Computer Architecture

Computer Architecture is the set of rules and methods that describe the way in which computer systems are implemented, as well as how they work and how they are built.[3] There are many areas of computer architecture but the main ones are: Instruction Set Architecture, Microarchitecture, and System Design. Computer architecture is focused largely around the Central Processing Unit (CPU), and more specifically how it operates and how it deals with memory adresses.[5]

Instruction Set Archictecure (ISAs) is a subset of computer architecture based around the CPU. It is the embedded programming language of the CPU and defines the CPU's functions and capabilities based on what programming it can perform or process.[1] In more laymens terms it functions more like an interface in which to "talk" to the hardware components through software. As well as holding the current version of operations, modes and storage locations that the hardware supports.[2] The most common language for this is Assembly.[5] The instruction set is like a document that manufacturers often create, this document will have the “syntax” of the CPU, and how the CPU works. The manufacturer of the CPU will decide what instruction set the CPU comes with, however anyone can create their own assembler using that instruction set.[6]

The two main types of instruction sets implemented in commercial computers, are called Complex Instruction Set Computer (CISC) and Reduced Instruction Set Computer(RISC).
CISCs have many specialised instructions that the CPU rarely, if ever needs to use. These run parrallel to the instructions that most programs would use frequently making it slower.
RISCs allows those instructions that most programs don't use to be implemented as subroutines. For example if a program were to crash first the more used instruction set would be run before not working and then trying the less common instruction set.[4]

References

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