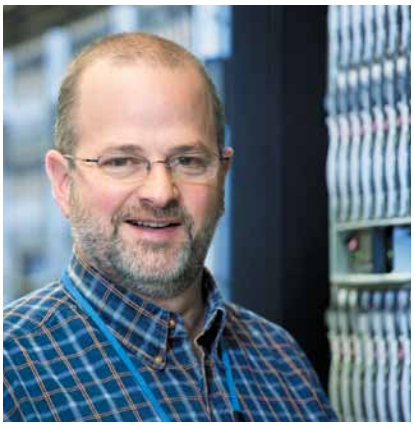
CASE STUDY
Intel® Xeon® processor 5500 and 5600 series
Enterprise Server
Virtualization

Laying the foundation for business growth

By adopting Cisco Unified Computing System* servers with Intel® Xeon® processors, Terremark increases data center density and delivers up to 30 percent better application performance for customers

From enterprise businesses and government agencies to e-commerce companies and application developers, organizations in an array of fields rely on Terremark to provide co-location, managed hosting, network, security, and cloud computing services. For its recent Enterprise Cloud deployments, the company selected the Cisco Unified Computing System* with servers based on Intel® Xeon® processors to improve the price/performance of systems, increase the density of the infrastructure, and control expenses. The move will help the company prepare for continued growth while providing customers with up to 30 percent better application performance.



terremark®

"By providing fast processor access to memory and support for greater memory capacity, the Intel® Xeon® processor 5500 series in the Cisco Unified Computing System* helps us deliver outstanding price/performance for customer applications running in our virtualized environments."

– Joel Stidley
Managed Services Architect
Terremark

CHALLENGES

- **Improve performance.** Deliver the greatest possible performance for a full range of customer applications running in the cloud computing environment.
- **Increase server density.** Adopt a dense hardware platform to prepare for future expansion while controlling power, cooling, and real estate costs.
- **Accelerate provisioning.** Deploy new servers rapidly, easily, and cost effectively to accommodate continued customer growth.
- **Differentiate services.** Offer industry-leading service-level agreements (SLAs) for availability.

SOLUTION

- **Cisco Unified Computing System* with Intel® Xeon® processors.** The Terremark team deployed Cisco Unified Computing System (UCS*) blade servers with the Intel Xeon processor 5500 series in its cloud computing environment. Future deployments of Cisco UCS servers will include the Intel Xeon processor 5600 series.

IMPACT

- **Enhanced performance.** The new Intel processor–based Cisco UCS improves application performance by up to 30 percent, helping Terremark attract and retain customers by enabling them to run more and larger workloads in less time.
- **Greater infrastructure density.** Compared with other platforms, the Cisco UCS blades with Intel processors enable Terremark to fit four times the number of processing cores per rack, facilitating continued business growth without increasing power, cooling, and real estate costs.
- **Faster provisioning.** By unifying compute, network, storage, and virtualization sources in a single system, the Cisco UCS helps reduce the time, complexity, and expense of installing new physical servers. The Cisco UCS Manager reduces new server provisioning to just a few clicks.
- **Competitive advantage.** The Cisco UCS and VMware* software capabilities help keep applications running during maintenance tasks, enabling Terremark to deliver on availability SLAs and achieve a competitive advantage.

Intel® Xeon® Processors Drive Improved Application Performance

SPOTLIGHT ON TERREMARK

With purpose-built data centers in the United States, Europe, and Latin America, and plug-and-play connectivity from 160 global network carriers, Terremark Worldwide provides government, enterprise, and Web 2.0 customers with a comprehensive suite of managed solutions including managed hosting, co-location, network, security, and cloud computing services.

To deliver new service offerings and accommodate an expanding customer base, Terremark needs cost-effective ways to scale its infrastructure. "Terremark's infrastructure growth is rapid and global, with recent and forecasted platform expansions in emerging Latin American and European regions," says Howard Grodin, vice president of strategic programs at Terremark. "We need to adopt new technologies that can help us support the growth of our cloud offerings without excessive expenditures."

Selecting technologies that can increase hardware density is essential. "As we continue to add servers to our infrastructure, we need to optimize data center space," says Richard Lovelace, Terremark's director of product development. "By implementing a dense hardware platform, we can grow while conserving power, cooling, and real estate."

At the same time, delivering outstanding performance is critical for attracting and retaining customers in a competitive marketplace. "We are constantly looking for ways to increase our customers' application performance while controlling our costs," says Joel Stidley, managed services architect at Terremark. "For our cloud computing environment, we need processors that can deliver the best price/performance."

To give customers the confidence to entrust their business-critical applications to the cloud, Terremark also needs to offer service-level agreements (SLAs) that guarantee availability. "We need capabilities that will help us keep applications running even during hardware maintenance and upgrades," says Lovelace.

Terremark shifts to Cisco and Intel

The Terremark team contemplated making a change from the previous servers they were using for cloud computing offerings. A long-standing Cisco partner, Terremark decided to explore the new Cisco Unified Computing System (UCS) platform, equipped with Intel Xeon processors. "The Cisco team helped us see the business benefits of moving to a new platform, and we provided feedback on ways to optimize these servers for service providers," says Grodin. "As we tested Cisco UCS evaluation units equipped with the latest Intel Xeon processors, it was clear that this platform could help us address several of our challenges."

The Terremark team deployed the Cisco UCS in both lab and production environments. Each Cisco UCS chassis contains eight B200 M1 blades with 64MB of RAM, and each blade is equipped with two Intel Xeon processors 5500 series. The cloud environment is virtualized with VMware vSphere* 4 software. Government and enterprise customers can run a full range of applications on Microsoft Windows Server* and Linux* operating systems, from enterprise back-office systems and Web servers to e-mail servers and databases.

"The Intel® Xeon® processors deliver up to 30 percent better performance on our benchmark than other processors with the same number of cores. That improved performance accelerates application response times for customers and enables them to use extra cycles for additional processing."

– Joel Stidley, Managed Services Architect, Terremark

Terremark selected Intel Xeon processors in large part because they offer the memory capacity and bandwidth Terremark needs for maximizing price/performance. "Memory is often a limiting factor in virtualized environments," says Stidley. "By providing fast processor access to memory and support for greater memory capacity, the Intel Xeon processor 5500 series in the Cisco UCS helps us deliver outstanding price/performance for customer applications running in our virtualized environments."

Intel Xeon processors boost performance by 30 percent

The improved processing performance is measurable. "We tested Microsoft SQL Server* workloads in a VMware environment to evaluate the performance of the Cisco UCS," says Stidley. "The Intel Xeon processors deliver up to 30 percent better performance on our benchmark than other processors with the same number of cores. That improved performance accelerates application response times for customers and enables them to use extra cycles for additional processing. They will be able to do more without having to spend more."

New platform delivers four times greater hardware density

Moving to the Cisco UCS with Intel Xeon processors has helped Terremark pack significantly more processing power into each rack. "In the past, we could fit only eight servers in each rack—64 cores total," says Stidley. "With the new Intel processor-based blades, we can fit 32 servers in each rack for a total of 256 cores, all while staying within the same power and cooling envelope."

The memory capacity per rack has increased substantially as well. "By using the Intel processor-based Cisco servers, we now have up to three times greater memory capacity per rack than before," says Stidley. "Customers can run larger virtual machines on the Cisco UCS, and we are better prepared to expand our services and add new customers."

Cisco UCS helps Terremark scale in minutes instead of days

By adopting the Cisco UCS, the Terremark team can cut the time and costs of scaling the infrastructure. In the previous environment, each new server required eight Ethernet and two Fibre Channel cables—a fully populated rack with eight nodes required 80 cables. Now, all 16 servers in the Cisco UCS chassis connect with just two cables to a pair of Cisco 6100 Fabric Interconnects at the end of the row. Any additional chassis and blades that Terremark adds connect through the same fabric interconnects, eliminating the cost and complexity of additional interface cards, cabling, and switch ports.

The design of the Cisco UCS saves considerable time for new server deployment. "When we deployed a previous batch of 90 rack servers for the cloud environment, it took eight full working days with five technicians just to perform the cabling," says Lovelace. "Cabling the Cisco UCS chassis for our Enterprise Cloud took about 30 minutes."

On an ongoing basis, server provisioning is also much faster now. "We use Cisco UCS Manager to create service profiles and apply them to new servers with a few clicks," says Lovelace. "It's a simple process, and it allows us to be very responsive to customer needs."

The physical design and system management capabilities also help Terremark save money. "As a service provider, we need to control costs and enhance efficiency everywhere we can," says Grodin. "With integrated switching and the use of service profiles, the Cisco UCS helps us preserve our margins."

New environment helps Terremark offer industry-leading SLAs

Running the VMware environment on the Cisco UCS helps the Terremark team to ensure uptime, giving customers the confidence to run business-critical applications in a cloud environment. "With VMware VMotion* capabilities and the 10 Gigabit Ethernet connectivity of the Cisco UCS, we can move memory and workloads between physical hosts rapidly to accommodate upgrades and repairs," says Stidley.

"With a six-core architecture, the Intel® Xeon® processor 5600 series will help us achieve even greater compute density. We also plan to capitalize on Intel® Trusted Execution Technology...to provide added layers of security for our cloud computing and managed hosting customers."

– Howard Grodin, Vice President, Strategic Programs, Terremark

Terremark plans for growth with the Intel and Cisco road maps

As Terremark expands its cloud service offering and migrates other managed services to the new platform, the IT team will begin using the latest Cisco UCS, built on the Intel Xeon processor 5600 series. "With a six-core architecture, the Intel Xeon processor 5600 series will help us achieve even greater compute density," says Grodin. "We also plan to capitalize on Intel® Trusted Execution Technology, which helps protect against software attacks, to provide added layers of security for our cloud computing and managed hosting customers."

Given the success of the Enterprise Cloud platform, it is no surprise that Terremark is deepening its relationship with Intel and Cisco. "It's extremely helpful to work with companies like Intel and Cisco," says Grodin. "With access to their expertise and technology road maps, we can find the most effective ways to support continued business growth."

Virtualization: Dynamic Resource Management. Optimize server utilization and increase agility through virtualization and dynamic policy-based resource management.

Find a business solution that is right for your company. Contact your Intel representative or visit the Reference Room at **www.intel.com/references**.

For further information on the Unified Computing System, please visit **www.cisco.com/go/ucs**.