

Soluciones al problema 2

2.1.

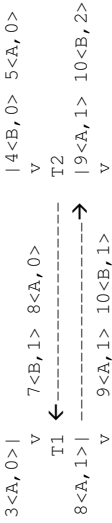
Historia (hay otras igualmente válidas):

- 1 T1 BEGIN
- 2 T2 BEGIN
- 3 T1 READ A
- 4 T2 READ B
- 5 T2 READ A
- 6 T2 WRITE B
- 7 T1 READ B
- 8 T1 WRITE A
- 9 T2 READ A
- 10 T2 WRITE B
- 11 T1 COMMIT
- 12 T2 ROLLBACK

Violaciones de aislamiento:

Lectura no repetitiva: pasos 5, 8 y 9.
Lectura sucia: pasos 6, 7 y 10.
No son posibles actualizaciones perdidas.

Diagrama:



2.2.

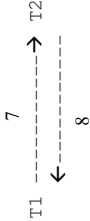
Transacciones protegidas (hay otras igualmente válidas):

- T1 BEGIN
- T1 XLOCK A
- T1 READ A
- T1 SLOCK B
- T1 READ B
- T1 WRITE A
- T1 COMMIT
- T2 BEGIN
- T2 XLOCK B
- T2 READ B
- T2 SLOCK A
- T2 WRITE B
- T2 READ A
- T2 WRITE B
- T2 ROLLBACK

Historia con interbloqueos (hay otras igualmente válidas):

- 1 T1 BEGIN
- 2 T2 BEGIN
- 3 T1 XLOCK A
- 4 T2 XLOCK B
- 5 T1 READ A
- 6 T2 READ B
- 7 T1 SLOCK B
- 8 T2 SLOCK A
- (interbloqueo)

Diagrama:



2.3. Historia sin interbloques, por ejemplo, historia serie:

| | TxRPC | ORIGEN | DESTINO | RESULTADO |
|-------------|----------------|--------|---------|--------------|
| T1 BEGIN | BeginTx | PT | TM | TrId |
| T1 XLOCK A | Xlock A | PT | RMA | OK** |
| | JoinTx | RMA | TM | OK |
| | Xlock A | RMA | LockM | OK |
| T1 READ A | Read A | PT | RMA | valor de A |
| T1 SLOCK B | Slock B | PT | RMB | OK** |
| | JoinTx | RMB | TM | OK |
| | Slock B | RMB | LockM | OK |
| T1 READ B | Read B | PT | RMB | valor de B |
| T1 WRITE A | Write A | PT | RMA | OK* |
| | Writelog | RMA | LogM | OK |
| T1 COMMIT | Commit | PT | TM | OK**** |
| | Prepare2Commit | TM | RMA | Ready2Commit |
| | Prepare2Commit | TM | RMB | Ready2Commit |
| | CommitRecord | TM | LogM | OK |
| | Commit | TM | RMA | Complete* |
| | UnlockA | RMA | LockM | OK |
| | Commit | TM | RMB | Complete* |
| | Unlock B | RMB | LockM | OK |
| T2 BEGIN | CompleteRecord | TM | LogM | OK |
| | BeginTx | PT | TM | TrId |
| | Xlock B | PT | RMB | OK** |
| T2 XLOCK B | JoinTx | RMB | TM | OK |
| | Xlock B | RMB | LockM | OK |
| T2 READ B | Read B | PT | RMB | valor de B |
| T2 SLOCK A | Slock A | PT | RMA | OK** |
| | JoinTx | RMA | TM | OK |
| | Slock A | RMA | LockM | OK |
| T2 WRITE B | Write B | PT | RMB | OK* |
| | Writelog | RMB | LogM | OK |
| T2 READ A | Read A | PT | RMA | valor de A |
| | Writelog | RMA | LogM | OK |
| T2 WRITE B | Write B | PT | RMB | OK* |
| | Writelog | RMB | LogM | OK |
| | Rollback | PT | TM | OK**** |
| | Rollback | TM | RMA | OK* |
| | UnlockA | RMA | LockM | OK |
| | Rollback | TM | RMB | OK**** |
| | Write(undo)B | RMB | LogM | OK |
| | Write(undo)B | RMB | LogM | OK |
| T2 ROLLBACK | Unlock B | RMB | LockM | OK |

* Responde después de la finalización del TxRPC siguiente.

** Responde después de la finalización de los dos TxRPC siguientes.

*** Responde después de la finalización de los tres TxRPC siguientes.

**** Responde después de la finalización de todos los TxRPC siguientes en la casilla.

PT: Programa Transaccional. TM: Transaction Manager

RMA, RMB: Resource Managers A y B.

LockM: Lock Manager. LogM: Log Manager.