

# Why Windows 10 and SSDs Still Need Diskeeper®

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THE DISKEEPER COMPANY

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# Why Windows 10 and SSDs Still Need Diskeeper

Many of our customers wonder if they should continue using Diskeeper if they are operating on the Windows 10 platform.

It certainly is a valid question – Windows 10 has a lot of capability. However, some of Windows 10's inherent characteristics work against optimal performance.

## The Problem:

Excessive I/Os continues to be a problem in Windows 10. This is a function of how the Windows OS is designed to organize data logically, and this inefficient pattern is at the software layer. It happens regardless of the type of hardware you have.

Solid state drives (SSD) are generally considered to be faster, more powerful, more efficient and in some respects more reliable than hard drives.

However, it's the NTFS file system that causes excessive and unnecessary writes and subsequent reads even if you have SSDs (Solid State Drives) or Flash memory.

A computer is only as fast as its slowest component, and **the storage system is by far the slowest part of any computer**. It is at least 100,000 times slower than RAM (Random Access Memory) and over 2 million times slower than the CPU.

Inherent problems with SSDs:

- SSDs start out fast but gradually lose speed and become subject to failure over time.
- Most SSDs experience a dramatic and noticeable deterioration in performance.
- SSDs possess a limited number of erase-write cycles, which can result in a shorter lifespan.
- SSDs require old data to be erased before new data is written over it, rather than just writing over the old information as is done with traditional hard drives. This doubles wear-and-tear and can cause major issues.

Click here for more detailed information about the effects of excessive I/Os on SSD storage: [Everything You Need to Know about SSDs and Fragmentation in 5 Minutes](#)

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## The Conundrum:

The built-in tools in Windows don't fix this. SSD/Flash/NVMe storage don't fix this. Upgrading to a faster processor or adding more memory doesn't fix this.

## The Solution:

Diskeeper eliminates the excessive I/Os that slow down users and applications and allows for more data throughput and faster access. Diskeeper was specifically re-engineered and designed for SSD/Flash/NVMe storage and all see significant benefit.

Here are a couple more links that help shine a spotlight on the subject, which apply to both Diskeeper and V-locity:

[How to Make NVMe Storage Even Faster](#)  
[SysAdmins Discover That Size Really Does Matter](#)

Diskeeper 18 Professional contains a toolkit of proactive and highly efficient technologies:

**IntelliWrite®** – Write I/O optimization technology prevents files from being fractured and broken apart into pieces, with each piece requiring its own I/O operation before being written to disk or SSD in a non-sequential manner. This stops the Windows phenomena of fragmentation from occurring before it becomes a problem.

**IntelliMemory®** – Read I/O optimization technology intelligently caches active data from read requests using idle system memory. This further reduces I/O overhead to the underlying storage device, enabling organizations to get more performance and life from the hardware they already have.

**InvisiTasking®** – Intelligent monitoring technology allows all "background" operations within the system to run with near-zero resource impact on current activities.

Millions of users benefit from Diskeeper daily. And here's proof using the industry standard workload utility, Intel's IOMeter.

IoMeter Workload	No Diskeeper	With Diskeeper	% Improvement
<b>512B; 75% Read; 70% random Test1</b>			
I/Ops	12043.45714	34170.5936	183.73
Read I/Ops	9025.945506	25612.88913	183.77
Write I/Ops	3017.511638	8557.704464	183.60
MiBps	5.880594	16.68486	183.73
		<b>Average =</b>	<b>183.71</b>
Average Response Time	0.082686	0.028978	<b>64.95</b>
<b>4K; 25% Read; 80% random Test2</b>	<b>No Diskeeper</b>	<b>With Diskeeper</b>	
I/Ops	14791.03311	23897.33763	61.57
Read I/Ops	3698.047286	5972.984563	61.52
Write I/Ops	11092.98582	17924.35306	61.58
MiBps	57.777473	93.348975	61.57
		<b>Average =</b>	<b>61.56</b>
Average Response Time	0.067261	0.041515	<b>38.28</b>
<b>16K; 50% Read; 50% random Test3</b>	<b>No Diskeeper</b>	<b>With Diskeeper</b>	
I/Ops	7136.04999	26035.37266	264.84
Read I/Ops	3564.751851	13009.26001	264.94
Write I/Ops	3571.298139	13026.11265	264.74
MiBps	111.500781	406.802698	264.84
		<b>Average =</b>	<b>264.84</b>
Average Response Time	0.139781	0.038094	<b>72.75</b>
<b>32K; 75% Read; 20% random Test4</b>	<b>No Diskeeper</b>	<b>With Diskeeper</b>	
I/Ops	5514.22347	24669.02767	347.37
Read I/Ops	4136.191707	18500.51993	347.28
Write I/Ops	1378.031764	6168.507748	347.63
MiBps	172.319483	770.907115	347.37
		<b>Average =</b>	<b>347.41</b>
Average Response Time	0.180988	0.040222	<b>77.78</b>
<b>32K; 25% Read; 60% random Test5</b>	<b>No Diskeeper</b>	<b>With Diskeeper</b>	
I/Ops	6909.310694	18347.65169	165.55
Read I/Ops	1725.140427	4584.455636	165.74
Write I/Ops	5184.170268	13763.19606	165.49
MiBps	215.915959	573.364115	165.55
		<b>Average =</b>	<b>165.58</b>
Average Response Time	0.144379	0.054173	<b>62.48</b>

Five different workload activities ranging from small 512B I/O requests to much larger 32K sized requests. Each sample performing different percentages of random, sequential, reads, and writes. Just like a real-world system behaves.

This was a real customer test running on a Windows 10 Lenovo 8500T ThinkCentre with 8 GB of DRAM with Samsung PM981 PCI SSD NVMe storage.

It's easy to see that with Diskeeper the system was able to process anywhere between 61% - 347% more throughput and data transactions. Even the average I/O response time was improved by nearly 80%.



Diskeeper solves a problem that hardware simply can't overcome and keeps your clients, physical servers, virtual servers and servers in the cloud running at peak efficiency.

## Diskeeper 18 Comparison Chart

Volume Discounts Available  
5+ servers  
20+ workstations

Windows®  
Built-In  
Defrag Tool

Diskeeper  
Server

Diskeeper  
Professional

Diskeeper  
Home

### TECHNOLOGY

HyperBoot® technology	✗	✗	✓	✓
IntelliMemory® DRAM caching	✗	✓	✓	Up to 2 GB
IntelliWrite® fragmentation prevention	✗	✓	✓	✓
InvisiTasking® technology	✗	✓	✓	✓
Instant Defrag™ Technology	✗	✓	✓	✓
Terabyte Volume Defrag technology	✗	✓	✓	✓
HyperFast® solid-state drive optimizer	✗	✓	✓	✓
CogniSAN® technology	✗	✓	✗	✗
Automatic Space Reclamation Technology	✗	✓	✓	✓
Extreme file fragmentation technology	✗	✓	✓	✓
Manual defragmentation technology	✓	✓	✓	✓

### PERFORMANCE

System Overhead	High	Near-zero	Near-zero	Near-zero
Thorough free space consolidation	✗	✓	✓	✓
Defrag volumes with <1% free space	✗	✓	✓	✓
Defrag severely fragmented files (millions)	✗	✓	✓	✓
24/7 Optimization	✗	✓	✓	✓