VMAX ALL FLASH

All Flash Meets Mission-Critical

ESSENTIALS

- Leverage advanced 3D NAND flash to consolidate high-demand transaction processing workloads
- Achieve consistent <.5ms response times at massive scale for extreme-growth hybrid cloud environments
- Process up to 4 million IOPS at sub-1ms latency by using up to 384 CPU cores and multi-threading technology
- Accelerate time to deployment with streamlined appliance packaging and easy non-disruptive migration utility
- Inline compression of new or existing VMAX All Flash data sets including all VMAX data services
- Protect vital open systems and mainframe information at six-nines availability via SRDF, the gold standard in remote replication
- Create hundreds of snapshots for each workload to optimize decision support, application testing and business analytics with SnapVX
- Deliver rapid backup and restore with Dell EMC ProtectPoint; backup directly from VMAX All Flash to Data Domain, eliminate app server overhead
- Use Dell EMC Unisphere to easily provision, manage, and monitor VMAX All Flash block and file storage
- Embed file services and reduce deployment costs by up to 33%

All flash arrays are accelerating the pace of business transformation as IT professionals search for the most relevant technologies to modernize their operation and drive down operational and capital expenditures. As flash prices rapidly decline, capacity points exceed spinning disk and data reduction techniques advance, more organizations are evaluating, testing, and deploying all-flash solutions to tackle the most demanding mixed workloads that span across the modern data center.

The powerful VMAX® All Flash arrays are architected to solve the CIO challenge of embracing a modernized flash-centric data center and hybrid cloud while simultaneously simplifying, automating and consolidating IT operations. VMAX All Flash isn't just bigger, better and faster – which it is – it was engineered for the latest, high density flash technology, but also to specifically exploit the rich set of data services of VMAX All Flash. These data services address the new requirements of the modern data center while continuing to deliver the reliability and mission-critical availability Dell EMC customers have relied on for years.

EASY

• Easily configure, deploy and manage VMAX All Flash through appliance packaging that pre-configures all hardware and software elements
• 1-click simplified provisioning for open systems, mainframe, IBM i, block and file environments
• Easily monitor and track up to 200 VMAX arrays in your data center from a single screen with Unisphere 360
• Simplify migrations to VMAX All Flash/VMAX3 arrays with in-family non-disruptive migration software -- three easy setup screens, 65% fewer steps

SCALABLE

• Leverage advanced multi-core / multi-threading algorithms and a flash-optimized design to meet strict SLAs for high-demand online transaction processing (OLTP), virtualized applications, and high growth Oracle and SQL databases
• Scale out performance and scale up capacity to achieve cloud scale with predictable performance of <.5ms response times

TRUSTED

• Mission-critical availability architecture with advanced fault isolation, robust data integrity checking, and proven non-disruptive hardware and software upgrades
• Six-nines availability for 24x7xForever operations using SRDF® software, the gold standard for multi-site remote replication.

CONSOLIDATION AT CLOUD SCALE

As the industry's most reliable platform for cloud scale consolidation, VMAX All Flash enables organizations to dynamically grow, easily share, and cost-effectively manage massive amounts of open systems and mainframe storage. VMAX All Flash is the leader in maintaining consistently high performance levels while running thousands of mixed workloads concurrently on a single VMAX All Flash array—you'll be able to deliver predictable and responsive service, even at massive scale.

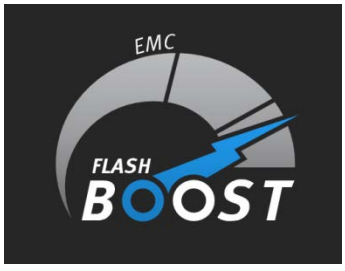
PURPOSE-BUILT FOR EXTREME PERFORMANCE

For enterprises that require petabyte-level scale, the VMAX All Flash is purpose-built to easily manage high-demand, heavy-transaction workloads while storing petabytes of vital data. The VMAX All Flash hardware design features the turbo-charged Dynamic Virtual Matrix Architecture that enables extreme speed and consistent sub-millisecond response time.

The VMAX All Flash architecture can scale beyond the confines of a single system footprint to deliver scalable performance where needed. It enables hundreds of multi-core Intel CPUs to be pooled and allocated on-demand to meet the performance requirements for dynamic mixed workloads. This is achieved though powerful multi-threading and the industry's first dynamic, user controlled core allocation so no workload is starved of resources.

The core element of VMAX All Flash is the V-Brick. Each V-Brick has one engine, two DAEs, and usable capacity with fully redundant components. Flash Capacity Packs are used to scale up to 4PB. The VMAX All Flash scales by aggregating up to eight V-Bricks as a single system with fully shared connectivity, processing, and capacity resources. Each V-Brick supports up to 48 CPU cores for blazing-fast performance scaling to a maximum of 384 cores per array.

FLASH-OPTIMIZED



Engineered for 3D NAND flash, VMAX All Flash outperforms solutions that offer flash drives as add-ons to traditional arrays conceived for 15K RPM disk drives. VMAX All Flash eliminates bottlenecks with FlashBoost technology to deliver the highest performance and the lowest latency for read-intense OLTP applications, while leveraging huge write caching to reduce response time on heavy write workloads.

Each VMAX All Flash array leverages the latest electronics and flash technology to super-charge the most demanding dynamic environments. Each VMAX All Flash model offers advanced 3D NAND flash, third-generation Intel multi-core processors, InfiniBand 56 Gb/s interconnect technology, PCIe Gen 3 I/O, and native 6 or 12 Gb/s SAS drive infrastructure.

INLINE COMPRESSION

VMAX All Flash delivers a net 4:1 overall storage efficiency benefit for typical transactional workloads when inline compression is combined with snapshots and other HYPERMAX OS space saving capabilities. VMAX inline compression minimizes footprint while intelligently optimizing system resources to ensure the system is always delivering the right balance of performance and efficiency. VMAX All Flash inline compression is granular, performance optimized, and flexible.

- GRANULAR: VMAX All Flash compression operates at the Storage Group (Application) level so customers can target those workloads that benefit the most. Compression can also be applied to existing data that was written prior to the availability of this new HYPERMAX release.

- PERFORMANCE OPTIMIZED: VMAX All Flash is smart enough to make sure very active data is not compressed until it becomes less active. This allows the system to deliver maximum throughput leveraging cache and SSD technology and ensures that system resources are always available when required.

- FLEXIBLE: VMAX All Flash inline compression even works with TimeFinder SnapVX, SRDF, embedded NAS, and encryption. Something other vendors cannot deliver.

Every VMAX All Flash array has shipped with compression hardware and can take advantage of this capability by simply upgrading to the latest HYPERMAX OS release.

UNMATCHED AGILITY

VMAX All Flash introduces unmatched breakthroughs in performance density and packaging designed to reduce costs and fit all of your data center needs. Each VMAX 450F and 850F array can store up to 480 high-density drives and deliver a complete VMAX All Flash engine on a single floor tile—that's an industry first of up to 1.7M IOPS in a single rack. And VMAX 250F supports up to 1PB of effective capacity in just half a rack, delivering 2x the performance and 2x the capacity in half the rack space compared with previous arrays.

For maximum agility, VMAX All Flash racks can be separated by up to 25 meters to avoid columns and other obstacles in a data center without a need to ever reserve empty floor tiles for future array growth. And all VMAX All Flash arrays support industry standard 19-inch racks and optional third-party racking to conform to your data center infrastructure.

STREAMLINED PACKAGING

VMAX All Flash arrays are built for simplicity and ease of ordering with appliance-based packaging that combines both hardware and software elements. VMAX All Flash systems ship with the F software package. Customers can easily add the FX package to deploy higher value data services as listed below.

Note: Above software applies to open systems configurations.

HYPERMAX: OPEN, EXTENSIBLE HYPERVISOR

VMAX All Flash leverages the industry's first open storage and hypervisor converged operating system, HYPERMAX OS. It combines industry-leading high availability, I/O management, quality of service, data integrity validation, storage tiering, and data security with an open application platform.

HYPERMAX OS features the first real-time, non-disruptive storage hypervisor that manages and protects embedded services by extending high availability to services that traditionally would have run external to the array. It also provides direct access to hardware resources to maximize performance. The hypervisor can be non-disruptively upgraded.

SCALABLE MANAGEMENT ACROSS ARRAYS

Dell EMC Unisphere for VMAX is an intuitive management interface that allows IT managers to maximize human productivity by dramatically reducing the time required to provision, manage, and monitor VMAX All Flash storage assets.

Unisphere delivers the simplification, flexibility, and automation that are key requirements to accelerate the transformation to the hybrid cloud. For customers who frequently build up and tear down storage configurations, Unisphere® for VMAX makes reconfiguring the array even easier by reducing the number of steps required to delete and repurpose volumes.

Unisphere 360 software aggregates and monitors up to 200 VMAX arrays across a single data center. This solution is a great option for customers running multiple VMAX All Flash arrays with embedded management (eManagement) 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. Customers can leverage the simplification of VMAX All Flash management, now at data center scale.

iCDM WITH TIMEFINDER SNAPVX

Integrated copy data management (iCDM) provides exceptional customer value by enabling application-consistent, on-array copy orchestration. TimeFinder SnapVX software features zero-impact snaps, simple user-defined names, faster snapshot creation/expiration, cascading, compatibility with SRDF, and support for legacy VMAX replication capabilities like TimeFinder Clone, VP Snap, and Mirror (emulation mode). SnapVX reduces replication storage costs by up to 10x with its space-efficient snapshot technology, meaning it is optimized for cloud scale and enables expansion of up to 16 million snaps per array. Customers can create up to 256 snapshots and establish up to 1024 target volumes per source device, providing read/write access as space-efficient snapshots or full clones.

Dell EMC AppSync is an advanced copy management software application that integrates seamlessly with VMAX All Flash arrays to enable iCDM. It offers a simple way to create and consume local and remote copies of VMAX All Flash. AppSync delivers application-consistency with critical applications like Oracle and VMware, enabling operational recovery and copy repurposing.

iCDM delivers powerful on-array copy data management with space-efficient snapshot technology and AppSync software. AppSync is provided as a starter pack in the base F software package for VMAX All-Flash arrays.

DYNAMIC HOST I/O LIMITS

VMAX All Flash Host I/O Limits (Quality of Service controls for VMAX) support defining limits to enforce service levels and make application performance even more predictable. Users can set maximum IOPS and/or throughput limits on a per application basis. VMAX All Flash automatically balances the limits across directors and ports and supports two levels of cascaded limits to simplify performance management in multi-application, multi-tenant, and cloud environments.

NON-DISRUPTIVE MIGRATION

VMAX non-disruptive migration enables existing VMAX 1 and VMAX 2 customers to migrate workloads live to a new VMAX3 or VMAX All Flash array without taking the applications offline. This capability is built into the latest HYPERMAX OS and simplifies the migration user experience by reducing the number of steps required to migrate data by 65%.

Customer can now perform non-disruptive migrations on their own or leverage Dell EMC's exceptional professional services for the more complex migrations. VMAX non-disruptive migration software makes VMAX tech refresh incredibly compelling for customers moving to the VMAX All Flash modern data center.

MISSION-CRITICAL AVAILABILITY

VMAX All Flash reliability, availability, and serviceability (RAS) make it the ideal platform for open systems and mainframe environments requiring mission-critical availability. These arrays are architected to provide greater than six-nines of availability in the most demanding, mission-critical environments. VMAX All Flash availability, redundancy, and security features are listed below.

MISSION-CRITICAL AVAILABILITY WITH VMAX ALL FLASH

• No single points of failure—all components are fully redundant to withstand any component failure

• Completely redundant and hot-pluggable field-replaceable units (FRUs) to ensure repair without taking the system offline

• RAID protection levels 5 and 6 to match different data protection requirements, with the RAID members distributed among power zones in disk array enclosures (DAEs) to assure high availability (HA) even if an entire power zone fails

• Mirrored cache, where the copies of cache entries are distributed to maximize availability

• Vault to flash with battery backup to allow for cache de-stage to flash and an orderly shutdown for data protection in the event of a power failure

• Active-active remote replication via SRDF/Metro with read/write access to both Site A and Site B ensures instant data access during a site failure.

• Fully non-disruptive upgrades, including loading HYPERMAX Operating System software from small updates to major releases

• Data at Rest Encryption with integrated RSA® key manager, FIPS 140-2 compliant to meet stringent regulatory requirements

• T10 DIF data coding, with extensions for protections against lost writes

• Extensive fault detection and isolation, allowing early wear-out detection and preventing the passing of bad data as good

• All flash cache data vault capable of surviving two key failures, ensuring that the system comes back even when something was broken before the vault and something else fails when returning from the power cycle

• Support for thermal excursions with graceful shutdown if, for example, a data center loses air conditioning

• Integrated data protection via Dell EMC ProtectPoint backup and rapid restore, combining the gold standards in backup with industry leading SRDF replication technology

DATA AT REST ENCRYPTION

VMAX All Flash Data at Rest Encryption provides hardware-based, on-array encryption, protecting block and file storage from unauthorized access when drives or arrays are removed from the data center. 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 that is easy to implement and maintain. Administrators can leverage automated embedded key management since there is no manual user intervention required to manage VMAX encryption keys. And all VMAX data services are compatible with data at rest encryption.

XPECT MORE PROGRAM

VMAX All Flash arrays are backed by Dell EMC's Xpect More Program. The Xpect More Program includes: Lifetime Maintenance Price Protection, 3-year Investment Protection, and Lifetime Flash Endurance Protection on all SSD drives. The industry's leading all-flash arrays are now backed by the industry's best guarantee.

Dell EMC GLOBAL SERVICES

VMAX All Flash platforms include a limited hardware warranty*. VMAX All Flash hardware and software maintenance contracts offer 24x7 access to technical expertise, Online Services, remote monitoring and problem resolution, on-site services, and premium software maintenance providing 24x7 access to technical expertise and rights to new releases of the software at no additional charge.

Dell EMC Global Services provides the strategic guidance and technology expertise that organizations need to address their business and information infrastructure challenges and to derive the maximum value from their information assets and investments. Our 16,000+ professional services and support services experts worldwide, plus a global network of alliances and partners, leverage proven methodologies, industry best practices, and experience and knowledge derived from Dell EMC's information-centric heritage to address the full spectrum of customer needs across the information lifecycle: strategize, advise, architect, implement, manage, and support. Ask your Dell EMC sales representative about the specific services that can benefit your organization.

* Warranties may vary outside the United States. Contact your Dell EMC representative for local warranty and service terms and conditions.