



The PHP Company

Stored Procedures with PHP on IBM i

Mike Pavlak

Solution Consultant

Agenda

- Updates
- Review of Stored procedures
- Examples
- Q&A

Collaborative Open Source with PHP for IBM i

www.zend.com

Updates

MySQL

- MySQL discontinued distributions last year.
- Zend and IBM are partnering to bring something back!
- Get ready for...



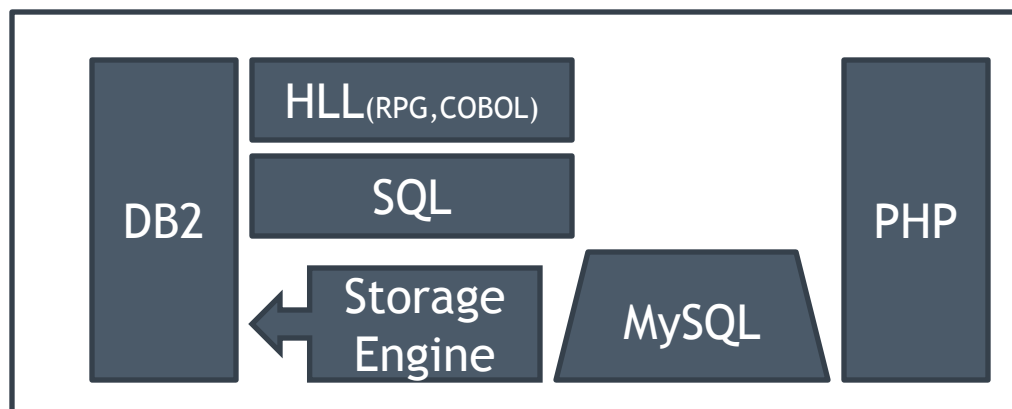
Zend DBi

Zend DBi

- Zend Technologies will provide **Zend DBi** as a drop-in replacement for *MySQL* on the IBM i platform
- **Zend DBi** will be shipped as a part of Zend Server for IBM i and freely downloadable as a standalone package
- The build will remain open-source and be updated over time to implement relevant bug fixes and features
- IBM will continue to maintain and deliver the DB2 Storage engine for *MySQL* for IBM i, via Zend Server and as a standalone package

Why Zend Db?

- COMMON, COMMON Europe and WMCPA (Wisconsin Midrange Computer Professional Association) all use open source application Joomla
- Manage their respective organizations with PHP handling the transactions and presentation layer.
- These organizations depend on MySQL as the database storing content and important transaction processing.



Zend Server 5.6

- GA Toolkit
- Application Deployment
- PHP version 5.3.8
- ZF version 1.11.10
- PTF Update as well as full package distribution

New toolkit FAQ

- New Toolkit is in Zend Server 5.1 as a beta
- Compatibility wrapper for i5_ functions
- GA with Zend Server 5.6

Zend Studio 9

- Only one version of Studio
- Check license screen to request free license
- Per our partnership with IBM...
 - ▶ 1 copy of Zend Studio per user
 - ▶ Must have IBM i serial number
 - ▶ Includes 1 year of updates and support
 - ▶ If studio was downloaded more than 1 year ago...
 - Check out store to purchase studio
 - See account manager for development solution

Collaborative Open Source with PHP for IBM i

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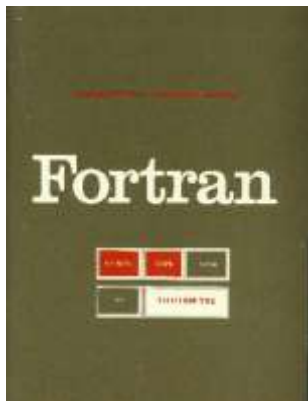
Stored procedures Introduction

Stored Procedures...What are they?

- Database artifacts that perform a specific task.
- Zend Server PHP on IBM i supports access to multiple DB's
 - ▶ DB2
 - ▶ MySQL
 - ▶ MS SQL Server
 - ▶ Oracle
 - ▶ Mongo DB (Zend Server 5.6)
- Therefore, SP's on each are available to PHP on IBM i

Stored Procedures on IBM i...What are they?

- Database artifacts that perform a specific task.
- Typically written in SQL or RPG, but...
- Can be written in nearly any HLL like
 - ▶ Java, REXX, C, CL, C++, COBOL, FORTRAN, PL1



What do they look like?

Simple SP data retrieval:

```
CREATE PROCEDURE sales_price(  
    IN Customer# CHAR(8),  
    IN Product# CHAR(8),  
    OUT price DECIMAL(12,2))  
LANGUAGE SQL  
BEGIN  
    SELECT CustPrice    FROM priceTable  
    WHERE CUSTNO=Customer# AND  
    PRODNO=Product# AND  
    active = 'Y'  
END
```

New Toolkit...

```
tn5250 - zend.idevcloud.com
File Edit View Help
Columns . . . : 1 71 Browse XMLSERVICE/QSQLSRC CRTSQL
SEU==>
FMT ** . . . + . . . 1 . . . + . . . 2 . . . + . . . 3 . . . + . . . 4 . . . + . . . 5 . . . + . . . 6 . . . + . . . 7
0018.00 CREATE PROCEDURE XMLSERVICE.iPLUG4K(
0019.00 IN IPC CHAR(1024), IN CTL CHAR(1024),
0020.00 IN CI CHAR(4064), OUT CO CHAR(4064))
0021.00 LANGUAGE RPGLE
0022.00 NOT DETERMINISTIC
0023.00 CONTAINS SQL
0024.00 EXTERNAL NAME 'XMLSERVICE/XMLSTOREDP(iPLUG4K)'
0025.00 PARAMETER STYLE GENERAL;
0026.00
0027.00 CREATE PROCEDURE XMLSERVICE.iPLUG32K(
0028.00 IN IPC CHAR(1024), IN CTL CHAR(1024),
0029.00 IN CI CLOB(32000), OUT CO CLOB(32000))
0030.00 LANGUAGE RPGLE NOT DETERMINISTIC
0031.00 CONTAINS SQL
0032.00 EXTERNAL NAME 'XMLSERVICE/XMLSTOREDP(iPLUG32K)'
0033.00 PARAMETER STYLE GENERAL;
0034.00

F3=Exit F5=Refresh F9=Retrieve F10=Cursor F11=Toggle F12=Cancel
F16=Repeat find F24=More keys

5250 MW 009/002
```

Command line procedure creation ...

From PASE:

```
QSH  CMD('/usr/bin/db2 -t -f  
      /QSYS.LIB/MPAVLAK.lib/QSQLSRC.FILE/MPSQL1.MBR')
```

Or...

From Native Command Line

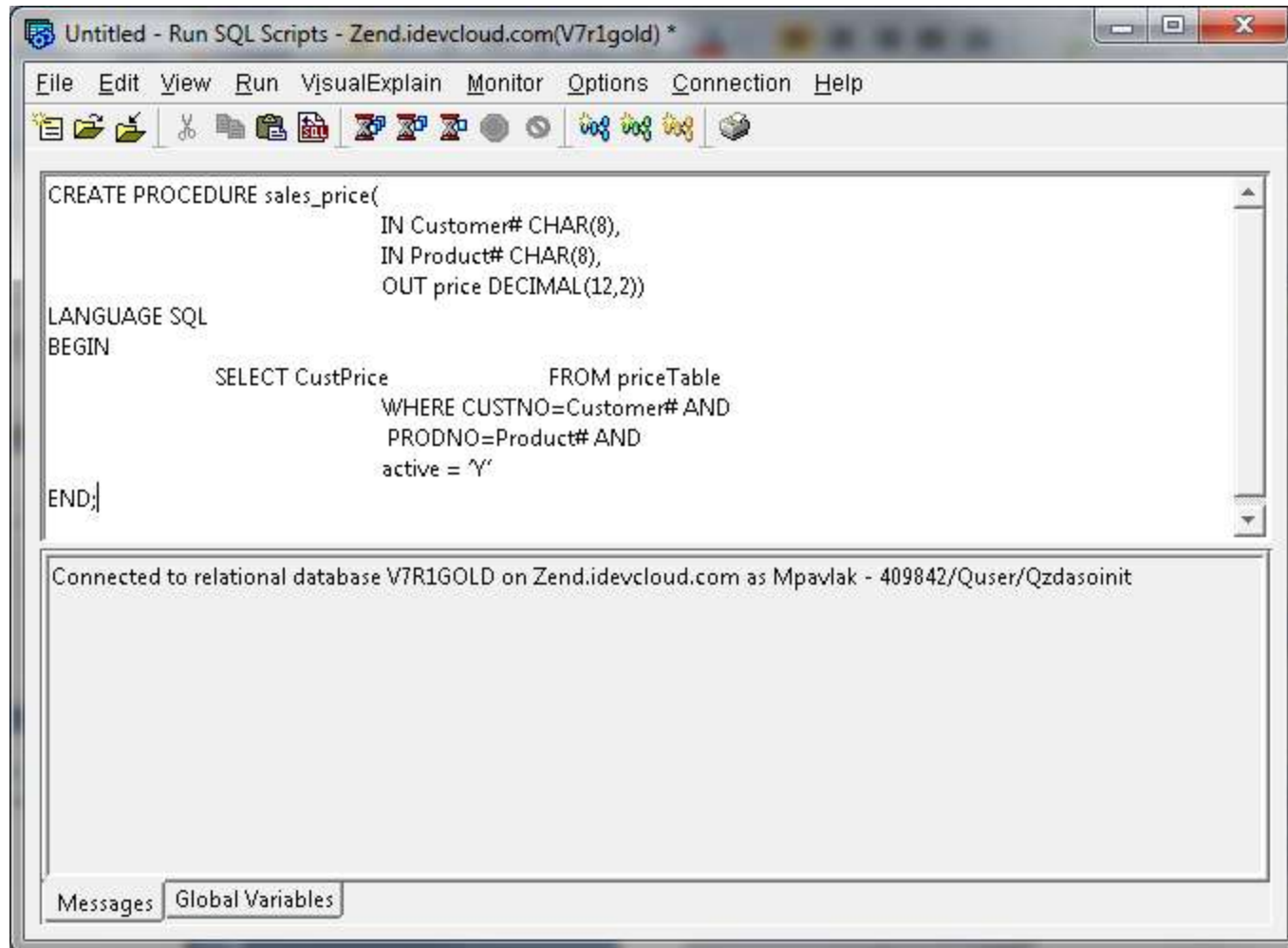
```
RUNSQLSTM
```

```
SRCFILE(MPAVLAK/QSQLSRC) SRCMBR(MPSQL1)
```

Examples in New Toolkit

- New toolkit (XML Service) is made up of
 - ▶ RPG
 - ▶ CL
 - ▶ DB2 Stored procedures

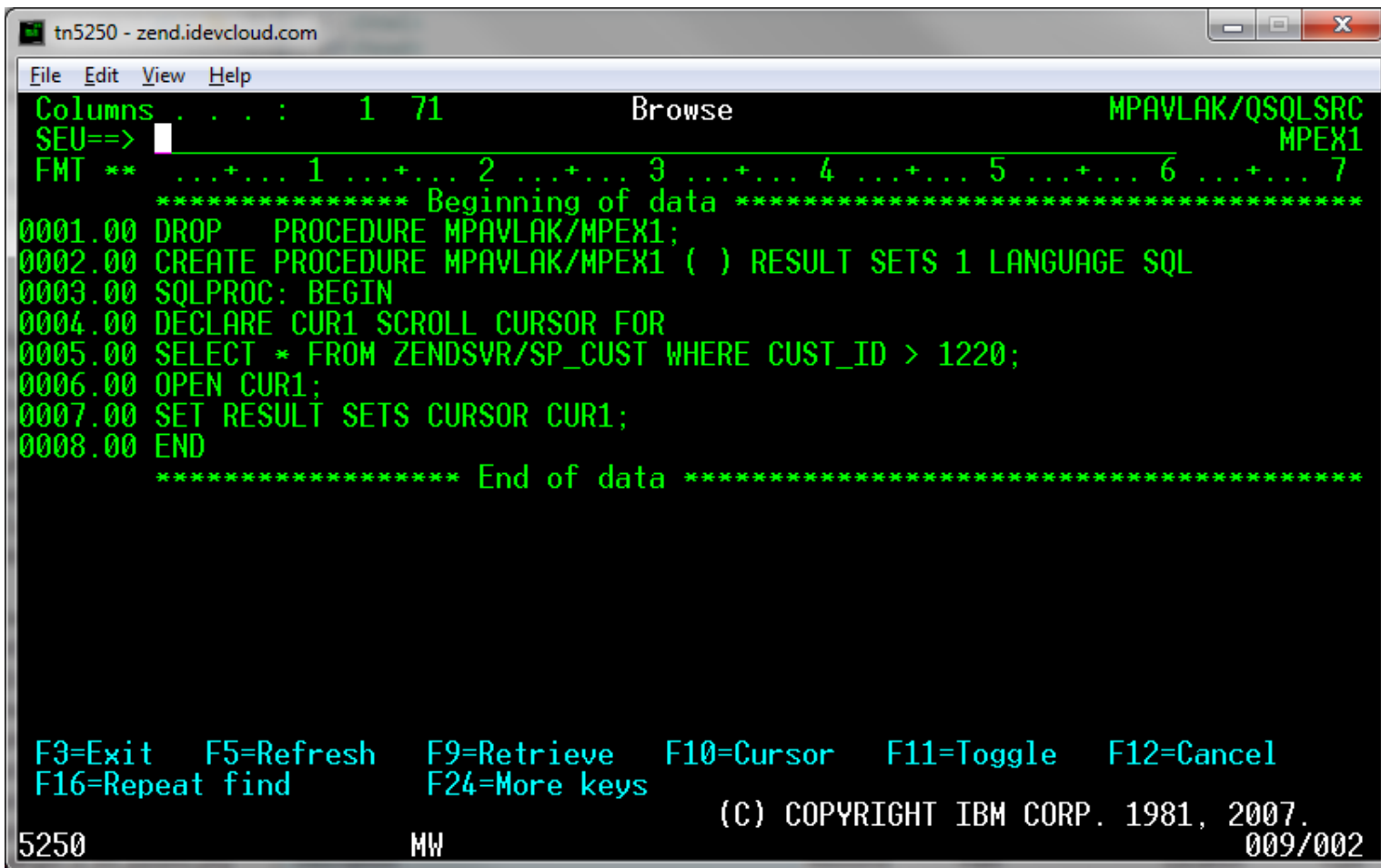
IBM Systems Navigator...



DB2 House Keeping...

- **Supports 2 types**
 - ▶ External (RPG, COBOL, etc.)
 - ▶ SQL
- **Implemented via C programs**
- **Enhancements with each release of IBM i**
 - ▶ Be Careful if developing for multiple OS versions
- **SQL details:**
 - ▶ Supports multiple statements
 - ▶ Supports iterative processing (Loop, Repeat Until, While)
 - ▶ Get Diagnostics and feedback (SQLSTATE, SQLCODE)
 - ▶ Can return discrete results or result sets

Example...



The screenshot shows a terminal window titled "tn5250 - zend.idevcloud.com". The window contains a menu bar with "File", "Edit", "View", and "Help". The main content is a green monospaced font on a black background. At the top, it says "Columns . . . : 1 71" and "Browse" in the center, and "MPAVLAK/QSQLSRC" and "MPEX1" on the right. Below this is a line "SEU=>" followed by a cursor. Then a line "FMT ** ...+... 1 ...+... 2 ...+... 3 ...+... 4 ...+... 5 ...+... 6 ...+... 7". This is followed by a separator line of asterisks and the text "Beginning of data". The main body of the terminal contains the following SQL code:

```
0001.00 DROP PROCEDURE MPAVLAK/MPEX1;
0002.00 CREATE PROCEDURE MPAVLAK/MPEX1 ( ) RESULT SETS 1 LANGUAGE SQL
0003.00 SQLPROC: BEGIN
0004.00 DECLARE CUR1 SCROLL CURSOR FOR
0005.00 SELECT * FROM ZENDSVR/SP_CUST WHERE CUST_ID > 1220;
0006.00 OPEN CUR1;
0007.00 SET RESULT SETS CURSOR CUR1;
0008.00 END
```

Below the code is another separator line of asterisks and the text "End of data". At the bottom of the terminal, there is a legend for function keys: "F3=Exit F5=Refresh F9=Retrieve F10=Cursor F11=Toggle F12=Cancel", "F16=Repeat find F24=More keys", and a copyright notice "(C) COPYRIGHT IBM CORP. 1981, 2007." The bottom left shows "5250" and "MW", and the bottom right shows "009/002".

PHP code original...

```
24
25 /* Construct the SQL statement */
26 $sql = "SELECT * FROM ZENDSVR.SP_CUST WHERE CUST_ID > ? FOR FETCH ONLY";
27
28 /* Prepare, bind and execute the DB2 SQL statement */
29 $stmt= db2_prepare($conn_resource, $sql);
30 $lower_limit = 1220; //from the CUST_ID value
31 $flds = db2_num_fields($stmt);
32 if($flds > 0 )
33 {
34 //show Table Header (analyze result set) 0 bordercolor=red bgcolor=green
35     echo "<table border=10 bordercolor=red bgcolor=lightgreen>";
36     echo "<tr>";
37     for($i=0; $i<$flds; $i++)
38     {
```

Output...

zend.idevcloud.com/mpavl x
zend.idevcloud.com/mpavlak/wc/spex1.php

Stored Procedure Example 1

Executing SQL statement: `SELECT * FROM ZENDSVR.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	809-453-5076	809-453-5022

PHP Code new...

```
9
10 $connect = db2_connect("*LOCAL", "", "");
11
12 $storedProcedure = "CALL MPAVLAK.MPEX1";
13
14 $stmt = db2_exec($connect,$storedProcedure, array('cursor' => DB2_SCROLLABLE));
15 $type=db2_cursor_type($stmt);
16
17 $flds = db2_num_fields($stmt);
18 if($flds > 0 )
19 {
20     //show Table Header (analyze result set) 0 bordercolor=red bgcolor=green
21     echo "<table border=10 bordercolor=red bgcolor=lightgreen>";
22     echo "<tr>";
23     for($i=0; $i<$flds; $i++)
```

New, looks like the old...

Stored Procedure Example 2

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
	Ocean				PO Box		Kaunua Kona		94756		808-	808-

Wrap it up...

- **Advantages?**

- ▶ Static objects
- ▶ Security is better (See Kevin Schroeder's piece in SystemiNews)
- ▶ Indexing, permanent objects
- ▶ Manage queries, DBA role is emerging

Upcoming webcasts

- **Zend Server update Zend Server 5.6**
 - ▶ Moved to January 11, 2012
 - ▶ Demo the new toolkit
 - ▶ Application Deployment
- **Performance tuning Zend Server**
- **More webcasts on the way**

Q&A

mike.p@zend.com