

# RAM

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Let's talk about RAM, our computers short-term memory. We use RAM to store data that we want to access quickly. This data changes all the time so it isn't permanent. Almost all RAM is volatile, which means that once we power off our machines, the data stored in RAM is cleared. Remember that our computer is comprised of programs. To run a program, we need to make a copy of it in RAM so our CPU can process it. When you see a new phone or laptop that says it has 16 gigs of RAM, that means it can run up to 16 gigs of programs, meaning you can run lots of programs at the same time, when you type the document, you're using RAM. If you've ever had the misfortune of working on an important presentation or paper and losing power, you know the feeling you get when all of the work you've done is lost. It's a total bummer, this happens to anything with RAM, even video games. Have you ever gone on a long campaign without saving, then right as you get to a safe point, the power goes off on the console and all the progress you've made is lost forever? It's not fun at all. You spend the next hour or so deciding whether or not just to rage quit the game completely and start all over from scratch. Not that this happened to me or anything that was just a friend. Anyway, all of this happens because RAM clears its data when powered off. There are lots of types of RAM, and the one that's commonly found in computers is DRAM or dynamic random-access memory. When 1 or 0 is sent to DRAM, it stores each bit in a microscopic capacitor, this is either charged or discharged, represented by 1 or a 0. These semiconductors are put into chips that are on the RAM and store our data. They're also different types of memory sticks that DRAM chips can be put on. The more modern DIMM sticks which usually stands for Dual Inline Memory Module have different sizes of pins on them. I should call out, we don't really buy RAM based on the number of DRAM chips they have, they're labeled by the capacity of RAM on a stick, like an eight-gig stick of RAM. After DRAM was created, RAM manufacturers built something called SD RAM which stands for synchronous dram. This type of RAM is synchronized to our system's clock speed, allowing quicker processing of data. In today's system, we use another type of RAM called double data rate SDRAM or DDR SDRAM for short. Most people refer to this RAM as DDR, even shorter. There are lots of iterations of DDR, from DDR1, DDR2, DDR3, and now, DDR4. DDR is faster, takes up less power, and has a large capacity than earlier SD RAM versions. The latest version DDR4 is the fastest type of short-term memory currently available for your computer, and faster RAM means that programs can be run faster and that more programs can run at the same time. Keep in mind that any RAM sticks you use need a compatible motherboard with a different number of pins aligned with the motherboard RAM slots.

Just like with the CPU, make sure that your motherboard is compatible with any RAM sticks that you buy. Up Next, we'll take a deep dive into motherboards.

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