

Durability

by Sophia



WHAT'S COVERED

This lesson explores the durability property in a transaction and how it affects the database, in two parts. Specifically, this lesson will cover:

1. [Introduction](#)
2. [Durability Example](#)

1. Introduction

Durability is the last ACID property and one of the easiest to understand. This property focuses on ensuring that once the data from a transaction has been saved/committed to the database, it will stay in place and will not be affected by a system failure. This means that any completed transactions should be recorded and saved in memory.



TERM TO KNOW

Durability

A quality that ensures that once a transaction is committed, its effects are permanent and persist even in the face of system failures or crashes.

2. Durability Example

Once again, consider our banking example.

⇒ **EXAMPLE** Jennifer would like to make a \$100 payment to Randall through an account transfer. This transaction is a balance transfer between two accounts at two different branches of the same bank. Here's what the transaction looks like:

1. \$100 would be deducted from Jennifer's account at branch 10.
2. Branch 10's balance would be decreased by \$100.
3. Branch 50's account would be increased by \$100.

4. Randall's account would be increased by \$100.

Let us look at the transaction in SQL:

```
BEGIN;  
UPDATE customer_account  
SET balance = balance - 100  
WHERE account_id = 10;  
UPDATE branch_account  
SET balance = balance - 100  
WHERE branch_id = (SELECT branch_id FROM customer_account where account_id = 10);  
UPDATE branch_account  
SET balance = balance + 100  
WHERE branch_id = (SELECT branch_id FROM customer_account where account_id = 50);  
UPDATE customer_account  
SET balance = balance +100  
WHERE account_id = 50;  
COMMIT;
```

Once the transaction has successfully completed execution, the updates and changes to the database are stored in and written to the database. These changes will still persist even if the system fails, as those updates are now permanent. The effects of the account transfer will never be lost. Note that durability is only applied after the transaction and the COMMIT has been successfully executed. Anything that occurs prior to that is part of another ACID property.



SUMMARY

In this lesson, in the **introduction**, you learned that durability ensures that once a transaction has been committed, its effects persist even in the event of a system failure or crash. This property ensures that the changes made by a transaction won't be lost and will remain intact in the database. Providing this assurance ensures the safety and recoverability of users' data. Durability is ensured by transaction logs or journals that keep track of each transaction's changes. In case of a system failure, database management systems use this log to recover the database's state. This is accomplished by reapplying uncompleted transactions to the database to restore consistency.

In the **durability example**, you reviewed the scenario of a bank transfer where the system crashes immediately after the transaction is committed. Because of durability, the committed transaction remains intact, stored permanently and reliably.

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TERMS TO KNOW

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