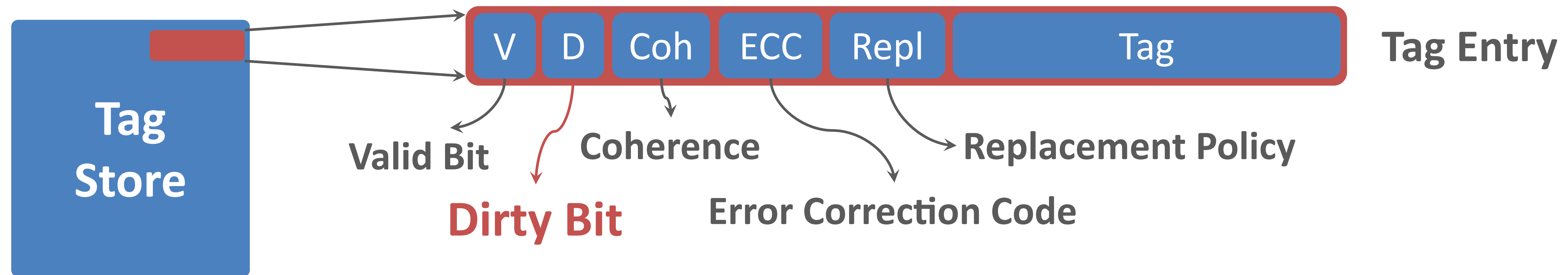


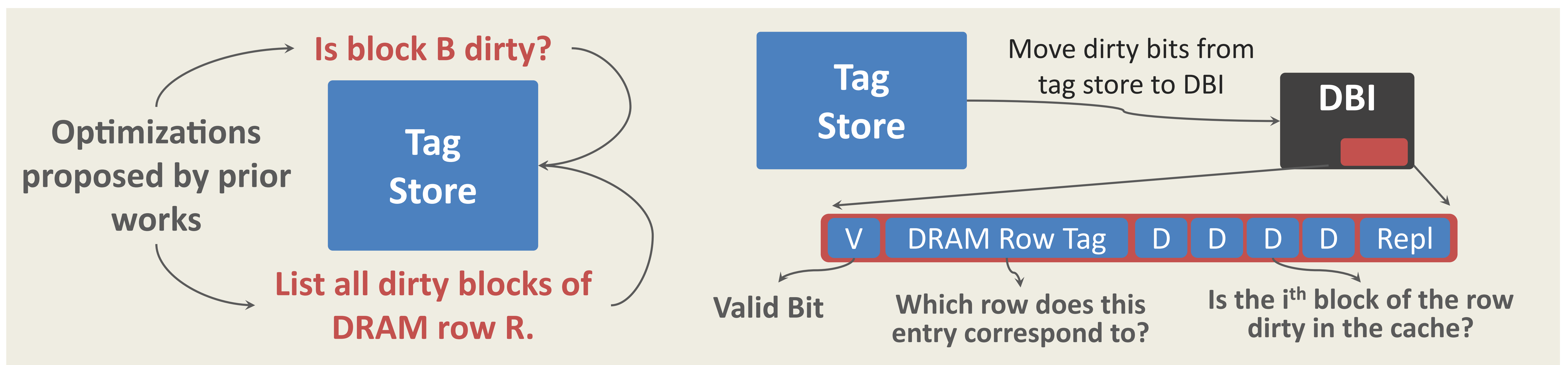
The Dirty-Block Index

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[ISCA '14]



Problem – Any metadata query requires a **high latency/energy tag store lookup**

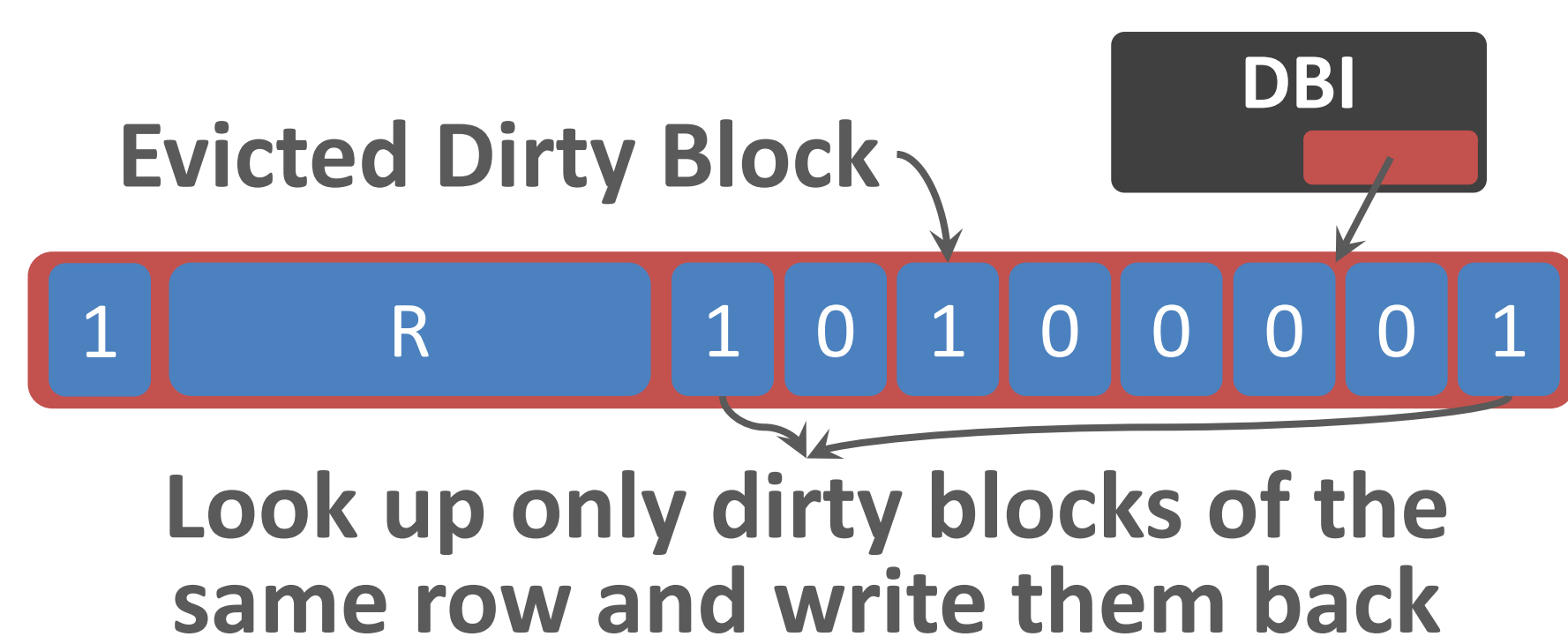


Aggressive DRAM-aware Writeback

- Writes are buffered and served together
- Row hits faster/more efficient row misses

Writeback dirty blocks of same DRAM row together!

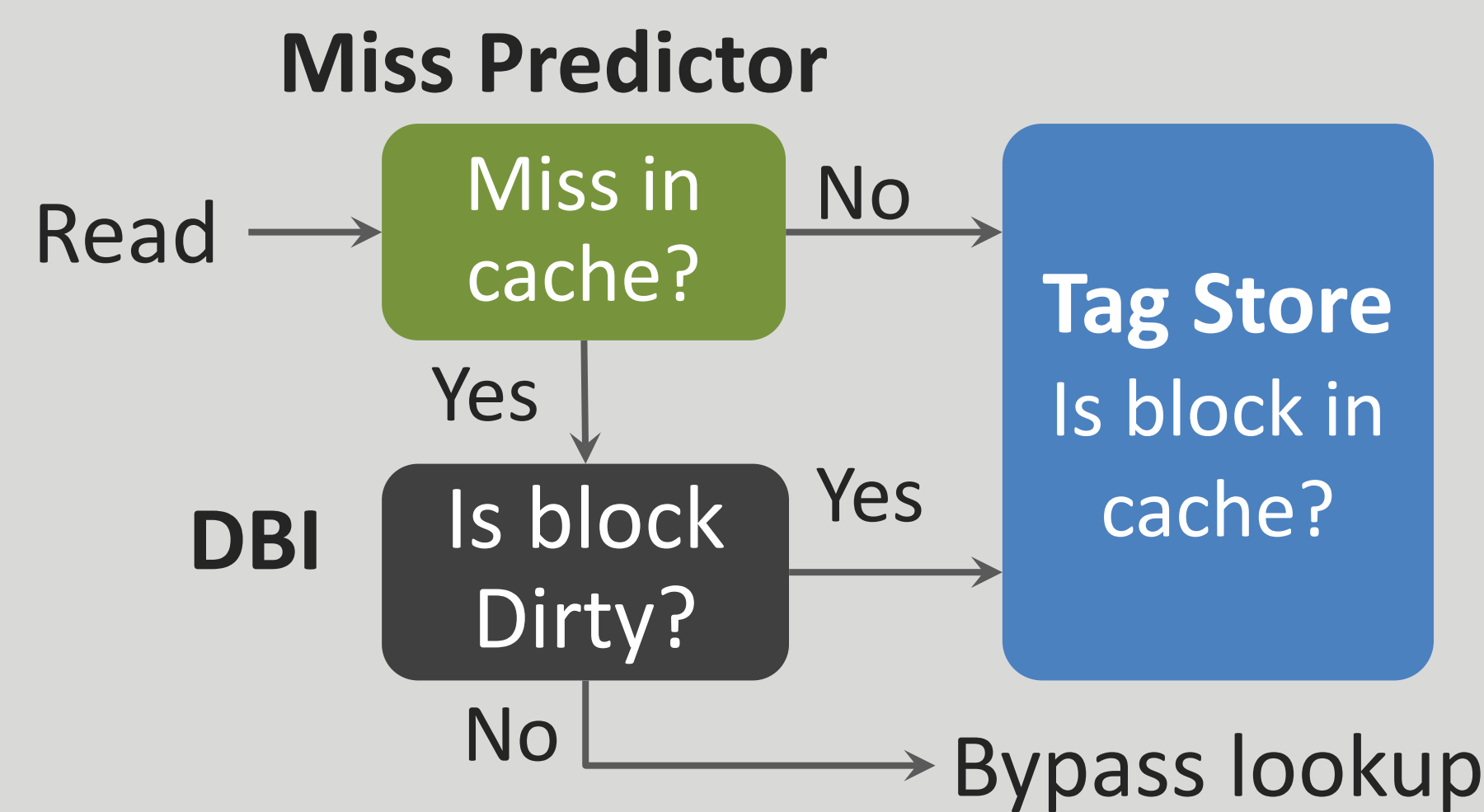
Problem with current organization: Several tag store lookups required



Cache Lookup Bypass

Bypass the lookup for an access that is likely to miss in the cache!

Problem with current organization: Cannot bypass lookup for dirty block



Reducing ECC Overhead

Store ECC only for dirty blocks. Store only EDC for clean blocks!

Problem with current organization: Any cache block can be dirty



8% Reduction in Cache Area

**Load balancing accesses to cache and memory · Cache flushing (power down banks, persistent memory)
Efficient bulk DMA · Efficient memory write scheduling · Reducing metadata overhead for dirty blocks**

