

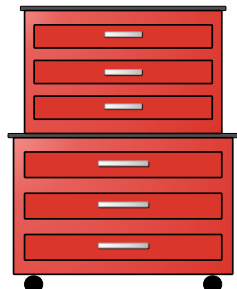


UNIVERSITY of ROCHESTER

Hybrid TM Using N0rec STM

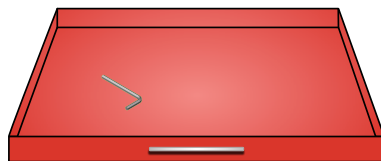
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Michael Scott, URCS

"Ideal" HTM



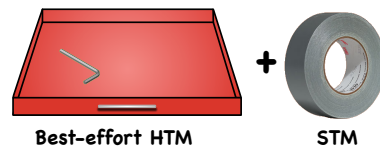
"Solves all your synchronization needs"

Best-effort (real) HTM



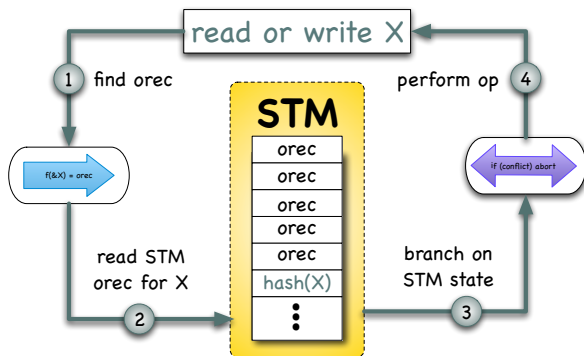
	Rock	ASF
TX loads?	L1 D\$	4\$ lines
TX stores?	32	4\$ lines
Fn calls?	sort of	yes
others?	?	?

Hybrid TM



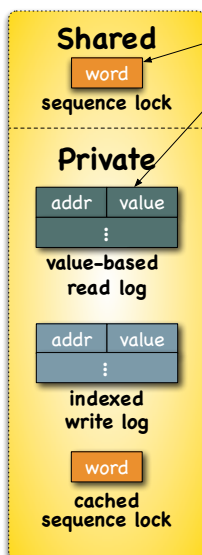
- (1) STM provides unbounded txns when needed.
- (2) SW txns run concurrently with HW txns.

Hybrid HW Instrumentation

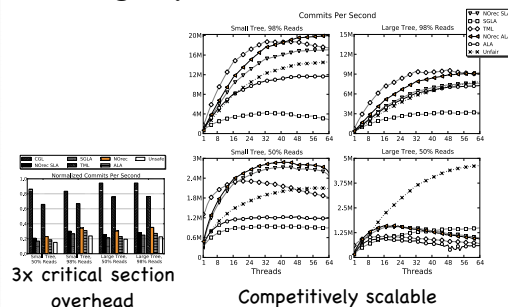


- (1) extra work on HW path
- (2) larger read sets
- (3) cache/predictor pollution

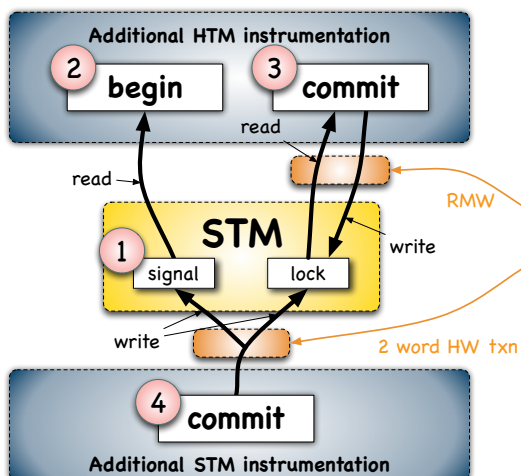
N0rec STM



- (1) single shared location
- (2) value-based validation
- (3) serialized writeback
- (4) high performance



N0rec Hybrid



- (1) small constant space overhead
- (2) no per-access HW instrumentation
- (3) SW txns tolerate HW commits
- (4) HW txns perform shared RMW
- (5) assume HW progress guarantees

- 1 STM metadata is extended with signal word
- 2 HW reads signal word; subscribes to SW commit notification
- 3 HW read-modify-write of lock notifies SW of HW commit
- 4 SW commit writes signal word; notifies concurrent HW txns