

Concurrency Models in SQL Server 2012

By Dusan Petkovic (<https://logicalread.com/author/dusan-petkovic/>) on September 11, 2013

The SQL Server Database Engine supports two different concurrency models:

- Pessimistic concurrency
- Optimistic concurrency

Pessimistic concurrency uses locks to block access to data that is used by another process at the same time. In other words, a database system that uses pessimistic concurrency assumes that a conflict between two or more processes can occur at any time and therefore locks resources (row, page, table), as they are required, for the duration of a transaction. As you will see in the section "Locking," pessimistic concurrency issues shared locks on data being read so that no other process can modify that data. Also, pessimistic concurrency issues exclusive locks for data being modified so that no other processes can read or modify that data.

Optimistic concurrency works on the assumption that a transaction is unlikely to modify data that another transaction is modifying at the same time. The Database Engine supports optimistic concurrency so that older versions of data rows are saved, and any process that reads the same data uses the row version that was active when it started reading data. For that reason, a process that modifies the data can do so without any limitation, because all other processes that read the same data access the saved versions of the data. The only conflict scenario occurs when two or more write operations use the same data. In that case, the system displays an error so that the client application can handle it.

NOTE

The notion of optimistic concurrency is generally defined in a broader sense. Optimistic concurrency control works on the assumption that resource conflicts between multiple users are unlikely, and allows transactions to execute without using locks. Only when a user is attempting to change data are resources checked to determine if any conflicts have occurred. If a conflict occurs, the application must be restarted.

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