

# Optimize and simplify Oracle solutions with Dell PowerMax Storage

Today's business requires fast execution of their mission-critical workloads coupled with real-time insights from business data to make strategic decisions that differentiate. Databases workloads are essential for these functions, and Oracle is the most prevalent database management system.

## Dell PowerMax



### Highlights

#### Performance

- Lightning-fast Oracle performance with ultra-low response times for mission-critical, high-performance, and data-intensive mixed Oracle workloads all optimized on the same array

#### Consolidation

- Hyper consolidation with massive scale in performance, capacity, connectivity, LUNs/devices, block, and file data—all with end-to-end NVMe technologies and inline data reduction efficiencies
- Supreme simplicity with integrated copy data management, database-centric tools, and Oracle Enterprise Manager plug-ins

#### Protection

- Designed for 99.9999% availability with built-in advanced fault isolation, robust data integrity, non-disruptive upgrades and migrations, end-to-end data encryption, 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 Smart DR for active/active replication

## Optimize Oracle with performance and data management

The growing need for faster decision systems, 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 many conventional storage architectures supporting them.

As these workloads continue to evolve, several defacto workarounds have emerged for Oracle database workloads to overcome these storage limitations. Some 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 overly complex to deploy, manage, and evolve. 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 critical real-time analytics-based decisions.

[Dell PowerMax](#), the world's most secure storage, brings a new foundation for all modern and traditional Oracle workloads. It transforms the Oracle landscape and meets the most demanding Oracle performance requirements while dramatically simplifying Oracle database management. PowerMax leverages the latest features to consolidate production, development/test, and business analytics workflows onto a single mission-critical platform at cloud- scale including:

- Robust, scalable architecture to meet ever-increasing performance and capacity requirements
- Built-in machine learning engine for continuous intelligent data placement with next-generation storage media
- Outstanding inline data efficiency and data reduction features

## A Single Consolidated Platform for ALL Oracle Environments

PowerMax bridges the legacy performance gap between the server or computing stage and storage platform with ultra-low, sub-60 microseconds latency even at cloud-scale. PowerMax delivers unmatched end-to-end NVMe performance to meet the growing data and analytics requirements of Oracle applications of today and well into the future.

The ultra-fast performance of PowerMax eliminates the silos of data that make it extremely hard to find, cleanse, and integrate data into modern Oracle solutions. PowerMax enables organizations to not only accelerate IOPS- hungry transactional

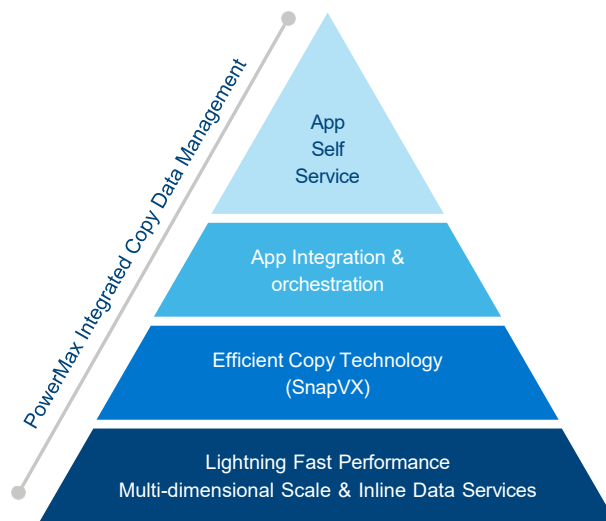
workloads but also speed up bandwidth-heavy complex Business Intelligence (BI) queries while running both Oracle transactional and Oracle Analytics workloads on the same array. Businesses can now consolidate and localize all Oracle data to combat data mart sprawls, gain real-time business insights, and simplify management.

Performance benefits come with state-of-the-art inline data reduction technologies for space efficiencies. The global inline deduplication and compression operations are carried out transparently in hardware, with no software performance penalties. Customers receive a 4:1 storage efficiency guarantee while simultaneously enjoying ultra-fast performance without compromise.

PowerMax provides massive scale in every possible dimension—performance (millions of IOPS), capacity (18 PBe), 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 be consolidated at massive scale across online transaction processing (OLTP), online analytical processing (OLAP), enterprise data warehousing (EDW), DevOps, and Big Data applications. PowerMax protects production database performance from the performance impact of other non-production, or any additional workload, with built-in Quality of Service (QoS) tools ensuring workloads deliver as required.

## 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.



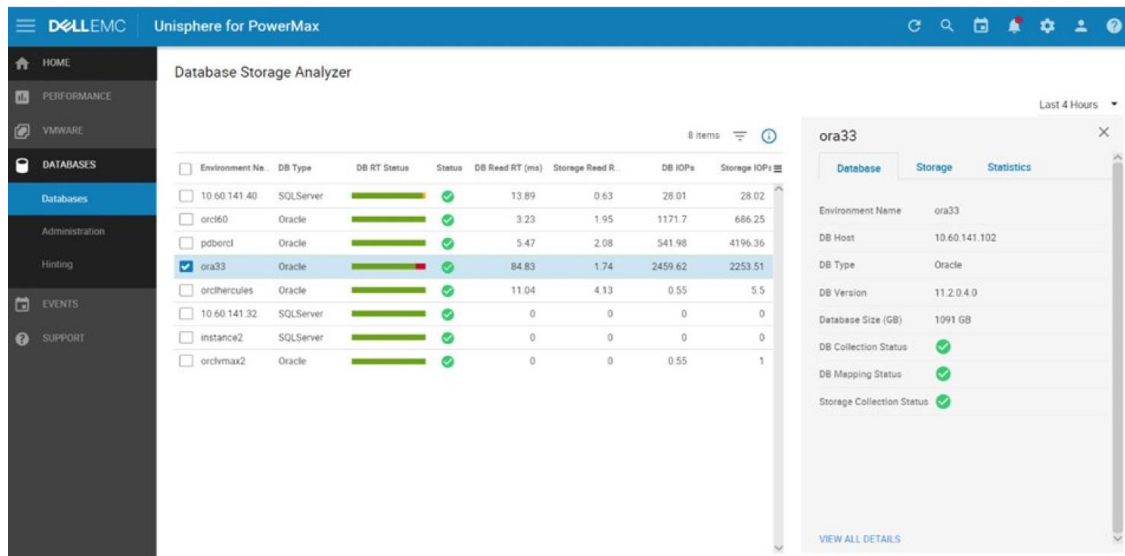
PowerMax Offers Transformative Management

Dell AppSync provides further orchestration and automation of database copy workflows by an advanced copy data management software tool that seamlessly integrates with PowerMax. Assigned DBAs can now create and manage application-consistent database copies without any contention with storage or data center administrators.

Database administrators spend significant time diagnosing system issues and monitoring system performance. PowerMax includes tools that enable DBAs to increase their end-to-end Oracle system proficiencies. For example, Database Storage Analyzer (DSA) from PowerMax quickly troubleshoots performance and growth anomalies and defines where new workloads can best be optimized to understand the impact on performance.

DSA, included with PowerMax arrays, bridges the gap between DBAs and storage administrators by monitoring End-to-end performance analysis with database-relevant statistics (e.g., top wait events for storage devices, tablespaces, objects, indexes, and partitions for Oracle). DBAs and storage administrators alike benefit from the analysis and design recommendations from DSA.

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



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

## High Performance Coupled With Unmatched Data Protection and Mission-Critical Availability

PowerMax delivers an industry-leading six nines (99.9999%) availability for mission-critical Oracle applications. Engineered for advanced fault isolation, robust data integrity, and non-disruptive upgrades and migrations to ensure Oracle databases always remain online and available. Administrators use SnapVX capabilities to create hundreds, even thousands, of local copies used for database protection and recovery.

Dell PowerProtect Storage Direct software tools for PowerMax dramatically reduce the Oracle database backup windows by eliminating the need for Oracle backup servers, and the requirement of sending backup data over the network.

Administrators can back up databases directly from Oracle RMAN with data transmitted directly from PowerMax to a Dell Data Domain protection storage system. PowerProtect Storage Direct eliminates backup impacts on application and database servers—giving up to 20 times faster backup, with reduced cost and complexity.

PowerMax comes with proven security features engineered to meet corporate governance and compliance requirements, prevent accidental or malicious intrusion, and are compatible with all its data services. Critical elements for Oracle include data-at-rest encryption, internal and external key management, secure snapshots, tamper-proof audit logs, and reliable access controls.

PowerMax also offers Symmetrix Remote Data Facility (SRDF). SRDF maintains near real-time copies of data on a production storage array at one or more remote storage arrays. 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 downtime, customers leverage PowerMax SRDF/Metro Smart DR for valid active-active data center configurations across geographic locations for Oracle RAC stretched clusters.

## Future-Proof Oracle Infrastructure Investments

PowerMax storage solutions for Oracle with the industry's most secure end-to-end NVMe array offer future-proof investments for Oracle deployments. It protects today's investments with non-disruptive upgrade paths to the latest next-generation technologies. More importantly, its operating system, PowerMaxOS, comes with an intelligent built-in machine-learning engine that constantly analyzes all host IOs and will automatically place data on the most optimal media placement with zero management overhead.

Oracle deployments will continue to benefit from the innovations in next-generation storage media because 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.

## Oracle value and future expansion

Dell PowerMax is a versatile platform with a performance-centric design that delivers multi-dimensional scale, always-on data reduction, and non-disruptive upgrade support for next-generation media. It brings the simplicity of the public cloud to on-premises infrastructure, streamlining operations with a built-in machine-learning engine and seamless automation. PowerMax offers predictive analytics to easily monitor, analyze, and troubleshoot the application environment, all while providing investment protection through flexible consumption models and data-in-place upgrades.

High-value applications like Oracle are fundamentally changing the way data is used to support the business. The blend of massive amounts of data and technology innovation provides the opportunity for companies to transform. As the value and scale of this data grow, the need to provide an easy-to-manage [future-proof platform](#) with innovation for future growth is critical. Oracle on Dell PowerMax combines leadership technology to bring IT organizations the ability to be agile, efficient, and responsive to business demands.



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