CASE STUDY
Intel® Xeon® processor 5500 series
Energy: Efficiency, Environment, and Performance
Enterprise Server
Technology

Changing the Game

Oracle uses Intel® Xeon® processor 5500 series–based systems with Intel® Intelligent Power Node Manager to increase rack density and propel business growth

Oracle was intent on increasing the computing density of its data centers so it could serve more customers at a lower cost and be in a strong competitive position when the economy improves. The gating factor: power consumption. The only way to reduce the amount of power each server used would be to pack more processing capability into the same space. With the Intel Xeon processor 5500 series, Oracle can match the power to the application.

ORACLE®

"The Intel® Xeon® processor 5500 series is a true game-changer, enabling greatly increased density and power management."

– Don Nalezyty
Director of IT Enterprise Architecture
Oracle

CHALLENGES

- **Increase computing density**, enabling Oracle to serve more customers in its data center space
- **Manage power consumption** to allow more servers in each rack
- **Reduce costs** of data center power and cooling

SOLUTION

- The Intel® Xeon® processor 5500 series with Intel® Intelligent Power Node Manager

IMPACT

- **More processing capability** can fit within the data center power envelope because Oracle can actively manage power consumption for individual servers and applications
- **Energy savings of 35 percent** are projected with Intel Intelligent Power Node Manager, for reduced operating expenses
- **50 percent more servers per rack** saves data center space and enables more growth while keeping costs low

Adding New Luster to the Gold Standard

Oracle is well known worldwide as the gold standard for database technology and information management applications. The company maintains five major data centers around the world to run its own internal IT services as well as Oracle On Demand*, Oracle University*, and other popular services for customers. The Oracle IT team is constantly looking for ways to increase data center efficiency and boost competitiveness.

The Name of the Game: High Density

To make the most of its data center space, the Oracle team virtualized and consolidated the IT environment using an open-source solution, but the number of servers the team could place in the data centers was still limited. "High computing density is the name of the game for us because it drives profitability," says Don Nalezyty, director of IT enterprise architecture at Oracle. "The more servers we can fit in a rack, the lower the cost of hosting virtual machines. However, with an average 5 kW power envelope per rack, we were hitting our density limit."

A New Level of Granular Power Management

Intel® Intelligent Power Node Manager

Oracle was refreshing its existing dual-socket, quad-core servers on a three- to five-year schedule to increase processing capability and energy efficiency, but had no significant power management in use in the data centers. "We started investigating and talked with the people at Intel," says Nalezyty. "They made us aware of Intel® Intelligent Power Node Manager in the Intel® Xeon® processor 5500 series, and showed us how we could integrate it with the Oracle Enterprise Manager software we already used."

Proof of Concept Shows Results

The Intel team helped conduct a proof of concept at the Oracle Advanced Technology Lab to evaluate the Intel Xeon processor 5500 series using workloads from Oracle University. "We were impressed by both the performance and the power management," says Frank Martin, architect for global IT at Oracle. "Having Intel Intelligent Power Node Manager built into the Intel processors enables us to throttle them up or down for optimal frequency and power. By actively managing the power consumption in individual servers, we can put a lot more processing capability in each of our data centers."

Oracle is in the process of ordering Intel Xeon processor 5500 series–based servers with Intel Intelligent Power Node Manager technology for its internal IT environment. The company plans to extend deployment to Oracle University and on-demand services in the future.

Projected Energy Savings

With active power management enabled by the Intel Xeon processor 5500 series, the Oracle team projects an energy savings of approximately 35 percent. "If we have virtual machines scheduled to run on a server and it doesn't have enough space, we power up a second server," explains Martin. "But now we don't have to bring the entire machine up, just enough processor frequency and RAM to do the job. Since it's not all running, the energy use and operational expense is significantly reduced."

More Servers in Each Rack

As a result of the reduced power consumption, the Oracle team projects it will be able to get at least 50 percent more servers into a rack using the same amount of power that is currently allocated. "To provision 5 kW of power, we can use twice as many Intel Xeon processor 5500 series–based servers compared to our previous multi-core servers," says Martin. "We no longer have to assume every machine will use maximum power, because we can designate which applications need high-frequency processing and which should be executed at lower frequencies to save energy."

SPOTLIGHT ON ORACLE

One of the world's largest software companies, with annual sales of over US$22 billion, Oracle is well known for database management, data warehousing, customer relationship management, and supply chain management software. Oracle uses tens of thousands of Intel processors to host its fast-growing hosted services business.

More Customers per Data Center

The advanced memory architecture of the Intel Xeon processor 5500 series allows the IT team to add more RAM on each physical server. "We can have 64 GB of RAM compared to 16 GB or 32 GB on our other servers," says Martin. "We can then partition that memory into more virtual machines. Ultimately, it means we can serve more customers in the same data center space while meeting our service-level agreements."

Nalezyty credits the Intel technology with dramatically increasing the density of the data center space. "The Intel Xeon processor 5500 series is a true game-changer, enabling greatly increased density and power management," says Nalezyty. "Our business model in IT comes down to the cost per virtual machine, and we think Intel Intelligent Power Node Manager fundamentally improves the equation."

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

Energy: Efficiency, Environment, and Performance: Lower energy and cooling costs through more environmentally friendly computing.

To learn more about Intel's Predictive Enterprise strategy, visit **www.intel.com/references/pe/index.**