
Web Services on IBM i with PHP and Zend Framework



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Advancing PHP on IBM i

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Where to download these slides

From my site

<http://alanseiden.com/presentations>

On SlideShare

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What we'll discuss

- **How web services can help you**
- **Quick overview on Zend Framework**
 - (ZF makes services easier)
- **Web services case study with PHP on IBM i**
 - Focus on the CLIENT side with SOAP
- **Tips and techniques**
- **Questions**

PHP on IBM i

Zend Server for IBM i

- **Current PHP stack for IBM i**
- **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 (PE)
 - Subscription-based license
 - High value extra features, higher Support SLAs
- **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
 - Get version 5.6.0 or higher
- **Prerequisites**
 - v5r4 or higher and:
 - http://files.zend.com/help/Zend-Server-IBMi/i5_installing_zend_server.htm
 - IBM’s FastCGI PTF (free)
- **Try Zend Studio’s IDE (no charge, courtesy of IBM)**
 - “Zend Studio for Eclipse, IBM i Edition”
 - <http://zend.com/en/products/studio/downloads>
 - Look for “IBM i Edition”

Cheat sheet for upgrade

<http://alanseiden.com/2010/04/21/differences-between-zend-core-and-zend-server-on-ibm-i/>

	Zend Core	Zend Server
Installation folder	/usr/local/zend/core	/usr/local/zendsvr
PHP.INI	/usr/local/zend/core/etc	/usr/local/zendsvr/etc
Web server root(s)	/www/zendcore, /usr/local/zend/apache2	/www/zendsvr
Document root	/www/zendcore/htdocs	/www/zendsvr/htdocs
Zend Framework	/usr/local /Zend/ZendFramework	/usr/local/zendsvr/share /ZendFramework
PHP binaries folder * * where php and php-cli reside	/usr/local/zend/core/bin	/usr/local/zendsvr/bin
PHP Log files	/usr/local/zend/core/logs	/usr/local/zendsvr/ var/log
Web user profile (assign authority to it)	NOBODY	QTMHHTTP
Default HTTP Port	:89	:10088
Admin Interface URL	http://yourIBMi:89 /ZendCore/	http://yourIBMi:10088 /ZendServer/

Zend Framework

Zend Framework

- **A free, open source, cross-platform collection of components written in PHP**
 - Simplifies over 70 common needs, including:
 - Web form creation
 - Database access
 - Web services
 - Multi-language (English, French, Spanish...)
- **Included with Zend Server for IBM i and at <http://framework.zend.com>**

More than components

- **Optionally, a starting point for your applications, providing modular design**
- **It provides standards and functionality but does not limit you**
- **“Use at will” philosophy**

More benefits of ZF

- **Safe license for corporate use**
 - Use ZF's code however you like
 - <http://framework.zend.com/license>
- **High quality, unit tested**
- **It keeps up with trends and APIs**
 - Databases, authentication standards (Windows AD) and APIs (Twitter)

Zend Framework Community

- **Contributors include individuals and companies. Companies include:**
 - Zend (of course)
 - IBM
 - OmniTI
- **Technology partners:**
 - Adobe, Google, IBM, Microsoft, nirvanix, Strikelron
- **Individuals:**
 - Me! Improvements for IBM i developers

Web services

Web services help computers talk

- **No middleware needed**
- **HTTP transport is used**
 - Firewall-friendly
 - Many tools available to analyze
- **Popular and well documented**

Web Services are mainstream, growing

- **Once you understand web services, they start solving problems for you**
- **Examples:**
 - Vendors or suppliers may require them
 - Teams in your organization can cooperate and share data or application functionality

Your IBM i can be a server or client

- **As server:**
 - Selectively make your resources available to the outside
 - Define the service you want to offer and who is allowed to “consume” it.
- **As client: “consume” services provided by others**
 - But IBM i is a server! It can be a client too?

Your server can be a client!

- **Analogy: Your browser is a web client**
 - It makes a request to a web server
 - It receives a response
 - It interprets the response and shows you the result
- **Web services do the same thing**
 - But your IBM i is the web client
 - It makes a request to a web server
 - It receives a response
 - It interprets the response and returns the results to your PHP application

Three situations that call for web services

1. You need access to public web services

Document conversions, search results from the web, databases, geolocators, stock quotes

2. Your organization's departments need to work together, yet not have to compromise on their favorite technology

3. Your customers, vendors, or service providers offer their web services, or require you to create a web service for them to use

Sharing within one organization

Web services for sharing within an org

- **I helped Waitsfield Valley Telecom in Vermont set up a server & client**
 - Their IBM i and Linux servers both run PHP
 - IBM i is for internal users, Linux for external
 - IBM i uses db2, Linux uses MySql
 - Different teams, wishing to keep doing what they do well
 - But the systems need to share data and functionality
- **Till now they've been copying files to synchronize. Messy and not timely**
- **They want real-time data sharing, and the ability to trigger actions on the other server, without mucking in the other's database**
- **Web services to the rescue!**
- **One phone call was sufficient to set up server/client with a few functions to expose needed data, using Zend Framework's SOAP classes**



Public web services

Many PUBLIC web services are available

- **Some require a subscription**
- **Others are free**
- **Most need registration of some kind**
- **Let's take a look at a few**
 - Zend Framework has built-in support

Zend Framework supports these services

You are not limited to these, but ZF has BUILT-IN support to make these especially easy to use. Some are SOAP-based, some are REST-based.

<http://framework.zend.com/manual/en/zend.service.htm>

- `Zend_Service_Akismet`
- `Zend_Service_Amazon`, `Ec2`, and `S3`
- `Zend_Service_Flickr`
- `Zend_Service_LiveDocx`
- `Zend_Service_Nirvanix`
- `Zend_Service_ReCaptcha`
- `Zend_Service_ShortUrl`
- `Zend_Service_Simpy`
- `Zend_Service_SlideShare`
- `Zend_Service_Strikelron`
- `Zend_Service_Technorati`
- `Zend_Service_Twitter`
- `Zend_Service_WindowsAzure`
- `Zend_Service_Yahoo`

Zend_Service_Yahoo

Search the web with Yahoo

- Get your application ID from <http://developer.yahoo.com/wsregapp/>
- Class uses Zend_Rest_Client under the covers
- Sample search: **IBM PHP**

```
$yahoo = new Zend_Service_Yahoo("YAHOO_APPLICATION_ID");
$results = $yahoo->webSearch('IBM PHP',
                             array('results' => '10',
                                    'start'    => 1));

foreach ($results as $result) {
    echo '<b>' . $result->Title . '</b> ' . $result->Url .
        '<br />';
}
```

Results from \$yahoo->webSearch

Search: IBM PHP (these results are from early 2009)

IBM developerWorks : Blogs : Patrick Mueller <http://www.ibm.com/developerworks/blogs/page/pmueller?tag=php>
Informed Networker - Social News for IT Professionals. - IBM, Zend ... <http://www.informednetworker.com/other/ibplatform/>
:: News : PHP : Zend Core for IBM on Linux <http://madpenguin.org/cms/?m=show&id=4775>
:: News : PHP : IBM backs open-source Web software <http://madpenguin.org/cms/index.php/?m=show&id=3567>
Digg - IBM: PHP development within Eclipse http://digg.com/programming/IBM_PHP_development_within_Eclipse
Digg - Will IBM Buy Zend / PHP ? http://digg.com/linux_unix/Will_IBM_Buy_Zend_PHP_php_simplexml | **Diigo** <http://www.diigo.com/tag/php+simplexml>
ibm, rest | **Diigo** <http://www.diigo.com/tag/ibm,rest>
IBM poop heads say LAMP users need to "grow up" <http://naeblis.cx/rtomayko/2005/05/28/ibm-poop-heads>
Hypergene MediaBlog " IBM, blogging and the rise of the world's biggest ... <http://www.hypergene.net/blog/print.ph>

Now try Yahoo local search

```
require_once('Zend/Service/Yahoo.php');

// type of business and zip code are the GET parameters
$bizType = $_GET['type'];
$zip = $_GET['zip'];
// Anaheim zip near conference = 92802

// The few lines below do all the work
$yahoo = new Zend_Service_Yahoo('YAHOO_APPLICATION_ID');
$results = $yahoo->localSearch($bizType, array('zip' => $zip));
foreach ($results as $result) {
    echo $result->Title . '<br />';
}
```

Results from \$yahoo->localSearch

URL: <http://myIBMi.com/yahoolocal.php?type=pizza&zip=92802>

Starbucks

Deli-Icious Cafe

Coco's Bakery Restaurant

McCormick & Schmick's Seafood - Anaheim

California Pizza Kitchen

Starbucks

Starbucks

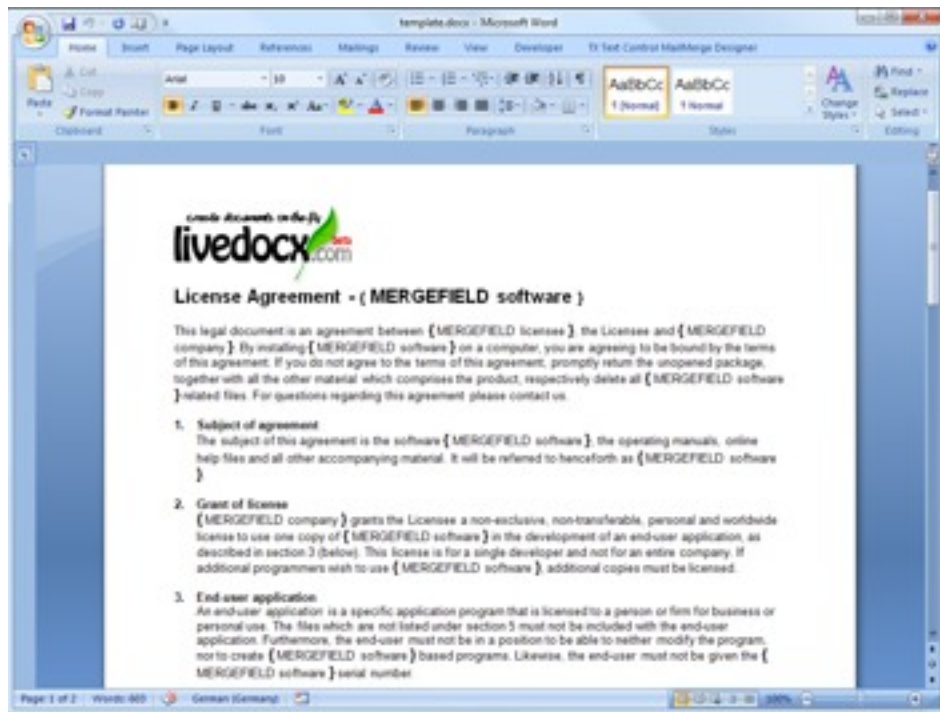
J W's Steakhouse

Starbucks Coffee

Starbucks

LiveDocx service

LiveDocx is a SOAP service that allows developers to generate word processing documents by combining structured data from PHP with a template, created in a word processor. The resulting document can be saved as a PDF, DOCX, DOC, HTML or RTF file. LiveDocx implements mail merge in PHP.



```
$phpLiveDocx = new
    Zend_Service_LiveDocx_MailMerge();

$phpLiveDocx-
    >setLocalTemplate('template.docx');

$phpLiveDocx->assign('software', 'Magic
    Graphical Compression Suite v1.9')
    ->assign('licensee', 'Henry
    Döner-Meyer')
    ->assign('company', 'Co-
    Operation');

$phpLiveDocx->createDocument();

$document = $phpLiveDocx-
    >retrieveDocument('pdf');

file_put_contents('document.pdf',
    $document);
```

Case study problem and solution

The Challenge

- **Allied Beverage Group, NJ's largest wine and spirits wholesaler, needed an online delivery tracker**
- **Their customers ask: "Where is my wine?"**
- **Real-time delivery data was available in a UPS RoadNet system on a Windows server**
- **How to get that data and bring it into the IBM i-based website built with PHP and Zend Framework?**

How it was done before

- **A previous attempt by an earlier consultant accessed the RoadNet server's Oracle database directly (it was a .NET site)**
- **This worked fine until UPS upgraded their software and database structures changed**
- **“BOOM”**
- **I didn't want that to happen to us**

RoadNet defined a Web Services API

- **Vendors support their APIs (unlike database structures)**
 - UPS can upgrade database and their API will still work
 - They will answer questions and support their product
- **IBM i can “consume” RoadNet’s service**
 - We are the web services “client”
 - We make function calls and receive data from the service
- **APIs can do some of the work**
 - Example: RoadNet calculated time zones on dates/times

What the final page looks like on “i” (pardon the blurring):












Delivery Center

Date: 4/21/2010

[7]

of deliveries: 30

[Hide Deliveries](#)

Rt#	Stop#	Acct Name, City	Arrival Times Scheduled/Actual	Status	Driver's Name	Acct Phone#	Total Pieces	More Info
46	2	WILSON, RICHARD, WILSON, RICHARD (NET)	9:00 AM/9:28 AM	Delivered 0:28 Behind	ROJAS, EDGAR	(201) 345-2828	planned: 28 actual: 28	
32	5	WILSON, RICHARD, WILSON, RICHARD (NET)	9:43 AM/10:06 AM	Delivered 0:22 Behind	GARCIA, SIXTO	(973) 345-2874	planned: 27 actual: 27	
42	6	WILSON, RICHARD, WILSON, RICHARD (NET)	9:45 AM/9:52 AM	Delivered 0:07 Behind	MARTIN, CHRISTOPHER J	(201) 405-3633	planned: 3 actual: 3	
690	6	WILSON, RICHARD, WILSON, RICHARD (NET)	9:56 AM/10:32 AM	Delivered 0:36 Behind	FRANCHI, STEVE	(908) 227-4736	planned: 3 actual: 3	
45	8	WILSON, RICHARD, WILSON, RICHARD (NET)	10:07 AM/10:00 AM	Delivered 0:06 Ahead	MORAN, HECTOR	(201) 947-4813	planned: 18 actual: 18	
42	9	WILSON, RICHARD, WILSON, RICHARD (NET)	10:32 AM/10:14 AM	Delivered 0:18 Ahead	MARTIN, CHRISTOPHER J	(201) 245-2112	planned: 3 actual: 3	
39	10	WILSON, RICHARD, WILSON, RICHARD (NET)	10:55 AM/11:27 AM	Delivered 0:31 Behind	STRASSBERG, MICHAEL	(201) 641-1792	planned: 3 actual: 3	
32	12	WILSON, RICHARD, WILSON, RICHARD (NET)	11:21 AM/12:06 PM	Delivered 0:45 Behind	GARCIA, SIXTO	(973) 345-7946	planned: 25 actual: 25	
09	15	WILSON, RICHARD, WILSON, RICHARD (NET)	11:34 AM/12:05 PM	Delivered 0:31 Behind	CULLER, CLARENCE	(973) 772-4146	planned: 3 actual: 3	
31	13	WILSON, RICHARD, WILSON, RICHARD (NET)	12:07 PM/1:33 PM	Delivered 1:25 Behind	TANGNEY, DONALD P	(201) 843-7777	planned: 6 actual: 6	
32	15	WILSON, RICHARD, WILSON, RICHARD (NET)	12:22 PM/1:55 PM	Delivered 1:32 Behind	GARCIA, SIXTO	(973) 345-8816	planned: 8 actual: 8	

Now for more details...

- **REST vs. SOAP**
- **How it's done**
- **What's WSDL?????**
- **Tips and more**

REST/SOAP

Two main philosophies of web services

- **REST: Representational State Transfer**
 - More of an architecture or philosophy than a protocol
 - URL-based, could make requests from browser address bar
 - CRUD-oriented with GET/POST/PUT/DELETE
 - Not limited to XML. JSON or other formats OK
 - Various implementations, including Zend Framework's `Zend_Rest_Server` and `_Client`
- **SOAP: (Not an acronym any more...see next slides)**
 - Popular Web Services protocol, been around a long time
 - Uses XML to send and receive
 - Specific implementation, rules, strict data types
 - Not 'hip' anymore but is well documented and solid
- **We will be focusing on SOAP today for our case study**

SOAP

SOAP is no longer an acronym

- **Used to be:**
 - “Simple Object Access Protocol”
- **Now it's just SOAP**

SOAP is language-independent

- **PHP-.NET**
- **PHP-PHP**
- **.NET-PHP**
- **RPG-LISP (someone here probably knows how to do that)**
- **more**

It's like being there

- **Use functions/methods as if the server were local**
- **Leverage your existing PHP skills**
- **Example from RoadNet:**
 - `retrieveLocationsByCriteria()`

WSDL defines it

WSDL defines the transactions and data

- **Web Services Description Language**
 - Defined at <http://www.w3.org/TR/wsdl>
- **WSDL is fairly readable once you get the hang of it**
- **Even if the service provider does not give you a manual, WSDL tells the story**

Web service provider will give you the WSDL

- **If not, you'll have to define all the classes and data types manually**
- **Ask nicely for WSDL**
 - WSDL makes your life easy

WSDL defines the server to access

```
<service name="TransportationWebService">
  <documentation>UPS Logistics Technologies
    Transportation Web Service</documentation>
  <port name="TransportationWebService"
    binding="tns:TransportationWebService">
    <SOAP:address location="http://192.168.99.223:82" /
    >
  </port>
</service>
```

More from the WSDL file

```
<!-- "function/method" definition -->
<element name="RetrieveLocationsByCriteria">
  <complexType>
    <sequence>
      <element name="criteria"
        type="ns1:LocationCriteria" minOccurs="0"
        maxOccurs="1" nillable="true"/>
    </sequence>
  </complexType>
</element>
```

More from WSDL: complex type defined

```
<!-- Complex data type defined of simpler types that
      will translate to objects in your PHP -->
<complexType name="LocationCriteria">
  <sequence>
    <element name="regionID" type="xsd:string"
minOccurs="0" maxOccurs="1"/>
    <element name="locationType" type="xsd:string"
minOccurs="0" maxOccurs="1"/>
    <element name="locationID" type="xsd:string"
minOccurs="0" maxOccurs="1"/>
    <element name="description" type="xsd:string"
minOccurs="0" maxOccurs="1"/>
  </sequence>
</complexType>
```


SOAP and PHP

PHP has SOAP client extension built in

- <http://www.php.net/manual/en/class.soapclient.php>
- **Excellent tutorial**
 - <http://devzone.zend.com/article/689>
 - by Dmitry Stogov, one of the authors of PHP's SOAP extension
- **Example use of PHP's SOAP client:**
 - ```
<?php
$client = new SoapClient(
 "http://services.xmethods.net/soap/urn:xmethods-delayed-quotes.wsdl");

print($client->getQuote("ibm"));
?>
```

# ZF's SOAP Client

# Zend Framework has a SOAP client class

- **It's called Zend\_Soap\_Client**
  - <http://framework.zend.com/manual/en/zend.soap.client.html>
- **Wraps around PHP SOAP extension**
  - More foolproof than ordinary PHP SOAP
    - Checks that the SOAP extension is loaded
    - Validates URLs before passing to SOAP
    - Better error/exception handling if incorrect params passed
  - Caching of WSDL handled directly rather than needing set\_ini
- **Provides additional functionality**
  - Example: getLastMethod()

# Subtle difference when using ZF

- **Creating instance of regular PHP SOAP object:**
  - `$client = new SoapClient($wsdl);`
  - Connects immediately, interprets WSDL; generates exceptions if errors found, or if OK, returns SOAP client object
- **Creating instance of ZF's SOAP object:**
  - `$client = new Zend_Soap_Client($wsdl);`
  - Does not connect until first remote method/function is executed
  - To connect and get SOAP client object immediately, add:  
`$soapClient = $client->getSoapClient();`
  - ZF's "lazy loading" technique gives developer more control

# Other reasons I use ZF's SOAP client

- **It fixes some glitches connecting to .NET**
- **Easy to customize if you need to**
  - Extend `Zend_Soap_Client` with logging, performance metrics, or pre- and post-processing for unique situations
  - Method definitions provided for you:
    - `_preProcessArguments($arguments)`
    - `_preProcessResult($result)`
- **I use ZF for everything anyway!**

# How to use ZF SOAP Client

# Include/Require the class

- This “include/require” is not needed if you use ZF and its Auto-Loader
- Do it if you use Zend\_Soap\_Client from a regular PHP script

```
require 'Zend/Soap/Client.php' ;
```



# Connect with WSDL

```
$wsdl = '/mypath/FileTheyGaveYou.wsdl' ;
$soapClient = new Zend_Soap_Client($wsdl) ;
```

## Then use your methods to retrieve data

```
$locCrit = new stdClass(); // generic class in PHP
$locCrit->criteria->regionID = $region;
$locCrit->criteria->locationID = $locationId;
$locCrit->criteria->locationType = 'SIT'; // site
// try it with our first choice of location id.
$locations = $soapClient->RetrieveLocationsByCriteria($locCrit);
// Now, $locations is an object containing a list of matching
// locations. Use foreach() to loop through
```

# Tricks and Traps

# WSDL is cached locally by default

- Caching improves performance but can be confusing
- “I changed the WSDL file but I’m getting the same results”
- Look in the /tmp folder by default
- Configured in PHP.INI (see below)

```
[soap]
```

```
soap.wsdl_cache_enabled = "1"
; enables or disables WSDL caching feature
```

```
soap.wsdl_cache_dir = "/tmp"
; sets the directory name where SOAP extension will cache files
; SUGGESTION: use "/tmp/wsdlcache" so you can find it
```

```
soap.wsdl_cache_ttl = "86400"
; (time to live) sets the number of seconds while cached file will be used
 instead of original one
```

```

<?php
// or handle in PHP: disable caching while testing different WSDL variations
ini_set('soap.wsdl_cache_enabled', '0'); // disable WSDL cache while in dev
?>
```

# The “optional” parameter that wasn’t

- **I thought I was following the spec**
- **But there was an “optional” parameter that I needed to specify**
- **It caused an error on the server**
- **Chain reaction:**
  - Service crashed and restarted
  - But there wasn’t enough virtual memory on the Windows server to restart
- **The UPS support team researched this, admitted a bug, and suggested I add the optional param**

# SOAP Servers

# Quick notes on SOAP Server with ZF

- **This presentation is mostly about the client side but I wanted to encourage you to try the server part, too.**

# AutoDiscover generates WSDL for you

- **It's free and included in Zend Framework**

- Class name: `Zend_Soap_AutoDiscover`
- <http://framework.zend.com/manual/en/zend.soap.autodiscovery.html>

```
function function1() {
}
```

....

```
require_once('Zend/Soap/AutoDiscover.php');
$autodiscover = new Zend_Soap_AutoDiscover();
$autodiscover->setUri('http://myIBMi.com/url-of-service');
$autodiscover->addFunction('function1');
$autodiscover->addFunction('function2');
$autodiscover->addFunction('function3');
$autodiscover->handle(); // outputs WSDL
```

// Note: Use “PHPDoc” comments on your PHP functions so that autodiscover can map your input params and return types into the WSDL (see documentation link above for examples)

# Serving the SOAP service is similar

- <http://framework.zend.com/manual/en/zend.soap.server.html>

```
require_once('Zend/Soap/Server');
```

```
// $wsdlLocation can be a local file or remote URL
```

```
$server = new Zend_Soap_Server($wsdlLocation, $options);
```

```
$server->addFunction('function1');
```

```
$server->addFunction('function2');
```

```
$server->addFunction('function3');
```

```
$server->handle(); // outputs the SOAP response
```



# Debugging Tactics

# Generic client makes testing painless

- **“STORM”**: a free, generic SOAP Client

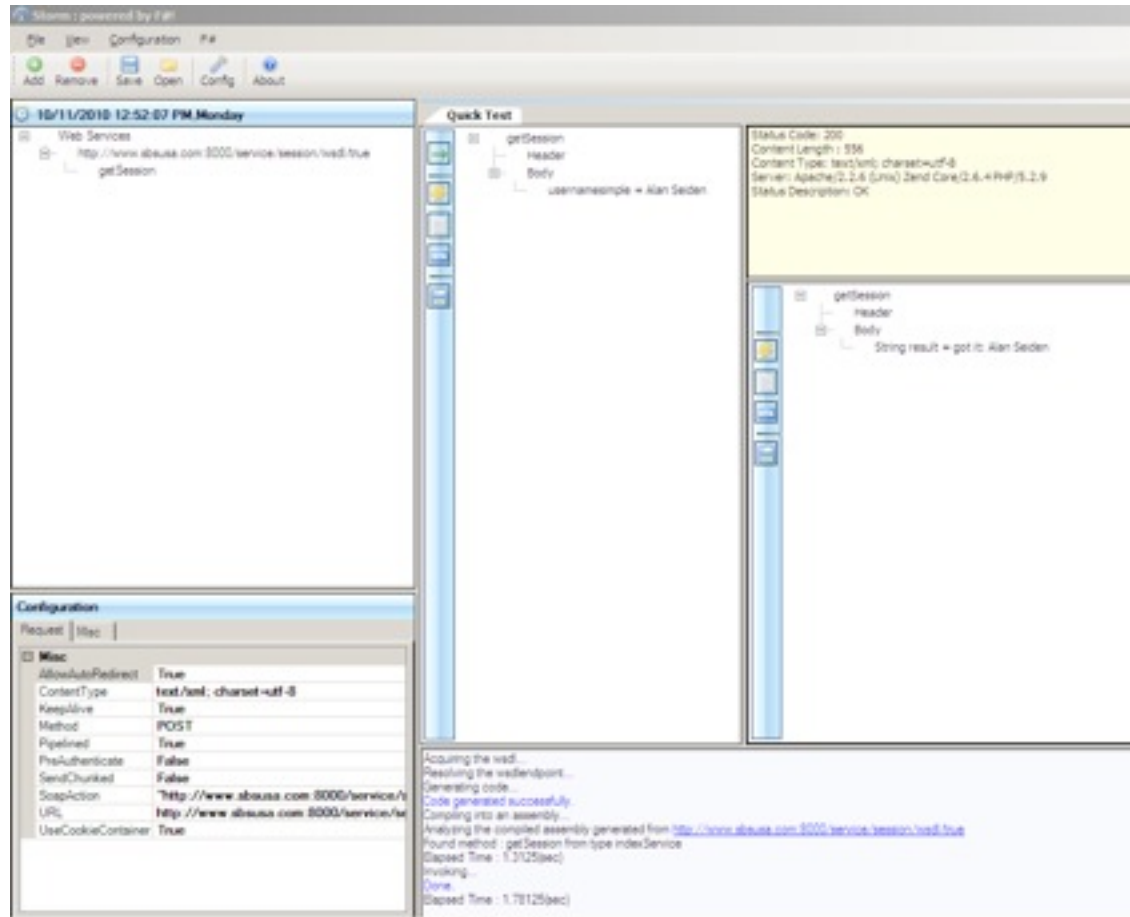
- <http://storm.codeplex.com>

- **Uses:**

- Check validity of WSDL
- Test server output
- Verify your client's results
- View raw XML if desired
- Runs on Windows only

- **Some prefer soapUI**

- <http://www.soapui.org/>
- Cross-platform (OK on Mac)



# Or get raw XML via your PHP code

- If you get unexpected results but can't duplicate them with a generic tool such as STORM, you can collect and log the XML from within your application
- Four functions/methods give you the XML

```
$client->getLastRequestHeaders ()
```

```
$client->getLastRequest ()
```

```
$client->getLastResponseHeaders ()
```

```
$client->getLastResponse ()
```

# Useful tools are Firefox + Firebug + FirePHP

- **Free tools**
- **Firebug (<http://getfirebug.com>) lets you analyze web pages in Firefox**
- **FirePHP (<http://firephp.org>) plugs into Firebug.**
  - Lets you see server-side data, for testing purposes, that you provide to it in your PHP code.

# Logging XML with Firebug/FirePHP

Product Catalog Search - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.sbsusa.com:8000/

Google

|    |    |                                    |                 |                           |                     |                           |
|----|----|------------------------------------|-----------------|---------------------------|---------------------|---------------------------|
| 08 | 21 | PORTLAND W CAMP, BERGENFIELD (NET) | 2:11 PM/2:41 PM | Delivered<br>0:30 Behind  | PETRONE, LUIS       | planned: 40<br>actual: 40 |
| 09 | 27 | PORTLAND W CAMP, CLIFTON (NET)     | 2:39 PM/3:02 PM | Delivered<br>0:23 Behind  | CULLER, CLARENCE    | planned: 17<br>actual: 17 |
| 51 | 24 | UPPER MERIDEN, CT (NET)            | 3:14 PM/2:26 PM | Delivered<br>0:47 Ahead   | DEFLIPPO, VINCENT A | planned: 4<br>actual: 4   |
| 39 | 25 | PORTLAND W CAMP, CLIFTON (NET)     | 3:14 PM/4:32 PM | In Transit<br>1:17 Behind | STRASSBERG, MICHAEL | planned: 14               |
|    |    | UPPER MERIDEN, CT (NET)            |                 | Delivered                 |                     | planned: 4                |

Console HTML CSS Script DOM Net

Clear Persist Profile

- connected to soap client:
- retrieve locations by criteria request headers: POST / HTTP/1.1 Host: 192.168.99.222:81 Connection: Keep-Alive User-Agent: PHP-SOAP/5.2.9 Content-Type: application/soap+xml; charset=utf-8; action="" Content-Length: 450
- retrieve locations by criteria request: <?xml version="1.0" encoding="UTF-8"?> <env:Envelope xmlns:env="http://www.w3.org/2003/05/soap-envelope" xmlns:ns1="http://www.upslogisticstech.com/UPSLT/TransportationSuite/TransportationWebService"><env:Body><ns1:RetrieveLocationsByCriteria><ns1:criteria><ns1:regionID>CARLSTADT</ns1:regionID><ns1:locationType>8IT</ns1:locationType><ns1:locationID>000262</ns1:locationID></ns1:criteria></ns1:RetrieveLocationsByCriteria></env:Body></env:Envelope>
- retrieve locations by criteria response headers: HTTP/1.1 200 OK Server: qSOAP/2.7 Content-Type: application/soap+xml; charset=utf-8 Content-Length: 2241 Connection: close
- retrieve locations by criteria response: <?xml version="1.0" encoding="UTF-8"?><SOAP-ENV:Envelope xmlns:SOAP-ENV="http://www.w3.org/2003/05/soap-envelope" xmlns:SOAP-ENC="http://www.w3.org/2003/05/soap-encoding" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:ns1="http://www.upslogisticstech.com/UPSLT/TransportationSuite/TransportationWebService"><SOAP-ENV:Body><ns1:RetrieveLocationsByCriteriaResponse><ns1:locations><ns1:locationIdentity xsi:type="ns1:LocationIdentity"><ns1:regionID>CARLSTADT</ns1:regionID><ns1:locationType>8IT</ns1:locationType><ns1:locationID>000262</ns1:locationID></ns1:locationIdentity><ns1:description>PORTLAND W camp</ns1:description><ns1:accountType></ns1:accountType><ns1:serviceTimeType>DEF</ns1:serviceTimeType><ns1:timeWindowType>DEF</ns1:timeWindowType><ns1:timeWindowFactor>3</ns1:timeWindowFactor><ns1:address><ns1:line1>22 PORTLAND AVE.</ns1:line1><ns1:line2></ns1:line2><ns1:region1>BERGENFIELD</ns1:region1><ns1:region2></ns1:region2><ns1:region3>NJ</ns1:region3><ns1:postalCode>07621</ns1:postalCode><ns1:country>US</ns1:country></ns1:address><ns1:latitude>40927600</ns1:latitude><ns1:longitude>-73997300</ns1:longitude><ns1:buildingDeliverySequence>0</ns1:buildingDeliverySequence><ns1:locQuality>grAuto</ns1:locQuality><ns1:locConfidence>gcHigh</ns1:locConfidence><ns1:contact></ns1:contact><ns1:alternateContact></ns1:alternateContact><ns1:faxNumber></ns1:faxNumber><ns1:phoneNumber>2013944294</ns1:phoneNumber><ns1:standardInstructions></ns1:standardInstructions><ns1:preferredRouteID></ns1:preferredRouteID><ns1:storeNumber></ns1:storeNumber><ns1:userDefinedField1>0203-44-004-004</ns1:userDefinedField1>

>>> /www/ebizdev/htdocs/application/models/Delivery/Stops.php : 348

New York: Wed 16:13 Done 7.124s 13.591s 218.07KB 8req

# You won't normally need to examine XML

- **But good to know you can**
- **Try it once as a learning experience**
  - Seeing the XML demystifies the process of SOAP

# Demo or recording

**Now it's your turn**



# Questions? How will you use web services?

- **Need to share data or functionality between two systems on different servers?**
- **Want your teams to work together?**
- **Or access remote content?**
- **This could be a job for web services!**

# Contact

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