HPE and SUSE Deliver Cost-Effective, Scalable Data Storage without Limits

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Index.

Data Storage for Today's Skyrocketing Needs

The world is in the midst of a virtual information explosion, as data sources increase exponentially across geographies and industries. Experts say that by 2020, the average Internet user could be creating 1.5 GB of traffic per day. Connected airplanes could generate up to 5 TB daily. And a smart factory might produce a full petabyte of data every day.[1]

Yesterday's storage solutions just aren't up to the task of maintaining this massive onslaught of data—we need a whole new kind of storage.

The solution is software-defined storage (SDS). That's a storage system that delivers a full suite of persistent storage services via an autonomous software stack that can run on an industry-standard, commodity hardware platform.

Hewlett Packard Enterprise (HPE) and SUSE have partnered to deliver the benefits of SDS on reliable hardware. SUSE Enterprise Storage™ on HPE ProLiant DL and Apollo, Cloudline and Synergy servers can simplify management of today's volume of data—and provide the time to value, cost control and flexibility to scale for all of your enterprise storage needs.

HPE and SUSE: A Partnership Based on Mutual Trust

With more than 25 years of joint engineering and innovation, HPE and SUSE have a longtime partnership that can benefit your business. HPE uses SUSE technologies to develop, qualify and provision ProLiant servers, and SUSE Enterprise Storage is the first object-based, multiprotocol storage certified on HPE Synergy servers.[2]

HPE also uses SUSE® Linux Enterprise Server as the operating system for all Superdome benchmarks.

This strong partnership means that you get powerful storage capabilities on enterprise-class hardware—components built to integrate seamlessly with each other.

A Closer Look at the Components
SUSE ENTERPRISE STORAGE

SUSE Enterprise Storage is based on Ceph, an industry-leading SDS solution and the most popular one among OpenStack users. SUSE Enterprise Storage integrates with popular OpenStack environments and allows you to deploy a unified block, object and file storage environment to reduce the capital and operational costs of storage infrastructure. With Ceph, a single system administrator can manage up to 3–4 PB of data, six times more than an administrator in an equivalent block-storage environment. The solution can scale even further horizontally, with increasing performance results as it grows.

It is designed as a distributed storage cluster to provide unlimited scalability from tens of terabytes to petabytes (see sidebar for more information). You can easily add HPE hardware and extend SUSE Enterprise Storage at the rate your organization needs. Because it is self-managing, your IT burden does not grow faster than your storage.

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1   Source: Intel, **https://s21.q4cdn.com/600692695/files/doc_presenta-tions/2017/2017_Intel_Investor_Meeting_Krzanich.pdf**

2   **https://community.hpe.com/t5/Converged-Data-Center/HPE-Syner-gy-certifies-the-first-object-storage-offering-with/ba-p/6976500#.WmJ1w66nG6J**

Ceph also comes with erasure coding, which lets you define settings for data protection. You can determine how many device failures your cluster can tolerate before considering the data compromised. The latest iteration of Ceph, available in SUSE Enterprise Storage 5, offers BlueStore, which doubles the write performance of previous releases and significantly reduces input and output latency. It can also help you free up capacity via data compression.

SUSE Enterprise Storage can help make your storage solution affordable by reducing the need for IT staff. SUSE Enterprise Storage is self-managing and self-healing. It automatically rebalances data without manual intervention.

SUSE Enterprise Storage Clusters

A SUSE Enterprise Storage cluster is made up of four types of nodes. The minimum SUSE Enterprise Storage cluster consists of at least one administration server (physical or virtual), four object storage device nodes (OSDs), three monitor nodes, and one or more gateway node.

OBJECT STORAGE DEVICE NODES are the workhorses of the cluster and do the actual data storage. SUSE recommends a minimum of four OSDs for each SUSE Enterprise Storage cluster.

MONITOR NODES maintain information about cluster health, a map of other monitoring nodes and an overall map of the cluster. Monitor nodes also keep a history of changes performed to the cluster. SUSE recommends a minimum of three monitor nodes.

GATEWAY NODES translate between your backup server and the SUSE Enterprise Storage cluster. If you have two different backup servers or archive applications, one using object storage and one using block storage, you would need two gateway nodes.

- For object storage (such as S3 and Swift), use a Ceph RADOS Gateway.
- For block storage, SUSE uses iSCSI gateways that enable block and multipathing storage to heterogeneous clients like Windows and VMware vSphere.
- For file storage, use either Ceph Filesystem (CephFS) or NFS-Ganesha.

ADMIN NODES allow you to make changes to your Ceph cluster. They have the smallest requirements of any of the nodes and can be run as a virtual machine or on repurposed existing hardware, if desired.

You can deploy SUSE Enterprise Storage using DeepSea and Salt. Guidelines are available in the SUSE Enterprise Storage documentation.
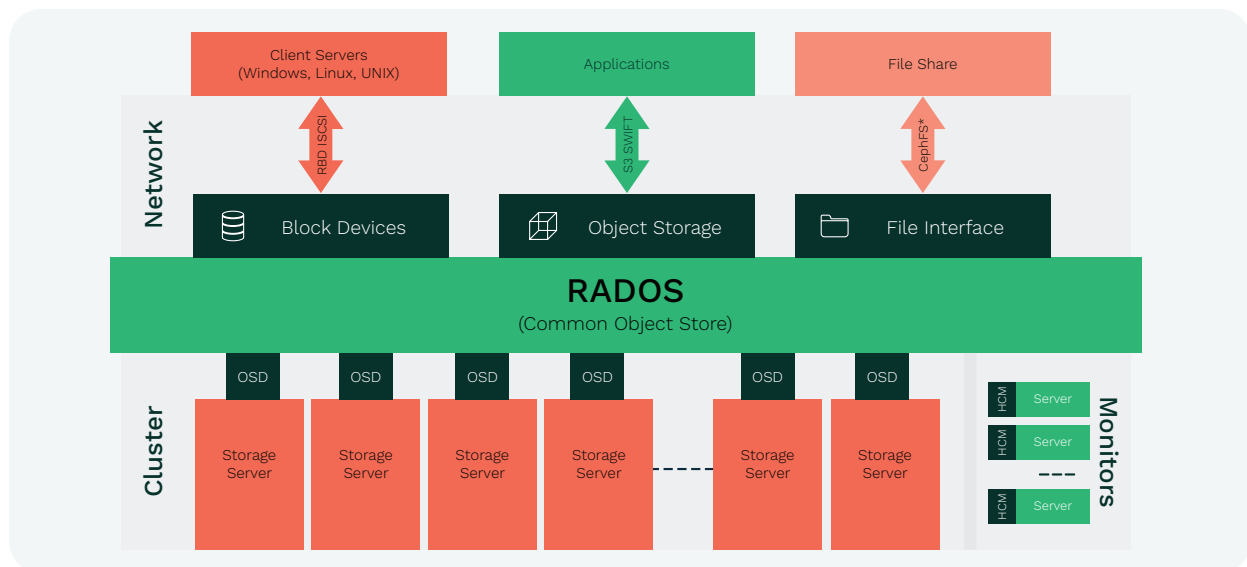

Figure 1. A logical diagram of the various kinds of SUSE Enterprise Storage nodes and the ways they interact with the rest of your environment.

HPE SERVERS

The HPE-SUSE storage solution allows you to take advantage of the cost efficiencies and reliability of HPE hardware for your enterprise storage, rather than having to rely on expensive branded disk arrays.

HPE Apollo servers offer breakthrough performance, economy and scalability in a small footprint. You can use the HPE Apollo 4200 and 4510 as OSD nodes and the HPE ProLiant DL360 as your monitor and admin nodes. Learn more with our reference architecture, SUSE Enterprise Storage on HPE Apollo 4200/4500 System Servers.

HPE Cloudline servers are designed for use in cloud data centers. They're built on open industries technologies, so they work seamlessly within a multi-vendor environment—helping you to reduce costs and easily add capacity to support even rapid business growth.

HPE ProLiant servers give you the perfect balance of performance, expansion and manageability. You can use the HPE ProLiant DL380 as an OSD node and the HPE ProLiant DL360 as your monitor and admin nodes. Learn more with our guide, SUSE Enterprise Storage Deployment Guide for HPE ProLiant Series.

HPE Synergy is the world's first platform architected for composable infrastructure.[3] You can use one of the fully adaptable HPE Synergy 480 compute modules as your administration node, three for your monitor nodes, and four for your OSD nodes. Learn more with our guide, HPE Best Practices for Deploying SUSE Enterprise Storage on HPE Synergy.

"The combination of HPE hardware and SUSE made it easy to implement, and performance has been everything we could have asked for—the cluster has been extremely stable. Even being cross-site, real-life throughput IOPS easily go into thousands, and having a metro-area cluster means business continuity is taken care of."

Howard Samm
Head of Infrastructure
Experian Business Information Systems[4]

Designed to Deliver What You Value

Together, HPE and SUSE deliver a storage solution that is:

SIMPLE

SUSE Enterprise Storage is aggressively priced and based on nodes rather than capacity. This means you can deploy cost-efficient object storage using densely configured industry-standard servers. HPE servers are sold and supported directly by HPE and include simple management and storage tools, along with proven configurations that provide easy remote access.

SCALABLE

Building on an existing array expands capacity and performance as SUSE Enterprise Storage grows to meet future demand. Hardware upgrades are easily phased in, thanks to the inherent resiliency of Ceph architecture. HPE's diverse hardware options provide you with a wide variety of choices when it comes to scale-up or scale-out needs to support your business growth.

PROTECTED

SUSE Enterprise Storage supports local and geographic replication as well as erasure coding to maximize the trade-off between protection and overhead. The SUSE operating system also supports trusted boot scenarios to ensure that only signed kernels and drivers can be booted from and loaded.

HPE is the only vendor to provide silicon root of trust on Gen10 servers, which creates a digital fingerprint in the silicon and ensures that the server will never boot with compromised firmware. This root of trust and other unique security features have garnered HPE recognition for having the "world's most secure industry-standard servers."[5]

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3   A composable system virtualizes the entire IT infrastructure. It treats physical compute, storage and network devices as services, and manages all of IT via a single application.

4   **https://suse.lookbookhq.com/suse-and-hpe-on-sds-business-view/ experian-success-story**

5   Based on external firm conducting cybersecurity penetration testing of a range of server products from a range of manufacturers, May 2017, **www.hpe.com/us/en/solutions/infrastructure-security.html**

AVAILABLE

The solution supports file, block and object access to make your data available in the format your business requires. In addition, various protocols, such as iSCSI, RADOS, NFS and CIFS, can be provided via gateways.

EFFICIENT

SUSE Enterprise Storage provides customization options so you can build a system for the same price range as you'd expect from cloud products. HPE offers a range of server memory options, including persistent memory, to ensure that you get the performance and efficiency you need.
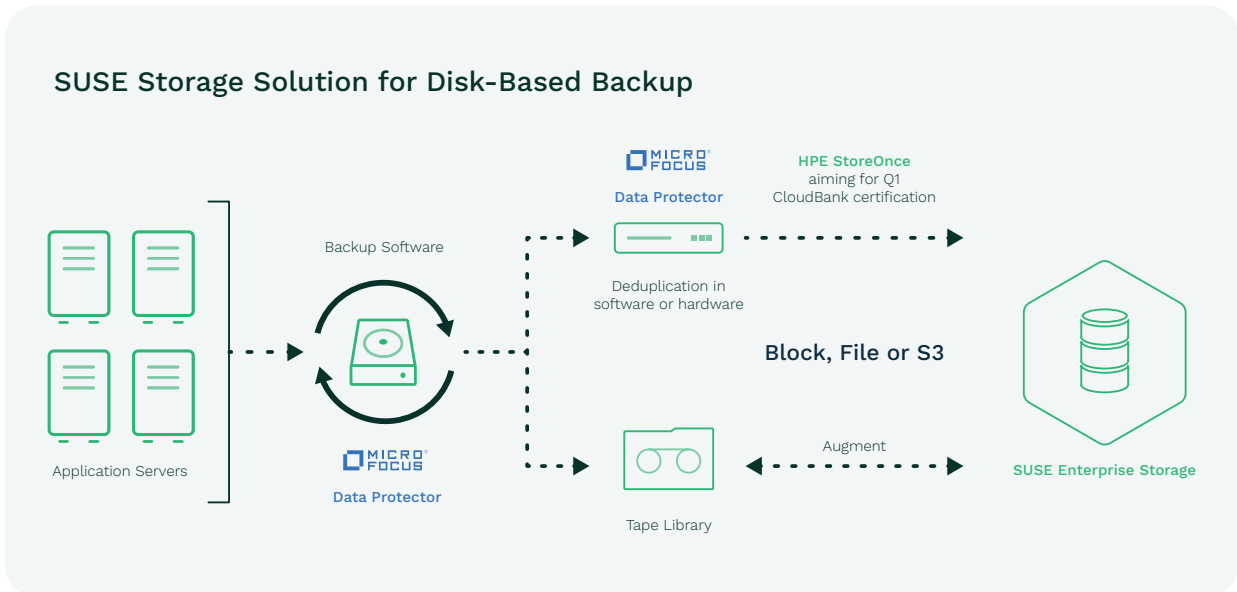
Block Storage   **File Storage**   **Object Storage**
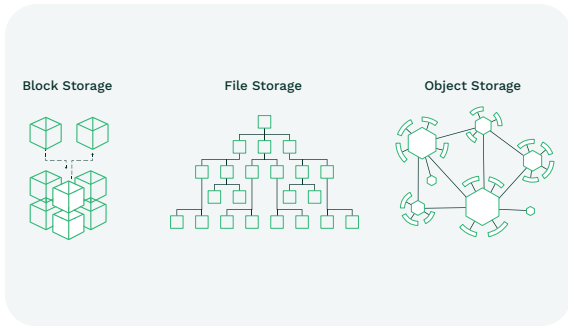
A Solution Built for the Way You Work

SUSE Enterprise Storage on HPE hardware gives you a lot of options when it comes to how you want to use the solution. Here's a look at several common workloads supported by the solution.

DISK-BASED BACKUP

For disaster recovery purposes, most organizations have short and aggressive recovery time objectives (RTOs). There's little chance that tape backup can meet such an RTO. That means that organizations in the past have had to invest in more expensive disaster recovery options. This often leads to duplication of effort, with a tape backup for most data and a disaster recovery backup for mission-critical data. Because of the lower cost of a SUSE Enterprise Storage solution, you have the option to store more data on-premises, and because a disk-to-disk backup solution is always on and offers rapid recovery of data, you no longer need another system. You can back up everything your organization needs while offering your end users a better RTO.

SUSE Storage Solution for Disk-Based Backup

MICRO FOCUS
Data Protector

HPE StoreOnce
aiming for Q1
CloudBank certification

Backup Software

Deduplication in
software or hardware

Block, File or S3

Application Servers

MICRO FOCUS
Data Protector

Tape Library

Augment

SUSE Enterprise Storage

MICRO FOCUS   VEEAM   COMMVAULT   VERITAS

HIGH-PERFORMANCE COMPUTING (HPC) STORAGE

The HPE-SUSE solution is ideal for home directories or archival storage in HPC systems, which often demand a constant, bidirectional flow of data from storage. The solution works with HPE Data Management Framework, leading hierarchical storage management software. Also, because most HPC systems are Linux-based, a Linux-based storage solution will fit well into those environments.

"For IT organizations undergoing digital transformation, SDS provides a good match for the capabilities needed—flexible IT agility; easier, more intuitive administration driven by the characteristics of autonomous storage management; and lower capital costs due to the use of commodity and off-the-shelf hardware."
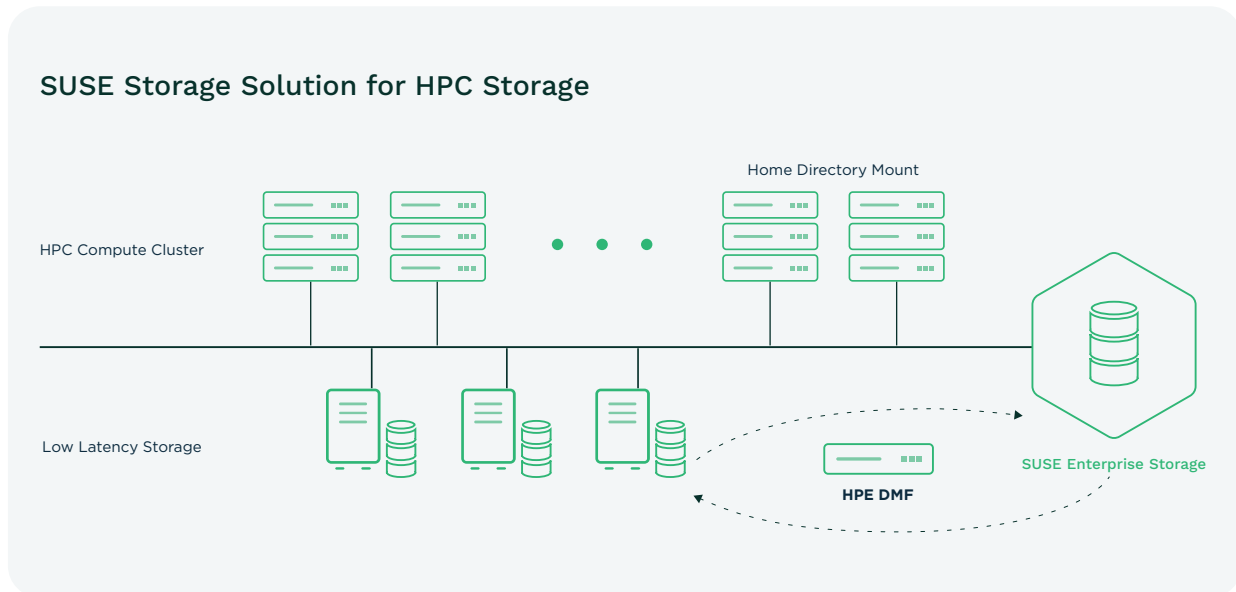
Eric Burgener
Research Director for Storage
IDC[6]

"It usually takes three months to procure, install and configure a new midrange storage system. Now, we can simply order a new bespoke system ... and add its capacity to the storage pool within days."

Michael Nieporte
Head of IT Infrastructure
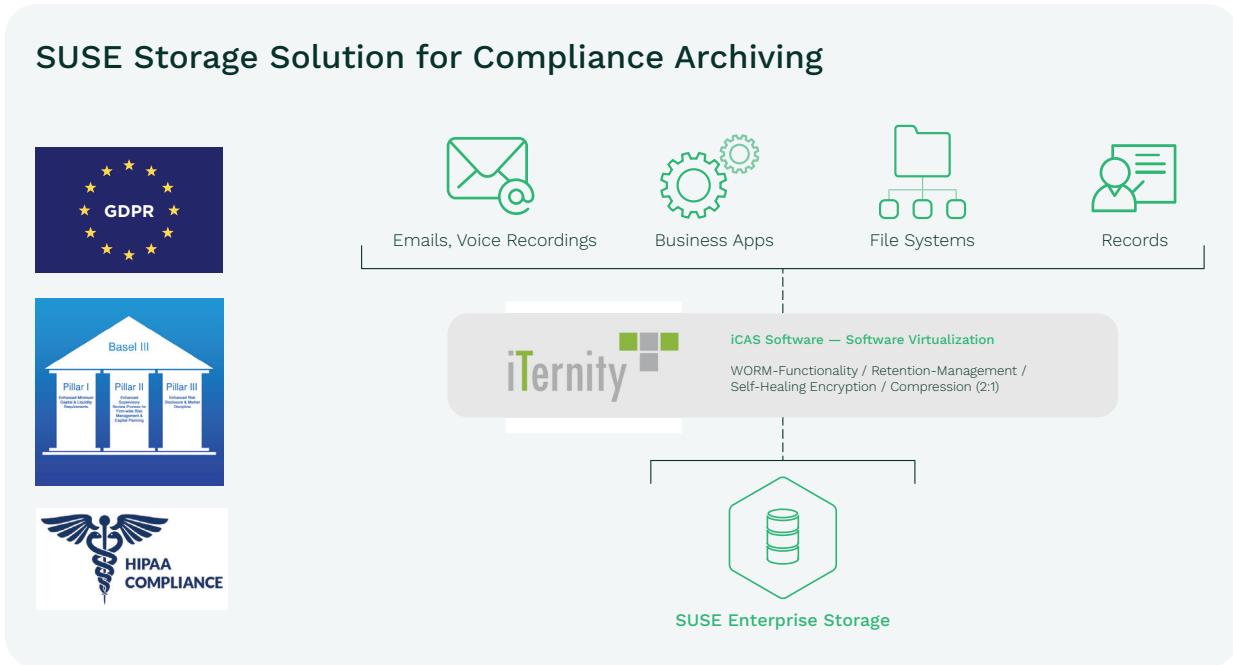University Hospital Essen

IDC FORECASTS THAT THE WORLDWIDE SDS MARKET WILL SEE A COMPOUND ANNUAL GROWTH RATE (CAGR) OF 13.5% OVER THE 2017–2021 FORECAST PERIOD, WITH REVENUES OF NEARLY $16.2 BILLION IN 2021.[7]

6   "IDC Forecasts Software-Defined Storage Solutions to Generate Worldwide Revenues of Nearly $16.2 Billion in 2021," IDC press release, October 3, 2017.

7   Ibid

SUSE Storage Solution for HPC Storage

SUSE Storage Solution for Compliance Archiving

GDPR

Emails, Voice Recordings

Business Apps

File Systems

Records

Basel III

Pillar I — Enhanced Minimum Capital & Liquidity Requirements

Pillar II — Enhanced Supervisory Review Process for Firm-wide Risk Management & Capital Planning

Pillar III — Enhanced Risk Disclosure & Market Discipline

HIPAA COMPLIANCE

iTernity

iCAS Software — Software Virtualization
WORM-Functionality / Retention-Management /
Self-Healing Encryption / Compression (2:1)

SUSE Enterprise Storage

COMPLIANCE ARCHIVING

To remain compliant with various regulations, you may have to store emails, legal documents and other files for specified periods of time. SUSE Enterprise Storage can act as a target for compliance archiving systems such as iTernity to meet these very specific requirements. Learn more about the total cost of ownership of a joint HPE, SUSE and iTernity solution.

VIDEO SURVEILLANCE SYSTEMS AND CONTENT DISTRIBUTION/MEDIA ORGANIZATIONS
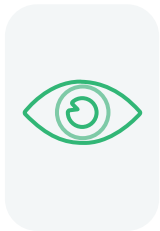
Both video surveillance systems and content and media businesses need to store large numbers of potentially very large files. These video and content files also need to be available at all times. SUSE Enterprise Storage and HPE offer affordable, scalable storage to support these use cases.

SUSE Storage Solution for Video Surveillance and Content Distribution

Network

Backup Server

Cluster Interface

SUSE Enterprise
Storage Cluster

Network

Backup Server

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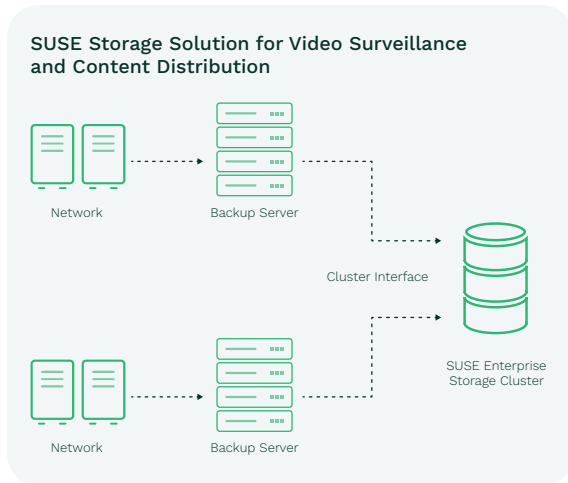
8   www.suse.com/docrep/documents/vzgl0gsucn/university_
    hospital_essen_cs.pdf

Thank You