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Why Database Administrators Need Dell PowerStore Metro Volumes for Enterprise Database Workloads

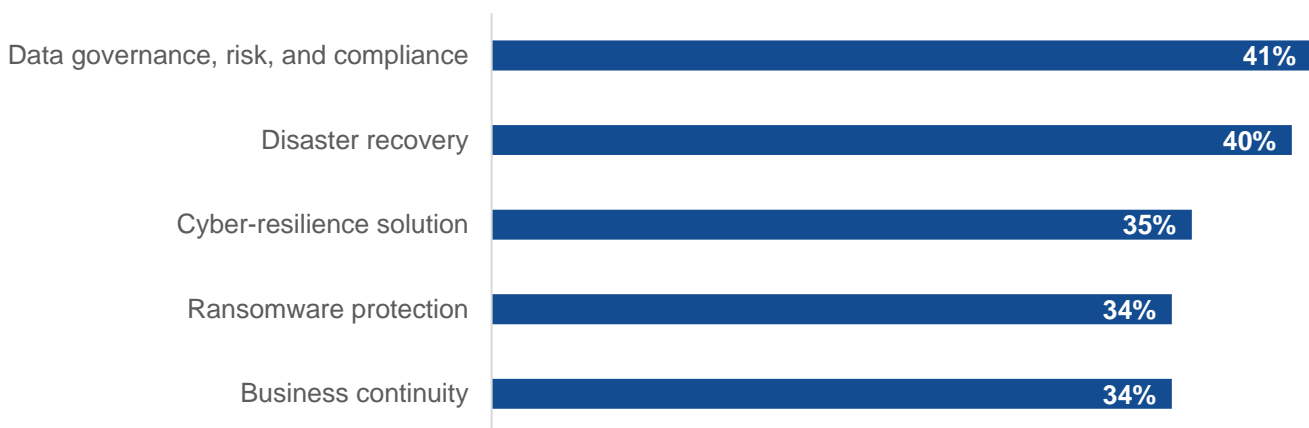Craig Ledo, Senior IT Validation Analyst

IT Challenges

Data is one of the most valuable assets to an organization, and storage is a fundamental component of any enterprise database system (e.g., Microsoft SQL, Oracle, etc.). Its performance and reliability directly impact the efficiency and effectiveness of business-critical enterprise database operations. Outages can occur at any time. They can be restricted to a single system or location or affect an entire data center. To protect against different outage scenarios, organizations—especially those in mission-critical industries (e.g., financial services, healthcare, manufacturing, telecommunications, utilities, etc.)—should plan and implement a data protection strategy that includes a data replication solution for their enterprise database workloads.

TechTarget's Enterprise Strategy Group research shows that organizations are planning on making significant investments in several top data protection technologies and services, including data governance, risk, and compliance (41%); disaster recovery (40%); cyber-resilience solutions (35%); ransomware protection (34%); and business continuity (34%, see Figure 1).[1]

Figure 1. Top Five Data Protection Spending Technologies and/or Services

In which of the following data protection technologies and/or services does your organization plan to make the most significant investments over the next 12 months? (Percent of respondents, N=562, multiple responses accepted)

Category	Percent
Data governance, risk, and compliance	41%
Disaster recovery	40%
Cyber-resilience solution	35%
Ransomware protection	34%
Business continuity	34%

Source: Enterprise Strategy Group, a division of TechTarget, Inc.

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[1] Source: Enterprise Strategy Group Research Report, *2024 Technology Spending Intentions Survey*, February 2024.
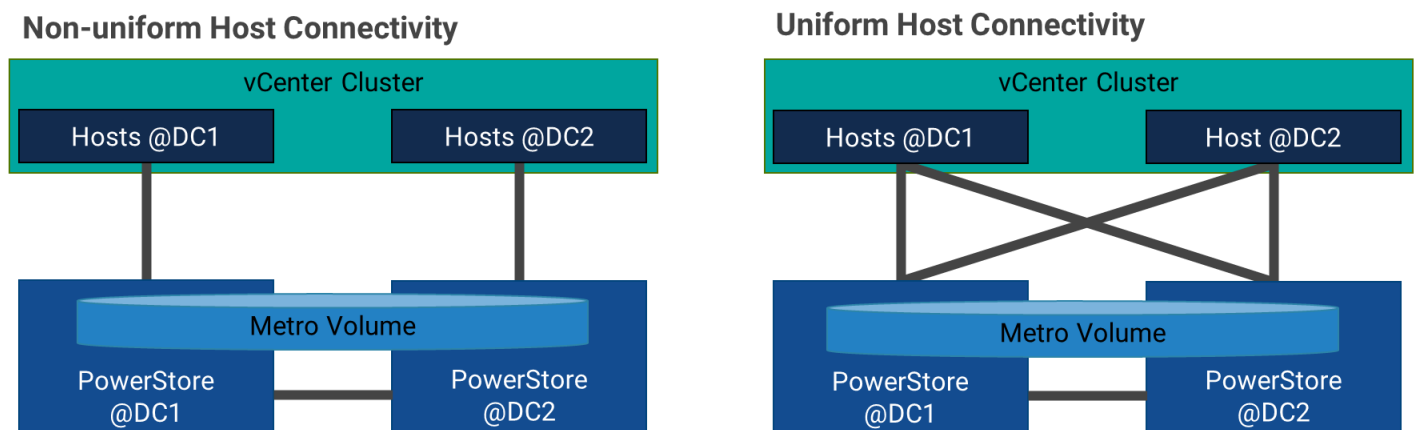
Dell PowerStore Metro Volume

Dell PowerStore Metro Volume provides active/active synchronous replication between two sites for Linux, VMware, and Windows environments. This ensures that data is always up to date and available, even if one site goes offline. Specifically, a Metro Volume provides synchronous replication of spanned block storage volumes or volume groups across two PowerStore clusters in metro-area distance. When a Metro Volume is fully synchronized, it provides concurrent host read and write access to the same Metro Volume on both PowerStore clusters.

In addition, Dell PowerStore Metro Volume's third site witness is deployed at an independent location, running on a server, that continuously monitors and verifies replication and failover processes between the two sites in a high-availability or disaster recovery (DR) setup. It also provides a tie-breaking vote to prevent split-brain scenarios during a network partition or failure. Specifically, users can add a witness server to metro protection to defend against additional failure scenarios. When a failure occurs, the local and remote PowerStore systems contact the witness server and request to sever the metro session, except under certain failures such as loss of connectivity to the witness. The witness then determines which system remains accessible to hosts and continues to service I/Os. If possible, the witness gives precedence to the PowerStore system that was assigned with the preferred role. The witness service does not maintain critical data that cannot be recreated; therefore, there is no need to backup, save, or recover the witness, and it can be removed and reinstalled whenever recovery is required.

During the configuration of a Metro Volume, the administrator can choose the host connectivity, with PowerStore supporting both uniform and non-uniform host access (see Figure 2). In a non-uniform host connectivity configuration, each host has paths to only a single PowerStore appliance. In a setup with uniform host connectivity, each host has active paths to both PowerStore clusters. The uniform configuration provides direct access to the other site in situations where the local site goes down so VMs can write directly to the other site.

Figure 2. Example VMware vSphere Metro Storage Cluster

Source: Dell Technologies and Enterprise Strategy Group, a division of TechTarget, Inc.

First Look

Enterprise Strategy Group reviewed the Dell PowerStore Metro Volume solution's capabilities and assessed how it would benefit organizations—and especially database administrators—around the availability and performance of business-critical database workloads.

PowerStore Metro Volume's native metro synchronous replication lets organizations create a high availability shared storage environment across a metro-area distance, with no additional equipment or software purchase required.

The Dell PowerStore Metro Volume solution is designed to offer enterprise databases the following benefits:

- **High availability and performance in enterprise database workloads.**
  - Uninterrupted operations ensures critical database applications remain operational even during site failures.
  - Improved availability of services leads to better customer satisfaction and retention.
  - Minimized downtime through automated failover and replication helps reduce costs.
  - Increased regulatory compliance helps avoid potential fines and legal repercussions.
- **Automated protection for uninterrupted operations.**
  - Robust protection ensures data is continuously mirrored across geographically dispersed locations with a third-site witness.
  - Rapid recovery with automated failover and switchover provides continuity of operations.
  - Metro Volume is native to PowerStore, eliminating the need for additional DR infrastructure to help organizations with constrained budgets.
- **Scalability and flexibility.**
  - Increased replication volumes (8x more than the previous PowerStore 3.6 release), 5:1 data reduction ratio, and a scale-out-and-up architecture helps with database growth and transaction processing needs.
  - Integration with Dell Virtual Storage Integrator, OpenStack, VMware Site Recovery Manager, VMware vSphere Storage APIs Array Integration/Storage Awareness, and VMware vRealize Orchestrator/Container Storage Interface/Red Hat Ansible/Terraform plugins provides flexibility.
  - Ability to scale up and/or out enables IT to satisfy capacity and performance requirements.
- **Single platform simplicity.**
  - Simple setup, configuration, and management via an intuitive GUI reduces complexity and reduces time to productivity.
  - Robust automation capabilities reduce maintenance/servicing, leading to fewer disruptions.
  - Less time spent on maintenance helps free up key resources for innovation and improvements.
  - The all-inclusive solution lowers operational costs (i.e., there's nothing else to buy).

Why Dell PowerStore Metro Volume for Enterprise Databases?

To provide business continuity, enterprise databases depend on reliable and consistent storage connectivity between the database servers and storage. The loss of storage connectivity would be catastrophic for applications running on enterprise databases like Microsoft SQL or Oracle. Database administrators can use database mirroring or log shipping across platforms, but those techniques are labor-intensive and require manual intervention. Log shipping techniques don't automatically fail over from the primary to the secondary, and database replication requires close monitoring for data consistency and out-of-sync issues, for example. Enterprise Strategy Group analysis revealed that the Dell PowerStore Metro Volume solution provides the following key benefits for enterprise database workloads:

- **Zero downtime.** Metro Volume ensures continuous operation, preventing data loss and minimizing downtime during both planned or unplanned outages. By having an identical copy of the database at a secondary site, the solution enables database administrators to perform both routine maintenance and planned data migration without downtime.

- **Load distribution.** The solution offers the ability for database administrators to create workload distribution, storage utilization balancing, and I/O traffic balancing between PowerStore clusters, ensuring optimal database operation.

- **Synchronous replication.** Metro Volume ensures real-time data commitment to both source and destination volumes, providing transactional consistency between replicated volumes in the event of a failure.

- **Operational efficiency.** Users have support for their Linux, VMware, and Windows environments with a single, easy-to-use, native workflow.

- **Availability.** The solution improves enterprise availability and performance of business-critical database workloads, whether in VMware or non-VMware environments.

Conclusion

Organizations must recognize that traditional disaster recovery is not enough to defend critical assets (e.g., data, databases, and applications). New processes and technologies are needed to adjust to the era of cyber-recoverability, presenting vendors in the data protection space ample opportunity to differentiate their products and services in this regard. In addition, the core technology underpinnings that support a company's digital strategy continue to play a critical role in helping organizations deliver effective, efficient, and reliable services, and storage technology remains a key part of that. Organizations are evolving their storage environments across the stack to support a variety of workloads and applications, including enterprise database workloads.

Enterprise Strategy Group found that the Dell PowerStore Metro Volume solution improves the availability and continuity of business-critical enterprise database workloads. While Metro Volume is easy to deploy and manage, organizations need to consider that critical database workloads that require high availability should be made interoperable with Metro Volumes. For example, an organization should develop a DR plan that includes a site and network assessment before implementing Dell PowerStore Metro Volumes, as this will help ensure successful implementation of the solution because the organization will know upfront if its infrastructure meets the necessary requirements for high availability and DR, then take corrective action if needed.

Overall, it is important for organizations—and especially IT managers and database administrators—to adopt advanced storage solutions like Dell PowerStore Metro Volume to operate, manage, and maintain robust and efficient enterprise database systems. If your organization is looking to prevent the loss of data or transactions with a reliable method of continuous data protection and high availability, you should consider the Dell PowerStore Metro Volume solution.

For more information on Dell PowerStore, please visit Dell Technologies PowerStore.