Hewlett-Packard Laboratories

FOEDUS: OLTP Engine for 1,000 Cores and NVRAM

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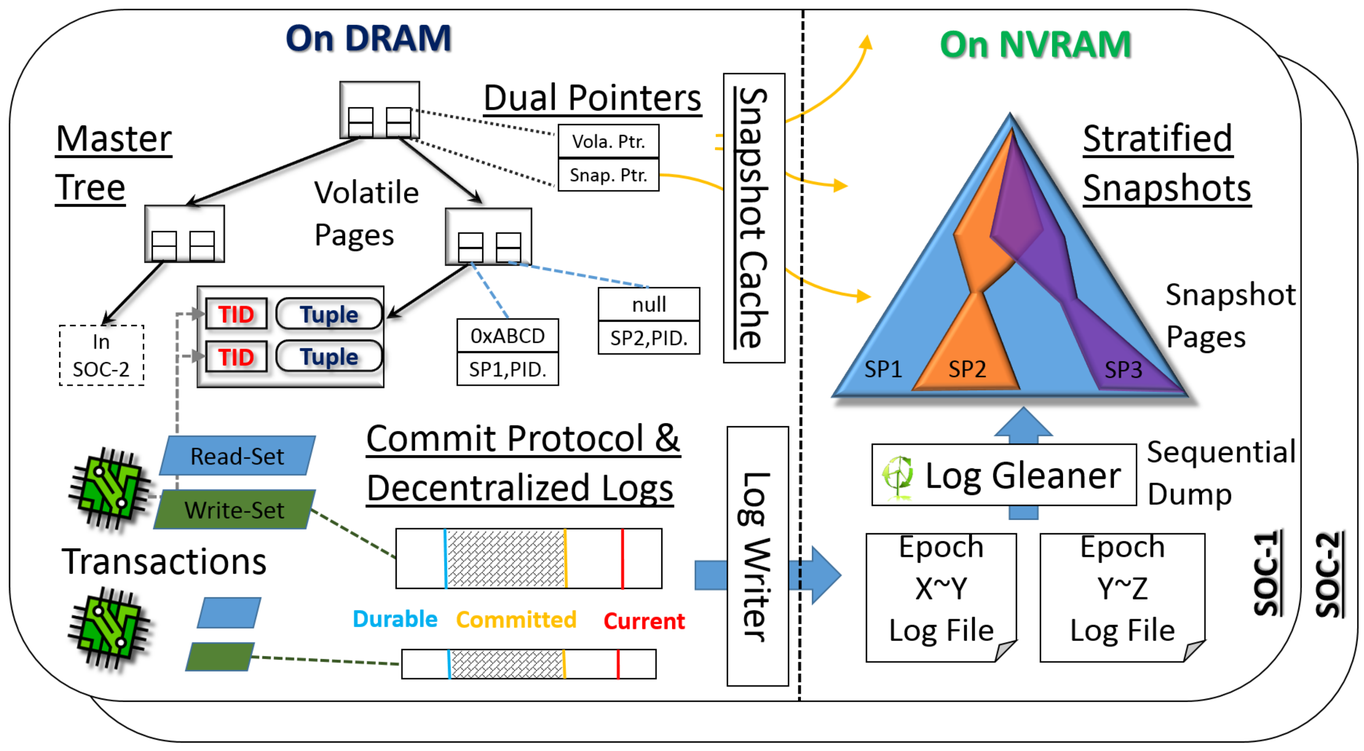
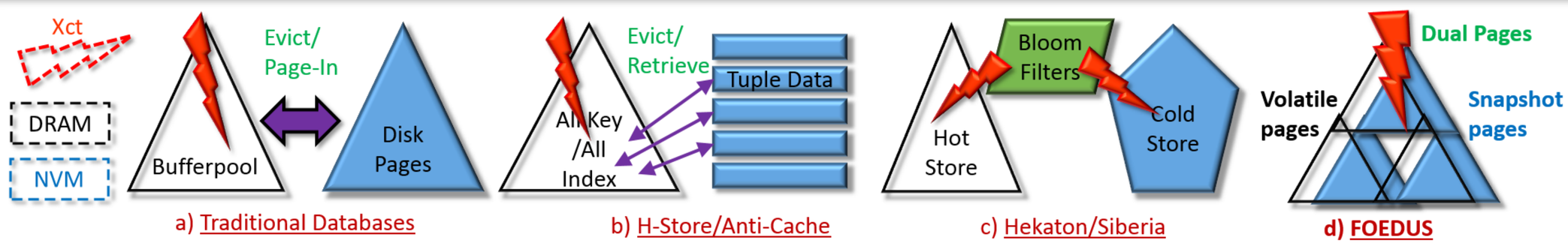
FOEDUS is a New Database Kernel for Next-Gen Servers

- Extreme Scalability via Extreme Decentralization
- Super-Lightweight Optimistic Concurrency Control (OCC)
- Master-Tree, a Novel B-tree Devised for OCC and NVRAM
- Fully ACID, yet Scalable



Dual Pages: Logically Equivalent, Physically Independent

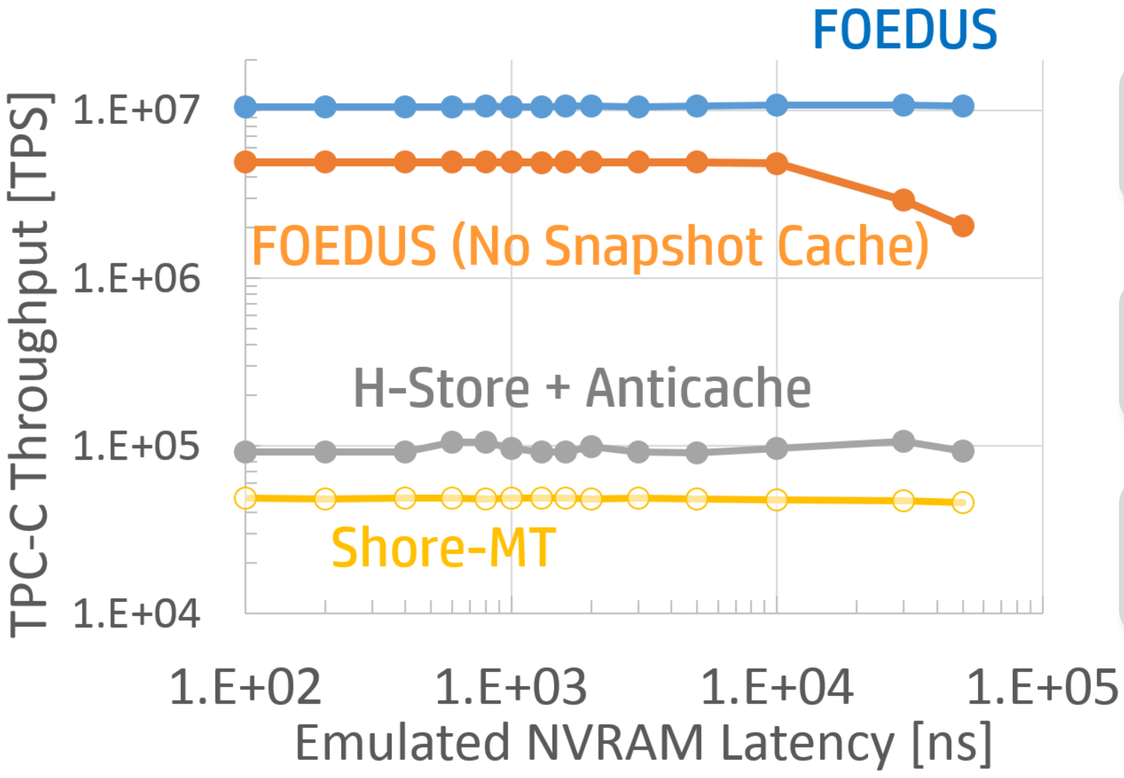


Duality of Volatile/Snapshot Pages

- Mutable Volatile Pages on DRAM
- Immutable Snapshot Pages on NVRAM
- Independent, but 1:1 Correspondence

Stratified Snapshots

- Serializable Transactions touch Single Version of Data Pages
- Immutability Speeds Up OCC
- Large Sequential Writes to NVRAM



Orders of magnitude faster than state-of-the-art on HP Superdome X (240 cores).

80x faster than the current TPC-C **World Record** (Oracle on SPARC T5)

Performs best when NVRAM latency **<10us**
⇒ **Fully Utilize NVRAM's Potential**

open source

http://github.com/hkimura/foedus

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