

# Scalable and Quantitative Contention Generation for Performance Evaluation on OLTP Databases

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# Problems & Ideas

- Critical transaction processing requirements
  - Innovative databases or optimized traditional databases -> SecKill.
    - High Concurrency.
    - High Contention.
- Ideas: The new method.
  - Contention status is defined by Contention Ratio CR and Contention Intensity CI.
    - CR: the ratio of contention transactions to the whole transaction set.
    - CI : the number of transactions contending to each other for the same resource at the same time.



# Main Contributions

- Scalability
  - Two kinds of contention generation modes.
- Fine-grained
  - Three levels of contention granularity.

# Scalability

- Two kinds of contention generation **modes**.
  - In *gMode*, CR/CI is an average value calculated by the number of contention transactions to the whole workload set.
  - In *IMode*, CR/CI is calculated by the number of real-time contention transactions to current transaction set.

# Fine-grained

- Three levels of contention granularity.
  - Lev1: Contention on Table(*CoB*).
  - Lev2: Contention on Transaction(*CoT*).
  - Lev3: Contention on Transaction to Transaction(*CoT<sup>2</sup>*).

# Main Contributions

- Design a scalable quantitative contention generation method with fine contention granularity control.
- Designed two iterative algorithms to simulate transaction contentions.
- Our method can be widely used for OLTP database testing and performance evaluation or optimization.