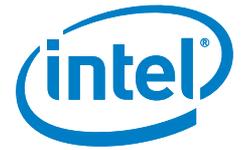


## SOLUTION BRIEF

SUSE Enterprise Storage™  
Intel® Xeon® Processor E5 Family  
Software-Defined Storage  
Public/Private/Hybrid Cloud



# Intelligent Software-Defined Storage based on Intel® Processors and SUSE Storage Technology

## Keep Pace with the Rapidly Growing Demand for Data Storage



“Bringing Ceph storage innovation to market first—enterprise ready and fully supported—makes our customers more agile and able to take advantage of rapidly emerging innovation in their own enterprises.”

— Michael Miller,  
President of Strategy,  
Alliances and Marketing, SUSE



SUSE Enterprise Storage™ takes advantage of the performance and reliability of Intel® processors and storage technologies to enable IT to transform enterprise storage infrastructure. SUSE Enterprise Storage delivers highly scalable, resilient, and cost-efficient storage clusters that seamlessly adapt to changing business and data demands. An intelligent software-defined storage solution, it creates a self-healing and self-managed distributed storage cluster that easily scales from terabytes to petabytes.

Coupling SUSE Enterprise Storage with Intel processors and storage building blocks results in industry-leading, cost-efficient storage. iSCSI support allows non-SUSE (Linux,\* UNIX,\* and Windows\*) servers to access block storage from the SUSE Enterprise Storage Cluster. Tight integration with SUSE® Linux Enterprise Server enables IT organizations to easily provision additional storage and seamlessly deliver it to lines of business on demand. Truly unlimited scalability with SUSE Enterprise Storage enables enterprise IT organizations to deliver the agility that businesses demand by non-disruptively adding capacity at the price they want to pay. Intelligent, self-healing, self-managing distributed storage enables storage administrators to minimize the amount of time spent managing storage. This enables organizations to support more capacity per storage administrator or spend more time focused on delivering future innovations to the business.

SUSE Enterprise Storage is built on open source Ceph\* software functionality, providing the SUSE storage solution with the following capabilities:

- **Scalable:** SUSE Enterprise Storage is designed as a distributed storage cluster to provide unlimited scalability from tens of terabytes to petabytes.
- **Self-managing:** SUSE Enterprise Storage intelligent algorithms store data in a highly distributed manner, continuously monitoring data utilization and re-balancing data placement to optimize system performance with no storage administration involvement.
- **Highly Available:** SUSE Enterprise Storage is highly redundant and designed with no single points of failure, maximizing system resiliency and availability. Background data scrubbing continuously verifies data integrity. SUSE Enterprise Storage is self-healing when hardware failures do occur to minimize storage administration involvement and to mitigate the effects of downtime. Optimized data placement enables rapid reconstruction of redundancy following hardware failure with minimized system performance impact.

### Key Benefits

#### Reduced IT Costs

Storage solutions based on proprietary hardware and software are expensive to scale in capacity or performance. SUSE Enterprise Storage helps keep CAPEX costs down by leveraging industry standard equipment that is 30-50% less than proprietary solutions.<sup>1</sup> A single tool for managing a storage cluster for your heterogeneous server environment helps reduce IT operational expense. SUSE Enterprise Storage automatically rebalances data placement without any manual intervention, optimizing infrastructure without growing your IT staff.

#### Seamlessly Adapt to Changing Demands

SUSE Enterprise Storage enables you to be highly responsive to emerging business and data needs. It can automatically respond to changing demands with self-managed and self-healing storage that optimizes for system performance, enables you to easily provision and seamlessly deliver additional storage without disruption, and provides maximum flexibility by using industry-standard hardware that you can re-purpose if business priorities change.

### Key Features

SUSE Enterprise Storage provides industry-leading storage functionality including:

- Self-repairing
- Cache tiering for performance
- Thin provisioning for optimized utilization

- Copy-on-write clones for application rollback
- Erasure coding for space-efficient resilience
- Unified object, block, and file system storage
- No disruptive scalability of capacity online
- Heterogeneous Operating System Access (iSCSI)
- Data "at rest" encryption
- Rolling Upgrades

### SUSE Enterprise Storage and Intel® Technologies

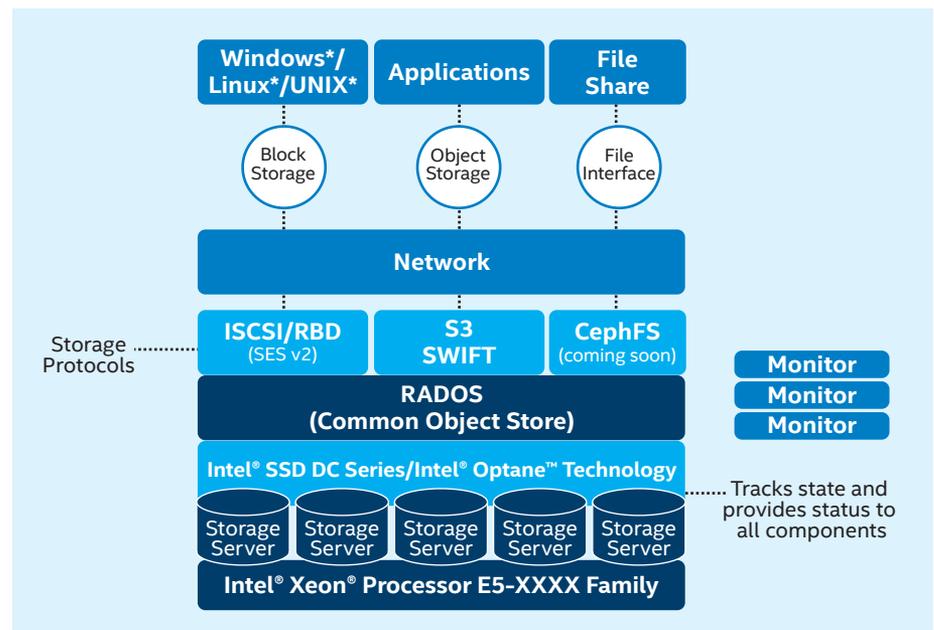
The SUSE and Intel strategic alliance stretches back for decades, with Intel® Xeon® processors and SUSE Linux Enterprise Server bringing out the excellence in each other with joint enablement of hardware and software innovation. The relationship continues with performance and innovation for the software defined data center, including Ceph, and encompassing many Intel® technologies.

### Challenges with Proprietary Storage Solutions

Proprietary storage solutions rely on technologies available only through single vendors, as opposed to open source solutions, such as Ceph. Proprietary-based solutions thus often result in the following limitations:

- Growth of stored data leading to escalating costs while budgets decrease.
- Expensive to scale in capacity or performance.
- Limited flexibility to leverage new innovative hardware.
- Static performance.
- Locked in to a single vendor.

Storage offerings based on open source technologies allow companies, such as SUSE, to provide powerful, innovative, and differentiated solutions without the limitations of proprietary technologies.



### Intel® Xeon® Processor E5 Family

The Intel® Xeon® processor E5 family brings an evolutionary leap in performance and capabilities to next-generation data centers running on software defined infrastructure and supporting an agile cloud architecture and highly-efficient traditional workload management. Intel Xeon processor E5 family supports workloads for cloud, high-performance computing, networking, and storage.

### Intel® Solid State Drives Data Center Family

Intel® SSD Data Center Family helps businesses reduce their data center footprint and declutter their infrastructure, reducing costs, boosting performance, and enabling efficiencies via Software Defined Infrastructure (SDI)—all while tackling the most data-intensive workloads. Intel SSD DC family provides an ideal storage platform for Ceph, offering high server density, low latency, and a total cost of ownership that is substantially lower than traditional HDDs. Intel SSD DC P3700 and P3600 series of NVMe\* devices, with up to 4 TB of capacity, maximizes storage performance and minimizes latency by tapping into the power of the NVMe interface. Advanced storage technologies from Intel, including Intel® Optane™ technology based on 3D XPoint™ technology, will further enhance performance and capacities in software defined storage solutions. Intel® Data Center SSDs, particularly NVMe SSDs, are very important to Ceph journaling and metadata functions, and they are key to maximizing the value from the overall storage system.

### Intel® Intelligent Storage Acceleration Library

Intel has worked with the Ceph open source project to optimize Ceph for storage usages and outcomes. One key component was inclusion of the Intel® Intelligent Storage Acceleration Library (Intel® ISA-L), which provides tools to maximize storage throughput, security, and resilience, as well as minimize disk space usage. The functions provided in this library help with storage recoverability, data integrity, data security, and faster data compression mechanisms, which means that these storage systems have the data services and capabilities expected of durable and reliable enterprise-class storage.

### Build Your Business on SUSE and Intel

SUSE and Intel have enjoyed a winning combination in the data center for many years, and now you can trust your data and your business to be stored in SUSE Enterprise Storage. Its rich data services (Erasure Coding, Thin Provisioning, etc.) will run best on Intel Xeon processor E5 family. By providing Intel® Data Center SSDs for the storage cluster, the total cost of ownership of the system will be safeguarded, as well as the performance of the system and the applications it can serve. These systems will likely carry Intel® Converged Ethernet Adaptors, which will help manage the cross-node traffic. And a well-designed storage system, one built with Intel throughout, will be robust in recovering from predictable and occasional component failures that will be spread throughout a large storage cluster—meaning your business and storage will keep calm and carry on through any bumps in the road.

### Use Cases

A typical usage of SUSE Enterprise Storage™ would replace a mid-range proprietary storage array as a block storage repository for systems connecting via iSCSI.

Some example use cases for a storage environment such as this would be:

- Storage for Test/Dev
- Storage for low-to-moderate I/O virtual machines
- Disk-based backup target
- General archive storage

## GET MORE INFORMATION

For detailed SUSE product specifications and system requirements, visit: [www.suse.com/products](http://www.suse.com/products).

To learn more about Intel storage products and technologies, visit [www.intel.com/storage](http://www.intel.com/storage).

Contact your local SUSE Solutions Provider, or call SUSE at:

1-800-796-3700 U.S./Canada

1-801-861-4500 Worldwide

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<sup>1</sup> The Epic Migration to Software Defined Storage paper, written by Frank Berry – CEO and Chief Analyst at IT Brand Pulse.

[https://www.suse.com/docrep/documents/kbj4tn8a3w/software\\_defined\\_storage.pdf](https://www.suse.com/docrep/documents/kbj4tn8a3w/software_defined_storage.pdf)

Intel technologies' features and benefits depend on system configuration and may require enabled hardware, software or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer or learn more at [www.intel.com/storage](http://www.intel.com/storage).

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