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WHITE PAPER

How an SSD can Improve the Microsoft Windows® 10 Experience

Introduction

Earlier this year, Microsoft launched its new operating system, Windows® 10, to PC users from across the globe. It's replacing arguably one of the most controversial and divisive versions of the operating system ever—Windows 8. To its credit, Microsoft has revamped its design and brought back some of the old favorites, such as a start menu that's completely customizable based on your app preferences. New and refined features, such as a better search function that includes the Windows store and your browser in addition to folders, apps, and files that are stored locally. The new operating system also now has virtual desktop capabilities, universal apps to have them run across all platforms, and DirectX 12 installation to optimize the gaming experience to name a few.

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All these new features might not result in a hit to your wallet since Microsoft is allowing existing Windows 7 and 8 users to upgrade for free, but you might want to take a closer look at your hardware.

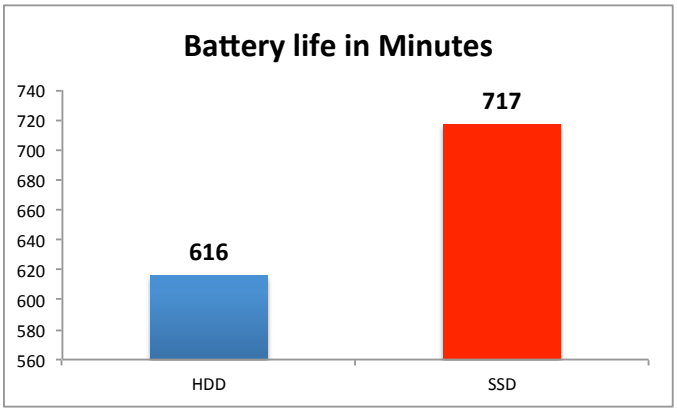
According to some PC experts, Windows 10 has the same systems requirements as Windows 8/8.1, and Microsoft claims that you'll only need a 1GHz processor and 1GB of RAM for the 32-bit version and 2GB of memory for the 64-bit version. Based on what we've seen, you'll need at least twice as much memory and at minimum a dual-core processor for it to be running optimally.

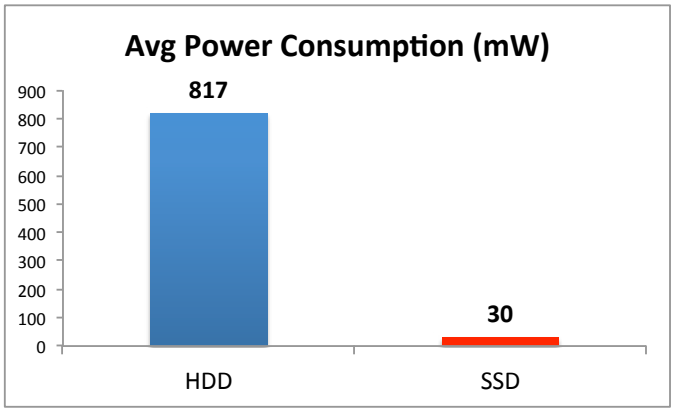
But what about all those apps running on your system? Will Windows 10 operating system live up to the reputation of giving you a dynamic and optimal experience in an instant-on world? How much of an impact does your storage device have on your system when it comes to boot up and application load times on Windows 10? How does power consumption of your storage device play a role and how does that impact your user experience? That's what we set to find out in a series of tests comparing the SanDisk® Z400s vs. a hard drive running on the new Windows 10 operating system.

Battery and Power Consumption

To start, we conducted a basic test to measure power consumption from both a hard drive and a SanDisk Z400s drive using MobileMark® 2014.

What makes MobileMark 2014 stand out is that it reflects the latest usage patterns of business users in the areas of office productivity and media creation & consumption. Unlike benchmarks that only measure battery life, MobileMark measures battery life and performance simultaneously, showing how well a system design addresses the inherent tradeoffs between performance and power management. After running the software, results indicated that the system with the SanDisk Z400s consumed less power by over 2,600%. More importantly, that translates to a little over a hundred extra minutes in battery life.





Test using Windows 10 Pro, Intel Core i7-4600@2.9GHz, 8GB RAM, 64-bit OS, PCMark Vantage, SanDisk Z400s, 256GB vs. 5400 RPM, 500GB.

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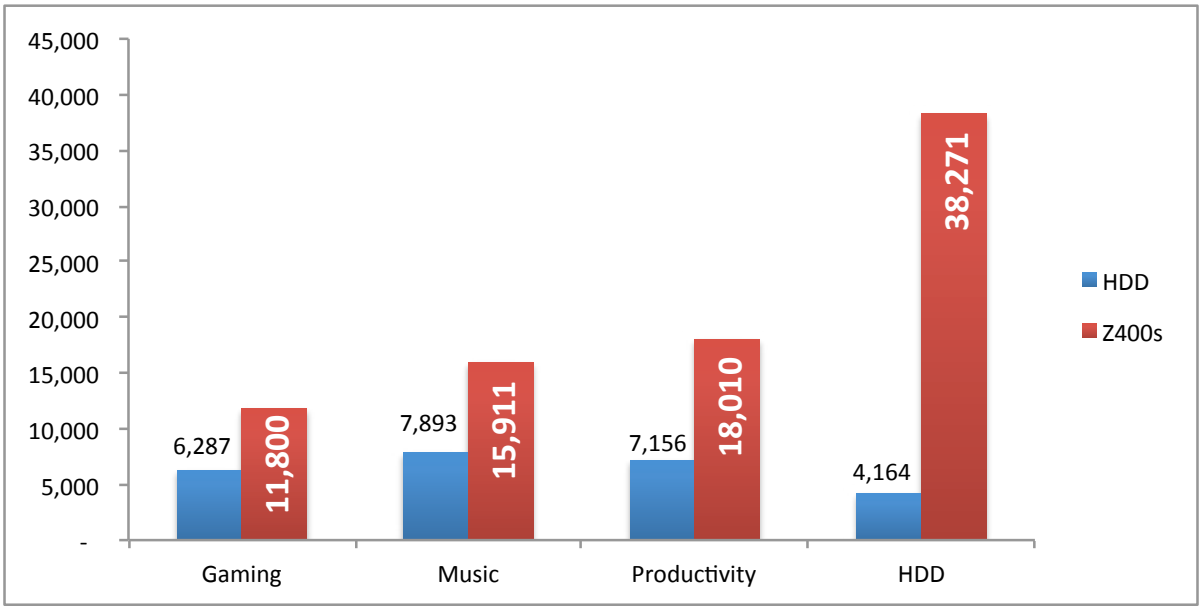
Performance

Next, we conducted a test to measure performance using PCMark® Vantage, which is a computer benchmark tool used to test the performance of a PC at the system and component level. In most cases, the tests in PCMark are designed to represent typical home user workloads, and PCMark scores with higher numbers indicate better performance.

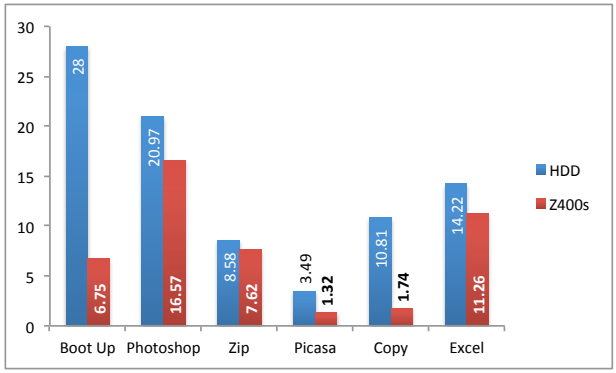
We looked at four areas in PCMark Vantage including: gaming, music, productivity, and HDD usage.



SanDisk Internal benchmark test using Windows 10 Pro, Intel Core i7-4600@2.9GHz, 8GB RAM, 64-bit OS, SanDisk Z400s, 256GB vs. Seagate 5400 RPM, 500GB. Boot up time measured using BootRacer. Time represents power on to pre-desktop application loading.

As you can tell by the results, PCMark Vantage scores for the SanDisk Z400s exceed hard drive scores by a wide margin. But what does that mean exactly?

We live in a world where we want things at the flick of a switch. There is no exception when it comes to wanting our applications running on our PCs to load instantaneously. The higher PCMark vantage scores tell us that a typical PC user will see increases in load times and file transfer rates for applications including: photo editing, spreadsheets, file copying and compression, and music. For gaming applications, it means being able to load games installed on a solid state drive much faster because the transfer rates are substantially higher than on a hard drive.[1] SSDs can also reduce hitching, which refers to brief pauses in games when they can't pull assets from the hard drive fast enough to keep up with the player.



Test using Windows 10 Pro, Intel Core i7-4600@2.9GHz, 8GB RAM, 64-bit OS, PCMark Vantage, SanDisk Z400s, 256GB vs. 5400 RPM HDD, 500GB.

SanDisk also ran an internal benchmark test where multiple programs were launched in parallel to mimic a real-world

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scenario. As evident by the test results from figure 4, the Z400s SSD outperformed the hard drive in every application when it comes to load times. Furthermore, the Z400s SSD booted up over 4X faster than the HDD in our test.[2]

Summary

In summary, this examination reminds us that as user experiences and expectations evolve, evolution in technology at the software and hardware level must run in parallel. Whether the discussion revolves around gaming and multimedia entertainment or optimizing office productivity, consumers want and expect to be able to have instant access to information and applications. The Z400s presents an opportunity for not only PC OEMs, but also systems integrators and builders to be able to provide its end users with fast and reliable machines that come at an affordable price point.

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[1]http://www.pcgamer.com/how-do-ssds-affect-gaming-performance/

[2]Based on SanDisk internal test. Dell E6440 with 8GB RAM, Intel i7, SanDisk Z400s vs. 500GB 5400 HDD.

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