Samsung boosts VM density and performance for Budd Van Lines

Budd Van Lines realizes a sixfold improvement in its VDI environment using Samsung AutoCache

Company Overview

Founded in 1975, Budd Van Lines is a nationwide independent household goods carrier specializing in relocating top executives of corporate America. Its corporate data center is located in Somerset, NJ, with a remote disaster recovery (DR) site in Corona, CA. Ninety percent of its data center users are in the Somerset headquarters.

The Somerset data center is the heart of its corporate operations center. It supports a virtual desktop infrastructure (VDI) with approximately 140 desktop users and is built on Citrix® and VMware® servers. The other applications supported by this infrastructure and accessed by the VDI users include Microsoft® Exchange and SQL Server®.

Customer Needs

With all its users accessing 100 percent of the corporate applications from its data center, Budd Van Lines needed to improve the performance of its VDI environment and the supporting storage infrastructure for all its applications. VDI environments are very I/O extensive; in particular, they generate a lot of read IOPS in the data center. In addition, Budd was seeing intensive boot storms between 8 and 9 a.m. as its users logged in for the day.

Budd was also seeing the same I/O bottleneck issues whenever there was a power or server failure, which disconnected all users. Once service was restored, all the VDI users were reconnected at once. In both the boot storm and failure scenarios, user productivity was impacted and the virtualized server and storage environments were overrun with read requests.

According to Doug Soltesz, CIO at Budd Van Lines, “As the virtual desktop users log in, a gold image creates a virtual machine for each desktop. Every time you make a copy of that image, known as a linked clone, you start to see the whole process slow down.

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AutoCache improved average read throughput sixfold with a tenfold performance gain during bursty periods

"We needed a solution that would allow us to load that one gold image onto a very fast disk or in memory to accelerate the process. We were also beefing up our DR sites and the data center environment was constantly being replicated, so we wanted to increase the IOPS at the DR site."

Solution

Soltesz knew he had to fix these issues, but had yet to find a cost-effective way to do so. He began by bringing in the Nexenta® NexentaStor™ SAN to help alleviate the heavy I/O loads on the servers. NexentaStor is a full-featured NAS/SAN software platform with enterprise-class capabilities that addresses the challenges presented by ever-growing data sets. The Nexenta functionality includes full integration with hypervisors and it can create shared pools of storage from any combination of storage hardware, including SSDs.

Solution Summary

- **Industry:** Transportation
- **Use Case:** VDI (Citrix and VMware) and Microsoft Exchange and SQL Server application environments for both data center and remote DR sites
- **Requirement:** Increase VDI and application performance without increasing overall system and storage costs
- **Solution:** Samsung AutoCache, hypervisor-based caching, with Intel® SSD 330 SATA devices and Nexenta NexentaStor SAN
- **Business Benefit:** Sixfold average improvement in read performance and threefold gain in read IOPS and the speed and number of transactions processed

According to Soltesz, "Upgrading to a Nexenta SAN system was a great improvement. We saw three times the performance gain and could use our choice of more cost-effective storage."

To further improve the efficiency and performance of the virtual server environment, Soltesz then added the Samsung AutoCache™ hypervisor-based caching software to each of the servers in its corporate data center and DR sites (a total of eight).

"The great thing about using AutoCache is that I can put a minimal amount of cache in each host and I am getting a six-time gain in average read throughput. During bursty periods, such as a boot storm, we saw an order of magnitude performance improvement — a 10-time gain!"

- Doug Soltesz, CIO, Budd Van Lines

AutoCache is a read cache with write-through and write-around techniques and includes the following advantages:

- The only I/O caching solution designed specifically to increase VM density and accelerate business-critical applications in virtualized servers
- Cost-effective and incredibly easy to deploy and maintain because it is totally transparent to system resources and fully integrated with native management infrastructure for the hypervisor
- Can increase VM density by up to three times with absolutely no impact on IT operations, depending on the workload
- Requires no guest OS agents and no changes to current storage processes, such as backup, snapshot or replication services

With its patented I/O Intelligence, AutoCache automatically characterizes I/O in real time and dynamically places hot I/O into a local PCIe flash card or SSD. It then intelligently supplies priority data traffic to the VMs. AutoCache dynamically adjusts to changing workloads and will not impact high-availability processes in DR environments, such as vMotion®.

AutoCache is not only an incredibly simple solution, but is also the most cost-effective way to take advantage of the performance benefits of enterprise flash, converting a modest flash investment into a huge value. For the server-side flash SSD, Soltesz added 200 GB to each server using Intel SSD 330 devices.

The Intel SSD 330 devices offer SATA six gigabit per second (Gb/s) transfer rates, boosting the overall system performance and responsiveness for the broad range of the company's applications. Soltesz was thrilled with the outcome achieved by adding AutoCache to accelerate the overall storage environment.

Budd Van Lines realized increased IOPS performance and lower read latency, enabling faster application processing

An additional result of adding AutoCache to the firm's virtual server infrastructure was a threefold improvement in the read IOPS, the number of active transactions processed and the speed at which transactions were completed. AutoCache increased the IOPS performance and lowered the read latency, enabling more application transactions to be processed faster.

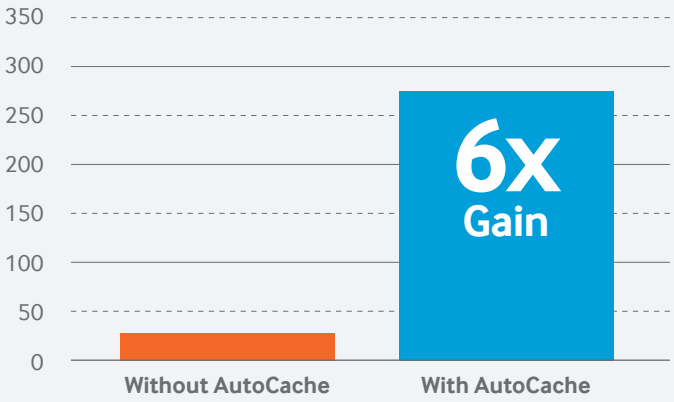

Figure 1. Read throughput

The combined Samsung, Intel and Nexenta solution enabled Budd Van Lines to achieve a sixfold improvement in the overall performance of its VDI environment. There was also a boost in the performance of all its applications, including its DR environment.

Result

AutoCache enabled Soltesz to improve the performance of Budd's entire application environment and reduce costs by enabling the company to use more cost-effective storage and systems. In addition, at the Somerset, NJ data center, Soltesz has increased the number of VMs running on the virtual servers by up to two times, with room to grow.

In the DR center, he expects to triple the IOPS and run more VMs than are currently running. Soltesz also saw a cost savings on the DR side by removing the burstiness in the server-to-user traffic, which eliminated the need for more IOPS and more expensive, higher-performance systems to generate them.

"We saw our average read response times and sporadic bursts smooth out with AutoCache. It actually seemed to eliminate bursts. We increased the effectiveness of the virtual environment with a very small investment on the server-side storage. We also expect that we will be extending the life of the IT infrastructure for our data center and remote DR sites by not having to upgrade our equipment as often."

Another business and cost benefit that Soltesz saw was a reduction in the overall network traffic. It is the same network that his users and SAN traffic run over, but reducing the SAN traffic eliminated the need to add a more costly network bandwidth.

"Everyone is looking to accelerate their VM environments, but it is cost-prohibitive to upgrade your SAN or network to compensate for the I/O bottleneck. By moving that data closer to the VM, we can eliminate multiple headaches. AutoCache puts the resource very close to the demand so you don't have to spend money on things in between the application server and the SAN."

AutoCache is totally transparent to the hypervisor, system and storage hardware. It enabled Soltesz to gain performance using a cost-effective solution that allowed him to use the best-of-breed VDI and hypervisor solutions (Citrix and VMware) and storage solutions (Nexenta and Intel).

"AutoCache was an easy and affordable way to solve the problems I was seeing. It allows me to use any application along with the hypervisor and any storage that I want rather than be tied to vendor-specific solutions."

- Doug Soltesz, CIO, Budd Van Lines

The most exciting part of using AutoCache for Soltesz was that he was able to focus on other things instead of performance problems. "Our users are leaving us alone and allowing us to do other work, rather than asking us to put out fires. They are more productive and I can control the costs of my VDI and DR infrastructures ever since we've deployed AutoCache."

Legal and additional information

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For more information

For more information about Samsung AutoCache, visit www.samsung.com/semiconductor.

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