

Symmetrix Raises the Performance Bar

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Abstract: EMC started 2008 with significant announcements for its flagship Symmetrix family—quietly announcing their version of thin provisioning and higher-capacity SATA drives and loudly throwing down a bar-raising performance gauntlet.

Summary of the Announcements

There were a number of elements to EMC's Symmetrix news in January 2008:

- Flash-based solid state drives—an option of either 73GB or 146GB on the DMX-4 product.
- "Virtual Provisioning"—EMC's name for their implementation of thin provisioning technology.
- 1TB SATA drives.
- All of the above to be available at the end of Q1'08.

There were also some software enhancements (SRDF, new Mainframe support, and IPv6 support) but the key points are clearly the introduction of the solid state drives and what that means for performance and 'tiering' at the highest end of the enterprise storage market.

So, what happened?

Solid state storage has been around a long time. The lack of mechanics in such 'drives' makes for an attractive combination—headlined by blazing speed, and supported by compactness and attractively low power consumption. However, the technology has remained a niche market over those many years, due largely to issues of credibility, write performance and potential reliability concerns in heavy usage environments—as well as a much higher cost per comparable capacity versus standard mechanical disk. Claiming to have addressed these reliability issues (with specially produced components from STEC), EMC is introducing their 'Tier 0' storage option as an integrated part of the Symmetrix offering aimed squarely at those high-end shops for whom there is never enough performance. In short, they are taking solid state technology into the core data center storage mainstream.

The solid state news is clearly the main item of the announcement, but the other announcements are also relevant to EMC's broader strategy. By themselves, ever-higher capacity drives are a natural progression; and, by itself, Virtual Provisioning (available for both the DMX-3 and DMX-4) is EMC's name for their implementation of thin provisioning—where EMC has been notably absent thus far on its block-based offerings (EMC has been shipping this functionality on its Celerra NAS line for several years). EMC claims to have leap-frogged the competition in terms of ease of use—fewer panels and clicks to adjust provisioning—its ability to also utilize the new 'Tier 0' within the virtual provisioning environment and native support of their internal and external replication (SRDF, TimeFinder, etc.) and system management tools. Although both the 1TB drives and Virtual Provisioning have been overlooked in all the frenzied excitement around the solid state introduction, they do constitute further elements in a coherent internal Symmetrix tiering offering from EMC. If you buy into the need for 'Tier 0,' then by definition you buy into the need for tiering, and thus EMC is ensuring that it all exists in the one system—blocking potential competitive entrants at that tier.

Nonetheless, it is the dramatic Tier 0 introduction that is deservedly getting the bulk of attention. This is a pure performance play, with EMC very keen to stress that 'this is not your grandfather's solid state device.' It is targeted to a very limited slice of the market that can actually benefit from its performance. Size for size, the flash-based SSD can deliver the same level of IOPS of 30 15K FC drives—at 98% less power per IOPS. This could matter to the precise target market as this class of user tends to be located within major metropolitan areas where power

availability is a serious and growing concern. The new SSD offers much higher capacity than the existing mirrored cache. Finally, it's not just the sheer speed that's important, it's also the performance *consistency* that helps storage professionals (this is something you want at every tier, but is hard to get at any).

Solid State Notes

Historically, flash-based solid state devices (read consumer) have had a number of issues that EMC claims to have addressed in their announcement:

1. **Poor write performance**—EMC says that their implementation has been re-engineered to ensure low latency and high throughput—around 1ms response and a realistic 10 times the throughput of FC drives.
2. **Component wear out**—Under extreme duty cycles and demanding SLAs, the consumer MLC (multi layer cell) flash memory, used in USB sticks, for example, could literally wear out. Not only is EMC using the better SLC (single level cell) technology but they have built in wear-leveling tools as well as EMC Control Center and other monitoring to, they say, preclude the issue.
3. **Cost**—For sure SSD is expensive....very expensive....but there's always been a market for the next level of performance for certain crucial applications and/or markets. In such instances, performance justifies cost. Of course, there's also always been a market for the next level of ever-higher capacity—hence EMC's introduction of the 1TB drives, with an emphasis to tier your data placement appropriately, and thus creating a cost "blend" that averages out in the user's favor.
4. **Market acceptance**—SSD has been around for decades and has taken a backseat to all the other performance upgrades in disk. EMC is betting that its sheer market clout and confluence of falling component prices with enhanced operational capabilities will help make flash-based SSD—and Tier 0—a legitimate level in the storage hierarchy, with economies of scale driving the technology more broadly.

The Bottom Line

While this new flash storage for Symmetrix has still to be proven out, EMC has staked a lot of credibility by throwing down the gauntlet here on their flagship product. To see EMC leading the market here is intriguing—you could argue that they introduced thin (aka virtual) provisioning on Symmetrix because they *had* to (a combination of direct competitive pressure and a general market acceptance via the newer storage players)...but clearly they are bringing Tier 0 flash storage to the market because they *want* to.

If it all works as advertised, then EMC will have a distinct performance advantage until the other players can catch up. Indeed, being able to claim 'first to market' will not be new ground to EMC—the people that first introduced us to the modern disk array, along with many other "firsts" in the industry. But it may well boost Symmetrix sales even to those users who don't actually take 'Tier 0' storage. As a great sales and marketing machine, EMC has managed to weather the storms of the volatile high tech competitive market and often even increase share during times when they had—at best—competitive products. With a clear advantage at the highest end of the performance market, we assume EMC will pull out all the stops to take advantage as long as they can—and across all of their offerings. The market for hyper-performance (at a cost) may be small, but it is also true that those within that market are very large IT shops—the kind that buy lots and lots of products and services.

Overall, there is certainly always some small percentage of high-end users who can never get enough performance....and they'll likely lap this up. Two other things for sure—1) the competition will likely be forced to say 'you don't need this' until they can close whatever real gap exists,...and 2) we can reasonably expect the 'mainstreaming' of commercially robust flash-based SSD sooner rather than later.