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Components of computer specifications

Updated: 08/31/2020 by Computer Hope Finding the hardware installed in your computer may be necessary for many reasons. Whether it's to determine if your computer meets minimum system requirements, check on compatibility for upgrades, compare your machine to another, or help sell the computer. To check your hardware specifications, find your version of Windows in the section below and follow the instructions. Tip Some information, like brand, power rating, or size, can be determined by looking at the hardware. For example, most hardware displays the brand somewhere on the front or side panel. The power rating of a power supply, in terms of wattage outage, is often displayed on the side of the unit. Note Although often correct, keep in mind that whenever viewing any information about computer hardware through a program, it may be incorrect. Also, any hardware that is overclocked displays the overclocked speed and not the original speed. The dxdiag utility included with DirectX allows you to not only display all system information but save it in an easy to read a text file. To run this utility click Start, run, and type: dxdiag and press Enter. See our dxdiag page for further information on this program. Msinfo32 Run the Windows System Information (msinfo32) that comes pre-installed with Windows to determine installed hardware and software specifications. See the msinfo32 definition for complete information about this utility. Device Manager Generic hardware information of what Microsoft Windows is detecting is found through the Device Manager. If more detailed information is required, use a third-party utility. Below is an example of what the Device Manager looks like and what devices may be listed. Third-party programs If this program does not list the information you need, see the third-party program section on this page. It contains a list of programs that can be installed to detect and list the hardware and software on your computer. Windows 95 users Device Manager Generic hardware information of what Microsoft Windows is detecting is found in the Device Manager. If more detailed information is required, use a third-party utility. Third-party programs If this program does not list the information you need, see the third-party program section on this page. It contains a list of programs that can be installed to detect and list the hardware and software on your computer. MS-DOS and Windows 3.x users To see the computer's system specifications, run the MSD command from an MS-DOS prompt. Note: As mentioned on the MSD command page, this command is only meant for older computers running MS-DOS and not Windows computers running the Windows command line. Third-party programs Computer manufacturer's such as Dell also have unique identification numbers (Service Tag) that can be used on the manufacturer's website to determine all your system specifications. Finally, there are third-party programs that enable users to display their system specifications and in some cases also benchmark their computer. Below is a list of these programs and the program's capabilities listed in the order we recommend most. Belarc Advisor The Belarc free personal PC audit is a great software program and another highly recommended program that creates a fantastic report of your computer hardware and software. Below is a list of what this program is capable of detecting and displaying. Operating system and system model type. Processor speed and primary and secondary cache amount. Motherboard type/chipset, controllers, bus clock speed, and BIOS. Installed memory including what size of chips and what bank they're installed into on the motherboard. Drives including hard drive manufacturer, size, SMART status, network drives, and other disc/diskette drives. Installed local and network printers and their paths. Installed video card and display. Installed sound card and other multimedia cards. Other connected devices (e.g., keyboard, mouse, USB devices). User accounts and last login date and time. Installed virus scanner and its version. Installed Microsoft Security hotfixes and if any missing hotfixes are detected. Software license information. Installed software version. Fresh Diagnose Another great free method for determining your system specifications through software and benchmarking your hardware devices. The program is capable of detecting such hardware as the CPU, hard drive, video, sound, motherboard, and drive performance. Note: The program does require a valid e-mail address to download. HWiNFO and HWiNFO32 Another great software tool for getting a comprehensive list of your hardware information that is available as a 14-day trial. HWiNFO can also display sensor information used for detecting the temperature of the motherboard, CPU, and any other devices and displaying voltage and fan RPM speeds. Finally, the program includes a benchmarking comparison that can compare your computer against other hardware. FinalWire AIDA64 Formerly Lavalys EVEREST, FinalWire AIDA64 is a program capable of displaying a complete list of the software and hardware installed on your computer and can run benchmarks. The program is capable of detecting as much as many of the other programs listed on this page. SiSoftware SANDRA Short for System ANalyser Diagnostic and Report Assistant, SANDRA is an information and diagnostics software program capable of listing the hardware in the computer. Additional information Vania Zhukevych/Shutterstock You might not realize it, but every time you purchase a new desktop CPU, you also get a ticket for a giveaway called the "silicon lottery." Two CPUs of the same model can perform differently when pushed to their limits thanks to something called "CPU binning." What Is Binning? Binning is a sorting process in which top-performing chips are sorted from lower-performing chips. It can be used for CPUs, GPUs (graphics cards), and RAM. Say you want to manufacture and sell two different models of CPU: one that's fast and expensive, and another that's slower at a bargain price Do you design two different models of CPU and manufacture them separately? Why bother when you could just use "binning?" The manufacturing process is never perfect, especially given the incredible precision necessary to produce CPUs. When you're manufacturing those speedy, expensive CPUs, you'll end up with some that just can't run at the top-end speeds. You can then tweak these to run at slower speeds and sell them as bargain processors. For a simpler example, say you're manufacturing an eight- and six-core chip. Rather than manufacturing two separate products, you just have your factory manufacture the eight-core chips. Some will be faulty and only have six functional cores. So, to get six-core chips, you just take those faulty eight-cores, disable the two nonfunctional cores, and then sell them as six-core chips. Binning is a way of being more efficient and reducing waste in the manufacturing process. Sorting Processors Into Metaphorical "Bins" A processor might start its life destined to be a higher-powered processor, such as the Core i7-10700 or its predecessor, the Core i7-9700. But when it comes time for Team Core i7 tryouts, our little chip doesn't make the cut and never gets a jersey. The chip can still perform reasonably well, however, and it would be a waste of time and money to just throw it out. So, our silicon "gets binned," has some cores disabled, and drops down to Team Core i5, where it happily competes in the Spreadsheet Olympics. Creating a processor is a complicated, time-consuming, and expensive process. That's why businesses always want to reduce waste as much as possible during manufacturing. So, if a chip designed to be a top-performer doesn't pass quality assurance, it gets the proverbial chuck into the lower-performing bin to become a CPU further down the product line. Now, to be clear, no one is grabbing CPUs, throwing them in a barrel, and then dumping them into Core i5 or Core i3 boxes. Just think of "binning" as a type of sorting, in which CPUs get placed into different pricing and performance tiers depending on how well they do during factory testing. Also, keep in mind that different generations of CPUs can have different (or multiple) binning procedures. The examples we covered above are for illustrative purposes only—that isn't necessarily what happens with every generation of CPU. RELATED: How Are CPUs Actually Made? How It All Happens Intel We've covered how CPUs are made before, including the more complicated details. Briefly, however, a CPU manufacturer starts with a silicon ingot that gets sliced into thin circular wafers. The wafers then get transistors etched onto them via a process called photolithography. There are also various steps during manufacturing in which the wafers are polished, doused with copper ions, and have metal layers added to them. By the end of this complicated process, you get a finished wafer loaded with processors. Most of the work is done by machines with humans observing in protective overalls, booties, hoods, and even masks. This is because silicon wafers are sensitive to contaminants, including human skin and hair. Thus, one of the main goals during manufacturing is to keep the wafers as pristine as possible. Inevitably, however, there'll be sections of the wafer that aren't up to snuff. Once the wafer is cut into CPU silicon and placed on the green substrate (that piece of circuit board that sits between the silicon and the computer's CPU socket), the units go off for testing. This is when our "tryouts" occur. The company runs tests on the CPUs to see if they perform at the right voltages, temperatures, and clock speeds. Any that don't might be candidates for lower-tiered models. A processor might be downgraded because it has poor-performing or nonfunctional cores. These cores are then disabled, usually by being laser cut. When that happens, an eight-core chip can become a six-or even a four-core. Similarly, if the integrated GPU isn't working, it might be disabled and the CPU downgraded to an Intel F-series chip that ships without integrated graphics. For example, in October 2020, AMD released four Ryzen 5000 desktop processors: the 9 5950X, 9 5900X, 7 5800X, and 5 5600X, with 16, 12, 8, and 6 cores, respectively. These processors are built using what's called a "core complex," which is the silicon that contains the CPU's cores. Ryzen 5000 CCXs have eight cores by design, meaning the eight-core Ryzen 7 5800X has one CCX, while the 16-core Ryzen 9 5950X has two. But how do you get a 12-core chip from an eight-core CCX? Most likely, via binning. AMD disabled two cores on two eight-core CCXs to create 12- and 6-core CPUs without much waste. How Binning Can Impact Overclocking FeelGoodLuck/Shutterstock For anyone who doesn't overclock their CPU, binning often doesn't have much of a noticeable impact. The specs you see on the package are what you can expect the CPU to do in your system. If you're interested in overclocking, however, binning can matter, and the aforementioned silicon lottery comes into play. It's possible for disabled cores to be coaxed back to life, but this is exceedingly rare now as bad cores are physically disabled via laser cutting. A more common result is the chip just performs at higher frequencies than expected. This varies from CPU to CPU, which is why it's dubbed a "lottery." There are even specialty retailers that sort the processors by performance and sell the same model of CPUs with different top frequencies. This means two Ryzen 7 processors sitting right next to each other on a store shelf can have very different outcomes for overclocking. One might perform faster, but also get a lot hotter than it should, while the other performs as expected based on the processor's boost speeds. If you want to find out how you fared in the silicon lottery, be sure to check out our guide on how to overclock an Intel processor. AMD overclocking is a little easier if you use the company's Ryzen Master software, rather than dipping into the BIOS with Intel CPUs. Just remember that overclocking voids your part's warranty. Scratching that ticket for the silicon lottery with overclocking isn't for everyone. However, it can be worthwhile, especially if you treat it as a "built-in upgrade" for a CPU that's a bit older. Even if you're not interested in overclocking, at least you now know what binning is! RELATED: How to Overclock Your Intel Processor and Speed Up Your PC 1 Who's A Clever Dog? 30 Exceptionally Smart Canine Breeds 2 What Does a Low ALT and AST Signify? 3 What Are Some Foods That Start With the Letter Z? 4 What Is a Product in Science? 5 How Much Does One Million Dollars Weigh? 1 How Many Teaspoons of Minced Garlic Equals One Clove? 2 Instant Crabification: Why Evolution Keeps Coming Up Crustacean 3 Dolly Parton: The Surprising Life Story of the Queen of Country 4 Can Dogs Eat Cooked Eggs? 5 What Is Social Location in Sociology? TechRadar is supported by its audience. When you purchase through links on our site, we may earn an affiliate commission. Learn more Graphics cards, processors, motherboards and more. TechRadar newsletter Sign up to get breaking news, reviews, opinion, analysis and more, plus the hottest tech deals! Thank you for signing up to TechRadar. You will receive a verification email shortly. There was a problem. Please refresh the page and try again. By submitting your information you agree to the Terms & Conditions and Privacy Policy and are aged 16 or over.