

# Reverse Engineering Essential SSD Characteristics

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Recent advancement in NAND Flash memory technology in SSDs such as bits per cell [1] has led to various applications in storage systems. Along with extending storage capacity of the device, SSDs actively exploit parallelism through channels and ways producing higher bandwidth which is the stepping stone for replacing mechanical storage device. It is true, however, the current computing system is designed with HDD devices in mind, which are not optimized for SSDs. Although there are several issues that have to be addressed before software engineers can properly maneuver and work around the issues to make SSDs widely accepted storage medium; however, one of the issues is that NAND characteristics such as size of page, blocks, and units of erase and garbage collection is not disclosed to the public. Flashbench provide a ways to figure out how SDcard is configured; however, since SSDs have more complex architecture, flashbench is insufficient in unmasking the characteristics, especially when SSDs exploit channels and ways to improve the performance. In this paper we propose a methods to expose the size of page and block of the SSDs, and also number of channels that a SSD utilizes. Fig 1 shows the result of finding the page size of a SSD.

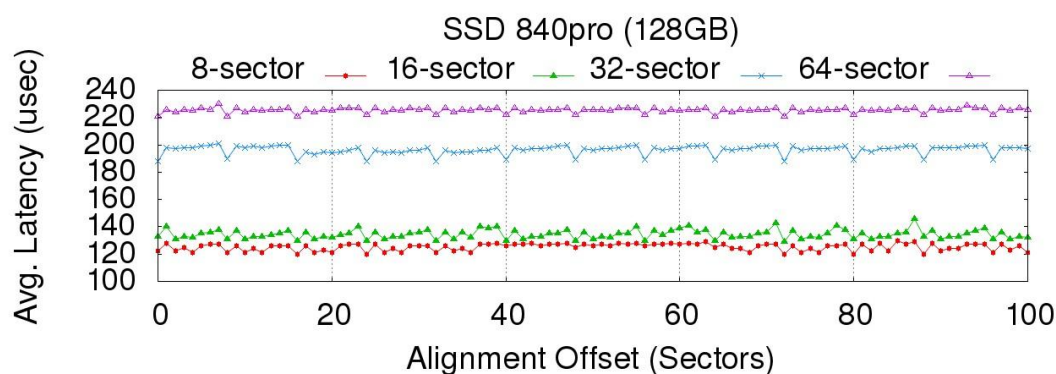


Fig 1. Finding Size of a Page in SSD

[1] GRUPP, L. M., CAULFIELD, A. M., COBURN, J., SWANSON, S., YAAKOBI, E., SIEGEL, P. H., AND WOLF, J. K. Characterizing Flash Memory: Anomalies, Observations, And Applications. In MICRO 42: Proceedings of the 42nd Annual IEEE/ACM International Symposium on Microarchitecture (New York, NY, USA, 2009), ACM, pp. 24–33.