

Loose Ends and x86

2-14-2003

Opening Discussion

- What did we talk about last class?
- Have you seen anything interesting in the news?

Init Codes

- Let's write the codes for initializing an array using either the array syntax or the pointer syntax and compare them.

The x86 Architecture

- Being the most widely used architecture in the world right now, the x86 probably deserves some commenting upon.
- If you have read the book, you have seen that it is something that has been evolving over time, and that it is a fair bit more complex than the MIPS.
- The original 8086 was a 16-bit extension of the 8080. The 80286 went to 24-bits and the 80386 pushed it to 32.

Registers and Two Operand Instructions

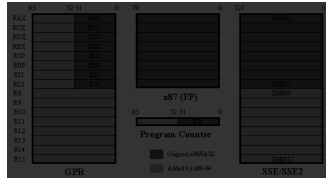
- The 386 had 8, 32-bit general purpose registers in it. This was a step up from earlier versions where the registers were special purpose.
- The instructions on the x86 only take two operands so one register must be source and destination. However, it also allows one operand to be a memory location.

Conditions Codes and Variable Instruction Size

- Unlike the MIPS, conditionals in an x86 (and the PowerPC) use condition codes. These are set or cleared by certain instructions and can be checked by conditional branches.
- x86 instruction can vary from 1 byte in length to 17 bytes in length. While this adds significant complexity, it also adds flexibility and is part of the reason the architecture has lived so long.

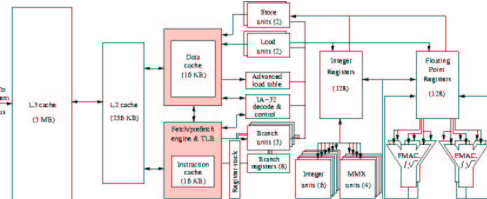
More Add-Ons: x86-64

- The x86 architecture isn't dead yet. Now it is AMD that is trying to breath new life into it with the x86-64 architecture.



Itanium (Short Version)

- Itanium is a bit more complex. You get 32 general use registers, but you also have a sliding "stack" like in the SPARC.



RISC vs. CISC

- In the early to mid 1990s, there was a significant ideological debate over whether computer instruction should be complex (like the x86) or simple (like the MIPS). There was a significant shift to the RISC style during that time.
- Moore's law has meant that you can put a lot more logic on a chip to work around limitations in the ISA. Flexibility in an ISA also helps.

Minute Essay

- What are your thoughts on the RISC vs. CISC debate?
- Have a great weekend.
