Multicore and Empirical Research

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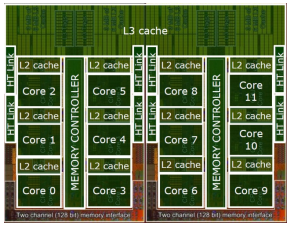
Lehrstuhl für Programmiersysteme

AMD Opteron 12 cores

~1.8 Bill. T. on 2x3.46cm^2



Sun Niagara3 16 cores

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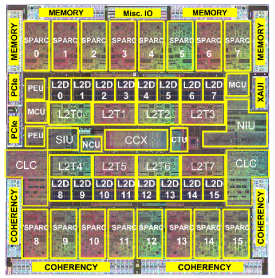
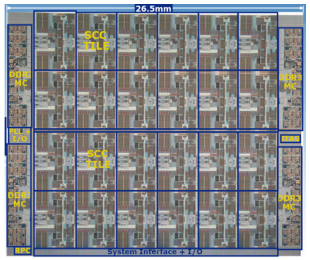


Intel SCC 48 cores

~1.3 Bill. T. on 5.6 cm^2



Intel 8 cores

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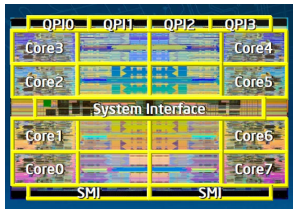
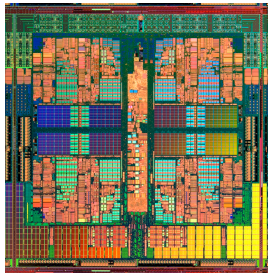


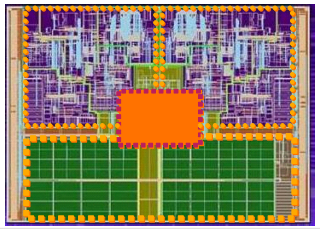
Intel 4 cores

~582 Mio. T on 2.86cm^2



Intel 2 cores

~167 Mio. T. on 1.1cm^2



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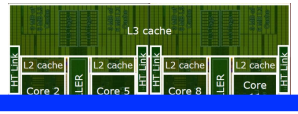

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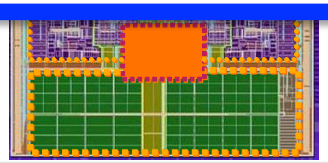

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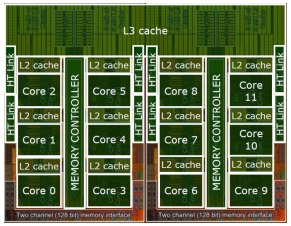

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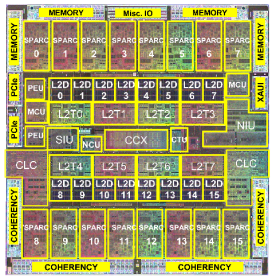

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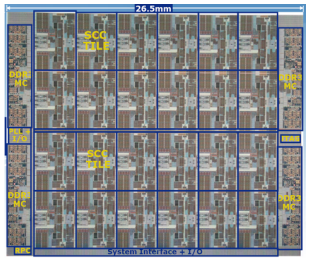

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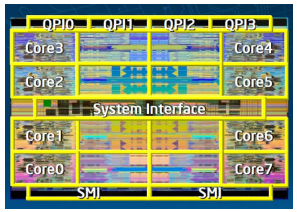

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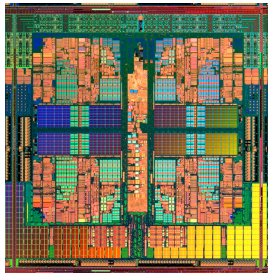

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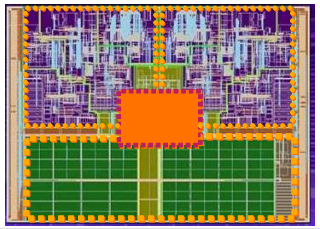

Software?

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Research Topics

- Multicore is ripe for method/tool development
- With Empirical evaluation in the loop
  - Re-engineering sequential applications (real ones)
  - Case studies on how parallelization works
  - Tools to clean up sequential programs for parallelization
  - Autotuning
  - New language constructs (with empirical eval.)
  - Memory models
  - Parallel testing and testing in parallel
  - Finding synchronization bugs and race conditions
- Don’t even know the right questions to ask

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