

ACCELERATE AND SIMPLIFY ORACLE DATABASES WITH DELL EMC POWERMAX

Redefine Oracle Environments for High Performance and Business Agility

POWER UP THE MODERN ORACLE DEPLOYMENT

PowerMax transforms Oracle databases with game-changing IOPS, latency, and throughput



Performance

- Lightning fast performance with ultra-low response times for mission-critical, high-performance, and data-intensive mixed Oracle workloads (OLTP, DW/BI, Analytics)—all running on the same array
- Supreme simplicity with integrated copy data management, database-centric tools, and Oracle Enterprise Manager plug-in

Consolidation

- Hyper consolidation with massive scale in every possible dimension—performance, capacity, connectivity, LUNs/devices, data—all with end-to-end NVMe technologies and inline data reduction efficiencies

Today's businesses require fast execution of their mission-critical workloads and real-time insights from business data to make strategic decisions that differentiate their products and services. Databases are essential for these functions, and Oracle is the most prevalent one. The growing need for faster execution against a backdrop of exponential data growth has led to an IT environment where the requirements of database applications have outpaced the performance capabilities of the storage architectures supporting them.

Several workarounds have been designed for Oracle databases to overcome these storage performance limitations. Examples include advanced indexing and partitioning schemes, pre-calculation of data to accelerate queries with materialized views, and workload stove piping. However, the performance benefits of these techniques come with trade-offs and the Oracle environment becomes more bloated, rigid, and complex to deploy and manage. Separate silos for production, development, testing, patching, and analytics make it increasingly difficult to expand the scope of Oracle deployments to improve business agility and make real-time analytics-based decisions.

Dell EMC PowerMax, the world's fastest storage array¹, transforms the Oracle landscape and meets the most demanding Oracle performance requirements. PowerMax leverages the following features to consolidate production, development/test, and business analytics workflows onto a single mission-critical platform at cloud-scale:

- Powerful scale-up and scale-out architecture
- Built-in machine learning engine for intelligent data placement with next-generation media
- Outstanding inline data reduction
- Integrated copy data management

A Single Consolidated Platform for ALL Oracle Environments

PowerMax is specifically designed to bridge the legacy performance gap between compute and storage. With up to 10M IOPS, 150 GB/s throughput, and ultra-low, sub-300 microseconds latency even at cloud-scale, PowerMax delivers unmatched performance to meet the growing data and analytics requirements of Oracle applications of today and the future.

¹ Based on Dell EMC internal analysis of published bandwidth of the PowerMax 8000 versus competitive mainstream arrays, March 2018.

Protection

- 99.9999 percent availability with built-in advanced fault isolation, robust data integrity, non-disruptive upgrades and migrations, Data at Rest Encryption, and simple and efficient database copies
- Bullet-proof disaster recovery services with Oracle RAC support, local and remote protection, constant availability using Oracle RAC, and SRDF/Metro for active-active support
- Transformative backups with Dell EMC ProtectPoint direct connect backup

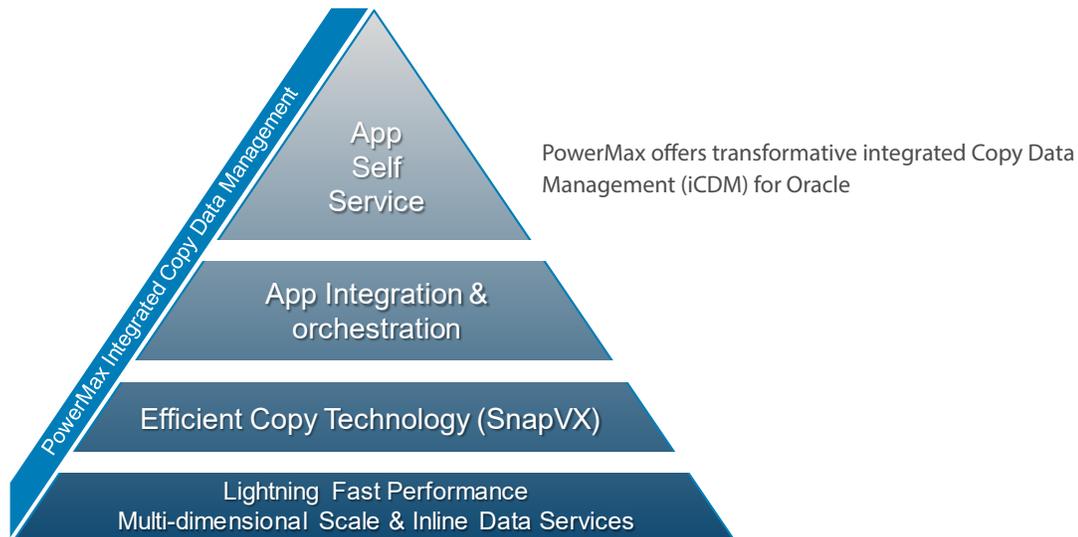
The ultra-fast performance of PowerMax eliminates silos of Oracle data marts that make it extremely hard to find, cleanse, and integrate data for real-time analytics. PowerMax enables organizations to not only accelerate IOPS-hungry transactional workloads but also speed up bandwidth-heavy complex Business Intelligence (BI) queries while running both Oracle transactional and Oracle Analytics workloads on the same array. Businesses can now consolidate and localize data to combat data mart sprawls while gaining real-time business insights.

Performance efficiencies are complemented with state-of-the-art inline data reduction technologies for space efficiencies. The inline deduplication and compression operations are carried out in hardware, so there are no performance penalties. Customers receive 4:1 storage efficiency guarantees while simultaneously enjoying ultra-fast performance without compromise.

PowerMax provides massive scale in every possible dimension—performance (millions of IOPS), capacity (4 PB), connectivity (hundreds of ports), LUNs/devices (64,000) and data copies (millions of snapshots)—all while incorporating the latest NVMe technology. Oracle databases, both production and non-production, can now be consolidated at massive scale across online transaction processing (OLTP), online analytical processing (OLAP), enterprise data warehousing (EDW), and Big Data applications. PowerMax protects production database performance from the performance impact of non-production, or any other workloads, with Quality of Service (QoS) tools ensuring key workloads always get the performance they demand.

Redefined Database Administrator (DBA) Productivity

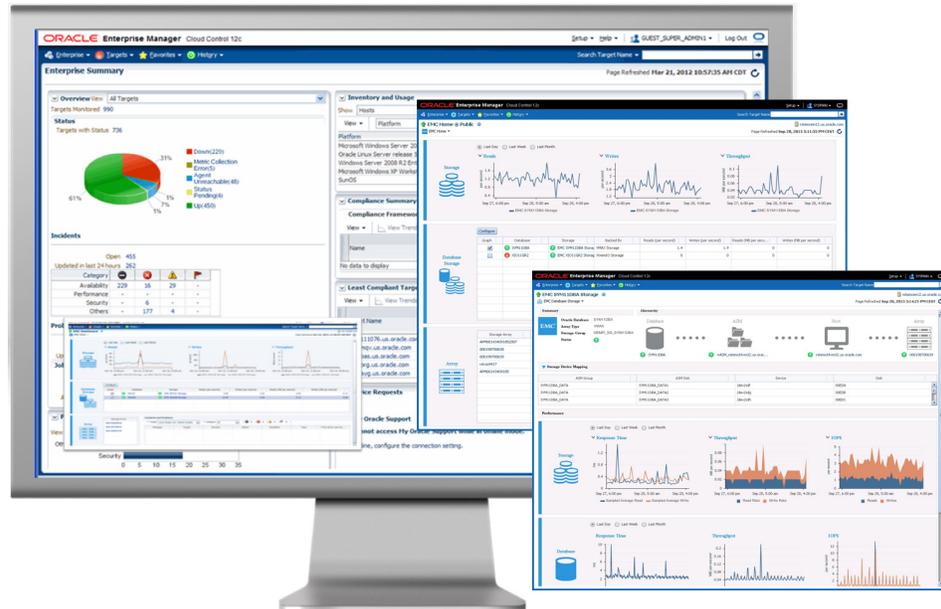
PowerMax offers integrated Copy Data Management (iCDM) to transform the workflows of Oracle environments. DBAs use SnapVX to create zero-impact, space-efficient database copies that can be used for local data protection or repurposed for many other use cases including development/test, analytics, backups, and patching.



Further orchestration and automation of database copy workflows are achieved by Dell EMC AppSync, an advanced copy data management software that seamlessly integrates with PowerMax. DBAs can now create and manage application-consistent database copies without any contention with storage administrators.

DBAs spend significant time diagnosing system performance issues and monitoring system performance. PowerMax includes many tools that enable DBAs to increase their end-to-end Oracle system proficiencies. For example, DBAs use Database Storage Analyzer (DSA) from PowerMax to quickly troubleshoot performance anomalies or define where new workloads can be added without affecting performance.

DSA bridges the gap between DBAs and storage administrators by serving end-to-end performance analysis with database relevant statistics (e.g., top wait events for storage devices, table spaces, objects, indexes, and partitions for Oracle). Analysis and design recommendations from DSA are widely leveraged by DBAs and storage administrators alike.



Database Storage Analyzer (DSA) increases DBA productivity with end-to-end monitoring and performance analysis

Extreme performance, complete efficiency, and cloud-scale consolidation combined with Oracle ecosystem integration enable PowerMax to dramatically simplify all aspects of database administration. DBAs free up time from tactical operational activities to focus on strategic initiatives and work closely with application, cloud, and data science teams.

Unmatched Data Protection and Mission-Critical Availability

PowerMax is built with industry-leading six nines (99.9999%) availability. It uses advanced fault isolation, robust data integrity, and non-disruptive upgrades and migrations to ensure Oracle databases remain online and available at all times. DBAs use SnapVX to create hundreds, even thousands, of local copies that can be used for database protection and recovery.

Dell EMC ProtectPoint for PowerMax dramatically reduces the Oracle database backup window by completely eliminating the backup servers and the requirement of sending backups over the network. Oracle DBAs can back up databases directly from Oracle RMAN with data sent directly from PowerMax to a Dell EMC Data Domain protection storage system. ProtectPoint completely eliminates backup impact on application and database servers—enabling up to 20 times faster backup, up to ten times faster recovery, and reduced cost and complexity.

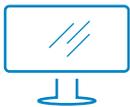
PowerMax comes with proven security features that meet corporate governance and compliance requirements, prevent accidental or malicious intrusion, and are compatible with all of its data services. Key features for Oracle environments include: D@RE with internal and external key management, secure snaps, tamper proof audit logs, and secure access controls.

PowerMax also offers SRDF, the gold standard in remote replication, for mission-critical availability. Integration with Oracle Real Application Clusters (RAC) provides cluster-aware active-active remote disaster recovery for Oracle databases and applications. For constant availability with zero down time, customers leverage PowerMax SRDF/Metro for true active-active data center configurations and Oracle RAC stretched clusters. Dell EMC RecoverPoint is also available to provide heterogeneous replication support and any-point-in-time recovery for PowerMax.

Future-Proof Oracle Infrastructure Investments

PowerMax future-proofs your investments for Oracle deployments. It protects today's investments with non-disruptive upgrade paths to NVMe over Fabric and next-generation storage-class memory (SCM) drives. And the PowerMax operating system, PowerMaxOS, comes with an intelligent built-in machine learning engine that constantly analyzes the incoming IOs and will automatically place data on the most optimal media type (flash or SCM) with zero overhead.

Oracle deployments will continue to benefit from the innovations in the next-generation storage media as the PowerMaxOS machine-learning engine continues to optimally place the data between the fastest media available today and the next-generation media of the future.



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