



Gain a Business Advantage with Scale-Out Storage

Intel® architecture-based solutions provide energy-efficient performance, data protection, and scalability for tomorrow's data centers

EXECUTIVE SUMMARY

You are probably well aware of the challenges facing data centers today. A full 17 percent of IT budgets are devoted to storage,¹ and power and cooling costs represent as much as 40 percent of operational expenses. And that's just today. Corporate data is expected to increase by 650 percent in just five years, from 2009 to 2015.²

To keep pace with the data growth problem, as well as increasing access demands, it may be tempting to continue "scaling up" by adding storage capacity. But doing so perpetuates storage silos and drives up operating costs. The solution instead must come from scale-out storage, in which a more intelligent and agile storage architecture improves the way data is stored, moved, protected, and accessed. This new architecture can create a dynamic, flexible environment that supports data growth at a lower overall cost and provides secure, anytime access to data from anywhere in the world.

The bottom line: The world needs storage, and it needs it in new ways. Intel® architecture-based storage solutions can support scale-out storage solutions that address your immediate need for efficiency and prepare you to meet tomorrow's challenges. Intel® Xeon® processors can help by providing more energy-efficient storage performance, delivering added data protection, and enabling new usage models and greater scalability.

The move to scale-out storage

Data centers have traditionally relied on independent silos of compute, storage, and multiple networks, but numerous challenges have arisen. Server virtualization

technologies have placed new demands on storage environments and data protection processes, which has led to performance bottlenecks. Storage sprawl is another problem, which is occurring as additional storage systems are deployed to meet demands for more capacity and performance.

To address these issues, businesses need to move to a new, more intelligent scale-out storage architecture that takes full advantage of the compute power available today. This dynamically balanced infrastructure can address the performance, availability, and protection issues faced by today's data centers—and provide the flexibility to expand storage resources as demands increase and change over time.

For example, to stop storage sprawl and optimize your storage investment, you can enable storage virtualization over a unified 10 GbE network that provides access to pooled storage capacity and performance across your data center, while reducing capital expenditures. As another example, companies that currently underutilize their deployed capacity can implement intelligent optimization capabilities such as data de-duplication, thin provisioning, and automated storage tiering to greatly increase the efficiency of their existing storage.

These are just a few examples of the benefits available from scale-out enterprise storage, which provides the storage that enterprises need now, and enables new usage models such as cloud computing that prepare you to meet tomorrow's data center needs.

Advantages of Intel® architecture-based storage solutions

Intel architecture-based storage solutions enable the energy-efficient performance, added data protection, and scalability you need to address the explosion of data, improve data center efficiency, and prepare for emergent usage models.

Energy efficiency – access sophisticated, efficient storage capabilities

Intel Xeon processors provide the energy-efficient performance required to shift compute-intensive storage workloads into the storage sub-system. In addition, multi-core Intel architecture technology enables intelligent, compute-intensive capabilities like thin provisioning and data de-duplication, which deliver greater efficiency and optimization across the data center.

The following are a few examples of the innovative capabilities supported by Intel® storage technologies that are being used today to power tomorrow's data centers:

- **Thin provisioning:** A technology that allows capacity to be easily allocated to servers beyond the capacity of the physical disks installed. Benefits: Reduces operational costs and saves storage space.
- **Storage virtualization:** Refers to the process of completely abstracting logical storage from physical storage. Adds flexibility and lowers costs.
- **Data de-duplication:** A specialized data compression technique for eliminating coarse-grained redundant data. Benefits: Removes multiple instances to improve storage utilization and reduce backup capacity requirements.
- **Automated storage tiering:** Intelligently moves storage to the appropriate tier based on algorithms that determine likely frequency of access. Benefits: Reduces backup requirements and need for high-performance disks.
- **Erasure coding:** Distributes private data across multiple data center sites and public cloud storage for added data protection. Benefit: Improves storage utilization.

Data protection - increase data protection without sacrificing performance

Increasing concerns about the security of data are leading to wider implementation of data security technologies in corporate data centers. To keep pace with the growing need for security, Intel has integrated advanced storage features directly into the chip. The latest Intel Xeon processors offer new encryption instructions to boost performance and offload that task from your servers.

Storage also has to provide more than just data protection as security workloads shift to the storage subsystem.

The compute power of Intel Xeon processors enables data discovery, mining, analysis, and optimized archiving at the storage subsystem.

Scalability - power new usage models within storage-server convergence

Emerging usage models such as storage virtualization and cloud computing require greater compute power where the data resides. A scale-out storage architecture provides the foundation to build these value-add storage solutions and address the data explosion—all while keeping operations and capital expenses as low as possible.

With multi-core Intel architecture technology, you can scale storage as you grow, in small and large increments, and you can do so without the need for system redesigns or replacements. The compute power of Intel Xeon processors makes it possible to shift

compute-intensive storage workloads to the storage subsystem and scale capacity with virtualized storage nodes—all while providing added data protection, and without sacrificing performance.

Conclusion

As enterprise storage continues to grow at a staggering rate, businesses can no longer meet their capacity needs by simply adding more racks of storage to their traditional, siloed data center infrastructure. A scale-out storage architecture is needed that allows storage systems to expand while still maintaining functionality and agility, and containing costs.

A full range of smarter storage solutions based on Intel Xeon processors are available to help you build your scale-out storage architecture. These solutions are designed to let you more easily scale your enterprise storage, while adding data protection and security—and staying within your storage budget.

For additional information go to:
www.intel.com/cloudcomputing

1. "Defining and Measuring IT Efficiency: Maximizing Return on Storage Investments," Forrester Research, March 2011.

2. Gartner Group, 2009. "Hot Trends and Innovations in Data Centers."

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