# NVMe/TCP and SmartFabric Storage Software

Accelerate the evolution of your storage connectivity with a modern, automated and validated solution

## Introduction

Enterprises are being challenged to modernize IT infrastructures to keep up with the growing data storage and traffic demands of today's workloads and applications while preparing for the future. The market is shifting towards next-generation disaggregation and composability of compute, storage, and networking infrastructures as customers move to a software-defined-data center.

The rapid adoption of NVMe all-flash arrays within storage platforms helps enhance the workload performance. In addition, new open standards like NVMe over Fabrics that leverage transport such as TCP/IP along with the rapid integration of higher Ethernet-based speeds like 25GbE/100GbE and 400GbE are paving the way for modern, cost-effective storage interconnect offerings that can easily scale up and out to help meet these demands.

Modern infrastructures are critical for the high-performance access, delivery, and response times needed to lead in today's business marketplace. Dell Technologies drives products and services through a vision of engineered solutions that deliver both operational and infrastructure efficiencies with leading-edge technologies, automation, with global support and services.

### One of the industry's first end-to-end NVMe/ TCP solutions

**Agility** with NVMe storage technology providing secure, policy-driven storage and adaptive connectivity that easily scales up and out with significant cost savings

**Automation** of complex storage and fabric tasks and management to help simplify deployment and life cycle management tasks of storage connectivity through autonomous operations with SmartFabric Storage Software

**Reliability** with global support and services across a tightly integrated server, storage, and networking solution to increase performance and availability

## Challenges

While transitioning toward next-generation, software-defined technologies, enterprise organizations are looking for storage connectivity solutions that not only meet the exploding data and traffic demands but will also scale to meet demands in the future. Second, there is a strong desire for these new storage interconnect solutions to help reduce CAPEX and OPEX-related costs with open standard- based products that incorporate automation capabilities much like existing Fibre Channel offerings. The final challenge  encompasses a modern end-to-end storage solution that is tested and validated across compute, storage, and networking platforms and is backed by global support and services.

## Benefits of NVMe/TCP

NVMe/TCP allows organizations to use an Ethernet network for a lower cost per port for the SAN deployment.  For network infrastructure deployment, Ethernet cost is up to 81% less than Fibre Channel in some configurations*.   At the same time, NVMe/TCP provides nearly equivalent performance as Fibre Channel.

* Based on Dell internal research calculation (April 2023). Actual results may vary.

Simplify NVMe IP SAN Adoption

To simplify NVMe IP SAN adoption, Dell Technologies is leading the industry by providing comprehensive NVMe/TCP validated ecosystem and pursuing a standards-based approach to discovery automation with SmartFabric Storage Software.

NVME/TCP Ecosystem Validation:   Dell Technologies is committed to expanding the ecosystem of validated NVMe/TCP components.  Dell Technologies E-Lab qualified some of the most popular hardware across storage, servers, switching products and operating systems.

| Storage | Servers | Ethernet Network Switches |
|---|---|---|
| **PowerStore**<br>• PowerStoreOS 3.x+ supports 25GbE and 100GbE<br><br>**PowerMax 2500/8500**<br>• PowerMaxOS 10+<br><br>**PowerFlex**<br>• PowerFlex 4.0+ | **PowerEdge OS Support**<br><br>• VMware<br>• SUSE Linux Enterprise Server (SLES)<br>• Red Hat Enterprise Linux (RHEL)<br><br>**VxRail**<br>• See Support Matrix<br><br>**3rd party servers**<br>• Cisco UCS<br>• HPE | **PowerSwitch**<br>• OS10 in full switch and SmartFabric Services modes<br>• SONIC<br><br>**3rd party Ethernet switches**<br>• Cisco Nexus<br>• Arista<br>• Juniper<br>• HPE |

For more details about our validated ecosystem, please refer to:

NVMe/TCP Host/Storage Interoperability
NVMe/ TCP Switch Interoperability

SmartFabric Storage Software Deployment Automation:  SmartFabric Storage Software is a stand-alone software solution packaged as a containerized application, enabling an end-to-end automated and integrated NVMe-oF solution running TCP over an Ethernet fabric. The key functions of SmartFabric Storage Software are policy-driven to help automate NVMe/TCP endpoint discovery, registration, connectivity and zoning.

Please refer to SmartFabric Storage Software Specification Sheet for more information.

## Dell Services

Organizations deploying solutions based on Dell Technologies products are never alone: Dell Technologies provides a comprehensive set of deployment and support options covering the entire lifecycle of the enterprise IT investment.

Services such as planning and design, deployment and integration, and education are just a few offerings within a comprehensive set of customer services available. Dell ProDeploy and ProDeploy Plus provide full- service installation and configuration of both hardware and system software by certified deployment engineers. Dell Technologies delivers single vendor support, eliminating the usual headaches encountered when dealing with a multi-vendor solution.

## NVMe Transport Performance Comparison White Paper  Link

This technical white paper provides the results of NVMe transport performance testing using Dell PowerStore with the same workload configurations to determine performance benefits with Fibre Channel, NVMe/Fibre Channel, NVMe/TCP and iSCSI.

## Summary

Whatever the size of your organization, Dell Technologies NVMe IP SAN solutions can help you derive the full value out of your server, storage, and networking investments. We offer proven end-to-end solutions, comprehensive global services, and a vision that sets the pace in a rapidly changing industry. To find out how we can help you achieve your business goals, contact your Dell Technologies representative today.

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