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Dalea: A Persistent Multi-Level Extendible Hashing with Improved Tail Performance

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Research Objectives

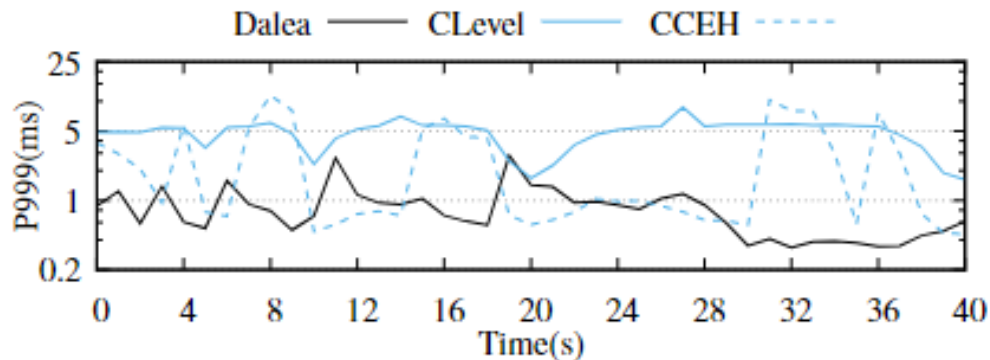
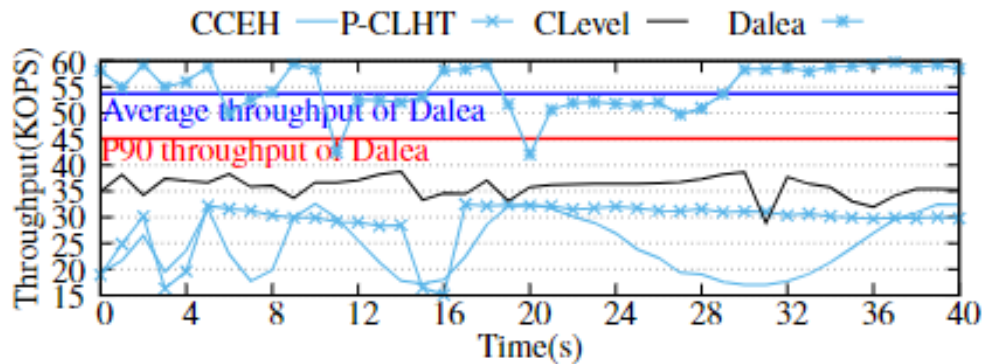
- Existing persistent hashing working on persistent memory targets achieving high average performance.
- Tail performance is also important but is not well optimized by existing works.

Research Method

- Tail performance is significantly determined by rehashing granularity and concurrency.
- We propose multi-level extendible hashing to enable fine-grained rehashing without sacrificing average performance.
- We use volatile locks to further improve tail performance.

Research Results

- Dalea is able to achieve 4.1x higher tail throughput and 5.4x lower tail latency.



Research Conclusions

- Fine-grained rehashing can greatly improve tail latency.
- Volatile locks can improve both tail throughput and tail latency.
- Fingerprinting mainly benefits average performance instead of tail performance.