

Concurrency Example – SQL Server

committed snapshot isolation = **RCSI**

Transaction 1	Transaction 2	Transaction 3
<pre>-- transaction 1 use DBMS_Lab3 -- use a trigger to enforce a variation of a foreign key constraint, but one that enforces the relationship for only certain child table rows: ALTER DATABASE DBMS_Lab3 SET READ_COMMITTED_SNAPSHOT ON WITH ROLLBACK IMMEDIATE; GO SET TRANSACTION ISOLATION LEVEL READ COMMITTED; GO CREATE TABLE dbo.Parent (ParentID integer PRIMARY KEY); GO CREATE TABLE dbo.Child (ChildID integer IDENTITY PRIMARY KEY, ParentID integer NOT NULL, CheckMe bit NOT NULL); GO CREATE TRIGGER dbo.Child_AI ON dbo.Child AFTER INSERT AS BEGIN -- Child rows with CheckMe = true must have an associated parent row IF EXISTS (SELECT ins.ParentID FROM inserted AS ins</pre>	<pre>use DBMS_Lab3 -- transaction 2 SET TRANSACTION ISOLATION LEVEL READ COMMITTED; BEGIN TRANSACTION; waitfor delay '00:00:10' DELETE FROM dbo.Parent WHERE ParentID = 1; COMMIT TRANSACTION; SELECT P.* FROM dbo.Parent AS P; SELECT C.* FROM dbo.Child AS C; -- For our child won't be any parent</pre>	<pre>-- transaction 3 use DBMS_Lab3 -- avoid the problems, when RCSI is enabled, a lock is requested by using the table hint READ COMMITTED LOCK ALTER TRIGGER dbo.Child_AI ON dbo.Child AFTER INSERT AS BEGIN -- Child rows with CheckMe = true -- must have an associated parent row IF EXISTS (SELECT ins.ParentID FROM inserted AS ins WHERE ins.CheckMe = 1 EXCEPT SELECT P.ParentID FROM dbo.Parent AS P WITH (READCOMMITTEDLOCK) -- NEW!!) BEGIN RAISERROR ('Integrity violation!', 16, 1); ROLLBACK TRANSACTION; END END;</pre>

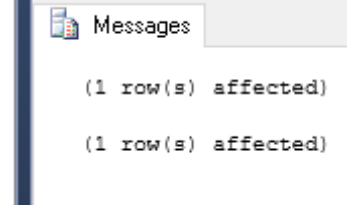
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WHERE ins.CheckMe = 1
EXCEPT
SELECT P.ParentID
FROM dbo.Parent AS P
)
BEGIN
RAISERROR ('Integrity violation!', 16, 1);
ROLLBACK TRANSACTION;
END
END;
GO
-- Insert parent row #1
INSERT dbo.Parent (ParentID) VALUES (1);

waitfor delay '00:00:05'

INSERT dbo.Child (ParentID, CheckMe) VALUES (1, 1);

```



Results Messages

ParentID

	ChildID	ParentID	CheckMe
1	1	1	1
2	2	1	1

Query executed successfully.

Editor Results Messages

ParentID

No row!

	ChildID	ParentID	CheckMe
1	1	1	1

References:

<https://sqlperformance.com/2014/05/t-sql-queries/read-committed-snapshot-isolation>