COMP 3311 Database Management Systems Spring 2015

Lab 1. Introduction to Oracle and Oracle SQL*Plus

Objectives of the Lab

- After this lab you should be able to
  - Know more about the Oracle DBMS.
  - Know how using SQL*Plus to connect to the Oracle DBMS.
  - issue simple SQL commands to the Oracle DBMS through the SQL*Plus client.
  - run script files on the Oracle DBMS through the SQL*Plus client.

Why Oracle?

- Oracle database system is the one of the most widely used commercial DataBase Management Systems (DBMS) – you are likely to use it at some point in the future.
- Other DBMSs are similar to the Oracle database system - you should be able to program with other DBMSs, if you are familiar with the Oracle system.

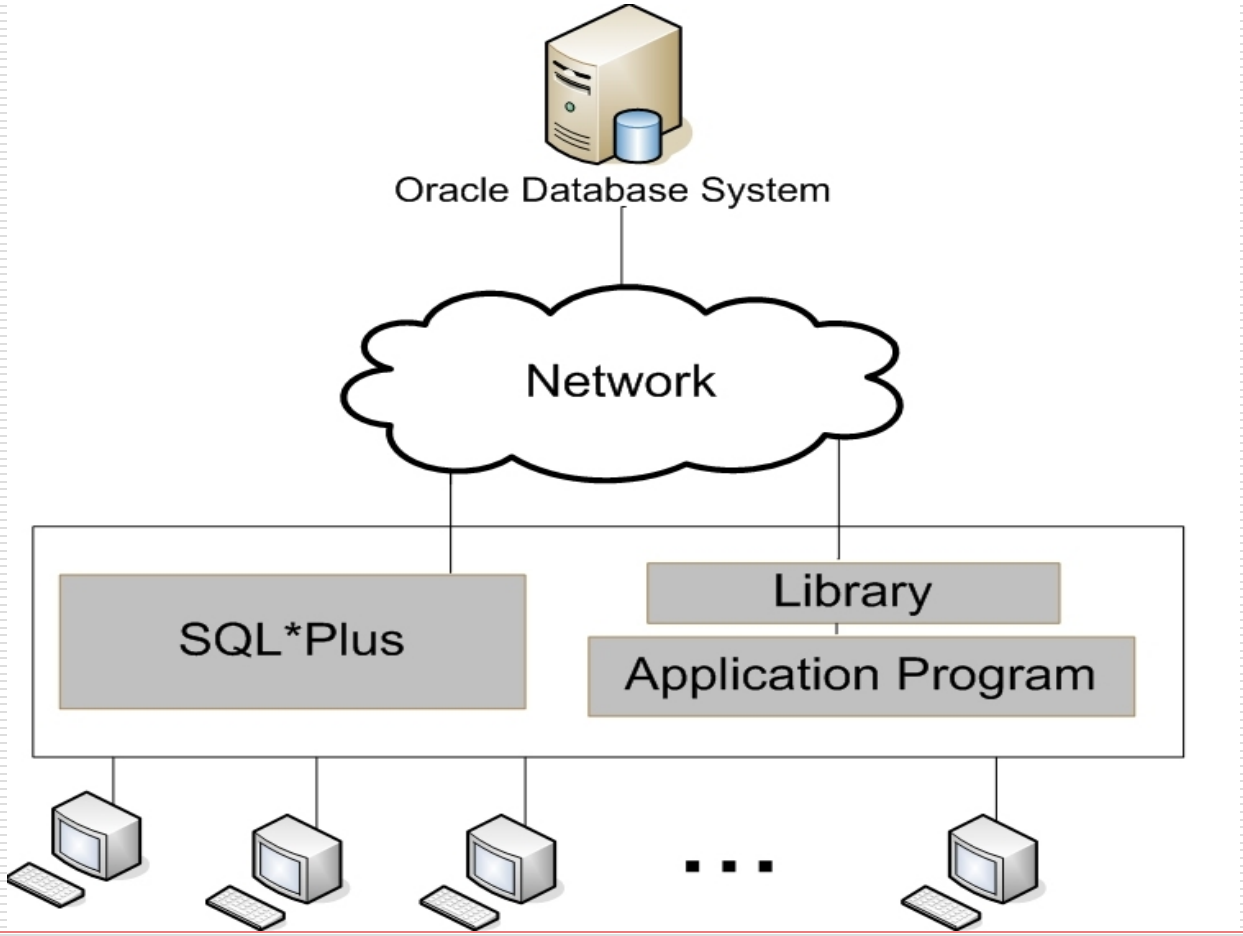
Getting the Oracle

- CS system provides Oracle Database 11g Enterprise edition.
- The express edition of the Oracle database system is free to download at
  http://www.oracle.com/technology/software/products/database/index.html
- You can download and install the Oracle database system to your own PC.
- It is okay if you have already installed earlier versions 8i,9i, 10g or 11g – because we will only use the most basic functions.

A bit more about Oracle database

- Based on the relational model introduced by E.F Codd.
- The first commercially available SQL based database.
- Having supported the Client-Server model (will discuss) since version 5.
- The latest stable version is Oracle Database 12c (c for cloud).

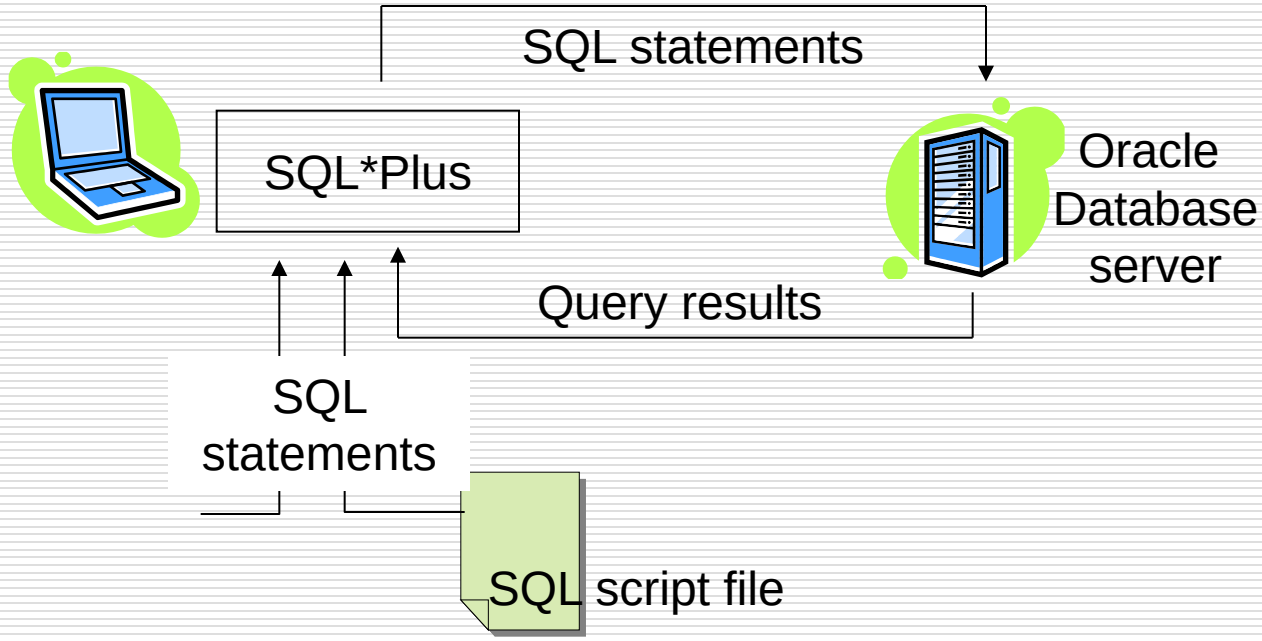
The Oracle Client/Server Model



The Oracle Client/Server Model

- The Oracle Database server for this course is running on a CSE server – dbsvr1.cse.ust.hk
- The Oracle client known as SQL*Plus is running on user PCs csl2wk01.cse.ust.hk- csl2wk41.cse.ust.hk
- The client (SQL*Plus) accepts SQL statement or commands from the users and sends them to the Oracle database server using the networks.
- The Oracle database server performs the queries and returns the results to the client(SQL*Plus).
- The client then delivers the results to the user.

The SQL*Plus database client



Connecting to the SQL*Plus client 1

- To connect to SQL*Plus client, you need to
  1. Run the "SSH Secure Shell client" and connect to csl2wkxx.cse.ust.hk, where xx=01-40
  2. Key in your username and password for the CSE Unix account.
  3. You will see a command prompt looks like: csl2wk01:sampleTA:1>

Connecting to the SQL*Plus client 2

- You need to set environment variables – ”ORACLE_HOME” and “PATH” before you can connect to the Oracle database server.
- You need to create/modify the “.login_user” file so that the environment variables will be set automatically every time you login.
- To do this, at the command prompt do the following

```
csl2wk01:sampleTA:2> cd ~
csl2wk01:sampleTA:3> pico .login_user
```

Connecting to the SQL*Plus client 3

- Type the following two lines to the pico prompt:

```
setenv ORACLE_HOME /usr/local/dbpackages/oracle
setenv PATH $ORACLE_HOME/bin:${PATH}
```

- Then press “Ctrl-o” to save the two lines in the .login_user file.

Connecting to the SQL*Plus client 4

- To connect to SQL*Plus client, you need to

4. Get your Oracle username and password from the following URL: https://course.cse.ust.hk/comp3311/labs/account2015.pdf

5. Type

```
sqlplus <oracle_account>@comp3311.cse.ust.hk
```

to run SQL*Plus, replace `<oracle_account>` with your Oracle user name you got from the course web site.

Logging into the Oracle database server through SQL*Plus

You will see something like this:

SQL*Plus: Release 11.2.0.1.0 - Production on Mon Feb 10 16:20:42 2015

Copyright (c) 1982, 2009, Oracle. All rights reserved.

Enter password:

6. Enter your Oracle password.

7. You should be able to see the following command prompt if you have logged into the oracle database server successfully.

SQL>

Changing your password 1

- The first problem.
  - You are using the passwords from account2015.pdf, so you know one another's passwords!
  - But you don't want others to alter your database!
  - Please do not use others' accounts and try to change others' passwords.

Changing your password 2

- So we need to change the passwords. Type:

```
alter user <oracle_account>
    identified by <new_password>;
```

replace <oracle_account> and <new_password> with your Oracle account name and the new password. Remember adding a “;” at the end of the SQL statement, because all SQL statement ends in a “;”. Here is an example:

```
alter user comp3311ta2 identified by “123456”;
```

Please remember the new password!

Changing your password 3

- Type exit and press enter to log out from the Oracle database. We shall come back to SQL*Plus later.

Running a SQL script file 1

- Download the lab1.sql file as follows

  1. login to an arbitrary machine where xx=01-40

     csl2wkxx.cse.ust.hk

  2. at the command prompt type

     ```
     csl2wk01:sampleTA:20> cd ~
     csl2wk01:sampleTA:21> wget \
      ? http://course.cs.ust.hk/comp3311/labs/lab1.sql
     ```

- Log into Oracle database server again user SQL*Plus with your new password.

Running a SQL script file 2

- Type '@lab1' in the SQL*Plus client to execute the SQL statements contained in the lab1.sql script file.
- Basically lab1.sql creates a table called 'students' with 6 attributes.
- And lab1.sql inserts 3 different instances of students into the table.
- Don't worry if you do not understand the SQL statements for the time being. We shall cover them in details in the future labs.

Displaying the table structure

- Command: **DESC[RIBE] *<tablename>***
- Type **desc students** in SQL*Plus
- What you see?
  - Null? –Means whether a column must contain data
  - Type – The data type of the column
  - NUMBER(p, s) – A number of p digits, s decimal points
  - VARCHAR(s) – Variable characters of max. length s

SQL*Plus commands

- As mentioned earlier, when we run SQL statement in SQL*Plus, the SQL statements will be stored in the buffer.
- We can use SQL*Plus commands to edit the SQL statements in the buffer.
  - L[IST] – List all lines in the SQL buffer
  - <n> (a number) – Specifies the line to make the current line
  - A[PPEND] <*text*> – Add text to the end of current line
  - C[HANGE] /<*text1*> /<*text2*> – Change the text in the current line

Examples – Editing SQL statement using tools provided by SQL*Plus

```
SQL> select last_name
  2  from students;

LAST_NAME
-------------------------
Harry
Leonardo
Legolas

SQL> L
  1  SELECT last_name
  2*  FROM students
SQL> 1
  1* SELECT last_name
SQL> A , CGA
  1* SELECT last_name, CGA
SQL> L
  1  SELECT last_name, CGA
  2*  FROM students
```

Type "/" to see what happens

Examples – Editing SQL statement using tools provided by SQL*Plus

```
SQL> L
  1  SELECT last_name, CGA
  2* FROM students
SQL> 1
  1* SELECT last_name, CGA
SQL> C /last_name/first_name
  1* SELECT first_name, CGA
  2  FROM students
```

Type "/" to see what will happen

SQL*Plus file commands

- SAV[E] *<filename>* – Save the SQL buffer into a file
- GET *<filename>* – Read the file into SQL buffer
- STA[RT] *<filename>* – Run a SQL file
- @*<filename>* – Same as STA[RT]
- ED[IT] – Edit the SQL buffer
- ED[IT] *<filename>* – Edit a SQL file
- EXIT – Quit SQL*Plus

Customizing SQL*Plus' default editor

- The default editor for SQL*Plus is *vi*
- If you want to change it to pico, type:

```
define _editor = pico
```

- You may also save it as **login.sql**, so it will run automatically for each SQL*Plus session

Examples – SQL*Plus file commands

```
SQL> L
  1  SELECT first_name, CGA
  2*  FROM students
SQL> SAVE myQuery
```

What do you see?

```
SQL> START myQuery
```

What happens?

When you use the **EDIT** command, you will see the file name is "afiedt.buf". Your latest command is stored here.

Conclusions

- We covered the following topics in this lab:
  - Introduction to the Oracle DBMS
  - Introduction to the SQL*Plus client
  - Connecting to the Oracle DBMS through the SQL*Plus client
  - Running simple SQL scripts
  - Editing SQL statements in SQL*Plus
  - Simple SQL*Plus file commands for SQL script files