Solution Showcase

Simplify IT with Lenovo ThinkSystem DM & DE Storage Solutions

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Abstract:

Data and IT services are the backbone of the modern business. As business demands on IT increase, it has become more complex than it has ever been to architect an optimized data center ecosystem. Companies not only need access to the latest technologies, they require assistance optimizing the technology's use. Lenovo, a leader in IT, with its newly announced ThinkSystem DM and DE Series, is delivering adaptable and dynamic data storage technologies that drive down the cost and complexity of IT, enabling businesses to thrive in the modern digital era.

Overview

Delivering modern IT services is nearly impossible today without leveraging flash storage. Far surpassing its early perceptions, flash storage has transformed IT infrastructure for a vast assortment of workloads, not just performant databases, but virtualization, and even file environments and home directories, as well. Now, with the advent of NVMe, a new data protocol designed to maximize the potential of flash technology, the benefits of flash storage are poised to only increase.

While the gains have been substantial, flash storage is only one piece in a much larger infrastructure designed to deliver modern IT services. The pressures of the digital economy have forced IT leaders to assume new responsibilities in order to help their businesses maximize the value of their data, such as leveraging analytics to better engage with customers and improve productivity or enabling application development to develop digital products or services. These increased responsibilities consume cycles away from managing infrastructure, and simply scaling personnel to meet these increased demands is unsustainable.

As a result, a gap is created. For example, one third of IT organizations surveyed by ESG consider IT architecture and planning an area in which their organization has a problematic shortage of existing skills.[1] Given the complexity of IT and the growing business demands to maximize the value of data, IT leaders need more than advanced technology, they need validated, managed, and supported data-center-wide solutions that keep infrastructure costs low. Lenovo, a trusted IT leader and partner, has designed end-to-end infrastructure solutions that maximize the potential of new technologies, such as its newly announced ThinkSystem DE and DM series products, while eliminating the complexity of architecting a modern IT ecosystem.
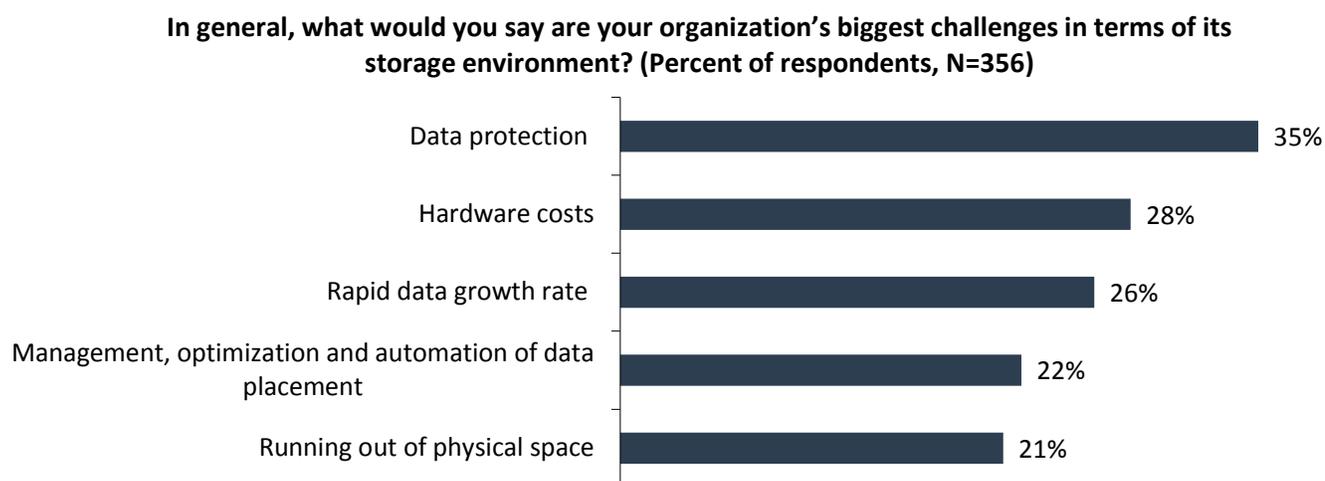
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[1] Source: ESG Research Report, *2018 IT Spending Intentions Survey*, February 2018.

Lenovo Is Addressing the Complexity of Modern IT

IT complexity is a result of the ever-present challenge of managing modern data levels. In ESG's *2018 IT Spending Intentions Survey*, 68% of IT decision makers indicated that IT was more complex than it was just two years ago. Increased data capacity was the most commonly identified factor (41%) driving that complexity.[2]

A separate study on enterprise storage trends further supports the link between data and IT complexity.[3] From the five most commonly identified storage challenges (see Figure 1), a similar narrative emerges: The rapid growth rate of data is driving up the costs of infrastructure and increasing the complexity of data protection. In addition, new technologies are making it more difficult to ensure data is placed on the right storage media in the right location.

Figure 1. Top Five Enterprise Storage-related Challenges

In general, what would you say are your organization's biggest challenges in terms of its storage environment? (Percent of respondents, N=356)

Challenge	Percent
Data protection	35%
Hardware costs	28%
Rapid data growth rate	26%
Management, optimization and automation of data placement	22%
Running out of physical space	21%

Source: Enterprise Strategy Group

Lenovo has developed a portfolio of solutions designed to address these principal IT challenges. As an end-to-end IT solution vendor with servers, networking, and storage, Lenovo tackles the complexity of IT infrastructure design. Compute, networking, and storage offerings are designed and optimized to work together, rather than validated as disparate elements. This more holistic approach to IT offers several advantages beyond what can be achieved by vendors focused solely on a single component, such as:

- **Optimized Technology Delivery**: Lenovo has built a history of innovating around a streamlined supply chain. Supply chain expertise and purchasing power are core strategic advantages that have fueled Lenovo's history of reducing costs. These advantages extend across Lenovo's product lines to servers, networking, and storage solutions for both block and file environments.

- **Architected and Validated End-to-end**: Lenovo invests in ensuring that technology resiliency and capability are delivered at both an individual component level and at a larger IT solution level. With extensive end-to-end validation, Lenovo ensures its servers, networking, and storage systems are validated together. Lenovo also offers multiple integrated solutions designed to address critical IT use cases, removing guesswork and risk when architecting an optimized IT environment, while reducing the burden on IT personnel.

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[2] Source: ESG Master Survey Results, *2018 IT Spending Intentions Survey*, December 2017.
[3] Source: ESG Master Survey Results, *2017 General Storage Trends*, November 2017.

- **XClarity IT Wide Manageability:** XClarity Administrator consolidates the management of Lenovo ThinkSystem servers, networking, and storage. By simplifying end-to-end infrastructure management, administrator time is freed for other tasks. With REST APIs, IT administrators can leverage XClarity to automate manual infrastructure tasks, further eliminating the burden of routine IT management.

These architectural benefits are extended to the latest Lenovo portfolio additions, the ThinkSystem DM Series and ThinkSystem DE Series.

Lenovo's ThinkSystem DM & DE Series

The newly announced ThinkSystem DM series and DE storage solutions extend an already robust portfolio of high-performance and highly scalable storage systems, with all-flash storage for enterprise applications and hybrid options for low-cost or secondary data.

ThinkSystem DM Series

The ThinkSystem DM series delivers a portfolio of enterprise-grade, multiprotocol storage systems that feature an architecture capable of scaling both up and out to increase performance as well as capacity. A few ThinkSystem DM highlights include:

- **Efficient, Adaptable Data Platform**: ThinkSystem DM products are embedded with an intelligent data storage platform designed to persistently store data efficiently in the optimal location. ThinkSystem DM systems can intelligently place data across internal storage media tiers and public cloud resources. Data placement is seamless to the application. With adaptive QoS capabilities, ThinkSystem DM arrays can ensure that business-critical applications get the system resources they need. With integrated inline deduplication, all data movement and placement activities are optimized. This efficiency improvement extends the ThinkSystem DM's robust data protection capabilities, such as replication, snapshots, cloning, metro cluster support, and migration of data to public cloud storage.

- **Security of Sensitive Data:** As a multiprotocol storage system, supporting both file and block-based data, the ThinkSystem DM design integrates several capabilities optimized to protect sensitive file data. Data can be encrypted in place, with support for data locking and legal hold for regulatory compliance. Further enhancing system security, ThinkSystem DM also offers multi-factor authentication.

- **NVMe-based Storage Architecture:** All-flash storage was only an early step in transitioning the industry away from its dependency on slow mechanical storage architectures. With NVMe technology, a protocol designed for memory-based flash media, unlike SAS or SATA, data access latencies are poised to improve even further. For example, with the ThinkSystem DM series, Lenovo claims less than 1ms latency performance to all data.
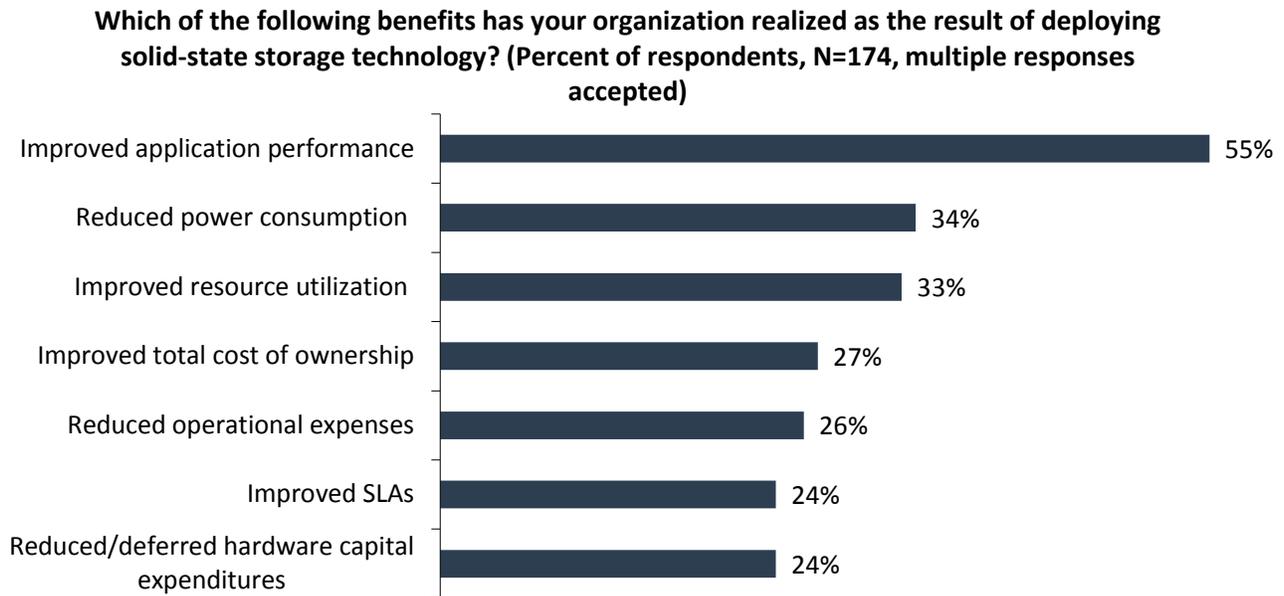
ThinkSystem DM Series

- Multiple protocol 16/32Gb FC, 10/40Gb iSCSI, NFS, CIFS, NVMe-oF support.

- Scale to 4 million IOPS with submillisecond latency.

- All-flash/hybrid storage.

- 99.9999% availability.

- Data security: encryption, locking for compliance, multi-factor authentication, legal hold.

- XClarity Integration for simplified solution management.

- Enterprise functionality: Adaptive QoS, deduplication (average 5 to 1), sync replication, snapshots, clones, tiering to the cloud, metro cluster.

Transformational Impact of NVMe-based Flash

Flash storage's elimination of the mechanical hard drive bottleneck dramatically reduced data-access latencies and generated a series of benefits for IT organizations, improving infrastructure efficiencies and reducing costs. In an ESG research study on enterprise storage trends, 27% of storage decision makers using flash storage identified a reduction in total cost of ownership (TCO) as a benefit of their use of flash storage, 26% identified reduced operational expenditures, and 24% identified reduced or deferred capital expenditures (see Figure 2). In total, 57% of participants identified a positive cost benefit resulting from flash storage deployment.[4]

Figure 2. Benefits Realized from Deploying Solid-state (Flash) Storage

Which of the following benefits has your organization realized as the result of deploying solid-state storage technology? (Percent of respondents, N=174, multiple responses accepted)

Benefit	Percent
Improved application performance	55%
Reduced power consumption	34%
Improved resource utilization	33%
Improved total cost of ownership	27%
Reduced operational expenses	26%
Improved SLAs	24%
Reduced/deferred hardware capital expenditures	24%

Source: Enterprise Strategy Group

Now, NVMe technology is poised to further reduce latencies and increase the benefits of flash. And IT organizations are already bullish on its potential. In the same enterprise storage study, 79% of storage decision makers familiar with NVMe technology expected NVMe-based flash storage to eventually replace traditional solid-state flash storage (i.e., SAS- or SATA-connected flash).[5]

Additionally, an NVMe-based storage system is a requirement to leverage future technologies, such as NVMe over Fabrics (NVMe-oF). Support for the NVMe-oF standard is quickly being added across data center infrastructure components: storage systems, storage network switches, host bus adapters, and operating systems. With a full NVMe-based data center in place, one supporting NVMe-oF, the shift in data accessibility could be incredible, not only further accelerating workloads, but also delivering dramatic improvements to workload consolidation and data center simplification.

ThinkSystem DE Series

- 16/32Gb FC and 10/25Gb iSCSI.

- Up to 1M IOPS with submillisecond latency.

- All-flash/hybrid storage.

- 99.9999% availability.

- XClarity Integration for simplified solution management.

- Enterprise functionality: synchronous replication, encryption, Snapshot, SSD Cache, Thin Provisioning.

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[4] Source: ESG Master Survey Results, *2017 General Storage Trends*, November 2017.
[5] ibid.

ThinkSystem DE Series

Lenovo's second portfolio addition, the ThinkSystem DE series, is designed for mid-sized IT environments and supports block storage protocols (FC, ISCSI). The ThinkSystem DE controllers are upgradeable, allowing IT organizations to scale performance as demands increase or as new technologies are introduced. With its scale-up architecture and controller upgradeability, the ThinkSystem DE is ideal for smaller storage deployments that require a simple mechanism to quickly scale capacity or performance as application demands increase.

As part of the Lenovo ThinkSystem family, the DE is validated within the larger Lenovo ecosystem, supports XClarity management integration, and benefits from Lenovo's supply chain optimization. The net result makes the ThinkSystem DE a reliable, cost-effective storage option for budget-conscious IT organizations.

The Bigger Truth

Ideally, technology is supposed to make our lives better and easier. Recently, however, it seems the opposite is true for IT. Each new technological advance often introduces a myriad of new decisions: how to optimize the new technology, how to deploy it properly, will it deliver the expected benefits, will it work in the existing environment with existing investments. Addressing these questions depends less on the technology itself, but rather on how the technology, such as NVMe, is delivered. Lenovo ThinkSystem Storage Solutions address end-to-end IT complexity by addressing end-to-end IT needs.

As new technologies emerge, the benefits they provide are either limited or magnified based on how well the technology provider ensures each innovation is simple to manage, resilient, and optimized to fit into the user's budget. Lenovo's advantages shine across these factors. Leveraging its extensive supply chain to drive down the cost of IT, Lenovo helps ensure new technologies can fit into today's compressed IT budgets. With its broad portfolio, XClarity management, and extensive validation process, Lenovo delivers end-to-end, validated data center solutions instead of disparate components. The digital demands created by the modern economy are simply too great for IT organizations to have the luxury of managing and maintaining infrastructure on a component-by-component basis. Lenovo is simplifying IT in a time when simple IT is essential to keeping pace in this rapidly evolving and competitive digital marketplace.

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