MorphDAG:
Elastic DAG-based Blockchains at Scale

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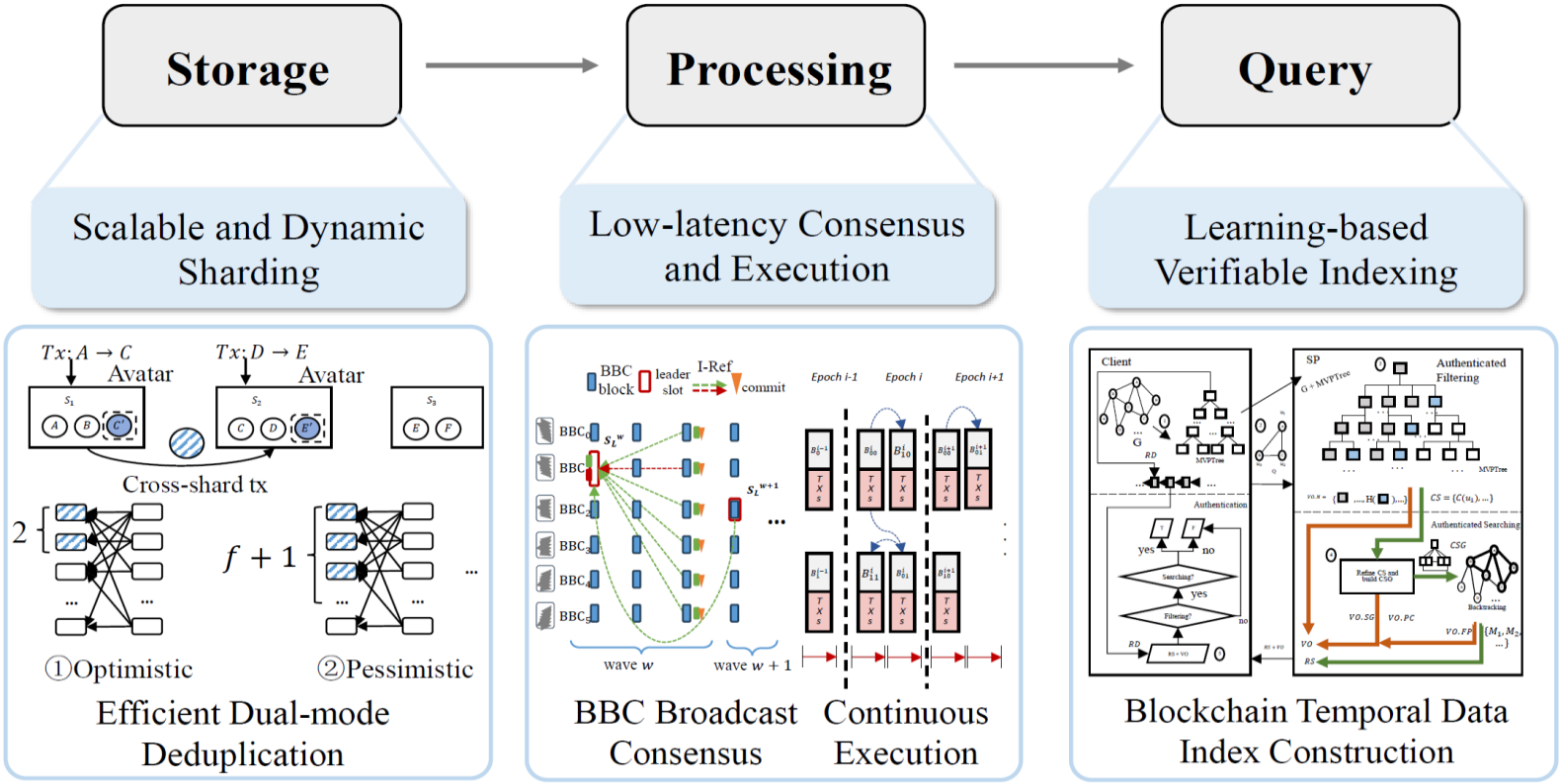
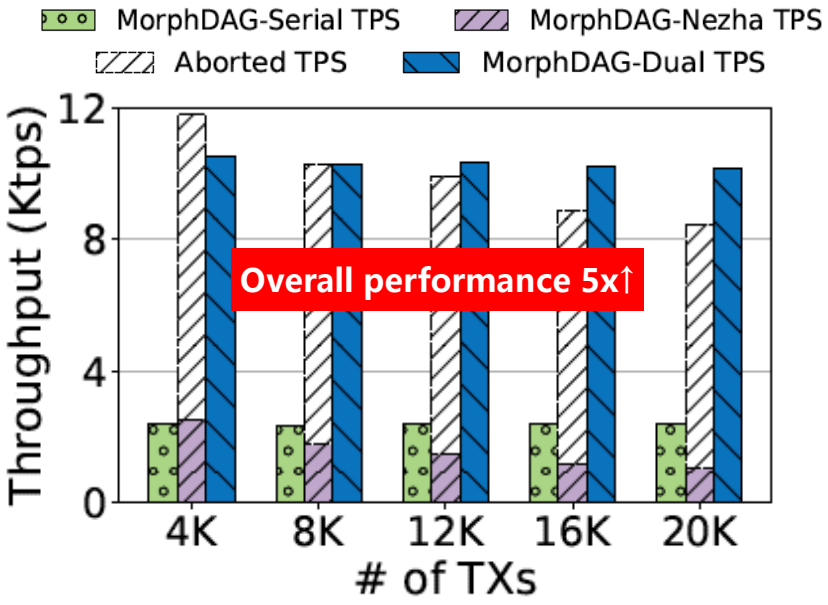
Problems & Ideas

- Problems of conventional DAG-based blockchains:
  - Concurrent transactions result in duplicate storage, inefficient execution, and high query latency
- Idea
  - An elastic DAG-based blockchain system with dynamic sharding storage scheme, low-latency consensus and execution, and efficient learning-based query mechanism



Main Contributions

- To the best of our knowledge, this work presents the first **elastic DAG-based blockchain storage system**:
  - A novel dynamic sharding mechanism that supports an efficient and secure dual-mode cross-shard communication protocol
  - A high-performance consensus module that adopts lightweight broadcast and an execution engine optimized for handling duplicate transactions
  - An efficient learning-based indexing framework for blockchain data queries



Overall performance of MorphDAG compared with state-of-the-art