Managing Objects with Data Dictionary Views

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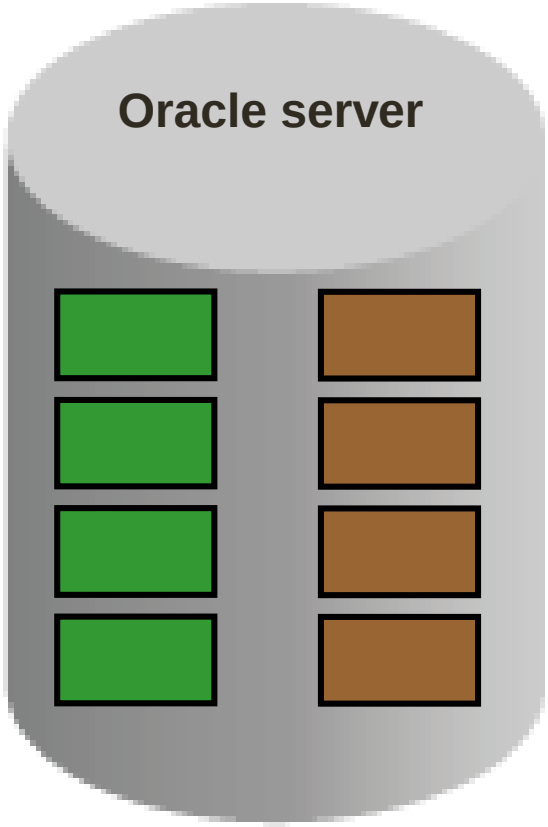
Objectives

- After completing this lesson, you should be able to do the following:
  - Use the data dictionary views to research data on your objects
  - Query various data dictionary views

The Data Dictionary

Tables containing business data:

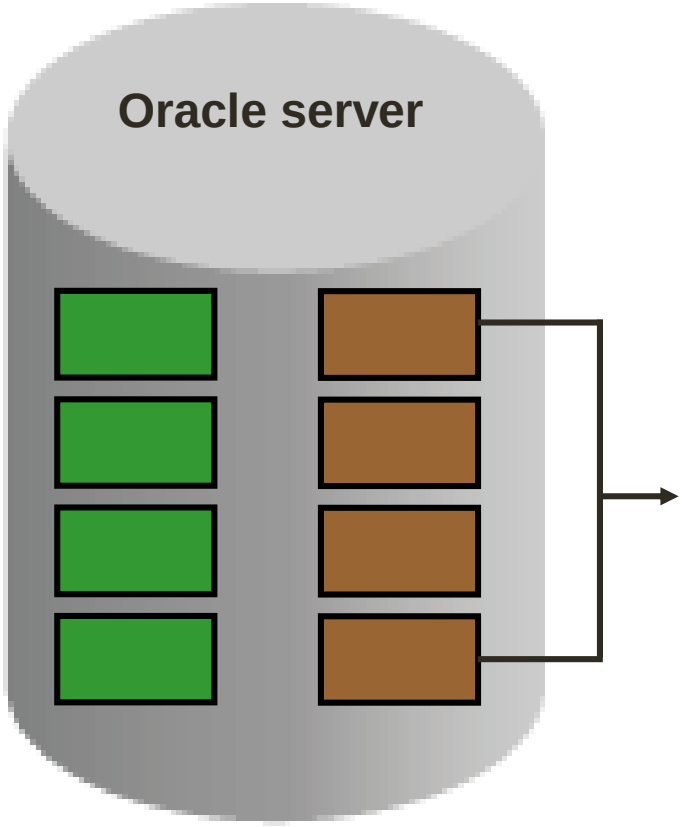
EMPLOYEES
DEPARTMENTS
LOCATIONS
JOB_HISTORY
...



Data dictionary views:

DICTIONARY
USER_OBJECTS
USER_TABLES
USER_TAB_COLUMNS
...

Data Dictionary Structure



Consists of:

- **Base tables**
- **User-accessible views**

Data Dictionary Structure

- View naming convention:

View Prefix	Purpose
USER	User's view (what is in your schema; what you own)
ALL	Expanded user's view (what you can access)
DBA	Database administrator's view (what is in everyone's schemas)
V$	Performance-related data

How to Use the Dictionary Views

Start with `DICTIONARY`. It contains the names and descriptions of the dictionary tables and views.

```
DESCRIBE DICTIONARY
```

Name	Null?	Type
TABLE_NAME		VARCHAR2(30)
COMMENTS		VARCHAR2(4000)

```
SELECT *
FROM   dictionary
WHERE  table_name = 'USER_OBJECTS';
```

TABLE_NAME	COMMENTS
USER_OBJECTS	Objects owned by the user

USER_OBJECTS and ALL_OBJECTS Views

USER_OBJECTS:

- Query USER_OBJECTS to see all of the objects that are owned by you
- Is a useful way to obtain a listing of all object names and types in your schema, plus the following information:
  - Date created
  - Date of last modification
  - Status (valid or invalid)

ALL_OBJECTS:

- Query ALL_OBJECTS to see all objects to which you have access

USER_OBJECTS View

```
SELECT object_name, object_type, created, status
FROM   user_objects
ORDER BY object_type;
```

OBJECT_NAME	OBJECT_TYPE	CREATED	STATUS
REG_ID_PK	INDEX	10-DEC-03	VALID
...			
DEPARTMENTS_SEQ	SEQUENCE	10-DEC-03	VALID
REGIONS	TABLE	10-DEC-03	VALID
LOCATIONS	TABLE	10-DEC-03	VALID
DEPARTMENTS	TABLE	10-DEC-03	VALID
JOB_HISTORY	TABLE	10-DEC-03	VALID
JOB_GRADES	TABLE	10-DEC-03	VALID
EMPLOYEES	TABLE	10-DEC-03	VALID
JOBS	TABLE	10-DEC-03	VALID
COUNTRIES	TABLE	10-DEC-03	VALID
EMP_DETAILS_VIEW	VIEW	10-DEC-03	VALID

Table Information

USER_TABLES:

```
DESCRIBE user_tables
```

Name	Null?	Type
TABLE_NAME	NOT NULL	VARCHAR2(30)
TABLESPACE_NAME		VARCHAR2(30)
CLUSTER_NAME		VARCHAR2(30)
IOT_NAME		VARCHAR2(30)

```
SELECT table_name
FROM   user_tables;
```

TABLE_NAME
JOB_GRADES
REGIONS
COUNTRIES
LOCATIONS
DEPARTMENTS

...

Column Information

- USER_TAB_COLUMNS:

```
DESCRIBE user_tab_columns
```

Name	Null?	Type
TABLE_NAME	NOT NULL	VARCHAR2(30)
COLUMN_NAME	NOT NULL	VARCHAR2(30)
DATA_TYPE		VARCHAR2(106)
DATA_TYPE_MOD		VARCHAR2(3)
DATA_TYPE_OWNER		VARCHAR2(30)
DATA_LENGTH	NOT NULL	NUMBER
DATA_PRECISION		NUMBER
DATA_SCALE		NUMBER
NULLABLE		VARCHAR2(1)
COLUMN_ID		NUMBER
DEFAULT_LENGTH		NUMBER
DATA_DEFAULT		LONG

...

Column Information

```
SELECT column_name, data_type, data_length,
       data_precision, data_scale, nullable
FROM   user_tab_columns
WHERE  table_name = 'EMPLOYEES';
```

COLUMN_NAME	DATA_TYPE	DATA_LENGTH	DATA_PRECISION	DATA_SCALE	NUL
EMPLOYEE_ID	NUMBER	22	6	0	N
FIRST_NAME	VARCHAR2	20			Y
LAST_NAME	VARCHAR2	25			N
EMAIL	VARCHAR2	25			N
PHONE_NUMBER	VARCHAR2	20			Y
HIRE_DATE	DATE	7			N
JOB_ID	VARCHAR2	10			N
SALARY	NUMBER	22	8	2	Y
COMMISSION_PCT	NUMBER	22	2	2	Y
MANAGER_ID	NUMBER	22	6	0	Y
DEPARTMENT_ID	NUMBER	22	4	0	Y

Constraint Information

- `USER_CONSTRAINTS` describes the constraint definitions on your tables.
- `USER_CONS_COLUMNS` describes columns that are owned by you and that are specified in constraints.

```
DESCRIBE user_constraints
```

Name	Null?	Type
OWNER	NOT NULL	VARCHAR2(30)
CONSTRAINT_NAME	NOT NULL	VARCHAR2(30)
CONSTRAINT_TYPE		VARCHAR2(1)
TABLE_NAME	NOT NULL	VARCHAR2(30)
SEARCH_CONDITION		LONG
R_OWNER		VARCHAR2(30)
R_CONSTRAINT_NAME		VARCHAR2(30)
DELETE_RULE		VARCHAR2(9)
STATUS		VARCHAR2(8)

...

Constraint Information

```
SELECT constraint_name, constraint_type,
       search_condition, r_constraint_name,
       delete_rule, status
FROM   user_constraints
WHERE  table_name = 'EMPLOYEES';
```

CONSTRAINT_NAME	CON	SEARCH_CONDITION	R_CONSTRAINT_NAME	DELETE_RULE	STATUS
EMP_LAST_NAME_NN	C	"LAST_NAME" IS NOT NULL			ENABLED
EMP_EMAIL_NN	C	"EMAIL" IS NOT NULL			ENABLED
EMP_HIRE_DATE_NN	C	"HIRE_DATE" IS NOT NULL			ENABLED
EMP_JOB_NN	C	"JOB_ID" IS NOT NULL			ENABLED
EMP_SALARY_MIN	C	salary > 0			ENABLED
EMP_EMAIL_UK	U				ENABLED
EMP_EMP_ID_PK	P				ENABLED
EMP_DEPT_FK	R		DEPT_ID_PK	NO ACTION	ENABLED
EMP_JOB_FK	R		JOB_ID_PK	NO ACTION	ENABLED
EMP_MANAGER_FK	R		EMP_EMP_ID_PK	NO ACTION	ENABLED

Constraint Information

```
DESCRIBE user_cons_columns
```

Name	Null?	Type
OWNER	NOT NULL	VARCHAR2(30)
CONSTRAINT_NAME	NOT NULL	VARCHAR2(30)
TABLE_NAME	NOT NULL	VARCHAR2(30)
COLUMN_NAME		VARCHAR2(4000)
POSITION		NUMBER

```
SELECT constraint_name, column_name
FROM   user_cons_columns
WHERE  table_name = 'EMPLOYEES';
```

CONSTRAINT_NAME	COLUMN_NAME
EMP_EMAIL_UK	EMAIL
EMP_SALARY_MIN	SALARY
EMP_JOB_NN	JOB_ID
EMP_HIRE_DATE_NN	HIRE_DATE

...

View Information

1
```
DESCRIBE user_views
```

Name	Null?	Type
VIEW_NAME	NOT NULL	VARCHAR2(30)
TEXT_LENGTH		NUMBER
TEXT		LONG

2
```
SELECT DISTINCT view_name FROM user_views;
```

VIEW_NAME
EMP_DETAILS_VIEW

3
```
SELECT text FROM user_views
WHERE view_name = 'EMP_DETAILS_VIEW';
```

TEXT
SELECT e.employee_id, e.job_id, e.manager_id, e.department_id, d.locat ion_id, l.country_id, e.first_name, e.last_name, e.salary, e.commissio n_pct, d.department_name, j.job_title, l.city, l.state_province, c.cou ntry_name, r.region_name FROM employees e, departments d, jobs j, loca tions l, countries c, regions r WHERE e.department_id = d.department_id AN D d.location_id = l.location_id AND l.country_id = c.country_id AND c.region _id = r.region_id AND j.job_id = e.job_id WITH READ ONLY

Sequence Information

```
DESCRIBE user_sequences
```

Name	Null?	Type
SEQUENCE_NAME	NOT NULL	VARCHAR2(30)
MIN_VALUE		NUMBER
MAX_VALUE		NUMBER
INCREMENT_BY	NOT NULL	NUMBER
CYCLE_FLAG		VARCHAR2(1)
ORDER_FLAG		VARCHAR2(1)
CACHE_SIZE	NOT NULL	NUMBER
LAST_NUMBER	NOT NULL	NUMBER

Sequence Information

- Verify your sequence values in the USER_SEQUENCES data dictionary table.

```
SELECT   sequence_name, min_value, max_value,
         increment_by, last_number
FROM     user_sequences;
```

SEQUENCE_NAME	MIN_VALUE	MAX_VALUE	INCREMENT_BY	LAST_NUMBER
LOCATIONS_SEQ	1	9900	100	3300
DEPARTMENTS_SEQ	1	9990	10	280
EMPLOYEES_SEQ	1	1.0000E+27	1	207

- The LAST_NUMBER column displays the next available sequence number if NOCACHE is specified.

Synonym Information

```
DESCRIBE user_synonyms
```

Name	Null?	Type
SYNONYM_NAME	NOT NULL	VARCHAR2(30)
TABLE_OWNER		VARCHAR2(30)
TABLE_NAME	NOT NULL	VARCHAR2(30)
DB_LINK		VARCHAR2(128)

```
SELECT *
FROM   user_synonyms;
```

SYNONYM_NAME	TABLE_OWNER	TABLE_NAME	DB_LINK
EMP	ORA1	EMPLOYEES	

Adding Comments to a Table

- You can add comments to a table or column by using the COMMENT statement:

```
COMMENT ON TABLE employees
IS 'Employee Information';
Comment created.
```

- Comments can be viewed through the data dictionary views:
  - ALL_COL_COMMENTS
  - USER_COL_COMMENTS
  - ALL_TAB_COMMENTS
  - USER_TAB_COMMENTS

Summary

- In this lesson, you should have learned how to find information about your objects through the following dictionary views:
  - DICTIONARY
  - USER_OBJECTS
  - USER_TABLES
  - USER_TAB_COLUMNS
  - USER_CONSTRAINTS
  - USER_CONS_COLUMNS
  - USER_VIEWS
  - USER_SEQUENCES
  - USER_TAB_SYNONYMS

Practice 11: Overview

- This practice covers the following topics:
  - Querying the dictionary views for table and column information
  - Querying the dictionary views for constraint information
  - Querying the dictionary views for view information
  - Querying the dictionary views for sequence information
  - Querying the dictionary views for synonym information
  - Adding a comment to a table and querying the dictionary views for comment information