



DELL EMC SC ALL-FLASH STORAGE ARRAYS

Smart AFA choice for modern workloads

Welcome to a better flash architecture

Bring the power and speed of Dell EMC all-flash storage to bear on your toughest business challenges. Whether your goals include general-purpose workload consolidation, a new VDI deployment, high-volume OLTP systems or an all-flash private cloud, SC All-Flash storage delivers modern SSD performance with simplicity, flexibility and value. Why compromise with less complete solutions? These arrays have everything you need to get started with all-flash faster – and see all-flash results sooner.



Transformational performance

End-to-end flash helps you do things you thought were impossible, taking your business to new levels of productivity and success. SC All-Flash's active/active, performance-centric design keeps IOPS and throughput high as you scale up and out, while ensuring every dollar you spend is targeted directly on application acceleration.



Dynamic intelligence

Purpose-built to adapt to constant change and growth, SC All-Flash boosts workloads without interruption, even as environments evolve unpredictably. The days of saying “no” to business opportunity because of rigid storage infrastructures are over. You now have unprecedented flexibility to test new ideas and shift strategies on the fly, helping your data center become a key competitive enabler for your company.



Efficiency and value

Automate your cost savings with innovative self-optimization features, including Intelligent Deduplication and Compression. Pervasive “thin methods” and intuitive management tools maximize and extend critical resources – and best of all, the entire suite of advanced SC Series software features is enabled by default. *No extra licenses to buy or maintain!*

Fully mobilize your data

Everything about SC All-Flash is fast (over 1 million max IOPS fast¹) – but IOPS-crunching performance is just the beginning. These dependable arrays also provide deployment velocity and configuration agility to help your business compete in today's dynamic markets. The enterprise-proven SC Operating System automates and manages the most time-consuming, error-prone aspects of change, including server/LUN mappings, allowing you to freely migrate, rebalance and consolidate data without interrupting workloads or reconfiguring hosts.

FEDERATE the combined performance and capacity of up to 10 arrays

Thanks to their built-in “storage hypervisor” capability, multiple SC All-Flash arrays can be grouped in federated systems under unified management. Data mobility within a federation is easy and transparent to hosts. Need to move a volume to another array? Live Migrate makes it click-simple, keeping workloads online and preserving snapshot and replication relationships throughout the move. Included Volume Advisor even offers ongoing load balancing guidance, suggesting the best initial data locations, then alerting you with optimization recommendations as time goes by.

Always available storage

Included Live Volume also keeps workloads running during *unexpected* outages and disasters. Non-disruptive auto-failover between fully-synchronized volumes on local and remote arrays protects your vital business operations with no need for extra hardware or software purchases. Live Volume helps you achieve ZERO RTO/RPO, and even auto-repairs your high-availability environment when a downed array comes back online.

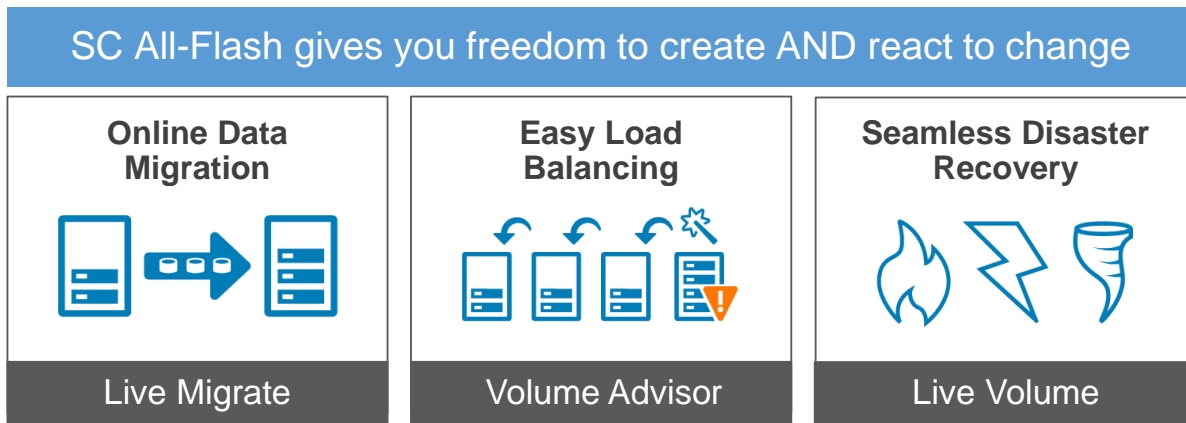


Fig. 1 – Change storage configurations quickly without impacting your workloads. Federated architecture with built-in auto-failover makes SC All-Flash the smart choice to deliver consistent value in volatile business environments.

Aggressive cost savings

Despite these advanced capabilities, SC All-Flash arrays are remarkably affordable – and they don’t wait around for you to figure out how to reduce lifecycle expense. Proactive self-optimization features such as Intelligent Deduplication and Compression, RAID tiering, and a host of others work constantly in the background to auto-tune your environment to respond to real-world usage patterns. Data is placed, migrated and space-reduced at just the right time to maximize cost savings while minimizing performance impact – yet you always maintain policy-based, system-wide control.

All-Flash value – everything’s included!

Exclusively with SC All-Flash, every advanced feature in the SC Series line-up is enabled at no extra cost, making this the most value-intensive SC product ever. *All features are licensed to the full capacity of the array.* Key items include:

- **Powerful management tools** – New Unisphere HTML5 Web UI lets you configure SC All-Flash quickly with no software installation required. Just point your browser from any mobile device to accomplish most day-to-day tasks. Popular DSM (Dell Storage Manager) client application is still available for advanced management.
- **CloudIQ** – Free cloud-based SaaS (Software as a Service) suite provides predictive analytics, categorized alerts, remediation recommendations and a convenient dashboard to monitor the health of your SC environment.
- **Intelligent Deduplication & Compression** – Low-impact data reduction reduces raw capacity needs.

- **Live Migrate Federation** – Simplify multi-array environments with quick and seamless data movement among SC All-Flash arrays, or in heterogeneous environments with other SC Series hybrid arrays.
- **Live Volume** – Auto-failover between fully synchronized volumes on local and remote arrays.
- **Volume Advisor** – Monitors federation in background, makes proactive policy-based data placement recommendations.
- **Data Progression** – Achieve IOPS goals with the least expensive mix of storage media.
- **RAID tiering** – Eliminates manual provisioning. RAID levels change dynamically to optimize for reads/writes separately. Provides great performance at low cost.
- **Dynamic Capacity** – Pervasive “thin methods” allocate capacity exclusively on demand.
- **Thin snapshots** – Records changes only, preserved automatically when you move data within a federation.
- **Thin clones** – Create virtually unlimited volume copies for VDI or Test/Dev, without consuming additional space.
- **Replication** – Single-hop, multi-hop (chained), 1-to-many mixed topology. Works with all SC arrays.
- **Remote Instant Replay** – Sync/async replication across IP networks, deduped for efficiency.
- **Multi-protocol network support** – Flexible Fibre Channel and iSCSI connections, up to 29,000 MB/s bandwidth.²
- **Native application recovery tools** – Replay Manager ensures reliable application consistent snapshots of Microsoft Volume Shadow Copy (VSS) enabled applications (Exchange, SQL Server and Hyper-V) and VMware virtual machines (VMs). Recover more quickly from farther back in time, with lower risk of human error.
- **Encryption** – Optional FIPS 140-2 certified self-encrypting drives (SEDs), auto-lock on power down or removal.
- **Integration with PS Series (EqualLogic™) arrays** – Unified management and cross-platform replication lets you combine two platforms in a single solution.
- **Chargeback** – Simplifies budgeting by calculating storage costs for individual applications and departments.
- **Multi-VLAN tagging** – Provides segmented, controlled access for up to 64 VLANs per port, great for service providers, large corporations and others with multi-tenancy needs.
- **Quality of Service (QoS)** – Prioritize storage resources to match your business goals, eliminate “noisy neighbour” problems. User defined alerts, scriptable via REST.
- **VVOLs support** – Apply advanced SC array services to individual VMs using familiar vSphere tools.

Trusted, enterprise-class solution

And of course SC All-Flash is backed by the #1 market leader in all-flash arrays, and the #1 leader in storage overall.² Dell EMC products are ubiquitous in data centers around the world -- and *you* get the benefit of all that technology and business expertise!

- **World-class services options** – Choose from a range of comprehensive deployment and support options, including ProSupport, ProDeploy, and new Optimize Services.³ Our renowned team can reduce deployment costs, accelerate time to completion, and even monitor your environment to fix problems before they occur.
- **Dell EMC hardware/software support** – SC All-Flash supports popular Dell EMC products including PowerPath, ViPR, VPLEX, AppSync, RecoverPoint, Connectrix, Data Domain and more.
- **Broad 3rd-party integration** – Dell EMC has deep relationships with the ecosystem and application leaders that matter to you. VMware, Microsoft, Oracle, OpenStack, IBM, CommVault, VERITAS, Foglight and more.

Dell EMC Future-Proof Storage Loyalty Program

Get an extra level of investment protection with Dell EMC's 4:1 Efficiency, 3-year Satisfaction, "Never Worry" Data Migration, Hardware Investment Protection and All-Inclusive Software offers. The Future-Proof Storage Loyalty Program offers an unmatched set of assurances that your SC All-Flash array will provide lasting value for the lifetime of your applications. Unlike our competitors' programs, this offer is available at no additional cost – either in terms of higher product price or higher maintenance price. Visit DellEMC.com/FutureProof for details.⁴



Two powerful platforms

Take the inside track to great storage with two SC All-Flash base array options. Both models feature a 3U "all-in-one" format, including active/active dual controllers with 8-core Intel Xeon processors, up to 256GB memory and multi-protocol flexibility with 32Gb FC, 16Gb FC, 10Gb iSCSI and new 100Gb and 25Gb iSCSI I/O options.⁵ With SC All-Flash, your infrastructure will be ready for tomorrow's network speeds!



SC5020F

- (30) 2.5" drive slots, 3U
- 222 drives, 2.16PB max expansion
- Up to 1M max IOPS²



SC7020F

- (30) 2.5" drive slots, 3U
- 606 drives, 4PB raw max expansion
- Up to 1.2M max IOPS²

Growing your all-flash array is quick and simple, using modular SC420F expansion enclosures as building blocks. Both the base arrays and the enclosures support a variety of flash types, including FIPS-certified Self-Encrypting Drive (SED) SSDs. Multiple SC arrays of any size may be grouped in larger federated systems with seamless volume movement between arrays, allowing their combined performance and capacity resources to be fully utilized by your business.



SC420F

- (24) 2.5" drive slots, 2U
- 12GB SAS back-end

Specifications

Unless otherwise specified, all technical specifications below apply to both SC5020F and SC7020F arrays.

SC All-Flash	
Base Chassis Overview	
Chassis format	All-in-one (dual controllers, internal drive bays, networking) with expansion options
Rack size	3U

SC All-Flash

Controllers	2 hot-swappable per chassis (active/active)
Processors	SC7020F: Dual Intel® Xeon® Processors, E5-2628 v3 2.5GHz, 8 cores SC5020F: Single Intel® Xeon® Processor E5-2630 v3, 2.4GHz, 8 cores
Internal storage capacity	30 x 2.5" drive bays
System memory	SC7020F: 256GB per array (128GB per controller) SC5020F: 128GB per array (64GB per controller)
Operating system	Dell Storage Center OS (SCOS) 7.2 or greater

Expansion Capacity

Supported expansion enclosures	Dell SC420F: 24 x 2.5" drive bays (12Gb SAS)
Maximum drive count	SC7020F: 606 drives per array, more in federated systems ⁶ SC5020F: 222 per array (with optional expansion enclosures), more in federated systems ⁶
Max raw capacity	SC7020F: 4PB per array, more in federated systems ^{6,7} SC5020F: 2.16PB per array, more in federated systems ^{6,7}
Storage media	SSD: write-intensive and read-intensive drives (can be mixed in single system), SED SSDs

Network and Expansion I/O

Front-end-network protocols	FC, iSCSI (supports simultaneous multiprotocol)
Max 32Gb FC ports	SC7020F: 24 per array (SFP+) SC5020F: 8 per array (SFP+)
Max 16/8Gb FC ports	SC7020F: 24 per array (SFP+) SC5020F: 8 per array (SFP+)
Max 100Gb iSCSI ports ⁵	SC7020F: 16 per array (QSFP28) SC5020F: 8 per array (QSFP28)
Max 25Gb iSCSI ports ⁵	SC7020F: 16 per array (SFP28) SC5020F: 8 per array (SFP28)
Max 10Gb/1Gb iSCSI ports	SC7020F: Up to 32 SFP+ (10Gb) or Base-T ports per array SC5020F: Up to 16 SFP+ (10Gb) or Base-T ports per array
Management ports	2 per array (1Gb BASE-T)
Back-end expansion protocols	12Gb SAS
Max back-end expansion ports	SC7020F: 24 per array SC5020F: 8 per array

Functional & Performance

Array configurations	All-flash arrays only
Storage format	Native block (SAN) ⁸
Max SAN hosts	500
Max initiator ports	1000
Max LUN size	500TB
Max number of LUNs	2000

SC All-Flash	
Max number of snapshots	SC7020F: 16,384 SC5020F: 8,192
Max IOPS ¹	SC7020F: 1,200,000 SC5020F: 1,025,000
Max IOPS ¹ (with latency <1ms)	SC7020F: 1,050,000 SC5020F: 818,000
Max IOPS ⁹ (80% reads, 20% writes)	SC7020F: 346,000 SC5020F: 330,000
Max throughput (reads) ¹⁰	SC7020F: 29,000 MB/s SC5020F: 19,000 MB/s
Max throughput (writes) ¹¹	SC7020F: 14,000 MB/s SC5020F: 9,500 MB/s
Data Optimization	
Auto-tiering method	Policy-based migration based on real-time data usage, customizable 512KB-4MB page size.
Auto-tiering structure	Up to 2 SSD tiers (write- and read-intensive SSDs)
Tiering customizations	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 in 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
Thin snapshots	Records changes only, snapshots auto-migrate to lower-cost storage
Intelligent deduplication and compression	Selectable option per volume "Deduplication + Compression" and "Compression only" modes available
Data Mobility and Migration	
Replication	Heterogeneous arrays (SC Series any-to-any) 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 in base product) enables host-transparent data movement among arrays; see also Federation section
Federated multi-array systems	Live Migrate (included in base product) enables host-transparent movement of volumes among arrays Snapshots maintained/preserved during migration ⁶
Thin Import	Space-efficient, non-disruptive data migration from PS Series (EqualLogic) and MD3 arrays

SC All-Flash

Thin Clones	<p>Clone standalone volumes with zero duplication of data</p> <p>Clones maintain independent snapshots and replication</p> <p>Ideal for VDI, test/dev, other applications that require discrete instances of common data</p> <p>More efficient than dedupe for database copies</p>
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Data Protection, Disaster Recovery, Security

Business continuity	<p>Live Volume bi-directional auto-failover, auto-repair</p> <p>Heterogeneous arrays (any-to-any SC, except SCv2000 Series)</p> <p>Continuous operations, disaster recovery, disaster avoidance</p> <p>Includes third-site (tertiary) replication options with Live Volume Managed Replication</p> <p>Zero RTO/RPO with customizable site failover SLAs per volume</p> <p>Does not require identical hardware at each site</p> <p>VMware Metro Stretch Cluster, VMware Site Recovery Manager support</p>
Thin snapshots	Records changes only, snapshots auto-migrate to lower-cost storage
Replay Manager	Application-consistent snapshots in Microsoft or VMware environments
Data-at-rest encryption	<p>Supports self-encrypting drives (SEDs)</p> <p>Full Disk Encryption (FCE) based on AES-256</p> <p>Drives certified to FIPS 140-2 Level 2</p> <p>Key Management Server (KMS) options available for FIPS 140-2 Level 1, 2 and 3</p>
External key manager support	<p>Gemalto's SafeNet KeySecure k460, SafeNet KeySecure k250, SafeNet KeySecure k150v</p> <p>Thales EMS 200</p>

Management

Management interface	<p><u>Browser-based (HTML 5)</u></p> <ul style="list-style-type: none"> • CloudIQ (cloud-based storage monitoring and analytics) • Unisphere for SC (single-array element manager, no software installation required) • Unisphere Central for SC (multi-array management) <p><u>Client application</u></p> <ul style="list-style-type: none"> • Dell Storage Manager – Advanced multi-array, multi-site and cross-platform (PS Series) management
Federation	<p>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, all SC models supported.⁶</p>
Scripting support	<p>Microsoft PowerShell API</p> <p>RESTful API</p>
Host OS support	<p>Microsoft® Windows Server®, Oracle® Solaris, HP®-UX, Oracle Linux, IBM® AIX®, Novell® NetWare, SLES, Apple, HPTTru64, VMware®, Citrix® XenServer®, RedHat®</p>
Third-party application integration	<p>VMware, Microsoft, IBM, OpenStack, Symantec, CommVault, Foglight, Docker</p>
Coexistence with PS Series arrays	<p>Replication in either direction</p> <p>Day-to-day management from a single interface</p> <p>Thin import: space-efficient, non-disruptive data migration from PS Series arrays</p>

SC All-Flash	
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
Firmware updates	Online, non-disruptive. ¹² Firmware may be set to download automatically, with option to trigger installation manually if desired.
Workload management	QoS, VVOLs
Physical	
Rack size	3U
Height	13.33 cm (5.25 inches)
Width	44.5 cm (17.52 inches)
Depth	78.5 cm (30.9 inches)
Weight at max configuration	24.22 kg (53.4 lb)
Weight empty	15.15 kg (33.4 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
Power	
Power/wattage	SC7020F: 2 hot-swappable 1485W power supplies SC5020F: 2 hot-swappable power supplies (1378W or 1485W options available, wattage type not interchangeable after point of sale)
Maximum output power	SC7020F: 1485 W SC5020F: 1378 W (1378W supply option) or 1485 W (1485W supply option)
Maximum input power	SC7020F: 1688 W SC5020F: 1584 W (1378W supply option) or 1688 W (1485W supply option)
Maximum input current	SC7020F: 8.8 A SC5020F: 16 A (1378W supply option) or 8.8 A (1485W supply option)
Maximum inrush current	55A for 10 ms or less
Nominal input voltage operating range	SC7020F: 200-240 VAC SC5020F: 100-240 VAC (1378W supply option) or 200-240 VAC (1485W supply option)
Nominal input frequency	50/60 Hz
Thermal output/heat dissipation (maximum)	SC7020F: 5,760 BTU per hour SC5020F: 5,770 BTU per hour (1378W supply option) or 5,760 BTU per hour (1485W supply option)
Environmental Operating Conditions	
Operating temperature	50 - 95°F (10 - 35°C)
Non-operating temperature	-40 - 149°F (-40 - 65°C)

SC All-Flash	
Operating humidity ranges (non-condensing)	10% to 80% with 29°C (84.2°F) maximum dew point
Non-operating humidity (non-condensing)	5% to 95% with 33°C (91°F) maximum dew point
Inlet type	NEMA 5-15/CS22.2, n°42
Services, Warranties ³	
Services	Dell ProSupport with deployment and consulting services. Optional ProSupport Plus is available offering proactive and preventative services to improve performance and stability. Dell Optimize is 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 EMC Live Optics
Drive warranty	All SSDs are warranted for full lifetime wear-out replacement with valid service agreement. SSD warranty covers all formats: SLC, MLC and TLC

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.¹³ For more information, visit Dell.com/OEM.

Footnotes

1 – Based on internal tests performed in February, 2018. 100% sequential reads with 4K sector transfer size. Actual performance will vary based on configuration, usage and manufacturing variability.

2 – Based on internal tests performed in February, 2018 on SC7020. 100% sequential reads with 4K sector transfer size. Actual performance will vary based on configuration, usage and manufacturing variability. See Specifications section for additional Dell EMC performance test results.

3 – Availability and terms of Dell Services vary by region. Contact your Dell representative or Authorized Partner for details.

4 – Contact your Dell EMC representative or Authorized Partner for details regarding the Future-Proof Storage Loyalty Program. Terms and Conditions apply.

5 – Support for 100Gb and 25Gb iSCSI speeds requires update to SCOS 7.3.

6 – Multiple SC Series arrays may be deployed in federated configurations using the Live Migrate feature included with firmware version 7.1 and above. 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 10 SC7020F arrays can provide a total of over 5,000 drives (up to 40PB raw capacity) with over 2.5TB of system memory.

7 – Using 2MB page sizes. For maximum flash performance, 512K page sizes are recommended. Discuss your performance and capacity needs with your Dell EMC representative or Authorized Partner.

8 – File solution available via optional NX Series NAS appliance.

9 – Based on internal tests performed in February 2018 running OLTP type workloads with 80% reads, 20% writes and 4k sector transfer size. Actual performance will vary based on configuration, usage and manufacturing variability.

10 – Based on internal tests in February 2018 running 100% sequential reads. Tests covered 256Kb-2048Kb sector transfer sizes. Actual performance will vary based on model, configuration, usage and manufacturing variability.

11 – Based on internal tests in February 2018 running 100% sequential writes. Tests covered 64Kb-2048Kb sector transfer size for SC5020F and 128Kb-2048Kb for SC7020F. Actual performance will vary based on model, configuration, usage and manufacturing variability.

12 – Although upgrades are non-disruptive in the vast majority of cases, Dell EMC reserves the right to require a reboot if necessary to protect user security or system integrity.

13 – OEM-ready available on certain models. See your Dell EMC representative for details.



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