



Feature Brief

SC Series Live Migrate and Live Volume

Data mobility and business continuity for your data center

Always available storage

- ZERO workload downtime during planned migrations or maintenance
- ZERO workload downtime during unplanned outages or disasters
- No extra hardware or host-based software required

Live Migrate

- Multi-array federations over local, metro or geo distances
- Transparent volume movement between arrays
- Proactive, policy-based load balancing alerts and wizards

Live Volume

- Volume-level auto-failover between arrays
- Auto-failback and repair of HA environment
- Sync and async replication
- 3rd-site disaster recovery replication
- Change uptime SLAs “on the fly”
- VMware Metro Storage Cluster (vMSC) certified

Accustomed to the growing ubiquity of cloud solutions, today’s businesses expect “cloud-like” availability, flexibility and “instant on” deployment velocity from nearly every aspect of their infrastructure. IT platforms of all kinds must now be automated, self-provisioning and intensely application-aware.

For storage, the new requirement includes dynamic allocation, seamless data mobility (both inside the data center and between geographical locations), and above all, rock solid business continuity. Storage must guarantee top performance despite changing ecosystems, rapid growth and unplanned outages and disasters — all with a minimum of management overhead.

The SC Series innovative Live Migrate and Live Volume features provide exactly this level of business agility, non-stop availability, and cloud-ready simplicity, keeping your applications online and data accessible as you meet evolving demands.

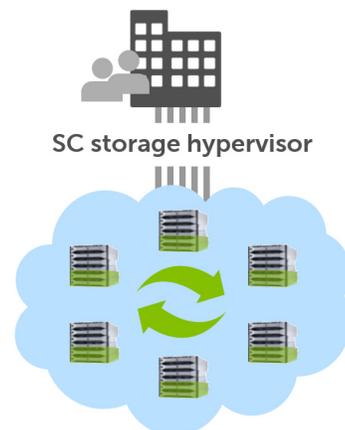
Virtualized SC Series architecture protects hosts from disruption

Like other signature SC Series advantages, Live Migrate and Live Volume are extensions of Dell’s modern, fully-virtualized Storage Center architecture. In SC Series arrays, data volumes are completely separate from physical drive location or RAID levels — a key factor already enabling advanced tiering, flash-optimization and data reduction capabilities. SC volumes routinely span diverse media types at multiple RAID levels per tier, and are constantly re-optimized for peak performance and cost-savings.

In addition, the SC operating system provides a second layer of virtualization in *multi-array* environments, acting as a “storage hypervisor” to abstract and dynamically manage LUN mappings across more than one SC system, independent of their physical location.

Live Migrate

The new Live Migrate feature, now included with every SC Series array,¹ leverages this virtualization layer, allowing you to move data freely and transparently across local, campus, metro or geo distances, without interrupting workloads or reconfiguring hosts.



Host/LUN mappings and data protection are preserved, even when volumes are moved between arrays



Volume Advisor proactively monitors arrays, makes it easy to balance workloads

Manage storage at the data center level

With Live Migrate, you can easily balance workloads across federated clusters of heterogeneous SC arrays, maximizing performance and resource utilization. Since the virtualization layer shields hosts from storage changes, there is no need to involve server administrators when you migrate volumes.² Snapshot data protection is preserved at all times, and the entire cluster can be managed as a single entity.

When a new array is added to the federation, it is immediately available for load balancing, again without modifying server configurations — and with zero workload downtime. This dramatically minimizes the effort of managing large data centers, allowing you to expand or reconfigure your environment quickly and easily.

Best of all, the included Volume Advisor feature proactively monitors your federated arrays for the best data placement based on customizable performance and capacity policies. Thresholds and alerts warn you when you need to make a change — and intuitive wizards help you fix any problems quickly.

Live Volume

Also leveraging the storage hypervisor, the optional Live Volume feature³ provides even greater levels of data protection and business continuity. Unlike Live Migrate, which facilitates a one-time movement, Live Volume creates synchronous or asynchronous live copies of data on separate arrays, transparently maintaining and swapping the primary host source, either on-demand or in response to an unexpected outage. From the hosts' perspective, a Live Volume appears like any other internal or SAN-attached drive — yet behind the scenes, data is continually replicated between two locations. Reads and writes can occur on both paths, which means either underlying volume may be moved or taken offline with no impact to users.

On-demand failover

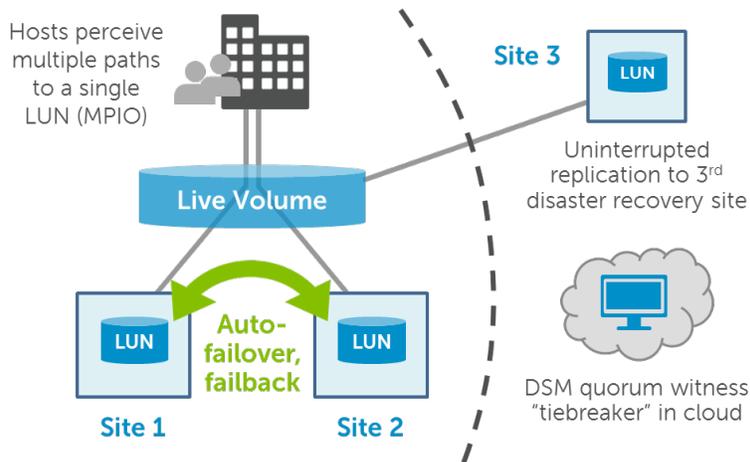
Live Volume lets you perform maintenance on an active system without affecting production workloads, replicating new writes automatically as you go, and swapping primary paths manually as needed. You can also take impromptu "disaster avoidance" precautions to quickly prepare for potential outages, such as hurricanes, without predefined disaster recovery mappings.

Fully automatic failover

Auto-failover between local and remote arrays lets you maintain full operations during natural disasters, power outages, hardware or software failures, or other unplanned events.³ By default, Live

Volume uses the most active source as the primary volume, swapping roles when shifts in workload patterns are detected. No administrative intervention is required for seamless failover — and when the downed array comes back online, the high-availability environment is efficiently and automatically repaired. Users will never know the outage occurred.

Activating auto-failover protection is a single-click operation for existing Live Volumes, and the feature can be easily turned on or off as needed. The Dell Storage Manager (DSM)⁴ "tiebreaker" service further simplifies management by automatically keeping each array aware of the other's status and ensuring they synchronize fully during recovery. The DSM tiebreaker runs on a VM in a public or private cloud at a third location, providing additional fault tolerance for the overall system.



Achieve Recovery Time and Point Objectives (RTO, RPO) of ZERO

VMware Metro Stretch Cluster support

Live Volume is the perfect storage complement to a vMSC environment, allowing you to leverage clustered VM technology across multiple arrays in two data centers. VMware automates failover at the host level, while Live Volume guarantees uninterrupted storage access from either location. VMs restored on new physical servers will not lose their volume mappings, even if the failure also affects local arrays. Management occurs either through DSM or the vSphere management console with SC Series plug-in.

Third node managed replication

Live Volume can also provide uninterrupted replication to a third disaster recovery site if one of the primary arrays fails. Managed 3rd-site replication uses the virtualized Live Volume as its source, tracking either underlying array, depending on its current availability. Synchronous and asynchronous modes are supported, as well as the ability to change high availability SLAs "on the fly." These capabilities further extend the value of Live Volume, allowing you to provision rich replication topologies to meet advanced business continuity needs.

Cost-effective SC solutions – no extra hardware or software required

While other storage virtualization methods require separate in-band appliances or software, both Live Volume and Live Migrate are native to the array itself, and do not require additional hardware or host-based software. Live Migrate is available for use immediately when your array is purchased. The optional easy-to-apply Live Volume license may be purchased on its own or in convenient feature bundles with other SC options. Like all SC Series software, licensing is perpetual (no renewal fees) and transferable if you decide to upgrade your array in the future.

¹Live Migrate is included with SC9000, SC8000 and SC4020 arrays running firmware version 7.1 or greater, available Q3 2016. Existing SC Series customers with a current support contract may upgrade at no charge. Live Migrate supports Windows, Linux and all major virtualized server environments, including VMware® vSphere®, Microsoft® Hyper-V®, Citrix® XenServer® and Oracle®.

²Assuming storage fabric connectivity has been verified by a disk rescan and MPIO connectivity.

³Live Volume is available for SC9000, SC8000, SC4020 or S40 arrays, and supports Windows, Linux, and all major virtualized server environments, including VMware vSphere, Microsoft Hyper-V, Citrix XenServer and Oracle. Auto-failover feature is supported in VMware environments on SC9000, SC8000, SC4020 and S40 arrays with SCOS 6.7, and in Microsoft environments on SC9000, SC8000 and SC4020 arrays with SCOS 7.1, available Q3 2016. Existing Live Volume users with a current support contract may upgrade at no charge.

⁴Formerly Enterprise Manager. Either Enterprise Manager and Dell Storage Manager may be used to access Live Volume features.

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