

**Application Note: Storage Benchmarks for the Trenton Systems TKL8255 PICMG® 1.3 Single Board Computer**

**Date: August 30, 2016**

The [Trenton Systems TKL8255 PICMG® 1.3](#) single board computer is undergoing final validation testing. Due to advances in interconnect technology, the TKL8255 implements the new M.2 slot on the back of the board. M.2 is a versatile interface, providing up to a x4 PCIe 3.0 link to attached devices in a compact form factor. The TKL8255 also provides six, industry-standard SATA/600 ports onboard for legacy storage.

**About NVMe**

NVMe (Non-Volatile Memory Express) is a technology that allows solid-state flash storage to be addressed directly via the PCIe bus. This allows for much greater transfer speeds and lower latencies than legacy storage interfaces while reducing system size and power requirements. Often, NVMe drives utilize the M.2 interface because of its compact footprint.

The NVMe standard allows system designers to reduce system complexity and reliably increase performance in the area that has traditionally been the most restrictive bottleneck on computing systems, the non-volatile storage.

This document provides preliminary benchmarking results of several standard, off the shelf storage solutions so that system designers can observe the efficiencies that utilizing NVMe on a M.2 device as an alternative to traditional non-volatile storage paradigms can provide.



**The rear of the TKL8255 and various sizes of M.2 NVMe SSDs.**

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NOTE: What follows are synthetic laboratory tests, designed to approximate real-world performance scenarios. Environmental variables, the type of application code executed and ancillary system device speeds may impact final configured system performance. For more information about the performance you can expect from a TKL8255 equipped with Intel's new Skylake-S processors in your application, contact Trenton Systems.

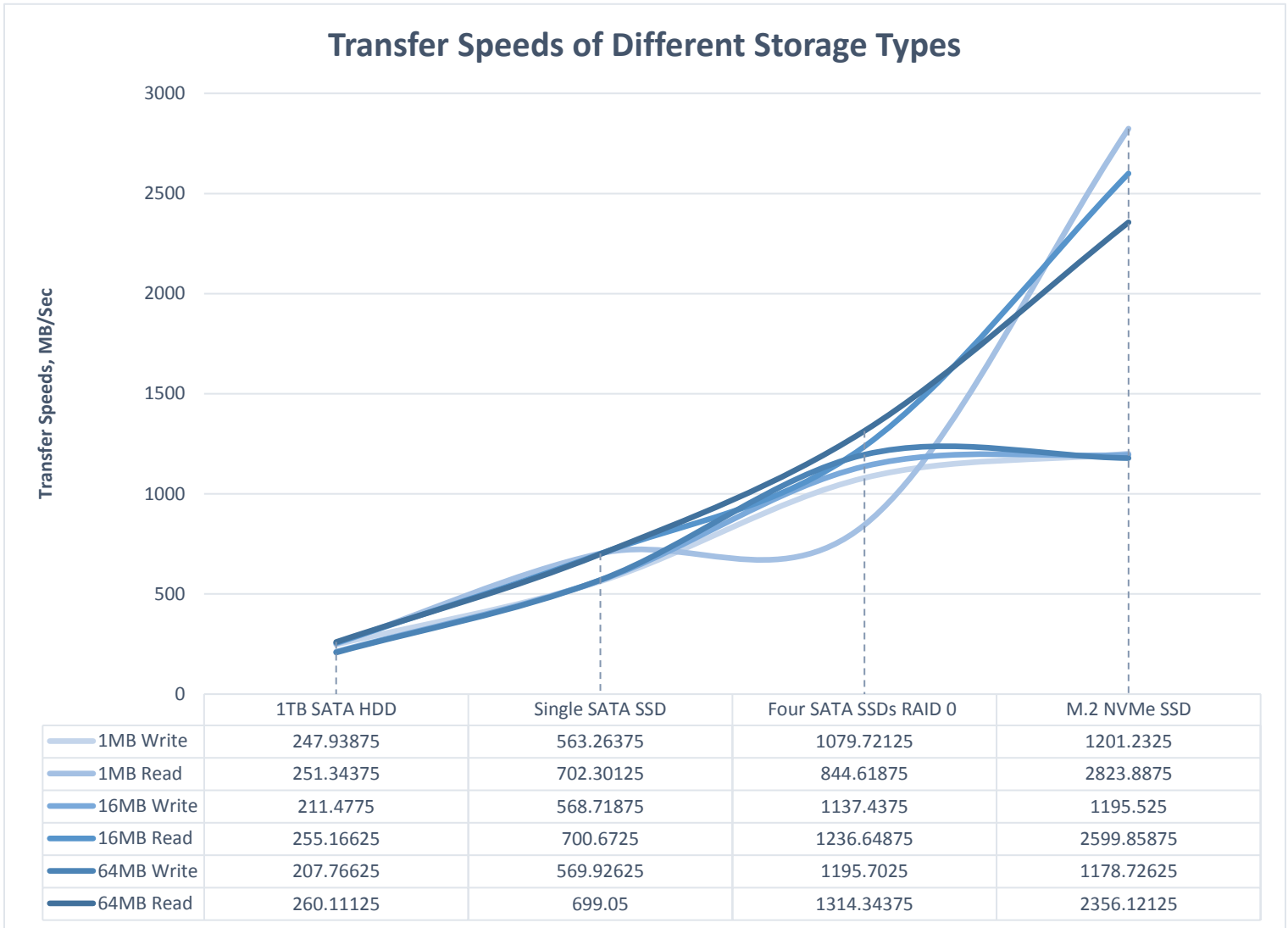
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## Transfer Speeds of Different Storage Types

The following is a table and graph of four different standard system storage paradigms, a traditional, 1TB magnetic rotating 7200RPM SATA600 drive, a single SATA Solid State Disk (SSD), four SATA SSDs in a RAID0 and a M.2 x4 PCIe NVMe SSD. As you can see, the performance increase the NVMe M.2 drive provides is dramatic, even over the RAID0 of SATA SSDs, on all data block sizes.

Percent read increase of M.2 over other drives (64MB block):

- 89% faster than a 1TB SATA HDD
- 70% faster than a SATA SSD
- 44% faster than a SATA SSD RAID0 (4 drives)



For more information on the TKL8255, check out the [TKL8255 Datasheet](#).

Hopefully, you find this information helpful as you assess the performance benefits of the new TKL8255 PICMG 1.3 single board computer in your particular system application. For additional information contact Trenton toll-free in the U.S. at 1-800-875-6031 or worldwide at +1-770-287-3100. Please visit our website at [www.TrentonSystems.com](http://www.TrentonSystems.com) or follow us on:

