Configure Oracle 10g server to work with the Multimedia with through the web interface

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Abstract: Article briefly discusses the general principle of web pages and describes how do they work in Oracle. It described server configuration, descriptors and tables that are necessary for the proper operation of portal using Oracle as the database of both text and multimedia data.

Key words: InterMedia, Oracle

1 Introduction

The plan is as follows:

- Comparison of the rules of standard web sites construction using Oracle.
- Installation and configuration of Oracle server.
- Installing and configuring a web server.
- Adapting base to work with forms.

2 How the web site works

Most sites on the Internet has the following scheme of action (see Figure 2.1):

1. text data (names of menus, descriptions, comments, etc.) are usually stored in the database. When you visit it, page scripts (mostly PHP) collect the necessary information from the tables and dynamically generate the content of the HTML code and send it to your browser. Of course, what you see does not consist only of text, it includes many media, ie graphics, music, video, flash presentations, etc.
2. Multimedia data is usually stored physically on the hard disk (usually in the same directory as the entire website). The source code of the HTML tags are:
   `<img src="img/banner.jpg">,`

where is given relative or absolute path to the file to be displayed in your browser.

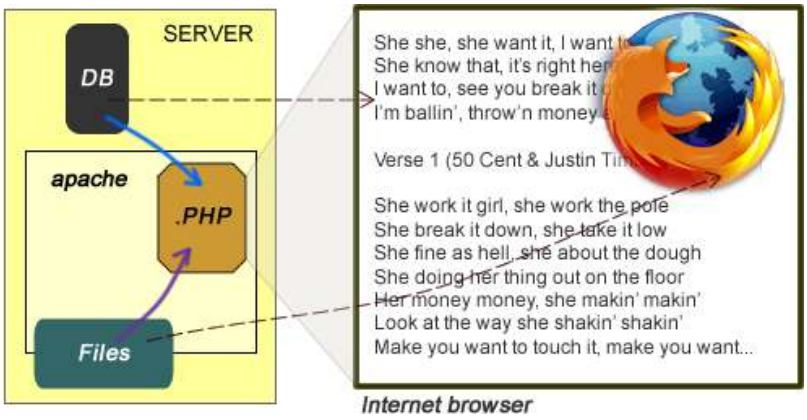

Figure 2.1 Simplified diagram of typical web page (Apache, PHP, MySQL)

In this article, however, we will look on another model. It will use only the database. Both text and multimedia will be stored in properly designed for this purpose tables. We will use for this Oracle databases. So powerful DBMS[1] certainly will not be use for people who care about the ordinary, simple www pages. It will be implement by companies that have huge portals based on a database with millions of records, which must be managed efficiently and quickly. However, the effectiveness of DBMS and discussed the disadvantages / advantages of the aforementioned model and the model, which will be presented in a moment, will not be the subject of discussion.

As already mentioned, the only source of data will be DB. Despite the construction based on Oracle's diagram model of the system is even simpler than the previous one (Figure 2.2).

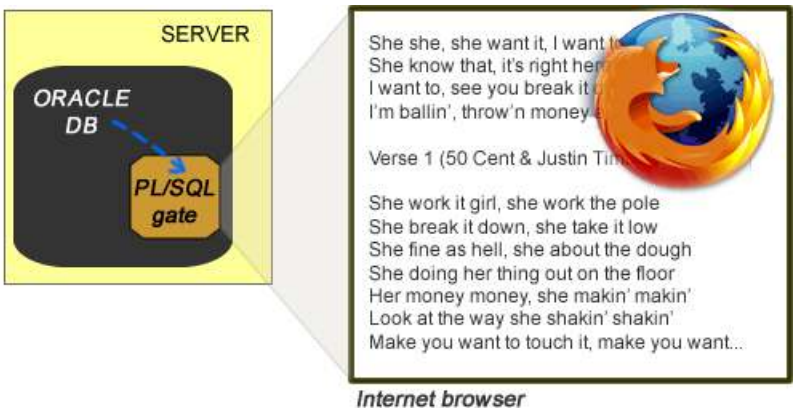

Figure 2.2 Simplified diagram of the system based on Oracle DBMS

As you can see, the schema is practically reduced to a minimum. We do not have PHP scripts or any other equivalent of files. External files have also

[1] DBMS – Data Base Management System

disappeard. Probably the strangest thing is - no apache server. This is not a mistake - Oracle capabilities allow you to create and manage Web pages within the database. We do not need any other external tools. How is this possible? We'll learn about later in this work.

3 Installing DB server

To make service based on Oracle's works properly, it needs the following components:

- Oracle Database 10g release 2 (10.2),
- Oracle InterMedia - Oracle 10g uses interMedia module to support multimedia data, which is compatible with standard SQL/MM[2]. SQL/MM (MM from MultiMedia), also known under the name of the SQL Multimedia and Application Packages. It extends SQL99 standard for supporting new and specific data types for storing dedicated media.

Installation of Oracle runs in a standard manner using the Universal Installer. Immediately upon installation of the environment we create a database of general use (by selecting the type of database will automatically install the sample schemas to us). Oracle InterMedia in this version of Oracle (10.2) is installed by default and no additional download module from the manufacturer.

During the installation process, we choose only the bare minimum - a number of options will be excluded that the system worked on as little disk space (all unmentioned options/parameters are default):

- run setup.exe and wait until the program will check the system requirements (eg do we have a minimum of 512 MB of RAM)
- select 'advanced installation' and 'Custom' type.
- provide an instance name eg OraBD10g_1 and the path for example: 'C:\oracle\10.2.0\db'

For make working with Oracle easier, we can select the following components:

- Oracle Call Interface (OCI) - enables communication such as PHP--Oracle. (provides APIs for other application)
- ISQL * Plus - Oracle web console. (provides an interface for sqlplus queries against a database acorss the internet)

If you want to save some disk space, you can uncheck the following items:

- Enterprise Edition Options
- Oracle Programmer
- Oracle XML Developement Kit
- Oracle Windows Interfaces

Sometimes Oracle throws the following message:

'Checking service pack requirements ... Check complete. The overall result of this check is: Not executed <<<<' –

[2] SQL/MM – Structured Query Language for MultiMedia

If you have SP2[3] you can safely ignore this problem and move on.

Choose 'Create database', after viewing the summary click 'Install'.

During the installation process you can receive a message that Windows Firewall asking if we unlock some application. If you use the Oracle server will be reduced to working only on the localhost, then we can leave programs and ports blocked for safety, if we are going to use the server on the LAN or the Internet - should unlocked it.

After installation, you are 'Oracle Net Configuration Assistant', please give name, protocol (TCP is sufficient) and port (default 1521) for the listener, where he will listen. One listener is enough for us so to question 'Would you like to configure another listener? " answer - no.

Next step is a 'Database Configuration Assistant'. Choose 'Custom Database', type 'Global Database Name' eg: ORA and set your password. We can change the default value for the 'Flash Recovery Area' from 2048MB to for example 216MB (the default minimum is 43% of RAM) - for our purposes it is sufficient to completely.

When selecting 'Database Components' don't need to configure 'Oracle Data Mining' and 'Oracle Spatial' – uncheck them.

After a successful installation you can manage the database through different website panels:

http://localhost:1158/em - enterprise manager,

http://localhost:5560/isqlplus - ISQL * Plus,

http://localhost:5560/isqlplus/dba - ISQL * Plus DBA

If the installation failed or there is a need to uninstall the system, first you must stop all Oracle services.

At this point we have successfully installed and configured Oracle 10g.

4 WWW server

Apache is the most widely used HTTP server on the Internet. In May 2006, its share among servers for nearly 65%. In conjunction with the PHP scripting language interpreter and a MySQL database, Apache is one of the most common environments in companies that offer a place to network servers. In older versions of Oracle's default install just the server. Since version 10g assumed his role with the Oracle HTTP Server takes PL/SQL[4] gateway (mod_plsql). This is an Apache module that allows you to dynamically generate web pages from the PL/SQL package and stored procedures. It is an ideal solution for fast and flexible creation of web applications. So we do not need to install any additional programming and configuration will affect only the descriptors of access - as in the next section.

[3] SP2 - Windows XP Service Pack 2

[4] PL/SQL - procedural language extension to structured query language

5 Access descriptors

Each query sent from the web browser to the PL/SQL gateway has included descriptor, which has assigned configuration parameters used when connecting to the database. The user who creates a access descriptor must be granted to roles:

1.CONNECT
2.RESOURCE
3.XDBADMIN
and have the right to execute SYS.DBMS_EPG package.

According to the documentation, Oracle should be the default listen on port 8080 - but it does not. So we must make it and modify the listener.ora file (C:\oracle\10.2.0\db\NETWORK\ADMIN). To the DESCRIPTION_LIST add the following entry:

```
(DESCRIPTION=
   ( ADDRESS = (PROTOCOL = tcp)(HOST = localhost)(PORT =
8080) )
   (Presentation=HTTP)(Session=RAW) )
```

Built-in PL/SQL gate is implemented by DBMS_EPG package, which allows the browser to calling PL/SQL stores procedures via HTTP Listener. The above code tells the Listener listen on port 8080 and intercept http requests. Remember to restart the Listener after above modification. Then use your ORDSYS (after granting the appropriate permissions), create a Database Access Descriptor:

```
BEGIN
   --deletes a descriptor, if necessary
   --DBMS_EPG.DROP_DAD('DZ_DAD');

   -- create descriptor: we give the name and alias
   -- The only mandatory instruction
   -- when you want to create any DAD
   DBMS_EPG.CREATE_DAD('DZ_DAD', '/dz/*');

   -- Authorization make possible to execute commands
   - with the rights of selected user
   DBMS_EPG.AUTHORIZE_DAD('DZ_DAD', 'ORDSYS');

   -- set the authentication type of users
   -- when setting the attributes, the first argument
   -- is always the name of the descriptor,
   -- then we give the attribute name and value
   DBMS_EPG.SET_DAD_ATTRIBUTE('DZ_DAD', 'authentication-
mode', 'Basic');

   --set the home page (example)
```

```
   DBMS_EPG.SET_DAD_ATTRIBUTE('DZ_DAD', 'default-page',
'img.home');
END;
/
```

Creating a DAD[5] we type the name of the object that will be used for further modification of descriptor parameters. The path is not a reference to the directories that are physically on the disk, but in the online alias, which we will use when referring to individual packages or PL/SQL procedures. Building web address for our descriptor is as follows:

http://localhost:8080/dz/

When you type it into your browser, you will be asked to authenticate and then redirected to the preset default page. If the default page is not specified, or want to see another add the name of the procedure to be followed by any schema name and a package in which it resides, eg:

http://localhost:8080/dz/SYS.package.procedure

Configuration is done. Best at this time is to restart the entire system, create a test page for example:

```
CREATE OR REPLACE PROCEDURE demo
IS
BEGIN
    htp.htmlOpen;
    htp.bodyOpen;
    htp.header(1, htf.bold('DEMO'), 'center');
    htp.hr;
    htp.p('The Demo HTTP procedure');
    htp.bodyClose;
    htp.htmlclose;
END;
/
```

and run the command: http://localhost:8080/dz/demo. If Oracle is working properly and the whole configuration has been carried out successfully, we should see the page as in Figure 5.1.

5 DAD - Database Access Descriptor

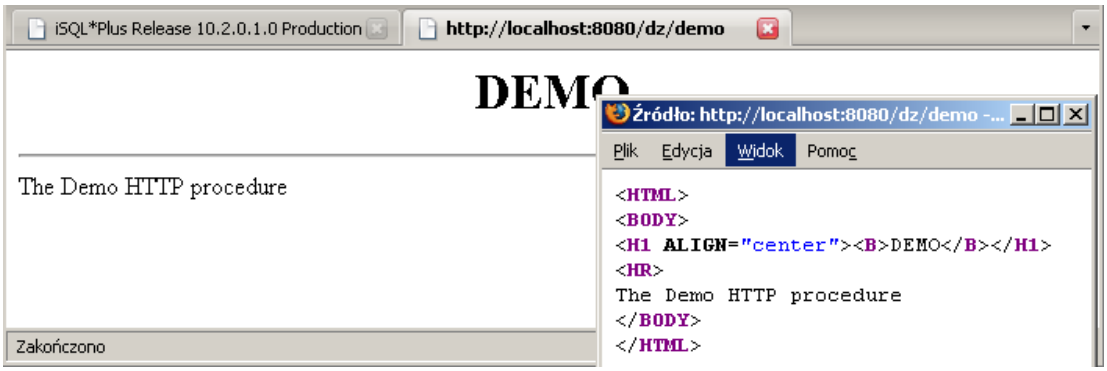

Figure 5.1 The result of demo procedure

The last thing needed to be prepared to properly support web page, is the definition of the necessary tables.

6 Table 'document-table'

All files that goal is the PL/SQL from web forms are stored in so-called 'document table'. This table is not in the database so our duty is to ensure - that was there. We must create a table for incoming (indicated by the user) documents (media files). This table is always the same structure - the only thing we can modify without fear of mistakes is the name. Specification of this table is:

```
CREATE TABLE media_upload_table (
    name  VARCHAR2(256) UNIQUE NOT NULL,
    mime_type   VARCHAR2(128),
    doc_size    NUMBER,
    dad_charset       VARCHAR2(128),
    last_updated DATE,
    content_type VARCHAR2(128),
    content     LONG RAW,
    blob_content BLOB
);
```

Each column means:

- name - the name of the file
- mime_type - MIME header sent to the browser, on the basis of the application decide how to handle the file,
- doc_size - file size
- last_updated - the last date of modification or creation of file
- content_type - information on the field is stored document, eg: 'BLOB',
- content, blob_content - boxes to store the file.

The last operation to be done to the whole system was 100% ready to work, is to link document table with access descriptor. To do this, use the following command:

```
BEGIN
  DBMS_EPG.SET_DAD_ATTRIBUTE('DZ_DAD',
            'document-table-name', 'media_upload_table');
END;
```

Now, when in our form we point at a file – it will be uploaded to the table media_upload_table. To be able to upload the mandatory is form include two elements:

5. box to indicate the file: <input type="file" name="moj_plik" />
6. and necessarily the attribute enctype: <form enctype="multipart/form-data" action="">.

The system is ready to work.

7 Summary

As might be noted - working with Oracle is not very complicated, if you know what elements are required and how to properly configure it.
The most important thing to remember when configuring a DB server and construction page:

1. setting a listener on the listener port
2. add enctype attributes of the corresponding values for the forms to transfer files.

References

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