



Dell Compellent Storage Center



PartnerDirect

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Dell Compellent Storage Center — at a glance

Next-generation architecture with built-in investment protection

Dell believes that storage should help you spend less while giving you the power to do more. Dell accomplishes this with a portfolio of products designed to keep your data dynamic as your business grows by putting the right data in the right place at the right time for the right cost., Dell Compellent offers self-optimized, intelligently tiered storage that helps you capitalize on business-critical data with enterprise-class performance, efficiency and scalability.

Why sell Storage Center?

Next-generation Dell Compellent offerings provide customers with a unified platform for block and file data while building on the agility, efficiency and resiliency they have come to expect from Dell Compellent. Together, SC8000 and FS8600 allow customers to scale non-disruptively while enjoying long-term economic advantages for both block and file.

As your customer's IT environment scales, it results in repeat revenue for you — and the opportunity to become a true IT advisor for your customer.

01

Features and
benefits

“We used to spend 75% of our time on maintenance and just 25% on R&D. Dell Compellent has allowed us to do a complete U-turn.”

– Jim DiMarzio, CIO, Mazda

The Dell Compellent Storage Center SAN is an all-in-one storage array that allows organizations to actively manage data, based on data access patterns, at a highly granular level using built-in intelligence and automation features. Storage Center actively manages and moves data in a virtual pool of storage, regardless of the raid type, or size and type of block, file or drive. Enterprises can help simplify management, improve performance for critical applications and reduce complexity and costs.

Leveraging 12 generations of design experience, the Dell Compellent SC8000 controller offers high performance and memory, advanced power efficiency and proactive diagnostics.

The Dell Compellent FS8600 NAS solution provides an extremely agile platform for constantly evolving block and file storage requirements. Performance and capacity scale non-disruptively to accommodate growing storage needs without forcing a platform rip-and-replace. The scale-out architecture supports a single namespace up to 2PB manageable space with two Storage Center arrays. Load-balancing continually optimizes performance as the FS8600 system scales.

Together, Dell Compellent's block-level intelligence, storage virtualization, integrated software and modular, flexible hardware enable a cost-efficient enterprise storage infrastructure that delivers exceptional performance, efficiency, and scalability.

Next-generation Dell Compellent ecosystem

Controller: SC8000

- Built-in intelligence, agility and automation
- No forklift upgrade and perpetual licensing
- FC, iSCSI and FCoE front-end interconnects



NAS: FS8600

- Resilient Dell hardware built specifically for Fluid File System
- Scale-out file solution that easily grows to accommodate changing storage needs
- Supports up to 2PB single namespace



Enclosure: SC200, SC220, all-flash solution

- SSD, SAS and FC drive technologies
- 80@ PLUS Silver Certified power supplies
- Tier data with both read and write intensive SSDs for applications that require high IOPs

Enclosure: SC280

- Densest enclosure available from any major SAN vendor
- Reduces OPEX by storing more data in smaller footprint
- Ideal for large-scale file applications, replication targets and bulk archive storage solutions

Agility with the future built in

Show your prospects what Storage Center can do for them by highlighting key features and benefits.

Storage Center and the FS8600 NAS solution provide a flexible SAN and NAS architecture that scales easily and supports evolving technology and business needs. Next-generation Compellent architecture adapts without artificial limits, restrictions or complexities. Grow as your business requires without fear of technology limitations.

Feature	Benefit
Enhanced VMware integration	Offers consistent progression of VMware integration improvements including new primitives for vStorage APIs for Array Integration (VAAI) to provide finer granularity for broader scale in virtual environments.
Optimize as you grow	Continually optimize performance and data placement as the system scales.
Advanced thin provisioning	Separates storage allocation from utilization, enabling customers to allocate any size volume upfront yet only consume physical capacity when data is written. Customers can also reclaim capacity that is no longer in use by applications.
Perpetual software licensing	Pay only once for features—even across hardware upgrades.
Open, agile hardware	Greater scalability for block and file from industry-standard hardware, helping customers avoid rip and replace. Add new technology without downtime or disruption. Flexible memory and connectivity options help accommodate unforeseen growth.
64-bit architecture	Enable highly-scalable block and file storage capacity.

Efficiency designed to drive down your total cost of storage

Having separate solutions for your block and file data is costly and inefficient. Storage Center and FS8600 combine to deliver a single platform for block and file built on the efficiency and intelligence of Compellent's patented architecture. Budget for your business by optimizing your back-end storage costs.

Feature	Benefit
Automated tiered storage	Lower TCO of storage for both block and file environments by freeing up space on high performance drives.
Data placement optimization	Purchase and use fewer high-performance drives without impacting application performance.
Thin Replication	Help lower storage capacity, bandwidth and management costs, and deliver multi-site replication without the traditional cost or complexity.
Enterprise Manager	A unified, point-and-click user interface that cuts administration time and eliminates the need for specialized administrative skills.
Efficient SAN and NAS platform	Avoid the complexity and overhead of separate solutions for file and block.
Data Progression	Continually optimize performance and data placement as the system grows that can help slash storage costs significantly. On-demand Data Progression can tier data from write-intensive single-level cell (SLC) SSDs to less-expensive, read-intensive multi-level cell (MLC) SSDs.

Resiliency to help ensure business continuity

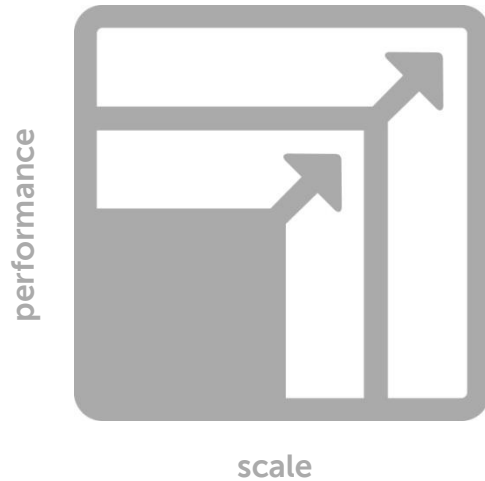
Next-generation Dell Compellent offerings provide a fully integrated set of reliability features to help you focus on your business needs without worrying about the reliability of your storage. Ensure business continuity through a resilient, highly-available solution paired with award-winning support.

Feature	Benefit
High availability	Dell Compellent's Storage Center system can provide up to five nines of availability (99.999% availability) with a 12 hour support option. ¹
Live Volume	Migrate storage to follow the movement of virtualized servers to optimize performance and eliminate downtime in virtual environments.
Point-in-time recovery	Replication is synchronous (short distance) or asynchronous (long distance); asynchronous replication uses snapshots to maximize the number of available recovery points.
Multiple configurations	Enable replication in bi-directional point-to-point or multipoint configurations.
Disaster recovery	All disaster recovery sites active and available for recovery.
Continuous snapshots	Replicate to any level of granularity.
Copilot Support	Proactively address concerns before they become issues with industry-leading, award-winning Copilot Support—a 96% customer satisfaction rating ² .

¹*Results based on March 2013 internal Dell testing with actual MTBF calculated from a run time total of 26 million+ hours (accumulated by 6724 systems). Run time and availability impacting failures for a 6 month period from 8/2012 thru 1/2013. Estimated weighted average MTTR of 6.6 hours for 12 hour part SLA. Actual performance will vary based on configuration, usage and manufacturing variability.

² Results based on Dell analysis of online surveys, 2009- 2013

Leveraging Fluid File System



- Multi-platform file solution expands across Compellent and EqualLogic arrays
- Scales capacity and performance easily and non-disruptively without architectural limitations
- Provides single scalable namespace for easy administration regardless of cluster size
- Based on Dell IP with a dedicated roadmap

EqualLogic

FS7600
FS7610

Compellent

FS8600

Extending Compellent efficiencies to NAS



Compellent Storage Center coupled with the innovative Dell Fluid File System (FluidFS) technology, the FS8600 enables highly efficient file storage through a single virtualized platform, avoiding the overhead and complexity of two solutions. Users can keep CAPEX and OPEX in check while leveraging Compellent's industry-leading block-level efficiencies for their file storage needs.

The Fluid File System is a clustered file system that avoids the architectural limitations of traditional file systems by allowing storage capacity and performance to be increased within a single namespace as needs grow over time.

Both storage capacity and performance can be scaled non-disruptively, avoiding the need for a painful and expensive platform rip-and-replace. Fluid File System also supports a variety of reliability features to ensure robust data protection and high availability.

The Dell Compellent FS8600 with FluidFS has better file OPS performance at approximately 1/3 the price of the market leader.¹

The FS8600 is also the industry's first primary storage solution with policy-drive variable block data reduction, which can decrease the storage capacity needed for common enterprise data by 48%.

Key Features – Fluid FS Version 3

- Simple, flexible scale-out NAS that lowers customer TCO
- Scales capacity and performance easily and non-disruptively without forklift upgrades
- Avoids architectural limits of traditional file servers or all-in-one controllers
- Ensures efficiency by leveraging a shared infrastructure for block and file data
- Provides block access to the SAN for maximum performance
- Delivers a highly-available solution with Active-Active controllers deployed in multiple pairs to scale performance
- Industry-leading price – performance
- Policy-based dedupe and compression

Source: *Performance results based on SPECsfs2008_nfs.v3 testing comparing Dell Compellent FS8600 using 8-node, 24 SLC and 120 eMLC SSDs configurations. Actual performance will vary based on configuration, usage and manufacturing variability. Pricing results based on May 2013 internal Dell comparison.

Gartner calls out Isilon as the market leader in their magic quadrant for disk storage: "Leading storage vendor" as identified by those organizations in the Leader quadrant of the Gartner Magic Quadrant for General-Purpose Disk Arrays.

02

Selling Storage
Center

Why sell Storage Center?

Gain repetitive revenue opportunities

With Dell Compellent, you only have one model to sell. Customers can easily add capacity and capabilities throughout the lifecycle of the product as business requirements change. This makes it easy for you to sell additional capacity, turn on new features, deliver seamless upgrades and generate continuous revenue.

Offer your customers a differentiated product vision

When your customers purchase Dell storage products, they are investing in the future of their data center. Unlike with legacy storage vendors, your customers will not need to rip and replace their systems when incorporating new technologies. The result: you become a trusted IT advisor, who helps meet their needs over the lifecycle of their system.

1

Stage Setting

Most companies spend 70% or more of their time, money and mindshare keeping things going.

2

Conflict

Legacy storage makes it hard to keep pace.

3

Resolution

Dell Compellent Storage Center offers an all-in-one storage array that allows organizations to actively manage data using built-in intelligence and automation.

4

Outcome

- Improve performance for critical applications
- Reduce storage complexity and costs
- Scale block and file to meet demand
- Continuously protect data from downtime and disaster
- Future-proof technology investments

Selling SC8000—feature function benefits

Key Features	Function	Benefit
What is it?	What does it do?	Why should the customer care? Are you adding features to close a competitive gap?
Memory Options	16GB and 64GB controller memory options 32GB or 128GB total memory per controller pair	<ul style="list-style-type: none"> Enables larger read cache for greater future performance gains, and larger page pools for greater future scalability Closes competitive gap with EMC, who has promoted greater than 32GB of cache against Compellent 6GB max
Capacity Scale	Each system supports up to 960 SAS drives. The maximum usable capacity supported by a system varies based on configuration.	<ul style="list-style-type: none"> Allows for non-disruptive, pay-as-you-grow capacity scaling
Platinum-related power supplies	Redundant hot-swappable 80 PLUS® Platinum certified high-efficiency power supplies	<ul style="list-style-type: none"> Prevent Storage Center controller from down-time due to a power supply failure
PCIe Gen3 IO Slots	Internal bandwidth for IO cards increases by 100%, bandwidth performance capability of IO cards doubles from x8 32Gb/s to x8 64Gb/s	<ul style="list-style-type: none"> Improves performance of IO cards to increase the performance of the Storage Center to provide faster reads and writes
Fresh Air Support	Operate at higher temperatures or chiller-less environments	<ul style="list-style-type: none"> Estimated capital expenditure savings of \$3M per MW of IT Potential annual operating savings of \$100–\$275K per MW of IT
Integrated Dell Remote Access Controller (iDRAC) 7 Enterprise Support	iDRAC provides hardware and environmental monitoring capabilities to the Storage Center software	<ul style="list-style-type: none"> Enables improved diagnostics and remote troubleshooting capabilities by providing proactive alerts and quicker time to resolution
Mixed multiprotocol network connectivity support	8Gb, 16Gb FC, 10Gb FCoE 2-port Copper, PCI Gen 2.0 and 1Gb & 10Gb iSCSI simultaneous front-end connectivity	<ul style="list-style-type: none"> Allows the customer to choose the connectivity protocol based on their needs, without investing in multiple systems just for different protocol support
Compellent Support*	Award-winning Copilot support	<ul style="list-style-type: none"> Customers get immediate access to a live Copilot engineer for any type of support issue or question from a renowned support organization

*Dell Copilot Support received a 96% customer satisfaction rating for over five years in a row.

*Results based on internal Dell analysis of online surveys, 2009- 2013.

Know your prospects

Ideal for:

"We are so thrilled with the cost reduction. We save about 60% every month – about \$120,000 to \$130,000 a year."

- Matthew Gentile, CFO, The Truland Group, United States

Mobile worksites around the world. Lower risk and labor costs

IT environment:

"We expect to save thousands of dollars each month in operational expenditures by migrating our SQL Server databases from leased EMC arrays to Dell Compellent arrays."

- Thirumala Kommineni, Database Admin., Dell

Dell wanted to expand its product offerings, boost service and save money with a new database storage solution.

IT environment:

"Dell provided us with a one-vendor solution for everything."

- Stephen Hart, Director of IT Architecture, Dreyer Medical Center

Aging server and storage platform reached its end of life and was unable to keep pace with the clinic's growth and performance requirements..

Identifying opportunities

When speaking with your target prospect or current customer, highlight the key benefits that will best meet their needs.

Target	Opportunity	Benefit
Prospect	Needs a system upgrade from a legacy platform	<ul style="list-style-type: none">Storage Center is built on a single platform that scales as business needs change, eliminating the need for rip and replaceEasily add new technologies as they become available without disruption or downtime
Prospect/ Customer	Needs to cut costs and improve performance	<ul style="list-style-type: none">Existing customers can maximize low-cost, high-performance drives without a hardware upgrade by activating Data Progression performance tuningThe innovative Dell Compellent Flash-optimized solution offers up to an approximate 2x price advantage over competitive hybrid solutions and up to an approximate 5x price advantage over competitive all-flash solutions.*
Customer	Needs to minimize manual administration	<ul style="list-style-type: none">Use Enterprise Manager to streamline system management, reduce administration time and help reduce operating costsIncrease IT productivity with built-in intelligent automation—set policies and let the system runOptimize data placement by tier/RAID level and support capacity planning, robust reporting, and storage chargebacks
Customer	Wants to avoid the complexity and overhead of separate solutions for file and block	<ul style="list-style-type: none">Optimize cost and data placement for both block and file environments with industry-leading automated tieringShared back-end infrastructure eliminates need to carve spindles separately

Questions to ask prospects

-
- What projects or applications will impact your storage needs in the next six months? In the next three years?
-
- Do you have virtual servers? Are you looking to virtualize your storage or desktop environment?
-
- Do you have problems with unutilized or underutilized space?
-
- What backup and recovery issues are you facing?
-
- Do you have any storage equipment reaching capacity or end of life?
-
- If project is planned within six months is budget approved? How much?
-
- Are you in years 4 or 5 of your existing support contract?
-

Handling objections

Potential Objection

Counter Response

How can I be sure that a forklift upgrade will never be necessary?

- Customers can take advantage of automated tiered storage without requiring an upgrade to a new controller model
- Adding functionality to an existing Storage Center SAN is as easy as activating that particular built-in software module

Everyone says their solution saves money. Can you back up your cost savings claims?

- Dell Compellent can reduce your total storage software costs up to 96% and your total hardware costs up to 44% compared to traditional storage over a 10 year period*
- Compellent installations tended to have a 96% longer productive life span than other storage solutions. Organizations in the study were replacing Compellent solutions every 6.9 years compared to 3.5 years for their other storage environments.*

Do I really need that high of a level of granularity? What's the benefit over competitive solutions?

- Dell Compellent manages and migrates data as highly granular 2MB blocks and then moves just the small pages that include those blocks to the appropriate tier or RAID level, creating a finely tuned tiered storage environment
- Using small pages increases the efficiency of data movement since it is more efficient to read, write and migrate small pages than larger ones

It sounds like management and set up can be complex and time-consuming. How easy is it?

- Storage Center is designed to help administrators manage more data in less time. This is largely because of built-in efficiency and intelligent automation. It also features an intuitive, point-and-click interface that provides a complete view of the entire storage environment.
- There is no need for specialized skill sets or ongoing systems training. Wizards guide users through system setup and application configuration, making even advanced operations simple and straightforward.
- Storage consumption and usage trends are automatically monitored and displayed, eliminating the need for manual capacity planning. Storage Center even generates executive summaries, cost-savings calculations and utilization chargeback reports with just a few clicks.

*Source: Based on 2013 Dell internal TCO tool analysis

*Source: 2012 Dell-sponsored IDC whitepaper, The Business Value of Dell EqualLogic and Compellent Primary Storage Solutions (External use requires permission from IDC)

Differentiating the FS8600 in a competitive market

Key differentiators of the Compellent and FluidFS solution:

Scale out architecture;
performance and
capacity to be scaled
independently

Flexible architecture
and perpetual software
licensing offers **non-
disruptive scaling** and
avoids platform
rip-and-replace

Single namespace;
managing a single
namespace up to 2PB

- File servers lack features, can't scale performance and don't offer robust data protection
- NetApp and EMC force customers to upgrade to a new generation platform upon reaching system capacity limitations

Use case:

Microsoft Exchange Server

The ability to automatically classify and migrate inactive portions of an Exchange Server database at the block level onto lower-cost drives is a key advantage of the intelligent features of Storage Center.

Advantage: Storage Center identifies inactive blocks of data in an Exchange Server configuration and automatically migrates those blocks off an expensive storage tier to a lower cost tier of storage.

Scenario: When configuring storage for Microsoft Exchange Server, administrators typically focus on low-latency response requirements and store all Exchange Server-related data on expensive high-performance disks—even though 80 percent or more of it is inactive and does not require the fastest spindles available to deliver high write performance.

The result: Administrators can easily place Exchange Server databases on multiple tiers of storage, reducing the overall system costs while maintaining a high level of performance.

Use case:

Oracle

Built-in intelligence helps ensure that data is spread evenly across all spindles at all times, minimizing micromanagement of the storage subsystem to maintain performance of the database.

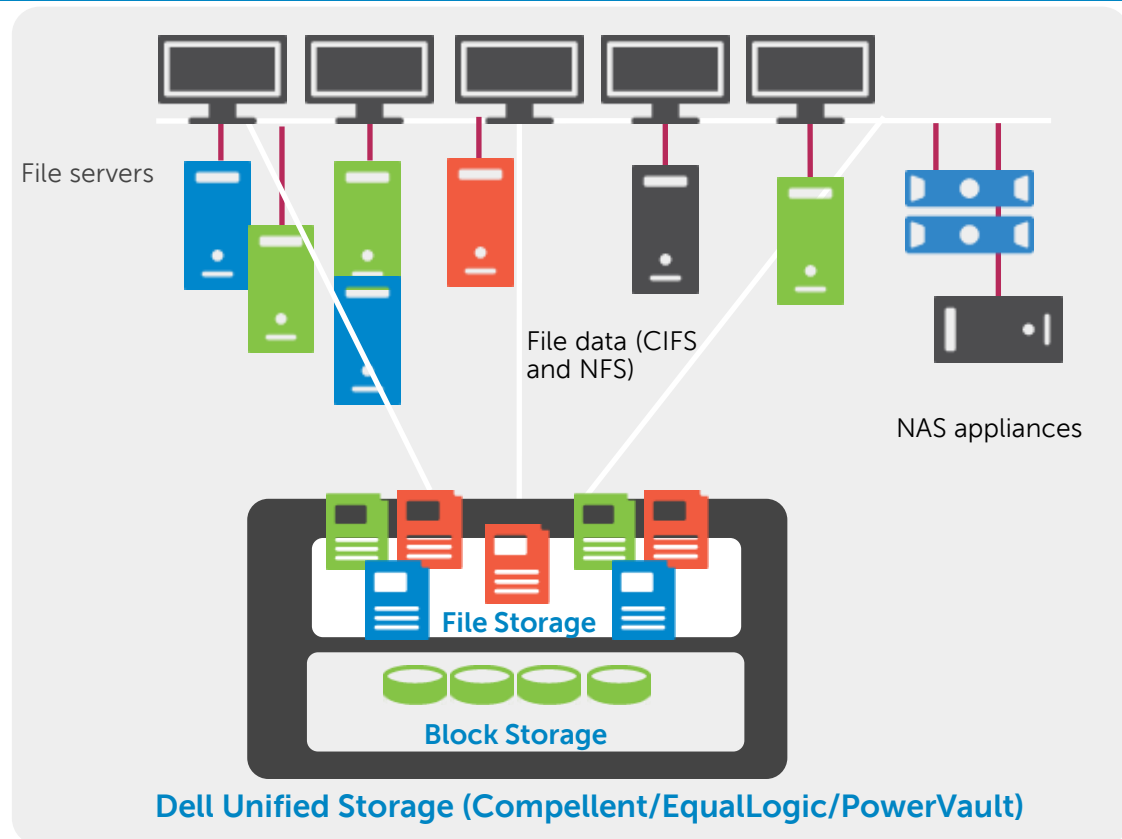
Advantage: Storage Center records and tracks specific information about every block of data. Information about the blocks is gathered without system overhead but is extensive, including time written, the type of disk drive used, the type of data stored, RAID level and more. All of these use characteristics enable Storage Center to take an intelligent approach to storing, recovering and managing data.

Scenario: The critical information contained in an Oracle database is frequently used to establish business success, making fast storage access essential. But simply dedicating more drives with the fastest spindles often won't deliver the necessary performance. Traditional storage systems are prone to "hot spots" because the same areas of specific spindles continually receive I/O requests from the distinct application for which they were provisioned. Administrators must spend a significant amount of time tuning performance. Virtualizing at the disk level eliminates these "hot spots" and increases performance by spreading server access across all drives in the system.

The result: Companies that harness the power of Oracle with the intelligence of Storage Center create a dynamic database infrastructure that is cost-effective and easy to manage. Administrators spend less time micromanaging storage to keep business-critical database performance high.

FluidFS Use Cases: File Server Consolidation for File Shares and Home Directories

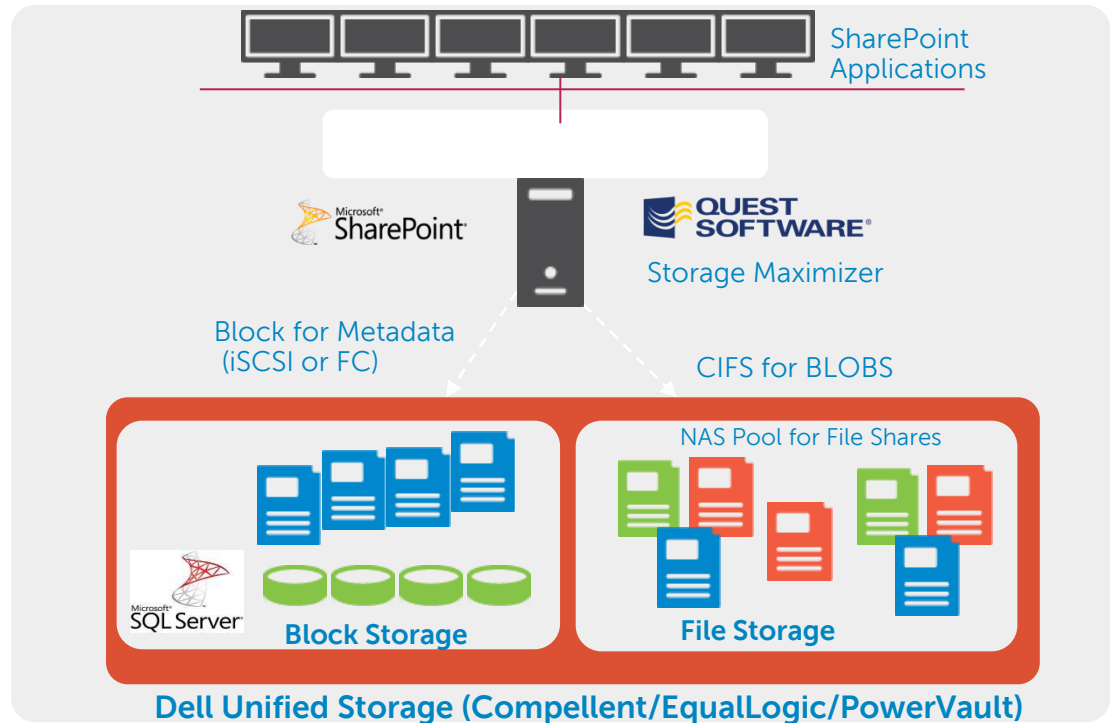
- Easy scale-out of capacity and performance reduces costs and drives efficiencies
- Benefits of automated tiering extended to NAS from back-end SAN storage
- Ability to add additional storage on-demand with no downtime
- Centralized management and streamlined backup



- **Challenge:** 1) Environments with a sprawl of CIFS and NFS file servers and legacy NAS devices; 2) Silos of storage limit access to business information; 3) Complex data migration, backup and management; 4) Limited scalability.
- **Solution:** File servers and traditional NAS devices are consolidated on a single Dell FluidFS storage platform.

FluidFS Use Cases: Sharepoint Storage Optimization

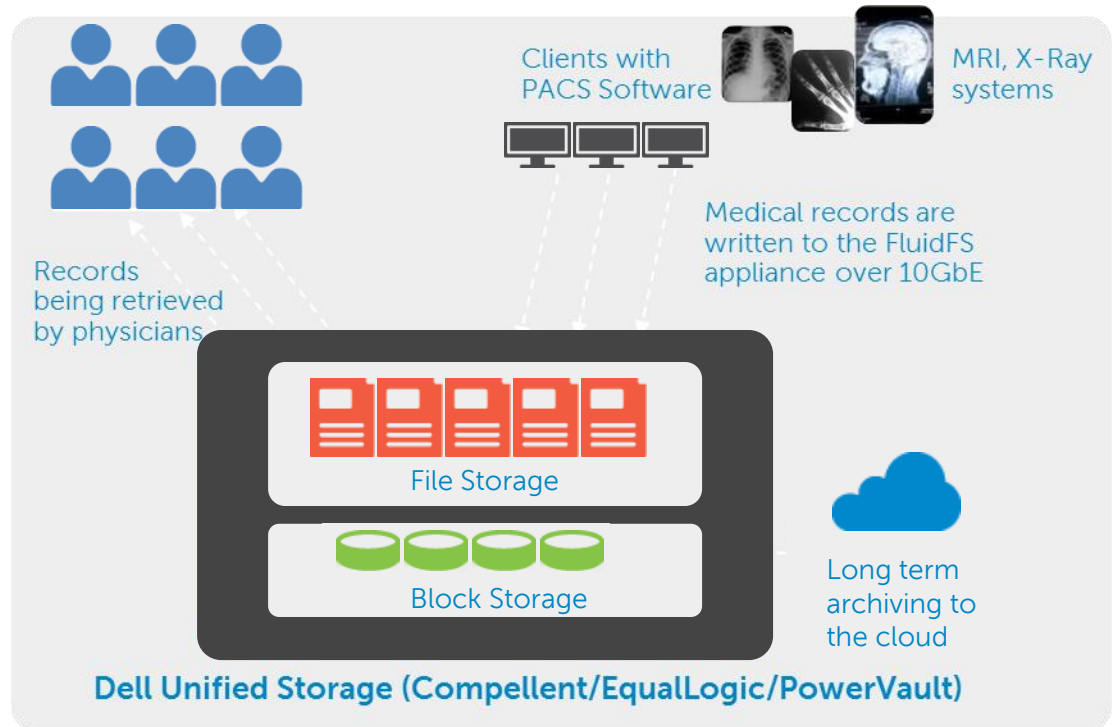
- Optimized performance and capacity by offloading SharePoint files to external storage repositories
- Maximized metadata and file workload concurrency
- SQL is now running optimally serving the metadata workload
- Unified platform for SharePoint storage, scalable block storage for SQL and CIFS for files



- **Challenge:** SharePoint files are stored in SQL. As the repository grows, SharePoint requires more SQL capacity, leading to database sprawl, data protection challenges, limited scalability, fragmentation, and I/O constraints.
- **Solution:** SharePoint storage environment is optimized by externalizing data to a Dell FluidFS storage with Quest Storage Maximizer.

FluidFS Use Cases: Medical Data Archive

- Scale-out performance for medical record storage and retrieval
- Fast retrieval of records by physicians
- Single namespace up to 2PB simplifies management
- HA architecture guarantees business continuity
- Multi-protocol access for NFS and CIFS clients



- **Challenge:** Primary PACS cache and long-term image archiving for a hospital radiology department overflow with digital patient records. Writing new records takes time, resulting in slow retrieval by doctors and system downtimes.
- **Solution:** Servers running PACS software write millions of patient records at high speeds into the Dell FluidFS storage. Records are now easily and reliably accessible to doctors from their workstations.

Sample solutions:
American University

American University's challenge was to consolidate over 1000 UNIX, Linux and Windows server and upgrade maxed-out storage system.

Solution: Deploy 8 clustered Dell PowerEdge R810 servers and Dell Compellent Storage Center SAN. Virtualize server environment with VMware and Oracle and Microsoft SQL databases.

Developers are spending less time fixing problems and more time developing so we've improved quality assurance for our end-users.

Sample solutions:
South Carolina Office of the
Attorney General

South Carolina Office of the Attorney General installed a Dell Compellent SAN with automated tiered storage to retain 25 years of criminal case-related data. They now pay \$46,000 less per year for faster access to case data helping to move from reactive storage management to an "active management strategy".

Cross-sell/up-sell: Automated Tiered Storage

- Unlike the many newcomers to the storage tiering market, Dell Compellent engineered its Storage Center SAN from the ground up to include an advanced automated tiering feature—Data Progression.
- This software automatically migrates data to the optimum storage tier and/or RAID level based on actual use and performance needs—without technology add-ons or manual intervention. Customers simply activate the feature and let it run.
- Customers and prospects that are running multiple tiers of storage, looking for best in class TCO, and need to simplify storage management are candidates for automated tiered storage.

Cross-sell/up-sell: Thin Provisioning

- All Storage Center SANs include Dell Compellent Dynamic Capacity—or thin provisioning—which completely separates allocation from utilization by only consuming physical disk space on write.
- Data Progression enhances the efficiencies inherent to Dynamic Capacity, enabling organizations to realize the greatest storage efficiency possible.
- Customers and prospects that need to shrink their data center footprint and contain costs while accommodating rapid data growth are excellent candidates for thin provisioning.

Cross-sell/up-sell: Live Volume

- Live Volume continuously protects data from downtime and provides high availability in virtualized data centers and the cloud.
- Live Volume combines volumes hosted on two Storage Center SANs and manages them as a single storage object. The source and destination volumes are mapped to the servers as a single volume and can continually process reads and writes. This new level of abstraction allows volumes to non-disruptively migrate from system to system.
- Customers and prospects that need additional ways to protect data and help eliminate downtime in virtual environments.

03

Specifications

SC8000 technical specifications

SC8000 Technical Specifications

Product Operating System	Storage 6.1 or later
OS Support	Microsoft® Windows Server®, Oracle® Solaris, HP®-UX, Oracle Linux, IBM® AIX®, Novell® NetWare, SLES, Apple, HPTru64, VMware® Citrix Xen-Server, RedHat
Processor	Two 2.5 GHz Six-core (Sandy Bridge) Intel™ processors per controller
Storage Capacity	Each system supports up to 960 SAS drives. The maximum usable capacity supported by a system varies based on configuration. Each 3.5" SAS enclosure holds up to 12 SAS drives. Each 2.5" SAS enclosure holds up to 24 SAS drives.
Drive Interfaces	SAS and NL-SAS drives. Also backwards compatible with existing Compellent Fibre Channel and SATA drives. Different drive types, transfer rates and rotational speeds can be mixed in same system.
Chassis	Rack size: 2U Height: 87.3 mm (3.44 inch) Width: 482.4 mm (18.98 inch) with rack latches; 444 mm (17.08 inch) without rack latches Depth: 755.8 mm (29.75 inch) with bezel Weight: 19.73 kg (43.5 lbs)
Environmental Operating Conditions	Power: Dual, redundant 750W 80 plus® Platinum certified power supplies power supplies Maximum Power: 425W Heat Dissipation: 1450 BTU/hr rated Power Supply Operating Temperature: 50 - 95°F (10 - 35°C) Non-operating Temperature: -40 - 149°F (-40 - 65°C) Operating Humidity Ranges (non-condensing): Operating, 20% to 80% Non-operating Humidity (non-condensing): 5% to 95% Inlet Type: NEMA 5-15/CS22.2, n°42

SC8000 PCIe IO expansion

The following IO cards are available for purchase with the SC8000

IO Card	Connectivity	Card Height
6Gb SAS, 4 wide-port, PCIe Gen 2.0	Back-end	Full-height
6Gb SAS, 4-wide-port PCIe Gen 3.0	Back-end	Low-profile
16Gb FC, 2-port, PCIe Gen 3.0	Front-end	Low-profile
8Gb FC, 4-port, PCIe Gen 2.0	Front-end (back-end for legacy FC enclosure migration)	Full-height
8Gb FC, 2-port, PCIe Gen 2.0	Front-end	Low-profile
1Gb iSCSI, 2-port, PCIe Gen 2.0	Front-end	Low-profile
10Gb iSCSI, 2-port, Copper, PCIe Gen 2.0	Front-end	Low-profile
10Gb iSCSI, 2-port, Optical, PCIe Gen 2.0	Front-end	Low-profile
10Gb FCoE, 2-port, Copper/Optical, PCIe Gen 2.0	Front-end	Low-profile

SC280 Specifications

2 Drawer Design:

- 42 drives/drawer
- Hot insert drives
- Hot swap drives



Hot Swap Power:

- 2 Power Supplies
- 5 Fans

Density

5U (Rack Units)

Drive Type

3.5" 4TB 7200RPM

Min/Max Drives

84x 4TB (336TB raw) or
42x 4TB (168TB raw)

Enclosures per loop

2x SC280

Controller Support:

SC8000 at RTS, Series 40 Post RTS

Maximum # of Enclosures:

- 5 SC280 enclosures per system (400 active drives, 1.6PB raw)
- 4 spares per SC280

- Compatible with SC280 enclosures on the same loop
- SC280 can be on same HBA, but different loop than other enclosures:

SC200/SC220 and Legacy Xyratex 6Gb SAS enclosures

Configurations

Compatibility

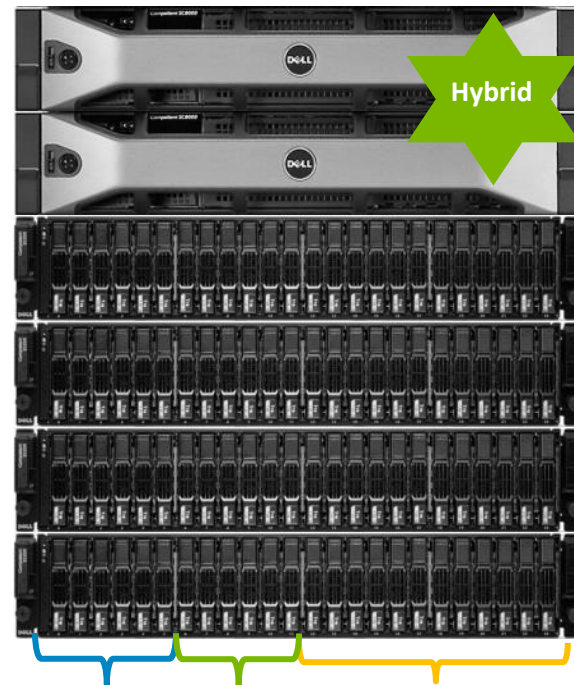
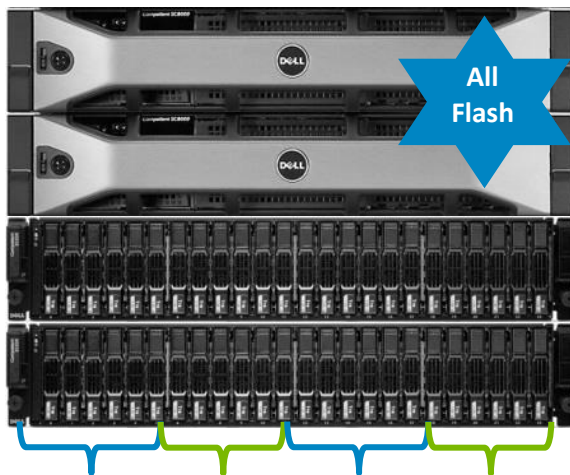
Flash Configurations

- **All-flash solution**

- SC8000 controllers
- Fibre Channel: 16Gbps & 8Gbps
- iSCSI: 10Gbps & 1Gbps
- FCoE: 10Gbps

- **SC220 flash enclosures**

- Create “All Flash” or Hybrid solution
- SC220 based
- Initially only sold as part of new SC8000 systems



SC200 and SC220 enclosures

The Dell Compellent SC200 and SC220 are new expansion enclosures based on Dell enclosure hardware with Energy Star power efficiency rating and Fresh Air Technology. The SC200 is a 2U 6Gb SAS enclosure that supports up to twelve (12) 3.5" disk drives. The SC220 is a 2U 6Gb SAS enclosure that supports up to twenty-four (24) 2.5" disk drives.

Max values	SC200	SC220
Height	8.7cm (3.43 inches)	8.7cm (3.43 inches)
Width	48.2cm (18.98 inches)	48.2cm (18.98 inches)
Depth	59.4cm (23.39 inches)	54.1cm (21.30 inches)
Weight	28.39 kg (62.6 lb) (maximum configuration) 8.84 kg (19.5 lb) (empty)	23.31 kg (51 lb) (maximum configuration) 8.61 kg (19 lb) (empty)
Wattage	700W 80 PLUS® Silver-certified power supplies, 450W maximum draw	700W 80 PLUS® Silver-certified power supplies, 475W maximum draw
Heat Dissipation	2,389 BTU/hr (at 700W) 1,536 BTU/hr Max	2,389 BTU/hr (at 700W) 1,621 BTU/hr Max
Voltage	100-240 VAC, auto sensing	100-240 VAC, auto sensing
Frequency	50/60 Hz	50/60 Hz
Amperage	8.6 A at 100 V, 4.3 A at 240 V	8.6 A at 100 V, 4.3 A at 240 V

Drives and connectivity

Disk Drives

SAS SSD (2.5-inch)	200GB SAS 400GB SAS
Fibre Channel HDD (3.5-inch)	300GB 15K RPM 600GB 15K RPM
SAS HDD (2.5-inch)	146GB 15K RPM 300GB 15K RPM 600GB 10K RPM 900GB 10K RPM 1TB 7.2K RPM 1.6TB read-intensive SSD
SAS HDD (3.5-inch)	450GB 15K RPM 600GB 15K RPM 2TB 7.2K RPM 3TB 7.2K RPM 4TB 7.2K RPM
RAID	Supports RAID 0, 5, 6 RAID 10, and RAID 10 DM (dual mirror). Any combination of RAID levels can exist on a single Storage Center. Multiple RAID levels can exist on the same storage tier within an array.

Connectivity

Front-end Connectivity	Fibre Channel (4Gb, 8Gb, 16Gb), iSCSI (1Gb, 10Gb), FCoE (10Gb) Simultaneous interface support
Maximum Front-end Ports	16 (Fibre Channel), 10 (1Gb iSCSI), 10 (10Gb iSCSI), 10 (FCoE) per controller NOTE: SC8000 controller can support up to 16 FC front-end ports with 4-port low-profile SAS back-end IO option
Back-end Connectivity	SAS (6Gb, 3Gb), Fibre Channel (2Gb, 4Gb, 8Gb)
Maximum Back-end Ports	16 (FC), 10 (SAS) per controller NOTE: No SATA ports, FC and SATA enclosures are connected to 8Gb Fibre Channel IO card

Enterprise software

Storage Center Core

Drive virtualization

Port virtualization

Server mapping

Drive optimizer

Thin import

Application optimizer

Copy-mirror-migrate

Boot from SAN

Heterogeneous OS

LUN masking

Performance monitoring

Unified user interface

System administration

Remote monitoring/phone home

Storage Center Licensed Features

Data Instant Replay

Remote Instant Replay

Dynamic Capacity

Data Progression

Fast Track

Dynamic Controllers

Enterprise Manager

Multipath Manager for Microsoft Servers

Replay Manager

Live Volume

FS8600 technical specifications

FS8600 Technical Specifications

Form Factor	2U
Power Supplies	2 PSUs per appliance, 717W, 115-230 VAC
Backup Power Supply	1 battery per controller, 2 batteries per appliance
CPU	Dual Intel E5620 4 core / 12MB L3 / 80W / 2.4GHz per controller
Memory	24GB DDR3 1066 MHz per controller (48GB per appliance)
Back-end Connectivity	2x8Gb FC ports per controller (switch required)
Front-end Connectivity	1GbE version: 4x1GbE ports per controller, 10GbE version: 2x10GbE ports per controller
Protocols	CIFS/SMBv1.0, SMBv2.1, NFSv3, NFS v 4 Active Directory, LDAP, NIS, NDMP, SNMP
Clustering	Single namespace for up to 4 appliances (8 controllers), active/active clustering for controller pairs
Maximum Storage Capacity	2 PB usable file capacity per NAS controller (with two Storage Center systems and SCOS 6.x)
Storage Center Requirements	Max number of Storage Center systems: 2, Supported controllers: Series 40 and SC8000, Supported SCOS versions: 5.5.6, 5.5.10, 6.2.3, 6.2, 6.3, 6.4 Minimum Enterprise Manager version: 6.2
Replication	Asynchronous to peer FS8600 appliance(s), like-to-like configurations only
Snapshots	Redirect-on-write snapshots, user-accessible over the network, thin volume cloning
Deduplication/compression	Post-process policy-based variable block (128KB +/- 64KB) data deduplication and LZPS compression per NAS volume
Automated Tiering	Compellent Data Progression applied to NAS Pool
Thin Provisioning	File-level and block-level with Compellent Dynamic Capacity
Space Reclamation	Not supported
Management	Enterprise Manager and Fluid File System GUI
NDMP	Three-way via Ethernet ports
Antivirus	ICAP, Symantec ScanEngine 5.2 and Protection Engine 7.0; McAfee Scan Enterprise 8.8 and Enterprise for Storage 1.0.2, Sophos Endpoint Security and Control 10.0; TrendMicro InterScan Web Security Suite 3.1
Boot Options	Local boot

Compellent NAS portfolio feature comparison

Features	NX3000*	zNAS	FS8600
FE Connectivity	4x1GbE or 2x10GbE	4x1GbE or 2x10GbE	4x1GbE or 2x10GbE
SMB	v2.0 & v2.1	v1.0	v1.0
NFS	v2 & v3	v2, v3 & v4	v3
Single Namespace	No	No	Yes
Replication	Block-level and DFS-R	Block-level	FluidFS asynch
Dedupe	SIS	No	No
Snapshots	Yes	Yes	Yes
Management	Microsoft GUI	EM & zNAS GUI	EM & FluidFS GUI
Thin Provisioning	White space reclamation	File-level	Block-level
NDMP	Not native	Remote	Remote
Antivirus	Not native	No	Yes (ICAP)
Boot Options	Local boot	Boot from SAN	Local boot
Clustering	Active/active, up to 4 nodes	Active/active, up to 2 nodes	Active/active, up to 8 nodes

* The Compellent-specific NX3000 is being replaced by the generic NX3300 (WSS2008R2 on 12G hardware).

FS8600 scalability specifications

Max values	Single appliance (2 controllers)	4 appliances (8 controllers)
Max system size	1PB	1PB
Max file size	4TB	4TB
Max number of files	64 billion	128 billion
Max file name length	255 bytes	255 bytes
Max number of directories	34 billion	68 billion
Max directory depth	512	512
Max NAS volumes	256	1,024
Max snapshots per volume	512	512
Max snapshots per cluster	10,000	10,000
Max replication policies	100	100
Max NFS mounts	1,024	1,024
Max CIFS shares	1,024	1,024
Max CIFS concurrent client connections	1,500	6,000
Max quota rules (user quotas)	100,000	100,000
Max quota rules per volume	512	512

Proactive support

Dell Compellent Copilot Support goes beyond traditional support offerings with the right combination of proactive processes, personal support and professional expertise to help ensure the satisfaction of every customer.

Feature	Dell Compellent Copilot Support		
Support Options	24x7 Support, Next Business Day Response	24x7 Support, Next Business Day Response	24x7 Support, Call Center Only
Call Center Support	24x7 Support Center	24x7 Support Center	24x7 Support Center
On-site Response	Priority (4-, 8- or 24-hour)	Next Business Day	—
Parts Delivery	Priority (4-, 8- or 24-hour)	Next Business Day	UPS Ground
Software Releases	Perpetual Software Licensing	Perpetual Software Licensing	Perpetual Software Licensing
PhoneHome Technology	24x7 Monitoring & Response	24x7 Monitoring & Response	24x7 Monitoring & Response
Incident Fees	\$0	\$0	Time & Material