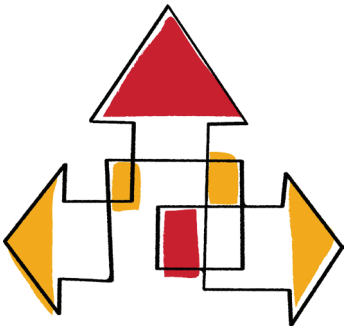

Solution Brief

Scale-Out Storage for Today's Demanding Workloads

NetApp and Intel deliver scale-out storage that effectively manages today's growth and pace of business

KEY FEATURES

Performance for Intelligent Data Management
Respond immediately to unpredictable and competitive pressures with agile, efficient operations.

Nondisruptive Operations for Continuous Access
Protect businesses from lost revenue with 24/7 operations, regardless of workload or storage protocol.

Unparalleled Levels of Scalability
Support endless growth with storage systems that scale out to very high capacities and performance.

Epic Data Growth Continues to Tax IT Resources

Data growth continues to plague organizations as the leading data center hardware challenge. IT is under constant pressure to respond to new business opportunities that deliver value with scalable speed, while managing data growth and the associated costs related to hardware,software, and maintenance within a constrained budget.

- International Data Corporation (IDC) predicts digital data will grow to 2.7 zettabytes in 2012, up 48% since 2011, with 90% of the data being unstructured (for example, images/ videos, social media, and Web-enabled workloads).
- As more and more data is ingested into the ecosystem, the avenues and attack surface for malicious security breach have increased dramatically.
- There is an urgency to act. IDC analysts predict that IT industry's shift to cloud and next-generation platforms will accelerate in 2012, forcing the industry's leaders to make bold investments and fateful decisions.

Accommodate Data Growth with Optimized NetApp Scale-Out Storage Solutions Based on Intel

NetApp® scale-out storage solutions built with Intel® Xeon® processors enable companies to successfully handle the massive data growth and infrastructure complexities required for today's demanding workloads. By optimizing data management at this tremendous scale, organizations can easily adapt to changes in the business with an immediate response to unpredictable data growth. Businesses get unprecedented agility and data protection to efficiently manage their growing data with cost-effective storage solutions that can result in greater business value.

Eliminate overprovisioning

Scale-out storage provides a modular design, allowing organizations to easily add storage resources as business needs change. With scale-out storage, both capacity and performance can be expanded linearly, resulting in a flexible network storage architecture that delivers the agility to address data growth while effectively managing cost and availability.

"The combination of the Intel Xeon processors in the NetApp FAS6280 system along with NetApp Flash Cache™ allows us to take full advantage of powerful exploration and production applications unhampered by storage bottlenecks for enhanced decision making."

Bradley Lauritsen
Director of Exploration Applications, Apache Corporation

Prepare for IT modernization

Scale-out storage architectures eliminate the traditional disruption that results from a technology refresh. When new storage is added, existing data can be migrated nondisruptively to take advantage of the new storage components. Then the older disks and controllers can be decommissioned or may be repurposed as part of a tiered storage strategy to extend its lifecycle.

NetApp's intelligent scale-out storage architecture also takes full advantage of the Intel Xeon processor's compute power to support today's emerging usage models such as storage virtualization, data deduplication, and automated storage tiering. Customers benefit from performance of greater processing power where the data resides, the agility to support continuing data growth, and the ability to manage constrained budgets by lowering IT capex and opex.

Performance for Intelligent Data Management

NetApp's scale-out storage solutions deliver increased computational horsepower and networking performance to support the demands of data-intensive storage workloads. By using Intel Xeon processors, NetApp storage solutions deliver improved application performance, data management, and storage optimizations to reduce IT expenses.

- **Optimized performance.** NetApp storage utilizes Intel Streaming SIMD Extensions (Intel SSE), available in Intel Xeon processors, to efficiently handle compute-intensive storage functions.
- **Improved cost efficiencies.** FAS systems with Intel Xeon processors improve application performance and data management and provide storage optimization to reduce IT expenses up to 70%[1] .
- **Superior storage efficiencies.** NetApp intelligent data management uses the Intel Advanced Encryption Standard New Instructions (Intel AES-NI)[2] in Intel Xeon processors to accelerate compression by 50%. The Intel multicore processor architecture within FAS systems also enables intelligent, compute-intensive capabilities such as data deduplication. Customers who have implemented data deduplication on the FAS systems have seen up to 80%[3] storage cost reduction.
- **Offload processing.** NetApp E-Series storage systems offload processing of parity calculations by using built-in RAID functionality in Intel Xeon processors, which increases cache efficiency and processor availability.

Unified networking architecture

Given its flexibility and long history, it is not surprising that Ethernet storage is the fastest growing segment of the storage systems market. Unified networking on 10 Gigabit Ethernet (10GbE) provides an easy path to cost-effective performance of next-generation storage networks, including a simplified infrastructure, lower equipment and power costs, and the flexibility to meet the needs of evolving virtualized data centers. Customers benefit from low latency and high throughput (1.5M I/O operations per second [IOPS]) required by today's demanding workloads with NetApp FAS6200 series using 10 Gigabit Intel Ethernet Converged Network Adapters (CNAs) and controllers.

1. Results collected through NetApp AutoSupport™.
2. (Intel AES-NI requires a computer system with an AES-NI-enabled processor, as well as software not from Intel to execute the instructions in the correct sequence. AES-NI is available on select Intel processors. For availability, consult your reseller or system manufacturer. For more information, see Intel Advanced Encryption Standard Instructions (AES-NI).
3. NetApp's IT Team Postpones Million Dollar Investment—Goes Green with NetApp Storage: *http://media.netapp.com/documents/netapp-greenit.pdf*

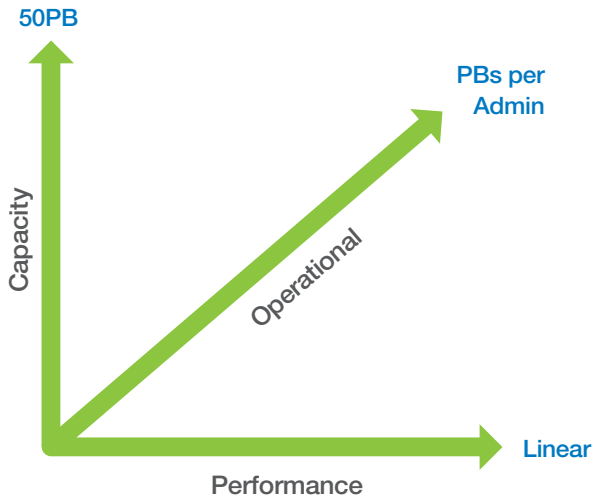

Figure 1) Benefits of scale-out storage architecture.

Nondisruptive Operations for Continuous Access

Business continuity requires that data always be online and accessible. With built-in high availability storage features, organizations benefit from continuous access to all business-critical applications and data.

Optimized availability

Scale-out architectures take advantage of the superior price/performance of clustered components and facilitate nondisruptive operations for improved efficiency and agility.

- **Eliminate planned disruptions.** Intel Xeon processor-based FAS systems running clustered Data ONTAP® enable nondisruptive operations by eliminating planned downtime for service upgrades, technology refreshes, and capacity expansion. Clustered Data ONTAP enables transparent movement of data within the infrastructure to eliminate service disruptions for maintenance.
- **Improve backup/recovery times.** FAS systems with Intel Xeon processors deliver faster data recovery times—seconds rather than hours—and can fail over to secondary sites to make sure of availability of applications and data.
- **Deploy with confidence.** Validation of 10 Gigabit Intel Ethernet CNAs with FAS systems through substantial engineering and testing makes sure that "it just works."

Built-in data protection

NetApp helps organizations protect their data and increase availability by using features built directly into the Intel Xeon processor.

- **Protection during power outages.** In the case of a power failure, asynchronous DRAM refresh (ADR) stores data from system memory into battery-backed DRAM to preserve it until power is restored.
- **Failure prevention.** Intel Xeon processors with nontransparent bridging (NTB) enable NetApp E-Series platforms to continue operation, without loss of data or platform availability even in the event of a controller failure.

World-Class Levels of Scalability

The ability to dynamically expand capacity, performance, and networking within a unified architecture delivers the flexibility to capitalize on new opportunities and needs without compromise. NetApp's agile data infrastructure based on Intel Xeon processors enables customers to scale storage capacity up to an amazing 69PB with performance throughput up to 1.5M IOPS[4]. This demonstrates a high scale-out capability, assuring that customers won't run out of capacity in the future.

Scale performance and capacity

NetApp delivers scale-out storage solutions with high-end features at a midrange price point by taking full advantage of the compute power and intelligence of Intel technologies. The multicore architecture scales storage in small or large increments without the need for system redesign or replacement. Organizations now have the ability to buy what is needed for today's requirements and easily scale the infrastructure, not staff costs, to meet future business needs.

4. *http://www.spec.org/sfs2008/results/*

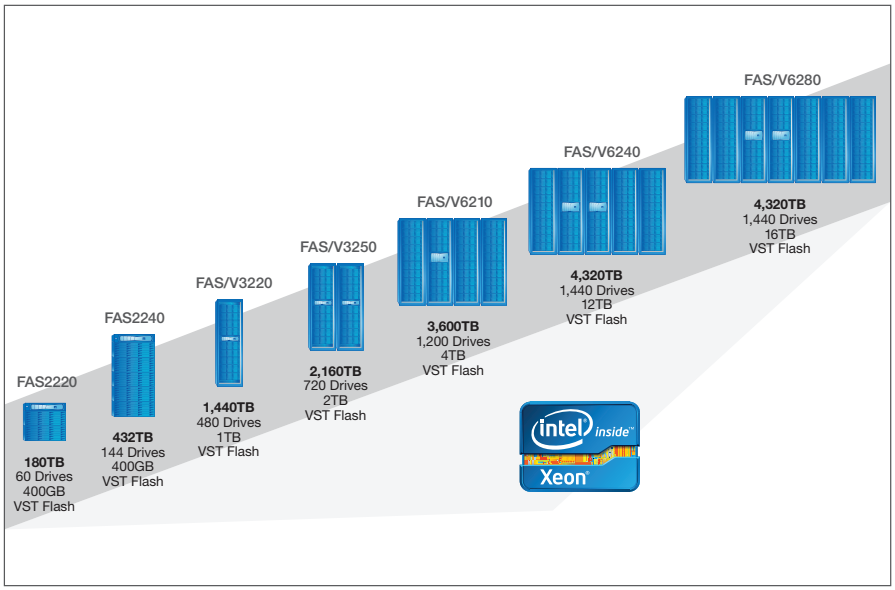

Figure 2) NetApp scale-out storage solutions based on Intel Xeon processors.

- NetApp storage solutions built on Intel Xeon processors eliminate stranded capital and overprovisioning. The FlexPod® data center solution is helping customers reach their goal of a 100% virtualized data center.
- Compute, I/O, and memory scale together to enable new usage models with scale-out architectures (for example, virtualization and cloud), providing greater compute power where the data resides.
- Scale performance and capacity two to three times to manage the exponential growth of big data generated by high-performance computing applications.
- 10 Gigabit Intel Ethernet CNAs with intelligent offloads deliver the network performance to access data in a timely fashion across clusters in a large global namespace.

Run IT at the Speed of Your Business

Cost-effective scale-out storage solutions from NetApp, powered with Intel Xeon processors, increase responsiveness to changing business needs with the flexibility and performance to support the most demanding workloads. The NetApp agile data infrastructure enables unlimited scaling, nondisruptive operations, and intelligent data management to accelerate the path to IT value. NetApp storage and Intel Xeon processors enable organizations to efficiently manage the proliferation of data and the demands of today's virtualized infrastructures and shared cloud environments.

Now is the time to make storage an enduring, flexible infrastructure with scale-out solutions from NetApp, powered by Intel Xeon processors.

Grow and keep pace with changing business opportunities, knowing that stability and predictability of services will be maintained throughout the life-time of critical data.

Learn More

Visit *www.netapp.com* and *www.intel.com/go/storage* for further information.

About NetApp

NetApp creates innovative storage and data management solutions that deliver outstanding cost efficiency and accelerate business breakthroughs. Discover our passion for helping companies around the world go further, faster at *www.netapp.com*.

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