Computer architecture
Homework week 12

Instructions

Submit by e-mail to the lecturer, as a PDF document with your name and student ID near the beginning. You can work in groups of 2, however, use different groups than week 10 and 11. Use the English language. Deadline: Nov 25th, 23:59.

Question 1 (2pt)

1) Explain in your own words what a VLIW processor is.

2) Explain in your own words the difference between VLIW issue and the multiple issue found in superscalar processors.

Question 2 (3pt)

1) Explain in your own words the difference between:

   a. hardware multithreading as found in barrel processors;
   b. hardware multithreading as found in the Sun/Oracle Niagara or Cray MTA processors;
   c. simultaneous multi-threading.

2) Explain why Intel's Hyperthreading is mostly limited to 2 threads per core, whereas barrel processors, Niagara or MTA use larger number of threads per core (4 to 128).

Question 3 (2.5pt)

You are in charge of selecting a processor chip for a new web server. You have a choice between two chips, a 1-core running at 2GHz and a 2-core running at 1 GHz. They use the same core micro-architecture, have nearly the same price. How do you choose? Why?

Question 4 (2.5pt)

Same as question 3, but this time the choice is between a 4-core processor with single-threaded cores running at 2GHz, and a 2-core processor with dual-threaded cores at the same frequency. How do you choose? Why?