Oregon State University

CS 472 - Computer Architecture

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IA32, better or worse then ARM

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One of the goals of this course is that you be able to apply what you learn about machine organization to unfamiliar machines. In this paper, you'll choose a listed computer architecture and compare and contrast that architecture with both ARM and IA32. This also requires that you compare and contrast IA32 and ARM. In the end, you will be discussing 3 distinct architectures.

Main point and purpose: This is an opportunity for you to apply what you've learned in class to a new situation. This is the best way to solidify your knowledge!

Contents and form: The paper must be single-spaced, 10 pt font, 2 column format. It should use correct grammar and spelling. You must not plagiarize material. You must cite any sources, and include a bibliography. The write-up must be created in LaTeX (or variant). It must be as long as it needs to be to do a thorough, complete job.

In the paper, you should include the following topics. REMEMBER YOUR AUDIENCE as you write and compare the architecture to what you know of ARM.

Introduction to the architecture including history: Instruction set design (is it RISC/CISC, what addressing modes are offered, how long are addresses, what's the minimum addressable unit in memory, etc.)

Datapath design (how many registers, is it single-cycle, multi-cycle, pipelined, is microcode used, etc.)

Memory subsystem (what are the memory limits, are there caches, how is virtual memory supported by the hardware, etc)

Other characteristics that are interesting about this system

An explanation of how the features of this system might boost performance.

In some of the above, you will likely be talking about specific implementations of the architecture. It is sufficient to focus on one implementation.

Topic Choices:

VAX, PowerPC, SPARC, HP PA-RISC, DEC Alpha, Parallel machines such a SGI Origin, IBM RS/6000 SP, Cray X-MP/416

History

Instruction Set Design

Datapath Design

Memory Subsystem

Other interesting Characteristics

How the features of the system might boost performance