

# Four reasons to move to NVMe right now

## From increased performance to solid security, NVMe SSDs boost business productivity

The working world is a different place today for your IT and security manager customers. The prevalence of data intensive programs utilizing artificial intelligence and machine learning (AI/ML) has made fast client storage a necessity for your whole workforce. The high cost of replacing IT equipment can make upgrading existing laptops and workstations a preferable way to reduce IT turnaround times while improving overall system performance. Adding NVMe Express™ (NVMe™) storage with its fast PCIe 4.0 bus connections to client SSDs will not just sustain the life of existing hardware, but will future-proof your workstations to withstand the ever-increasing performance requirements of modern applications. Here are four reasons to add client NVMe SSDs to your hardware deployments right now.

### 1 Primarily? Performance!

Faster transfer speeds and lower latency than SATA SSDs (see Figure 1) equals higher performance. NVMe SSDs can read and write up to 25x faster than SATA<sup>1</sup> SSDs. (HDD speeds? Barely a blip.) NVMe continues to optimize on PCIe, which doubles its speed with each generation. With Crucial NVMe SSDs delivering low latency and cost-efficient capacity from 232-layer TLC NAND and density innovations. You can help your customers get this performance at Crucial's ultra-competitive prices.

4K random read IOPS - client storage



Figure 1: 4K random read IOPS for NVMe SSDs are 16x faster than SATA SSDs.<sup>2</sup>

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## 2

### Winning productivity

The right storage choices can help organizations move faster, serve customers better and outpace their competition. NVMe SSDs help relieve data bottlenecks with faster load times, more efficient workflows, and multiple I/O queues (“parallelism”) to lower latency. NVMe has 2000 times more parallelism than SATA<sup>3</sup>. Plus, seconds add up! NVMe SSDs are known to accelerate application performance, especially for large graphics files (see Figure 2), and decrease wait and boot times.

For road warriors with data-intensive workloads, NVMe SSDs launching 1GB Photoshop PST files<sup>1</sup> can be up to:

**25x**  
faster than SATA SSDs

**92x**  
faster than HDDs

Figure 2: NVMe SSDs can launch large media files up to 92x faster than HDD<sup>1</sup>

## 3

### Improved TCO and efficiency

Upgrade to NVMe storage to extend the lifecycle of hardware. Upgrading can also cost 3-5x less than purchasing comparable new devices<sup>4</sup>. NVMe storage is faster than SATA for remote upgrades and backups. What used to take days to keep your medium to large workforce in compliance will now only take hours. More efficient battery use also helps TCO, and the Crucial T500 offers up to a 40% higher performance to power ratio than previous SSDs.

 **One**  
**in five**  
Companies are fully confident  
that their infrastructure security can support long-  
term remote work. — 2021 survey by Pulse

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## 4

### Solid security

From the moment of installation, Crucial NVMe SSDs can begin delivering built-in data security with flash-based protection of data-at-rest. Further encryption with SEDs is available<sup>5</sup>, plus our specialized algorithms can help improve data protection<sup>6</sup>. That's in addition to the road-worthy durability, reliability, consistency and extended longevity of SSDs. Crucial NVMe SSDs provide the hardware-assisted protection now mandated for [Windows 11 security](#), so secure boot and device encryption are ready to help safeguard against online attacks.

| 2TB Specs                                  | Crucial® P3    | Crucial® P3 Plus | Crucial® T500  | Crucial® T700  | Crucial® T705  |
|--|----------------|------------------|----------------|----------------|----------------|
| Sequential Read (up to MB/s) <sup>7</sup>  | 3,500          | 5,000            | 7,400          | 12,400         | 14,500         |
| Sequential Write (up to MB/s) <sup>7</sup> | 3,000          | 4,200            | 7,000          | 11,800         | 12,700         |
| Random Read (up to IOPS) <sup>7</sup>      | 650K           | 700K             | 1,180K         | 1,500K         | 1,550K         |
| Random Write (up to IOPS) <sup>7</sup>     | 640K           | 800K             | 1,440K         | 1,500K         | 1,800K         |
| Endurance Total Bytes Written (TBW)        | 440TB          | 440TB            | 1,200TB        | 1,200TB        | 1,200TB        |
| NVMe PCIe Interface                        | Gen 3 x4       | Gen 4 x4         | Gen 4 x4       | Gen 5 x4       | Gen 5 x4       |
| Warranty <sup>8</sup>                      | 5-year limited | 5-year limited   | 5-year limited | 5-year limited | 5-year limited |

Table 1: Crucial NVMe SSDs for client and consumer

## Micron and Crucial: Two brands. One channel.

Because Crucial is a brand of Micron, business customers enjoy reliable supply, competitive pricing and quality assurance. Micron's vertical integration manages every link in the supply chain from sand to silicon to testing to shipping, under our own roof. Our team of experts listens to our partners, carefully assesses their needs, and embeds the right SSD mix that will best help their business thrive.

For more info, visit [microncp.com/whynvme](https://microncp.com/whynvme) or contact your Micron salesperson.

1. Comparing Crucial T705 NVMe SSD listed sequential read speeds of 14,500MB/s to Crucial MX500 SATA listed sequential read speeds of 560MB/s to top consumer hard drive listed read speeds of 7200RPM (~ 156MB/s). Actual speeds may vary.
2. Comparing IOPS for random reads of a commercially available HDD vs a Crucial MX500 SATA 1TB SSD vs a Crucial T705 NVMe 1TB SSD. Typical I/O performance numbers as measured using CrystalDiskMark® with command queue full and write cache enabled. Fresh out-of-box (FOB) is assumed.
3. Parallelism: NVMe can have up to 65,355 I/Os, each with up to 64,000 queues, as reported in [Network World](#) and others.
4. Replacing 1500 PCs vs. upgrading storage and memory. Based on NewEgg list prices for 1250 ASUS Zenbook 14 UltraThin Laptops with 16GB DDR4 memory and 1TB NVMe SSD, equaling \$1,350,000 compared to 1250 Crucial 16GB laptop memory modules and 1250 1TB Crucial P2 NVMe SSDs, equaling \$300,000, for a savings of \$1,050,000, as of October, 2020.
5. To set up SEDs in Crucial using Bitlocker: <https://www.crucial.com/support/articles-faq-ssd/setup-ssd-encryption-via-bitlocker>
6. No hardware, software or system can provide absolute security under all conditions. Micron assumes no liability for lost, stolen or corrupted data arising from the use of any Micron products, including those products that incorporate any of the mentioned security features. Micron's new Secure Execution Environment is an isolated security processing engine within the SSD controller.
7. Typical I/O performance as measured using CrystalDiskMark® with a queue depth of 512 and write cache enabled. Windows 11 Core isolation disabled for performance measurement. Fresh out-of-box (FOB) state is assumed. For performance measurement purposes, the SSD may be restored to FOB state using the secure erase command. System variations will affect measured results.
8. Warranty on most Micron SSDs is valid for five years from the original date of purchase or before writing the maximum total bytes written (TBW) as published in the product datasheet and as measured in the product's SMART data, whichever comes first.