



# SUSE Enterprise Storage

An intelligent software-defined storage management solution, powered by Ceph technology, that enables organizations to deliver a unified, highly scalable, resilient and enterprise-grade storage infrastructure that is able to seamlessly adapt to changing business and data demands.

## Product Overview

SUSE Enterprise Storage enables IT teams to transform their enterprise storage infrastructure to deliver a unified and highly scalable storage solution that is cost-efficient and able to seamlessly adapt to changing business and data demands whether in your data center or in the cloud. As an intelligent software-defined storage solution, it delivers a self-healing and self-managed distributed storage cluster designed to scale from hundreds of terabytes to petabytes and beyond. Leveraging industry standard server cost-efficient and storage building blocks, you get the cost-efficient infrastructure you need with the unlimited scalability your business demands, without vendor lock-in. Improve efficiency and automatically optimize operations with intelligent, self-healing, self-managing distributed storage enabling organizations to support more capacity per storage administrator and spend more time focused on delivering future innovations to the business.

## Key Benefits

### HIGHLY SCALABLE AND RESILIENT

SUSE Enterprise Storage delivers a single unified software-defined storage cluster that provides applications with object, block and file system storage. It is designed with no single points of failure to maximize system resiliency and unlimited scalability from hundreds of terabytes to petabytes and beyond. SUSE Enterprise Storage is the ideal solution for most storage services in its class.

### REDUCED IT COSTS

Traditional storage solutions are expensive to scale in capacity or performance. SUSE Enterprise Storage helps keep CAPEX costs down by leveraging industry standard, off-the-shelf hardware no matter where they are, in your data center or in the cloud.

It helps reduce IT operational expense with a single tool for managing a storage cluster for your heterogeneous server environment. Also, SUSE Enterprise Storage helps optimize infrastructure without growing your IT staff by automatically rebalancing data placement without any manual intervention.

#### SEAMLESSLY ADAPT TO CHANGING DEMANDS

SUSE Enterprise Storage enables your IT teams to be highly responsive to emerging business and data needs with an intelligent solution that is self-managed and self-healing to optimize for system performance. It also enables you to easily provision and seamlessly deliver additional storage without disruption and provides maximum flexibility by using off-the-shelf commodity hardware that you can re-purpose if business priorities change. This also means no need for forklift upgrades and because the solution is open source, you never have to worry about vendor lock-in.

#### Key Features

RAM requirements are accommodated SUSE Enterprise Storage is built on the Open source Ceph project. Key features of the SUSE Enterprise Storage 7 technology include:

- **Scalable:** Designed as a distributed storage cluster to provide unlimited scalability from hundreds of terabytes to petabytes and beyond.
- **Enhanced management:** Self-healing and self-managing algorithms for optimized performance. Comprehensive management modules for human error minimization.
- **Unified storage solution:** Supports object, block and file storage within a single cluster.
- **Enterprise-grade:** Highly redundant and designed so there are no single points of failure, maximizing system resiliency and availability.
- **Simplified deployment and future upgrades and updates:** Containerized product delivery removes interdependencies between the underlying OS and the cluster.

Additionally, SUSE Enterprise Storage provides added industry-leading features, including:

- Enhanced manageability with the new management framework, cephadm, and a redesigned graphics dashboard interface.

- Expanded availability and interoperability with CephFS snapshots, sync to external cloud using S3 interface and Elasticsearch sync module for RADOS gateway objects.
- Improved IT efficiency with QoS for Rados block device clients and background operation QoS.
- Enhanced cluster performance with the new Ceph block I/O driver for Windows environments.
- Improved “out of box” defaults with auto-enabled PG autoscaler.

#### System Requirements

Minimum cluster configuration:

- Four Object Storage Nodes
  - + 10 Gb Ethernet (four interfaces)
  - + Thirty-two OSDs per storage cluster
  - + Dedicated OS disk for each Object Storage Node
  - + Total RAM required = OSD count times (1 GB + OSD memory target [default 4 GB]) + 16GB
- Three Ceph Monitor nodes (requires SSD for dedicated OS drive)
- Object Gateways and Metadata Servers nodes require redundant deployment
- iSCSI Gateways, Object Gateways and Metadata Servers require minimum incremental 4 GB RAM and four cores
- Separate management node with 4 GB RAM, four cores and 1 TB HDD capacity

#### Tech Specs

##### MINIMUM HARDWARE REQUIREMENTS

For SUSE Enterprise Storage 7 deployed with Rook, the minimal recommended configuration is –

- A highly available Kubernetes cluster with 3 master nodes
- Four physical Kubernetes worker nodes, each with two OSD disks and 5GB of RAM per OSD disk
- Allow additional 4GB of RAM per additional daemon deployed on a node
- Dual-10 Gb ethernet as bonded network
- If you are running a hyper-converged infrastructure (HCI), ensure you add any additional requirements for your workloads.

For traditional stack, the minimal configuration  
Minimal recommendations per storage node:

- Total RAM required = OSD count times (1 GB + OSD memory target [default 4 GB]) + 16 GB
- CPU recommendations
  - + 1x2 GHz CPU Thread per HDD
  - + 2x2 GHz CPU Thread per SSD
  - + 4x2 GHz CPU Thread per NVMe
- Separate 10 GbE networks (public/client and backend)
  - + Required 4x10 GbE, recommended 2x25 GbE
- OSD disks should be exclusively used by SUSE Enterprise Storage
- Dedicated disk/SSD for the operating system, preferably in a RAID 1 configuration

Minimal recommendations for monitor nodes:

- 3 SUSE Enterprise Storage monitor nodes are required
- 2 GB of RAM per monitor node, add 2 GB for a manager node running Ceph Dashboard
  - + Recommended 8 GB RAM per monitor with manger + OS

For further sizing information, please consult the technical documentation and SUSE sales

- SSD in a RAID 1 configuration
- Monitor nodes should be bare metal, not virtualized, for performance reasons In this configuration OSD must be bare metal
- Monitor nodes should have 2x25 GbE networks
- Configurations may vary from and frequently exceed, these recommendations depending on individual sizing and performance needs
- Bonded network interfaces for redundancy