Sanbolic AppCluster Eases SQL Virtualization

Active-active access and cluster-aware volume management provide reliability with no single point of failure

By James E. Bagley
Senior Analyst
Deni Connor
Principal analyst, Storage Strategies NOW
March 2012

Virtualization has many benefits as server hardware becomes more capable and hypervisors and management tools continue to improve. But the venerable SQL database continues to present unique problems to the virtualization process. The popularity of SQL has embedded it into many critical processes of organizations of all sizes. This has led to sprawling SQL installations that may span multiple locations with silos that must be individually managed, creating security holes and defying consolidation efforts. As database size and access requirements increase, server sprawl has become a major issue. Virtualization provides the means to address server sprawl, but in all cases, a mix of physical and virtual instances, without a cohesive method to manage them, has created a nightmare for database administrators.

Sanbolic’s Melio Enterprise with the new AppCluster system designed with SQL virtualization and management in mind addresses these issues by consolidating, protecting and managing physical and virtual SQL workloads.

Sanbolic Melio data management platform

Sanbolic™ has developed a cohesive data management platform for abstracting application data from heterogeneous storage hardware in a manner transparent to users. Its Melio™ software integrates extremely complex storage concepts, including clustered file system and volume management, rapid resource provisioning, and quality of service (QoS), into a workload, hypervisor and hardware agnostic offering.

Centralized data management and workflow controls make it easy to provision virtual and physical resources and establish quality of service. As shown in the following diagram, the data management platform can be installed in the operating system of either a virtual or physical environment.
Melio allows concurrent access by multiple servers, both virtual and physical to storage volume, for any workload. Because of the symmetrical architecture, the loss of a server does not affect other users, and there is no single point of failure. Its cluster-aware volume manager enables all management functions to be centrally performed on a single node and instantly applied to all system resources. Melio can provision to hundreds of physical and/or virtual servers, and dynamically aggregate storage capacity and bandwidth, allowing SQL environments to dynamically scale out and scale up. Volume sizes of up to 18 exabytes are supported, and can be striped across multiple storage controllers for improved bandwidth and load balancing. A capability called Storage Live Migration allows data volumes to be dynamically moved across heterogeneous storage hardware without application interruption, providing additional flexibility in matching storage performance against dynamic workloads.

Tight integration with Microsoft’s Hyper-V, Windows failover clustering, Active Directory and System Center makes it fast and easy to introduce Melio as a shared storage resource into a Windows-based data center. Volume shadow copy (VSS) based clustered snapshots work with Microsoft System Center Data Protection Manager (DPM) and third-party backup products for enhanced data protection, as well as enabling report generation from the out-of-band database created from the snapshot. Storage provisioning includes quality of service (QoS) that can be dynamically set for each database, a feature that is extremely useful for prioritizing performance sensitive applications ahead of background tasks.

The AppCluster architecture

Melio active-active storage access can be used with traditional SQL failover clustering, which significantly simplifies provisioning by consolidating databases onto a single volume, while providing advanced features such as QoS. But Melio also includes a component called AppCluster™, which allows databases or database groups to be dynamically moved across instances on separate physical or virtual servers. This provides more flexible and granular management than traditional failover clustering, and simplifies the deployment of mixed physical/virtual SQL Server clusters. If a server in a Melio cluster fails, AppCluster will automatically redistribute the databases across all of the servers in the cluster, based on the priority of the database and the resources available on each server. Melio is not limited to 16 node clusters, so it can support a large pool of SQL server resources and dynamically distribute the workload across it.
Advantages and benefits

Among the benefits associated with Melio installation are improved storage utilization, reduced management cost, fewer physical servers, reduced license and support fees, and reduced data center operating costs for space, heating and cooling. While these are the same benefits that have been driving the virtualization of applications, the ease of SQL virtualization, as compared to other implementations, brings these results while reducing database administration burdens.

Other advantages include the addition of new SQL servers and storage controllers without downtime and the ability to upgrade from one SQL version to another with virtually no impact. Moreover, the ability to decouple business-critical SQL functions from the rigidity of physical servers and storage provides a new level of business agility. The ability for live migration of SQL datasets across storage arrays without downtime enables dynamic workloads to run on the most appropriate storage. Databases can live on slow but high capacity storage and then be moved onto high performance solid state arrays during peak times. Moreover, the ability to apply a prioritization weight to physical and virtualized SQL Server instances and distribute the workload based on policy provides Microsoft customers with a heightened level of agility within overall business and IT operations.

Beyond SQL

The benefits described have been particularly focused on SQL, because of the difficulties associated with consolidation and management of business-critical database functions. However, other applications can benefit from the same feature set. Virtual desktops (VDI), general file serving, private cloud and Microsoft SharePoint all represent server datasets that benefit from centralized management, cluster-aware volumes, quality of service provisioning and scale-up and scale-out shared storage.

Our Take

Sanbolic, by focusing on virtualization of Microsoft server applications, has provided an extremely powerful tool set with the ability to produce dramatic results in capital and operating expense reduction, while significantly improving system reliability and security. Most impressive is the ease and flexibility of implementation. Storage arrays and physical servers no longer need to be application-specific silos, but become part of a flexible pool of resources that can be provisioned and resourced on the fly, without downtime and without the potential of single points of failure.

For more information visit: [http://www.sanbolic.com/SQL_Server.htm](http://www.sanbolic.com/SQL_Server.htm)

To download evaluation software: [http://clients.sanbolic.com/](http://clients.sanbolic.com/)

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