

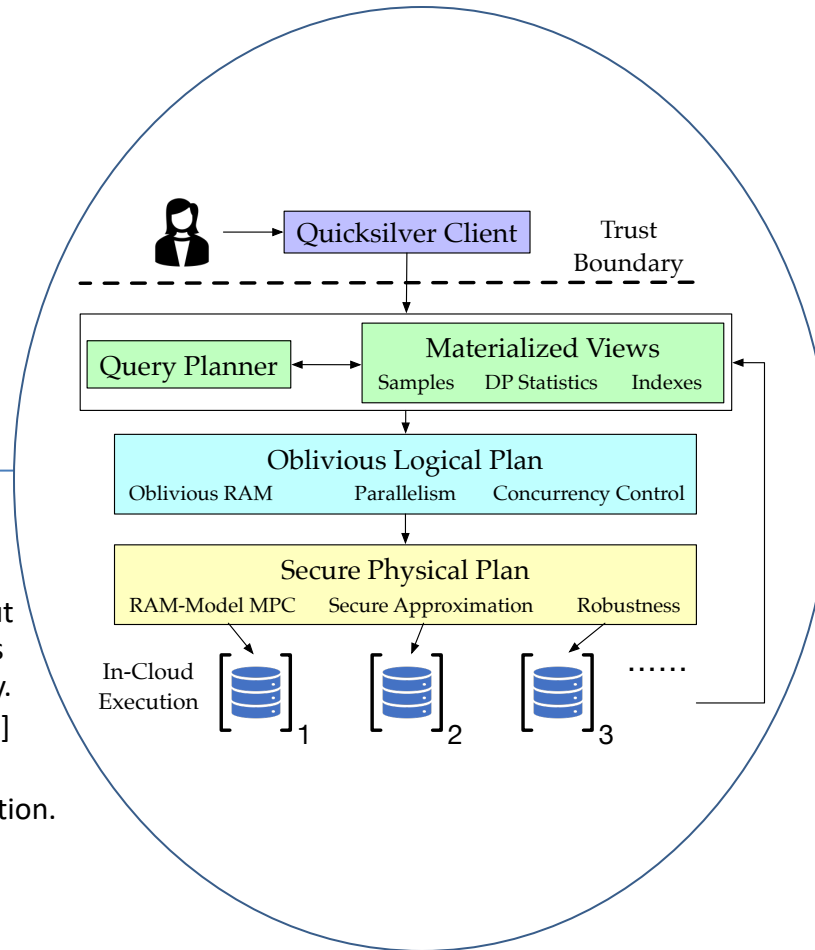
Quicksilver: A Write-Oriented Private, Outsourced Database Management System

Challenge:

- Database systems for business and personal use are increasingly outsourcing their database ops to cloud service providers
- Need strong security and privacy guarantees and good efficiency
- Databases need to support reads and writes

Solution:

- Developed Batch-Synthesize-Layout paradigm for updatable databases using MPC and Differential Privacy. Published DP-Sync [SIGMOD 2021] and IncShrink [SIGMOD 2022].
- Developed ZK proofs for computation. Quicksilver (CCS 2021, best paper runner up).



Scientific Impact:

- Creating a hybrid transaction/analytics processing system for diverse database workloads
- Building a unified understanding of data management in untrusted settings

Broader Impact and Broader Participation:

- Towards practical, secure and trustworthy cloud DB ops
- Study on usable differential privacy revealed opportunities for adoption
- Crypto Mentoring Series (9K views)