



Solution Brief

Simplify data center fabrics with Dell storage and networking

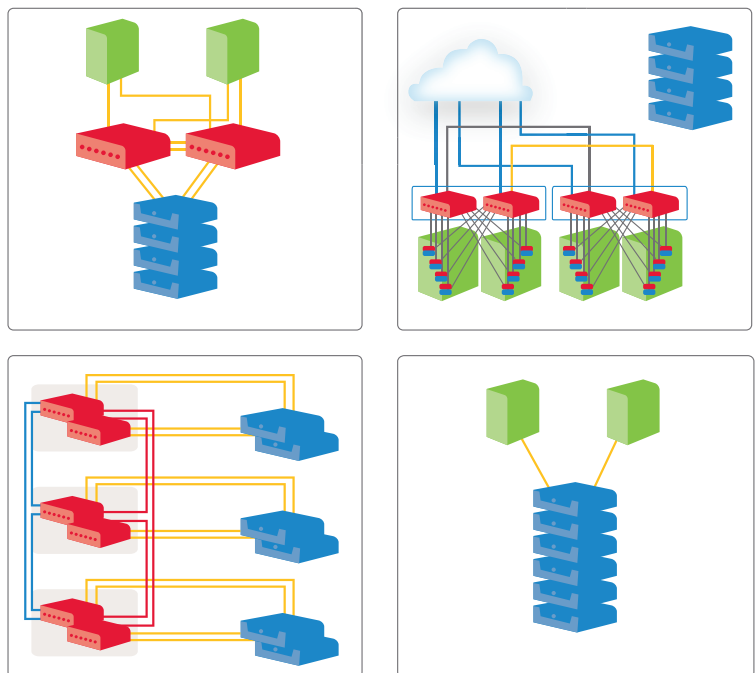
Dell storage and networking products can help organizations maximize the value of their data center fabrics. Specific benefits include:

- Standards-based interoperability across the data center, with Force10 switching and Compellent, EqualLogic, PowerVault storage
- Improved ROI through multiprotocol support, unified block-and-file storage, open architectures, seamless scalability, nondisruptive operations and innovative bundling of features and capabilities
- Exceptional investment protection, through extensible hardware designs, open APIs, virtualized operation of storage and networking, and Dell's active participation in strategic standards development bodies
- True, single-source partnering, with the depth of a networking and storage technology developer and the breadth of a solution partner to organizations with a diversity of sizes, IT missions, and environments
- Ready access to the Dell professional services organization, which can help ensure program success at any stage, from feasibility analysis and planning to deployment, operation and maintenance

With myriad trends reshaping IT today—emerging applications, workflow reinvention, evolving standards, and unorthodox topologies—it's no wonder that data center fabric upgrades can pose challenges. But when data center architects vacillate between optimizing fabrics today and waiting for technology churn to settle, innovation can be deferred, causing productivity to suffer.

To resolve this dilemma, organizations need to optimize their storage fabrics—whether mixed-legacy or greenfield—with open, standards-based platforms. Dell's innovative Ethernet fabric solutions coupled with Dell's enterprise-class storage solutions, can help IT organizations balance near-term optimization with future flexibility, no matter their direction or pace of change.

With Dell's Fluid Data™ architecture (for storage) and Virtual Network Architecture (for networking), IT professionals can achieve high ROI through data center fabric solutions that feature simplified operations, self-aware intelligence, performance, and efficiency.



Dell storage and networking solutions can help organizations optimize for a variety of environments and architectures, adapt to changing needs, and leverage tomorrow's innovations.

Virtual Network Architecture: a framework for network-as-business enabler

To serve the diverse needs of the marketplace, Dell has built its network portfolio on the core Virtual Network Architecture (VNA) principles of fabric scalability, virtualized services, simplifying the complex, and mobilizing users. A key enabler of these principles is the modular Force10 FTOS networking operating system, which provides common software functionality across the switching portfolio and simplifies such complex tasks as scripting and programmatic management.

Dell also participates actively in key storage and networking standards forums to help foster open approaches to maximizing the productivity of existing infrastructures while simplifying new technology adoption. Dell's contributions to Data Center Bridging (DCB), for example, help enable classification and prioritization of both iSCSI and FC storage operations over mixed-traffic Ethernet fabrics running at 10GB and higher. Dell engineers also contribute to the development of Virtual eXtensible LAN (VXLAN) and Network Virtualization using Generic Routing Encapsulation (NVGRE), two standards designed to virtualize, isolate and overlay multiple network domains within a broadband Ethernet fabric, in order to achieve radical improvements in data center flexibility and efficiency.

The evolution of standards (and the data centers they serve) will drive VNA evolution in turn. As this occurs, Dell storage fabric customers can look forward to leading-edge infrastructure-level control, along with continued deployment agility and simplified administration.

Fluid Data architecture: near-term benefits and future extensibility for storage

Dell's Fluid Data architecture comprises a set of capabilities designed to automatically and intelligently optimize data everywhere, and in turn to deliver improved storage efficiency, greater IT agility and superior business resiliency. These capabilities include numerous features that can help organizations derive the full value of their data center network fabrics, in addition to those that optimize the performance and efficiency of storage.

Collectively, Dell storage solutions help reduce data center complexity by removing the rigid boundaries associated with traditional storage systems. For example, Compellent Storage Center's unique Virtual Port technology abstracts all data path components – including host and server ports, controllers, and drives – from hardware; this enables organizations to easily migrate from FC to iSCSI or FCoE, for example, as requirements and opportunities evolve. EqualLogic port virtualization, multipath I/O (MPIO), and automated load

balancing all offer standards-based means for customers to fully leverage their network resources for high storage performance and availability. Likewise, PowerVault MD and NX Series storage offer support for 1GbE and 10GbE iSCSI, Fibre Channel and DAS interconnect options, which can help enable smaller start-up enterprises to architect affordable storage with advanced networking capabilities. All three product families support consolidation of both block and file data over IP networks, with the inclusion of Dell's scale-out Fluid File System.

Evolving opportunities and strategies drive fabrics' strategic value

Storage fabric architectures can vary profoundly to suit different missions, applications, strategies, and environments. Moreover, never-ending changes in business and technological landscapes make periodic revisions of data center fabric requirements a virtual inevitability. For this reason, IT organizations are increasingly likely to migrate over time from fairly basic architectures (e.g., DAS-based storage) to more sophisticated solutions (e.g., SAN or unified SAN/NAS architectures) to accommodate growth and change. Some organizations may even opt for more radical topology changes, perhaps to accommodate new infrastructures (blade servers or converged-stack solutions, for example) or new application models (such as those requiring high-performance computing clusters). In short, each stage of growth and evolution can bring about completely different opportunities and challenges for data center fabrics. When these fabrics incorporate closed, proprietary switching or storage platforms, the degree of risk associated with each such decision point increases materially.

IT organizations can maximize the durability, agility and ROI of their strategic data center fabrics by relying upon Dell open, standards-based storage and networking platforms. Whether building a data center from the ground up or optimizing an existing infrastructure, organizations can benefit from Dell's extensive product and services portfolio, as well as from Dell's experience in helping customers of all sizes overcome a variety of IT challenges across all industries worldwide. A true single-vendor solution provider, Dell offers unique advantages as a developer of storage and networking technologies, and as a provider of an expansive suite of professional service offerings.

For more information, go to www.DellStorage.com/StorageNetworking

