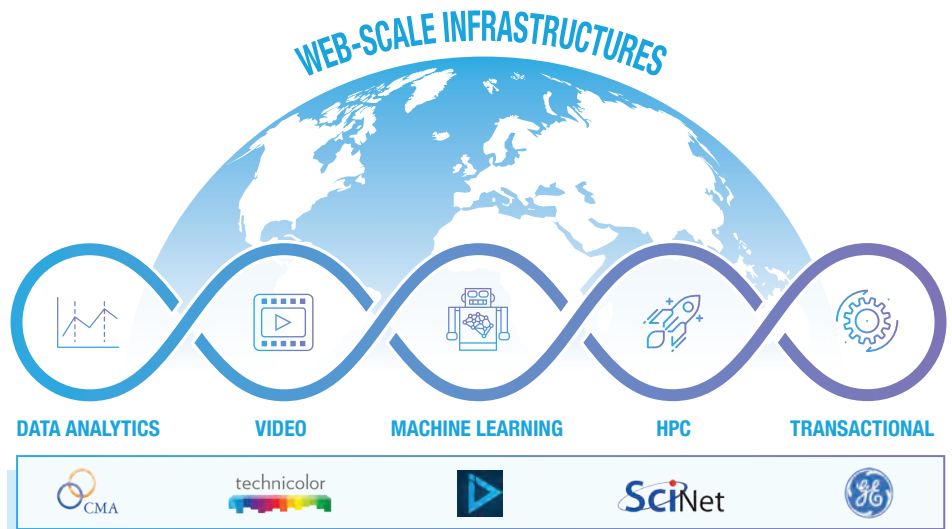# Excelero

NVMesh®

WORLD'S FASTEST AND LOWEST-LATENCY

NVMe OVER FABRICS BLOCK STORAGE

DATA SHEET

INTRODUCTION

The quest for zero-latency storage is real. In this era where technology is ubiquitous, the multitudinous latency-sensitive applications that surround us require fast and efficient processing of data at massive scale. Providing near-zero latency at such scale is the remaining storage challenge and by extension, the most pressing technology challenge for web-scale data centers.

WEB-SCALE INFRASTRUCTURES

DATA ANALYTICS — VIDEO — MACHINE LEARNING — HPC — TRANSACTIONAL

New-generation non-volatile media, such as NVMe, is moving the bar on storage latency. Single-digit micro-seconds latency is a reality when used locally. This is setting expectations for application developers, who now get much better performance from one local NVMe flash device than an entire enterprise-grade all flash array.

Excelero delivers the lowest-latency (25μs) NVMe over fabrics block storage for applications: NVMesh enables shared NVMe across any network and supports local or distributed file systems. Customers and their applications benefit from the performance of local flash with the convenience of centralized storage. Standard servers, networking and NVMe promote choice while avoiding proprietary hardware lock-in and reducing storage TCO.

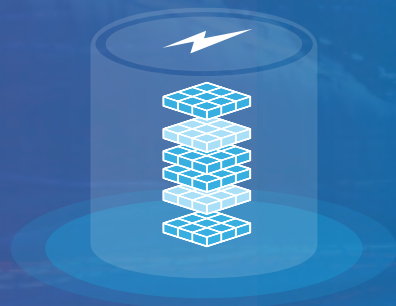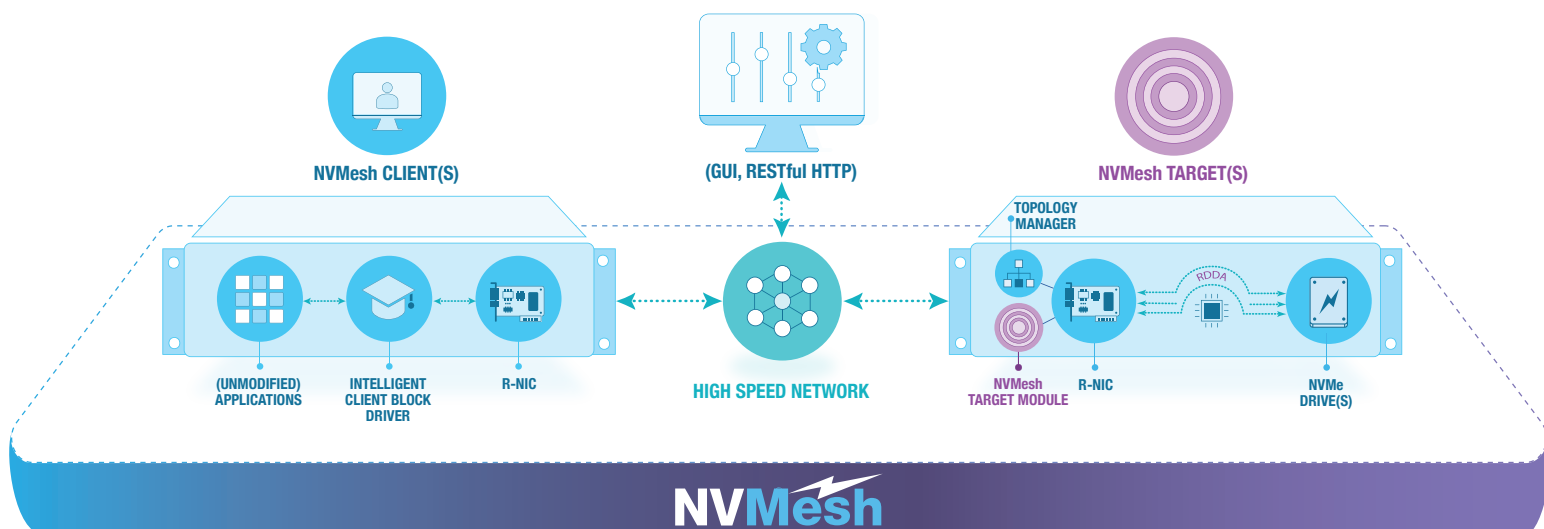| 100% SOFTWARE-DEFINED	LOWEST OVERHEAD	BLOCK STORAGE
Use any Hardware	Local Flash Latency across the Network	Use any File System

NVMesh was inspired by how Tech Giants like Amazon, Facebook and Google have redefined infrastructures for web-scale applications, leveraging standard servers and shared-nothing architectures to ensure maximum operational efficiency and flexibility.

Excelero's NVMesh is the lowest latency distributed block storage for shared NVMe. It's a 100% software-defined solution that supports any hardware. NVMesh runs any local or shared/parallel file system. NVMesh has capabilities that make it easier for web-scalers, enterprises and service providers to deploy shared NVMe storage at local performance across a wide range of network protocols and applications.

NVMesh features a revolutionary 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 protected against drive or host faults 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.

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.

NVMesh FEATURES

As most enterprise servers are NVMe-enabled, the rush is on to allow teams to share NVMe SSD resources to overcome the inherently low utilization rates of direct attached NVMe. Excelero's NVMesh is a complete web-scale SDS solution with the distributed data protection and storage provisioning that make shared NVMe storage practical, efficient and readily managed.

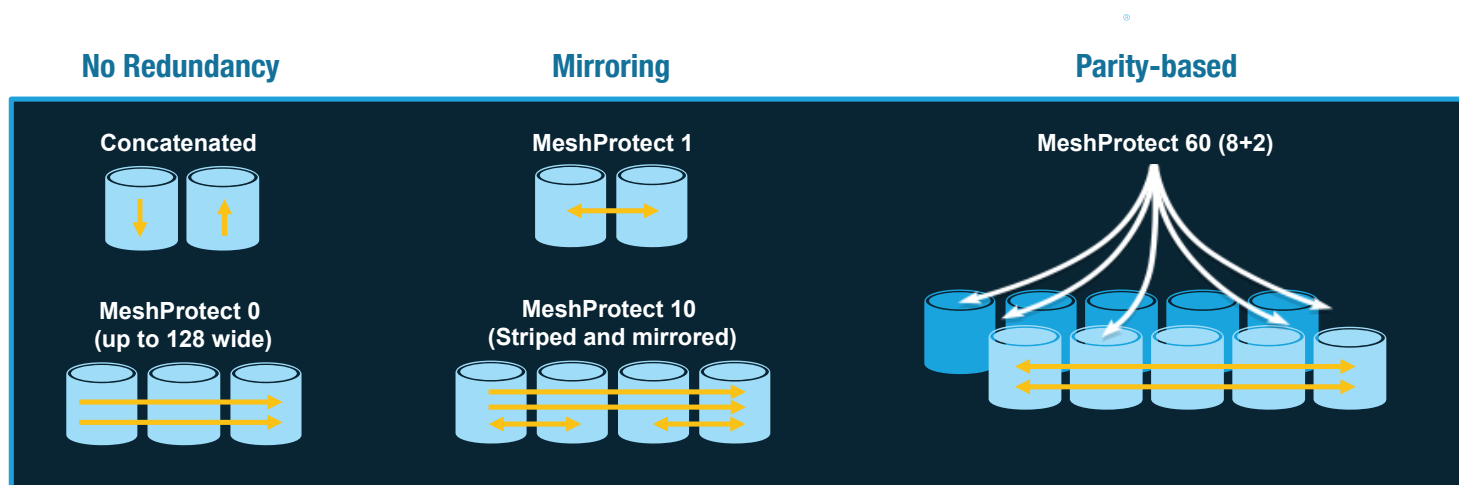| MeshConnect™	MeshProtect™	MeshInspect™
More Networks	More Data Protection	More Analytics

MeshConnect™ features support for traditional network technologies, giving NVMesh the widest selection of supported fabrics and protocols. Supported Protocols are TCP/IP or RDMA over fabrics including Ethernet and InfiniBand.

MeshProtect™ is a flexible, distributed data protection architecture offering various protection levels, matching resiliency and performance to application needs. Options range from no redundancy, mirroring (1+1) to parity-based (N+M). The latter provides over 90% storage efficiency, yet delivers ultra low-latency performance on large-scale configurations.

MeshInspect™ provides performance analytics for pinpointing anomalies quickly and at scale. Customers benefit from detailed cluster-wide performance and utilization statistics allowing for monitoring and analysis of the storage environment. Administrators benefit from a fully customizable display of detailed metrics of application workloads and datasets.

NVMesh BENEFITS

MAXIMIZE RESOURCE UTILIZATION

NVMesh enables customers to maximize their hardware utilization across their infrastructure. This applies to NVMe media, but also to application server CPU and GPU servers (for AI/ML/DL). Leveraging parity-based data protection, NVMesh delivers over 90% usable capacity while protecting against media and host failures; further driving down NVMe TCO.

STANDARD HARDWARE & PROTOCOLS

NVMesh was designed from the ground up to support any hardware without the need for special accelerator cards or specialized non-volatile memories. With support for traditional network fabrics and protocols, enabling NVMe over Ethernet, and InfiniBand, customers don't have to invest new networking technologies to deploy NVMesh.

MORE DIAGNOSTIC CAPABILITIES

NVMesh enables users to analyze cluster-wide performance and utilization, and build a customized dashboard from a selection of data visualization widgets.

NVMesh SPECS

DATA MANAGEMENT & PROTECTION

Multiple Transports	NVMeoF, Patented RDDA
MeshProtect	Virtual volumes in flexible choice of redundancy - Concatenated, RAID 0, RAID 1, RAID 10, Parity-based N(3-11)+M(1-2)
Multiple Drive Types	NVMe, NVMf, SATA, SAS, 3D-XPoint
Failure Domains	Customizable Host, Rack & Row aware

MANAGEMENT & MONITORING

Interactive Interfaces	Web GUI & CLI commands
Automated Provisioning	RESTful API, OpenStack Cinder and CSI

NEXT-GEN DATA CENTER

Flexible Topologies	Physically converged, disaggregated or mixed
Scalability	1000's of nodes up to 3TB/s and 640 Million IOPs, over 65 PB in one cluster
High Performance	Only +5μs additional latency, 100% linear performance scalability
Scale-Out Architecture	Logical volumes can span across drives and hosts for virtually unlimited single volume scalability
Connectivity	Ethernet (TCP/IP and RoCEv2), InfiniBand