



HP Upgrades EVA to Lower TCO for the Mid-Sized Enterprise

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Management Summary

Do you know the expression “If it ain’t broke, don’t fix it”? Well, that trusty maxim does not always apply. For example, with recent changes to standards and government regulations, by 2009 all over-the-air television transmissions in the U.S. will change from analog to digital. What does that mean to the average consumer with a perfectly good 21” analog TV? He either has to buy an adapter, adding to the cabling clutter in the den, or use the opportunity as an excuse to go out and buy that *really big* high-def TV that they have always wanted but couldn’t justify because that reliable set in the den still works. Now, you have to determine the features and functions of the new set, and most importantly, the size. If you have a 9’x9’ foot den, you may not be able to justify a 60” flat screen TV. If you have a larger room, however, with a 20’ wall, that home theater may be in your future. A mid-sized room may fit a 42” screen, perfectly. Determining the *right* size TV set for you is a really complex question. Unfortunately, you may also have to fit the size of the TV to the size of your budget!

The same situation exists in the data center of every enterprise around the world. With the requirement for the retention of data exploding by anywhere from 50% to 100% annually, the enterprise CIO, or equivalent, must address the data center storage requirements in order to remain competitive and to ensure business continuity. The CIOs of the largest data centers, those with hundreds of terabytes of data under their domain, need not worry; companies such as EMC, HP, and IBM always pay attention to the customer trying to give them millions of dollars at a whack. Whatever features or functions are required will be there. Complexity is not a serious problem either, with a multi-person IT staff available to administer to whatever integration or management issues appear. Likewise, the data centers in the smaller enterprises, often referred to as SMBs, have literally dozens of companies trying to sell them the latest and greatest in low-cost, scalable storage arrays that will support up to 10TBs of capacity. This is not because of the revenue at stake in a single transaction, but because of the potential revenue available from literally thousands of similar transactions. What about the mid-sized enterprise, trying to *right-size* data center storage? Who is out there addressing the feature/function needs of the enterprise with 25 – 50TBs of data, and growing? One company that is, is HP.

With the *StorageWorks MSA* family of disk arrays for the SMB and the *StorageWorks XP* family at the enterprise level, HP positioned their *StorageWorks EVA* family in the middle, as a virtualized storage solution for the mid-sized enterprise trying to reduce its total cost of ownership (TCO) by consolidating its data center servers and storage in a virtualized environment. With data growing at unheard of rates, HP has now complemented this family with the *EVA4400*, designed to increase scalability and functionality, and lower TCO. To learn more about the *EVA4400*, please read on.

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Mid-Sized Data Center Pains

The data center of any mid-sized enterprise faces the same issues as those of every other enterprise, although on a different scale. Where the largest enterprise is supporting thousands or tens of thousands of users with hundreds of terabytes of data, and growing, the mid-sized enterprise may *only* be supporting 500 to 1000 users, on possibly more than 100 servers, with between 25 to 50 TBs of data, *and growing*. The proliferation of open systems servers throughout the data center, and the enterprise, has resulted in uncontrolled server sprawl, adding complexity to an already entangled morass of IT infrastructure. Unfortunately, these mono- and dual-processor open system servers are usually running at less than 20% efficiency, with 80% of the system resources, and electrical energy, wasted. This complexity and waste cannot help but contribute to an increase in the TCO of the data center due to excess costs for maintenance, systems management, floor space, and energy. The IT staff must change the architectural infrastructure of the data center. They need to change the IT paradigm by removing complexity from the data center through the consolidation and virtualization of enterprise servers and the deployment of a scalable, virtualized storage area network, or SAN.

Through consolidation, the IT staff can simplify the **physical** management of existing enterprise resources throughout the data center, replacing under-utilized, under-performing servers with new, multi-core processors in multi-socket systems. This will enable the data center to reduce the server count by a factor of up to 10:1, lowering the TCO of the data center. The flexibility of these servers enable the improvement of server utilization through the **virtualization** of the server environment with applications such as *VMware*. **By virtualizing multiple mission-critical, and business-critical, applications within a single physical server, the data center not only improves server utilization but also increases the I/O activity of the virtualized environment to the SAN.** This results in the need for an affordable storage array with both higher throughput and higher capacity to meet today's unique scalability demands of a growing mid-sized enterprise, as compared to an SMB or large enterprise, but keeping in mind the higher performance requirements of tomorrow.

This increased number of virtual servers will clearly drive a significantly higher number of

I/Os onto the SAN that might exceed the limitations of the 2Gbps Fibre Channel network that most mid-sized enterprises have installed over the past decade. In fact, it may also stretch the capabilities of some of the 4Gbps SANs currently in use. The mid-sized data center must plan today for a throughput capable of supporting the virtualized, multi-tiered storage requirements that applications will demand six months and a year from now. Further, in order to reduce the TCO of the SAN, most mid-sized data centers will need to implement some form of information lifecycle management (ILM) program to control the cost of storage.

As data ages, the urgency to access it decreases. *Mission-critical* applications typically have a requirement for instantaneous access to storage. Therefore, the IT staff tends to store this information on the fastest, most reliable media available, typically 15K RPM F.C. drives. As you might suspect, this is also the most expensive media available in open systems storage arrays. On the other hand, the data for *business-critical* applications, such as email and data warehouse, do not necessarily have to be on *Tier 1* drives. This secondary data can be on *Tier 2* drives, such as F.C. drives running at 10K RPM, or even high-capacity FATA (Fibre Attached Technology Adapted)¹ drives running at 7200 RPM. *Tier 3* data, such as *backups* and *archives*, can clearly utilize the high capacity, low-cost characteristics of FATA drives. The data center needs to deploy a SAN that has the flexibility to support this type of ILM infrastructure.

In addition to the cost and scalability issues, the mid-sized enterprise is also most concerned about ease of use and the reliability, availability, and serviceability (RAS) features of their storage infrastructure. The SAN must be easy to deploy and manage – this is a mandatory! In addition, key mid-size business applications, such as *Microsoft Exchange* must be easy to implement with a template to accelerate growth and adapt to a changing business environment. With regard to RAS, mission-critical and business-critical applications have no tolerance for risk; they must be highly available with constant access to data to ensure business continuity. The storage arrays

¹ See **The Clipper Group Navigator** dated April 8, 2004, entitled *HP Adapts StorageWorks with FATA for Multi-Tier ILM Storage Environment*, which is available at <http://www.clipper.com/research/TCG2004033.pdf>.

must be able to replicate data in both synchronous and asynchronous environments.

The HP Storage Solution Set

Data centers acquiring storage systems from HP can be sure of one thing: they will not be forced to try to fit their storage environment to a one-size-fits-all storage array. From experience, we know that **one-size-fits-all equates to one-size-fits-no-one very well!** HP has one of the broadest storage offerings for the data center, including the *Modular Storage Array (MSA)*² family for the SMB, the *Enterprise Virtual Array (EVA)* for the small- to mid-sized enterprise, and the *XP* family for enterprises with the highest storage requirements.

Within each of these families, HP provides the data center staff with options to meet the specific needs of each enterprise. For example, in the EVA family, HP has had three offerings, the *StorageWorks 4100 EVA*, the *StorageWorks 6100 EVA*, and the *StorageWorks 8100 EVA*. Each of these SAN arrays was targeted at customers with specific immediate and future configurability needs, with the 4100 scalable to 56 TB, the 6100 scalable to 112TB, and the 8100 scalable to 240TB. In the past, the smaller enterprise that did not need the scalability or functionality of the higher-end 6100 and 8100 could go with the EVA 4100 to meet their storage requirements. With the rapid growth of data in recent years, however, those enterprises no longer have the scalability that they need to remain competitive in today's Internet environment. The low-cost 4100 that met yesterday's needs is no longer a viable solution. Therefore, HP has done the only thing that makes sense for the mid-sized enterprise – they have almost doubled the storage capacity of the 4100 with a new model, reduced price, and a full set of services to migrate your data from the EVA 4100, or a competitive array. The new model is the *StorageWorks 4400 EVA*.

The HP StorageWorks 4400 EVA

The StorageWorks 4400 Enterprise Virtual Array is an easy to use, high-performance, scalable, reliable, and highly available storage solution. It is easy to install, upgrade, and maintain at

² See [The Clipper Group Navigator](http://www.clipper.com/research/TCG2008017.pdf) dated March 14, 2008, entitled *Reliability, Responsiveness, Risk-Reduced – HP Delivers Scalable Storage for the SMB*, which is available at <http://www.clipper.com/research/TCG2008017.pdf>.

Exhibit 1 - EVA SW Functionality

- **Command View** – Provides a comprehensive storage management software suite designed to simplify, enhance, and maximize the EVA family and is included in all starter kits;
- **Business Copy** – Creates manages and configures **local** snapshots of data for zero-downtime backup, disaster recovery mirroring, and application development to meet business continuity and regulatory requirements;
- **Continuous Access** – Creates, manages, and configures **remote** replication for the EVA family to protect information in the event of a disaster; Provides the data center with remote mirroring of data between EVA arrays for disaster recovery, data migration, and high availability; to keep applications on-line during backup and restore operations;
- **Dynamic Capacity Management** – Provides automated storage provisioning and capacity utilization for the EVA family to help efficiently manage resources and improve overall productivity; and
- **Smart Start (EVA 4400 only)** – Simplifies installation and configuration of the EVA 4400 for the enterprise that wants to do it itself.

a very affordable price. HP designed the EVA 4400 from the ground up to address the needs of the mid-sized enterprise. The EVA 4400 uses its virtualization features to respond quickly to requests to increase capacity and reduce management complexity, enabling the data center to grow easily while protecting the investment in enterprise storage.

While the EVA4400 is less expensive than the EVA4100 per unit of storage, it is more scalable, with twice the performance as the result of hardware improvements and firmware efficiencies. For example, for disk reads, the EVA 4400 can execute 26,000 I/Os per second, compared to 13,800 for the EVA 4100, with a throughput of 775MB/s, compared to 350MB/s for the EVA 4100. The EVA4400 supports up to 96TB of data over 96 1TB FATA disk devices in eight 2U drawers, compared to up to 56 TB of data over 56 1TB FATA disk devices in four 3U drawers for the EVA 4100. It connects up to 256 physical

hosts via a F.C. front-end, or 150 iSCSI hosts. The EVA4400 supports up to 512 LUNs, with each LUN having a capacity of up to 2TB. It supports *Vraid1*, *Vraid 0+1*, *Vraid 5*, and *Vraid 0+5*, with *Vraid 6* on the roadmap for a future release. The EVA4400 provides O/S support for *Windows*, *Linux*, *NetWare*, *IBM AIX*, *Sun Solaris*, *VMware*, *Apple Mac OS x*, as well as *HP-UX*, and *HP OpenVMS*.

The EVA 4400 supports fault tolerance with the *right hardware architecture*, a redundant architecture with dual controllers, power supplies, fans, and power distribution units. The EVA4400 also has hot-plug support for power supplies, fans, cache batteries, I/O modules, environmental monitoring units, and disks. These fault-tolerant and high-availability features deliver the *right reliability* for the mid-sized enterprise with 5 “9”s availability – equal to less than 6 minutes of unplanned downtime per year, or only six seconds of downtime per week. The data center can now deploy the robust storage functionality, previously only available on high-end systems, required to protect the enterprise. **This eliminates single points of failure and promotes business continuity.** The EVA 4400 also has the *right software functionality* that you need, but could not afford before. Now you can afford the features required to grow and protect the information that your enterprise depends upon to stay competitive including support for local and remote replication software (as shown in Exhibit 1, on the previous page).

With over 140,000 I/Os per second based on cache reads, the EVA4400 provides the *right response time* for mission-critical applications, and with the recently announced *StorageWorks 8Gb Simple SAN Connection Kit*, the data center has the throughput to future-proof its SAN for years to come. HP is now providing 8Gb performance at 4Gb pricing, enabling the enterprise to protect the investment made today in data center IT. This kit includes a switch capable of supporting up to 20 ports, four 8Gb PCI Express FC host bus adaptors, software to simplify SAN management, and all required 8Gb SFP+ optical transceivers and FC cables needed to connect them to a dual-controller storage configuration.

HP also provides the data center with a series of “Solution Blocks”, or blueprints for integration, to simplify the deployment of leading 3rd party business applications such as *Microsoft Exchange Server*, *Microsoft SQL Server*, *Oracle*

JD Edwards EnterpriseOne and *Oracle E-Business Suite*, and *SAP*, among others. These solution blocks combine the right server, storage, and application components for a quick deployment of business intelligence, disaster recovery, mail, and messaging applications.

HP designed the EVA4400 to remove the complexity from the deployment and maintenance of SAN storage for the mid-sized market. It is easy to use and designed to be user-installable and user-maintainable, with remote support capability, although HP has trained partners worldwide to perform these tasks for the mid-sized enterprise looking to outsource this service. In fact, HP has placed detailed instructions and videos on their *Services Media Library* website to walk any administrator through an installation or maintenance activity.

Conclusion

The mid-sized enterprise faces a set of unique architectural and functional situations, unknown to the high-end enterprise with a staff of specialized administrative personal and a substantial budget, or the SMB, with limited expansion requirements and little or no budget for advanced features or functionality. Mid-sized enterprises not only are concerned about the uncontrolled growth of data, but they also have to be concerned about the protection of data for mission- and business-critical applications. With years of experience and a broad product set, HP has tailored specific products to each of these data center environments. With the EVA4400, HP has developed the *right* product to *right* size the mid-sized data center, and with an entry cost of \$15,000, it has the *right* price.

The EVA4400 has the enterprise class availability that the data center demands to ensure business continuity; it has the advanced functionality to protect mission- and business-critical information; and it has the performance you need to remain competitive and to grow the business at an affordable price. If your mid-sized enterprise needs an easy to use SAN with the RAS features of a high-end SAN array, consider the EVA4400. It may have the features, scalability, and price that you are seeking.



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