ANSI SQL Isolation Levels

A Summary of the Original Paper
«A Critique of ANSI SQL Isolation Levels»
with concrete SQL-DML Examples

12/01/2014 by Stefan Lütolf
Contents

• Introduction (chapter 1)
• Isolation Level Concepts (chapter 2)
• Analysis and Simulation (chapter 3)
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• Introduction
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Introduction

Topic: ANSI SQL Isolation Level

• Paper summary “A Critique of ANSI SQL Isolation Levels”
• Simple SQL-DML examples (Simulation)
Contents

• Introduction
• Isolation Level Concepts
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Isolation Level Concepts

• “Conflict” Serializability Concepts
• Phenomena
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Analysis and Simulation
“Dirty Read”

A1: w1[x]... r2[x]... (a1 and c2 in either order).

H1: r1[x=50] w1[x=10] r2[x=10] r2[y=50] c2 r1[y=50] w1[y=90] c1

P1: w1[x]... r2[x]... ((c1 or a1) and (c2 or a2) in any order)

• Simulation (demo)
Analysis and Simulation
“Non-repeatable Read”

**A2**: r1[x]... w2[x]... c2 ... r1[x] ... c1

**H2**: r1[x=50] r2[x=50] w2[x=10] r2[y=50] w2[y=90] c2 r1[y=90] c1

**P2**: r1[x]... w2[x]... ((c1 or a1) and (c2 or a2) in any order)

- Simulation (demo)
Analysis and Simulation
“Phantom”

A3: r1[P]... w2[y in P]... c2 ... r1[P] ... c1

H3: r1[P] w2[y in P] r2[z] w2[z] c2 r1[z] c1
(z is the number of items in P)

P3: r1[P]... w2[y in P]... ((c1 or a1) and (c2 or a2) in any order)
Analysis and Simulation

“Summary”

Isolation Levels

- Serializable
- Repeatable Read
- Read Committed
- Read Uncommitted

P1
P2
P3
Discussion

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