ACID. Isolation Levels – Questions and Answers

1. What is the Atomicity?

2. What is the Consistency?

3. What is the Isolation?

4. What is the Durability?

5. What is the Non-repeatable reads?

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7. What are the differences between READ-COMMITTED and REPEATABLE-READ transaction isolation levels?

8. What's the difference between using the NOLOCK table hint and the Read Uncommitted transaction level?

1. What is the Atomicity?

Atomicity - means that each step in the transaction must complete successfully, or they're all rolled back.

2. What is the Consistency?

Consistency - in database systems refers to the requirement that any given database transaction must change affected data only in allowed ways.

3. What is the Isolation?

Isolation - means that data in a transaction that's in process shouldn't be visible to another transaction until it completes. Main goal: to improve performance. Providing isolation is the main goal of concurrency control.

4. What is the Durability?

Durability - means that the result of the committed transaction is a permanent modification to the system, meaning that even if the system were to crash and reboot, the data will remain.

5. What is the Non-repeatable reads?

Non-Repeatable Reads happen when in a same transaction same query yields to a different result. This occurs when one transaction repeatedly retrieves the data, while a difference transaction alters the underlying data. This causes the different or non-repeatable results to be read by the first transaction.

6. What is the difference between Dirty reads and Phantom reads?

Dirty read occurs when one transaction is changing the record, and the other transaction can read this record before the first transaction has been committed or rolled back. This is known as a dirty read scenario because there is always the possibility that the first transaction may rollback the change, resulting in the second transaction having read an invalid data.

Phantom read occurs where in a transaction execute same query more than once, and the second transaction result set includes rows that were not visible in the first result set. This is caused by another transaction inserting new rows between the execution of the two queries. This is similar to a non-repeatable read, except that the number of rows is changed either by insertion or by deletion.

7. What are the differences between READ-COMMITTED and REPEATABLE-READ transaction isolation levels?

Read committed is an isolation level that guarantees that any data read was committed at the moment is read. It simply restricts the reader from seeing any intermediate, uncommitted, 'dirty' read. IT makes no promise whatsoever that if the transaction re-issues the read, will find the Same data, data is free to change after it was read.

Repeatable read is a higher isolation level, that in addition to the guarantees of the read committed level, it also guarantees that any data read cannot change, if the transaction reads the same data again, it will find the previously read data in place, unchanged, and available to read.

8. What's the difference between using the NOLOCK table hint and the Read Uncommitted transaction level?

Both approaches tell the database engine not to issue shared locks when reading the requested data; however, the two approaches differ in scope, within the context of the current session.