BBSF: Blockchain Benchmarking Standardized Framework

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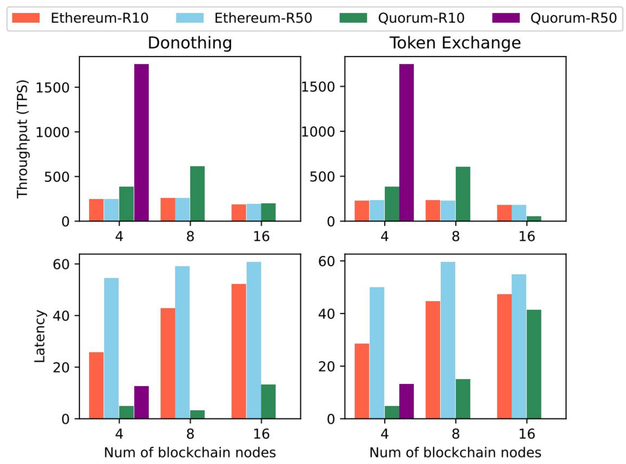
Problem Statement

- Blockchain benchmarks are “in-house”, non-standardized benchmarks
- Blockchain organizations’ claimed results
  - **Ethereum**: 15 TPS (Transactions Per Second)
  - **Solana**: 29,000 TPS
  - **Algorand**: 1000 TPS
- Results are not comparable to each other
  - How is “transaction” defined?
  - What workloads were these results measured under?
  - What runtime environment and hardware was used?

Implementation: Blockbench v3

- A blockchain benchmark focused around web3 applications composed of 4 workloads with a range of transaction types, arrival distributions, and metrics
- Token Exchange
  - Trading tokens, supplying liquidity, and withdrawing liquidity
- NFT Marketplace
  - Listing, bidding, and exchanging of NFTs
- NFT Minting
  - Minting NFTs
- Sports Betting
  - Paying out the winners after a completed game

Preliminary Results



Blockchain Benchmarking Issues

- A transaction can represent many things
  - Sending tokens
  - Invoking smart contract
  - Minting tokens
- Finality - When is a transaction complete? A transaction has a statistical probability of being done after so many blocks, when do we measure its completion?
- Blockchains are decentralized and thus open to attacks, important to find a way to measure the “robustness” of a system

Our Solution: BBSF

- A standardized framework for developing blockchain benchmarks
- Workload Framework
  - Definition of transaction
  - Explicit workload size, transaction mix, arrival distribution
  - Standardized micro-metrics
- Standardized Metrics
  - Ensure that all metrics create comparable results
  - Micro metrics that compose macro metrics
- Driver to run workloads and aggregate measurements
- Standardized reporting format for easy comparison of results

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