

SSDs not running at the correct speed: Causes and solutions.

Is your SSD not performing at its advertised maximum speed? Find out the causes of bandwidth bottlenecks and effective solutions to speed up your computer.

You've just upgraded to an expensive 4th or 5th generation NVMe SSD, but file copying, Windows startup, and game loading speeds are still slow. This is a very common problem many users face.

The problem isn't necessarily due to a faulty hard drive, but often stems from incorrect settings, excessive heat, or motherboard bandwidth limitations. This article will help you pinpoint the exact cause and provide steps to thoroughly resolve the issue of your device not running at the correct speed.

Key points

1. The actual SSD speed depends primarily on random access, not the sequential speed specifications printed on the box.
2. Incorrect port installation, overheating, full capacity, or missing TRIM can all prevent SSDs from performing at their maximum potential.
3. Maintaining 15-20% free space, updating firmware, and optimizing the system can significantly improve speed.
4. Use tools like CrystalDiskMark and CrystalDiskInfo to check performance and detect hardware errors early.

1. The difference between advertised speed and actual speed.

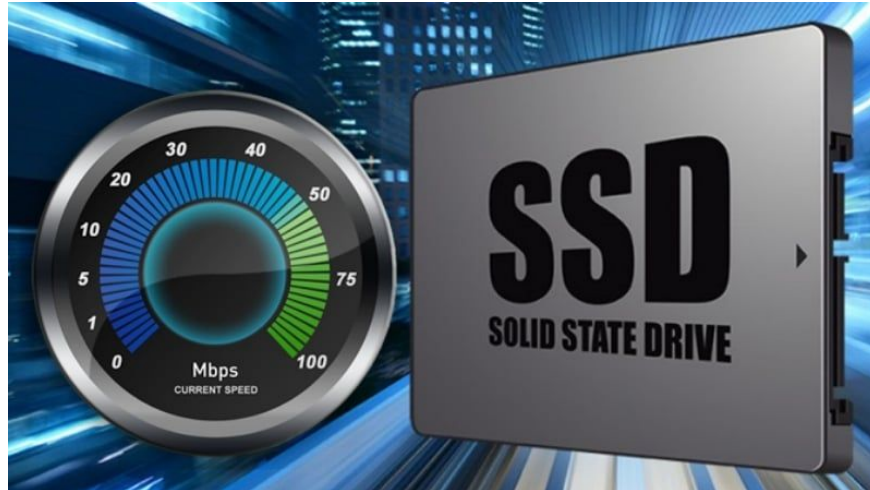
The SSD speed specifications printed on the product box actually refer to sequential read/write speeds. This figure is only accurate when copying a very large file and the transfer process is continuous.

However, the actual user experience depends entirely on random speed. When launching the operating system or opening heavy software, the hard drive has to access thousands of small files scattered throughout the system.

The fundamental difference between the two types of speed:

1. **Sequential speed:** Handles large, seamless files, often resulting in very high benchmark scores.
2. **Random speed:** Processes thousands of small data points, accurately reflecting the smoothness of use.

3. **Difference level:** Random speeds are always much lower than sequential speeds.



Understanding SSD speeds in real-world use

2. Reasons why SSDs aren't running at their correct speed.

2.1. Incorrect port installation or motherboard bandwidth limitations.

This is the most common reason why devices don't reach their maximum speed. Many users often upgrade their hard drives without checking motherboard compatibility .

Common cases of incorrect installation:

1. **Plugging a 2.5-inch drive into a SATA 2 port** will limit the actual transfer speed to 300MB/s instead of the 600MB/s of a SATA 3 port.
2. **Installing a 4x4 Gen NVMe PCIe SSD into a 3x4 Gen slot** will split the bandwidth in half, reducing the drive's theoretical speed by half.
3. **Incorrectly plugging into the secondary M.2 slot:** The secondary M.2 slot typically shares data streams with the chipset instead of connecting directly to the CPU like the primary M.2 slot.



Installing the SSD in the wrong slot will reduce its bandwidth.

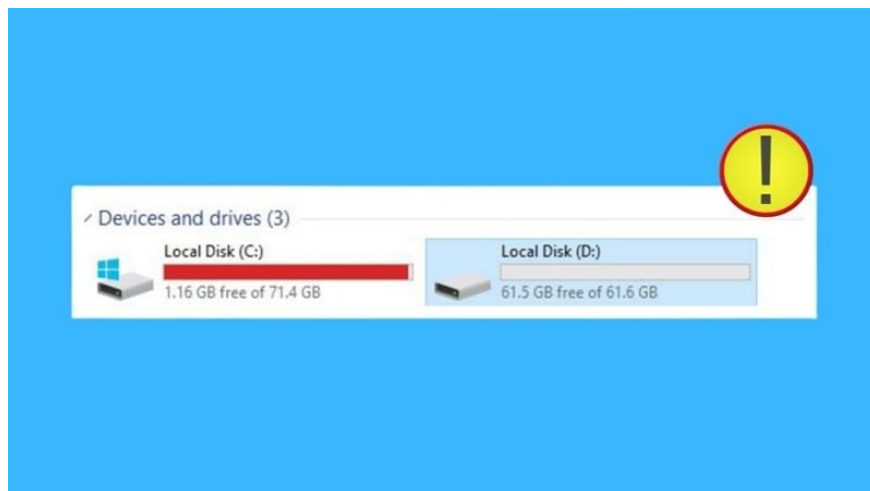
2.2. Overheating and Pulse Reduction Mechanism

High-speed NVMe drives typically generate a significant amount of heat during data processing. When the temperature exceeds a certain threshold, the controller activates a throttling mechanism. This automatically reduces the clock speed and transfer rate to protect the NAND Flash memory chips from short circuits and fire hazards.

2.3 . Hard drive is full.

When the memory capacity exceeds 80%, the controller takes longer to search for free memory areas. This causes significant delays in writing new data.

To prevent your SSD from slowing down when it's full, you should regularly clean up junk files and the operating system cache. Additionally, move infrequently used data such as movies and documents to your HDD to reduce the load.



SSDs that are full cause speed reductions.

2.4. Testing the TRIM feature

The TRIM feature informs the Windows operating system which data blocks are no longer in use. This allows the hard drive to proactively clean up and maintain stable write speeds.

Steps to check and activate TRIM:

1. **Step 1: Open the Windows search bar** , right-click on **Command Prompt** , and select **Run as administrator** .



Right-click on Command Prompt

1. **Step 2: Enter the command `fsutil behavior query DisableDeleteNotify`** and press **Enter** . If the result is 0, the feature has been successfully enabled. If the result is 1, enter the command **`fsutil behavior set DisableDeleteNotify 0`** to activate it.

```
Administrator: Command Prompt
Microsoft Windows [Version 10.0.18363.719]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\WINDOWS\system32>fsutil behavior query DisableDeleteNotify
NTFS DisableDeleteNotify = 0 (Disabled)
ReFS DisableDeleteNotify = 0 (Disabled)

C:\WINDOWS\system32>
```

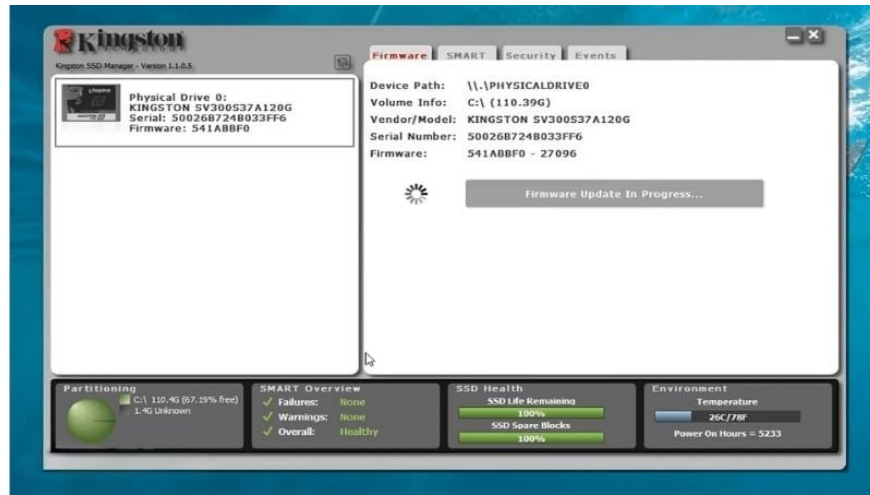
If the result returned is 0, TRIM is enabled.

2.5. Skip Firmware and Driver Updates

Operating systems typically use standard drivers to recognize new components. However, these default drivers cannot optimize latency and fully utilize the device's true performance. You need to download the official management software from the manufacturer to update the firmware.

Popular hard drive management software by manufacturer:

1. **Samsung Magician:** A specialized tool for Samsung storage devices.
2. **Western Digital Dashboard:** Helps monitor and optimize performance for WD products.
3. **Kingston SSD Manager:** System health management and update software for Kingston products.



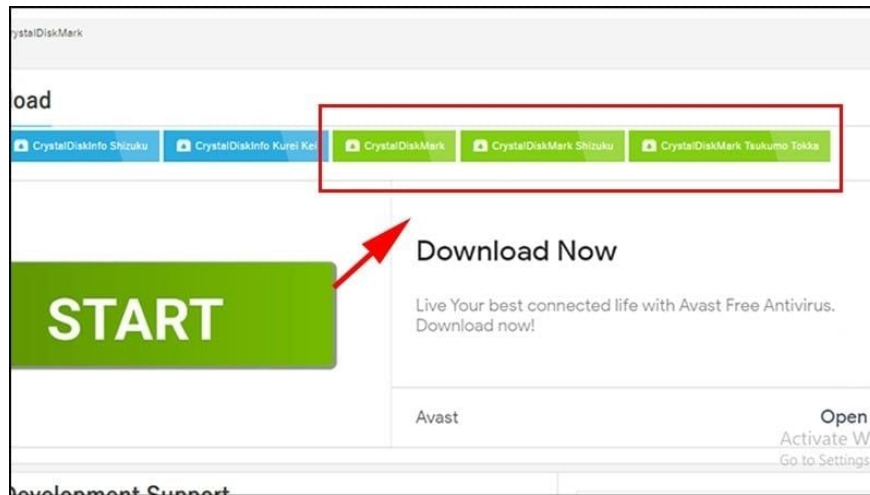
Use hard drive management software to update firmware and drivers.

3. Guide to checking SSD speed and health status

3.1. Use CrystalDiskMark to test speed

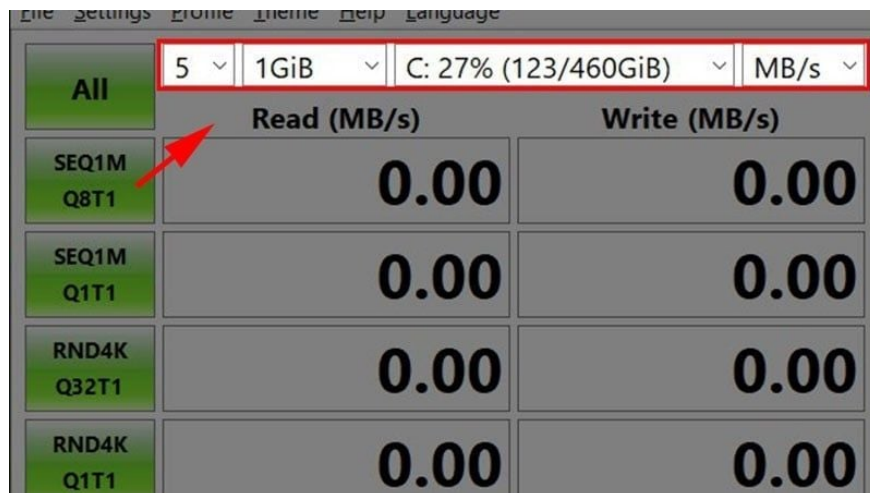
CrystalDiskMark is a popular benchmarking tool for accurately assessing data transfer speeds. This software helps you verify actual performance against the manufacturer's stated specifications.

1. **Step 1:** Download and install the latest version of **CrystalDiskMark software** [HERE](#) .



Download and install CrystalDiskMark software.

- B??c 2:** Chọn phân vùng ??a c?n ki?m tra và nh?n nút **All** ?? b?t ??u quá trình ??c. Quan sát **SEQ1M** (??c/ghi tu?n t?) và **RND4K** (truy xu?t ng?u nhiên khi m? app, game).

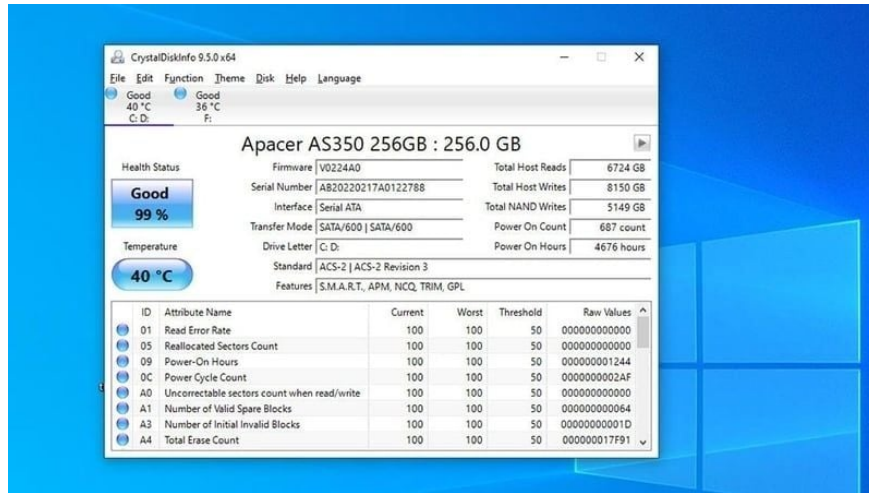


Nh?n nút All ?? b?t ??u quá trình ??c???????

3.2. Dùng CrystalDiskInfo ki?m tra s?c kh?e

CrystalDiskInfo giúp b?n theo dõi tình tr?ng ph?n c?ng m?t cách tr?c quan. Ngay trên giao di?n chính, b?n có th? ? quan sát chu?n giao ti?p ?ang ???c h? th?ng nh?n di?n.

Hãy chú ý ??n m?c Transfer Mode ?? bi?t linh ki?n có ?ang ch?y ?úng chu?n PCIe hay không. Ngoài ra, ch? s? Temperature s? c?nh báo n?u thi?t b? ?ang ho?t ??ng ? m?c nhi?t ?? nguy hi?m.



CrystalDiskInfo giúp bạn theo dõi tình trạng phần cứng

4. Mua SSD chính hãng, uy tín tại GearVN

GearVN chuyên cung cấp các sản phẩm Hi-End PC, laptop, PC, linh kiện máy tính (RAM, CPU, SSD,..) và thiết bị gaming (màn hình máy tính, tai nghe, bàn phím, chuột,..) đáp ứng mọi nhu cầu của game thủ và người dùng công nghệ. Vì vậy, GearVN còn nổi bật với các ưu điểm như:

- 1. Đa dạng sản phẩm và cấu hình tốt:** GearVN mang đến vô số lựa chọn cho các thiết bị hi-end như Samsung, Kingston, TeamGroup, Gigabyte, Corsair,.. Các sản phẩm đều được chọn lọc kỹ lưỡng.
- 2. Giá cả cạnh tranh và nhiều ưu đãi:** GearVN thường xuyên triển khai các chương trình khuyến mãi, giảm giá hấp dẫn vào các dịp đặc biệt. Bạn có thể dễ dàng sở hữu linh kiện ưng ý với mức giá tốt nhất, đi kèm quà tặng hấp dẫn hay chính sách trợ giá linh hoạt.
- 3. Chính sách bảo hành và hậu mãi uy tín:** Mua sắm tại GearVN, bạn sẽ hoàn toàn yên tâm với chính sách bảo hành rõ ràng và đội ngũ hỗ trợ kỹ thuật tận tình. Các chuyên viên giàu kinh nghiệm luôn sẵn sàng trợ giúp bạn chọn đúng sản phẩm và giải đáp mọi thắc mắc trong quá trình sử dụng.
- 4. Trải nghiệm mua sắm tiện lợi:** Dù bạn muốn trải nghiệm trực tiếp tại các showroom hay mua sắm online qua website với dịch vụ giao hàng nhanh chóng, GearVN đều mang đến sự tiện lợi tối đa.

Thông tin liên hệ GearVN:

- 1. Website:** gearvn.com
- 2. Hotline:** 1900.5301



Mua SSD chính hãng, uy tín tại GearVN

5. Câu hỏi thường gặp về tốc độ của SSD

5.1. SSD NVMe Gen 5 có thực sự cần thiết với người dùng phổ thông không?

Không hẳn. Với các tác vụ văn phòng, học tập hay chơi game thông thường, SSD Gen 3 hoặc Gen 4 đã đáp ứng rất tốt. Gen 5 chỉ phù hợp với người làm việc nặng như dựng phim 8K hoặc xử lý dữ liệu lớn.

5.2. Vì sao cùng một SSD nhưng máy này chạy nhanh hơn máy khác?

Hiệu năng SSD còn phụ thuộc vào CPU, RAM, mainboard và chuấn kết nối. Nếu hệ thống không đủ mạnh hoặc không tương thích, tốc độ sẽ bị giảm đáng kể.

5.3. Có nên dùng nhiều SSD cùng lúc để tăng tốc độ không?

It's possible, but it requires RAID configuration and a compatible motherboard. However, for the average user, this is unnecessary due to the high cost and difficulty in optimizing practical efficiency.

See more:

1. How long is the lifespan of an SSD? How to accurately check its durability?
2. The simplest and most accurate way to check if your hard drive is an SSD or HDD.
3. Signs that your SSD is about to fail that you need to know immediately.

Properly connecting ports, adding cooling, and fine-tuning the software will help your storage system operate stably and at maximum speed. If you need to purchase peripherals or computer components, contact GearVN for advice on upgrading your configuration to best suit your needs.

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