Class Note 6 PHP Oracle Development (Updated 7/2/2015)

Oracle Connection

The "class note" is the typical material I would prepare for my face-to-face class. I am sharing the notes with everyone assuming you are in the class.

For the best result of your study, please make sure you do the following:

- 1. Read the chapter(s) in your textbook, corresponding to the week.
- 2. Read this class note. Please understand that I will only highlight the important points from your chapters in the textbook. I do not intend to repeat it.

Now, here comes the most exciting part of this course: how to use PHP to access your Oracle database so that you may present or manipulate the data on or through your web page? Before you are able to do this, the first step is, of course, you have to have an Oracle database up and running.

I. Version(s) of Oracle Database

a. Oracle Enterprise Edition (Oracle 9i, 10g, 11g or 12c): If you have taken my TEC 5333 Advanced Database Technology or TEC 5363 Database Security and Reliability, chances are you have already had Oracle Enterprise Edition (9i, 10g, 11g or 12c) installed in your computer. You may just use the Oracle database as it is installed. In other words, if you have Oracle installed in your computer already, you may just use it. No more sweat is necessary. If you are patient enough, I will show you the trick to connect to the database in the later part of this Class Notes.

b. If you have not installed Oracle database on your computer, you may select any of Oracle database versions (Oracle 9i, 10g, 11g or 12c). If you have an old computer like my old laptop (XP, 256MB RAM), Oracle 10g or 11g Express Edition will be ideal since it takes the least amount of resources to run it. It does not slow down your computer. In other words, any Oracle database will suffice for this class. If you have never done anything with Oracle before, I recommend Oracle 10g or 11g Express Edition (as in your textbook).

c. If you have never done the installation of Oracle database, the first question you would have is how do I can get the Oracle database. The answer is: you need to download it from Oracle's web site. EIU has a corporate license agreement with Oracle. Thus, you may be able to download a whole range of Oracle products. The one you need will be Oracle database (in any version of your choice) that is designed for your computer platform (Windows, Linux, Unix, or Mac). You may have to register with Oracle. That is just one hurdle you have to jump before you can download. There is no charge.

If you are lazy and do not even want to type "Oracle 10g Express Edition" on Google search, you may use the following link to find the Oracle Express Edition:

http://www.oracle.com/technology/software/products/database/xe/index.html

II. Installation of Oracle Database

The detailed installation guide for Oracle 9i, 10g or 11g Enterprise Edition can be available in the following course web sites for my previously mentioned classes.

http://www.eiu.edu/~pingliu/tec5323/Schedule/tec5323schedule.htm

or

http://www.eiu.edu/~pingliu/tec5363/Schedule/tec5363Schedule.htm

The following is my notes for my Oracle Express Edition installation, for your reference.

Notes for Oracle XE installation (on my old laptop):

Destination Folder: C:\oraclexe\

Port for 'Oracle Database Listener': 1521

Port for 'Oracle Services for Microsoft Transaction Server': 2030

Port for HTTP Listener: 8080

Please make sure to take note on you SYSTEM password.

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After installation, you may test to see of your Oracle XE works.

Run SQL Plus to Test Your Oracle 10g Express Edition

Start—All Programs—Oracle Database 10g Express Edition--Run SQL Command Line, as follows.



You will then see the following screen:



If you see the above screen shot, that means your Oracle Express Edition has been installed successfully.

III. Tricks and Trouble Shooting for Database Connection

You will need to do something to ensure you are able to connect to Oracle database using your PHP program. The following list those factors. If you are lucky enough, some of the issues have already been resolved automatically during installation. If you are not that lucky, you may follow those steps. It is going to be a good learning experience.

a. Oracle database has to be up and running. You cannot talk to a dead person.

The above example of running SQL Plus can be one of the ways to know if your database is running or not. If you are able to login your database using user: SYSTEM and password (as you entered during your installation), you will see something similar to the above screen shot.

Depending on your version and your operating system, the way of login your SQL Plus may be slightly different. The following shows you one example on how I login in SQL Plus in Oracle 11g (on my desk top).

| Console | |
|--|----------|
| Eile Edit View Help | |
| j D 🖻 🛍 🤋 | |
| 📴 Console - sqlplus system | 4 Þ 🗙 |
| Microsoft Windows XP [Version 5.1.2600] (C) Copyright 1985-2001 Microsoft Corp. | ^ |
| C:\PingLiu\pingliu\Download\console\Console-2.00b120-Beta\Console2>cd\ | |
| C:\>sqlplus system | |
| SQL*Flus: Release 11.1.0.6.0 - Production on Tue Jul 6 14:05:22 2010 | |
| Copyright (c) 1982, 2007, Oracle. All rights reserved. | |
| Enter password: | |
| Connected to: Cracle Database 11g Enterprise Edition Release 11.1.0.6.0 - Production With the Partitioning, CLAP, Data Mining and Real Application Testing options | |
| 2012 | |
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| Ready | .:: |

The general syntax is:

C:\sqlplus system/password;

If you forget your password for the SYSTEM schema/user, you may have to call me or someone else in the class. We will help you out as long as you promise to return the favor some day.

For Windows User: Another way to know if your Database is running or not is to use Control Panel and Services, as in the following example:

| Неір | | | | | |
|---------------------|--|---|---------|--------------|--------------|
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| Semilary (Level) | | | | | |
| · Services (Local) | | | | | |
| DracleServiceORACLE | Name / | Description | Status | Startup Type | Log On As |
| | MAPI CD-Burning COM Service | Manages CD recording using Image Ma | | Manual | Local Syst |
| Stop the service | Indexing Service | Indexes contents and properties of files | | Manual | Local Syst |
| Pause the service | iPod Service | iPod hardware management services | | Manual | Local Syst |
| Restart the service | IPSEC Services | Manages IP security policy and starts th | Started | Automatic | Local Syst |
| | 🆓 Java Quick Starter | Prefetches JRE files for faster startup o | Started | Automatic | Local Syst |
| | 🍓 LiveUpdate | LiveUpdate Core Engine | | Manual | Local Syst |
| | 🍓 Logical Disk Manager | Detects and monitors new hard disk dri | Started | Automatic | Local Syst |
| | Service Service Service | Configures hard disk drives and volume | | Manual | Local Syst |
| | LVCOMSer | Logitech Video COM Service | Started | Automatic | Local Syst |
| | Structure Contraction Contract | Launcher for Logitech Video Components. | | Automatic | Local Syst |
| | Macromedia Licensing Service | Provides authentication services for Ma | | Manual | Local Syst |
| | Messenger | Transmits net send and Alerter service | | Disabled | Local Syst |
| | Microsoft Office Diagnostics Service | Run portions of Microsoft Office Diagno | | Manual | Local Syst |
| | MS Software Shadow Copy Provider | Manages software-based volume shad | | Manual | Local Syst |
| | Net Logon | Supports pass-through authentication o | Started | Automatic | Local Syst |
| | menter i co Port Sharing Service | Provides ability to share I CP ports over | | UISADIEO | Local Serv |
| | NetMeeting Remote Desktop Sharing | Enables an authorized user to access t | | Manual | Local Syst |
| | Wetwork Access Protection Agent | Allows windows clients to participate in | | Manual | Local Syst |
| | Network Connections | Manages objects in the Network and Di | Started | Manual | Local Syst |
| | Network DDE Network DDE | Manages Duramis Data Suchages (DDS | | Disabled | Local Syst |
| | Network DDE DSDM (NLA) | Manages Dynamic Data Exchange (DDE | Charles | Disabled | Local Syst |
| | Network Excellion Awareness (NEA) | Manages VML configuration files on a d | Starteu | Manual | Local Syst |
| | A Neurotochnologija | Neurotechnologica activation convice | Charled | Automatic | Local Syst |
| | Sent LM Socurity Support Provider | Provides security to remote procedure | Starteu | Manual | Local Syst |
| | Son NTRU Hybrid TSS v1 05 TCSD | TCSD service for accessing TPM | Started | Automatic | Local Syst |
| | NV/IDIA Dieplay Driver Service | Provides system and deckton level supp | Started | Automatic | Local Syst |
| | Control Source Engine | Saves installation files used for undates | Started | Manual | Local Syst |
| | So OracleDBConsoleoracle | Saves instantion mes asea for apaatesin | | Manual | Local System |
| | Oracle Job Scheduler ORACLE | | | Disabled | Local Syst |
| | CracleOraDb11g_home1TNSListener | | Started | Automatic | Local System |
| | OracleServiceORACLE | | Started | Automatic | Local Syst |
| | Performance Logs and Alerts | Collects performance data from local o | | Manual | Network S |
| | Plug and Play | Enables a computer to recognize and a | Started | Automatic | Local Syst |
| | Portable Media Serial Number Service | Retrieves the serial number of any port | | Manual | Local Syst |
| | 🍓 Print Spooler | Loads files to memory for later printing. | Started | Automatic | Local Syst |
| | PrismXL | | Started | Automatic | Local Syst |
| | Process Monitor | Injector service | Started | Automatic | Local Syst |
| | Protected Storage | Provides protected storage for sensitive | Started | Automatic | Local Syst |
| | QoS RSVP | Provides network signaling and local tr | | Manual | Local Syst |
| | Remote Access Auto Connection Manager | Creates a connection to a remote netw | | Manual | Local Syst |
| | Remote Access Connection Manager | Creates a network connection. | Started | Manual | Local Syst |
| | Remote Desktop Help Session Manager | Manages and controls Remote Assistan | | Manual | Local Syst |
| | Remote Procedure Call (RPC) | Provides the endpoint mapper and othe | Started | Automatic | Network S |
| | Remote Procedure Call (RPC) Locator | Manages the RPC name service databa | | Manual | Network S |
| | Nemote Registry | Enables remote users to modify registr | Started | Automatic | Local Serv |
| | Removable Storage | | | Manual | Local Syst |
| | Routing and Remote Access | Offers routing services to businesses in | | Disabled | Local Syst |
| | Secondary Logon | Enables starting processes under altern | Started | Automatic | Local Syst |
| | Security Accounts Manager | Stores security information for local us | Started | Automatic | Local Syst |
| | Security Center | Monitors system security settings and c | | Automatic | Local Syst |
| | Neg Server | Supports file, print, and named-pipe sh | started | Automatic | Local Syst |
| | Shell Hardware Detection | Provides notifications for AutoPlay hard | Started | Automatic | Local Syst |
| | Smart Card | Manages access to smart cards read b | | Manual | Local Serv |
| | SQL Server (SQLEXPRESS) | Provides storage, processing and contr | | Manual | Network S |
| | The Little Longer Active Disasters Helper | Enables integration with Active Director | | Dicaplod | Nobwork S |

If you see "OacleServiceORACLE" is "started," you are ready to go. Of course, depending on how you named your database during installation, your service name may be different. (I named my database instance as "ORACLE" during installation, as you can see from the above example.)

When any students approached me in the past, saying "I cannot connect to Oracle database." or "I have error from my database." The first question I ask is always "are you sure your database is up and running?"

b. Your TNS Listener (from Oracle) has to on: You cannot talk to a deaf.

The fist way to know if the Oracle TNS Listener has been started is to go to Control Panel and Services (for Windows).

| es _ | | | | | | | |
|---------|---------------------------------|--|--|-----------|--------------|--------------|--|
| View | Help | | | | | | |
| 1 m 1 m | | | | | | | |
| | | | | | | | |
| (Local) | Services (Local) | | | | | | |
| | | | | | | | |
| | OracleOraDb11g home1TNSListener | Name 🕖 | Description | Status | Startup Type | Log On As | |
| | 3- | MAPI CD-Burning COM Service | Manages CD recording using Image Ma | | Manual | Local Syst | |
| | Stop the service | Service | Indexes contents and properties of files | | Manual | Local Syst | |
| | Restart the service | BiPod Service | iPod hardware management services | | Manual | Local Syst | |
| | | PSEC Services | Manages IP security policy and starts th | Started | Automatic | Local Syst | |
| | | Java Quick Starter | Prefetches JRE files for faster startup o | Started | Automatic | Local Syst | |
| | | Ne LiveUpdate | LiveUpdate Core Engine Detects and meniters new hand diek dri | Charles | Manual | Local Syst | |
| | | Second Disk Manager Administrative Service | Configures hard dick drives and volume | Starteu | Manual | Local Syst | |
| | | Service | Logitech Video COM Service | Started | Automatic | Local Syst | |
| | | Sel VSrvi auncher | Launcher for Logitech Video Components. | Started | Automatic | Local Syst | |
| | | Macromedia Licensing Service | Provides authentication services for Ma | | Manual | Local Syst | |
| | | Messenger | Transmits net send and Alerter service | | Disabled | Local Syst | |
| | | Microsoft Office Diagnostics Service | Run portions of Microsoft Office Diagno | | Manual | Local Syst | |
| | | MS Software Shadow Copy Provider | Manages software-based volume shad | | Manual | Local Syst | |
| | | Net Logon | Supports pass-through authentication o | Started | Automatic | Local Syst | |
| | | Net.Tcp Port Sharing Service | Provides ability to share TCP ports over | | Disabled | Local Serv | |
| | | NetMeeting Remote Desktop Sharing | Enables an authorized user to access t | | Manual | Local Syst | |
| | | Network Access Protection Agent | Allows windows clients to participate in | Charles | Manual | Local Syst | |
| | | Panetwork DDE | Manages objects in the Network and Di | Starteu | Displied | Local Syst | |
| | | Network DDE DSDM | Manages Dynamic Data Eychange (DDE | | Disabled | Local Syst | |
| | | Network Location Awareness (NLA) | Collects and stores network configuration | Started | Manual | Local System | |
| | | Network Provisioning Service | Manages XML configuration files on a d | Started | Manual | Local System | |
| | | Neurotechnologija | Neurotechnologija activation service. | Started | Automatic | Local Syst | |
| | | NT LM Security Support Provider | Provides security to remote procedure | | Manual | Local Syst | |
| | | NTRU Hybrid TSS v1.05 TCSD | TCSD service for accessing TPM | Started | Automatic | Local Syst | |
| | | NVIDIA Display Driver Service | Provides system and desktop level supp | Started | Automatic | Local Syst | |
| | | Source Engine | Saves installation files used for updates | | Manual | Local Syst | |
| | | Solution Consoleoracle | | | Manual | Local Syst | |
| | | OracleJobSchedulerORACLE | | Charles | Disabled | Local Syst | |
| | | Second Consistence | | Started | Automatic | Local Syst | |
| | | Performance Logs and Alerts | Collects performance data from local o | Starteu | Manual | Network S | |
| | | Plug and Play | Enables a computer to recognize and a | Started | Automatic | Local Syst | |
| | | Portable Media Serial Number Service | Retrieves the serial number of any nort | Startes | Manual | Local System | |
| | | Print Spooler | Loads files to memory for later printing. | Started | Automatic | Local Syst | |
| | | PrismXL | , , , , | Started | Automatic | Local Syst | |
| | | Referencess Monitor | Injector service | Started | Automatic | Local Syst | |
| | | Protected Storage | Provides protected storage for sensitive | Started | Automatic | Local Syst | |
| | | QoS RSVP | Provides network signaling and local tr | | Manual | Local Syst | |
| | | Remote Access Auto Connection Manager | Creates a connection to a remote netw | | Manual | Local Syst | |
| | | Remote Access Connection Manager | Creates a network connection. | Started | Manual | Local Syst | |
| | | Remote Desktop Help Session Manager | Manages and controls Remote Assistan | Charles 4 | Manual | Local Syst | |
| | | Pamote Procedure Call (RPC) Locator | Manages the PPC name copies databa | Starteu | Manual | Network S | |
| | | Remote Registry | Enables remote users to modify registr | Started | Automatic | Local Serv | |
| | | Removable Storage | | | Manual | Local Syst | |
| | | Routing and Remote Access | Offers routing services to businesses in | | Disabled | Local Syst | |
| | | Secondary Logon | Enables starting processes under altern | Started | Automatic | Local Syst | |
| | | Security Accounts Manager | Stores security information for local us | Started | Automatic | Local Syst | |
| | | Security Center | Monitors system security settings and c | | Automatic | Local Syst | |
| | | Server | Supports file, print, and named-pipe sh | Started | Automatic | Local Syst | |
| | | Shell Hardware Detection | Provides notifications for AutoPlay hard | Started | Automatic | Local Syst | |
| | | Smart Card | Manages access to smart cards read b | | Manual | Local Serv | |
| | | SQL Server (SQLEXPRESS) | Provides storage, processing and contr | | Manual | Network S | |
| | | SQL Server Active Directory Helper | Enables integration with Active Director | | Disabled | Network S | |

You can see from the above that my TNS listener is up and running. If your TNS Listener is not running yet, you need to trouble shoot and make sure the TNS listener is up before you can use your PHP program to test the Oracle connection.

Another way is to use the command line command from Oracle, known as "lsnrctl." The following screen shot shows you an example.

| Console | | | |
|---|----------------------------|---|-------|
| <u>F</u> ile <u>E</u> dit <u>V</u> iew <u>H</u> elp | | | |
| D 🖻 🛍 🤶 | | | |
| Console - Isnrcti | | | 4 Þ × |
| C:\>lsnrctl | | | ~ |
| LSNRCTL for 32-bit Win | dowe. Version 11 | 1.0.6.0 - Production on 06-JUL-2010 14:22:32 | |
| IDARCID ICI OZ DIC WIN | dows. version ii. | | |
| Copyright (c) 1991, 20 | 07, Oracle. All | rights reserved. | |
| Welcome to LSNRCTL, ty | pe "help" for inf | Formation. | |
| LONDOTIN N-1- | | | |
| The following operatio | ns are available | | |
| An asterisk (*) denote | s a modifier or e | extended command: | |
| | | | |
| start st | op | status | |
| services ve | r910n | reload | |
| Save_config tr | ace | change_password | |
| duit ex | 16 | Set^ | |
| | | | |
| LSNRCTL> status | | | |
| Connecting to (DESCRIP | TION= (ADDRESS= (PH | ROTOCOL=IPC) (KEY=EXTPROC1521))) | |
| STATUS of the LISTENER | | | |
| Alias | LISTENER | | |
| Version | TNSLSNR for 3 | 32-bit Windows: Version 11.1.0.6.0 - Production | |
| Start Date | 06-JUL-2010 (|)8:45:29 | |
| Uptime | 0 days 5 hr. | 37 min. 29 sec | |
| Trace Level | off | | |
| Security | ON: Local OS | Authentication | |
| SNMP | OFF | | |
| Listener Parameter Fil | e C:\app\pliu\p | product\11.1.0\db_1\network\admin\listener.ora | |
| Listener Log File | c:\app\pliu\d | liag\tnslsnr\154862EIU\listener\alert\log.xml | |
| Listening Endpoints Su | mmary | | |
| (DESCRIPTION= (ADDRES | S=(PROTOCOL=ipc) | (PIPENAME=\\.\pipe\EXTPROC1521ipc))) | |
| (DESCRIPTION= (ADDRES | S=(PROTOCOL=tcp) | (HOST=154862EIU.eiuad.eiu.edu) (PORT=1521))) | |
| Services Summary | | | |
| Service "oracle" has 1 | instance(s). | | |
| Instance "oracle", s | tatus READI, has | 1 nandler(s) for this service | |
| Instance "oracle. 154862 | tatus UNKNOWN b | a has i instante(s). | |
| Service "oracleXDB" ha | s 1 instance(s) | is i manufer(s) for this service | |
| Dest. | 5 <u>1 1110001100</u> (5). | | |
| кеаду | | | : |

You may use:

C:\lsnrctl status

To see the status of your TNS Listener.

The "Isnrctl" is a utility that comes from Oracle. It applies to any operating system platform.

Another useful utility (from Oracle) that will be handy for trouble shooting Oracle connection is: tnsping. For example, if you have a database called "oracle," and if you want to see if and how your TNS listener communicate with your database, you may issue:

C:\tnsping oracle



The above "Isnrctl" and "tnsping" utilities will give you plenty of information to trouble shoot your Oracle connection.

The trouble shooting of TNS listener will require some extensive experience, especially if you had problems during installation. Contact me If you could not resolve the TNS listener issue.

c. You have to have something in your database so that you may ask Oracle database.

To do that, you need to create an Oracle account, as follows (for Windows):

C:\sqlplus system/password

Once you are able to login Oracle SQL Plus, you will see something similar to the following:



Here I used a SQL command "show user" to confirm that I have logged in as "SYSTEM." The "SYSTEM" user will allow you to create other users such as "php."

Now, you are ready to create a user called "php" with a password "php", as in your textbook, on page 44.

SQL> CREATE USER php IDENTIFIED BY php;

You may then grant some necessary privileges to the user "php" so that "php" can login the database.

SQL> GRANT resource, connect TO php;

Once the above grant is successful, you should be able to login as "php" with a password "php."

SQL>connect php/php;



The user ("php") and password ("php") will be used now to test if your PHP program can talk to the Oracle database.

d. The above tasks are meant to make sure your Oracle database is alive before anyone (including your PHP program) can communicate with the database. Now, we need to make sure that the PHP engine understands the communication protocol or language. The communication between PHP and Oracle is handled by OCI8 (Oracle Call Interface 8). OCI8 is your agent who negotiates between Oracle and PHP.

OCI8 came with your Zend Server as you have already installed earlier this semester. But, you need to make sure it is on in your PHP engine. To do it, please login your Zend Server, as follows:



Please note: The following example is for Zend Server Community Edition. As of this writing on June 5, 2015, Zend offers a Developer Edition. It may vary slightly from the following procedure. But, the idea remain similar. Use it as your reference.

If your installation is similar to mine, you may access the Zend Server with the following link:

http://localhost/ZendServer/Login

Once you login the Zend Server, you will see something like:



You can then drill to Server Setup, Extensions, and find OCI8, as follows:

| Zend S | ierver - W | indows | Internet | : Explorer provided by Yahoo! | | | |
|------------------|-------------------------------|------------------|---------------|--|-----------------------------|--|------------|
| - 96 | http://loca | lhost/Zend | Server/Index/ | Index#1278446276602 | 🖌 🛃 🗙 Yai | hoo! Search | ٩ |
| ile <u>E</u> dit | <u>V</u> iew F <u>a</u> vorit | es <u>T</u> ools | <u>H</u> elp | | | | |
| Google or | acle 10g expres | s downloa | d 🖌 | 🚼 Search 🕐 🛷 * 🐥 🔹 🖉 Share * 🔊 * 🔍 Sidewiki * 🥙 Check * 👪 Translate * 🦕 AutoFill * 🥖 🖾 oracle 🖾 10g 🖾 express 🖾 download | | 🖏 🔹 🔵 peter • | 9 2 |
| 🖌 🍫 (8) | 3 🔹 🍇 Blackbo | ard Learni | ing Sy 📥 I | PHP Oracle Developmen | 🔓 • 🖻 | + Description + Descri | ols ▼ |
| | Server | | | | | Help About Logout | |
| Mor | nitor 🗳 | Server Se | etup 🍳 | Administration | | | |
| Compon | ents Exten | sions | Directives | Debugger | | | 1 |
| OFF | memcache | Turn on | Directives | | | | ^ |
| ON | mhash | Turn off | | | | (1) | |
| ON | mime_magic | Turn off | Directives | | | (1) | |
| OFF | ming | Turn on | | | | (1) | |
| OFF | mssql | Turn on | Directives | | | (1) | |
| ON | mysql | Turn off | Directives | | | 1 | |
| ON | mysqli | Turn off | Directives | | | | |
| ON | oci8 | Turn off | Directives | | | 1 | |
| OFF | odbc | Turn on | Directives | | | 1 | |
| ON | openssl | Built-in | | | | 1 | |
| ON | pcre | Built-in | Directives | | | (1) | |
| ON | PDO | Built-in | | | | (1) | |
| ON | pdo_mysql | Turn off | | | | (1) | |
| orr | PDO_OCI | Turn on | | | | (1) | |
| ON | pdo_pgsql | Turn off | | | | 1 | |
| ON | pdo_sqlite | Built-in | | | | 1 | |
| ON | pgsql | Turn off | Directives | | | 1 | |
| ON | Reflection | Built-in | | | | (1) | |
| ON | session | Built-in | Directives | | | (1) | |
| OFF | shmop | Turn on | | | | (1) | |
| ON | SimpleXML | Built-in | | | | (1) | |
| ON | soap | Turn off | Directives | | | 1 | |
| ON | sockets | Turn off | Directives | | | | |
| ON | SPL | Built-in | | | | 1 | |
| ON | SQLite | Turn off | Directives | | | 1 | |
| ON | standard | Built-in | | | | 0 | ~ |
| | | | | ш | | | 7 |
| | | | | | | O Restart PHP | ind |
| ne | | | | | Second Second Second Second | itranet 🔍 100% | , - |

Turn on OCI8, and "Restart PHP." Your communication agent is awake and working for you.

e. Your parameters in PHP have to be correct. You have to speak to the same language (English, Chinese, Hindi or others) as you talk to others.

I am going to ask you to use the <u>OracleStandardConnection.php</u> (pages 351-352) to test if you are able to connect to your Oracle database. To prepare you for more complex projects in the future, however, I am going to ask you to slightly modify the above code.

\$schema='php'; //The schema defines the user name you like to access in Oracle database

\$password='php'; //It defines the password of the above schema/user

\$database='xe'; //It defines the database (instance) name

Those are the three parameters that you will use to communicate with Oracle database. Your <u>OracleStandardConnection.php</u> code can be modified as:

```
<?php
```

```
$schema='php'; //The schema defines the user name you like to access in Oracle database
$password='php'; //It defines the password of the above schema/user
$database $database='xe'; //It defines the database (instance) name
if ($c=@oci_connect($schema,$password,$database))
{
Print "Successfully connected to Oracle database.<br>";
oci_close($c);
}
else
{
$errorMessage=oci_error();
print '';
foreach ($errorMessage as $name=>$text)
{
print ''.$name.'';
print ''.$text.'';
}
print '';
}
?>
```

If you installed Oracle 10g Express Edition, chances are the above code may produce the result you like, as in the following figure.



If you are not lucky enough yet, you may have to do some more work, before you can declare a victory. Here are the possibilities, assuming that you have followed all the steps above:

a. If you have installed Oracle 10g, 11g Express Edition, the code still gives you error message such as the following:

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You may redefine your \$database variable as:

\$database='localhost/xe';

That was the case on my laptop.

b. If you installed Oracle 9i, 10g, 11g or 12c Enterprise Edition, the most reliable way is to use "tnsping" utility to get the database connection string, as follows:



If you see your thsping is successful, that means that all communication channel to Oracle database base is clear. The "OK (20 msec)" is a good news for you. Then, you may use the database string to redefine your \$database variable, as:

\$database=' (DESCRIPTION = (ADDRESS_LIST = (ADDRESS = (PROTOCOL = TCP)(HOST = 154862EIU.eiuad.eiu.edu)(PORT =1521))) (CONNECT_DATA = (SERVER = DEDICATED) (SERVICE_NAME = oracle) (INSTANCE_NAME = oracle)))';

If you follow the above steps, the above approach will never fail. Good luck.

Challenge: There are other ways to find out the database connection string above. One way is to look for the string in this the string in the string. I hope you can find the file in your computer. Then, you can copy the connection string. Just do not change the file.

IV. To Prepare for the Future

Now, you have made the connection with Oracle database successfully. Your PHP code will look like the following if you have installed Oracle Enterprise Edition.

```
<?php
```

```
$schema='php'; //The schema defines the user name you like to access in Oracle database
$password='php'; //It defines the password of the above schema/user
$database="(DESCRIPTION = (ADDRESS LIST = (ADDRESS = (PROTOCOL = TCP)(HOST =
154862EIU.eiuad.eiu.edu)(PORT =1521))) (CONNECT_DATA = (SERVER = DEDICATED)
(SERVICE_NAME = oracle) (INSTANCE_NAME = oracle)))";
//It defines the database (instance) name
if ($c=@oci_connect($schema,$password,$database))
{
Print "Successfully connected to Oracle database.<br>";
oci_close($c);
}
else
{
$errorMessage=oci_error();
print '';
foreach ($errorMessage as $name=>$text)
{
print ''.$name.'';
print ''.$text.'';
}
print '';
}
?>
```

This seems to be very easy and straight forward. Nonetheless, what if you have 200 PHP programs that need to connect to Oracle database, how can you do it (to define the database connection parameters)? Of course, at the beginning, you could elect to copy and

paste the parameters to those 200 PHP files. That does not seem to be too difficult, either. You can do it with a little sweat.

What if after two years, a new database administrator in your organization decides to upgrade your system. As a result of the upgrade, the database is named as "oracle1" from the old name "oracle." What do you do with those 200 PHP files with such as a slight change? Chances are if I do not document them well, I will not be able to find those 200 files easily. Of course, your new system will end up with a lot of problems after the upgrade. Your customers including your boss and your wife/husband will not be happy. This is a typical issue of "scalability."

In order to make your PHP/Oracle system easily scalable in the future, you can define your Oracle database parameters in a single file. For the purpose, I am going to ask you to name this file as "oracle_parameters.php".

Now, what I am asking you to do is to move the three lines of Oracle connection parameters into a separate PHP file, named as "oracle_parameters.php," and place this file in the same document root as your main PHP program. Your OracleStandardConnection.php code will look like as follows:

<?php

```
include_once("oracle_parameters.php");
if ($c=@oci_connect($schema,$password,$database))
{
    Print "Successfully connected to Oracle database.<br>";
    oci_close($c);
}
else
{
    {
    $errorMessage=oci_error();
    print '';
    foreach ($errorMessage as $name=>$text)
    {
    print ''.$name.'';
```

```
print ''.$text.'';
}
print '';
}
?>
```

Now, as a project for this week, you will be creating the parameter file (oracle_parameters.php) based upon your own computer system, and make the above code work for you.

I have tested on my computer system. It is now your turn. Have fun.