

## RCSI – Read Committed Snapshot Isolation

### SI – Snapshot Isolation

use DBMS\_Lab3

go

Select \* from Authors

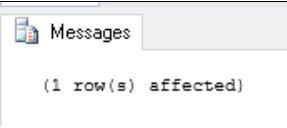
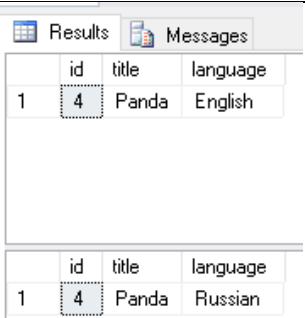
Select \* from Books

|   | id | name                          |
|---|----|-------------------------------|
| 1 | 4  | J.K. Rowling                  |
| 2 | 5  | transaction 2                 |
| 3 | 6  | Petre Ispirescu transaction 1 |
| 4 | 7  | test                          |

|    | id   | title                                   | language  |
|----|------|---|-----------|
| 1  | 4    | Panda                                   | English   |
| 2  | 7    | Codul lui Davinci                       | English   |
| 3  | 9    | Harry Potter and The Chamber of Secrets | English   |
| 4  | 10   | Insomnii                                | English   |
| 5  | 13   | transaction 2                           | English   |
| 6  | 20   | La ciresu transaction 1                 | Romani... |
| 7  | 21   | test                                    | test      |
| 8  | 27   | Sub dom                                 | French    |
| 9  | 32   | Baltagul                                | Chineza   |
| 10 | 33   | Bambi                                   | French    |
| 11 | 34   | Copii Capitanului Grant                 | English   |
| 12 | 1024 | Peter Pan                               | English   |
| 13 | 1025 | Peter Pan                               | English   |
| 14 | 1026 | Inferno                                 | English   |

Before each of the examples – the record from Books with the id 4 has to be set to language=English (to see the results)

Example for RCSI:

| Transaction 1   | Transaction 2  |
|---|--|
| <pre> --transaction 1 use DBMS_Lab3 go  BEGIN TRAN UPDATE Books SET language = 'Russian' WHERE id=4 waitfor delay '00:00:10' COMMIT TRAN </pre> | <pre> --transaction 2 Use DBMS_Lab3 go  BEGIN TRAN select * from Books where id=4 -- initial value = English waitfor delay '00:00:10' select * from Books where id=4 -- the new value Russian COMMIT TRAN </pre> |
|    |    |

Example for SI:

| Transaction 1                               | Transaction 2                              |
|---|--|
| <pre> -- transaction 1 use DBMS_Lab3 </pre> | <pre> --transaction 2 Use DBMS_Lab3 </pre> |

```
go

BEGIN TRAN
UPDATE Books SET language = 'Russian'
WHERE id=4
waitfor delay '00:00:10'
COMMIT TRAN
```

Messages

(1 row(s) affected)

go

```
SET TRANSACTION ISOLATION LEVEL SNAPSHOT
BEGIN TRAN
select * from Books where id=4
-- initial value = English
waitfor delay '00:00:10'
select * from Books where id=4
-- the value committed at the beginning of
the transaction = English
COMMIT TRAN
select * from Books where id=4
-- the new value Russian
```

Results

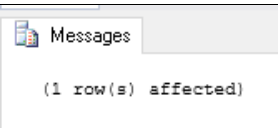
Messages

|   | id | title | language |
|---|----|-------|----------|
| 1 | 4  | Panda | English  |

|   | id | title | language |
|---|----|-------|----------|
| 1 | 4  | Panda | English  |

|   | id | title | language |
|---|----|-------|----------|
| 1 | 4  | Panda | Russian  |

### Example - Update conflicts

| <pre> ALTER DATABASE DBMS_Lab3 SET ALLOW_SNAPSHOT_ISOLATION ON ALTER DATABASE DBMS_Lab3 SET READ_COMMITTED_SNAPSHOT ON </pre>  |   |
|--|---|
| Transaction 1  | Transaction 2   |
| <pre> -- transaction 1 use DBMS_Lab3 go  waitfor delay '00:00:10' BEGIN TRAN UPDATE Books SET language = 'Israel' WHERE id=33; -- language is now Israel waitfor delay '00:00:10' COMMIT TRAN </pre> | <pre> --transaction 2 Use DBMS_Lab3 go  SET TRANSACTION ISOLATION LEVEL SNAPSHOT BEGIN TRAN Select * from Books where id=33 -- Bambi - French - the value from the beginning of the transaction Waitfor delay '00:00:10' select * from Books where id=4 -- the value from the beginning of the transaction - Panda-English Update Books set language='Portugues' where id=33 -- process will block -- Process will receive Error 3960. COMMIT TRAN </pre> |
|  <p>(1 row(s) affected)</p>   | <pre> (1 row(s) affected)   (1 row(s) affected) Msg 3960, Level 16, State 3, Line 13 Snapshot isolation transaction aborted due to update conflict. You cannot use snapshot isolation to access table 'dbo.Books' direc </pre>  |
| <pre> ALTER DATABASE DBMS_Lab3 SET ALLOW_SNAPSHOT_ISOLATION OFF ALTER DATABASE DBMS_Lab3 SET READ_COMMITTED_SNAPSHOT OFF </pre>  |   |

Msg 3960, Level 16, State 3, Line 13

Snapshot isolation transaction aborted due to update conflict. You cannot use snapshot isolation to access table 'dbo.Books' directly or indirectly in database 'DBMS\_Lab3' to update, delete, or insert the row that has been modified or deleted by another transaction. Retry the transaction or change the isolation level for the update/delete statement.