DELLEMC

Dell Storage SC9000

DELL STORAGE
SC9000 ARRAY CONTROLLER

Ultimate in storage performance, efficiency and scalability

OPTIMIZING THE CORE OF BUSINESS

The SC9000 storage controller, the flagship product in the SC Series family of arrays, provides the ideal solution for large-scale systems, high-end workload performance and distributed data center environments. Whether you're building a private or hybrid cloud, a big data analytics center or a secure OLTP platform, SC9000 gives you quick, strong return on investment by optimizing, accelerating and protecting the data that's most important to your business goals.

SC9000 builds on the success of the popular SC8000 Series arrays with a fully upgraded, more scalable hardware platform powered by the robust new SCOS 7 operating system.

MANAGE STORAGE AT THE DATA CENTER LEVEL

Each SC9000 offers modular expansion to over 3PB raw SAN and/or NAS capacity, and can also be linked with other SC Series arrays in larger federated systems under unified management. Federation helps you elevate and abstract data control and resource utilization across a broader environment.

Live Migrate, included with the base array, acts as a "storage hypervisor," allowing you to move volumes non-disruptively between arrays without remapping hosts or impacting data protection. Volume Advisor protectively monitors clustered arrays for the best data placement based on customizable performance and capacity policies.

FLASH AND HYBRID PERFORMANCE POWERHOUSE

All-flash and hybrid SSD/HDD configurations can revolutionize the speed and impact of your mission-critical applications. The ability to apply write- and read-intensive SSDs within the same volume, plus add an ultra-dense HDD tier at any time, gives SC9000 flexibility to target a variety of mixed-workload performance requirements. You can easily evolve from one configuration to another without having to replace drives.

New 12Gb SAS back-end and flexible front-end network connections provide plenty of throughput headroom for growth, making the advantages of SSD storage practical at any scale.

AUTOMATED COST-SAVINGS AND EFFICIENCY

Yet even as it cranks up performance, SC9000's intelligent architecture constantly tunes your environment for economy. Patented Data Progression auto-tiering leverages diverse drive types (write- and read-intensive SSD, HDD), using each to its best advantage while optimizing data placement according to real-time access patterns.

Thin methods are active by default, and RAID levels are dynamically provisioned, adjusting and rebalancing automatically to help you achieve your most aggressive application objectives with the fewest drives possible.

INTELLIGENT DATA REDUCTION

SC Series arrays provide the most comprehensive data reduction, applying deduplication and compression dynamically to data at the right point in its lifecycle to maximize both performance and cost savings.[3] For example, 10:1 capacity reduction in VMware® environments drives real budget savings you can reinvest in your business.

ALWAYS AVAILABLE STORAGE

Designed for today's non-stop business environments, SC Series' innovative Live Volume feature now offers seamless disaster recovery with transparent auto-failover to synchronized standby volumes on another array. Workloads continue to run during unplanned outages, with zero downtime or administrative intervention.[4]

Better still, when a failed array comes back online, the high-availability environment is efficiently and automatically restored. And the entire solution is native to the array itself — no additional virtualization hardware or software is needed.

IRONCLAD SECURITY

SC9000 protects data from theft, loss or unauthorized access with optional self-encrypting drives (SED), providing failsafe data-at-rest encryption without impacting performance or other advanced capabilities. Dell encryption is FIPS 140-2 certified to meet the most stringent requirements for government data centers, and is also ideal for healthcare, finance or any business with significant intellectual property.

Available in SSD and HDD formats, Dell SEDs automatically lock on power down or removal from the array. Unlike other solutions, SC Series SEDs may be deployed securely in all or just a portion of the array, allowing incremental phase-in of encryption technology in your environment. Leading industry standard external key management services are supported.

MODULAR, PROVEN PLATFORM

Redundant, hot-swappable components make SC9000 a resilient, flexible and easy-to-deploy solution. The 2U controller unit functions in active/active pairs for maximum performance and availability. Adding capacity is simple, with five supported expansion enclosure options — including two new models with 12Gb SAS interconnect.

Each SC9000 controller includes 6 dedicated I/O slots (12 per array) for high-bandwidth expansion and connectivity to Fibre Channel, iSCSI and FCoE SANs, and can simultaneously support file storage via the optional FS8600 NAS appliance.

THIRD-PARTY INTEGRATIONS

As a premiere global solutions provider with a huge install base, Dell has the industry touch-points to ensure support for the applications you need. Application Protection Manager Suite, for example, provides application-consistent snapshots in Oracle, VMware and Microsoft environments. Microsoft® Azure Site Recovery support enables VM failover between two private clouds, and VMware Metro Stretch Cluster support helps VMs "follow the storage" in the event of an array or site failure.

Additional VMware integrations, including a vSphere® plug-in, vCenter™ and VAAI support help you manage storage and virtual machines together — and the Microsoft Windows® PowerShell and RESTful APIs streamline system management with intuitive scripting interface options. See the SC Series Management spec sheet for more certified, validated platforms.

INVESTMENT PROTECTION

SC9000 customers can proceed with confidence, knowing they are deploying a truly future-ready solution.

- **SC Series tiering architecture** — Designed to incorporate new technologies faster and with less disruption.

- **Lifetime warranty on flash drives** — Full coverage while the array is under a support agreement, regardless of wear or maximum life rating.

- **No forklift hardware upgrades** — Fully modular architecture, including data-in-place SC8000 upgrades.

- **Simplified, evergreen software licenses** — Never pay twice for the same advanced features.

- **Award-winning Copilot support and Dell Deployment Services** — Ensure deployments go right the first time; proactive services resolve issues before they become a problem.

- **Coexists with PS Series (EqualLogic™) arrays** — Unified management and cross-replication extends and enhances the value of either platform.

Specifications

CHASSIS OVERVIEW	
PROCESSORS	Dual 3.2GHz 8-core Intel® Xeon® processors per controller
CONTROLLERS PER ARRAY	2 (active/active)
OPERATING SYSTEM	Dell Storage Center OS (SCOS) 6.7 or greater
SYSTEM MEMORY	256GB per controller (512GB total per array)
EXPANSION CAPACITY	
MIN/MAX DRIVES	6/1024[5] per array, more in federated systems[6]
MAX RAW CAPACITY (SAN)	3PB per array (SSD or HDD), more in federated systems[6]
MAX RAW CAPACITY (NAS)	3PB per array with optional FS8600 6PB in single namespace (with FS8600 and multiple SC9000 arrays)
STORAGE MEDIA	SAS and NL-SAS drives; different drive types, transfer rates and rotational speeds can be mixed in the same system • SSDs: write-intensive, read-intensive • HDDs: 15K, 10K, 7.2K RPM

EXPANSION ENCLOSURES	Mix and match from the following options
	• SC420 (24 2.5" drive slots, 12Gb SAS)
	• SC400 (12 3.5" drive slots, 12Gb SAS)
	• SC280 (84 3.5" drive slots, 6Gb SAS)
	• SC220 (24 2.5" drive slots, 6Gb SAS)
	• SC200 (12 3.5" drive slots, 6Gb SAS)

NETWORK AND EXPANSION I/O

PCIe GEN 3 SLOTS	7 per controller
	• 4 full-height (cache card consumes one)
	• 3 low-profile
	Any slot may be used for either front-end network or back-end expansion capacity connections
FRONT-END NETWORK PROTOCOLS	FC, iSCSI, FCoE (supports simultaneous multiprotocol)
MAX 16Gb FC PORTS	32 per array (SFP+)[5]
MAX 8Gb/4Gb FC PORTS	24 per array (SFP+)[5]
MAX 10Gb ISCSI PORTS	20 per array (SFP+ optical or copper card, BASE-T, iSCSI DCB, IPv6)
MAX 1Gb ISCSI PORTS	20 per array (BASE-T)
MAX 10Gb FCOE PORTS	12 per array (SFP+ optical or copper card, BASE-T)
BACK-END EXPANSION PROTOCOLS	12Gb SAS (auto-negotiates to 6Gb)
MAX BACK-END EXPANSION PORTS	32 per array[5]

FUNCTIONAL

ARRAY CONFIGURATIONS	All-flash, hybrid or HDD arrays
STORAGE FORMAT	Block (SAN) and/or file (NAS) from same pool[2]

DATA OPTIMIZATION

AUTO-TIERING METHOD	Policy-based migration based on real-time data usage, customizable 512KB-4MB page size
AUTO-TIERING STRUCTURE	Up to 3 primary (media-based) tiers total, up to 2 SSD tiers (write- and read-intensive SSDs)
TIERING CUSTOMIZATIONS	Default and user-defined profiles, option to "pin" volumes to any tier
RAID SUPPORT	RAID 0, 1, 5, 6, RAID 10, and RAID 10 DM (dual mirror); any combination of RAID levels can exist on a single array
RAID TIERING	Auto-provisions and dynamically restripes multiple RAID levels on the same tier; no need to pre-allocate RAID groups
THIN PROVISIONING	Active by default on all volumes, operates at full performance across all features
DEDUPLICATION AND COMPRESSION	Selectable option per volume on SSD and/or HDD tiers
	Compression-only option also available
HDD OPTIMIZATION	FastTrack moves frequently accessed data to outer tracks for quicker response times

DATA MOBILITY AND MIGRATION

REPLICATION	Synchronous/Asynchronous via FC or iSCSI
	Target/source relationships may be one-to-many or many-to-one
	Supports all SC data services on source and target volumes
	Change replication types and topologies on demand
	Supports cross-platform replication with PS Series/EqualLogic arrays (either direction)
VOLUME MOBILITY	Live Migrate (included with base product) enables host-transparent data movement between arrays;[5] see also Federation section
	Maintains snapshots/replication relationships
THIN IMPORT	Space-efficient, non-disruptive data migration from PS Series (EqualLogic) arrays
THIN CLONES	Clone standalone volumes with zero duplication of data
	Clones maintain independent snapshots and replication
	Ideal for VDI, test/dev, other applications that require discrete instances of common data
	More efficient than dedupe for database copies

DATA PROTECTION, DISASTER RECOVERY, SECURITY

BUSINESS CONTINUITY	Live Volume bi-directional auto-failover, auto-repair
	Continuous operations, disaster recovery, disaster avoidance
	Includes third-site (tertiary) replication options
	Zero RTO/RPO with customizable site failover SLAs per volume
	Does not require identical hardware at each site
	VMware Metro Stretch Cluster support
	VMware Site Recovery Manager
	Microsoft Azure Site Recovery support
THIN SNAPSHOTS	Records changes only, snapshots auto-migrate to lower-cost storage
APPLICATION DATA PROTECTION	Application Protection Manager Suite protects and restores host-side data from array in Oracle, Microsoft or VMware environments
DATA-AT-REST ENCRYPTION	Self-encrypting drives (SED) in SSD or HDD formats
	Full-disk encryption (FDE) based on AES-256
	Drives certified to FIPS 140-2 Level 2
	Key Management Server options available for FIPS 140-2 Level 1, 2 and 3
EXTERNAL KEY MANAGER SUPPORT	Gemalto's SafeNet KeySecure k460, SafeNet KeySecure k250, SafeNet KeySecure k150v
	Thales EMS 200

MANAGEMENT

MANAGEMENT INTERFACE	Dell Storage Manager (DSM), formerly Enterprise Manager
	Multi-array, multi-site, cross-platform management from single interface

FEDERATION	Create large multi-array systems under unified management, with seamless workload migration between arrays via included Live Migrate feature. Add arrays non-disruptively, efficiently utilizing their combined capacity and performance. Volume Advisor monitors federated arrays to suggest optimal data placement and load balancing. Volume movement does not impact snapshots or replication data protection. Federate like or unlike arrays: SC9000, SC8000, SC7020, SC4020.[6]
SCRIPTING SUPPORT	Microsoft PowerShell API, RESTful API
HOST OS SUPPORT	Microsoft Windows Server®, Oracle® Solaris, HP®-UX, Oracle Enterprise Linux, IBM® AIX®, Novel® NetWare®, SUSE® Enterprise Linux®, Apple®, HPTru64, VMware, Citrix® XenServer®, RedHat®
THIRD-PARTY APPLICATION INTEGRATION	VMware, Oracle, Microsoft, IBM, OpenStack™, Symantec™, CommVault®, Foglight™, Docker™; see the SC Series Management spec sheet for additional integrations and details
COEXISTANCE WITH PS SERIES (EQUALLOGIC) ARRAYS	Replication in either direction
	Day-to-day management from a single interface
	Thin import: space-efficient, non-disruptive data migration from PS Series arrays
CERTIFICATIONS	VMware vSphere Metro Storage Cluster, VMware SRM, Veritas Storage Foundations Suite, IBM VIOS Recognized, Oracle Validated Infrastructure (OVI); see Dell Storage Support Matrix for additional certifications and details
REPORTING/ALERTS	Support Assist (phone home), remote diagnostics and performance monitoring, automated alerts, reports and notifications, departmental chargeback
PHYSICAL	
POWER SUPPLIES	Dual, redundant 1100W 80 PLUS Platinum certified power supplies
MAX POWER	425W
INLET TYPE	NEMA 5-15/CS22.2, n°42
CHASSIS	Height: 2U/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 lb)
RACK SUPPORT	ReadyRails™ II static rails for tool-less mounting in 4-post racks with square or unthreaded round holes or tooled mounting in 4-post threaded-hole racks
ENVIRONMENTAL	Temperature
	Operating: 41°F to 104°F (5°C to 40°C)
	Non-operating: -40°F to 149°F (-40°C to 65°C)
	Humidity
	Operating: 10% to 80% (non-condensing)
	Non-operating: 5% to 95% (non-condensing)

SERVICES, WARRANTIES[7]

SERVICES	Dell Copilot support with deployment and consulting services. Dell Copilot Optimize available for additional ongoing strategic counsel and guidance from a highly trained system analyst.
DIAGNOSTICS ENGINE	Integrated Dell Remote Access Controller (iDRAC)
SYSTEM SIZING	Dell Performance Analysis Collection Kit (DPACK) tool
DRIVE WARRANTY	All SSDs and HDDs are warrantied for full lifetime wear-out replacement with valid service agreement

End-to-end technology solutions

Reduce IT complexity, lower costs and eliminate inefficiencies by making IT and business solutions work harder for you. You can count on Dell for end-to-end solutions to maximize your performance and uptime. A proven leader in Servers, Storage and Networking, Dell Enterprise Solutions and Services deliver innovation at any scale. And if you're looking to preserve cash or increase operational efficiency, Dell Financial Services™ has a wide range of options to make technology acquisition easy and affordable. Contact your Dell Sales Representative for more information.

OEM-ready version available

From bezel to BIOS to packaging, your storage arrays can look and feel as if they were designed and built by you. For more information, visit Dell.com/OEM.[8]

Learn more at Dell.com/SCseries.

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[1] Compared to previous SC8000 controller.

[2] NAS support requires optional Dell Storage FS8600 NAS appliance.

[3] Source: Dell internal analysis (March 23, 2016) comparing against the top 5 other vendors in the mid-range enterprise market.

[4] Requires optional Live Volume feature and 6.7-level firmware.

[5] With 4-port 16Gb SAS card.

[6] Multiple SC Series (SC9000, SC8000, SC7020, SC4020) arrays may be deployed in federated configurations using the Live Migrate feature included with firmware version 7.1. Transparent, non-disruptive volume movement among arrays is enabled, allowing the combined capacity and cache of the entire federated cluster to be seamlessly utilized for maximum performance and scalability in expanding data centers. For example, a cluster of eight SC9000 arrays can provide a total of 8,192 drives (up to 48PB raw capacity) with over 4TB of system memory. Similar capability is available for arrays running previous firmware versions using the optional Live Volume feature.

[7] Availability and terms of Dell Services vary by region. For more information, visit Dell.com/ServiceDescriptions.

[8] OEM-ready available on certain models.