Database Programming with PL/SQL

9-3
Review of the Data Dictionary

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Objectives

This lesson covers the following objectives:

- Describe the purposes of the Data Dictionary

- Differentiate between the three types of Data Dictionary views

- Write SQL SELECT statements to retrieve information from the Data Dictionary

- Explain the use of DICTIONARY as a Data Dictionary search engine

Purpose

- Imagine that you have created many procedures and/or functions, as well as tables and other database objects.

- It's hard to remember all their names, isn't it?

- The Data Dictionary remembers this information for you.

What Is the Data Dictionary?

- Every Oracle database contains a Data Dictionary.

- All database objects, such as tables, views, users and their privileges, procedures, functions, and so on are automatically registered in the Data Dictionary when they are created.

- If an object is later altered or dropped, the Dictionary is automatically updated to reflect the change.

- Think of the Dictionary as an automatically-managed master catalog of everything in the database.

How Can You Read the Dictionary?

- There are two classes of tables from which you can SELECT to view information from the Dictionary:
  - The USER_* tables contain information about objects that you own, usually because you created them.
  - Examples: USER_TABLES, USER_INDEXES.
  - The ALL_* tables contain information about objects that you have privileges to use.
  - These include the USER_* information as a subset, because you always have privileges to use the objects that you own.
  - Examples: ALL_TABLES, ALL_INDEXES.

How Can You Read the Dictionary?

- A third class of tables you can SELECT to view information from the Dictionary are normally only available to the Database Administrator:

- The DBA_* tables contain information about everything in the database, no matter who owns them.

- Examples: DBA_TABLES, DBA_INDEXES.

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Viewing Information in the Dictionary

- Although you are not allowed to modify the dictionary yourself, you can DESCRIBE and SELECT from Dictionary tables.

- For example, to see information about all the tables that you have privileges to use:

```
DESCRIBE ALL_TABLES
```

Viewing Information in the Dictionary

- The output from this shows that many columns of data are held about each table.

- You decide you only want to see the name and owner, so you enter:

```
SELECT table_name, owner FROM ALL_TABLES;
```

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Another Example

- Suppose you want to see all the objects that you own.

- You could SELECT … from USER_TABLES, then from USER_INDEXES, then from USER_SEQUENCES, then from …. for each type of object.

- But, it is easier to use USER_OBJECTS, which shows all the objects of every type:

```
SELECT object_type, object_name FROM USER_OBJECTS;
```

Another Example

- Remember that you can use WHERE conditions, ORDER BY, GROUP BY, and so on with the Dictionary tables, just like regular tables.

- Suppose you want to see how many objects of each type you own:

```
SELECT object_type, COUNT(*) FROM USER_OBJECTS
  GROUP BY object_type;
```

Using the Super-View DICTIONARY

- Several hundred Dictionary tables exist and no one can remember the names of all of them.

- You don't have to!

- A super-view called DICTIONARY (or DICT for short) lists all the Dictionary tables.

- You can use DICT like an Internet search engine to show the names and descriptions (comments) of a relevant subset of Dictionary tables.

- The next slide shows how to do this.

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Using the Super-View DICTIONARY

- First try:

```
SELECT COUNT(*) FROM DICT WHERE table_name LIKE 'USER%';
```

- You see that there are more than a hundred USER_* tables.

- Can you remember which one of them shows you information about which table columns are indexed?

- Most people can't.

Using the Super-View DICTIONARY

- You can reasonably assume that all Dictionary tables that describe indexes have names containing the substring 'IND'.

- So:

```
SELECT * FROM DICT WHERE table_name LIKE 'USER%IND%';
```

- Now you can see that the table you want is USER_IND_COLUMNS.

Viewing the Dictionary using Application Express

- The Object Browser in Application Express provides an easier way to see much of the Dictionary information.

- To use it, go to SQL Workshop -> Object Browser -> Browse and click the desired object type.

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Viewing the Dictionary using Application Express

- Much easier, isn't it?

- So why do you still need to know about the USER_* and ALL_* tables?

- The Object Browser does not show everything:
  - It shows only the objects that you own, not other objects that you are allowed to use.
  - It shows only a subset of information about each object.
  - It does not show all the possible object types.

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Terminology

Key terms used in this lesson included:

- ALL_* tables

- Data Dictionary

- DBA_* tables

- USER_* tables

Summary

In this lesson, you should have learned how to:

- Describe the purposes of the Data Dictionary

- Differentiate between the three types of Data Dictionary views

- Write SQL SELECT statements to retrieve information from the Data Dictionary

- Explain the use of DICTIONARY as a Data Dictionary search engine

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