White Paper

EMC's VNX Family

A Unifying Force in Storage

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EMC Unified Storage Products

Producing unified products that merge functions, or even increase them, without introducing compromise is a well understood value—whether it's for data storage or any other endeavor. Imagine, for example, having multiple kitchens in your house: certain ingredients are only found in one place while others are duplicated; the range of dishes you can create is limited in each kitchen. However, combine everything into one kitchen and suddenly the recipe book opens up not just for all your traditional dishes to be made in one place, but for new combinations of ingredients and options that just didn't exist before.

Similarly, storage has grown up in islands (different kitchens, if you will), which has lead to the same issues of limiting choice, yet with duplicated efforts and poor utilization. Unified storage, when done well, is not about replacing all storage with one magic box, it is about providing unified products that enable the entire IT recipe book to be served. The well-known challenges of complexity, data growth, and application needs make the case for unified storage simultaneously more urgent and more compelling across all market segments. It is also crucial that it should not compromise any existing functional or business value and should be easier to manage and more economical to own and manage than the devices it replaces. In short, unified storage can be viewed as easy, cost-effective, a la carte, Cordon Bleu cooking for data centers!

Against this requirement, EMC has just announced two new unified storage platforms: the enterprise and mid-range sized VNX and the smaller VNXe. EMC states that these two products build on the simplicity and efficiency focus it is already driving by adding affordability and power—overall its new products are "optimized for virtualized IT." This paper will review the validity and relevance of these assertions against market needs. So first, in a nutshell, what has EMC announced?

- **VNXe:** Billed as the "World's Simplest Storage," VNXe takes EMC into new market spaces as it is targeted for users in small and medium sized businesses, mid-range organizations, or in enterprises outside the data center (departmental or remote office, often termed ROBO, use, for instance). Starting at under $10K (although with plenty of oomph that can take it into the mid-tens-of-thousands-of-dollars space), this is a unified storage product designed for users that don't (or don't want to) eat, sleep, and breathe storage. An intuitive and simple management dashboard with wizards (for e-mail, virtual servers, and popular applications from Microsoft, Oracle, etc.) underpins its focus on ease of use. Functionally, it is no slouch; although only requiring a few clicks, users can take advantage of sophisticated tools such as snapshots and remote replication. Technically, it has multi-cores; offers redundancy; handles CIFS, NFS, and iSCSI; and runs on a 6 Gb/sec SAS back end—its target user (storage-savvy or not) will just know that it can handle pretty much anything and everything they're likely to throw its way.
- **VNX:** In keeping with EMC understatement, VNX is tagged as the "World's Most Powerful Midrange Storage." It's the beefier cousin to the VNXe and is effectively a marriage of EMC's two existing, market leading mid-range offerings, CLARiiON and Celerra, although with much improved performance and operational value over either of those platforms. Very clearly an enterprise-class device, it offers much of the same features and manageability as the VNXe, but has extended capabilities exactly where one would expect them: far more scalability; extended "UltraFlex IO" connectivity that adds FC, FCoE, IP, pNFS, and MPFS protocols together with a heavy focus on a single optimized storage pool that takes automated advantage (via EMC "FAST VP," Fully Automated Storage Tiering for Virtual Pools) of flash; high-speed; and high-capacity drives. Its target user will know that file, block, and object storage is on hand and tuned—both by EMC itself and also via access to a support community—for virtual server environments and applications. While integration with VMware is naturally tight, EMC has made considerable efforts to embrace Microsoft Hyper-V and other virtualization platforms as well.

Beyond the actual platforms, EMC is also investing in its channel to help serve the "sub $75K" market and has repackaged its software to make popular combinations easier to consume for all users. Finally, users of current EMC products will be able to run a mixed environment as they gradually add in the new products since the Unisphere management platform supports both the old and the new. Overall, this is a huge announcement for EMC (and the

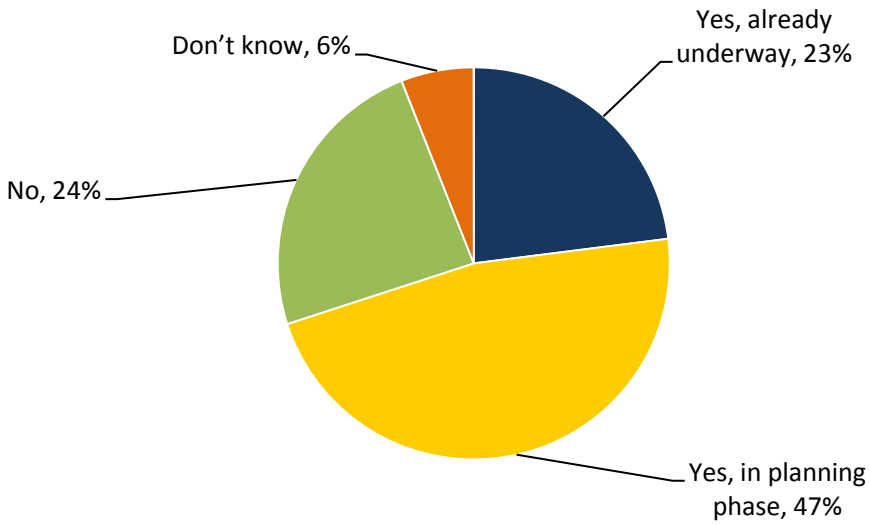
market) and a substantial adjustment for a company that has long seemed to positively embrace a plethora of different, specialist platforms. But why the change of direction and why now?

Why Unified Storage?

The essence of unified storage (at least for the majority of users the majority of the time) is a platform that supports both block and file data. While no one with a laptop thinks twice about the flexibility of the storage on their C: drive, data centers have grown up in a far more Balkanized style. It can be argued that such specialist storage islands (separate kitchens if you like!) are good from an effectiveness perspective, but the main drivers for unification stem from a strong desire (which in many organizations is also a de facto necessity) to add resource-efficiency to that effectiveness. The acceleration of server and application virtualization (itself enabled by dense, multi-core processing) is both a catalyst of this change and a reaction to it. Convergence and consolidation is a rallying-cry across IT to drive necessary efficiencies—and unified storage can make a substantial contribution to such efforts. Users are clearly motivated to move to unified storage as recent ESG research confirms: Figure 1 shows that 70% of respondents to a recent survey are either underway with efforts to consolidate NAS and SAN into a unified storage architecture or have plans to do so.[1]

Figure 1. Degree of Current Usage of and Planning for Unified Storage

Does your organization have any plans to consolidate NAS and SAN storage resources into a unified storage architecture that supports both file-based/NAS and block-based/SAN storage? (Percent of respondents, N=306)



Source: Enterprise Strategy Group, 2010.

There are other contributory factors at work: server virtualization demands a more flexible storage pool and tiered storage architectures also support that flexibility—solid state drives and higher capacity HDDs can both be part of an application-suitable, TCO-optimized storage pool. EMC's move to offer unified storage platforms (as flagship offerings and not sideline science projects) marks a significant change for the industry, demonstrating that this is definitely a mainstream approach that allows users to benefit both operationally and financially.

[1] Source: ESG Research Report, *Scale-out Storage Market Trends*, December 2010.

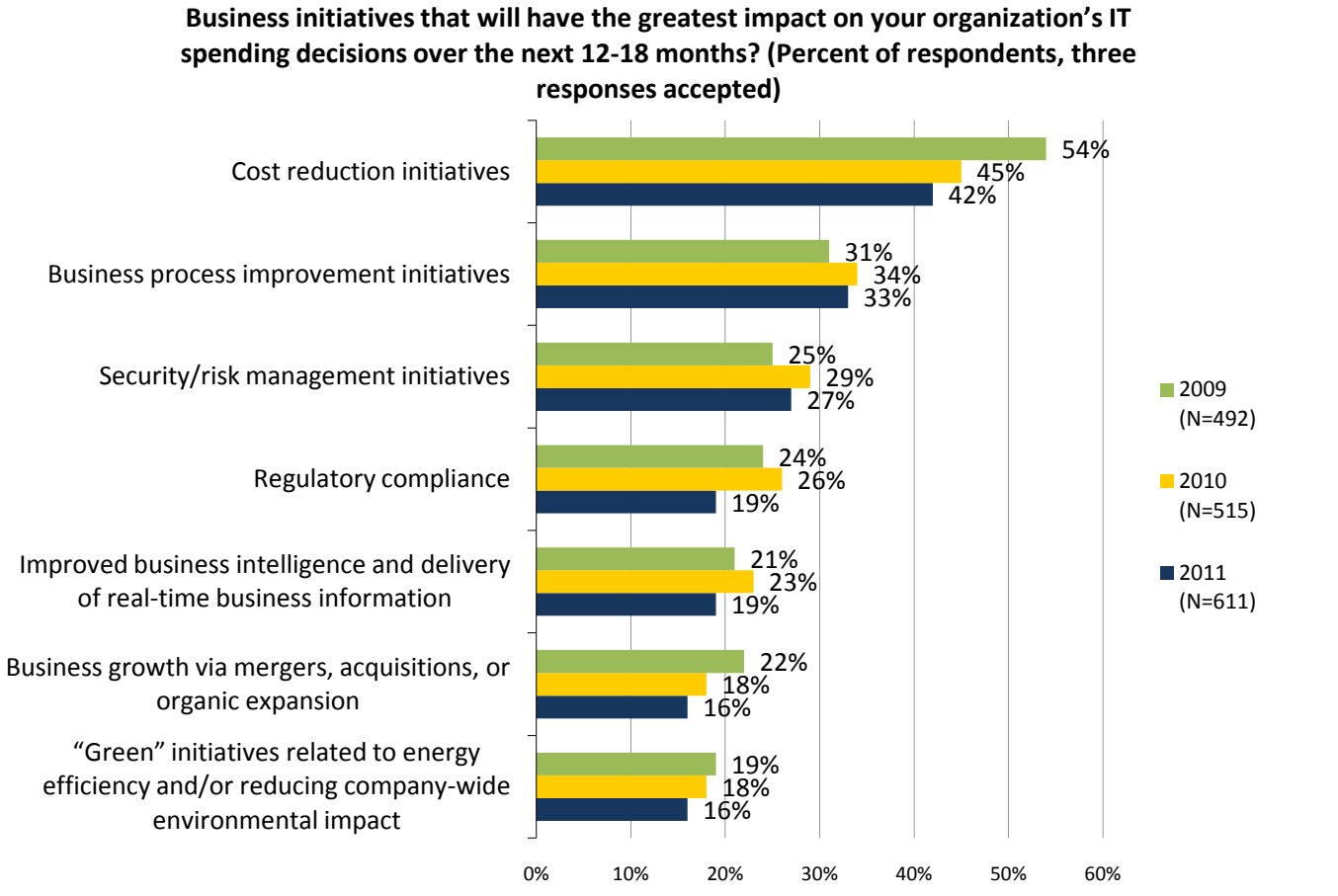
Market Relevance of EMC's New Unified Storage Products

The suitability of EMC's VNX and VNXe can be viewed from four different aspects of the storage marketplace:

1) Business and Application Drivers of IT Investments

Deciding what new IT investments are made in any well-run business is always a function of higher level business initiatives, and ESG's research (see Figure 2) demonstrates that unified storage can be beneficial to the most crucial acknowledged business demands. While the balance has changed over the last three years, cost reduction and business process improvements have remained consistently the most impactful initiatives. Unified storage can address both by driving down costs (via better utilization and lower capital, management, and environmental costs) and improving business processes (via greater flexibility and responsiveness, especially in virtualized environments).

Figure 2. Business Initiatives That Will Impact IT Spending Decisions, Three-Year Trend[2]



Source: Enterprise Strategy Group, 2011.

An excellent way to achieve both of these is to understand *and* integrate with key user applications (especially Microsoft suites and Oracle) and EMC has invested heavily here to make the VNX Family more operationally valuable, especially for the growing numbers of IT "generalists." Storage should be a servant, not a master.

2) "Automated Optimization"

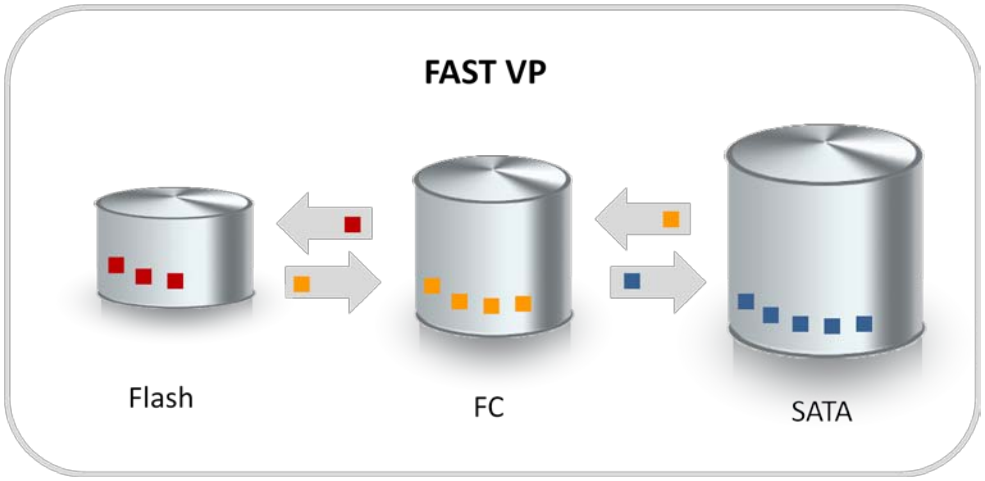
Unified storage—certainly as exemplified by EMC's VNX Series, which supports both FAST VP and FAST Cache—demonstrates what we call Automated Optimization. Beyond the standard value of consolidation into one pool, Automated Optimization describes the ability to have a fully automated storage system that provides optimal

[2] Source: ESG Research Report, *2011 Spending Intentions Survey*, January 2011.

performance (by data use, server, user, or application) at the lowest cost. A significant element in delivering such optimization is EMC's FAST Suite, which itself consists of two components:

1. FAST Cache continually ensures that "hot" data is served from the highest available tier (usually flash SSDs) for the fastest response time.
2. FAST VP (Figure 3) optimizes storage pools automatically on a regular schedule to ensure that the most active data is served from flash drives and "cold" (less active) data is moved to a lower cost storage tier (higher density HDDs).

Figure 3. Sub-LUN Tiering Ensures Hot Data Blocks are on the Fastest Media, While Cold Blocks are on Cost-Effective Dense Storage



Source: Enterprise Strategy Group, 2011.

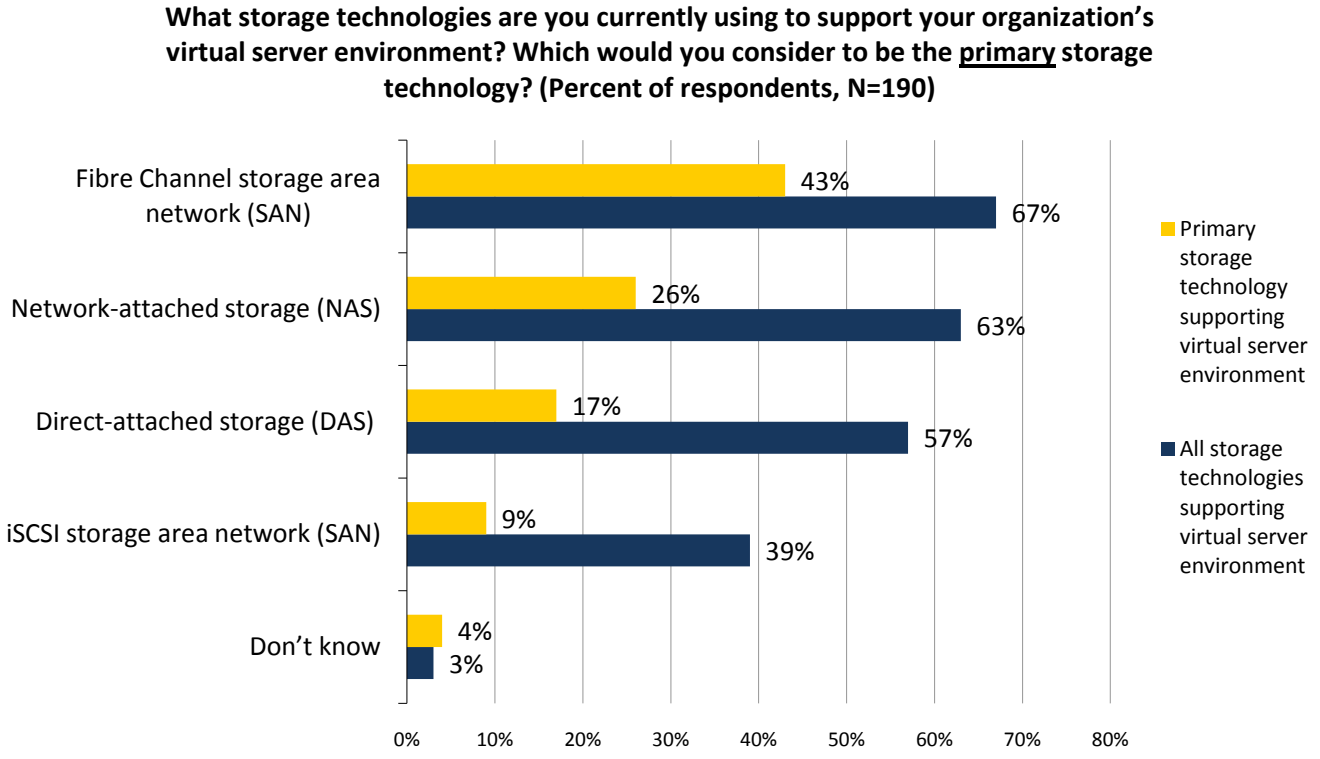
As previously mentioned, the imperative for this approach is magnified by data, application, and virtual server growth in association with a lack of an equivalent budget increase. The *only* viable way to address such challenge and complexity is optimization—and the *only* viable way to deliver such optimization is via automation. There aren't enough knob-twiddling storage experts in the world with the knowledge (or desire) to try to keep up any other way. The situation applies just as much to the SMB space as to the enterprise world, thus Automated Optimization is also a relevant concept for the smaller environments that VNXe serves, the only difference being that the implementation is—appropriately for its target market—focused on simplicity and delivered, for instance, by advanced and capable wizards focused on setup and application integration, rather than the higher end tiering functionality like FAST VP that is more beneficial in larger, multi-tiered environments.

3) Virtualized Environments

EMC has taken care to ensure that the VNX Family is optimized for server virtualization whether it is VMware, Hyper-V, or other platforms. Naturally, integration is tightest with VMware, even to the extent of VNXe offering easy, "few-click," application-centric provisioning. Yet the flexibility that is so beneficial with virtual servers can exert varying demands on its infrastructure. Look (see Figure 4) at how many storage tools users are employing![3]

[3] Source: ESG Research Report, *The Evolution of Server Virtualization*, November 2010.

Figure 4. Storage Technologies Being Used to Support Virtual Server Environments



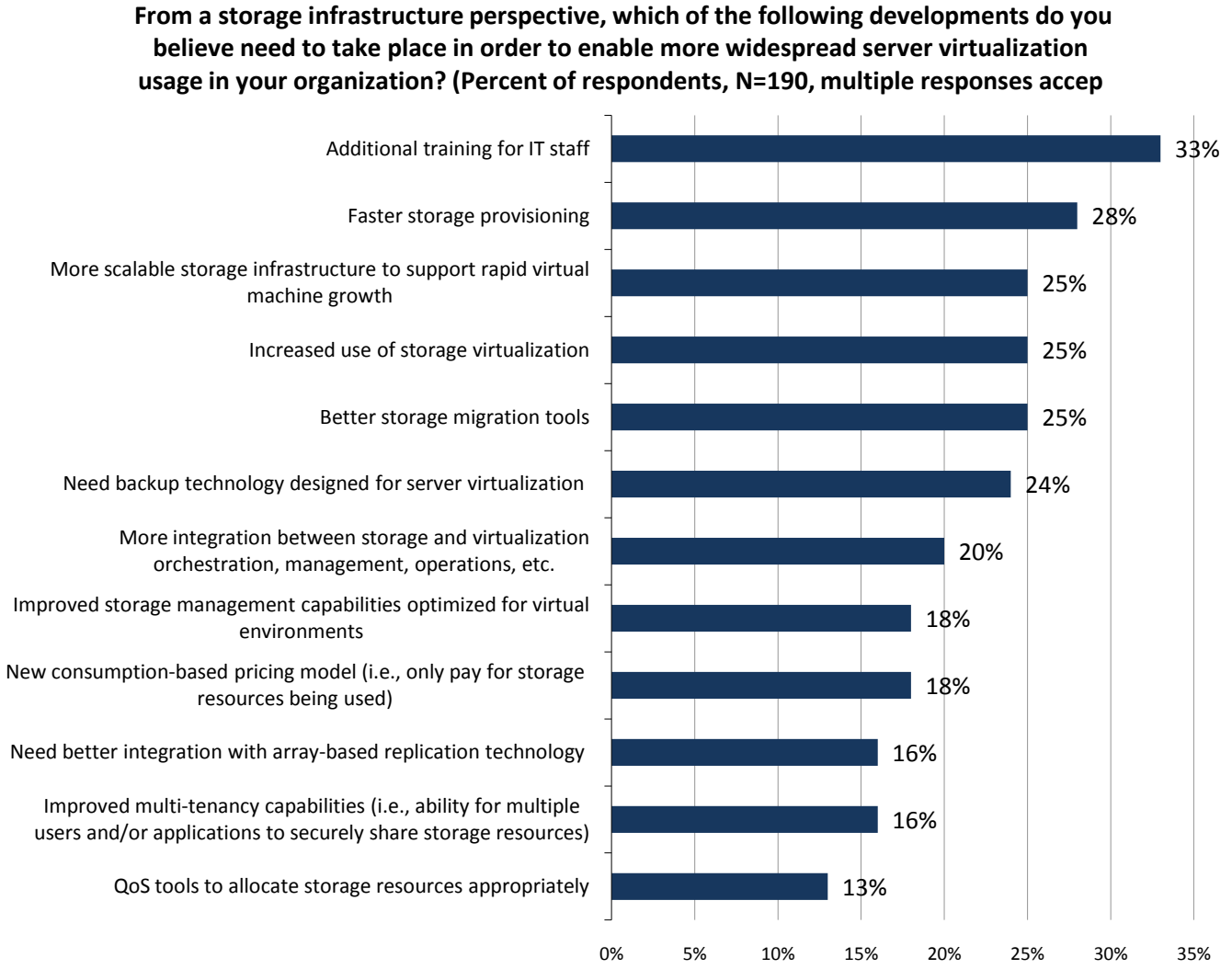
Source: Enterprise Strategy Group, 2010.

Clearly, many data centers are using a wide range of storage architectures to support their server virtualization efforts and clearly, therefore, a unified storage approach—such as that which EMC is now offering—would allow greater operational flexibility and lower consolidated TCO in combination with enhanced capabilities such as backup/recovery and remote replication (which can be streamlined, thinned, deduplicated, and compressed—possibly improving "standard" utilization by as much as 3X—in a single pool of automated-and-optimized storage). Put succinctly, as business needs and applications change, so a unified storage system can adapt to enable and support that change.

And, notably, driving down the overall cost of the storage supporting virtual server environments is not just a "nice-to-have:" when ESG recently asked[4] users what they consider to be their most significant storage challenges related to server virtualization usage, the number one response (by a wide margin and ahead of things like scalability, OPEX, and performance) was the capital cost of new storage infrastructure. The same research study also revealed specific ways in which unified storage could be a valuable tool to actually *enable more widespread use of server virtualization*: Figure 5 shows what users need to happen from a storage perspective in order for increased use of server virtualization to occur.

[4] Source: ESG Research Report, *The Evolution of Server Virtualization*, November 2010.

Figure 5. Factors That Would Enable Wider Use of Server Virtualization



Source: Enterprise Strategy Group, 2011.

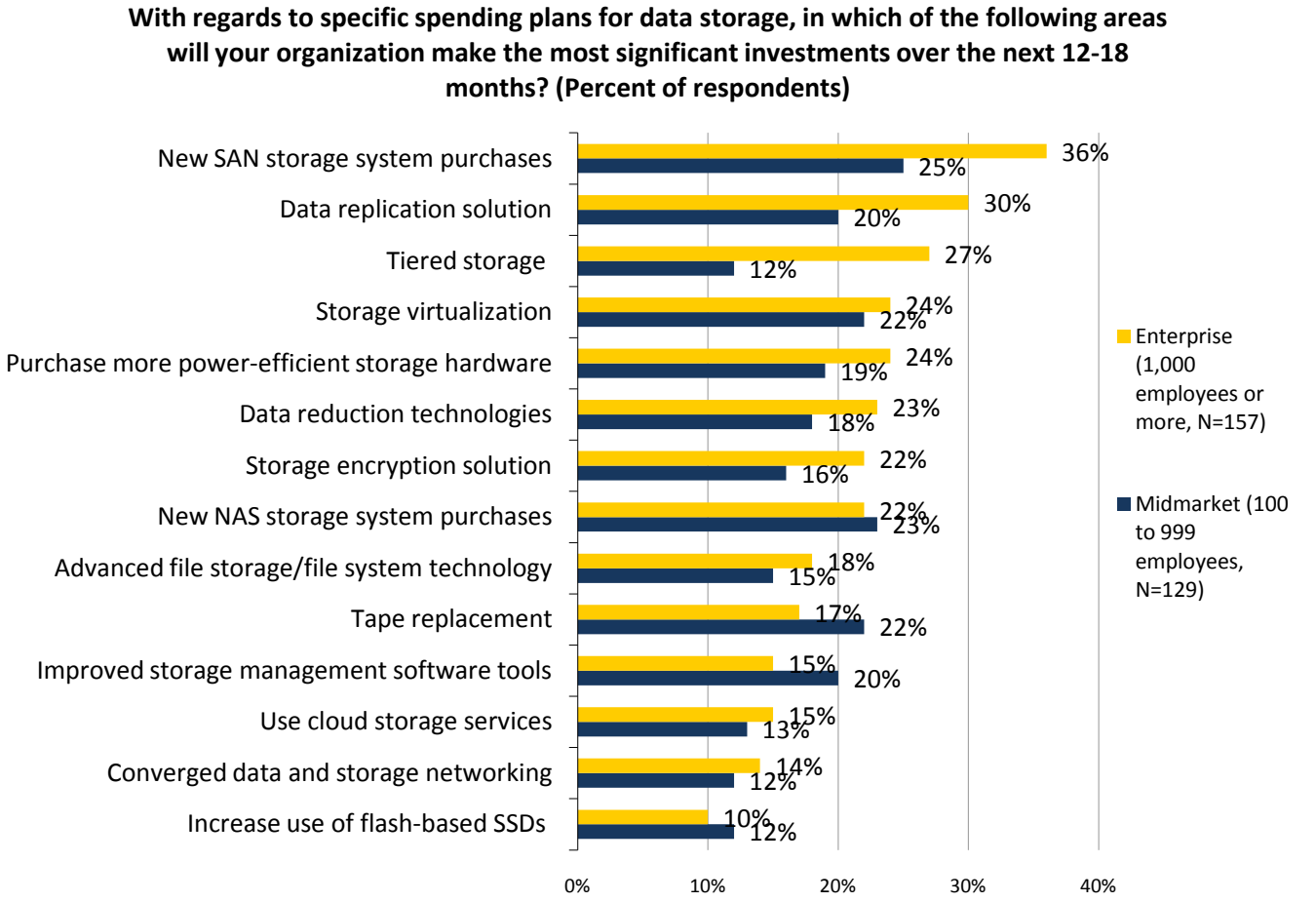
Again, increasing the use of server virtualization is not just something that IT users would vaguely like to happen. It is considered the number one most important IT priority for 2011 and beyond.[5] Unified storage in general, and the VNX family specifically, can address most of the challenges, and certainly the key ones, that users face as they try to extend their usage of server virtualization. For instance, IT staff training: unified storage clearly precludes the need for training across multiple architectures and systems, and EMC goes one step further by making its VNXe ultra-easy to use "even by people that don't have storage in their title or on their hobby list." Such needs can only be more pressing when there's so much growth to manage, and ESG research[6] shows that only 6% of users expect to add a significant number of new IT staff in 2011 compared to 2010 (57% expect no change or a decrease from 2010 levels). As to the need for faster storage provisioning, this, too, can be met by EMC's new unified products. Not only is everything intrinsically faster and easier, it is managed from one interface and there are automated wizards for many of the most popular storage and application actions performed day in and day out on virtual servers; these each take just a couple of minutes and include setting up and configuring volumes for VMware and Hyper-V, setting up and configuring of iSCSI volumes or Exchange-ready storage, and setting up of NFS and CIFS shares and snapshots.

[5] Source: ESG Research Report, *Scale-out Storage Market Trends*, December 2010.
[6] Source: ESG Research Report, *2011 Spending Intentions Survey*, January 2011.

4) The Broad Market Applicability of Unified Storage

EMC's unified storage products are a fusion of simplicity and suitability that is broadly useful; regardless of size, most users want to improve value, ease, data protection capabilities, and so on. Server virtualization is used across businesses and yesterday's advanced functions (such as remote replication, thin provisioning, and snapshots, which are all used by 62-66% of mid-range users[7]) are today's table stakes. That said, a good unified storage system will be more than just SAN and NAS connectivity: it will merge (unify!) many available features and functions so that the new devices can serve a variety of needs. As well as just sheer scale and (often) complexity, there are variances in what mid-size and enterprise users are looking for when buying storage in 2011-12, as Figure 6 summarizes.[8]

Figure 6. Key Planned Storage Investments by Users, 2011-12



Source: Enterprise Strategy Group, 2010.

For instance, unlike in the enterprise, in the midmarket, new NAS and SAN investments are *both* more likely to be top priorities than in larger enterprises. Unified storage such as the VNX family can preclude the need to choose and buy separate platforms. EMC's new platforms adapts to the specific user needs.

[7] Source: ESG Research Global Study, April 2010.
[8] Source: ESG Research Brief, *2010 Storage Spending Trends*, February 2010.

The Bigger Truth

Much as the need for unified storage is clear to the majority of users, the value of the new VNX family from EMC can also be stated simply for each relevant constituency:

- **From a user perspective,** VNX and VNXe are excellent, flexible products that address clear market needs. Automated Optimization provides maximum value to users across the spectrum with minimized effort and is especially focused on *application* integration and value, especially seemingly ubiquitous applications such as SQL Server and Oracle. And for an increasingly virtualized server world, the linkage to vCenter and vSphere—allowing for either storage or server personnel to manage the VNX family—is important as a resounding 91%[9] of users expect server virtualization to have either some or significant impact ("impact" meaning the migration of functionality to the virtualization platform) on their storage management.
- **From a market perspective,** this new family will most likely make EMCs existing customers *and* channel partners happy as it acknowledges and serves the growth of a new kind of storage need in smaller offices and departments, one that is more serious, sophisticated, and more application- and business-oriented. At the same time, the VNX family, particularly the VNXe, makes EMC solutions available to the SMB and lower end of the mid-market that are easily consumable by the IT generalist and do not require a storage architect or storage specialist to operate efficiently and cost effectively. This is clearly another "market gauntlet" thrown down by EMC.
- **And from EMC's perspective?** Although EMC was already extremely strong in the mid-market, leaders always change before they have to. This marks a significant market leader move by EMC, which over the last decade or two has shown a distinct ability to move the market. EMC has a lot of user loyalty and the VNX family looks to have all the necessary capabilities to allow EMC to retain that loyalty. As part of a storage product range that has been fully refreshed in the last couple of years, the VNX family continues to show EMC's skill to deliver not just new products and features but products that are timely, advanced, and embody relevance that matters to its customers—whether those customers are large or small and or end-users or channel partners—as well as to a whole new market for EMC.

The bottom line? EMC's new VNX family shows the company understands and is addressing market needs (which might be summarized as "you don't have to know the storage business to run your business") and also that those needs are equally applicable at both enterprise scale and in the rapidly growing mid- and lower markets. The VNX family mantra is simplicity that masks, yet delivers, advanced functionality and application-focused business value to a unified, and unifying, world.

[9] Source: ESG Research Report, *The Evolution of Server Virtualization*, November 2010.

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