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WHITE PAPER

UNIFIED STORAGE DEPLOYMENT WITH OPTIMIZED SUPERMICRO TOTAL SOLUTIONS FOR NEXENTA

Software Defined Storage Made Easy

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UNIFIED STORAGE BENEFITS

Unified storage is the most common type of storage architecture for midrange systems. Unified storage combines Storage Area Networks (SAN) for structured data for applications such as databases and Network Attached Storage (NAS) for unstructured data typically file based storage.

In a SAN the file system is installed on the compute client, and the data is organized into blocks which reside on a specialized storage system. These storage systems typically consist of dual RAID controllers to which a number of disks are attached. The block protocols are either Fibre channel or iSCSI. SANs are designed for mission-critical applications that require low latency and are highly transactional such as relational databases.

In NAS the compute client does not access its own file system as it does on a SAN, as the file system resides on a specialized device, the NAS system. Clients address the storage on a file basis. The typical network used is Ethernet and the most common protocols are NFS (Networked File System) and SMB (Server Message Block). NAS systems contain a processor often referred to as a NAS head, and disk drives typically protected in a RAID arrangement.

In unified storage the features of the NAS head and the RAID controller are combined, so one storage system can serve the different needs of an organization. Depending on the protocols used by the applications, unified storage systems can interact with clients on dedicated storage networks or on general local area networks. This brings many benefits including less time to administer the storage and can facilitate simpler network deployments. Figure 1 below illustrates a typical deployment in a data center.

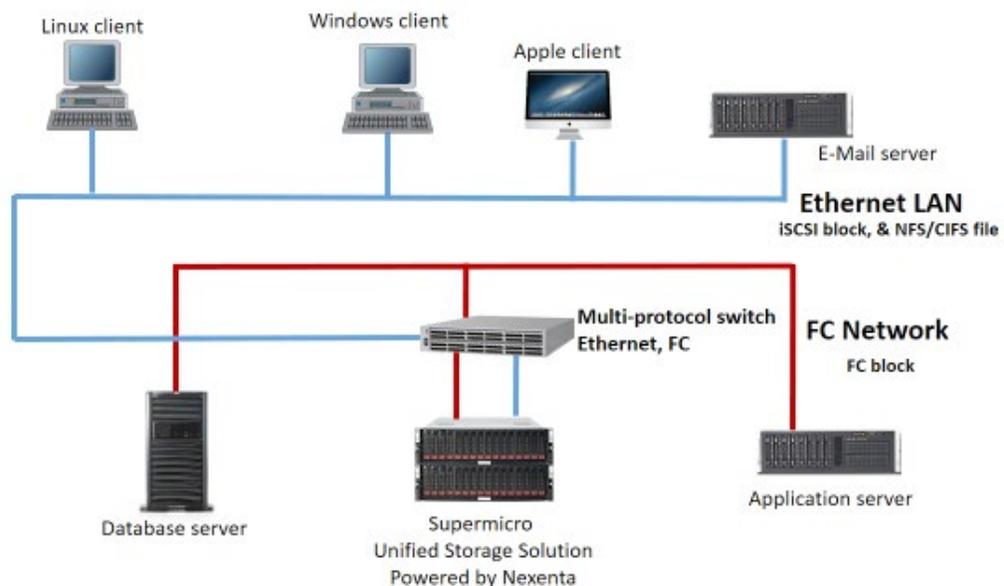


Figure 1. Typical deployment in a data center.

In this example the unified storage appliance is serving both SAN and NAS clients with multiple protocols using a multi-protocol switch. But it could easily serve those clients over two separate switches each dedicated to its own protocol, for example a storage switch running only Fibre Channel or an Ethernet only switch. The protocols selected are typically based on the performance needs of the application. In this example the database and application servers are using FC, while the email server is using iSCSI, and the file services are being provided using NFS and SMB. Unified storage appliances offer tremendous flexibility.

SOFTWARE DEFINED STORAGE

A trend that is gaining momentum in recent years has been to implement storage in a software defined manner. This is done using industry standard hardware, which allows for much greater flexibility and cost savings compared to proprietary storage appliances. Figure 2 below provides a graphical model illustrating the main differences between traditional proprietary storage and the new software defined model.

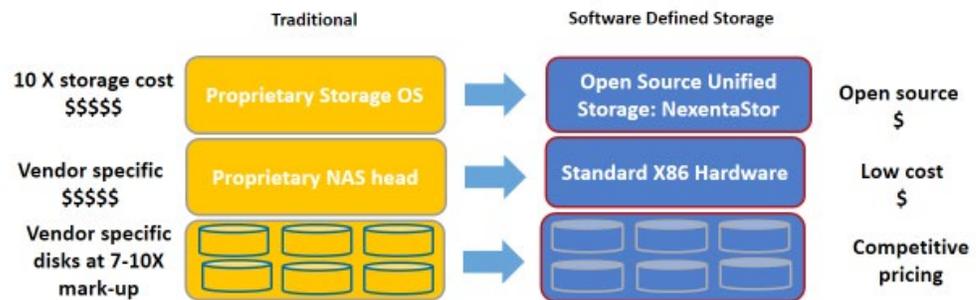


Figure 2. *Traditional vs. Software-Defined Storage*

While software defined storage offers tremendous savings and flexibility, it also requires substantial investments in integration, testing, and validation, which can tax an organization's resources.

NEXENTASTOR

Nexenta has created a unified storage platform NexentaStor implemented entirely in software. It uses the open source OpenZFS file system. It provides full SAN and NAS functionality, and is scalable to hundreds of Petabytes with an unlimited file system size. It supports Fibre channel and iSCSI for SAN, and NFS and CIFS/SMB for NAS. NexentaStor provides a complete set of data management features both in terms of data protection as well as data reduction. For data protection NexentaStor offers mirroring, RAID Z1 (equivalent to RAID5), RAID Z2 (equivalent to RAID6), and RAID Z3 which offers triple parity data protection allowing a RAID set to survive three disk failures. It also offers snapshots, clones, and high performance asynchronous replication. For data reduction NexentaStor offers thin provisioning, and inline compression which greatly increases effective storage

capacity and lowers costs. NexentaStor can be implemented entirely in flash storage, in hybrid configurations, or in all disk configurations.

NexentaStor includes VMware integration with a multi-tenant vCenter Plug-in and VMware Virtual Volume (VVOL) support, which simplifies capacity, performance, and security administration tasks. It supports containers with Docker integration, and is integrated with OpenStack Cinder. NexentaStor is ideal for database and ERP applications such as Oracle™, Microsoft SQL Server™ and SAP™ as well as Microsoft Exchange; virtual machines and desktops such as VMware and Microsoft Hyper-V. NexentaStor is also ideal for backup or disaster recovery use cases.

NexentaStor is easy to deploy and manage with the NexentaFusion GUI and advanced analytics, as well as the traditional command line interface.

PERFORMANCE

A Nexenta appliance powered by Supermicro in an all-flash configuration, was tested and achieved 180,000 8K IOPS in a mixed read/write workload, and sustained bandwidth of 8 GB/s.



Figure 3. *Benchmark results*

SUPERMICRO TOTAL SOLUTIONS FOR NEXENTA – A UNIFIED STORAGE SOLUTION

Until now software defined storage required a substantial investment in integration, testing, and validation. Reference architectures exist, but they are advisory in nature, and much work needs to be done by an IT organization to deploy such solutions. Supermicro has partnered with Nexenta to create a line of total storage solutions optimized for different workloads. These solutions have been integrated, tested, and validated just like a traditional storage appliance, ready to deploy right out of the box, but at a fraction of the cost. These storage total solutions are available with enterprise support services. Figure 4 below shows the Unified Storage Solutions currently available, and more are expected to be added in the near future.

All Flash	Hybrid	Capacity HDD
		
IOP Performance	Mixed Workload	Online Archive
Use Cases: High Performance VM, Databases, Analytics, Mail Servers	Use Cases: Virtual Environments, Home Share, Enterprise Block & File	Use Cases: Back-up, Disaster Recovery, Archive
Capacity: 15TB to 61TB & 46TB to 502TB usable 1.9TB & 3.8TB drive configs Up to 48 drives in 2 expansion bays (up to 72 drives total)	Capacity: 20TB to 106TB & 48TB to 272TB usable 2 Hybrid configs, options based on workload Up to 88 drives in expansion bays (up to 132 drives total)	Capacity: 128TB to 640TB usable High capacity RAIDZ2 media configuration Up to 88 drives in 2 expansion bays (up to 132 drives total)

Figure 4. Supermicro Unified Storage Solutions Portfolio

Supermicro Total Solutions for Nexenta are backed by a comprehensive support program that includes a single point of contact. Support programs are available for three years and up to five years. Two options are available: Monday-Friday 9am-5pm with next day response on-site, or optionally, 7x24 support with four hour on-site response. A Nexenta remote installation service is also available for HA deployments.



SUMMARY

Storage deployments are transitioning from expensive, closed implementations to more cost effective software defined configurations. This represents aggressive cost savings of up to 54% compared to traditional solutions, without any vendor lock in. In addition commodity hardware coupled with Software Defined Storage represents the ability to scale out in a seamless and more granular fashion. However, software defined solutions require substantial additional efforts in ordering, assembling, integrating, testing, and validation, and those costs are substantial, as they require many man-hours that detract from productivity. Supermicro's partnership with Nexenta has resulted in an optimized and pre-validated Unified Storage solution. Now organizations can take advantage of this solution and have all the convenience and ease of use and deployment of an appliance, while enjoying all the cost savings of software defined storage.

For further information relating to Supermicro Total Solutions for Nexenta, please contact your Supermicro sales representative.

About Super Micro Computer, Inc.

Supermicro® (NASDAQ: SMCI), the leading innovator in high-performance, high-efficiency server technology is a premier provider of advanced server Building Block Solutions® for Data Center, Cloud Computing, Enterprise IT, Hadoop/Big Data, HPC and Embedded Systems worldwide. Supermicro is committed to protecting the environment through its “We Keep IT Green™” initiative and provides customers with the most energy-efficient, environmentally-friendly solutions available on the market.

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