

NVIDIA RTX IO: GPU Accelerated Storage Technology

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Instant game loading and stutter free navigation through endless open worlds has long been a goal of gamers and developers alike. Even with the incredible performance of Gen4 NVMe SSDs, this goal has remained out of reach. Modern game engines have exceeded the capability of traditional storage APIs; a new generation of I/O architecture is needed.

Introducing NVIDIA RTX IO

Leveraging the advanced architecture of our new [GeForce RTX 30 Series graphics cards](#), we've created NVIDIA RTX IO, a suite of technologies that enable rapid GPU-based loading and game asset decompression, accelerating I/O performance by up to 100x compared to hard drives and traditional storage APIs. When used with Microsoft's new DirectStorage for Windows API, RTX IO offloads dozens of CPU cores' worth of work to your GeForce RTX GPU, improving frame rates, enabling near-instantaneous game loading, and opening the door to a new era of large, incredibly detailed open world games.

Object pop-in and stutter can be reduced, and high-quality textures can be streamed at incredible rates, so even if you're speeding through a world, everything runs and looks great. In addition, with lossless compression, game download and install sizes can be reduced, allowing gamers to store more games on their SSD while also improving their performance.

"Microsoft is delighted to partner with NVIDIA to bring the benefits of next generation I/O to Windows gamers. DirectStorage for Windows will let games leverage NVIDIA's cutting-edge RTX IO and provide game developers with a highly efficient and standard way to get the best possible performance from the GPU and I/O system. With DirectStorage, game sizes are minimized, load times reduced, and virtual worlds are free to become more expansive and detailed, with smooth & seamless streaming." - Bryan Langley - Group Program Manager for Windows Graphics and Gaming

How NVIDIA RTX IO Works

NVIDIA RTX IO plugs into Microsoft's upcoming DirectStorage API, which is a next-generation storage architecture designed specifically for gaming PCs equipped with state-of-the-art NVMe SSDs, and the complex workloads that modern games require. Together, the streamlined and parallelized APIs, specifically tailored for games, allow dramatically reduced IO overhead and maximize performance/bandwidth from NVMe SSD to your RTX IO-enabled GPU.

Specifically, NVIDIA RTX IO brings GPU-based lossless decompression, allowing reads through DirectStorage to remain compressed while being delivered to the GPU for decompression. This removes the load from the CPU, moving the data from storage to the GPU in its more efficient, compressed form, and improving I/O performance by a factor of 2.

[GeForce RTX GPUs](#) are capable of decompression performance beyond the limits of even Gen4 SSDs, offloading dozens of CPU cores' worth of work to deliver maximum overall system performance for next generation games.

NVIDIA RTX IO: GPU Accelerated Storage Technology For The Next Generation of Games

Microsoft is targeting a developer preview of DirectStorage for Windows for game developers next year, and NVIDIA RTX gamers will be able to take advantage of RTX IO-enhanced games as soon as they become available. Developers interested in RTX IO can contact NVIDIA at <https://developer.nvidia.com/rtxio>.

For more information about this exciting technology, stay tuned.