Supermicro® Total Solution for SUSE Enterprise Storage

Highly Scalable and Resilient Software-defined Storage Powered by Ceph

Software-defined storage solutions enable the transformation of enterprise infrastructures by providing a unified platform where structured and unstructured data can co-exist and can be accessed as files, blocks, or objects depending on the application requirements. The combination of open-source software such as Ceph and Supermicro SuperServer based on industry standard x86 architecture can reduce overall cost while providing a solid foundation to unlimited scalability for future demands.

COMPONENTS OVERVIEW

This solution is built and validated with Supermicro SuperServers, SuperStorage systems, and Ethernet switches that are optimized for performance and designed to provide the highest levels of reliability, quality and scalability. This cloud-ready storage solution has been rigorously tested and validated in Supermicro labs, integrating best-in class hardware platforms with enterprise-ready, software-defined storage capabilities.

Data Switches
2x SSE-X3648SR

IPMI Switches
2x SSE-G3648BR

Admin Node
1x SYS-5019P-WTR

GW Nodes
2x SYS-5019P-WTR

Monitor Nodes
3x SYS-5019P-WTR

Storage Nodes
4x SYS-6029U-E1CR4

SUSE ENTERPRISE STORAGE SOLUTIONS

- **Simple to setup and deploy**
- **Adaptable to physical and logical constraints**
- **Resilient to changes in physical infrastructure**
- **Capable of providing optimized object and block services**

FOR MORE DETAILS

SUSE Enterprise Storage v5 Implementation Guide

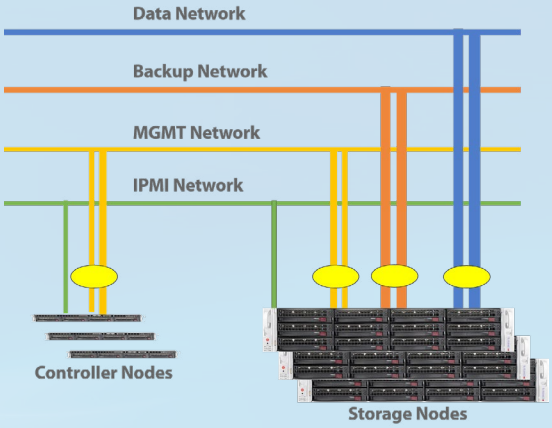
- System requirements
- Architectural overview
- Step-by-step implementation
- Architectural best practices

INFRASTRUCTURE ARCHITECTURE

Supermicro validated reference configurations for software-defined storage are cloud optimized for scale-out and high performance at maximum density. These Supermicro systems feature Intel® Xeon® Scalable processors and DDR4 memory. The storage nodes utilize the 2U Ultra Server systems with Intel® P4610 1.6TB NVMe PCI-E SSDs for high throughput and low latency storage.

SOLUTION ARCHITECTURE

SUSE Enterprise Storage provides unified block, file, and object level access based on Ceph, a distributed storage solution designed for scalability, reliability and performance. Ceph's foundation is the Reliable Autonomic Distributed Object Store (RADOS), which provides applications with object, block, and file system storage in a single unified storage cluster, making Ceph flexible, highly reliable and easy to manage.



NETWORKING ARCHITECTURE

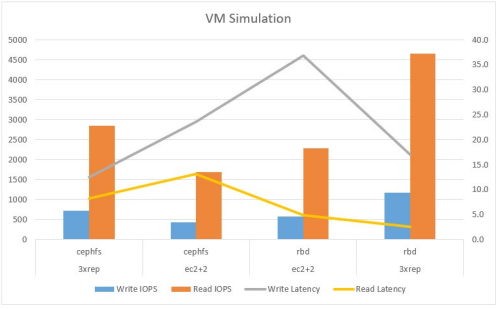
To achieve a reliable and robust infrastructure, Ceph offers both: (a) separation of cluster (backend) and client-facing network traffic and isolates Ceph OSD daemon replication activities from Ceph client to storage cluster access, and, (b) redundancy and capacity in the form of 40GbE bonded network interfaces from the storage nodes to the switches.

PERFORMANCE DATA

A comprehensive set of storage performance tests are documented in the Implementation Guide. Presented data can be used as references for sizing and performance of the solution. Test results are outlined for both sequential and random read/writes activities as well as for common scenarios including backup and recovery, VM activity, and data-base usage. The figure on the right shows example results from the kvm test, that simulates virtual machines operations.

VM Simulation

Write b/w (MiB/s)	Write IOPS	Write Avg Latency (ms)	Test Description	Read Avg Latency (ms)	Read IOPS	Read b/w (MiB/s)
2	718	12.4	KVM on 3xrep CephFS	8.2	2842	11
1	421	23.5	KVM on EC CephFS	13.1	1689	6
2	572	36.9	KVM on EC RBD	4.9	2283	8
4	1167	17.0	KVM on 3xrep RBD	2.5	4655	18



FOR MORE INFORMATION

SUSE Enterprise Storage v5 Implementation Guide For Supermicro SuperServer Platforms
For a complete bill-of-materials and thorough description of the highlighted reference architecture, as well as a step-by-step guide on how to implement an installation, please download the guide using the URL below, or scan the QR code on the right:
https://www.supermicro.com/white_paper/white_paper_SSG-SUSE-Storage-Guide.pdf

01_SUSE-Ceph-Solution-Brief_200424_Rev1