Chapter 12: Oracle SQL Data Dictionary Views

Introduction to the Data Dictionary

The Oracle Data Dictionary is a set of database tables and views automatically maintained by Oracle that stores **metadata** about all schema objects including tables, views, indexes, sequences, constraints, and more. It is populated in real-time with each DDL statement (CREATE, ALTER, DROP).

Key Characteristics

- **Owner**: SYS user (superuser account)
- **Access Method**: Users access dictionary via views, not base tables
- **Updates**: Automatically updated with every DDL operation

Metadata Stored

- Object names, owners, creation timestamps
- Column names, data types, precision, scale
- Constraints, indexes, sequences, and views

Data Dictionary View Prefixes

Oracle provides three levels of data dictionary views, distinguished by their prefixes:

Prefix	Description	Example
USER_	Objects owned by current user	USER_TABLES
ALL_	Objects user has privileges to access	ALL_TABLES
DBA_	All objects in the database (requires DBA privileges)	DBA_TABLES

Common Data Dictionary Views

Object Information Views

View Name	Description
USER_TABLES	Information about user's tables
ALL_TABLES	Tables user has access to
DBA_TABLES	All tables in database
USER_TAB_COLUMNS	Column metadata for user's tables
USER_OBJECTS	All objects owned by the user
USER_CATALOG	Summary of user's tables, views, sequences, synonyms
USER_VIEWS	SQL source code of views
DICTIONARY	Describes all data dictionary views

Documentation Views

View Name	Description
ALL_TAB_COMMENTS	Comments on tables/views
ALL_COL_COMMENTS	Comments on columns

Synonym Views

View Name	Description
USER_SYNONYMS	Private synonyms
ALL_SYNONYMS	All synonyms user can access
DBA_SYNONYMS	Public synonyms

Practical Query Examples

Finding Tables in Your Schema

```sql
SELECT TABLE_NAME
FROM USER_TABLES;
```

Getting Column Information

```sql
SELECT COLUMN_NAME, DATA_TYPE
FROM USER_TAB_COLUMNS
WHERE TABLE_NAME = 'INVOICES';
```

Checking for Invalid Objects

```sql
SELECT STATUS, OBJECT_NAME
FROM USER_OBJECTS
WHERE STATUS = 'INVALID';
```

Viewing SQL Text of a View

```sql
SELECT TEXT
FROM USER_VIEWS
WHERE VIEW_NAME = 'VW_EMPLOYEES';
```

Working with Comments

Adding a comment to a table:

```sql
COMMENT ON TABLE PORTS IS 'Listing of all ports of departure and arrival.';
```

Viewing comments:

```sql
SELECT COMMENTS
FROM USER_TAB_COMMENTS
WHERE TABLE_NAME = 'PORTS';
```

Dynamic Performance Views

Dynamic performance views provide real-time database activity information. They are prefixed with **V$** (for single instance) or **GV$** (for RAC environments).

Common Dynamic Performance Views

View Name	Information Provided
V$DATABASE	Database name, creation date, platform
V$INSTANCE	Host, instance name, startup time
V$PARAMETER	NLS settings and other system parameters
V$SESSION	Active sessions
V$OBJECT_USAGE	Index usage statistics

> ⚠️ **Important Note**: Use simple queries with V$ views—complex joins may give unreliable results.

Security and Privileges

Privilege-Related Views

View Name	Description
USER_SYS_PRIVS	System privileges for user
USER_TAB_PRIVS	Object-level privileges
USER_ROLE_PRIVS	Roles granted to user
DBA_SYS_PRIVS	System privileges for users and roles

Best Practices

Starting Your Data Dictionary Exploration

1. **List all available views**:

```sql
SELECT TABLE_NAME, COMMENTS
FROM DICTIONARY
ORDER BY TABLE_NAME;
```

2. **Search by keyword**:

```sql
SELECT TABLE_NAME, COMMENTS
FROM DICTIONARY
WHERE UPPER(COMMENTS) LIKE '%INDEX%';
```

Key Exam Topics

1. **Understand the three prefix types** (USER_, ALL_, DBA_) and their scope
2. **Know how to retrieve table and column metadata** using appropriate views
3. **Be able to query and interpret dynamic performance views** (V$)
4. **Understand privilege checking** through system views
5. **Know how to add and retrieve comments** from the data dictionary
6. **Remember that the data dictionary is owned by SYS** and accessed through views

Summary

The Oracle Data Dictionary is your primary source for database metadata. Master the use of USER_, ALL_, and DBA_ prefixed views to effectively query object information. Dynamic performance views (V$) provide real-time monitoring capabilities. Always start with the DICTIONARY view when exploring available metadata views.