://forums.zend.com/viewtopic.php?f=113&t=46688>

Connect from “off the box”

2-tier = Run PHP on Windows/Linux/Mac

- **Answers a common request from developers**
- **Develop on laptop, connecting to XMLSERVICE on IBM i; then deploy to IBM i with no code changes**
- **Or run production PHP on non-i machine, calling IBM i-based RPG, commands, etc.**
- **Never a charge or cost for this 2-tier support**
 - All free and open source

Alternatives for 2-tier transports

- **Two popular transports (drivers/connectivity)**
 - “DB2 Connect” software from IBM (not free)
 - Advantage: handles SQL queries, too, as if they were local to PC
 - No-charge alternative: ODBC (free with IBM i Access)
- **Other alternatives**
 - CGI/HTTP (no drivers needed)
 - Many more are possible because XML can be sent over any type of connection

Connect via ODBC

- **First, set up ODBC database config on your PC**
 - Connection name will be used as the db name (*LOCAL is not allowed)
 - Documentation:
<http://publib.boulder.ibm.com/infocenter/iserics/v7r1m0/index.jsp?topic=%2Frzaii%2Frzaiiodbc04.htm>

- **CW style connection**

- Specify database name in toolkit.ini

```
[hosts]
```

```
myibmi = MYODBCCONN
```

```
// PHP to connect via ODBC
```

```
$options = array(CW_TRANSPORT_TYPE=>'odbc');
```

```
$conn = i5_connect('myibmi', 'myuser', 'mypw', $options);
```

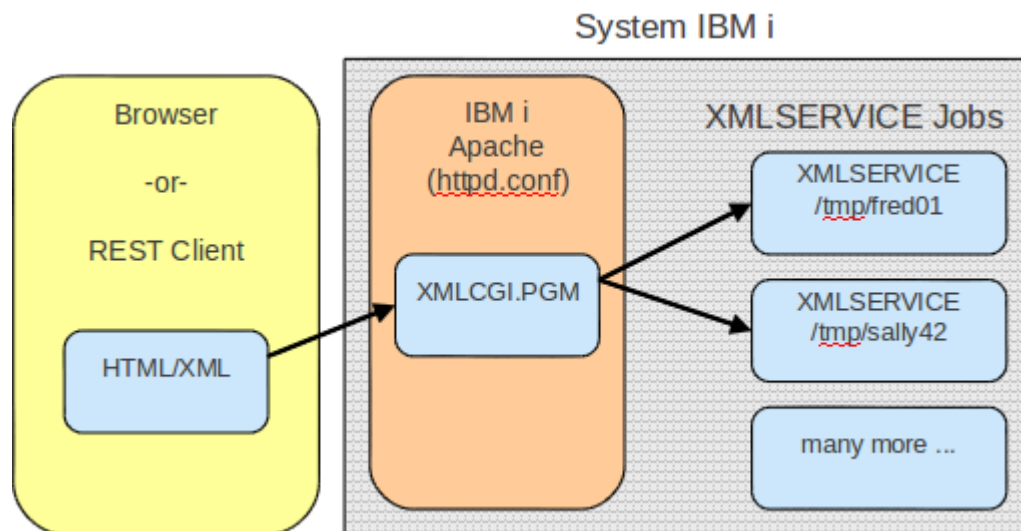
- **New API style connection**

```
$conn = ToolkitService::getInstance('MYODBCCONN', 'myuser',  
    'mypw', 'odbc');
```


How else to connect....

- **HTTP/CGI interface, no drivers needed**
- **Easy way to test XMLSERVICE functionality**
 - Once this interface is set up, can send XML via a browser form
 - Not enabled by default (secure)

174.79.32.155/wiki/index.php/XMLSERVICE/XMLSERVICE123NoPHP



Raw XML demos for the curious

<http://174.79.32.155/Samples/Toolkit/HTMLXML/index.html>

```
<pgm name='ZZCALL' lib='XMLSERVICE'>
  <parm><data type='1A'>a</data></parm>
  <parm><data type='1A'>b</data></parm>
  <parm><data type='7p4'>11.1111</data></parm>
  <parm><data type='12p2'>222.22</data></parm>
  <parm><ds>
    <data type='1A'>x</data>
    <data type='1A'>y</data>
    <data type='7p4'>66.6666</data>
    <data type='12p2'>77777.77</data>
  </ds>
</parm>
<return><data type='10i0'>0</data></return>
</pgm>
```

Troubleshooting

Troubleshooting tips

- **Get latest toolkit version**
 - XMLSERVICE and PHP wrapper, both from <http://www.youngiprofessionals.com/wiki/XMLSERVICE>
 - Test in XMLSERVICE library if unsure
- **Set your CCSID**
 - See earlier slides on this topic
- **Create debug log**
 - In toolkit.ini, set **debug=true**, then run script again
 - Creates **/usr/local/zendsvr/share/toolkitapi/debug.log**
 - Review log, post to forum, or share with support rep
 - Contains all XML sent and received, plus more information about connection

Resources, events, Q&A

Resources

- **Zend support**
 - Free for one year or extended with paid upgrades
- **Young i Professionals site**
 - <http://youngiprofessionals.com/wiki/XMLSERVICE>
- **Zend Toolkit Forum**
 - <http://forums.zend.com/viewforum.php?f=113>
 - “PHP on IBM i”->”Zend Server for IBM i”->”New Toolkit”
 - Ask questions, get real answers
- **Zend toolkit manual**
 - http://files.zend.com/help/Zend-Server-IBMi/php_toolkit_xml_service_functions.htm

A community effort: get involved

- **Help us test the toolkit**
 - Report any issues on the Forum
- **Contribute enhancements, tips, fixes**
 - Write to forum or alan@alanseiden.com
- **Why?**
 - Make the toolkit and IBM i platform better for everyone
 - Sharpen your skills; work with great people 😊
 - Working with open source demonstrates commitment to your chosen platform and your career as a whole

Alan's upcoming appearances

<http://alanseiden.com/presentations/upcoming>

April 18, 2012

Live presentation at LISUG (Long Island, NY)

<http://lisug.org>

May 6–9, 2012

COMMON spring conference (Anaheim, Calif.)

<http://common.org>

In New York City? I host the NYC Zend Framework Meetup

<http://www.meetup.com/ZendFramework-NYCMetro/>

Contact | Get tips

Alan Seiden

201-327-9400

<http://alanseiden.com>

Free PHP/i tips by email:
<http://alanseiden.com/tips>

Strategic Business Systems, Inc,

17 S. Franklin Tpk

Ramsey, NJ, 07446

Twitter: @alanseiden

