



# PHP Web Services

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## Some Quotes

- „Many Web Services Initiatives Risk Failure”
  - Gartner, July 2003
- „Gartner Says Web Services Ready for Prime Time”
  - eWeek, May 2004
- „Gartner predicts American business is going to squander \$1 billion on misguided Web services projects by 2007 ”
  - CIO Magazine, October 2003



## And What About PHP?

- Focus on .NET and J2EE
- In comparisons, PHP gets very little attention
- However Googlefight knows: There must be a way: ☺

web services comparison .NET J2EE ( 92 900 results ) versus web services comparison PHP ( 1 194 000 results )

The winner is: web services comparison PHP



## Aim Of This Presentation

- What's this Web Services stuff all about?
- What's about these acronyms?
- How can I consume (use) Web Services with PHP?
- How can I create my own Web Services with PHP?
- PHP 4 vs. PHP 5

## Agenda

- **A: Web Services – The Idea**
- B: Web Services – The Standards
- C: Web Services in PHP
- (D: Wish List)

## Web Services – The Idea

- Web Services are used for business-to-business communication
- This idea is rather old, however now there are specifications that describe how information is exchanged



## Web Services – Data Transmission

- Often, data is transmitted using HTTP
  - Good: Goes through most firewalls
  - Bad: Firewall makers upgrade their systems



## Old Idea, New Idea, Both?

- No, Web Services are no new concept
- No, Web Services were not invented (nor patented) by Microsoft
- However: Microsoft worked on many of the standards (!)
- However: Microsoft (and many others) promote Web Services with their huge budgets

## Key Players

- Dave Winer – worked on XML-RPC
- Don Box – Microsoft's Web Services guru (but started on the standardization with his own company)
- IBM, HP, ...
- Reference implementations (Amazon, Google, Yahoo!, Dell)
- Standardization committees (W3C, OASIS)



## Why Is Everybody Using This?

- Standards enable communication between totally different machines (and developers)
- Use of XML which is sexy, cool (and: human-readable, standardized)
- Machine-to-Machine communication means: No human interaction involved
- Gartner says it's important! ☺

## Why Should You Be Using This?

- Currently, rather few visible implementations (Amazon, Google, Yahoo!, eBay et al.)
- However, Web Services offer many possibilities:
  - Communication between servers (or websites) is easy
  - Platform independence
  - New Markets, new business models
  - More and more support in the various languages and technologies
    - Currently, 18 PEAR packages

## Why Not?

- It may be a hype
- Remember WAP?
- It is rather useless to use a Web Service on one page and call it from another page on the same web server
- KISS vs. early adopting



## Agenda

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## What About These Acronyms?

- Enough inspiration for a whole round of buzzword bingo
  - XML-RPC
  - SOAP
  - WSDL
  - UDDI
  - DISCO
  - REST
- However, PHP takes care of most of this stuff for you



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## XML-RPC

- „XML Remote Procedure Call(s)“
- Used for message exchange using HTTP and XML
- Quite easy to use
- Developed by Dave Winer (so we thought)
- However, done in then-secret cooperation with Microsoft

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## Let's Have A Look

### ▪ A request

```
POST /webservice.php HTTP/1.1
Host: www.hauser-wenz.de
Content-Type: text/xml; charset=utf-8
Content-Length: 1234
```

```
<?xml version="1.0" encoding="utf-8"?>
<methodCall>
<methodName>hauserwenz.GetStockPrice</methodName>
<params>
<param><value><string>PHP</string></value></param>
</params>
</methodCall>
```

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## Let's Have A Look (2)

### ▪ A response

```
HTTP/1.1 200 OK
Content-Type: text/xml; charset="utf-8"
Content-Length: 1234
```

```
<?xml version="1.0" encoding="utf-8"?>
<methodResponse>
<params>
<param><value><string>$41.00</string></value></param>
</params>
</methodResponse>
```

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## So, What Do You Think?

- **Good:**
  - Easy to use
  - Not too much code overhead
  - Quite in use, e.g. PEAR project
  - Short learning curve (you could do this manually)
- **Bad:**
  - Not „standardized“ by a committee
  - Quite complex with simple data
  - No user-defined data types

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## SOAP

- Successor of XML-RPC
- Used to be an acronym for „Simple Object Access Protocol“
- Is, however, neither simple nor relevant for object access
- Therefore, now stands for ... SOAP
- XML-based protocol to exchange messages
- Can be embedded in HTTP (but also in SMTP, ...)



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## Let's Have A Look

### ▪ A request

```
POST /webservice.php HTTP/1.1
Host: www.hauser-wenz.de
Content-Type: text/xml; charset=utf-8
Content-Length: 1234
SOAPAction: "http://hauser-wenz.de/GetStockPrice"

<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
  <soap:Body>
    <ns1:GetStockPrice xmlns:ns1="http://hauser-wenz.de/" soap:encodingStyle="http://schemas.xmlsoap.org/soap/encoding">
      <Stock xsi:type="xsd:string">PRFC/Stock</Stock>
    </GetStockPrice>
  </soap:Body>
</soap:Envelope>
```

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## Let's Have A Look (2)

### ▪ A response

```
HTTP/1.1 200 OK
Content-Type: text/xml; charset=utf-8
Content-Length: 1234

<?xml version="1.0" encoding="utf-8"?>
<soap:Envelope xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
  <soap:Body>
    <ns1:GetStockPriceResponse xmlns:ns1="http://hauser-wenz.de/" soap:encodingStyle="http://schemas.xmlsoap.org/soap/encoding">
      <Price xsi:type="xsd:string">$42.00</Price>
    </GetStockPriceResponse>
  </soap:Body>
</soap:Envelope>
```

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## So, What Do You Think?

- Good:
  - Very flexible
  - Very mighty (including user-defined data types)
  - Sanctioned by W3C
  - Most software vendors agree on SOAP
- Bad:
  - Not quite lightweight
  - Possibly bad data/information ratio

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## WSDL

- „Web Services Description Language“
- Describes the service
  - Methods
  - Parameters
  - Return values
  - Data types
  - Location of service

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## Let's Have A Look

### ▪ A WSDL description

```
<?xml version="1.0" encoding="utf-8"?>
<definitions name="WebService"
  xmlns="http://schemas.xmlsoap.org/wsdl/"
  xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap"
  xmlns:tns="http://hauser-wenz.de/WebService-wsdl"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <message name="GetStockPrice">
    <part name="Stock" type="xsd:string"/>
  </message>
  <message name="GetStockPriceResponse">
    <part name="Price" type="xsd:string"/>
  </message>
  <portType name="GetStockType">
    <operation name="GetStockQuote">
      <documentation>Retrieve current stock quote of a company submitted as parameter</documentation>
      <input message="tns:GetStockPrice" />
      <output message="tns:GetStockPriceResponse" />
    </operation>
  </portType>
```

Lots of namespaces ...

Messages (input/output)

Port (with operations)

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## Let's Have A Look (2)

### ▪ A WSDL description (cont'd)

```
<binding name="WebServiceSoap" type="tns:QuotePortType">
  <soap:binding
    transport="http://schemas.xmlsoap.org/soap/http">
    <operation name="GetStockPrice">
      <soap:operation soapAction="http://hauser-
        wenz.de/webService.php"/>
      <input>
        <soap:body use="literal" />
      </input>
      <output>
        <soap:body use="literal" />
      </output>
    </operation>
  </binding>
```

Bindings (rules  
for data transfer)

## Let's Have A Look (3)

### ▪ A WSDL description (cont'd)

```
<service name="WebService">
  <port name="WebServiceSoap"
    binding="tns:WebServiceBinding">
    <soap:address
      location="http://www.hauser-
        wenz.de/webService.php"/>
    </port>
  </service>
</definitions>
```

Which services,  
where?

- This looks rather messy!
  - Automatism do prove really helpful here

## UDDI

- „Universal Description, Discovery, and Integration“
- Provide „Yellow Pages“ for web services (and more)
- Web services information is stored in UBRs – Universal Business Registries – that may be queried using a standardized API
- Various URBs synchronize
  - Microsoft, IBM, SAP, HP, NTT, ...
- Unfortunately, most test registries have been recently shut down

## Agenda

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## Web Services With PHP

- Well, you can do it manually!
  - It's just XML and all standardized ☺
- However, there are modules that come in really handy!
  - On some web pages
  - In PEAR
  - In PHP itself

## XML-RPC

- XML-RPC For PHP
  - Homepage: <http://phpxmlrpc.sourceforge.net/>
  - Widely used, after some stalling, development is up to speed again (but look at CVS!)
- PEAR::XML\_RPC
  - Homepage: [http://pear.php.net/package/XML\\_RPC](http://pear.php.net/package/XML_RPC)
  - Port of XML-RPC for PHP
- XML-RPC Client/Server
  - Homepage: <http://keithdevens.com/software/xmlrpc>
  - Still in active development
  - Version 3.0 exclusively for PHP5

## SOAP

- NuSOAP
  - Homepage: <http://detrich.ganx4.com/nusoap/>
  - LGPL-rewrite of SOAPx4
  - Quite easy to use (if you use PHP4)
  - Can create WSDL automatically
- PEAR::SOAP
  - Homepage: <http://pear.php.net/package/SOAP>
  - Also based on SOAPx4
  - Under PHP4, the de-facto reference SOAP implementation

## SOAP (2)

- ext/soap a.k.a. PHP5-SOAP
  - Homepage: <http://php.net/manual/en/ref.soap.php>
  - New SOAP extension for PHP5
  - Written in C, so much faster than PEAR::SOAP
  - However, still lacks a bit the stability of PEAR::SOAP
  - Still some problems
  - No built-in WSDL generation
  - But in the future the most promising extension

## UDDI

- PEAR::UDDI
  - Homepage: <http://pear.php.net/package/UDDI>
  - Supports the inquiry API of UDDI 2.0
  - Publish API is in the works
  - LGPL-port of PHPUDDI to PEAR

## Demo Time!

- Using XML-RPC
- Using NuSOAP
- Using PEAR::SOAP
- Using PHP5-SOAP
- Using PEAR::UDDI

## Why So Complicated?

- Often, REST is "good enough"
- REpresentational State Transfer
  - PhD thesis of Roy Fielding, co-author of the HTTP specification
- Use HTTP for the request (parameters via GET)
- Retrieve XML via HTTP as the response
- Yep, that's it.



## Why REST?

- Very simple
- PHP (5) offers great XML support
  - Especially SimpleXML comes in handy
- Less error-prone than anything else
- Good support from popular web services
  - Amazon, Yahoo!, Google, ...
- Every search engine uses REST, more or less
  - <http://www.google.com/search?q=REST>
  - <http://a9.com/REST>

## Why not REST?

- You have to take care of object serialization
- Hard(er) to implement security
- There is no such thing as REST-WSDL
- More request/response approach than demanded by SOA activists

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## Yahoo! Web Services

- Demo time!
  - Calling Yahoo! Web Service using REST & SimpleXML
  - Add some AJAX to the mix ...

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## Wish List

- More documentation ☺ (as always)
- stay tuned → WSDL generation for PHP5-SOAP
- Integration of web services functionality in relevant PHP IDEs
- Support of security, transaction and process standards in PHP
- More interesting, useful Web Services

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## WSDL Generation With PHP5-SOAP

- There are options!
  - Services\_Webservice (now in PEAR)
    - <http://thinkforge.org/projects/wsdngen/>
  - Ctrix\_SOAP\_AutoDiscover
    - <http://ctrx.org/index.php?page=CtrixSoapAutoDiscover>
  - Webservice Helper tool
    - [http://jool.nl/newindex.php?file\\_id=1](http://jool.nl/newindex.php?file_id=1)
  - WSDL\_Gen
    - [http://www.schlossnagle.org/~george/phpWSDL\\_Gen.tgz](http://www.schlossnagle.org/~george/phpWSDL_Gen.tgz)

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Thank You!

Questions?

<http://www.hauser-wenz.de/>  
<http://www.hauser-wenz.de/blog/>  
<http://php.phrasebook.org/>



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