

EMC optimizes Symmetrix for the virtualized datacenter: The Symmetrix V-Max

Analyst: Simon Robinson

EMC has unveiled the latest version of its venerable high-end storage system, Symmetrix. The platform that EMC is perhaps best known for has been around for nearly 20 years, but the Symmetrix V-Max has been optimized to take advantage of the latest trends in enterprise datacenter design, not to mention the new economic realities, principally around the notion of the 'virtualized datacenter.' Indeed, in the past, high-end enterprise storage administrators felt fortunate to achieve any two of these criteria: highest performance, highest availability and lowest cost. With the Symmetrix V-Max, EMC claims that for the first time, it's possible to achieve all three in a single platform.

The 451 Take

Despite all the other directions that EMC has expanded in over the years, Symmetrix is still its flagship product and remains hugely important to the company, not only from a revenue perspective but also because it's still the best embodiment of what EMC strives to provide its customers – quality, reliability and performance. In the current economic climate, it's clear that customers are also looking for value and a swift return on their investment, even when it comes to their mission-critical applications and IT processes. EMC believes that by incorporating the key tenets of server virtualization – particularly the ability to dynamically adjust resource allocation according to demand – into the Symmetrix V-Max, it can continue to differentiate itself in a highly competitive market.

Context

EMC's Symmetrix platform has been at the forefront of enterprise storage since it was first released in 1990. Despite IT – and storage – having changed beyond recognition since then, Symmetrix remains EMC's flagship offering for large enterprises that have the largest and most demanding storage workloads. The first generation of Symmetrix systems was designed as a 'direct attached' storage platform, supporting single-application platforms – chiefly running on mainframes. But it was the advent of the fiber channel SAN in the 1990s that fueled EMC's growth as it positioned Symmetrix as the industry standard for serving data to multiple applications running on multiple servers.

The Symmetrix V-Max is designed to take advantage of the latest evolution of IT, where storage needs to not only serve multiple servers/applications, but do so in a way that recognizes that those entities are increasingly running in a virtualized environment. That

is, they are physically decoupled from the underlying server hardware. This enables the consolidation that drives greater efficiency in terms of IT asset utilization, and flexibility of movement that allows IT to respond to changing business requirements. However, in order for IT to fully leverage the value of virtualization at the server/application layer, it needs a storage system that is similarly optimized for both consolidation and flexibility. EMC contends that the Symmetrix V-Max does both these things.

Products

At the heart of the Symmetrix V-Max is a new 'virtual matrix architecture' (V-Max). This is an evolution of the 'direct matrix architecture' (DMX) – dubbed as the industry's first non-blocking controller architecture – that EMC introduced with the Symmetrix DMX in 2003, and that in 2006 became the first storage system to offer more than a petabyte of storage in a single chassis.

The Symmetrix V-Max is being positioned by EMC as the industry's first 'scale out' architecture for a high-end storage system. Although previous generations of Symmetrix are capable of scaling to massive levels – in terms of both performance and capacity – this was achieved within a single frame. V-Max is designed to extend this by supporting linear scale of all resources – performance, capacity and connectivity – by sharing it across a cluster of multiple 'Engines' within a single Symmetrix image. The idea is that this virtualized approach will provide unprecedented high availability and drastically simplified management through automation, as well as enable advanced features for data protection.

So what additional benefits does this new architecture deliver? EMC says the Symmetrix V-Max offers more than twice the performance and connectivity, plus three times the capacity, of the existing high-end model, the DMX-4. How? The base configuration is a high-availability V-Max Engine, doubling up the number of host ports, back-end connections and IOPS. Initially, each Symmetrix system can support up to eight Engines, offering up to 128 physical ports, support for up to 2,400 disks (equating to up to 2PB usable) and up to 512GB of global mirrored memory. The use of multicore, 2.3GHz processors increases the IOPS by as much as 2.6x in a smaller footprint. The Virtual Matrix interface connects and shares resources across engines to offer what EMC contends is 'massive' scale.

Though the initial version of the Symmetrix V-Max will be limited to supporting multiple engines within a single Symmetrix system, the architecture has been designed so that in the future it can support a single Symmetrix image across multiple, federated systems that could be distributed across the datacenter. This will eventually stretch to support 'dozens' of Engines, aggregating performance over tens of thousands of drives and host ports, while retaining redundancy and fault isolation. The Symmetrix V-Max will also support 'second generation' enterprise flash drives, supporting significantly higher-capacity drives (200GB and 400GB, up from 73GB and 146GB in previous systems), boosting the overall drive IOPS of the system, and helping shrink the power/cooling footprint relative to previous models (by almost a third, EMC claims).

A big focus for the Symmetrix V-Max is improving the management experience associated with configuring storage for virtualized servers, by abstracting and automating operations. Key among these improvements is a new 'auto-provisioning' feature, designed to drastically reduce storage provisioning time – for example, in a configuration of five ESX servers, driving down the number of 'clicks' to provision storage from 160 to just 15. It has done this by allowing users to set up, build and associate groups of resources (HBAs, storage ports, etc.), which automates both the initial configuration steps, as well as future changes and additions. In addition, EMC has quadrupled the volume size (up to 256GB) for its virtual provisioning feature, which it says makes it easier to grow and reclaim storage.

Further enhancements to EMC's Virtual LUN capability will also be welcomed by customers, since it allows volumes to be moved across different tiers of storage – any RAID groups and drive types (including flash) – for data-migration purposes, without impacting availability or other protection processes, such as local/remote replication.

Finally, EMC has added new replication options to its already extensive Symmetrix Remote Data Facility (SRDF) family of tools. The new SRDF Extended Distance Protection (EDP) is designed to be a lower-cost option for long-distance replication, offering synchronous recovery points at asynchronous distances. The big difference with SRDF-EDP and EMC's existing asynchronous replication offerings is that EDP initially replicates synchronously from the primary array to a 'pass through' array, also at the primary site/campus, before then replicating asynchronously over the WAN to the remote site.

This pass-through system can run without any data disk capacity or host connectivity since it is only storing the changed data (Delta Sets) in the system cache, thus reducing infrastructure costs. EMC claims this can drive TCO savings of up to 51%. Other new replication features in its Enginuity 5874 operating system include new compression capabilities to reduce WAN bandwidth and greater SRDF scale; it can now support 250 replication groups, up from 128.

Competition

The high-end storage space remains as competitive as ever, with a small but highly focused band of players duking it out with sometimes ferocious intensity. Why? Although overall growth of this market segment is not as high as it once was, it's still a very large market and, hence, a crucially important battleground, particularly because of the kudos gleaned from having the largest companies with the most demanding workloads using your storage systems.

EMC's key competitors in this segment remain IBM and Hitachi Data Systems, both of which compete aggressively for every point of market share and also have their own story around how they are optimized for the virtual infrastructure. EMC is hoping that with its latest Symmetrix V-Max, it can offer customers a compelling value proposition that

aligns with their key objectives. The focus here is clearly on datacenter virtualization, where EMC is positioning Symmetrix V-Max as the ideal storage consolidation and virtualization platform to a customer's server virtualization efforts. EMC undoubtedly has the resources to hammer home its claimed differentiators here, and the company has been making more concerted progress in leveraging its partnership with VMware, from both a marketing and technical perspective.

SWOT analysis

Strengths	Weaknesses
EMC's nearly 20-year legacy with Symmetrix gives it a market presence that few rivals can equal. It is also starting to turn its relationship with VMware to its advantage.	The high-end storage systems space is not the fast-growing segment it once was, and users will have to wait awhile for the 'federated' version of the new Symmetrix to arrive.
Opportunities	Threats
If large organizations are to reap the full benefits of the virtualized datacenter, then they are clearly going to need a storage platform that is optimized for such an environment.	Competition is as cut-throat as ever. Don't expect either IBM or HDS to receive EMC's new Symmetrix with anything but hostility.

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