



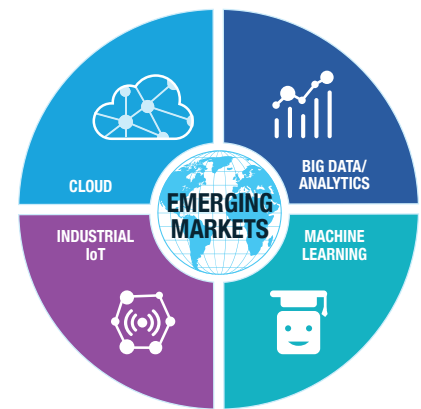
NVMesh®: HIGH-PERFORMANCE DISTRIBUTED SERVER SAN

DATA SHEET

INTRODUCTION







New application workloads are driving the need for new storage architectures. Cloud and mobile applications, Industrial IoT and machine learning have a massive impact on the volumes of data that need to be transferred, stored and processed. Real-time analytics demand the lowest levels of latency. To meet these new requirements, companies need to rethink their storage strategies.



Excelero has developed NVMesh®: a high-performance, low-latency Software-Defined Storage product running on standard servers and components. It provides remote, high-speed, low-latency shared storage facilities with in-server flash performance. It utilizes NVMe drives optimally, potentially spread over many physical systems and treats them as a unified, redundant storage pool. Management is a centralized function implemented as a distributed service. It provides programmatic provisioning capabilities aligned with modern data center best practices. Excelero's patented Remote Direct Drive Access (RDDA) functionality provides both the performance and the deployment flexibility expected by data center administrators: centrally managed storage in a converged architecture or a disaggregated (e.g. top-of-rack) storage solution. If required, the two methods can be blended for a hybrid deployment.

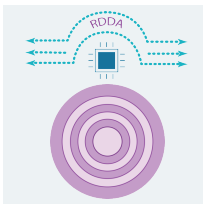
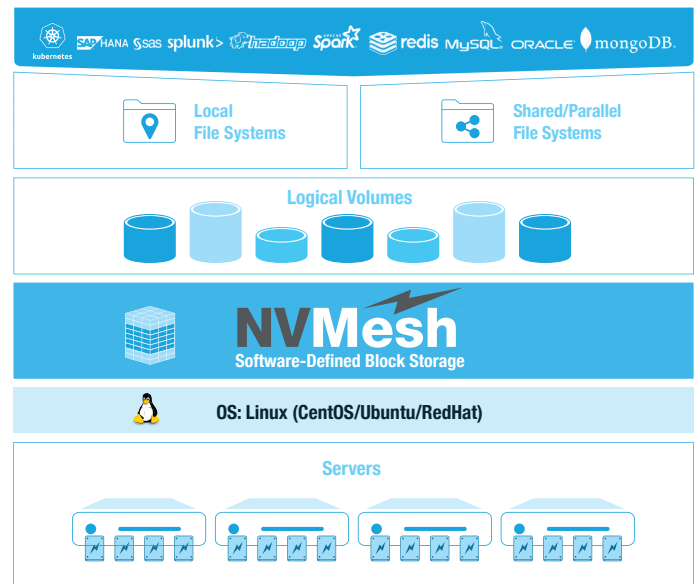
LOCAL PERFORMANCE AT DATA CENTER SCALE

 UBIQUITOUS ACCESS	 HIGHLY OPTIMIZED	 TRUE CONVERGENCE	 SCALABILITY
Remote IOPS = Local IOPS Remote BW = Local BW Remote Lat. = Local Lat. + ~5us	Capacity-optimized platform with 24 NVMe drives delivers: > 4.9M 4KB IOPS > 24GB/s < 200us of latency	Using RDDA, 0% target CPU usage Scales linearly to 100s of millions of IOPS per rack	20 servers, shared data, > 99% efficiency 128 servers @ NASA > 140 GB/s write throughput (bound by NVMe devices)

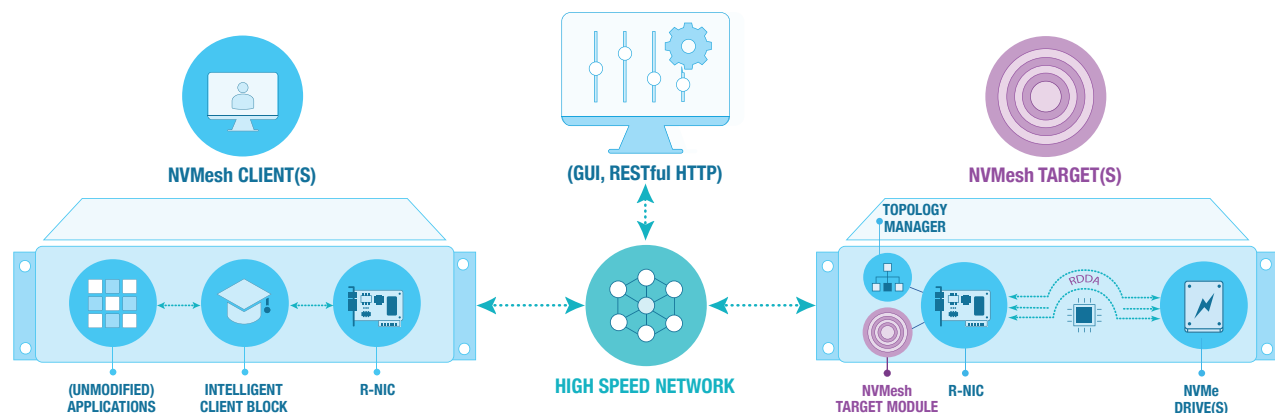
NVMe

Excelero's Software-Defined Storage NVMesh® enables customers to design Server SAN infrastructures for the most demanding enterprise and cloud-scale applications, leveraging standard servers and multiple tiers of flash. The primary benefit of NVMesh® is that it enables true converged infrastructures by logically disaggregating storage from compute.

NVMesh® is a **Software-Defined Block Storage solution** that features Elastic NVMe, a distributed block layer that allows unmodified applications to utilize pooled NVMe storage devices across a network at local speeds and latencies. Distributed NVMe storage resources are pooled with the ability to create arbitrary, dynamic block volumes that can be utilized by any host running the NVMesh® block client. These virtual volumes can be striped, mirrored or both while enjoying centralized management, monitoring and administration. In short, applications can enjoy the latency, throughput and IOPs of a local NVMe device while at the same time getting the benefits of centralized, redundant storage.



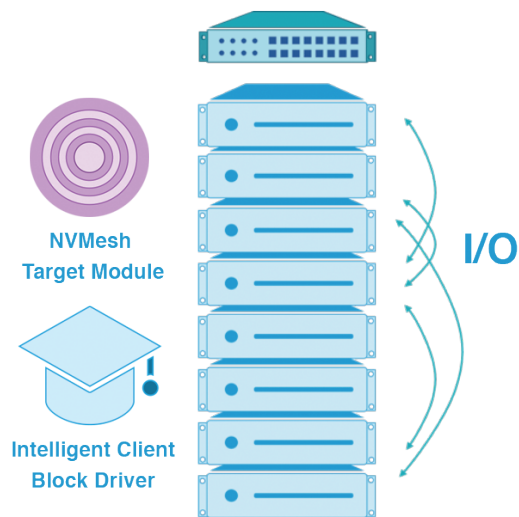
A key component of Excelero's NVMesh® is the patented Remote Direct Drive Access (RDDA) functionality, which bypasses the CPU and, as a result, avoids the noisy neighbors effect for the application. The shift of data services from centralized CPU to complete client side distribution enables linear scalability, provides deterministic performance for applications and enables customers to maximize the utilization of their flash drives.



SUPPORTS CONVERGED AND DISAGGREGATED ARCHITECTURES

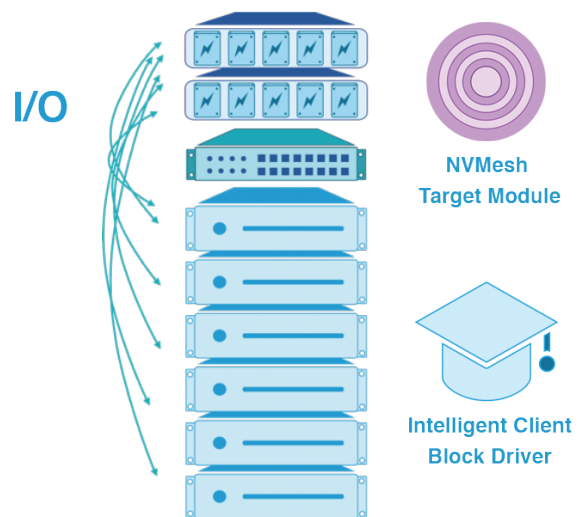
NVMesh® is deployed as a virtual, distributed non-volatile array and supports both converged and disaggregated architectures, giving customers full freedom in their architectural design.

LOCAL STORAGE IN APPLICATION SERVER



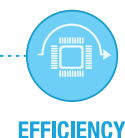
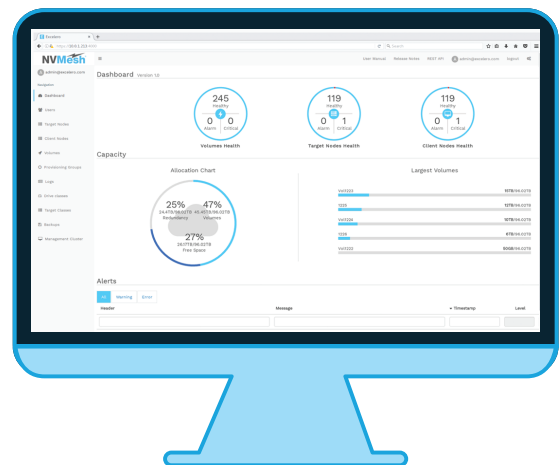
- Storage is unified into one pool
- NVMesh Target Module & Intelligent Client Block Driver run on all nodes
- NVMesh bypasses server CPU
- Linearly scalable

STORAGE IS CENTRALIZED




- Storage is unified into one pool
- NVMesh Target Module runs on storage nodes
- Intelligent Client Block Driver runs on server nodes
- Applications get performance of local storage

Maximizing operational efficiency, requires consolidation of storage silos and the ability to run multiple applications on a single storage platform. NVMesh® was designed to leverage any underlying storage medium so applications can be provisioned with volumes that meet all application requirements (scale, performance, availability, reliability, efficiency and cost) and guarantee internal or external SLA's. This can be done from a central interface (or API) that is very transparent and easy to use.




NVMe® FEATURES

DATA MANAGEMENT & PROTECTION



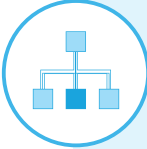
Multiple Transports.....	NVMf-ready, Patented RDDA
Logical Volumes.....	Concatenated, RAID 0, RAID 1, RAID 10
Multiple Drive Types.....	NVMe, NVMf, SATA, SAS, 3D XPoint
Failure Domains.....	Host, rack & row aware

MANAGEMENT & MONITORING



Interactive Interfaces.....	Web GUI & CLI commands
Automated Provisioning.....	RESTful API, Docker Persistent Volumes

NEXT-GEN DATA CENTER



Flexible Topologies.....	Physically converged, disaggregated or mixed
High Performance.....	Limitlessly scalable at near 100% linear performance
Scale-Out Architecture.....	Intelligent clients utilizing multiple hosts, drives,
Supports Multiple Fabrics.....	Network-paths and racks

NVMe® BENEFITS

100%
Server SAN

100% SDS, leveraging standard servers and next-generation storage & networking components



Elastic NVMe

Pools NVMe storage across a network at local speeds and latencies

0%
Zero-CPU

Enables 100% converged infrastructure



Virtual Array

Deployed as a virtual, distributed non-volatile array and supports both converged and disaggregated architectures

100%

Client-Side, Distributed Architecture

Enables NVMe sharing that scales performance linearly at near 100% efficiency