Theory for Transactional Memory

Opening Panel

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Transactional Memory Is Supposed to Make Things Simpler

- Raise the level of abstraction for synchronization
  - avoid common errors, performance anomalies
  - gain composability
  - maybe improve performance in some programs & systems, but that’s secondary

→ If TM is as complicated as locks (or monitors, or ...), then it probably has failed
All Sorts of Thorny Issues

- Basic issues: progress, memory model, speculation
- Permitted operations: nesting, concurrency, condition synchronization, irreversible operations
- Interaction w/ other mechanisms: exceptions, locks, larger (“system”) transactions, nontxnal accesses (publication/privatization)
- Pragmatic issues: early release, separate compilation, memory management, alternative implementations

★ We need a simple theory!