Solution Brief

Dell PowerVault ME5 for HPC Environments

Simplicity, speed, and value for high-performance computing workloads

Managing Oracle databases effectively is essential for businesses to remain competitive in today's data-driven world. However, traditional approaches often involve manual processes, complex workflows, and growing security concerns. IBM Storage Defender Copy Data Management (CDM) combined with Dell PowerMax provides a game-changing solution. Together, they simplify database management, ensure robust security, and automate critical workflows with unparalleled efficiency. This integrated solution streamlines backup, recovery, and disaster response while safeguarding data integrity with advanced security features. It empowers organizations to cut down operational overhead, enhance agility, and deliver consistently optimized performance for Oracle databases.

Dell PowerVault

Highlights

Simple

- PowerVault ME5 simplifies your operations with an intuitive interface and effortless management, making data storage and administration easier than ever. Its straightforward design eliminates complexity, freeing up time and resources so you can focus on achieving your business goals without disruptions.

Fast

- Designed for 99.999% availability, PowerVault ME5 delivers fast, efficient, and dependable performance, accelerating data access and optimizing storage to reduce costs. Its reliable design safeguards your data while simplifying management, so you can focus on growth with confidence.

Affordable

- PowerVault ME5 offers high-performance storage with a low acquisition cost, cost-effective TCO, and a flexible pay-as-you-grow model. It empowers businesses to scale seamlessly, optimize budgets, and focus on success without compromise.

Overview

High-Performance Computing (HPC) environments push infrastructure to its limits—rapid reads, parallel processing, constant data movement, and performance-sensitive applications are the norm. Many organizations struggle to keep storage aligned with compute growth, especially when cost, complexity, or administrative overhead slow innovation. Dell PowerVault ME5 offers a practical and scalable solution. It brings high-speed, simplified block storage into the HPC domain—without the need for specialized skills or excessive budgets.

Use Case: Research Institute Deployment

A regional life sciences research institute needed to modernize its HPC infrastructure to support growing demand in genomics, machine learning, and fluid dynamics simulations. Their compute environment had scaled, but storage was lagging—creating data access delays, backup congestion, and user complaints about inconsistent performance

Implementation Approach

Assessment & Design

The organization worked with a Dell Technologies channel partner to assess current and projected data flows, I/O patterns, and capacity requirements across workloads. Key design decisions included:

- **High-throughput SSDs** to support sequential reads for genomics workloads
- **10/25/100GbE** connectivity to support the existing HPC fabric and avoid new network hardware

Deployment Architecture

- **Hardware:** Two (or more) PowerVault ME5 systems (configured in a mirrored setup for HA) with optional all-flash SSD configurations.
- **Connectivity:** Connectivity: High-performance block storage with Fibre Channel (FC) and iSCSI protocols
- **Workload Tiering:** PowerVault tiering places bioinformatics data and AI/ML datasets on high-performance volumes; long-term datasets tiered off to lower-cost disk.

Integration with HPC Stack

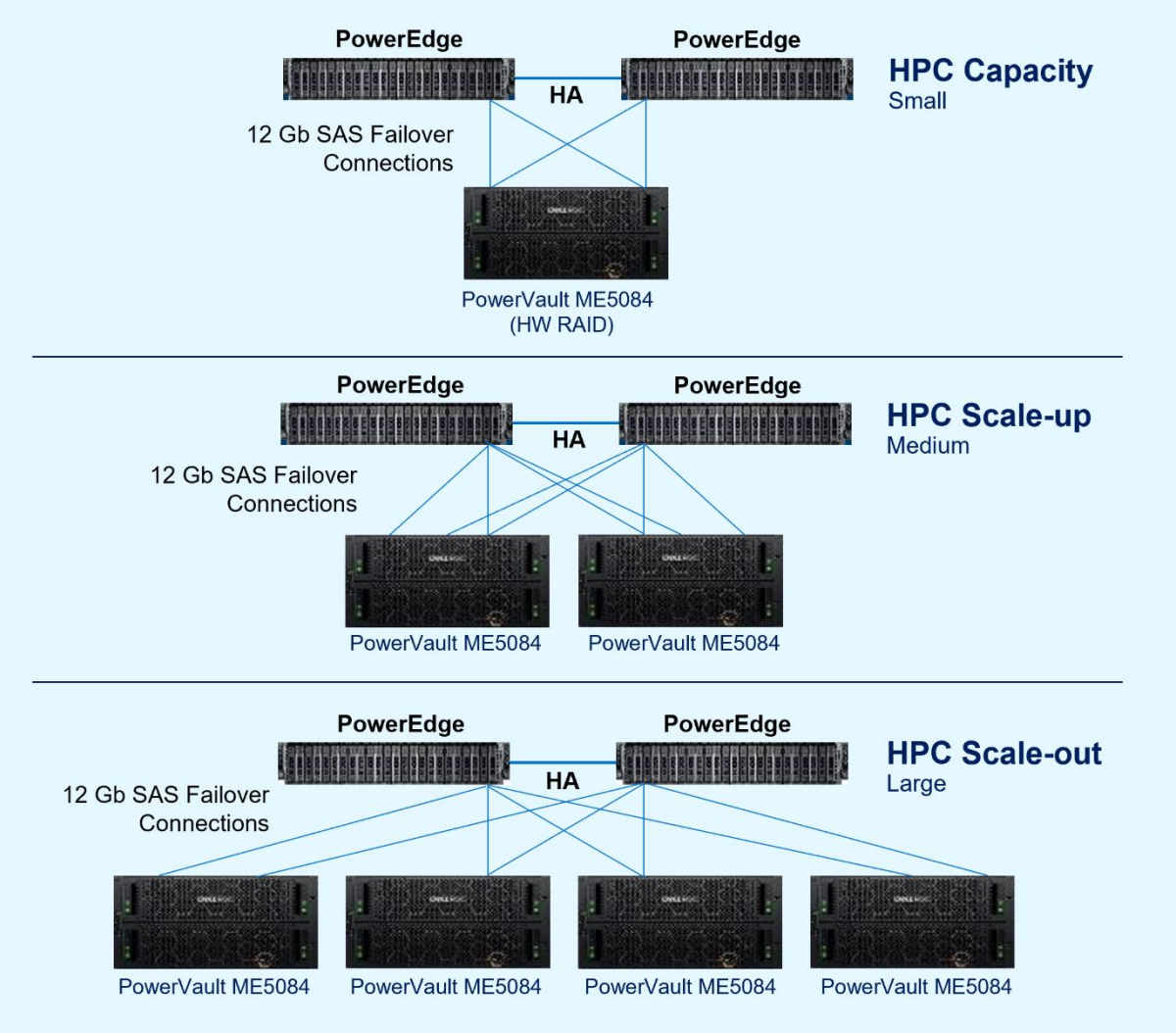
- **Parallel File System:** BeeGFs or PixStor parallel file system integrated with the ME5's high-performance block storage volumes.
- **Compute Compatibility**: Seamless integration with existing Linux-based HPC cluster nodes; best practice storage mount scripts can be automated via Ansible.
- **Data Ingestion**: Instrumentation labs connected via iSCSI or FC, automating transfer of lab data directly to scratch or processing volumes.

Management & Monitoring

- **Tools Used**: Dell AIOps for remote monitoring, alerts, and predictive analytics.
- **User Roles**: Delegated access to Dell HPC labs and HPC techs
- **Time to Deploy:** From rack-and-stack to live production can be less than a few business days.

Why PowerVault ME5 for HPC

- Performance that scales: Designed to meet growing compute demands with flash-speed performance.
- Operational agility: Web-based management, APIs, and integration with orchestration tools like Ansible make it ideal for lean teams.
- Right-size economics: Enterprise-class storage, midrange price point—perfect for education, research, and budget-conscious innovation environments.
- Future-ready HPC design: Scales up (adding drives) or scales out (adding appliances) with consistent performance.



Dynamic Maximum Capacity Configurations of PowerVault in HPC Environments With Modular Building Blocks That Simplify Deployment

In HPC, the race is always on – for discovery, insights, breakthroughs. PowerVault ME5 gives research and innovation teams the infrastructure they need to move faster, think bigger and spend smarter. It's not just an upgrade - it's a transformation of how storage supports high performance computing.

Learn more about Dell PowerVault Storage

Contact a Dell Technologies Expert