

Dropping ACID

a new look at databases and transactions

by

C. J. Date

ABSTRACT

Here are some questions that any database professional should be able to answer almost without thinking:

1. What exactly *is* a database?
2. What is the most important property a database should possess?
3. When should integrity constraints be checked?
4. What are the ACID properties of a transaction?

It is the speaker's contention, however, that there's more to these questions--or less, depending on your point of view!--than meets the eye. In fact, empirical evidence, gathered over many years, strongly suggests that a majority of database professionals are *not* able to give good answers to Questions 1, 2, or 3, even though most will happily give quite a lengthy response to Question 4. It's therefore interesting to observe that finding the "right" answer to Question 4 relies on finding the "right" answers to Questions 1, 2, and 3. What's more, the "right" answer to Question 4 (in the speaker's opinion) is not the one usually given; in fact, that "right" answer is somewhat at odds with conventional wisdom.

The purpose of this presentation is to explore the foregoing issues in some detail. It offers possibly novel answers to Questions 1, 2, and 3. It then goes on to examine the ACID properties (Question 4) in the light of those answers, and concludes that, while ACID might be a nice acronym, the concepts it represents don't really stand up to close examination. To be more specific:

- The "A" property (*atomicity*) might be pragmatically useful, but it's not logically required.

- If the "C" property is *consistency*, it's trivial; if it's *correctness*, it's unenforceable. In fact, the "C" property isn't really a property at all but merely a desideratum.
- The "I" property (*isolation*) is likewise merely a desideratum; it's unenforceable, even if all transactions execute at the maximum level of isolation.
- The "D" property (*durability*) isn't an ironclad guarantee, either.

These conclusions are clearly somewhat counter to orthodox opinion! Please note clearly, therefore, that they're *not* meant as an attack on the vast amount of excellent research that has been done on transaction management over the past 30 years or so, nor on the many elegant and useful results that have been obtained from that research. Rather, they're offered in an attempt to improve our understanding of some of the issues that lie at the very foundations of our field.

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Duration: 1-1½ hours.

Prerequisites: Attendees will be expected to be professionally interested in database technology.