STORAGE SWITZERLAND REPORT

SSD IS THE NEW GREEN

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What drives power utilization to the top of the IT professional's mind is not very often the staggering electric bill that the data center 'generates' as it performs its task. More often it's the cold reality when they are told that no more power can be pulled into the data center and the option is to reduce consumption or build a new data center. Since building a new data center is quickly ruled out, IT professionals are looking for ways to decrease power utilization. Solid State Disk (SSD) is moving beyond a storage performance option for the data center and becoming the new way to make storage more green.

The components of storage systems that use the most power are the drives themselves, followed most often by the shelves those drives run on. This is how some suppliers will distort the numbers that claim their latest release is more power efficient, when all they have done is increase the capacity per drive. The reality is that for many applications customers are not creating large drive-count RAID groups for the purpose of satisfying a capacity demand, they're creating them to deliver better performance. The capacity of the actual volume goes largely unused, as evidenced by several recent studies that cite capacity utilization below 15%.

In the past SSDs were brought in to address these high drive-count volumes that were still suffering from performance issues. The common situation was a system that had 100s of drives and was still performance starved. Often these were built around low-capacity, high-speed drives. In some cases these drives were also short-stroked, meaning that only about 1/3 of the fastest sections on each drive was formatted and available for data. SSD, in this use case, could bring the improved performance needed by the organization. The hard cost savings of not replacing or not having to use 100s of high-speed, small-capacity, short-stroked drives typically justified the move to SSD. The resulting savings of powering a single SSD vs an entire rack of drives and shelves was a very nice side benefit.

Helped by the improved cost competitiveness of SSD, the increasing scarcity of power has pushed SSD's power efficiency into a primary motivator for the exploration of the technology. This also means that SSD is no longer isolated to performance starved applications with 100s of drives, but is being used for standard applications that need only slightly better than average performance. These are systems that, on the surface, can have their performance needs satisfied by a slightly better than average RAID configuration. To this point there has been no need to consider building the drive count beyond 20 or 30 drives. Typically, for the power required by a single drive in a disk shelf, an entire SSD can be powered, at the same time offering substantially better performance.

In a SAN the combined cost of all of these array volumes adds up. If in that same SAN, a sharable SSD like Texas Memory's RamSan 620 is used to store all the data from these applications servers, shelves of additional mechanical drive capacity can be replaced. Essentially, data from servers that are more performance sensitive than capacity sensitive could be migrated to SSD. The data from servers that are more capacity centric could be migrated to storage with very high capacity but lower performing drives. The result in both cases is performance that is 'right-sized' for the application and a dramatic reduction in power.

The case in non-shared storage environments may be equally as great. Using Texas Memory's PCI-e based SSDs, specific servers with limited capacity but maximum performance needs can also be addressed. In many cases these systems will have an internal RAID setup with six to ten internal hard drives. Again, the actual capacity on those drives goes unused, as the count is needed for performance reasons. The more drives the server is capable of using, the larger the accompanying power supply needs to be. Also, more drives require greater airflow, typically resulting in larger fans. To keep those fans fed with cool air also requires air conditioning to compensate for the added heat.

With PCI-e based SSD those drives can be replaced with one SSD card, like the RamSan 20, using almost no additional power. They draw their power requirements from the PCI-e bus and run extremely cool. Simple airflow is all that's required for their correct operation. Installation is straight forward and does not require involving the storage infrastructure team.

As SSD becomes increasingly affordable its value to the data center is moving out of the sole domain of satisfying performance hungry applications. The purpose for implementing SSD can now also be to lower the power and cooling costs required by the enterprise, as it reduces operational costs. In the next part of this series we will explore the value of using SSD to increase storage administrator efficiency.