CASE STUDY

VAR DELIVERS COMPETITIVE ADVANTAGE WITH INTEL, ADAPTEC AND SEAGATE

When a next-generation Internet TV platform company needed an effective virtual environment to speed application development, they turned to Area Data Systems, Inc. for expert IT consultation. Based on a thorough examination and understanding of their customer's development process, Area Data Systems formulated a server solution utilizing exceedingly reliable, high-performance, and cost-effective Intel, Adaptec, and Seagate components. The final delivery was a platform exceeding developer demands—a highly capable virtual server with performance equivalent to 100 desktop platforms.

Meeting Developer Needs

Next-generation software applications can't grow beyond the concept phase without developers who are able to quickly and efficiently create, test, and execute their ideas. Unfortunately, code building and application testing can quickly consume the available resources of any single PC or workstation. In the past, developers and IT staffs have met this challenge with multiple physical development platforms.

Virtualization Demands Performance and I/O Throughput

Today, the mainstream acceptance of virtualization makes it easier than ever to move beyond physical development environments and achieve significant efficiency gains by consolidating using powerful next-generation servers. For these servers to meet the performance demands of virtualization, they require sufficient performance and I/O throughput headroom. New multi-core processors from Intel, high-performance RAID controllers from Adaptec and 15K-RPM drives from Seagate combine seamlessly in platforms able to accommodate the demands of virtualization. It was a platform featuring these components that was recommended by Area Data Systems, Inc.

With Internet TV quickly coming of age, a leading global Internet TV platform provider needed to meet the constantly shifting demands of their software engineering team. Area Data Systems, their trusted VAR for almost three years, recognized this situation as an ideal opportunity to deploy a virtualized development environment.

Need

Application engineers at a fast-moving Internet TV platform company found their workstation-based development environments unable to match pace with their diverse (and often simultaneous) code building and QA needs.

Solution

Rather than multiply physical desktop environments, Area Data Systems recommended and deployed a virtualized server environment running Citrix XenServer*. To meet the processing, I/O throughput and reliability demands of developers, Area Data Systems combined best-in-class components from Intel, Adaptec and Seagate.

Result

With the performance headroom of new Intel-technology based platforms combined with the latest Unified Serial (SATA/SAS) RAID technology from Adaptec and 15K-RPM Seagate Cheetah* hard drives, up to 100 simultaneous virtual images can be deployed and served per 1U rack server.

About Area Data Systems, Inc.

Since 1987, Area Data Systems, Inc. has built success by delivering the most cost-effective, reliable, scalable and leading-edge Server and External Storage hardware solutions. Area Data Systems has been an Intel® Channel Partner Premier Member since 1998.

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AREA DATA SYSTEMS

"In order to handle all the virtual machines running on the virtual server, the client needed a powerful processor."

William Huang
President,
Area Data Systems

The 4 Must-Haves

After analyzing their customer's needs, Area Data Systems identified four critical areas:

- **Processor.** Powerful and efficient multi-core processors featuring large on-die L2 caches and fast front side bus speeds would be needed to effectively handle the multiple virtual machines running on a virtual server.
- **Memory.** At least 16 GB of FB-DIMM memory per server would be required to maintain seamless throughput and excellent platform responsiveness.
- **I/O Performance.** A high-performance I/O RAID controller would be crucial for the effective routing of platform data and high platform responsiveness.
- **Hard Drive.** Fast and reliable hot-swappable hard drives with high capacities would increase work efficiencies while improving uptime.

Based on these requirements, Area Data Systems chose Intel, Adaptec, and Seagate components.

Turning to Intel Innovation

Because of the customer's diverse and constantly shifting code-development and application testing needs, there was a need for a physical server unit able to run multiple systems (or virtual machines) in various separate environments simultaneously without slowdown. With this in mind, Area Data Systems researched their options and made their decision to utilize an Intel technology-based platform featuring support for Intel® Virtualization Technology[1] (Intel® VT) and Intel® I/O Acceleration Technology (Intel® I/OAT).

Intel® Server System SR1560SFHS

Area Data Systems immediately saw the advantages of using the Intel® Server System SR1560SFHS. Since the solution required a significant memory footprint, Area Data Systems benefited from this Intel® Server System's support for sixteen fully buffered DIMM (FB-DIMM) sockets enabling up to 64 GB of registered ECC DDR2 667 MHz memory and Intel® Extended Memory 64 Technology (Intel® EM64T). Representing Intel's latest generation of rack-optimized server solutions, this system offers support for a fast system bus and high I/O bandwidth. Using the Intel® Server System SR1560SFHS meant that Area Data Systems had the foundation for their high-performance virtualization solution. Once selected, this platform guided development and influenced the selection of complimentary components.

Quad-Core Intel® Xeon® E5430 2.66GHz Processor

Selecting this platform also meant that Area Data Systems could integrate the Quad-Core Intel® Xeon® E5430 2.66 GHz processor. The decision to step up to quad-core was a natural one—the customer had already realized significant performance and efficiency gains when they made the move from platforms featuring single-core Intel® Xeon® processors to platforms featuring the Dual-Core Intel® Xeon® processor 5100 series. Upgrading to the powerful capabilities, efficiency and speed of a quad-core processor allowed for an exponential increase in the ability to capably handle multiple virtual machines.

With enhancements including Intel's exclusive 45nm technology, Intel® VT, and an L2 cache that's 50% larger than the previous-generation Intel® Xeon® processor, Quad-Core Intel® Xeon® processors E5400 series enable Area Data Systems to help their customers realize an improved return on investment while extending the leading performance and performance-per-watt advantages

enjoyed with Intel's proven multi-core processor technology. Platforms featuring the Quad-Core Intel® Xeon® processor 5400 series deliver the performance headroom needed to confidently consolidate applications onto fewer systems using proven virtualization solutions.

This Intel platform provided significant performance headroom thanks to built-in virtualization capabilities and highly efficient multi-core processor architecture. This processing capacity allowed Area Data Systems to recommend server consolidation options that would have been impossible or cost-prohibitive a few short years ago. Maximized I/O throughput enabled a single virtual server to deliver the performance equivalent to approximately 100 individual desktop computers.

Adaptec Advantage

An Adaptec RAID controller was selected in large part because Adaptec offers reliable, industry-leading RAID solutions. The Adaptec 3405 PCI-e 4-port Unified Serial (SATA/SAS) RAID Controller was chosen as the optimal choice for the required virtualization environment. Adaptec provided unmatched flexibility in running virtualization software as well as the necessary drivers and firmware for effective execution.

Choosing Adaptec provided distinct advantages throughout Area Data Systems' implementation. Hard drive performance dramatically increases through the use of the Adaptec Unified Serial controller. With the capabilities enabled by this controller, Area Data Systems found it extremely cost-effective to help their customer scale up to 200TB per controller while maintaining superior storage performance.

With the robust data demands of the virtualized server, I/O handling was critical. The selection of the MD2 low-profile Adaptec RAID 3405 effectively ensured fast, reliable I/O performance crucial to the customer thanks to cross-platform engineering and rigorous application testing.

The customer's stringent reliability requirements were also satisfied with Adaptec. The Adaptec RAID 3405 featured several levels of RAID, including RAID 0, 1, 1E, 5, 5EE, 6, 10, 50, 60, and JBOD—effectively providing safeguards against failure through redundancy and mirroring capabilities.

Seagate Selection

As a Seagate Premiere Provider and member, Area Data Systems is intimately familiar with the quality and reliability of Seagate hard drives. Seagate Cheetah* hard drives running at 15K RPM were selected as the data storage, OS and application loading component of the virtual server. Combined with the Adaptec RAID controller and the Intel® Server Platform, these high-performance drives provided hot-swappable functionality to enable superior uptime and versatility.

Due in large part to the customer's demanding application engineering, Seagate Cheetah hard drives, with their robust reliability attributes, were the only logical choice for storage. Featuring unprecedented levels of performance and reliability for Tier 1, mission-critical server and storage solutions, high-capacity Cheetah hard drives minimized any potential downtime while maximizing responsiveness. Inclusion of Cheetah hard drives provided unparalleled reliability with an MTBF of 1.6 million hours and the peace of mind of the Seagate five-year limited warranty.

Flawless Compatibility

The end result was a dozen units implemented for the first deployment phase. Each was capable of running virtual machines equivalent in performance to 100 individual desktops. Exceedingly responsive I/O performance was possible only through the flawless compatibility and cooperation of ecosystem leaders Intel, Adaptec, and Seagate and knowledgeable coordination of Area Data Systems.

"Adaptec does a great job of providing the drivers and firmware to use for each of the different OS being used on the virtual server."

William Huang
President,
Area Data Systems

"To minimize potential downtime while supporting maximum responsiveness, we used Seagate Cheetah hard drives."

William Huang
President,
Area Data Systems

COMPONENT	SPECIFICATIONS
Intel® Xeon® Quad-Core E5430 2.66 GHz 	**CPU Speed:** 2.66 GHz **FSB:** 1333 MHz **L2 Cache:** 12 MB **Architecture:** 45nm
Intel® Server System 1560SFHS 	**Supported Processors:** Quad-Core Intel® Xeon® 5400 sequence Dual-Core Intel® Xeon® 5200 sequence **Supported Memory:** Sixteen fully buffered DIMM (FB-DIMM) sockets enabling up to 64 GB of registered ECC DDR2 667 MHz memory (32 GB used in solution) **Additional Features:** Plug and play, IDE drive auto-configure, SMBIOS 2.3, ECC/parity support, multilingual support, enabled for rolling/online BIOS updates. Intel's latest generation of rack-optimized server solutions deliver a large memory footprint, fast system bus, and high I/O bandwidth—critical features for High-Performance Computing (HPC) applications as well as datacenters and general-purpose enterprise-class computing needs.
Adaptec 3405 PCI-e 4-port Unified Serial RAID Controller 	**Features:** ▪ 4-port card supports up to 128 SATA and SAS devices using SAS expanders ▪ PCIe host interface ▪ 3 Gb/s per port ▪ Supports approximately 200 TB (using 500 GB SATA drives) ▪ RAID levels 0, 1, 1E, 5, 5EE, 6, 10, 50, 60 JBOD ▪ 128 MB DDR fixed data cache ▪ MD2 low-profile form factor ▪ Optional battery backup module **OS support:** Microsoft Windows*, Linux* Open Source, Sun, VMWare*
Seagate Cheetah* 15,000 RPM Hard Drives 	**Features:** ▪ Broad range of capacities—from 73 GB to 450 GB ▪ Serial Attached SCSI (SAS), Ultra320 SCSI, 4-Gb/s Fibre Channel interfaces ▪ Sustained data rates up to 162 MB/s ▪ Seek times as fast as 3.5 ms ▪ Highest reliability rating in the industry ▪ 5-year limited warranty

Learn More

Intel® Xeon® Quad-Core Processors: **www.intel.com/xeon**
Intel® Servers and Workstations: **www.intel.com/products/server**
Adaptec RAID Controllers: **www.adaptec.com/raid**
Seagate Cheetah* Hard Drives:
www.seagate.com/www/products/servers/cheetah
Area Data Systems: **www.areasys.com**

[1] Intel Virtualization Technology requires a computer system with a processor, chipset, BIOS, virtual machine monitor (VMM) and applications enabled for virtualization technology. Functionality, performance or other virtualization technology benefits will vary depending on hardware and software configurations. Virtualization technology-enabled BIOS and VMM applications are currently in development.

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