## CrystalDiskMark

CrystalDiskMark is a widely used, open-source benchmarking tool for measuring the performance of storage devices such as hard disk drives (HDDs), solid-state drives (SSDs), and external drives, including NVMe SSDs.

What does CrystalDiskMark test?

* Sequential Read/Write Speeds: Measures how quickly large, contiguous blocks of data can be read from or written to the drive. This simulates tasks like copying large files.
* Random Read/Write Speeds: Assesses the drive’s ability to handle small, scattered pieces of data, which is important for tasks like loading programs or the operating system.
* Different Queue Depths and Threads: Tests are performed with varying numbers of simultaneous requests (queue depth) and threads, reflecting real-world multitasking and server environments.

How does it test?

* CrystalDiskMark creates and transfers files of user-specified sizes (from 16MB up to 64GB) to the drive, then measures the speed at which the drive can read and write this data.
* It offers multiple test modes, such as Peak, Real World, and Demo, to simulate different usage scenarios.
* Users can customize the number of test runs, file size, and target drive.

What results does it display?

* After running, CrystalDiskMark displays the measured speeds in megabytes per second (MB/s) for each test: sequential read/write and random read/write, often at various queue depths and block sizes.
* These results help users compare storage performance, identify bottlenecks, and verify manufacturer claims.

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## Novabench

Novabench is a popular PC benchmarking software designed to test the performance of key hardware components in a computer system, including the processor (CPU), memory (RAM), storage drive (disk), and video card (GPU).

* What it tests: Novabench runs tests on the CPU for processing speed, the GPU for graphics performance, RAM for memory bandwidth and latency, and the disk for read/write speeds.
* How it tests: The software executes a series of standardized tests for each component. For example, it may perform mathematical calculations and data compression for the CPU, graphics rendering for the GPU, memory transfer tests for RAM, and file operations for the disk.
* Results displayed: After running the tests (which typically take about a minute), Novabench provides a score for each hardware component and an overall system score. It also displays general system information and allows users to compare their results with other systems via an online database.