Overview of Final Exam Topics

Final Exam Information

- Exam Time and Place:
  - Monday, May 9, noon-2:00 p.m.
  - 4030 SC
- Exam Details
  - Closed-book, closed notes—one 8.5” by 11” (one side) page of notes permitted
  - Exam is not comprehensive—will cover material since midterm
  - Format will be similar to midterm—perhaps slightly more conceptual
- Remember:
  - Better of midterm and final exam scores counts 35% toward final grade
  - Poorer of midterm and final scores counts 25%

Final Exam Coverage

- Lecture Notes:
  - Material beginning with Slide 60 of Sixth Lecture Note Set (VLIW)
- Text:
  - Appendix G (VLIW)
  - Chapter 3 (Limits to ILP, Thread-level Parallelism)
  - Appendix C (Memory Hierarchy)
  - Chapter 5, except section 5.4 (Memory Herarchy)
  - Chapter 4 (Multiprocessors)

Final Exam Topical Coverage

- VLIW
- Thread-level parallelism
  - Fine-grained
  - Coarse-grained
  - SMT
- Memory Hierarchy
  - Underlying principles
    - Locality
    - More reads than writes
  - Cache Memory
    - Basic notions: miss rates, miss penalties, etc
    - Cache organizations: direct-mapped, set-associative, fully associative
    - Replacement policies
    - Write policies
    - Miss rates: The three Cs
    - Multilevel caches
    - Calculating cache performance
    - Cache Optimizations

Final Exam Topical Coverage (continued)

- Main Memory Organization
  - Interleaving
- Virtual Memory
  - Virtual versus Physical Address Space
  - Paged virtual memory orgranization
  - Multi-level page tables
  - TLB
- Multiprocessors
  - Flynn's taxonomy
  - Multiprocessor Organization: Centralized versus distrib. Memory, SMT versus NUMA
  - Cache coherence
    - Snoopy cache coherence: MSI, MESI, MOSI
    - Directory-based coherence protocols (just the general concept)
    - The fourth C: Coherency misses

Final Exam Topical Coverage (continued)

- Case Studies
  - PPC 620
  - Intel P6
  - Intel Nehalem
  - Sun (Oracle) T1-T3