HFSQL: THE NEW ISOLATION MODES OF TRANSACTIONS

The HFSQL engine allows you to manage an isolation mode for the transactions. The isolation mode defines how an application will read records which are in transaction in other applications.

This article presents the different isolation modes and proposes an example to understand these modes.

Example project

The project used to illustrate this topic is the "WD DemoTransaction" example.

Important: a HFSQL 19 server is required to use this example.

Reminder

A transaction is used to define a set of indissociable operations performed on the database.

If one of the operations fails, all the operations performed before must be canceled.

A simple example is a bank wire from account A to account B; we must be sure that the modification of the two accounts is effective.
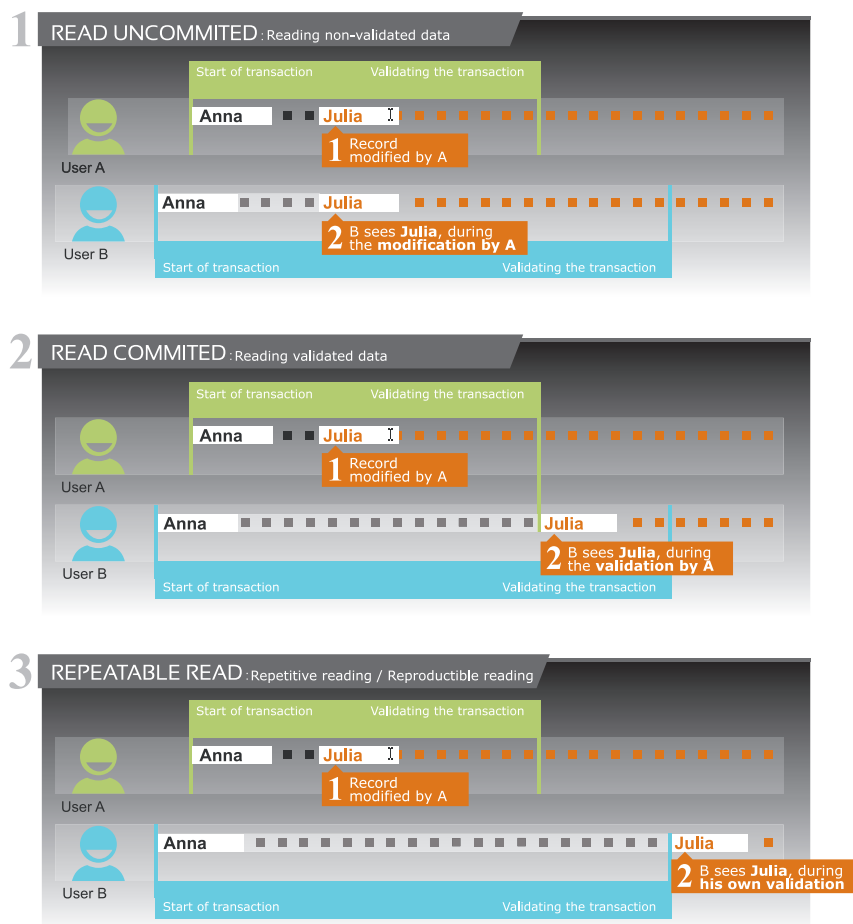
Isolation modes

Begining with version 19, HFSQL allows you to manage the isolation modes.

The isolation mode defines how an application will read records which are in transaction in other applications.

4 isolation modes are available:
• Read uncommited,
• Read commited,
• Repeatable read.

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Important

The isolation mode is important even if your application is not using *HTransactionStart*. In fact, without explicit transaction, HFSQL behaves as if each HFSQL function was performed in a transaction: this is called the "AUTOCOMMIT" mode by the other databases.

Read uncommitted

The "Read uncommitted" mode lets your application **read the modifications of current transactions (not committed yet) in other applications**.

This is the default mode of versions 18 and earlier.

Read committed

The "Read committed" mode does not allow your application **to read the modifications of current transactions** (not committed yet) **in other applications.**

Repeatable read

In the "Repeatable read" mode, **the modifications of the other users are not visible (even if they have been committed) during the entire transaction**. Your transaction works on a snapshot of the database.

If the computer that performed the transactions reads the records again, it will read the values as they were at the start of its transaction.

Important

To use the "Repeatable Read" transactions, you must check "Allow the REPEATABLE READ transactions" in the properties of the data file.

Important

In this case, **the data file cannot be used by applications in version 18** (and earlier).

Practical example

To demonstrate the isolation modes, the "WD DemoTransaction" example proposes 2 configurations:

1. "**Reference transaction**" is the reference configuration.
This configuration is used to:
• read a record,
• start a transaction,
• modify the record,
• commit/rollback the transaction.

2. "**Isolation mode**" is the test configuration of the different isolation modes.
This configuration is used to:
• define the isolation mode,
• start a transaction (required for the "Repeatable read" mode only),
• read a record.

We are now going to present the operating mode of each isolation mode.

Read uncommitted

1. Start the **Reference transaction** application and:
• read the record,
• start a transaction,
• modify the first name to "Mark" without committing the transaction.

2. Start the **Isolation mode** application, choose the "READ UNCOMMITTED" mode and read the record: the value read corresponds to the value modified in the other application, even if the transaction was not validated.

Read committed

1. Start the **Reference transaction** application and:
• read the record,
• start a transaction,

• modify the first name to "Manu" without validating the transaction.

2. Start the **Isolation mode** application, choose the "READ COMMITTED" mode and read the record: the value read corresponds to the value before modification.

3. Validate the transaction in the **Reference transaction** application and read the value again in the **Isolation mode** application: the value corresponds to the modified value.

Repeatable read

1. Start the **Isolation mode** application and:
• choose the "REPEATABLE READ" mode,
• start the transaction,
• read the record.

2. Start the **Reference transaction** application and:
• read the record,
• start a transaction,
• modify the first name to "Leena"
• commit the transaction.

3. In the **Isolation mode** application, read the record again: the values are still the same. An application in "Repeatable Read" mode is not influenced by other applications while it is in a transaction.

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