SATA is Everywhere…Really!

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SATA continues to be the major interface deployed across all segments of the storage market – both for HDDs and SSDs. This article explains various reasons where and why this interface is, and will continue to be the most dominant interface in most markets and applications around the world.

First, we need to distinguish the various markets we are talking about. Within the traditional Enterprise Markets, examples being Wall Street, Government, Medium-to-Large corporations, generally utilizing on-premise or company-owned data centers with traditional OEM server and storage equipment. These markets have traditionally been served by System OEM companies such as EMC, Dell, IBM, HP, etc… These system OEM companies offer full data center solutions that utilize their own servers and storage systems that are configured for the businesses specific needs.

Second, we talk about the Hyperscale or Data Center market. This market is dominated by a number or large companies – including Microsoft, Amazon, Baidu, Alibaba, Facebook, etc… These companies are not building and selling hardware based systems to an end customer. They are building their own datacenters that can service any individual or company in the world for their shopping, or business applications and storage requirements. They are hyperscale as they can scale as needed, when needed, for who needs it, and relatively cheaply. They consist of networked servers with direct-attached storage; capacity is expanded by simply adding more servers and/or storage racks (scale-out).

SATA in the enterprise has played an important role. Nearline SATA HDDs, from a total capacity perspective, have dominated all other HDD solutions. SATA HDDs have been the main technology used for all storage systems (and some archive) requirements in the traditional enterprise and hyperscale markets over the years to provide high capacity storage at lower costs than traditional performance enterprise models. On average, it has been the cheapest available storage ($/GB) on the market vs. all other storage solutions.

From a sourcing, technology, and roadmap alignment perspective, SATA HDDs have been the mainstay of all HDD vendors when dealing with their customer base. With anywhere between 250M-300M PC's shipped each year utilizing the SATA protocol, economies of scale will continue to favor this being the dominant interface in nearline HDDs as well. In addition, current and future technologies, such as SMR, HAMR, and helium have ensured that low-cost, high density SATA HDDs maintain a long and healthy life for many years to come

From a market share perspective, SATA HDDs have dominated unit shipments. Of the

100M HDD units (+/-) shipped each quarter, nearly all are SATA, with some minor SAS HDD units. Within the client HDD space, they are all SATA. When we talk about enterprise HDDs, we include 10Krpm, 15krpm, and Nearline (or 7200rpm). Of these three sub categories combined in the enterprise space, about 60% are SATA. If we talk about just the Nearline HDD segment, over 80% are SATA, with the remainder SAS.

When it comes to SATA SSDs, like SATA HDDs, they have also been highest unit volume shipped in both the client and enterprise markets. In addition, SATA SSDs have the highest supplier base of all SSD suppliers – ensuring supply, continuity of supply, and constant competitive pricing, vs. other competing interfaces. The economies of scale only get better as time goes on as SATA SSDs continue to make inroads in the Notebook and Desktop PC markets.

Within the Hyperscale market, SATA SSDs have been used for caching and server Storage, or tier1 utilization. Within the traditional enterprise market, SATA SSDs have been seen in some server deployments, but also offered in many All Flash Arrays. These All Flash Array systems offer the lower cost storage of all SSD interfaces, but also at much higher performance levels vs. the competing HDD storage systems. The other benefit that SATA SSDs offer, regardless of what market they serve is that they are offered in many different form factors. They can be utilized in a 2.5” FF or various M.2 offerings (22x60, 22x80, 22x110). These gumstick type form factors allows system designs that can be much smaller vs. their competing 2.5” form factor.

Like the HDD market, SATA HDDs have dominated unit shipments, and thus market shares in all segments. Total SSD shipments continue to rise each quarter. But if we take 2015 as an example, we shipped approximately 103M units, all units, all interfaces. Of these shipments, SATA represented over 83% of all SSDs shipped. Within the client space, SATA represented 79%. Within the enterprise SSD market, that percentage mix is just as high with 80% of the total enterprise SSDs shipped being SATA.

SATA features in the Enterprise space have proved to be more than adequate for use cases. Some of these features include power mgmt, various capacities and form factors, hot pluggability, and being able to operate within a SAS infrastructure.

As we look forward to the future, as with any product or technology, there will be continued pressure from competing technologies. We have to look at each specific market, and each specific interface within that market to determine to what extent SATA will give way to competing interfaces like SAS or NVMe.

NVMe has, or will shortly, overcome the inhibitors it has dealt with over the past number of years. Hot pluggability is being addressed in the technical committees, it is being offered in a 2.5” form factor. It is also being offered at much lower price points. Given these factors, NVMe can see future success in the hyperscale market. The main

reason for this is that, as stated above, the companies in this segment do not sell their hardware to end customers. If they are able to procure NVMe based PCIe SSD solutions at, or near, the same price point as SATA, they can take these solutions and design around them. System OEMs (like HP, EMC, and Dell), even though they may get PCIe NVMe at the same price as SATA, will still price their systems accordingly to the end market. PCIe will be more expensive than SATA based solutions – as they will be pricing based on performance and what the market will bear.

SAS SSDs will continue to see success (and growth) at the various storage networking companies currently buying these solutions. SAS SSD vendors have shown that they can continue to provide higher capacity, next gen controller technology, with increased performance, at much lower prices! Their opinion has been – 'If it's not broke, don't fix it!" Showing constant product improvements helps as well.

In summary, SATA has been, and will continue to be the dominant interface in the both HDD and SSD segments. Whether it is related to supplier base, pricing, technology, features, or just simply the competitive landscape and their interface strategies, SATA has proven to be resilient. And as anyone who has worked in the enterprise storage space over the decades…. It's slow to move!!!

References:

1) TRENDFOCUS. *Q4'15 NAND/SSD Information Service*. http://www.trendfocus.com/services/nand-ssd-information-service/
2) TRENDFOCUS. *Q1'16 SDAS Information Service.* http://www.trendfocus.com/services/sdas-hdd-information-service/