CoLT: Coalesced Large-Reach TLBs

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1. Address Translation Overhead
   • Nominally-sized applications: 10% - 15%1,2
   • Virtualization: 89%1,2

2. CoLT
   • OS allocates contiguous physical to virtual pages
   • Coalesce these contiguous translations

3. Real-System Contiguity
   • Buddy allocator, memory compaction, superpages
   • Exists even under high system load

4. CoLT Performance
   • 4 core, out-of-order processor, 128-entry ROB
   • Average performance number gain: 14%

5. Conclusion
   • Low overhead hardware, little software
   • Suggests examination of:
     • TLBs with greater associativity
     • Coalesced MMU caches, NTLBs (VMs)

6. References