

Oracle (PL/SQL)

Lesson 7: Locks

Lesson Objectives



Data Concurrency and Consistency

Locking in Oracle

Types of Locks

DDL & DML Locks



Introduction



Data Concurrency: Ensures users can access data at the same time

Data Consistency: Ensures each user sees a consistent view of data

- To ensure data concurrency and consistency means
 - Data must be read and modified in a consistent manner



Locking Mechanism in Oracle

Oracle manages control of access to Oracle resources and manages consistency by using Locks

Locks

- Used to manage access user defined resources such as tables.
- Help to maintain transaction consistency in database.
- Prevents one user from overwriting changes to the database made by another user



Lock Categories

DML Locks

- Row Level Locks
- Table Level Locks

Manual Lock

DDL Locks

- Exclusive DDL Locks
- Shared DDL Locks Like
- Breakable Parse Locks

Auto Lock

Types of DML Locks



DML locks are applied at two levels : Row level and Table Level

- Oracle provides six different types of locks:
 - Exclusive – allows queries on the locked table but prevents any other activity
 - Share – allows concurrent queries but prevents updates to the locked table
 - Share Row Exclusive – allows viewing of whole table but prevents others from locking the table in SHARE mode or updating rows

Types of DML Locks (contd..)



- Row share – allows concurrent access to the locked table but prevents users from locking the entire table for exclusive access
- Share update – Similar to ROW SHARE, and is included for backward compatibility
- Row exclusive – Similar to ROW SHARE but also prevents locking ins SHARE mode. These locks are automatically when updating, inserting or deleting



Acquiring Locks in Oracle

Syntax

```
LOCK TABLE tablename IN lockmode MODE NOWAIT;
```

➤ Example

```
LOCK TABLE staff_master IN SHARE UPDATE mode nowait;
```

```
LOCK TABLE student_master IN EXCLUSIVE mode;
```


Deadlock



- Deadlock occurs when two or more sessions are waiting for data locked by each other, resulting in all the sessions being blocked.
- Oracle automatically deals with deadlocks by raising an ORA-00060 exception in one of the sessions.



➤ Example

- If session 1 is locking row 1, session 2 locks row 2, then session 1 attempts to lock row 2 which will block since session 2 has the lock on that row, and then session 2 attempts to lock row 1 which will also block since session 1 has the lock on that row, then session 1 is waiting for session 2, and session 2 is waiting on session 1, which of course will never be resolved

Types of DDL Locks



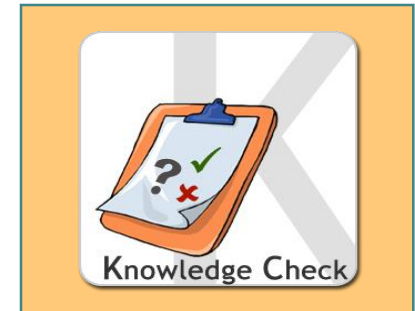
➤ Oracle provides three types of DDL locks

- Exclusive
- Shared
- Breakable Parse

Summary



- Data Concurrency and Consistency
- Locking in Oracle
- Types of Locks
- DDL & DML Locks



Review Question



➤ Question 1: Which of the following is a DML lock?

- Option 1: Share Update
- Option 2: Row update
- Option 3: Row Exclusive



➤ Question 2 : DDL locks are acquired automatically and cannot be acquired explicitly.

- True/ False