"Symmetricus Maximus"

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Abstract: EMC Symmetrix V-Max, the first iteration of EMC's new Virtual Matrix Architecture, both confirms—and extends—the trend to meet new demands and deliver greater IT value by combining industry-standard components with extremely smart, extremely flexible data center infrastructure virtualization capabilities.

New Architecture *and* New Product

We have come to expect a new Symmetrix every few years, so EMC's recent news does not surprise us from a scheduling perspective. However, we get a "two-fer" with EMC's April 2009 announcement. The significance of the announced Virtual Matrix Architecture may get somewhat lost as devotees and competitors alike rush to evaluate the 'new Symm,' but that would be a serious mistake as the architecture is at least as significant as the product—something EMC clearly understands as it made it the lead headline in the press release. With such sobriety (leading with a concept, rather than a sales pitch!), it is perhaps understandable that EMC felt the need to reach back into the hype-pool for its accompanying launch marketing blitz; 'Overtake the Future' (!) is rather passé, however good the motivation may be. Semantic disappointments aside, however, it is very clear what EMC was getting at. While this brief will focus on the business implications and value of EMC's new offerings, a quick review of what was actually announced is necessary.

Virtual Matrix Architecture: This new architecture encapsulates and reflects a lot of what is happening in the IT world. Its approach both acknowledges and integrates a number of major trends, including:

- **Virtualization** – There can be few remaining doubts about the value of IT virtualization, whether of servers or of storage. Its essence is to minimize the physical resources for any given work and to optimize the ease of management and use of what's left.

- **Industry Standard Components** – Incorporating proven components where possible allows for cost optimization, as well as freeing R&D budgets to be spent on smart software management—in other words, on intellectual property (IP) that delivers new user value rather than on the constant re-invention of the wheel, which does not.

- **Efficiency** - The drive to be more efficient is ubiquitous in IT now, driven partly by the economic situation to be sure, but also by the realization that IT has focused so much on effectiveness for so long that there is an enormous opportunity to be had by adding efficiency to the mix.

EMC's new architecture is the company's approach to link all three. Just as important (since EMC has not yet adopted charity status!), this architecture puts EMC squarely in a position to be an infrastructure player rather than 'merely' a storage provider. Assuming you *buy into* this, what you can actually *buy* today is the Symmetrix V-Max.

Symmetrix V-Max: Of course, the new Symmetrix offers everything that one would naturally expect of the new release of a flagship system: it's bigger, faster, has more connectivity, etc. But how that raw power is delivered to applications and users represents the real progress. If you have not seen EMC's diagrams, imagine a Spirograph drawing to get an idea of the configuration possibilities—an ever-increasing and ever-more-connected web. This, of course, could be viewed as complex and daunting were it not for the additional fact that V-Max's management tools are designed to hide pretty much all that complexity. Of course, the foundations are crucial to any structure, so here's a bulleted summary (relative comparisons are to the current—and still available—DMX 4):

- 3X performance and capacity (can reach millions of IOPS and PBs of storage)

- Intel quad-core processors supporting improved bandwidth and 2X connectivity
- Enhanced Virtual LUN technology targets data mobility across mixed drive types (SSD, FC, SATA) [1]
- Enhanced Virtual Provisioning which leverages all RAID and media types and offer pool shrinking
- "24 x forever" availability with fully non-disruptive operations
- Significantly improved both the ease and speed of use, including integration with VMware, Vcenter, and existing Symmetrix systems

From a user perspective, the functionality changes may appear subtle—at first. However, even though all the new possibilities of the device do not translate to direct new user benefits on day one, the engineering changes found in V-Max are far from subtle. In breaking away from a traditional back-plane connected architecture, EMC is implementing its virtual matrix—a radical approach to enterprise-class storage—in which director pairs using high-speed global memory communicate through a high speed virtual network. The flexibility of the package combines with energy-efficient and sharable major components to drive down TCO, while the clustered approach allows performance and availability to be uniformly high today (without the usual drawback of constant, complex tweaking) and holds the promise of a more federated approach in the follow-on releases.

Why Virtualization Matters

Virtualization—whether of servers or storage—is all about efficiency layered on top of effectiveness. It is the optimum application of minimum resources to complete productive work. The compelling logic is inescapable, both operationally and financially. It is thus important that leading-edge storage platforms, such as EMC's Symmetrix, keep pace with—if not also drive—the larger infrastructure trends in IT. In simple terms, this meant that EMC had to deliver a new Symmetrix that was not just capable of working well in a virtualized server environment (as the current DMX 4 is), but that was fully integrated into that environment, optimized for it, and capable of growing in concert with it—a peer, rather than a servant.

The virtualization of servers has had, and continues to exert, a profound and positive impact on networked storage at all levels and across all industries. Once servers and applications are shared, flexible, and mobile, it is only sensible that the storage underpinning them is itself part of a shared, malleable, and powerful data pool. This simultaneous consolidation and sharing allows central and easier management, means IT can be far more responsive to the changing needs of the business, and—a crucial point in the current economic situation—enables better cost efficiency. Quite simply, it is the modern fulfillment of the old IT adage, 'do more with less.'

Implications and Opportunities

Product Commentary

The product is in immediate GA and has been Beta tested in over 30 sites. Although it is not yet, of course, field proven, there's no reason to expect anything other than a continuation of EMC's solid Symmetrix quality and functionality. ESG Lab has already conducted early testing of the new product's functionality and usability with extremely good results.[2] As the report noted:

> *"ESG Lab was impressed with the new Symmetrix architecture. The concept of V-Max Engines and a 'virtual matrix' enables the Symmetrix V-Max to be deployed and provisioned very efficiently. Each system can start small and scale out in a modular fashion with power and cooling more closely aligned with actual hardware deployed, while maintaining the 24xForever attributes users expect of the Symmetrix."*

What was particularly noticeable—pleasing, even—were the results of EMC's efforts to make the product easier to use and faster to adjust; in plain English, fewer clicks to get stuff done—an area where the shortcomings of previous generations of EMC's Symmetrix and some other high-end offerings can fairly be criticized. Now, for instance, there's 'auto-provisioning,' which is very welcome as it will reduce the time needed to bring capacity online while significantly reducing the personnel cycles required to do so.

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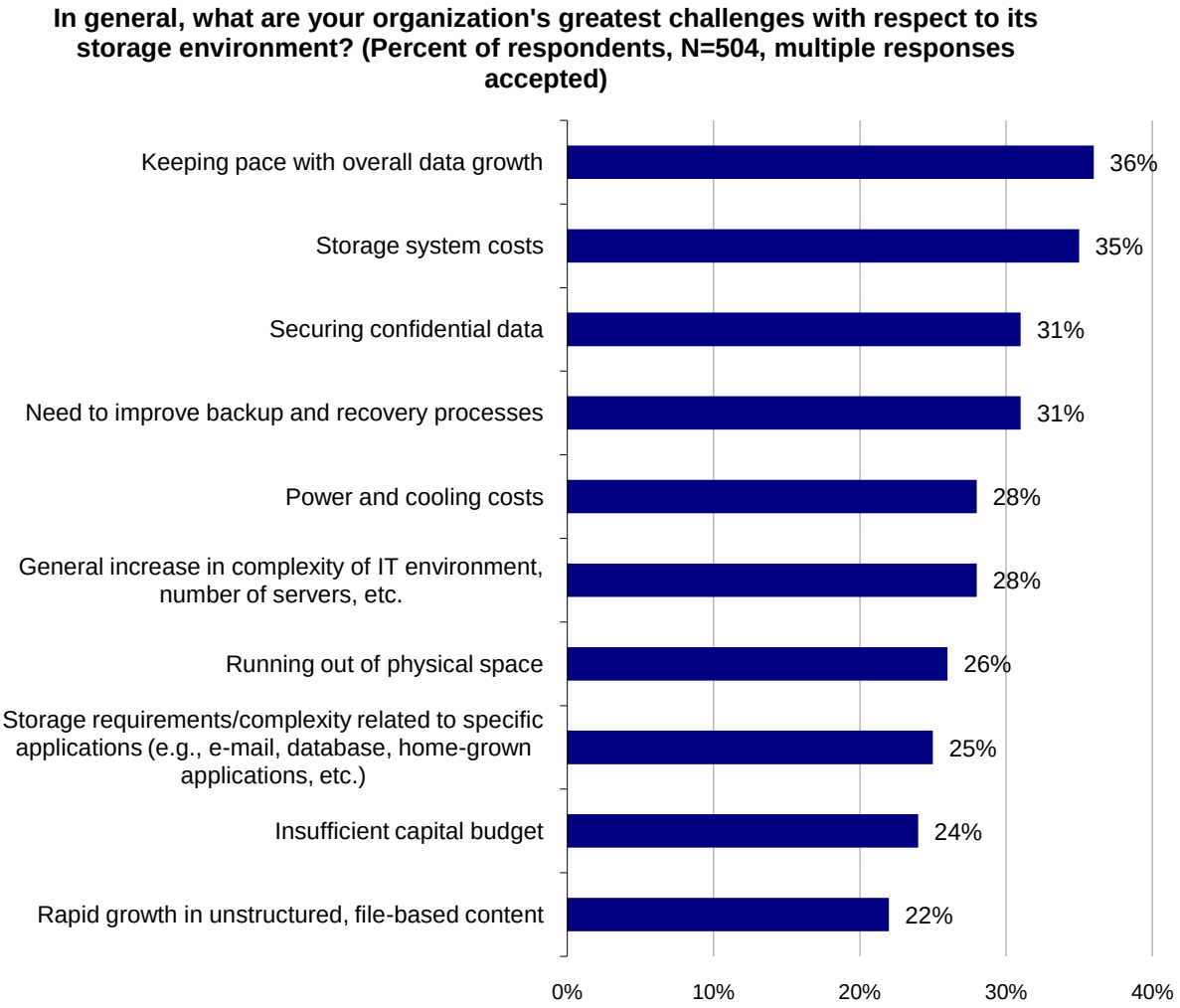
[1] Internal data mobility will be enhanced by EMC's 'FAST' (Fully Automated Storage Tiering), due later in 2009.
[2] Source: ESG Lab Validation Report, *EMC Symmetrix V-Max: 24xForever Storage for Virtualized Data Centers*, April 2009.

Bringing its scale-up and scale-out (a.k.a., matrix) capabilities to the enterprise, V-Max will—as it fulfills its roadmap—provide huge benefits to users where they are hurting the most since it can break down the constraints of physical cabinets and allow users to scale to multi-PB within a single system image. Figure 1 shows recent ESG research that confirms that simply coping with growth remains the number one challenge for enterprise users. It is invariably easier to manage one rather than manage many, so while today, the system achieves this via massive consolidation, the promised federated infrastructure holds great attraction.

FIGURE 1. GENERAL CHALLENGES FOR ENTERPRISE STORAGE USERS



Source: ESG Enterprise Storage Survey, 2008

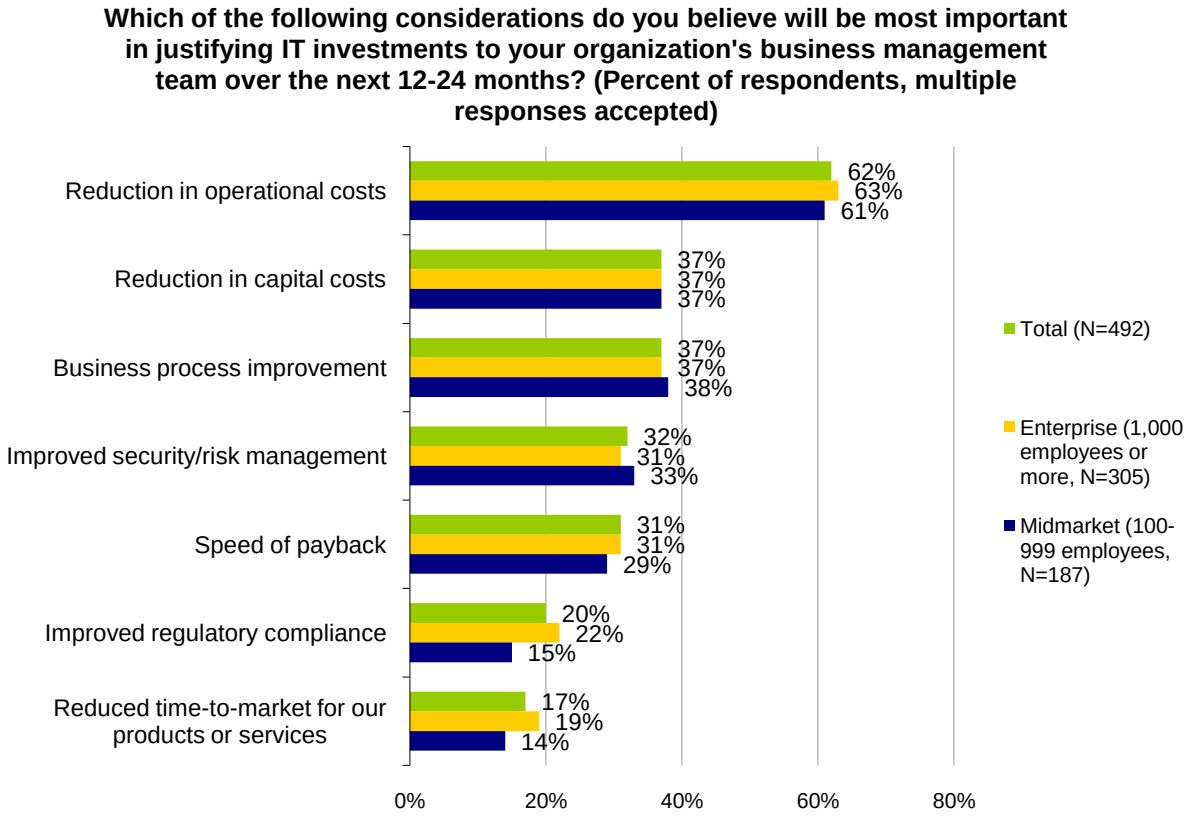
No product is perfect, of course. One example area where V-Max could be improved is to have more granularity for its Virtual LUN Migration. EMC is still taking a volume-centric view for the promotion and demotion of entire volumes into higher or lower storage tiers. Promoting or demoting heavily accessed or cold data—instead of the entire volume—would be a much more preferable approach. Since it's likely that something of an 80/20 rule applies, a user might find that, in any given volume, 20% of the data is very active and 80% is not; thus, when that volume is promoted to Enterprise Flash Drives (the term EMC uses for SSD), that user could have a lot of essentially-wasted SSD real estate holding 80% of the 'cold' data in any given volume. EMC is promising to provide a more granular LUN Migration capability down the road.

IT & Business Comments

Despite the dramatic underlying changes for the V-Max version, the many satisfied users of existing 'Symms' will be pleased to find just about everything with which they are comfortable and experienced remains. Support,

availability, reliability, and online serviceability, together with remote mirroring (SRDF is improved but familiar) and cloning (that is, TimeFinder), are all pretty much unchanged. Additionally, the ballpark pricing EMC has discussed for V-Max is roughly that of the DMX-4. All of this begs the obvious question: why change? The answer is straightforward: it's not about the underlying functions or the CAPEX, it's all about the OPEX. A combination of quality industry-standard components, together with a healthy dose of smarts (the IP that glues together the architecture, the matrix, and the controlling software), allows for resources to be optimized, which in turn means minimized costs. In today's market—in fact, in any market—that's going to be an attractive business proposition. Even with the scale-out architecture, automated provisioning, and enhanced data mobility, the big story for V-Max is the operational cost reductions it can offer users. More than a 'nice to have,' controlling OPEX is a necessity that far outweighs any other criteria when it comes to justifying IT spend nowadays—a point that is affirmed by some of the most recent research ESG has carried out regarding data center spending intentions. Figure 2 makes the point starkly: when asked which considerations would be most important in justifying IT investments over the next 1-2 years, 63% of respondents put OPEX reduction at the top of the list.

FIGURE 2. MAJOR CONSIDERATIONS DRIVING IT INVESTMENTS OVER THE NEXT 12-24 MONTHS



Source: ESG Research Report: 2009 Data Center Spending Intentions Survey, March 2009

While many other considerations were noteworthy, the emphasis on reducing operational costs is not only huge, but significantly ahead of any other consideration. It is a compelling picture, but also a portent for the future of IT. Efficiency is a factor that has come to the fore; it is highly unlikely to be one the world 'un-invents' or eschews going forward.

The Bottom Line

This is a large and important announcement for EMC. After all, Symmetrix is its flagship product—even users with no need for its attributes and no chance to buy it can appreciate that it exists as it confers an aura of quality and ability on all that EMC does. Walking the tightrope of continuation and progress—being evolutionary and revolutionary at the same time—is always a challenge for those in a leadership position in any market. You don't want to alienate those users that got you the leadership, but equally, there are always new vendors with

imaginative value propositions ready to defeat or destroy a complacent leader. The once mighty can fall if they do not constantly move—look at DEC, Wang, and even the recent sale of SGI. A paragraph from the previously mentioned ESG Lab Report sums this up well:

> *"To say that this new Symmetrix blends the best of the old and the new may be a cliché, but it is nonetheless true—and perhaps the bigger accomplishment because of that. Such blending is a fine and challenging art—we were pleasantly surprised at EMC taking on such a challenge; put simply, it could have chosen the easy path, done a whole lot less thinking and engineering, and still—for 2009—be delivering similar marketing claims and product benefits in terms of ease of use, energy efficiency, and even speed. BUT, instead, EMC has not taken the easy route; it chose to port everything to a new processor, to implement a new architecture, and yet managed to retain compatibility with its existing product. Although the immediate operational benefits are certainly worthy and to be applauded, there is a great deal of value remaining under the covers at this stage, and it is these key foundational aspects of the new Symmetrix that should garner the standing ovation."*

The size of EMC and the engineering skill of its approach do not guarantee success, of course. Despite the OPEX advantages and the potential for future federation capability, some customers may be very happy to stay with what they have. EMC is going to have to work hard before users see and buy into its "bread today, jam tomorrow" approach. Indeed, one wonders whether EMC would have been better off to have two distinct announcements—one for the Virtual Matrix Architecture and then a separate one for the Symmetrix V-Max—so that the interest in the latter does not subsume the importance of the former. That said, the immediate value of the new device is that it is ideally suited for the growing number of organizations that rely on virtualized servers and a consolidated application infrastructure to improve the efficiency and effectiveness of their information services. The new Symmetrix is designed to be an integral part of large-scale, highly virtualized, and consolidated environments. These environments are typified by dynamic change and the need for easy scalability. And the emphasis on operational cost savings (achieved via both the hardware *and* its ease of use) is something that many users are likely to embrace—whether by choice or obligation does not matter to EMC's bottom line.

Finally, there is the big picture. EMC is no longer aiming itself to be 'just' a storage vendor. Its infrastructure play is, of course, benefiting greatly from its linkage to VMware—itself the paragon of consolidation and OPEX reduction on the server side of things. And EMC is 'into' many other businesses; just for example, there's the Mozy back up/archive operation and the company's affiliation into things such as the Cisco-led Unified Computing System. But few long-term successful companies forget their roots, so for that alone it is just as good to see that EMC is not forsaking its flagship storage product as it is to see the company expanding into new areas. Shareholders will be pleased with success in either, or both, endeavors.

In business, it's myopic—and likely dangerous—to try to deal with new things in old ways. The monolithic structures of the last generation of IT are giving way to a massively flexible, scalable, and clustered world. EMC could have chosen to address the change with '*enhanced enablement'* for its Symmetrix by stretching to a DMX 4.5 or 4.6; instead it has chosen to *embrace* the new world with V-Max. While the full value of this move may not be so apparent to all today, the IT and business sense of it will be obvious tomorrow. And, rather than "overtaking the future," EMC is perhaps learning from the past—this announcement is more than just a new model year, it is indeed worthy of a new species name: Symmetricus Maximus!