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# Database

Driver Types

Type 1: JDBC-ODBC bridge driver.

Type 2: Java + Native code driver.

Type 3: All Java + Middleware translation driver.

Type 4: All Java driver.

Isolation Levels

|  |  |  |  |
| --- | --- | --- | --- |
| **Isolation level** | **Dirty reads** | **Non-repeatable reads** | **Phantoms** |
| Read Uncommitted | may occur | may occur | may occur |
| Read Committed | - | may occur | may occur |
| Repeatable Read | - | - | may occur |
| Serializable | - | - | - |

A ***dirty read*** (aka *uncommitted dependency*) occurs when a transaction is allowed to read data from a row that has been modified by another running transaction and not yet committed.

A ***non-repeatable read***occurs, when during the course of a transaction, a row is retrieved twice and the values within the row differ between reads.

A **phantom read** occurs when, in the course of a transaction, two identical queries are executed, and the collection of rows returned by the second query is different from the first.

Lock Duration

**"C"** - Denotes that locks are held until the transaction commits.  
**"S"** - Denotes that the locks are held only during the currently executing statement. Note that if locks are released after a statement, the underlying data could be changed by another transaction before the current transaction commits, thus creating a violation.

|  |  |  |  |
| --- | --- | --- | --- |
| **Isolation level** | **Write Operation** | **Read Operation** | **Range Operation (...where...)** |
| Read Uncommitted | S | S | S |
| Read Committed | C | S | S |
| Repeatable Read | C | C | S |
| Serializable | C | C | C |