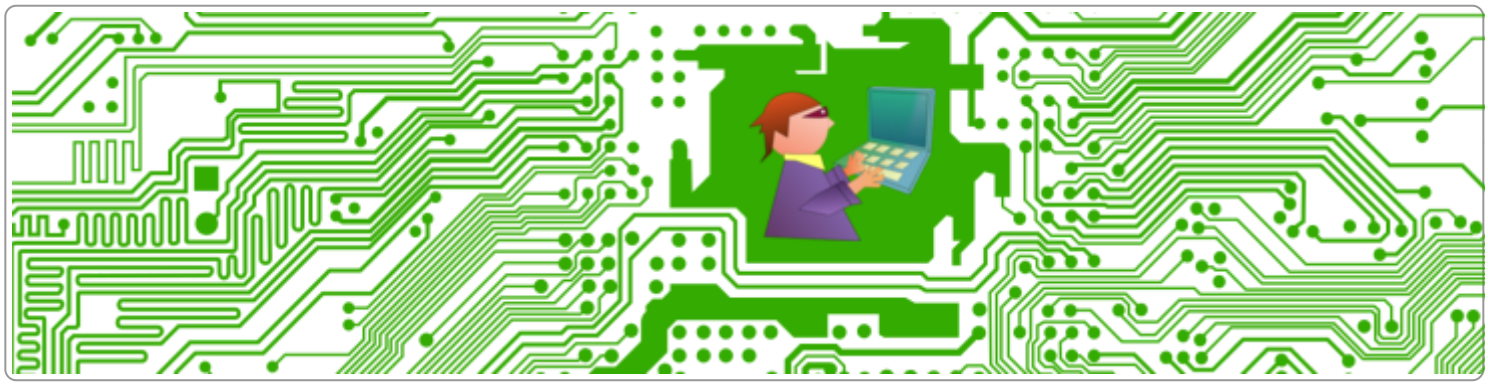

Difference between computer architecture and computer organization

Posted by admin on November 17, 2016 Go to comments Leave a comment (0)

This is a commonly asked question that sadly confuses many computer science students. Confusion comes from the fact that the literal meaning of the two terms is very close. Also, the historical context of the two terms does not help much as different people use the terms differently.

In this post I am going to summarize the differences between computer architecture and computer organization in an easy to memorize tabular form as shown below:

Computer Organization	Computer Architecture
Often called microarchitecture (low level)	Computer architecture (a bit higher level)
Transparent from programmer (ex. a programmer does not worry much how addition is implemented in hardware)	Programmer view (i.e. Programmer has to be aware of which instruction set used)
Physical components (Circuit design, Adders, Signals, Peripherals)	Logic (Instruction set, Addressing modes, Data types, Cache optimization)
How to do ? (implementation of the architecture)	What to do ? (Instruction set)

Computer Architecture and Computer Organization Examples

- Intel and AMD make X86 CPUs where X86 refers to the computer architecture used. X86 is an example on a CISC architecture (CISC stands for Complex Instruction Set Computer). CISC instructions are complex and may take multiple CPU cycles to execute. As you can see, one architecture (X86) but two different computer organizations (Intel and AMD flavors).
- nVidia and Qualcomm on the other hand make GPUs (graphics processing unit as opposed to a CPU central processing unit). These GPUs are based on the ARM (Advanced RISC Machines) architecture. ARM is an example on a RISC architecture (RISC stands for Reduced Instruction Set Computer). Instructions in an ARM architecture are relatively simple and typically execute in one clock cycle. Similarly, ARM here is the computer architecture while both nVidia and Qualcomm develop their own flavor of computer organization (i.e architecture implementation)

Summary

Can we tell the difference between computer architecture and computer organization in one line ? Here is my take on that:
Computer architecture roughly refers to instruction set design while computer organization refers to the corresponding circuit design. Feedback is welcome. Please use the comments section below. Thanks for reading.

Search Terms...

- difference between computer architecture and computer organization
- difference between computer organization and computer architecture
- difference between computer organization and architecture
- difference between computer architecture and Computer Organisation
- difference between computer organisation and computer architecture
- difference between computer architecture and computer organization in tabular form
- difference between computer architecture and organization
- difference between computer architecture and computer organization pdf

- difference between computer organisation and architecture
- Computer architecture vs computer organization

Related Posts ...

- Page table vs inverted page table
- CPU Scheduling Algorithms in Operating System
- Difference between Multiprogramming, Multitasking, Multithreading and Multiprocessing
- Monolithic Kernel vs Microkernel OS Architectures
- Difference Between User Level Threads and Kernel Level Threads

Like this:

One blogger likes this.

Operating Systems Lecture Notes

← Static data member in C++ Difference between paging and segmentation →

Leave a comment ? 0 Comments.

Leave a Reply

Subscribe

Get notified when new articles are posted

Email
Subscribe

Featured

- Throughput vs turnaround time
- Computer science vs computer engineering
- Memory mapped files
- Policy vs mechanism in OS
- Page table vs inverted page table
- Python mutex example
- Paging vs Segmentation
- Computer Architecture vs Organization
- Static data members C++
- Python power function
- Python For Loop
- Understanding SSL
- Top 10 Tips to Stay Safe Online
- Understanding Recursion

Categories

Algorithms and Data Structures

Articles and Tutorials Code Snippets

Computer Networks Computer Security

Database Systems General Topics

Interview Questions Math and Probability

Operating Systems

Software Quality Assurance

Popular

Difference between Multiprogramming, Multitasking,…
Difference Between User Level Threads and Kernel Level…
Monolithic Kernel vs Microkernel OS Architectures
Difference Between System Call, Procedure Call and Function
Iterative Binary Search Function
Sikuli Selenium Robot Framework Tutorial
Sikuli Java Tutorial
Difference between computer architecture and computer…
Dynamic Programming Assembly Line Scheduling
File Allocation Methods in Operating System

Tags

Cpp Recursion Big O String

Optimization Perl Java

Factorial Combinatorial Lecture Notes

Interview Divide & Conquer Python

Sort Hash Dynamic Programming

SQL Loop Invariant C#

Windows UNIX Binary Search

Pixel Bender Greedy Flex

Pixel Shader SSL Linux

Android Tree Sikuli Linked List