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Because computers get smaller, hardware components such as storage drives should be required. The introduction of solid-state drives has enabled thinner designs such as Ultrabooks, but this has clashed with the industry standard SATA interface. The mSATA interface was designed to create a thin profile map that could interact with the SATA interface. A new problem occurred when SATA 3.0 standards limited SSD performance. To solve these problems, you needed to create a new form of compact card interface. Originally called NGFF (next-generation form factor), the new interface was standardized in the M.2 disk interface according to SATA version 3.2 specifications. While size is a factor in interface development, drive speed is equally critical. Specifications SATA 3.0 limited the real bandwidth of the SSD on the disk interface to about 600 MB / s, which reached many disks. The SATA 3.2 specifications introduced a new mixed approach for the M.2 interface, as it did with SATA Express. Essentially, the new M.2 card can use existing SATA 3.0 specifications and be limited to 600 MB/s. It can also use PCI-Express, which provides bandwidth of 1 GB/s according to current PCI-Express 3.0 standards. This speed is 1 GB/s for a single PCI-Express band, but you can use multiple bands. Up to four lanes of traffic can be used in accordance with the M.2 SSD specification. Using two bands would theoretically provide 2.0 GB/s, while four bands would provide up to 4.0 GB/s. With the possible release of pci-Express 4.0, these speeds will effectively double. The release of PCI-Express 5.0 in 2017 saw bandwidth increase to 32 GT/s, with 63 GB/s in the 16-band configuration. PCI-Express 6.0 (2019) saw another doubling of bandwidth to 64 GT/s, allowing 126 GB/s each way. Intel not all systems achieve these speeds. The M.2 drive and interface must be configured in the same mode. The M.2 interface uses legacy SATA mode or a newer PCI-Express mode. The disk selects which one to use. For example, an M.2 drive designed with legacy SATA mode is limited to 600 MB/s. Although the M.2 drive is compatible with PCI-Express up to four lanes (x4), the computer uses only two lanes (x2). This causes a top speed of 2.0 GB/s. To speed up as much as possible, check that the drive and computer are supported by the motherboard. One of the goals of the M.2 drive design was to reduce the overall size of the storage device. This has been achieved in one of several ways. First, the maps were made more leotant than in the previous form factor of mSATA. Maps M.2 width 22 mm, compared to 30 mm mSATA. The maps are also shorter in length by 30mm in length, compared to 50mm mSATA. The difference is that the M.2 cards support longer lengths of up to 110 mm. This means that these disks can be larger, providing more space for chips and thus higher capacity. MSi In addition to length the width of the cards, there is an option for both lopbellent and Boards M.2. One-sided desktop boards provide a thin profile and are useful for ultra-thin laptops. The two-way board allows you to install twice as many chips on the M.2 board, allowing larger storage tanks to be used. This is useful for compact desktop apps where space isn't as critical. The problem is that you need to know which M.2 connector is on the computer, in addition to the space for the length of the map. Most laptops only use a one-sided connector, meaning that laptops can't use B-way M.2 cards. For more than a decade, SATA has done a plugin storage and playback operation. This is due to the simple interface and the AHCI command (advanced host controller interface). AHCI is how computers exchange instructions with storage devices. It is built into all modern operating systems and does not require the installation of additional drivers when adding new drives. AHCI was developed in an era when hard drives had limited ability to handle instructions due to the physical nature of drive heads and ply. One team queue with 32 teams is enough. The problem is that today's solid state drives do much more but are still limited by AHCI drivers. Samsung NVMe's (Non-Volatile Memory Express) command structure and drivers have been designed to eliminate this bottleneck and improve performance. Instead of using a single command queue, it provides up to 65,536 command queues, with up to 65,536 commands per queue. This allows for more parallel processing of storage read/write requests, which increases performance over the AHCI command structure. While it's great, there are a bit of a problem. AHCI is built into all modern operating systems, but NVMe is not. Drivers must be installed on top of existing operating systems to get the most out of drives. This is a problem for many older operating systems. The M.2 drive specification allows for either of the two modes. This makes it easier to adopt a new interface with existing computers and technologies. As support for the structure of NVMe commands improves, the same drives can be used with this new command mode. However, switching between two modes requires the disks to be reformatted. The mobile computer has limited running time based on the size of its batteries and the power drawn by its components. Solid state drives reduce the energy consumption of the storage component, but there is room for improvement. Since the M.2 SSD interface is part of the SATA 3.2 specification, it includes other features outside the interface. This includes a new feature called DevSleep. As more systems are designed to go into hibernation when closed or off rather than turning off the power completely, there is constant battery drawing to keep some data active for quick recovery when the device wakes up. DevSleep reduces the amount of energy used creating a new state of lower power. This should expand the for computers that are transferred to hibernation. The M.2 interface is a promotion in computer storage and performance. Computers must use the PCI-Express bus to get the best performance. Otherwise it works the same way as any existing SATA 3.0 drive. It doesn't look like a big deal, but it's a problem with many first motherboards to use the feature. SSD drives offer a better experience when used as a root or boot drive. The problem is that existing Windows software has problems with many boot drives from the PCI-Express bus, not with SATA. This means that having an M.2 drive using PCI-Express will not be the primary drive where the operating system or programs are installed. The result is a fast data disk, but not a boot disk. Not all computers and operating systems have this problem. For example, Apple has developed macOS (or OS X) to use the PCI-Express bus for root partitions. That's because Apple switched its SSDs to PCI-Express in the 2013 MacBook Air - before the M.2 specs were completed. Microsoft has updated Windows 10 to support new PCI-Express and NVMe drives. Older versions of Windows can also work if hardware is supported and external drivers are installed. Another area of concern, especially with desktop motherboards, concerns how the M.2 interface is connected to the rest of the computer system. There are a limited number of PCI-Express bands between the processor and the rest of the computer. To use a PCI-Express-compatible M.2 card slot, the motherboard manufacturer must take these PCI-Express bands away from other components of the system. The way these PCI-Express bands are split between devices on boards is of grave concern. For example, some manufacturers share PCI-Express bands with SATA ports. Thus, using the M.2 drive slot can consume more than four SATA slots. In other cases, M.2 may share these lanes with other PCI-Express expansion slots. Check how the board is designed to make sure M.2 won't prevent other SATA hard drives, DVDs, Blu-ray discs, or other expansion cards from being used potentially. The fast company is going to get a little faster. June:July 1998 issue marks our last as a bimono magazine. Starting with the August release, subscribers will receive Fast Company monthly. Our goal: to deliver a magazine that follows the competitive mantra of the new economy – faster, cheaper, better! Nothing in the new world of work stands still or stays the same for a very long time. Of course, this magazine does not. In an economy that works on change, Fast Company is both a chronicler of change and a participant in it: Witness our introduction to this issue of a new feature - The Big Questions - that will emerge from time to time in future matters. 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They recently received 19 awards - including 3 silver medals - from the Society of Publishing Designers for their work on Fast Company, and a place for the magazine as a finalist for the magazine's national award for excellence in design. When we switch gears from bimonty to monthly, we need to hear from you: Let us know how we do. Do we remain true to our mission? We still want to open windows, knock down doors and offer practical We just want to do these things faster, cheaper, better – and more often. Often.

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