DELL VMAX ALL FLASH F AND FX SOFTWARE PACKAGES

Essentials

The VMAX All Flash family includes world-class software in two all-inclusive software packages: the F or the FX.

F Package

The F Package is standard on VMAX All Flash Systems and includes the HYPERMAX OS and additional software:

- HYPERMAX OS, including:
  - Inline compression to reduce required storage capacity and lower TCO
  - Thin provisioning to optimize storage efficiency
  - Quality of Service (QoS) to prioritize application perfor- mance
  - Non-Disruptive Migration (NDM) for simplified tech refreshes
- Support for VMware Virtual Volumes (VVols) for per-VM storage control
- Embedded Management (Unisphere) for simple and intuitive system management
- TimeFinder SnapVX local replication for efficient snapshots and data protection
- AppSync iCDM Starter Bundle for unprecedented orchestration of production and non-production copy management

World-Class Software in Two All-Inclusive Packages

As flash prices rapidly decline and available data services grow, more organizations are evaluating, testing, and deploying all-flash solutions to tackle the most demanding workloads. These all-flash arrays also have to be easily managed, keep data secure, and be able to handle spikes in data growth and any impending disaster. The rich data services of Dell VMAX All Flash make this possible with features such as simple management tools, remote replication, and compression, just to name a few. Trust your mission-critical data to the all-flash leader.

VMAX All Flash products are Tier-1, highly scalable all-flash arrays that solve the broadest set of modern storage challenges with two all-inclusive software packages to simplify acquisition and deliver better TCO: the F or FX package.

VMAX All Flash Software Packages

Enterprise software for the modern data center

"F" Package
- HYPERMAX OS
- Thin provisioning
- Inline compression
- Non-disruptive migrations
- Virtual volumes
- QOS / Host IO limits
- Embedded Unisphere, Solutions Enabler, SMI-S
- TimeFinder SnapVX
- AppSync iCDM starter bundle

"FX" Package
- All "F" package items plus:
- Data encryption (D@RE)
- SRDF/S, SRDF/A, SRDF/Star
- SRDF 3 & 4-site
- SRDF/Metro (active/active)
- Embedded NAS (eNAS)
- Unisphere 360
- PowerPath (75 hosts)
- CloudArray Enabler
- ViPR Suite (SRM & Controller)

VMAX All Flash Software

F Package: Included with all VMAX All Flash arrays, the F package offers many of the trusted data services that VMAX users have relied on to provide the ease of management and unparalleled reliability for which VMAX is known. These include embedded management, local replication, inline compression, and copy data management.

VMAX All Flash advanced data services are built on the industry's leading operating system, HYPERMAX OS. Featuring real-time, non-disruptive storage hypervisors, every VMAX All Flash system extends high availability to services that traditionally have run external to the array— combining high availability, I/O management, quality of service, data integrity validation, storage tiering, and data security with an open application platform.

FX Package

The FX Package includes everything in the F Package and adds:

- SRDF for unmatched remote replication and mission-critical availability

- Data at Rest Encryption (D@RE) for controller-based encryption

- Dell Unisphere 360 for simple, consolidated storage management of up to 200 VMAX arrays in a single data center

- eNAS for unified block and file

- Cloud tiering capabilities for moving data to the cloud

- PowerPath/PowerPath VE for path optimization, failover, mobility, and IO management

- ViPR Suite (Controller and SRM) for automated provisioning, management, and monitoring

*Some software functionality

VMAX All Flash Compression
The Adaptive Compression Engine ensures VMAX All Flash prioritizes workload throughput at all times

Dell Unisphere
An intuitive management interface that allows IT managers to greatly reduce the time required to provision, manage, and monitor VMAX All Flash storage

FX Package: As an addition to all of the features of the F package, Dell offers the FX package that adds many additional VMAX All Flash capabilities, including: remote replication, data encryption, embedded NAS, cloud tiering, data path management and more.

The F Software Package

Standard on all VMAX All Flash systems, the F package includes many powerful data services required by VMAX customers, including management tools, local replication, and no-compromise inline data compression including the power of HYPERMAX OS.

Inline Compression

VMAX All Flash inline compression utilizes an Adaptive Compression Engine which delivers more than simple capacity savings. Intelligent algorithms paired with hardware acceleration deliver enhanced performance and reduced compression overhead, resulting in great overall system performance when inline compression is enabled. VMAX All Flash delivers no-compromise compression and works with all VMAX software data services, including but not limited to: eNAS, SnapVX, SRDF, and encryption.

Virtual Volumes (VVOLS)

VMware Virtual Volumes simplify management and provide per-VM storage control, enabling VMAX All Flash to take VVol integration to a whole new level. Not only was VMAX All Flash designed to support the scale of VVol storage— up to 64,000 virtual volumes today and many more in the future—but the VMAX All Flash management paradigm with radically simplified storage management realizes the full value of VVol storage policies. VMAX All Flash provides the highest levels of availability, data protection, and performance directly to the VM. And customers can manage VMware storage at a much more granular level (VM), providing even greater efficiency.
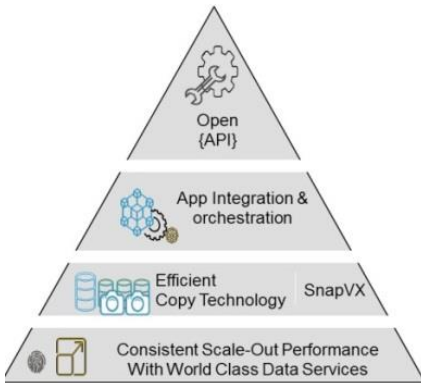
TimeFinder SnapVX

TimeFinder SnapVX enables zero-impact snapshots, simple user-defined names, faster and secure snapshot creation/expiration, cascading, compatibility with SRDF, and support for legacy VMAX replication modes. SnapVX reduces replication storage costs by up to 10x and is optimized for cloud scale with its highly efficient snaps and expansion of up to 16 million snaps per array. Customers can take up to 256 snapshots and establish up to 1024 target volumes per source device, providing read/write access as pointer (snap) or full (clone) copies. SnapVX also provides a new option to secure snaps against accidental or internal deletion.

Embedded Management with Unisphere

Embedded management (eManagement) leverages the HYPERMAX OS hypervisor reducing capital and operational expenses. This feature enables customers to further simplify management, reduce cost, and increase availability by running VMAX All Flash management software directly on the array.

Quality of Service (QOS)

VMAX All Flash offers specialized software to help prioritize host I/O performance and balance I/O across multiple ports in the system according to customer requirements. This capability helps simplify storage management while also ensuring critical applications continue to operate at their necessary levels of performance while minimizing any additional impact to other applications and hosts.

AppSync iCDM Starter Bundle

MAX All Flash inline compression utilizes an Adaptive Compression Engine which delivers more than simple capacity savings. Intelligent algorithms paired with hardware acceleration deliver enhanced performance and reduced compression overhead, resulting in great overall system performance when inline compression is enabled. VMAX All Flash delivers no-compromise compression and works with all VMAX software data services, including but not limited to: eNAS, SnapVX, SRDF, and encryption.

The FX Software Package

For customers who plan to leverage more VMAX array services, the VMAX All Flash FX package provides the additional management tools and functionality outlined below. While all of the data services included in the FX package are available a la carte, the FX bundle provides a single comprehensive package that bundles these items together for simplicity at a much lower cost. Generally, customers who intend to use at least two of these software titles will find it cheaper to buy the FX package than adding them onto the default F suite.

Symmetrix Remote Data Facility (SRDF)

The SRDF family of software is the industry gold standard for remote replication in mission-critical environments. Built for the industry-leading high- end VMAX hardware architecture, the SRDF family of solutions is trusted globally for disaster recovery and business continuity. The SRDF family offers unmatched deployment flexibility and massive scalability to deliver a wide range of distance replication capabilities. It consists of the following options: SRDF/S (synchronous option for zero data exposure loss), SRDF/A (asynchronous option for extended distances) SRDF/Star (multi-site replication option), SRDF/CG (consistency groups for federated data sets across arrays), and SRDF/Metro (for active/active data center protection).

Data at Rest Encryption (D@RE)

VMAX All Flash Data at Rest Encryption provides hardware-based, on-array encryption, protecting block and file storage from unauthorized access when drives are removed from the array. This technology eliminates the need for drive erasure services and allows for rapid decommissioning and repurposing of arrays, while helping achieve regulatory compliance. Encryption offers intelligent key management via embedded management or a standard KMIP centralized key management platform.

Unisphere 360

Unisphere 360 software aggregates and monitors up to 200 VMAX All Flash / VMAX arrays across a single data center. It is Ideal for customers running multiple VMAX All Flash arrays with embedded management and who are looking for ways to facilitate better insights across their entire data center. Unisphere 360 provides storage administrators the ability to view site-level health reports for every VMAX or coordinate compliance to code levels and other infrastructure maintenance requirements.

Embedded NAS (eNAS)

VMAX All Flash provides embedded file data services that enable customers to consolidate islands of block and file storage, simplify management, and reduce deployment costs by up to 33 percent. Embedded NAS uses the hypervisor provided in HYPERMAX OS to create and run a set of virtual machines on VMAX All Flash. Common

Unisphere 360
Single screen management of up to 200 VMAX arrays across the data center.

eNAS use cases include running Oracle on NFS, VMware on NFS, Microsoft SQL on SMB 3.0, home directories, and Windows server consolidation.

software data services, including but not limited to: eNAS, SnapVX, SRDF, and encryption.

Cloud Tiering

With the growth of public and private cloud solutions, VMAX All Flash provides direct integration with the cloud for simple data tiering and cloud access. As a supplement to the reliability of VMAX All Flash, cloud storage offers a more cost-efficient tier of storage that is ideally suited for moving "cold data" off of VMAX All Flash and maintaining available VMAX capacity. By combining the lower cost/scalability of the cloud with the power of VMAX All Flash, customers can achieve a complete storage solution for every step of the data lifecycle.

PowerPath and PowerPath/VE

PowerPath and PowerPath/VE deliver the power of automated data path management and load balancing for all heterogeneous server, network, and storage deployed in an environment. This streamlined data path enables more predictable and consistent application availability while providing up to three times the IOPS even during periods of high I/O.

ViPR Suite

The Dell ViPR Suite provides customers massive scale, automation, and simplification of the storage infrastructure. It includes both ViPR SRM and ViPR Controller, providing both monitoring and automation across customers' IT infrastructures. ViPR SRM provides additional metrics and reporting tools for VMAX users in heterogeneous storage environments (including non-Dell), while ViPR Controller layers policy-based automation on top of that system for a complete intelligent orchestration solution.

A la Carte Software

Dell ProtectPoint

In addition to the F or FX software packages, VMAX All Flash customers can deploy Dell ProtectPoint to provide faster, more efficient backups while eliminating backup impact on application servers. By enabling direct backup from VMAX All Flash to Dell Data Domain, ProtectPoint reduces cost and complexity by eliminating traditional backup applications. ProtectPoint enables up to 20 times faster backup, 10 times faster recovery, as well as instant access to backups from Data Domain for simple granularly recovery. ProtectPoint eliminates backup impact on application servers and empowers application owners to backup directly from native utilities like Oracle RMAN.

Dell RecoverPoint

Dell RecoverPoint provides replication with multiple recovery points to restore applications instantly to a specific point in time, leveraging snap-based replication on VMAX All Flash. Applications are protected using asynchronous heterogeneous replication using DVR-like recovery across the Dell block storage portfolio. RecoverPoint minimizes network utilization with unique bandwidth compression and deduplication, significantly reducing network bandwidth consumption.

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