Condusiv™
Technologies

CASE STUDY:

State of Wisconsin: Division of Enterprise Technology

The Division of Enterprise Technology (DET), within the Department of Administration for the State of Wisconsin, delivers infrastructure and computer services for state agencies, including management of the consolidated data center, print operations, statewide network and enterprise-wide applications. DET manages the state's IT assets and uses technology to improve government efficiency and service delivery.

DET hosts a variety of applications, platforms, and infrastructure. They strongly encourage and have policies regarding x86 server virtualization. DET predominantly utilizes VMware vSphere as their hypervisor, though they also leverage the z/VM hypervisor to run virtual Linux. Inside the datacenters they are over 87% virtualized in the x86 environment, with just under 1,000 virtual servers. The primary storage is EMC's VMAX platform, allocated into three virtual pools (tiers) and fully thin provisioned.

Providing efficient centralized services across the distributed state network requires a developed strategy for storage management.

Key Benefits

- Offset the need for additional 100TB–150TB of storage

- Avoiding 250 K in storage and staffing costs

- Increased VM density and performance

The Challenge

Through their efforts to provide peak service, DET upgraded their primary storage from EMC's Symmetrix DMX-3 platform to a fully thin provisioned Symmetrix VMAX.

What they discovered was poor reclamation rates while migrating data. DET needed to institute resource-intensive manual processes to clean and reclaim file systems or be forced to procure more storage capacity.

While DET has excellent monitoring and alerting tools in place to guard against resource bottlenecks, they lacked a tailored solution to optimize space utilization within the new storage infrastructure. They needed to find a way to identify and reclaim provisioned yet unutilized free space, in order to realize thin provisioning goals.

The Solution

The Division of Enterprise Technology discovered the solution they required to optimize VM density after researching Condusiv Technologies' V-locity® software.

DET first initiated a proof of concept in September of 2011 within their test environment. After successful compatibility tests, they conducted a high-level TCO and prepared a ROI business case for their leadership.

The ROI analysis specifically compared V-locity's low-impact, low-management overhead, and net return on storage capacity against other more manual methods of reclaiming or procuring storage. As part of the ROI analysis for V-locity, DET calculated the amount of staff time necessary to manually reclaim storage, utilizing tools initially created for securely wiping data. The staff time and performance impact of utilizing tools without throttling features quickly became a problem for DET. The only other choices were to procure more storage and corresponding infrastructure, or utilize V-locity.

After working with Condusiv, DET employed V-locity to take advantage of automated space reclamation in their infrastructure.

Ryan McKee, who is a Technical Architect for DET, and his team oversees and manages complex research and design efforts involving technical architecture, licensing, contract management, platforms, and statewide technology initiatives.

"A primary concern for an administrator of a large virtual infrastructure is the negative performance impact of distributed agents and the balancing act of scheduling these agents to do work," said McKee. "Without the hypervisor and storage awareness that Condusiv incorporates into its products, the overhead of managing this additional workload would have been undesirable."

The Benefits

ROI

Cost-per-application is a metric considering the number of virtual machines that can be run on each hardware server. The higher the virtual machine density, the more an IT department can cut costs, including hardware, networking, storage, power and cooling, and datacenter space.

Based on the ROI analysis for V-locity, DET anticipates avoiding approximately $250,000 in storage and staffing costs over the lifetime of the V-locity product.

Storage Capacity Savings

DET have been continually reclaiming space since V-locity was implemented in their virtual environment. Current estimates indicate that their reclamation strategy has offset the need to acquire approximately 100-150TB of additional raw storage capacity.

The increased density hasn't just been a storage and cost saver, though. "Condusiv's V-locity product helps us reclaim 'dirty free white space' [the non-zeroed blocks of free space on Windows file systems], improves application performance, and once fully implemented should reduce overall I/O to the storage subsystem and improve component utilization," McKee stated.

Optimized Performance

In addition to reclaiming free space, V-locity optimizes I/O on Windows virtual machines. DET realized a performance improvement on each server, due to V-locity organizing data for optimal transport. The individual server optimization also aggregates into reduced storage utilization. And reducing the amount of server work allows for greater server density in the virtual environment and deferment of storage procurements.

"The performance benefits of defragmented file systems were a value add to our organization and customers," said McKee, "The ability to deploy, report against, and manage certain agent functions from a centralized console is very beneficial."

"Our technicians reported that they were pleasantly surprised by the speed of the defragment and reclamation process. Also noteworthy was the small client footprint and the ease of installation."

Below is a "before and after" graph showing the improvement of Performance Monitor I/O indicators, which were retrieved from different servers in DET's environment:
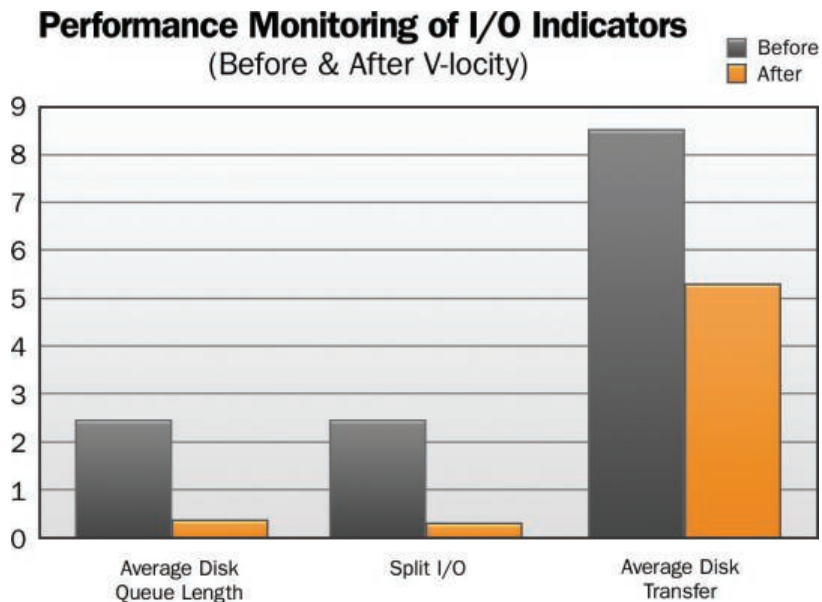
Performance monitoring of I/O indicators (before and after V-locity) from file and SQL database servers in DET's environment.

Reduced Staffing Time

Cleaning free space on the Windows servers had proven troublesome and time-intensive at DET. It required a technician to execute and monitor the cleaning process as well as monitor server, virtual, and storage resources for contention. The inability to throttle that process caused significant resource contention and response time issues for applications. The process couldn't be performed without causing customer impact.

At just under 800 Windows servers, the storage team calculated hundreds of hours of staffing time necessary to manually handle the problem that V-locity automatically addresses. The comparatively low management overhead of V-locity for the tactical goal of reclaiming storage was critical in the procurement decision. The ongoing optimization of the virtual servers with little to no technician interaction provides significant long-term value.

Conclusion

A virtual infrastructure is dynamic and responds to the storage and resource needs of the moment. But it must be kept healthy. Virtualization is designed to make the most efficient use of the IT network investment but succeeds only when resources are shared efficiently without sacrificing I/O bandwidth.

V-locity delivers invisible background optimization to give maximum I/O performance on virtual servers. Automatic zeroing of free space zeroes out unused data blocks on virtual disks and makes virtual disk compaction easy. Automatic Space Reclamation occurs online with no need for a maintenance window.

The V-locity virtual platform disk optimizer essentially bridges the gap between virtual guests that are natively unaware of their environment. Patented technology found in V-locity allows virtual machines to intelligently synchronize resource allocation of file movement operations, while groundbreaking IntelliWrite® technology prevents file fragmentation before it occurs, optimizing file placement and eliminating excess disk I/O.

To learn more about V-locity and try V-locity for free visit www.condusiv.com/products/v-locity.

About Condusiv

Condusiv Technologies creates high-performance software that optimizes and maintains application operation efficiency and equipment longevity to increase productivity in technology, people and businesses. Condusiv customers include enterprises, government agencies, ISVs, OEMs and home users worldwide. A market leader in data storage innovation, the company's solutions help technology function at peak levels.

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