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Memory Slots

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In this video from ITFreeTraining, I will look at memory slots. Memory slots allow memory to be installed into your computer. It also allows memory to be upgraded easily.

Memory Module

0:11 In computing, a memory module is essentially a printed circuit board with memory chips mounted on it. In the early days of computing, these memory modules were proprietary in design. The proprietary design meant that the memory module would only work on a certain computer and a certain model of that computer.

As time went on, memory modules were standardized. This allowed memory modules to be used in any system that was designed to use them. You can see this motherboard has four memory slots. To install a memory module, it is just a matter of inserting the memory module into the slot.

The memory modules in a computer hold the data and programs that the computer uses. The memory that is used is called Random Access Memory or RAM.

Random Access Memory

- Access any data at any time

0	0	1	1	0	1	1	0
0	0	1	1	1	0	1	1
1	0	0	1	1	1	0	1
0	0	1	1	0	1	1	0
0	1	1	1	0	1	0	1
1	0	1	0	1	0	0	0
1	1	1	0	1	0	0	1
0	1	1	0	1	0	1	1

0:56 Random Access Memory allows the computer to access any data in the memory modules at any time. Memory is accessed by the computer like you would access data in a spreadsheet. Essentially the computer can access any memory inside the memory module, in the same way you can access any cell in a spreadsheet.

The memory is laid out in ones and zeros, however when accessing the memory, it will be accessed as a group. In later videos I will look at this in more detail. Inside the memory module, depending on who makes it, the data may be grouped into groups of four bits called a nibble. However, data leaving or entering the memory module will always be a minimum of eight bits called a byte. Nowadays, generally more data is transferred than a byte at one time, and in later videos I will look at this in more detail.

Single In-line Memory Module (SIMM)

- Memory chips on one side only
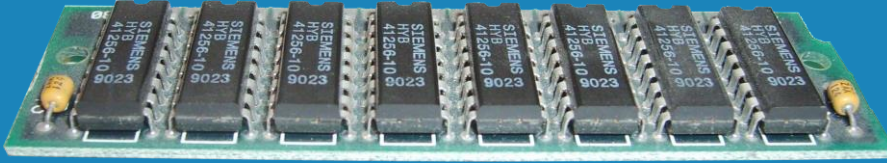
1:47 The first memory modules commonly sold were called single in-line memory modules or SIMMs. These memory modules had memory chips on one side of the memory board. As you can see in these examples, memory chips are found only on one side.

Having only one set of chips means that less connectors are required to connect the memory modules to the computer. This makes it less complex, but also means that there is the other side that you are not using. Using both sides increases the amount of chips on the memory modules and thus increases the amount of memory that it can store. Also, having more chips increases the amount of data that can be transferred at once.

Dual In-line Memory Module (DIMM)

- Memory chips on both sides

2:27 Having memory chips on both sides is called dual in-line memory module or DIMM. You can see some examples of a few DIMM memory modules. Nowadays you will find that generally all memory modules are double sided. The memory modules for desktop computers will generally have a minimum of eight chips on each side. Given that there are eight bits in a byte, this is no coincidence. We will look more into this in later videos.

Memory Slots

- Refer to motherboard manual to install memory
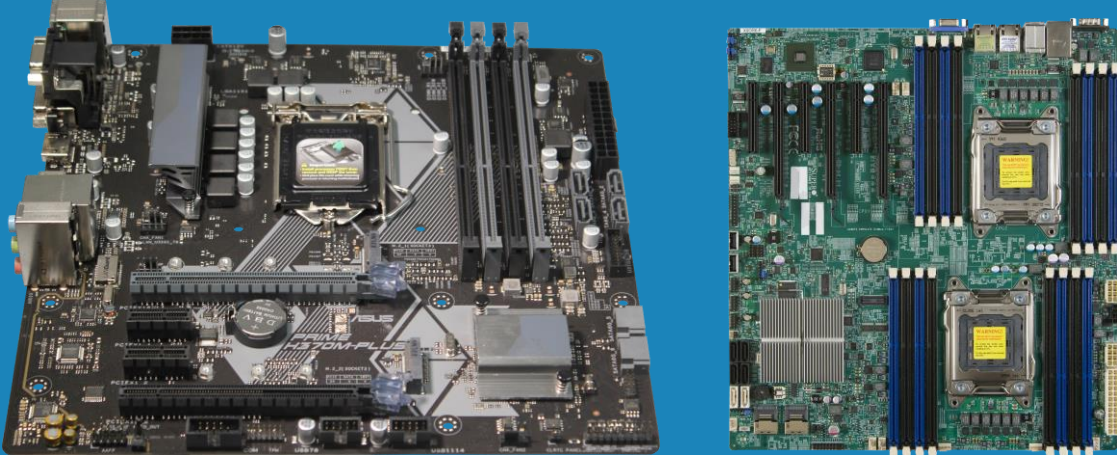
2:59 Different motherboards will have a different number of memory slots. A standard desktop motherboard will generally have two to four memory slots. Servers, high-end workstations and dual CPU motherboards may have more than four memory slots.

You will notice that the memory slots are generally different colors. The different colors will assist you when installing the memory modules. The motherboard will generally use memory modules in pairs. When the memory module is installed in a pair, they will work together giving better performance. Refer to your motherboard manual for more information on this. In some cases, the computer will not start up if a memory module is not installed in a particular slot. Usually a memory module closest to the CPU will need to have a memory module installed in it for the computer to start up. If no memory module is installed in this slot, the computer will not start.

I hope you have found this video on memory slots useful. Later in the course I will go into a lot more details about memory and how it works. I look forward to seeing you in these videos. Until then I would like to thank you for watching.

References
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Credits
Trainer: Austin Mason http://ITFreeTraining.com
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