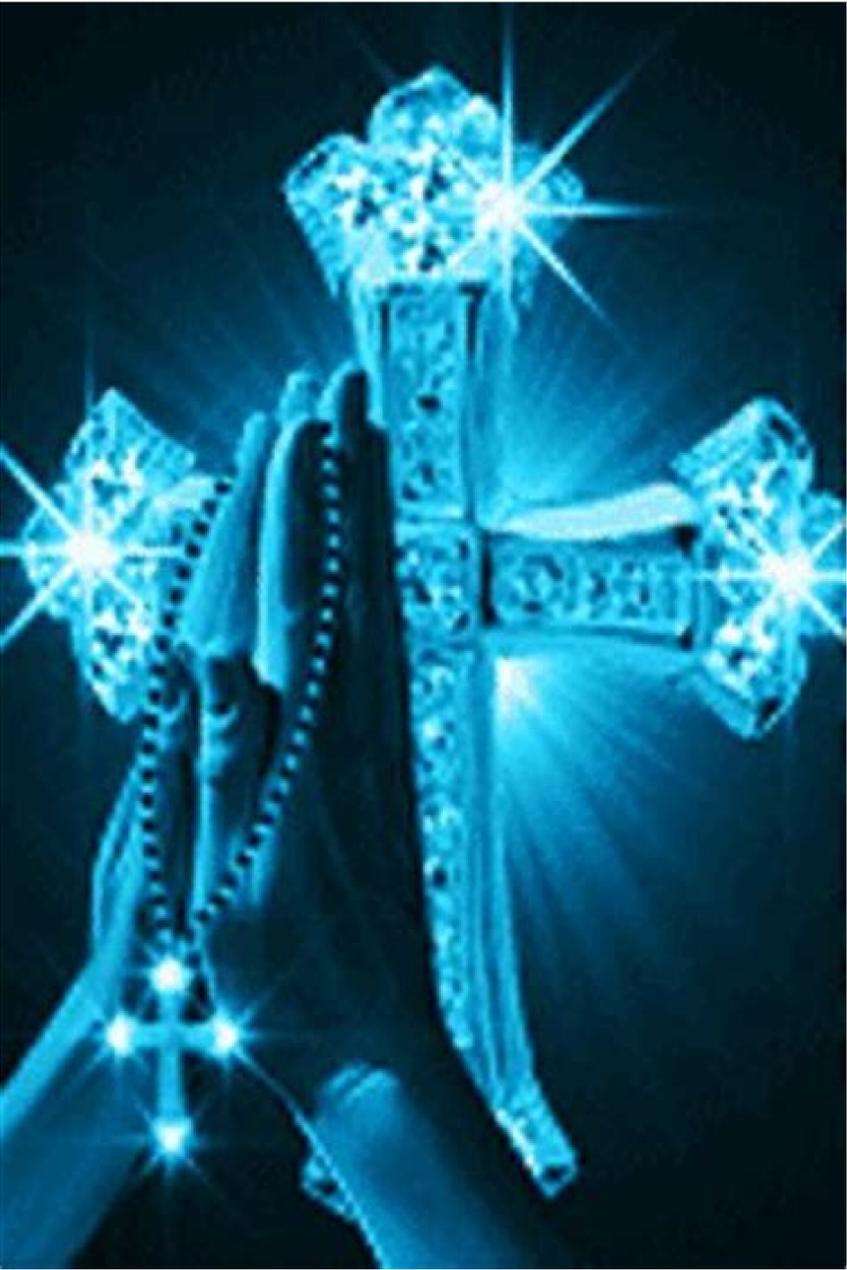


How to free up phone ram

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How to free up ram space in phone. How can i free up my phone ram.

Tarek El Nabawe's PC has 8GB of RAM, but Windows is using only 3.45GB. What happened to the rest? It sounds as if you're running a 32-bit version of Windows. A 32-bit operating system has only enough addresses to handle 4GB of memory. Once you get past that, it just doesn't know what to do with the rest. [Have a tech question? Ask PCWorld Contributing Editor Lincoln Spector. Send your query to [answers@pcworld.com](mailto:answers@pcworld.com).] To find out for sure in Windows 7 or Vista, click Start, right-click Computer, and select Properties. In Windows 8, go to the Search charm, type system, and select System. Either way, it will bring up the System dialog box. The "System type" field will provide the answer. Okay, so you have a 32-bit operating system. Why can't you at least use a full 4GB? The operating system needs some of those addresses to interface with the hardware. The exact amount can vary, but it's usually a half or more of a gigabyte. To take full advantage of 4GB, and any advantage of more RAM than that, you need a 64-bit operating system. All three current versions of Windows—Vista, Windows 7, and Windows 8—come in both 32- and 64-bit flavors. But be aware that you need a 64-bit computer to install a 64-bit operating system. If your PC, like Tarek's, can accept 8GB, there's a good chance that you have the right hardware. To make sure, download and run Gibson Research's free program, Securable. If the program displays a big 64, you can upgrade to a 64-bit version of Windows. You can buy 64-bit versions of Windows 7 and Windows 8. You'll have to do a full install, after which you'll have to reinstall all of your programs. Unless you've got some very old programs from the last century, they should all work. The installation program should move all of your existing files to a folder called C:\Windows.Old. After the install, you should move your library files back to the new libraries. And just to be safe, you should make a full backup before doing the install. Corsair People often draw parallels between computers and the human brain, and sometimes, it's an apt comparison. For example, both the brain and a computer have short- and long-term memory. RAM is where a computer stores its short-term memory. What is DDR? RAM stands for Random Access Memory, and if you've ever opened a lap- or desktop computer, you've seen it. In the image above, you see modern RAM sticks for desktop PCs. They have a sleek casing that functions as a heat spreader. However, unless you're a high-powered overclocker, this is mostly about looks (and making them easier to install.) Laptops, meanwhile, often have more basic RAM sticks, as space concerns are paramount. Plus, unlike modern PC cases with transparent sides, people rarely see the inside of a laptop. However, you can get laptop RAM (especially for gaming models) with heat spreaders. What RAM Does Crucial So now, we know that those sticks in your PC's motherboard are system RAM, and they function as short-term memory, but what does that all mean in practice? Well, when you carry out actions on your computer, like opening a text document, it requires access to the data contained in that file. When you're not working on that document or you click save, the latest copy of that file is saved to the hard drive in long-term storage. When you're working on the file, however, the most recent data is stored in RAM for quicker access. This is true for spreadsheets, text documents, web pages, and streaming video. It's not just document data, either. RAM can also store program and OS files to keep apps and your computer humming along. RAM isn't the sole source of short-term memory, though. For example, a graphics card has its own graphics RAM and the processor has smaller data caches. Nevertheless, RAM is the key location for data that are actively being used by the system. How RAM Works Georgii Shipin/Shutterstock RAM is made up of tiny capacitors and transistors capable of holding an electric charge that represents bits of data, similar to processors and other parts of your computer. This electrical charge needs to be constantly refreshed. If it's not, the capacitors lose their charge very quickly and the data disappears from RAM. The fact that data can be lost so quickly when the charge is gone is why saving any changed data to the hard drive or SSD is so important. It's also why so many programs have autosave features or cache unsaved changes in the case of an unexpected shutdown. Forensic specialists can retrieve data from RAM under special circumstances. However, most of the time, once you're done with a file or your computer shuts down, the information in RAM is gone. What Is DDR? Corsair Vengeance when it was DDR3 (and needed a haircut). Corsair The most common form of RAM currently used is DDR4. It's the fourth version of Double Data Rate Synchronous Dynamic Random-Access Memory (DDR SDRAM). "Double data rate" means data can be transferred twice per clock cycle, as opposed to just once. Effectively, it means you double the memory bandwidth, and also refers to how quickly data can be moved into and out of RAM. Prior to DDR4, computers were using (surprise, surprise!) DDR3. It's not uncommon for computers to still be rocking DDR3 RAM. DDR4 came out in late 2014, and it didn't become the most common type of RAM until a few years later. RAM sticks are "keyed" to prevent people from mixing and matching different generations of it that are incompatible. If you look at the RAM stick shown above, for example, you'll see a small divot in the bottom row. On DDR4, that divot is in a different place, so that (along with other differences) makes it impossible to put a DDR3 stick into a DDR4 slot. RAM also comes in two types: DIMM and SODIMM. DIMM is used in desktop tower PCs and servers, while SODIMM is used in smaller devices, like laptops and compact desktops. Some premade computers (especially laptops) also have RAM modules directly soldered to the motherboard. When this is the case, there are no RAM sticks, which makes upgrading impractical. Speeds, Voltages, and Capacities RAM sticks can also come with RGB lighting for desktops. G.Skill While the basics of what RAM does are very simple, there are vastly different types, even among DDR4. For example, RAM functions at varying speeds, such as 2,400, 3,000, or 3,200 MHz. It also comes in different sizes, like 4, 8, or 16 GB. Generally, modern computers need two RAM sticks (called a kit) of the same size to run in what's called "dual-channel mode." Basically, this just means a PC is running on two sticks of RAM. Many people claim you can mix and match different RAM configurations, and that's mostly true. However, it's much easier to maintain a PC if its RAM is the same speed and capacity, and comes from the same manufacturer, in that order of importance. Getting RAM of the same voltage is also a concern, but a lot of desktop DDR4 is sold at a stock 1.35 volts, making this less of an issue. Laptops and earlier generations of RAM, however, are a different story. If you can't get the same make of RAM for a laptop, at least make sure you use the same voltage, speed, and capacity. How much RAM you can use also depends on what your motherboard can take. An aging laptop, for example, might only be able to handle up to an 8 GB DDR3. A modern desktop PC, though, might be able to take something like a 128 GB DDR4, depending on its processor and motherboard. For most people, though, 8 to 16 GB is plenty. There's a lot more to RAM than this basic overview. If you're overclocking, then voltages and timings become important. If not, though, you hopefully now have a better understanding of what RAM does, and why it's such an important component of your PC. RELATED: How to Overclock Your Computer's RAM Random-access memory, or RAM, is an essential component in all devices, from PCs to smartphones to game consoles. Without RAM, doing just about anything on any system would be much, much slower. On the flip side, not having enough for the application or game you're trying to run can bring things to a crawl or even prevent them from running at all. But what is RAM exactly? In a nutshell, it's a high-speed component that temporarily stores all the information a device needs both right now and imminently. Accessing data in RAM is insanely fast, unlike hard drives that are slower but provide long-term storage. If this is all semantics and you need to know how to install some RAM or want to find out how much RAM you need, we have guides for that, too. Short-term memory RAM is essentially a device's short-term memory. It temporarily stores (remembers) everything currently running on a device, like all OS-specific services and any web browser, image editor, or game you're playing. RAM prevents the CPU from digging through the device's slower storage — like a hard drive or even a solid-state drive (SSD) — every time you request a new browser tab or load a new enemy to shoot. As fast as storage is compared to drives of years gone by, they're still far slower than RAM. Data that resides in RAM is readable from any capable component at almost the same speed. Because it has a hard-wired connection to the device, there's no real latency in cabling or connection. RAM doesn't remember everything forever, however. It's a "volatile" technology, meaning that once it loses power, it forgets everything. That makes it perfect for handling the multitude of high-speed tasks that your device throws at it each day. But it's also why storage systems like hard drives and SSDs are required. Unlike RAM, they hold information when the device powers off. Bill Roberson/Digital Trends Different types of RAM RAM is a bit of a catch-all term, like "memory," and covers a few different types. "RAM" or "memory" typically refers to dynamic random access memory (DRAM), or more accurately for modern systems, synchronous dynamic random access memory (SDRAM). The terminology doesn't matter beyond technicalities, but it's useful to know that the terms are relatively interchangeable colloquially. The most common type of RAM sold today is DDR4, though older systems may use DDR3 or even DDR2. The numbers denote RAM's generation, with each successive generation offering faster speeds through greater bandwidth — a higher megahertz (MHz) rating. Each generation also has physical changes, so they are not interchangeable. Another common term, especially in the video game space, is VRAM (video RAM). Although once a stand-alone piece of technology, VRAM is currently used to denote dedicated memory on the graphics card. For game consoles, it can also reference system memory, but in either case, it has to do with memory reserved exclusively for the GPU. Ram is critical to graphics DDR, or GDDR, usually with a generational designation, like GDDR6. Most modern graphics cards use GDDR6. However, some graphics cards may use a different VRAM form called High Bandwidth Memory (HBM, HBM2, and HBM2e). It has unique performance advantages, although it is typically expensive, and supply issues hinder widespread adoption. How much RAM do you need? The most significant consideration when buying RAM for a PC is how much is needed. A minimum amount is required to run an operating system, while many games and applications have a minimum requirement as well. Those requirements are listed in gigabytes (GB) and are often between 1GB and 8GB, depending on the application's hardware demands. Having more than the minimum amount of RAM is essential. A PC runs not only the current application but also other services and tasks in the background. However, having massive amounts of system memory doesn't necessarily make a PC run faster. The amount is not the only important aspect of RAM. While more gigabytes can help with multitasking, faster memory improves overall speed in certain games and applications. Like a CPU, RAM has its clock speed, which effectively controls how much data it can handle per second when combined with a few other factors. The memory's total speed is referred to as bandwidth and measured in megabytes per second (MBps), but traditionally, you'll see memory marketed with rates in megahertz (MHz). Typical DDR4 memory runs between 2,133MHz and 3,000MHz, but some can run upwards of 4,866MHz for the fastest kits available. You'll see these marketed as DDR4-2133 or similar, sometimes with the confusing "PC" label. The number following "PC" is simply the MHz speed multiplied by eight and then rounded. For example, you might see it listed as DDR4-2133 PC4-17000. Timings are another aspect of memory that can impact RAM performance, although they are no longer as important. It's effectively the time between clock cycles, and as memory speed increases, timings increase as well, reducing latency. Typically, timing is listed as several numbers separated by dashes, such as 15-15-15-35 or similar. When buying memory, timings are only crucial when considering high-performance memory for benchmarking or top-tier gaming. Timing isn't of real concern to the average consumer. Lastly, we have channels. Most memory sticks sold today support dual-channel at the very least, which means there are two lanes (buses) between one memory slot and the CPU's memory controller on the motherboard. However, this design requires two RAM sticks of the same type and speed that support dual channels. High-end RAM kits with three or four modules supporting triple- or quad-channel memory designs on motherboards are available as well. For practical purposes, multichannel designs don't make a huge difference in everyday performance. However, if you want to take advantage of dual or more channel memory, be sure to install the sticks in the correct colored slots on the motherboard. Check the manual for help on that front. How important is RAM? G.Skill RAM is significant. Too little can lead to sluggish performance, though smaller devices like tablets and smartphones don't need as much as high-end gaming desktops. However, installing massive amounts or using the highest MHz rating doesn't mean a device will run blazingly fast. Remember, RAM is only part of the overall equation. However, having enough RAM does matter. Having RAM that isn't bargain-basement slow is a good idea, too, especially for a complicated image or video editing task and playing games that are CPU-limited. But when it comes to improving a PC's overall performance, consider the costs involved. A faster CPU or graphics card will typically significantly impact the overall speed more than a memory upgrade. However, some CPUs, like AMD's Ryzen line, gain more significant benefits with memory upgrades. Upgrading from a hard drive to an SSD is also a big step in the right direction. The move to an SSD speeds up the slowest storage component by a considerable margin. It contributes massively to making a PC feel more snappy. As with any computing device, the slowest component typically limits performance. That means slow memory can hold the device back if it's the worst part of the configuration. Unless you're doing anything particularly intensive, something just beyond the minimum should be fine. A bit more than the amount necessary is enough, as long as it's not the bottom of the barrel. A figure just above the minimum for your equipment is adequate. Consider various factors like speed, size, and power. Some varieties also have RGB LED lighting. Final thoughts To understand your computer's abilities, you need to know about RAM, including an initial idea of how much your PC needs and how to install RAM. Knowing about RAM will save money on unnecessary hardware. All of the steps are essential to the performance, but RAM is where you see its abilities' speed and quality. Look at your whole setup and figure out the minimum amount of RAM needed to use the hardware. Simple models will have just enough RAM to run the PC but nothing else. When you start to add other pieces like programs and data, problems arise quickly. However, if this does happen to you, there are quite a few aftermarket solutions out there to grow your memory. Editors' Recommendations



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