Toward Transactional Memory Workloads

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What Programming Languages?

- Answer #1: All of them!
- Answer #2: The most commonly used:

What TM System?

- Ours, of course!
- Wisconsin Multifacet GEMS 1.2
  - [http://www.cs.wisc.edu/gems](http://www.cs.wisc.edu/gems)
  - Simulates hardware transactional memory
- Three levels of detail, three levels of performance
  - Tourmaline--Serializer
    - Serializes transactions, 15X slowdown vs. a uniprocessor
  - Tourmaline--Functional
    - Interleaved execution, 1000X slowdown vs. a uniprocessor
  - Ruby--LogTM Timing
    - Timing accurate hardware simulation, 10,000X slowdown vs. a uniprocessor
How Many Processors?

• Lots!

• Cost/Performance is the bottom line
  – Speedup(P) > Costup(P) [IEEE Computer 1995]
  – Costup(P) = Cost(P)/Cost(1)
    • For CMPs, Costup(P) = 1!!!!

• Longer term question
  – Caches vs. Cores?
  – Is Performance(P + Δ,C - Δ') > Performance(P,C)?
  – Or, can you get more performance than 128K of cache?
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