

Accessing DB2 from PHP

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1. Introduction

In this tutorial we will show you how to build a PHP application to access DB2 via the SOA Gateway.

2. Prerequisites

It is assumed that you are running the 3 components, DB2, PHP and the SOA Gateway on Windows.

It is assumed you already have a SOA Gateway server and Control Centre installed. See [here](#) for more info about installing the SOA Gateway.

3. Setup

3.1.PHP

Download the latest Windows binaries for PHP v5.x from the PHP downloads page, install it according to the install.txt document in the PHP distribution library.

Enable the PHP SOAP Extension. The soap extension is shipped as part of PHP 5, but needs to be enabled explicitly.

- If you downloaded the PHP source code and compiled it for your platform, you will probably need to rebuild, because ext/soap is not enabled by default. Repeat your previous build process, adding the `--enable-soap` option to the configure command.
- If you downloaded pre-compiled platform binaries, they have ext/soap compiled in, but not loaded, so you will need to update your PHP configuration to do so. Edit your php.ini (you might have to rename or copy it from php.ini-recommended), and look for the Dynamic Extensions section. Here you will need to add a line that causes the extension to be loaded automatically:

```
extension=php_soap.dll
```

If you have not previously loaded any optional extensions, you may also have to set the `extension_dir` directive to point to the directory containing the extension libraries, including `php_soap`, for example:

```
extension_dir="C:/php/ext/" (use forward slashes even on Windows)
```

Do not try to put directory information in the extension directive; use `extension_dir` if necessary.

3.2.Apache

You will also require a version of Apache installed and it is here that the PHP script is stored. See [Apache Downloads Site](#) for the binaries and documentation explaining how to install Apache for Windows.

Apache configuration

To enable Apache and PHP to interact you need to add your PHP script in a location known to Apache (see 2.1 for more on PHP scripting).

Go to the conf directory of Apache (e.g. C:\Program Files\Apache Group\Apache2\conf). Open file httpd.conf and find the entry for DocumentRoot:

e.g.

```
#  
# DocumentRoot: The directory out of which you will serve your  
# documents. By default, all requests are taken from this directory, but  
# symbolic links and aliases may be used to point to other locations.  
#  
DocumentRoot "C:/Program Files/Apache Group/Apache2/htdocs"
```

In this case C:/Program Files/Apache Group/Apache2/htdocs is where any PHP scripts must be placed.

3.3.DB2

You will also need a DB2 database. IBM provides a downloadable edition of DB2, called “DB2 Express-C”. See [this link](#) for the DB2 Express-C homepage. Download and install a version of DB2 Express.

Populate DB2 Database

Now that you’ve got DB2 installed, we need to populate it with some demo data. For this we’ll use the Risaris Bank Demo, which is available [here](#). Save this file to “c:\Temp\RisarisBank_db2.sql”.

- Open the DB2 Control Centre under “IBM DB2”, “General Admin Tools” in the Start Menu.
- Right click “All databases” and select “Create Database”, “Standard”.
- Name your new database “RISBANK”. All other options can be left as default, so click “Finish”.
- Open a DB2 command shell by typing “db2cmd” in a DOS box.
- From the db2 command shell, change directory to where you downloaded the RisarisBank_db2.sql. E.g “cd \temp”.
- Populate the RISBANK database by running the command “db2 -f RisarisBank_db2.sql”. Note you may see errors about “SYSTEM.CUSTOMERINFORMATION is an undefined name”. These occur because the RisarisBank_db2.sql attempts to drop any existing tables before creating new ones. To prove this, you can run the same command again, and the errors will disappear.
- You can now return to the DB2 Control Centre and view the newly created tables in the RISBANK database.

Set up ODBC Access

The final thing to do with your DB2 Database is to set up an ODBC DSN which will be used by the SOA Gateway to access this database.

Click Start, Control Panel, Administrative Tools, Data Sources (ODBC)

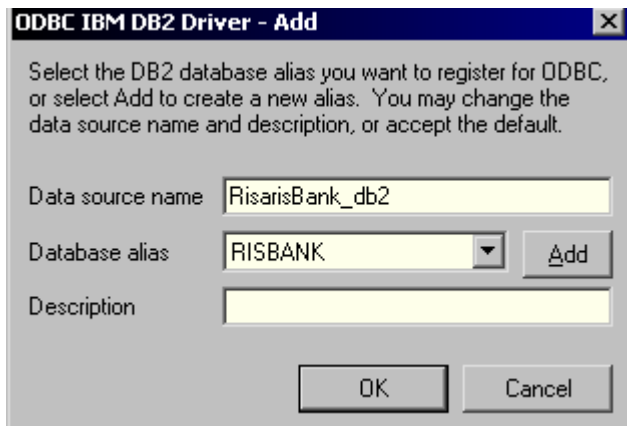
From the resulting screen, choose the “System DSN” Tab.

Click Add

From the list of data source drivers, select "IBM DB2 ODBC DRIVER", and click "Finish".

Enter "RisarisBank_db2" as the Data source Name.

Ensure that the Database Alias is RISBANK, and click "OK".



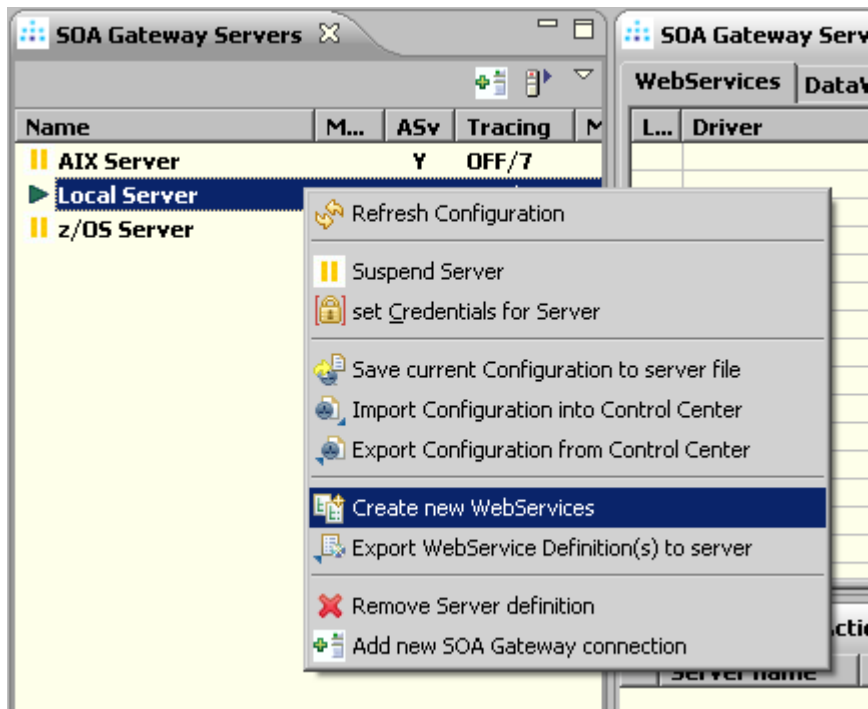
1. Discovery

At this stage you've got PHP installed, and a DB2 database with some sample data in it. In this section we'll show you how to create web services from each of the DB2 tables. These web services can be used by the PHP language (and many others) to give you direct real-time access to your DB2 Data.

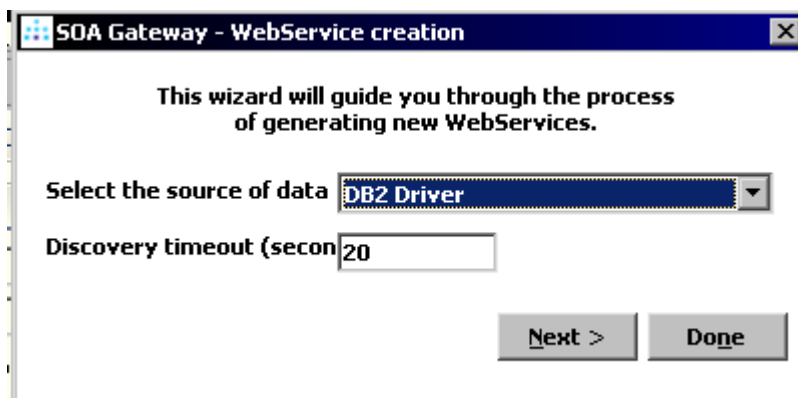
1.1. Web Service Creation using SOA Gateway

Start your SOA Gateway Control Centre. See [here](#) for an introduction to the Control Centre.

In your servers view, right click the entry which represents your local SOA Gateway Server. Select "Create New Web Services".

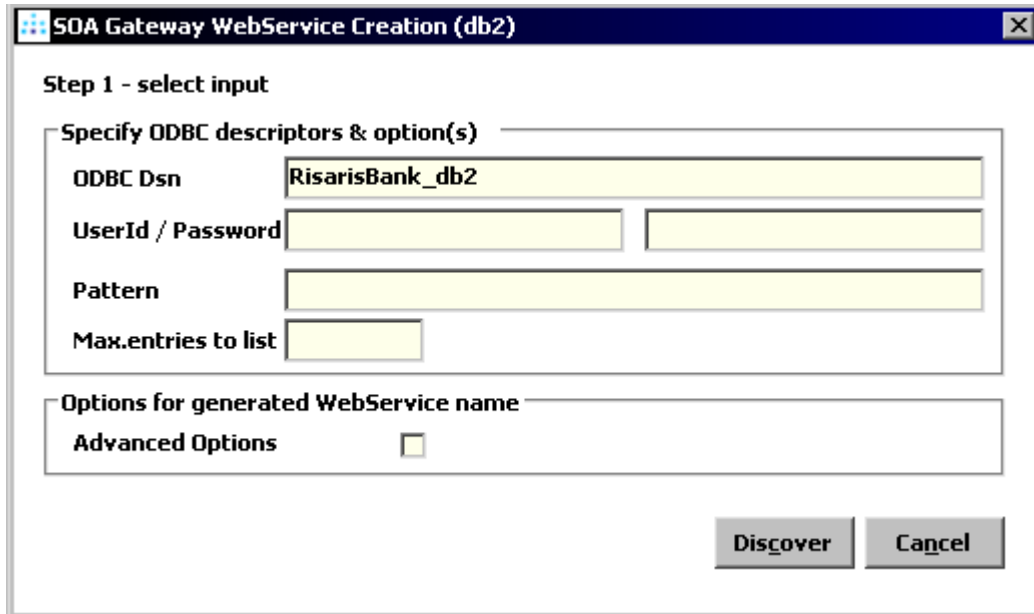


From the next dialog, choose “DB2 Driver”. If you do not see have a DB2 Driver in the list, see how to create one [here](#).



Click Next.

The next screen gives you the ability to add information about your DSN



Enter the above information and click Discover.

The wizard will display all the tables it finds at this (RisarisBank) DSN.

Look for the tables that are part of the "SYSTEM" schema, and select each of these by checking the box. These are the 8 tables we created during the populate step. Once they are all selected, click "Import"

The wizard will create web services from each one of these tables.

Name	M...	ASy	Mod	Driver	WebService	DataSource Id	DataView
AIX Server		Y		DB2	ACCOUNTSMOVEMENTS_SY...	odbcDsn=RisariskBank_db2, schemaNam...	ACCOUNTSMOVEMENTS_SYSTEM
DMZ		Y		DB2	AUDIT_SYSTEM	odbcDsn=RisariskBank_db2, schemaNam...	AUDIT_SYSTEM
dublin dev		Y		DB2	BRANCH_SYSTEM	odbcDsn=RisariskBank_db2, schemaNam...	BRANCH_SYSTEM
jk server		Y		DB2	CURRENTACCOUNT_SYSTEM	odbcDsn=RisariskBank_db2, schemaNam...	CURRENTACCOUNT_SYSTEM
jk server linux		Y		DB2	CUSTOMERACCOUNTXREF_S...	odbcDsn=RisariskBank_db2, schemaNam...	CUSTOMERACCOUNTXREF_SYSTEM
jom server		Y		DB2	CUSTOMERINFORMATION_S...	odbcDsn=RisariskBank_db2, schemaNam...	CUSTOMERINFORMATION_SYSTEM
Local Server		Y		DB2	DEPOSITACCOUNT_SYSTEM	odbcDsn=RisariskBank_db2, schemaNam...	DEPOSITACCOUNT_SYSTEM
lxbre server		Y		DB2	TELLERTABLE_SYSTEM	odbcDsn=RisariskBank_db2, schemaNam...	TELLERTABLE_SYSTEM
PCRJW9		Y					
risaris.com server		Y					
vse		Y					
z/OS Server		Y					
z/vse		Y					

You've just created 8 Web Services from your 8 DB2 Tables!

1.2. Accessing the WSDL

Web Service Description Language (WSDL) is a standard, XML-based language that is used to describe a Web Service.

For each of the 8 web services you've created in the previous section, the SOA Gateway provides you with a WSDL to describe the Web Service. The WSDL itself is usually interpreted by a web service client, such as PHP, but it is useful to know where to find the WSDL for each of your Web Services.

As WSDL is XML-based, it will open in your browser of choice. To see the WSDL for one of your Risar Bank web services, do the following in your SOA Gateway Control Centre:

- Click on the web service you are interested in, for example the "branch" web service.
- The properties for this web service should appear in your [Properties View](#). If you do not see the Properties view, select Window -> Show View -> Other -> General -> Properties and click OK.
- In the properties view, there is a link to your WSDL. Click it to open the WSDL in a browser.

The image shows two screenshots from an SOA Gateway interface. The top screenshot is a table titled 'WebServices' with columns: Mod, Driver, WebService, and DataSource Id. The 'BRANCH_SYSTEM' row is highlighted in blue. The bottom screenshot is the 'WebService properties' dialog for 'BRANCH_SYSTEM', showing fields for Name, DataView, Driver, Read-only, WSDL URL, and WebService Identification and options.

Mod	Driver	WebService	DataSource Id
DB2.	DB2 Driver	ACCOUNTSMOVEMENTS_SY...	odbcDsn=RisarisBank_db2, schen
DB2.	DB2 Driver	AUDIT_SYSTEM	odbcDsn=RisarisBank_db2, schen
DB2.	DB2 Driver	BRANCH_SYSTEM	odbcDsn=RisarisBank_db2, schen
DB2.	DB2 Driver	CURRENTACCOUNT_SYSTEM	odbcDsn=RisarisBank_db2, schen
DB2.	DB2 Driver	CUSTOMERACCOUNTXREF_S...	odbcDsn=RisarisBank_db2, schen
DB2.	DB2 Driver	CUSTOMERINFORMATION_S...	odbcDsn=RisarisBank_db2, schen
DB2.	DB2 Driver	DEPOSITACCOUNT_SYSTEM	odbcDsn=RisarisBank_db2, schen
DB2.	DB2 Driver	TELLERTABLE_SYSTEM	odbcDsn=RisarisBank_db2, schen

WebService properties

Resource: **WebService**

Name: BRANCH_SYSTEM

DataView: BRANCH_SYSTEM

Driver: DB2 Driver

Read-only:

WSDL URL is: http://localhost:56000/BRANCH_SYSTEM?WSDL

WebService Identification and options

odbcDsn: RisarisBank_db2

schemaName: SYSTEM

tableName: BRANCH

You can view the WSDL for the other web services by clicking the link from their properties view.

This WSDL is the starting point for using Web Services, and can be used time and again by different web service clients.

2. Accessing Web Service with PHP

PHP: Hypertext Preprocessor is a popular server-side scripting language for creating dynamic Web content. PHP is available as source code or as pre-compiled binaries for major platforms, including most Linux™ distributions, Windows®, Mac OS X, iSeries™.

We will use a PHP script to access our new Risar Bank Web Services via the WSDL. Those familiar with PHP will probably want to change the script provided but it can be run with minimum changes described below.

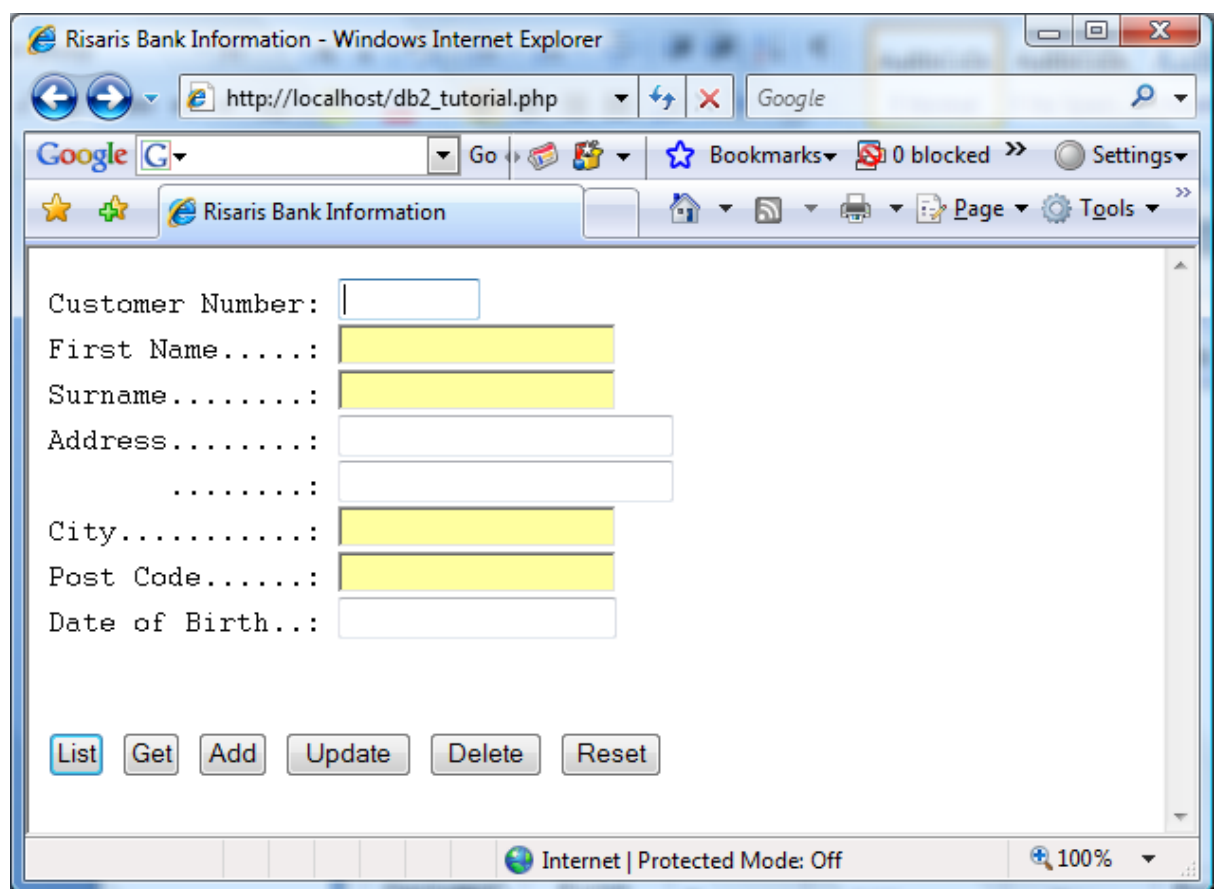
2.1. Initial Setup

PHP can be written using any editor such as Wordpad, Notepad, etc and saved with a .php extension. The resultant file must then be placed in the Apache documentation folder (e.g. C:\Program Files\Apache Group\Apache2\htdocs). Check your Apache httpd.conf file for the DocumentRoot entry:

```
#  
# DocumentRoot: The directory out of which you will serve your  
# documents. By default, all requests are taken from this directory, but  
# symbolic links and aliases may be used to point to other locations.  
#  
DocumentRoot "C:/Program Files/Apache Group/Apache2/htdocs"
```

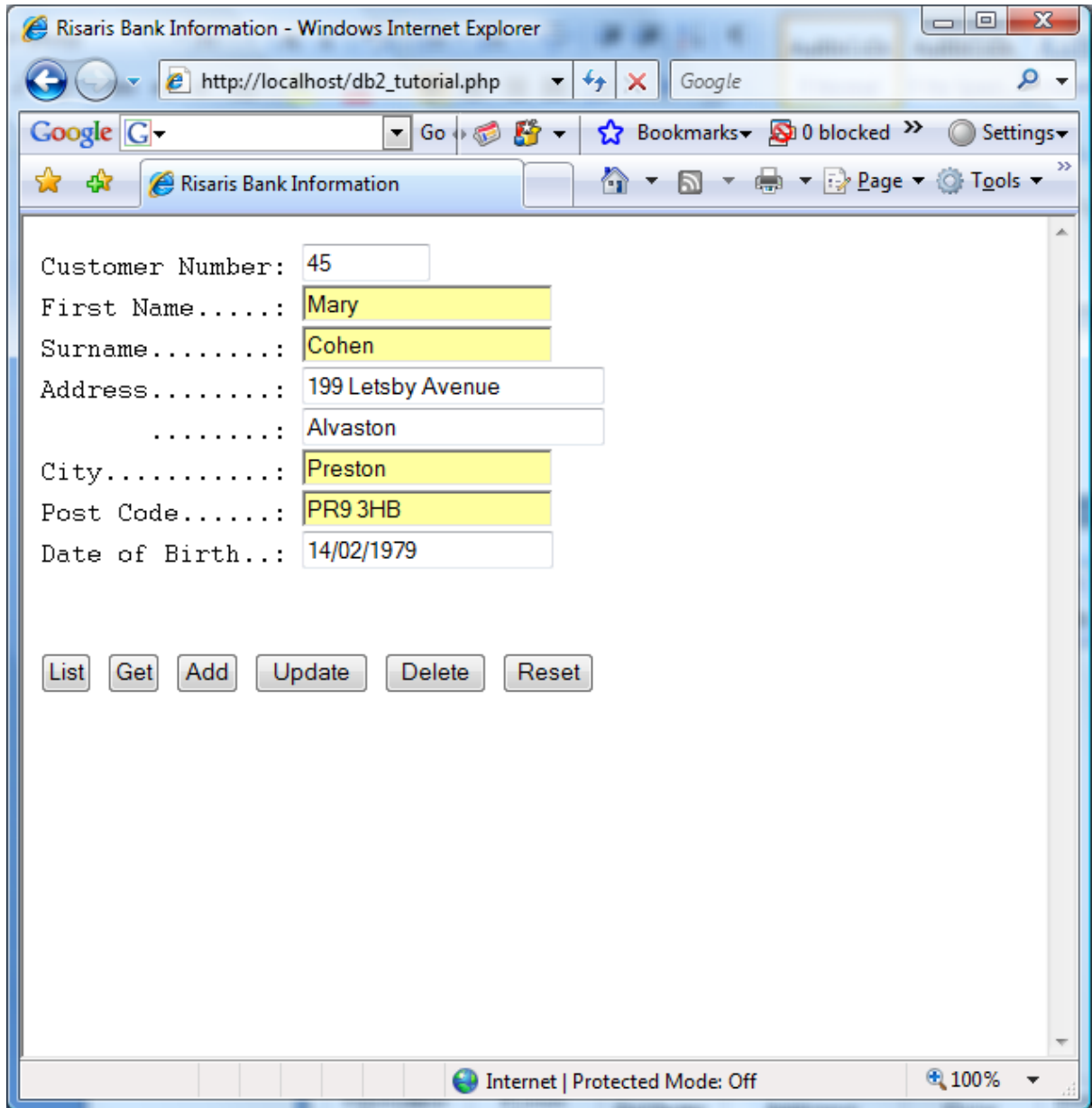
Appendix A shows the full script used in this tutorial. Copy the full contents of this into a file called db2_tutorial.php.

The script can then be invoked via a browser such as MS Internet Explorer which is used in this tutorial. Note the URL of http://localhost/db2_tutorial.php

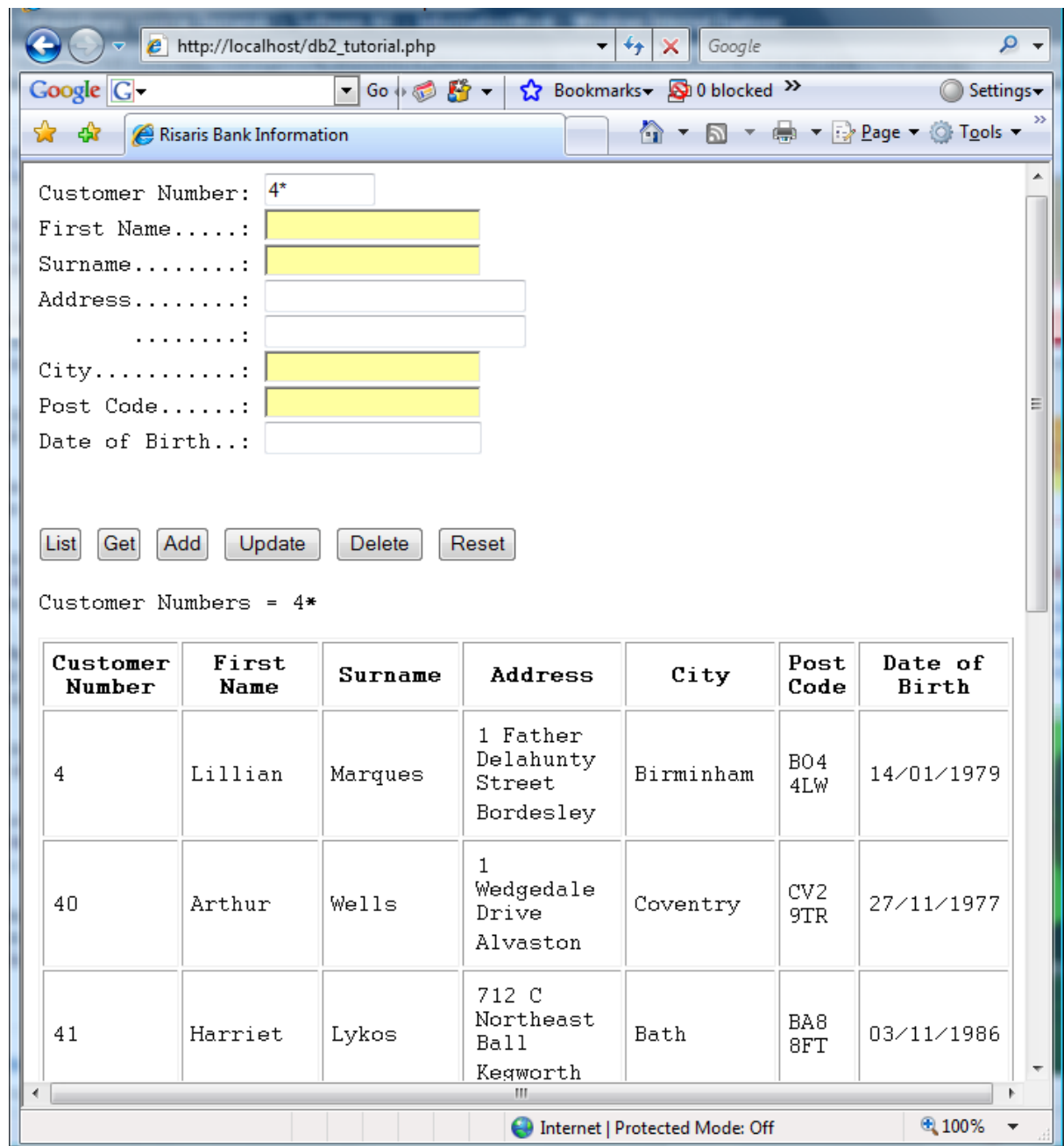


5.3 Query the database

Each of the buttons, apart from Reset, issues a database query via the SOA Gateway. In the example below 45 was entered as the Customer Number and Get selected. Note that Get, Add, Update and Delete require the Customer Number as the key.



The List request on the other hand can accept wildcard entries for Customer Number e.g. 4* which will return all customers with numbers beginning with 4. As there can be several relevant entries the results are displayed beneath the buttons as shown below.



3. Conclusion

This tutorial shows how to access DB2 from PHP using the SOA Gateway. As you can see, you have built a powerful application that uses Web Services to retrieve information in real-time.

4. Appendix

Copy the all the code below into a file and name it `db2_tutorial.php`. See 2.1 for next steps.

[Code available here](#)