

Computer architecture

Homework week 11 (BONUS)

Instructions

Submit by e-mail to the lecturer, as a PDF document with your name and student ID near the beginning. You must work on this individually. Use the English language. Deadline: Nov 18th, 23:59.

Question 1 (6pt)

1. Read section 2 of <http://staff.science.uva.nl/~poss/pub/poss13csh.pdf>
2. Provide a 1-2 sentence summary of why processors for commodity computers have more cores nowadays instead of one faster core.
3. Explain the difference between static and dynamic heterogeneity in processor chips. Give concrete examples of both.
4. The Cray T3E computer uses/used a non-uniform memory access (NUMA) architecture. Explain what this means in your own words.

Question 2 (4pt)

1. Explain in your own words the relationship and differences between Amdahl's law about performance scalability and Gustafson's law.
2. 65% of the critical path of a given program can be parallelized. Determine the maximum speedup that can be obtained with an ideal parallel computer.