

SYBASE

TECHWAVE

SYMPOSIUM 2009

Web Development with SQL Anywhere

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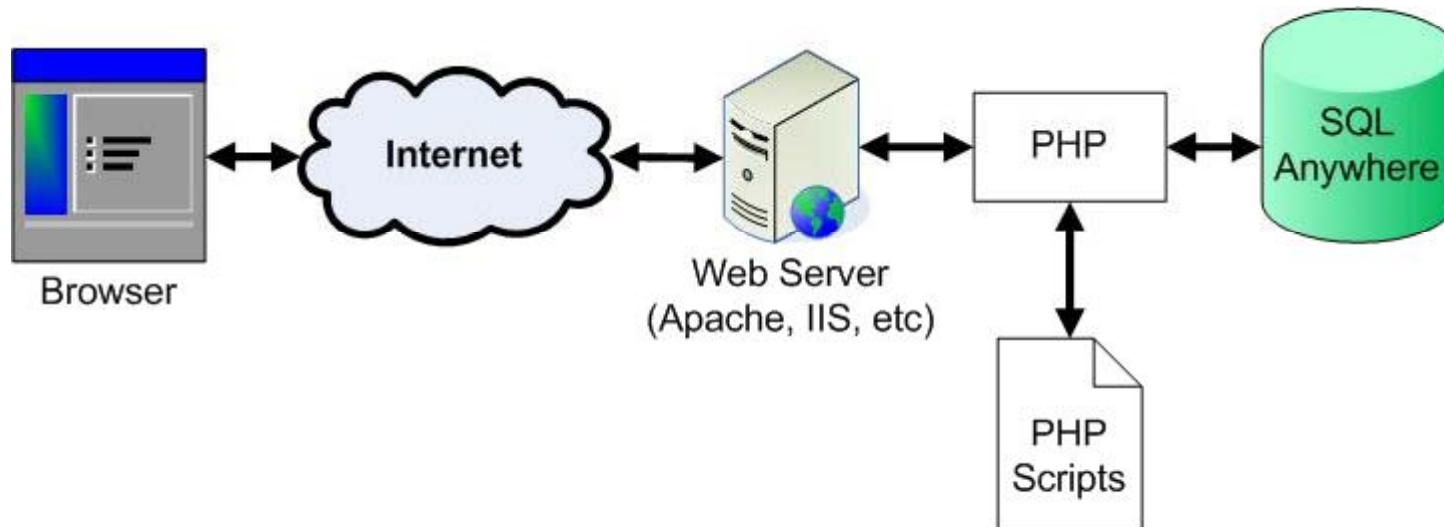


Outline

- **Server-side Scripting and Web Servers**
 - Updated PHP Support
 - New Ruby Support
 - New Python Support
 - Rich Internet Application (RIA) Technologies
- HTTP Server
 - JSON
 - New METHOD types
 - PHP Page Processing
 - Database-Hosted Web Applications
- Consuming Web Services
- SQL Anywhere Web Edition

Updated PHP Support

- PHP support was available in previous versions
- PHP must be installed locally on the server machine
- PHP connectivity is made through PHP libraries that are installed with SQL Anywhere 11



MySQL PHP API Compatibility

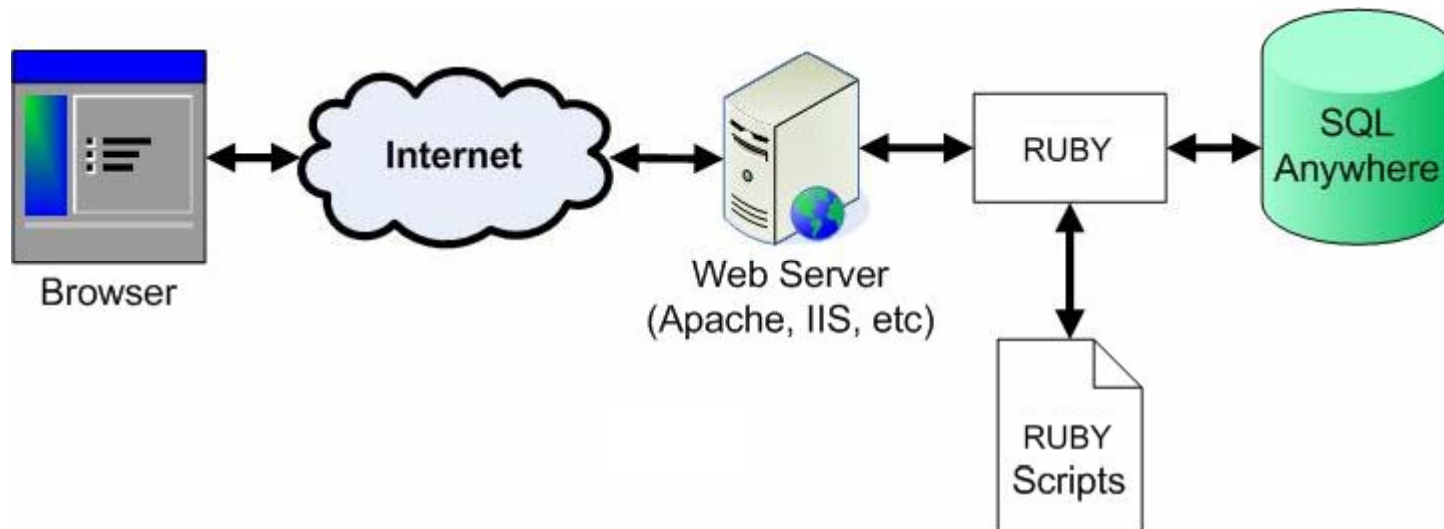
- Previous to version 11, all function calls had the format of `sqlanywhere_{function name}`
- For version 11, all function calls have format of `sql_{function name}`
 - Function calls have been changed to closely match the format of the `mysqli` PHP functions
 - Porting a PHP application from MySQL to SQL Anywhere can be mostly accomplished by changing all instances of “`mysqli_`” to “`sql_`”
- Old API still works in version 11, but is deprecated

Getting the PHP Driver

- Need to install a SQL Anywhere modules
 - Modules are DLLs (Windows) and Shared Objects ('nix)
 - Source code also available to build directly into PHP
- Precompiled PHP binaries available in `/Bin32`
- Newest version available from the *SQL Anywhere PHP Module* page
- Working to integrate into the PECL (PHP Extension Community Library) package manager

New Ruby Support

- New support for Ruby
- Ruby must be installed locally on the server machine
- Ruby connectivity is made through Ruby libraries that are available through the Ruby package manager (rubygem)

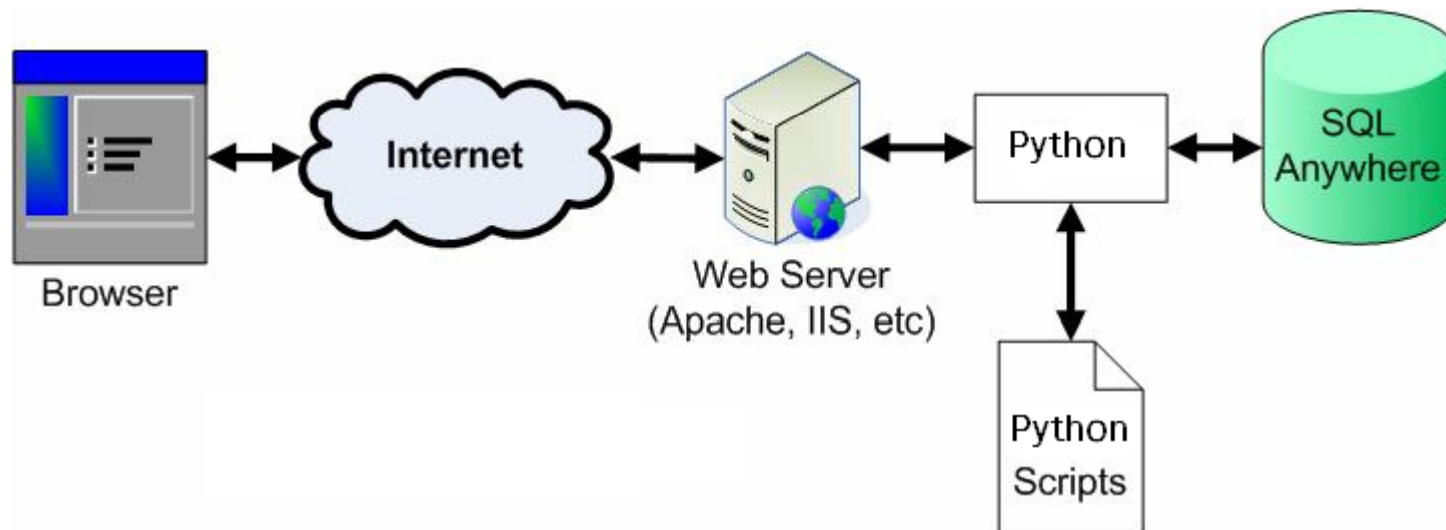


Ruby Modules

- There are two separate Ruby APIs for SQL Anywhere
 - `dbd-sqlanywhere`
 - SQL Anywhere driver for the for the popular Ruby/DBI module (based off of Perl DBI)
 - `activerecord-sqlanywhere-adapter`
 - Adapter for the ActiveRecord Object Relational Mapper
 - ActiveRecord is the ORM used by Ruby on Rails
- All are available though the RubyGem package manager
 - `gem install dbd-sqlanywhere`
 - `gem install activerecord-sqlanywhere-adapter`

New Python Support

- New support for Python
- Python must be installed locally on the server machine
- Python connectivity is made through Python libraries that are available as Python .eggs through `setuptools`



Python Modules

- SQL Anywhere Python Database API 2.0 driver
 - <http://code.google.com/p/sqlanydb/>
- SQL Anywhere Django Driver
 - <http://code.google.com/p/sqlany-django>
- Both modules are available using the `setuptools` package manager

Other Server-Side Scripting Environments

- Continued support and updates for
 - ASP.NET
 - New support for ADO.NET 3.5 and Entity Framework (LINQ)
 - New support for ASP.NET Membership and Role Providers
 - New support for ASP.NET 2.0 Providers
 - Nhibernate Dialect
 - JavaServer Pages and Servlets
 - iAnywhere JDBC
 - » Enhanced performance scalability
 - Hibernate Dialect
 - Perl
 - Rewrite of Perl DBI driver

Rich Internet Technologies

- SQL Anywhere can work with almost all RIA technologies
 - Including
 - Ajax
 - Adobe Flash/Flex/AIR
 - Microsoft SilverLight
 - JavaFX
 - Supports many data interchange formats
 - XML
 - HTML
 - Raw Binary
 - JSON (*new*)

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Built-In HTTP Server

- Introduced in version 9
- Integrated into the database engine
- Started using the `-xs` option
- Web services are created using `CREATE SERVICE` command
- Allows the database to produce web services
- Support return protocols:
 - HTTP
 - DISH
 - SOAP
- Support return formats:
 - XML
 - HTML
 - JSON (*new*)

What is JSON?

- JavaScript Object Notation
- Light-weight data interchange format
- Similar to XML, but less verbose (and less functional)

```
CREATE SERVICE "json_test"  
AUTHORIZATION OFF  
USER DBA  
TYPE 'JSON'  
AS  
SELECT TOP 2  
    Surname, GivenName, DepartmentID  
FROM  
    Employees
```

Web Service Definition

```
[  
  {  
    "Surname": "Whitney",  
    "GivenName": "Fran",  
    "DepartmentID": 100  
  },  
  {  
    "Surname": "Cobb",  
    "GivenName": "Matthew",  
    "DepartmentID": 100  
  }  
]
```

Resultant JSON string

Using JSON

- JSON strings are 'executable' in JavaScript
- Result Sets returned as array of key/value pairs
- No need to parse XML to exchange data
- JSON support available in almost all languages

```
var employeeList = eval("(" + json_text + ");  
alert (employeeList[1].Surname);
```

HTTP METHODs

- SQL Anywhere 11 supports (client and server requests):
 - GET
 - POST
 - PUT (*new*)
 - DELETE (*new*)
 - HEAD (*new*)
- METHODs accepted are set on a service-by-service basis

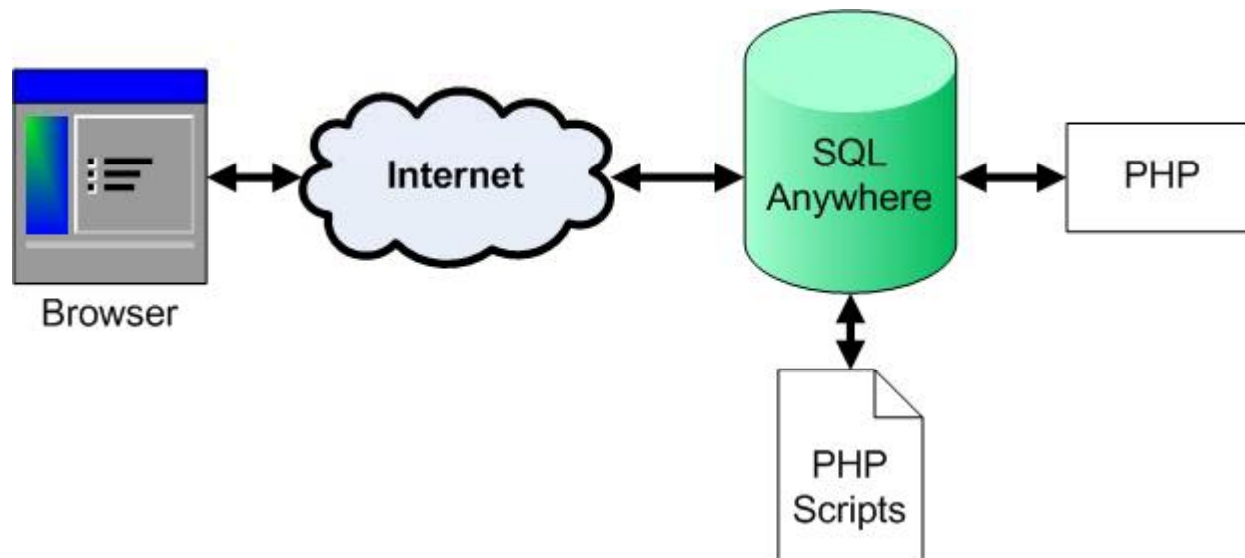
```
DECLARE method char(6);  
SET method = HTTP_HEADER('@HttpMethod');  
IF method = 'GET' THEN  
    ...  
ELSEIF method = 'POST' THEN  
    ...  
END IF;
```


HTTP Functions

- HTML_ENCODE
- HTML_DECODE
- HTTP_ENCODE
- HTTP_DECODE
- HTML_HEADER
- HTTP_BODY (*new*)
 - Returns the body of an HTTP in binary form without doing any character conversions
 - Useful for posting image data, compressed data, etc

PHP Page Processing

- SQL Anywhere 11 allows PHP as an External Stored Procedures
- HTTP Server can process PHP directly



Creating PHP External Stored Procedures

- Load PHP script into database using `INSTALL PHP`

```
INSTALL EXTERNAL OBJECT 'PHPScript'  
NEW FROM FILE 'php-file'  
ENVIRONMENT PHP;
```

- Create procedure to 'wrap' the PHP script

```
CREATE PROCEDURE SimplePHPDemo( params )  
EXTERNAL NAME '<file=PHPScript>  
    PHPFunction( $sa_php_arg0);'  
LANGUAGE PHP;
```

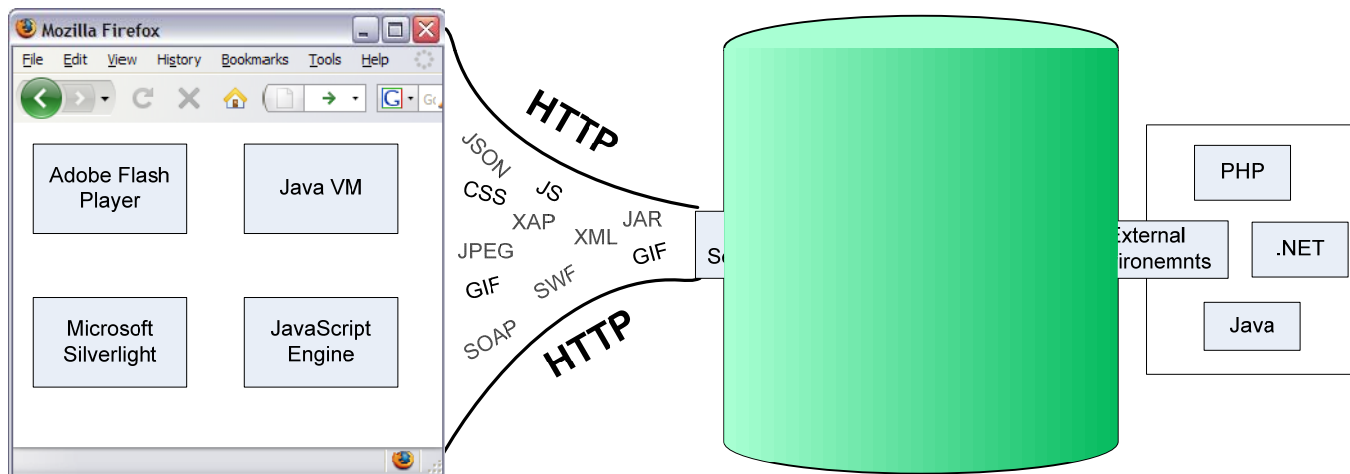
PHP Helper Functions

- Two stored procedures exist to run PHP from within SQL Anywhere:
 - **sa_http_php_page_interpreted(**
php_page, method, url, version,
headers, request_body)
 - **sa_http_php_page(***php_page***)**
- The *php_page* text is a regular long varchar. It can be:
 - read from disk
 - read from the database
 - etc.

Database-Hosted Web Applications

- SQL Anywhere can host RIA applications
 - Application executable can be stored in the database
 - Support files (JS, CSS, etc) can also be stored there
 - Built-in HTTP server can serve up the pages
 - HTTP Server can respond to web requests from the application
- Example
 - Offline Web
 - Can use MobiLink to synchronize both the application and the data
 - SQL Anywhere Monitor

Entire Web Applications in SQL Anywhere



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Using External Web Services

- SQL Anywhere can not only produce web services, it can also consume them
- Remote Web Service can be wrapped to appear as a regular SQL procedure

```
CREATE PROCEDURE test() URL  
'HTTPS://localhost/myservice' CERTIFICATE  
'file=C:\srv_cert.id;co=iAnywhere;  
unit=SA;name=JohnSmith';
```

- Sample use cases:
 - Hourly database event that retrieves current exchange rate for use with queries
 - Use Google Location APIs to determine distance between two addresses in the database

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SQL Anywhere Web Edition

- SQL Anywhere Web Edition is a free version of SQL Anywhere available for the development and deployment of web applications
- Supports Java, ASP.NET, PHP, and more
- May only be used for web browser applications
- No restrictions on database size, cache size, CPUs, optimization techniques, execution strategies, or SQL language support
- Intended to appeal to grass-roots web developers



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