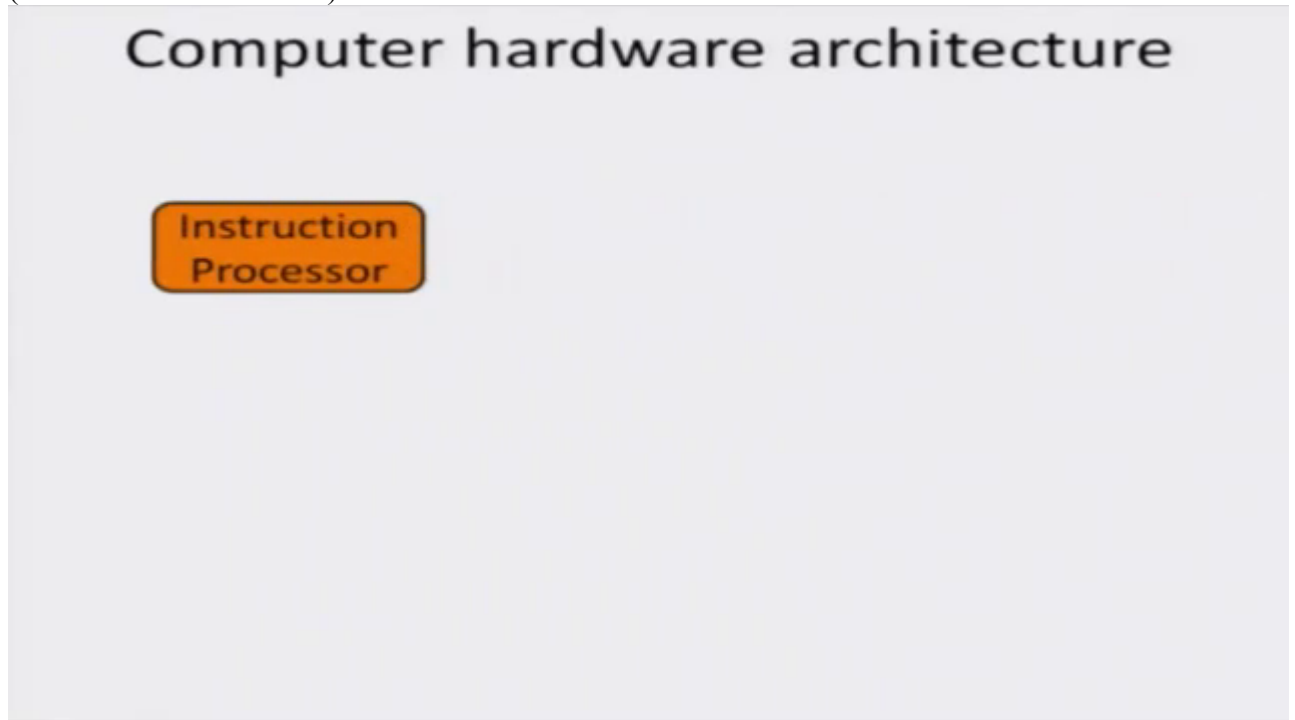


agMOOCs
What is inside a computer
Mainak Chaudhari

In this brief lecture we'll discuss what is inside a computer. As we mostly know a computer comprises of display device which is known as the monitor. It is attached to a motherboard and it also interfaces with keyboard, mouse and other input/output devices such as microphones, earphones and so on. So in this lecture what we'll do is that we'll take a look at what goes inside the motherboard of a computer.

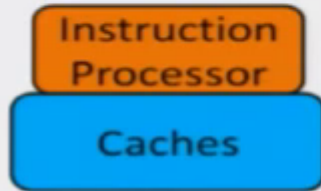
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The central processing unit of the motherboard is the main processor which executes instructions. These instructions come from the compiled program and often this is known as an instruction processor. These instructions can be of different types, for example, it could be doing arithmetic operations, it could be between logic operations or it could be doing data accesses, you need data to operate on any instruction.

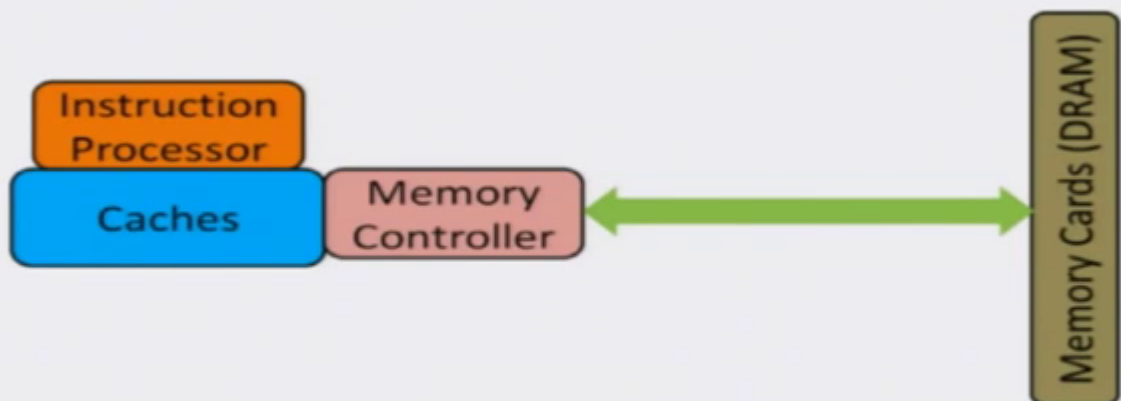
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Computer hardware architecture



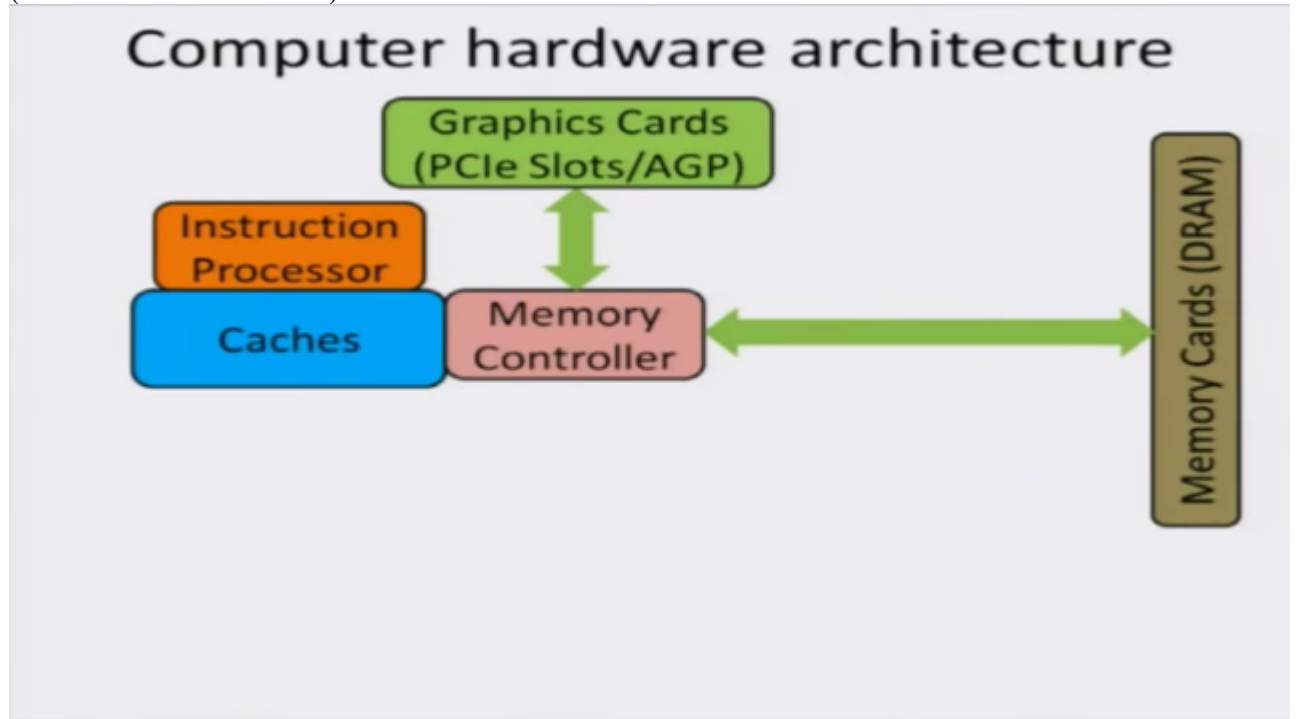
Whenever it requires data it first looks at something called a cache. Cache is a small memory which sits beside the processor and provides the data that have been accessed recently. However it is quite possible that the access data is not found in the Cache.
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Computer hardware architecture



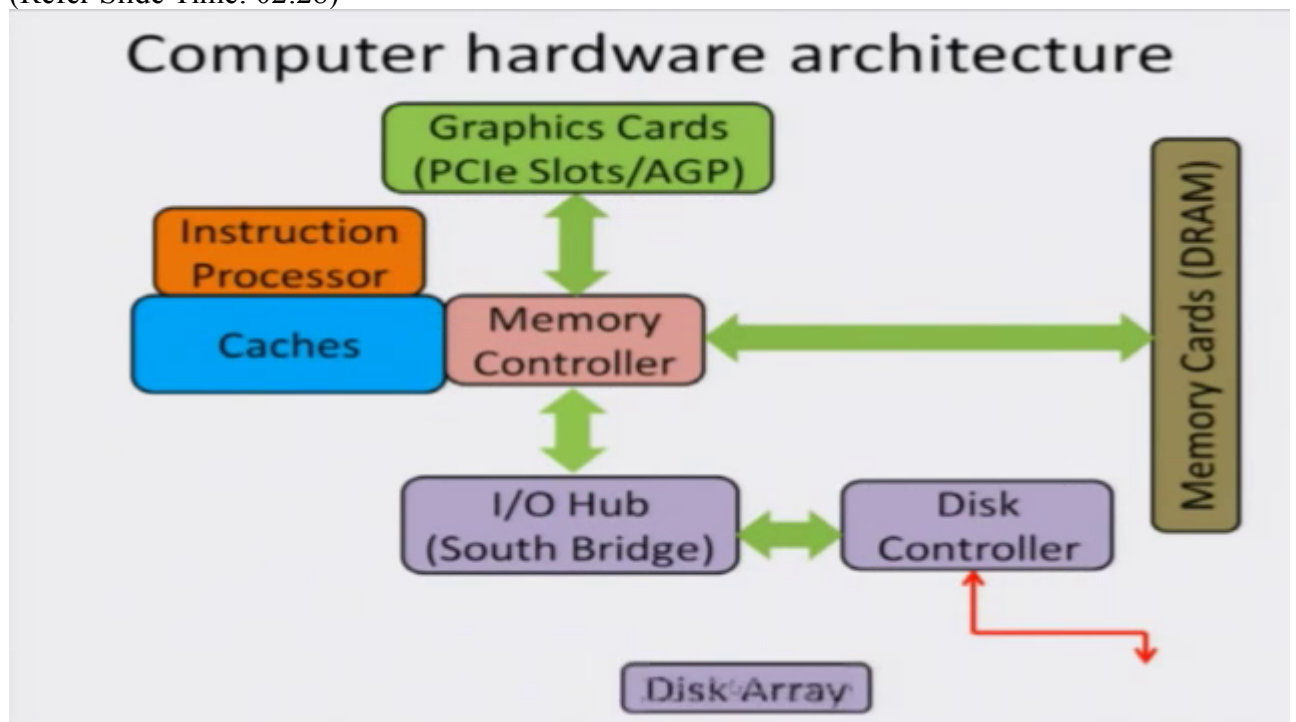
In that case it needs to access the main memory which is known as the Dynamic Random Access Memory or DRAM and these requests normally go through something called a Memory Controller which takes the requests from the Caches and sends the request to the Dynamic Random Access Memory or the Memory Cards and sends the response back to the Caches through the Memory Controller and the Caches will finally deliver the response to the processor which must have been waiting for the data.

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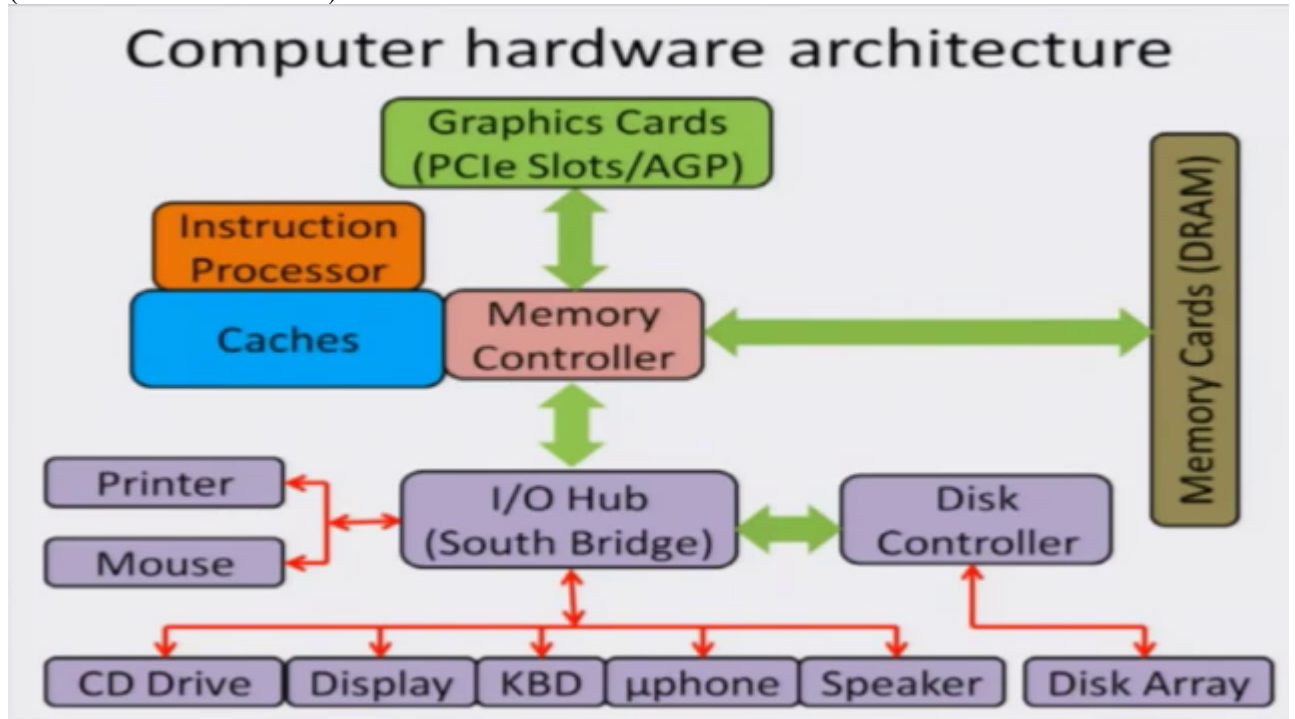
Additionally today in the computers you will find graphics cards for carrying out rendering of scenes and also for doing high-performance computing. These cars are normally connected to the memory controller through a special kind of fast buses that's called a PCI Express bus.

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Finally, you need to interact with the environment, which are also known as the I/O devices or the input/output devices, for example, the keyboards, mouse, printers, hard disks, CD-Rom drives, speakers, microphones and so on. so these requests also go through the Memory Controller but they are delivered to something called an I/O Hub or the input/output hub which is also known as the Southbridge of the motherboard. The input/output hub is

essentially a I/O controller which takes the requests from the Memory Controller, decodes the request and routes the request to the appropriate I/O device. One of the most important I/O devices connected to the Southbridge is the disk controller which controls accesses to the hard disk. So as you can expect the disk array would be connected to the disk controller. (Refer Slide Time: 03:22)



Additionally the south which connects to several other I/O devices, for example, the printer, the mouse the CD-Rom drive, the display or the monitor that you see, keyboard, microphone and the speaker. So this is roughly the overview of the motherboard which plays a key role in how a computer works. Thank you.