FaaSTCC: Efficient transactional causal consistency for serverless computing

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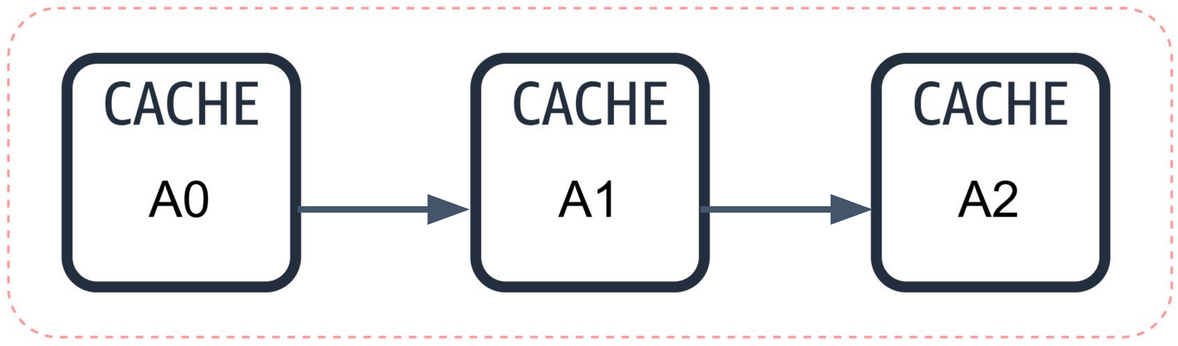
1. Motivation

- **Function-as-a-Service (FaaS)** provides **high scalability to applications** by **disaggregating computation from storage**;
- Disaggregation imposes functions to be **stateless**, requiring constant contact with the storage layer, **increasing latency response times**.
- **Caches** may be added to the computational layer, but **achieving consistency** along **multiple caches** is **not trivial**.

2. Cache Consistency

- Different caches may have **inconsistent versions**, leading to **inconsistent results** for DAGs that spread multiple caches;
- Caches must coordinate to read from the **same, consistent snapshot**;



3. Promises

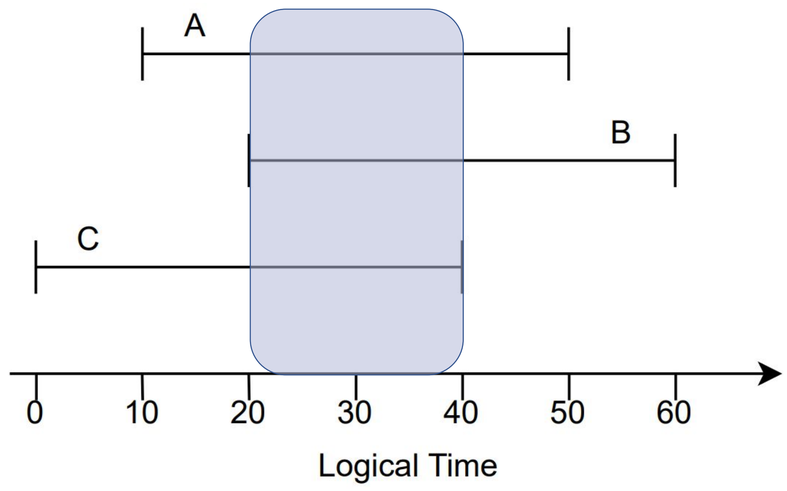
- Promises set an horizon on the cached versions where the values are still consistent, **allowing for consistency validation** of values given a snapshot;
- However, choosing transaction snapshots early may lead to **cache underutilization**;

Cache			
Key	Value	Version	Promise
A	500	10	50
B	600	20	60

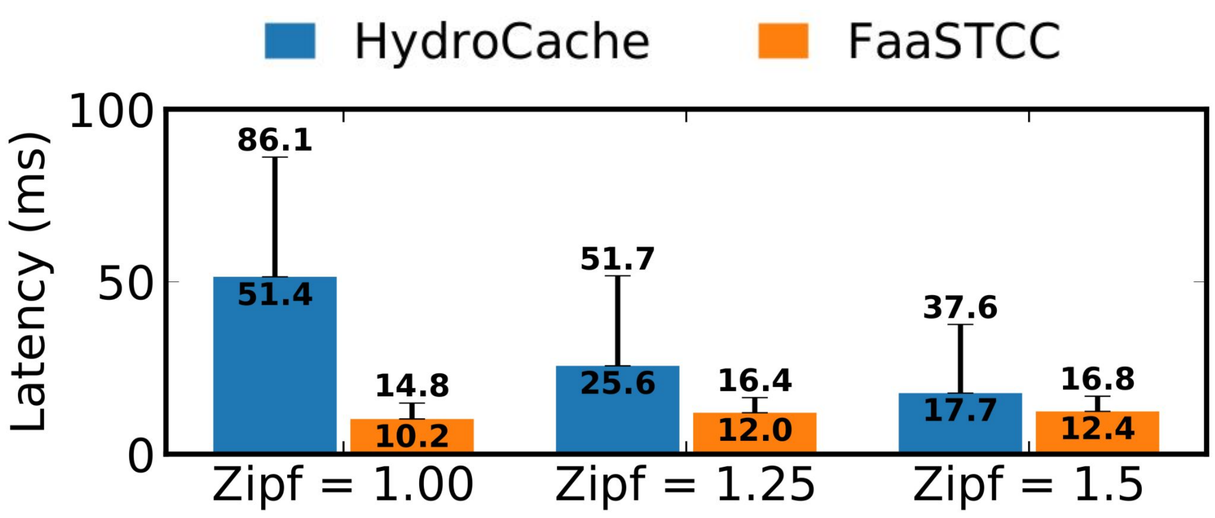
4. Snapshot Intervals

- Instead of choosing a snapshot at transaction start, clients discover the **interval of consistent values** for the transaction;

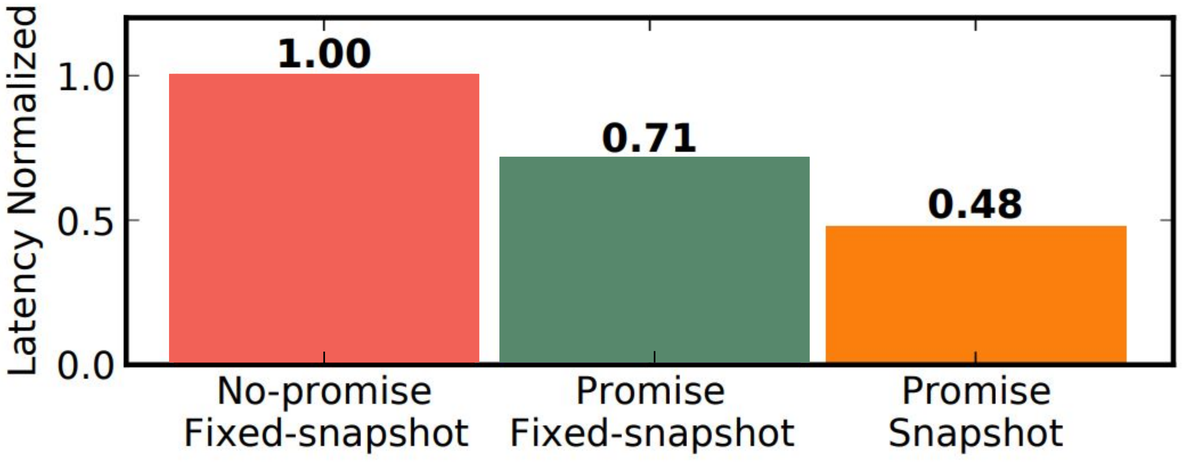
Snapshot Interval: **[20, 40]**



5. Experimental results



FaaSTCC provides 5x better performance than state-of-the-art



Both Promises and Snapshot Intervals are key for optimal performance

6. Acknowledgments

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