

Modernize your infrastructure

Create a high-performance, scalable, reliable and consolidated infrastructure with Dell, Brocade and QLogic solutions



Highlights

Challenge

- Provide the performance, scalability and availability to support new business initiatives without expanding the data center footprint.

Solution

- Modernize your infrastructure with Dell enterprise solutions that integrate Dell PowerEdge blade servers, Dell Compellent storage, Dell - Brocade® Gen 5 Fibre Channel switches and Dell - QLogic® Gen 5 Fibre Channel host bus adapters (HBAs).

Benefits

- **Performance:** Support large-scale application traffic and deliver a responsive user experience with end-to-end 16 Gbps performance.
- **Scalability:** Support growing environments without requiring excessive data center space.
- **Availability:** Bolster reliability and enhance availability for supporting mission-critical applications.
- **Cost savings:** Maximize hardware and space utilization while reducing operating costs through consolidation.

Enhance IT services without expanding the infrastructure footprint

Do more with less — it's a directive that is all too familiar with IT groups today. To support new business initiatives and enhance worker productivity, IT groups are asked to provide access to more IT resources, deliver better performance to users and offer nonstop availability for vital applications.

Some organizations are trying to address these challenges by expanding their infrastructure. For example, to accommodate data growth, Gartner predicts that by 2016, enterprises will expand the number of terabytes allotted to storage by 850 percent.¹ But each additional server, switch and storage array can add complexity. As it is, many organizations already spend 70 percent or more of their time and resources just keeping things going.²

With tight budgets and finite data center space, organizations cannot simply add hardware and expand their infrastructures to meet growing needs for IT services. They need ways to support new initiatives and improve productivity without the costs and disruptions of forklift upgrades and the management complexity added with continuous, large-scale deployments of new equipment.

Instead, IT groups must modernize their infrastructures. They need servers, storage and networking solutions that can deliver the required performance, scalability and availability without adding costs, increasing complexity or expanding the infrastructure footprint.

Dell enterprise solutions can help your organization meet its business goals while accommodating resource

limitations by modernizing your IT infrastructure. Drawing on next-generation technology from Dell, Brocade and QLogic, Dell enterprise solutions offer end-to-end 16 Gbps performance that can support increasing application traffic and deliver a responsive user experience.

Using compact, highly efficient and easily scalable servers, storage and networking solutions allows you to provide more IT resource capacity while controlling costs and conserving data center space. Redundant components, extensive monitoring and diagnostics capabilities, and data protection features help deliver the reliability and availability needed for mission-critical applications. By capitalizing on the modular approach of Dell solutions and the wide array of component options available, you can create a customized infrastructure that meets current and future needs.



Modernize the infrastructure with Dell and Brocade solutions

Dell enterprise solutions include industry-leading server, storage and networking technologies that can help you build a powerful, scalable, reliable and consolidated infrastructure.

Dell PowerEdge M-Series blade servers

Dell PowerEdge M-Series blade servers enable you to build a high-performance environment in a very compact space. Intel® Xeon® processors combine the raw compute performance, large-scale memory capacity and I/O throughput needed for hosting large server virtualization and desktop virtualization environments while delivering a responsive experience to users.

The PowerEdge M1000e blade enclosure helps maximize the benefits of blade servers by

Who should modernize their infrastructure?

Organizations in a wide range of fields can benefit from modernizing their infrastructure with solutions from Dell and Brocade. The best candidates for these solutions include organizations that need to:

- Consolidate infrastructure, reclaim floor and rack space, or reduce energy consumption
- Refresh infrastructure, replace aging systems or construct a new data center
- Support rapid growth of virtualized environments and tier 2 and tier 3 workloads
- Accommodate new and emerging workloads, such as virtual desktop infrastructure (VDI) or high-frequency trading (HFT) workloads, which require scalable, low-latency storage area network (SAN) solutions
- Maximize the value of solid-state drive (SSD) storage technology by increasing network performance
- Upgrade legacy Cisco and QLogic 4 Gbps networks to enhance bandwidth or improve port density in mid-sized or large data centers



providing a highly efficient chassis with shared power, cooling, networking and management capabilities. By using quarter-, half- and full-height blades with the M1000e, IT groups can create a large-scale environment with up to 32 blade servers in just a 10U rack space. Built for flexible scalability, the M1000e offers advanced I/O functionality and capabilities designed to help accelerate integration of new servers and other components. Integrated management tools and remote management capabilities help simplify ongoing blade administration.

Dell Compellent Storage Center storage area network (SAN) arrays

Dell Compellent storage arrays, based on the Dell Fluid Data architecture, help provide the robust performance needed

for delivering a responsive user experience and supporting mission-critical applications within a consolidated environment. With Storage Center 6.4, Compellent storage arrays offer flash-optimized solutions that are performance-tuned for the low-latency, high-input/output operations per second (IOPS) requirements of enterprise database, online transaction processing (OLTP) and data-intensive workloads. Compellent storage arrays support single-level cell (SLC) and multilevel cell (MLC) SSDs for write- and read-intensive tasks. Compellent Data Progression software, with automated tiering capabilities, helps dynamically migrate data across these and other drive types, optimizing data placement based on performance needs and usage.

Storage Center arrays also enable direct high-speed, low-latency access to storage resources. Equipped with QLogic Gen 5 Fibre Channel HBAs, Storage Center arrays enable you to create an end-to-end 16 Gbps environment when using servers with QLogic 16 Gbps Gen 5 HBAs. If you select server HBAs based on QLogic Gen 5 technology, you can use a single, stable driver stack and gain a consistent adapter management framework across that end-to-end 16 Gbps environment.

Dell Compellent storage helps ensure availability. Space-efficient snapshots, called Replays, help protect data and speed recovery while minimizing the storage space that backups consume. Replays and additional capabilities help deliver up to five-nines availability to help support mission-critical applications.

Compellent storage also provides the scalability to support rapidly growing environments without requiring a large amount of data center space. You can scale up and out across block and file data storage without disruptions or the need to rip and replace hardware. Compellent Dynamic Capacity thin provisioning software helps improve utilization and avoid unnecessary storage expenditures by consuming disk space only when data is written. Using the Compellent SC280 dense enclosure offers exceptional density: With multiple SC280 enclosures and two Storage Center arrays, you can build a 2 PB SAN and network attached storage (NAS) solution in a single 48U rack.

Dell - Brocade Gen 5 Fibre Channel switches and Dell - QLogic Gen 5 HBAs

Dell - Brocade Gen 5 Fibre Channel switches are purpose-built, data center-proven network infrastructure solutions for storage that deliver unmatched reliability and simplicity with 16 Gbps performance. You can achieve millions of IOPS performance when employing these switches with SSD storage technology. By using QLogic 16 Gbps Gen 5 Fibre Channel HBAs in both the host and target storage, you gain end-to-end 16 Gbps performance. This high-speed connectivity enables you to accommodate increasing application traffic and deliver the responsive experience that users expect.

Dell - Brocade Gen 5 Fibre Channel switches help facilitate consolidation. The Dell M6505 16 Gbps Fibre Channel SAN I/O module is fully integrated into the Dell PowerEdge M1000e blade enclosure — there is no need for a separate external switch that consumes rack space. Integration into the M1000e chassis also significantly reduces the need for complex cabling. No cables are required between the PowerEdge blade servers and the switch.

Support for end-to-end 16 Gbps speeds provides the throughput needed for consolidated virtualized environments. Quality-of-service (QoS) and fabric-based zoning features also help support highly consolidated cloud environments.



Offering more than five-nines availability, the Dell M6505 and other Brocade Gen 5 Fibre Channel switches can also help provide the nonstop reliability required for vital applications. These solutions use proven Fibre Channel technology: Purpose-built for storage traffic, Fibre Channel has become the de facto standard for enterprise data center networking.

The QLogic Gen 5 HBAs help ensure continuous availability by offering HBA-level redundancy and port isolation. If one port fails due to a firmware crash, the other, completely isolated port can continue to deliver exceptional performance without degradation. In addition, Brocade Fabric Vision technology offers a range of capabilities to help ensure high availability and sustain performance, including innovative diagnostic, proactive monitoring and management capabilities.

To accommodate growing IT environments, the Dell M6505 also enables fast, simple scalability without complexity. You can expand from 12 to 24 ports using Ports on Demand (PoD) capabilities. When using QLogic Gen 5 HBAs for both servers and storage, you can take advantage of resilient, redundant storage connectivity that helps optimize scalability for next-generation virtual machine architectures. In addition, the unique architecture of the QLogic HBAs provides true port-level isolation, which ensures deterministically predictive and scalable performance across both ports and enables higher virtual machine density. As more ports are added, the QLogic adapter's hardware protocol offload allows the throughput to scale, meeting the demands of business growth.

Realize the benefits of a modern infrastructure

Performance

The outstanding throughput enabled by Gen 5 switches and HBAs helps eliminate potential bottlenecks and enables your organization to maximize overall infrastructure performance. Meanwhile, powerful blade servers and high-performance storage allow you to support highly consolidated virtualized environments, private cloud implementations, analytics solutions and other mission-critical applications. Better performance helps you accommodate growing application traffic and deliver a responsive experience for users.

Consolidation and scalability

Together, Dell PowerEdge blade servers, Dell Compellent Storage Center and Brocade Gen 5 Fibre Channel solutions help create a compact IT environment. Organizations using 32 blade servers in an M1000e blade enclosure use less than one-third the rack space required for 32 1U servers. The Brocade "zero-U" M6505 that is integrated into the M1000e eliminates another 1U rack space that might be required for an external switch. And using a compact Compellent storage array such as the SC280 dense enclosure, you can operate up to 336 TB in a single 5U solution.

At the same time, Dell and Brocade solutions facilitate scalability. You can expand a virtualized server environment or private cloud, support an increasing volume of application traffic over the network and store more data without expanding the infrastructure footprint.



FireHost expands its infrastructure while controlling the footprint

Organizations are realizing the benefits of employing Dell enterprise solutions to modernize their infrastructure. Cloud-hosting service provider FireHost needed to expand its infrastructure to support rapid business growth while maintaining a small data center footprint. FireHost had previously standardized on Dell PowerEdge blade servers and VMware® virtualization software as the foundation for its secure multi-tenant public cloud environment. But the company needed a new storage environment that could deliver the performance required by customers and the scalability for continued growth.

After evaluating a number of possible storage solutions, the company deployed Dell Compellent storage arrays across multiple data centers in the United States and Europe. Brocade Fibre Channel I/O modules and switches provide fast, reliable networking.

The FireHost infrastructure can now deliver exceptional performance, with less than 2 millisecond latency for data writes in tier 1 and tier 2 storage. The infrastructure also enables rapid scalability; administrators can add capacity in just a few hours without causing downtime. And importantly, the company has maintained a dense infrastructure, which helps control the costs of power, cooling and real estate. Keeping those expenses in check is critical to running a successful cloud-hosting business.

Read more about the FireHost success story:
www.dell.com/learn/us/en/555/corporate~case-studies~en/documents~2013-firehost-10011809.pdf

Reliability and availability

Dell and Brocade solutions help deliver the reliability and high availability that you need to run mission-critical applications.

Redundant components, extensive monitoring and diagnostics capabilities, and data protection features available with Dell blade servers, the M1000e blade enclosure and Compellent storage keep applications running and information available.

Dell - Brocade Gen 5 switches combine the proven Fibre Channel technology employed by many enterprises and a range of

networking management tools to help ensure network reliability and resiliency.

Cost savings

Consolidating hardware enables you to maximize hardware and space utilization while also reducing costs. Virtualizing servers and storage, and using a switch that is fully integrated within the blade enclosure, helps reduce hardware acquisition costs. At the same time, creating a consolidated environment that requires less power and cooling can substantially decrease operating expenses.

Best-of-class management capabilities for servers, storage and networking help decrease the time, complexity and cost of managing the infrastructure. Dell offers an array of blade management tools that help streamline administration, including centralized management controllers; dynamic power management capabilities; keyboard, video and mouse (KVM) capabilities; and secure web interfaces.

Compellent Enterprise Manager provides a single, centralized management interface for the storage environment. Enterprise Manager continues to evolve in order to support new capabilities. For example, administrators can now easily check SSD wear rates for proactive planning.

Dell - Brocade Gen 5 switches offer extensive diagnostic and troubleshooting features. Automated management capabilities help increase resiliency and simplify management.

Meet growing demands for IT without adding size, cost or complexity

As demand for enterprise IT resources continues to grow, your organization needs ways to meet the needs of business groups and users while accommodating a tight budget and limited resources. Combining Dell PowerEdge blade servers, Dell Compellent Storage Center arrays and Dell - Brocade Gen 5 Fibre Channel networking solutions can help you build a modern infrastructure that delivers exceptional performance, scalability and reliability without expanding the size, costs and complexity of your data center.

[Learn more](#)

Dell PowerEdge M-Series blade servers:

Dell.com/us/business/p/poweredge-mseries-servers

Dell PowerEdge M1000e blade enclosure:

Dell.com/us/business/p/poweredge-m1000e/pd

Dell Compellent Storage Center:

www.dellstorage.com/compellent

Brocade Gen 5 Fibre Channel solutions:

brocade.com/downloads/documents/technical_briefs/brocade-gen5-tb.pdf

Dell and Brocade collaborative partnership:

Dell.com/brocade
brocade.com/dell

Dell and QLogic collaborative partnership:

qlogic.com/OEMPartnerships/Dell/Pages/DellOEMPartnership.aspx

¹ Gartner press release, "Gartner Identifies 10 Key Actions to Reduce IT Infrastructure and Operations Costs by as Much as 25 Percent," September 28, 2011, <http://www.gartner.com/newsroom/id/1807615>.

² Gartner press release, "Gartner Says Now More Than Ever Is the Time to Re-Imagine the Role of IT," October 17, 2011, <http://www.gartner.com/newsroom/id/1824816>.

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