Case Study

Intel® Xeon® Processor

Burlington Coat Factory

Burlington coat factory

Grid Computing Boosts Oracle Database Power and Availability

Innovative retailer moves critical databases to Oracle Database 10*g running on Intel® Xeon® processor-based IBM System x* clusters.**

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Bill Ubelacker
Director of System Services
Burlington Coat Factory

Challenge

Burlington Coat Factory has built its success on anticipating customer needs and providing great value. That philosophy extends to its datacenter, where Intel® architecture servers have cost-effectively powered massive Oracle databases for more than 20 years.

When the company moved some of its biggest and most critical databases to Oracle Database 10*g**, it wanted to take advantage of that database's ability to run in a grid environment and provide sophisticated storage management. Burlington Coat Factory wanted a hardware platform with the performance to flexibly power complex database queries and to provide cost-effective scalability, high availability, and low-cost management.

Solution

Burlington Coat Factory elected to run its 24 Oracle Database 10*g* databases on IBM x336* (since rebranded as the x3550*) servers configured as two redundant 18-node grids, powered by Intel® Xeon® processors. Grid computing gives Burlington Coat Factory unprecedented levels of performance, availability, flexibility, and scalability, while reducing management requirements for the IT staff.

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Xeon® inside™

Challenge

Customers and Value First

The Burlington Coat Factory Warehouse Corporation has built its reputation and its retail empire by making value a priority. The Burlington, New Jersey-based department store chain has grown steadily since its founding in 1924, by expanding its offerings to meet customer needs and keeping costs down. In 1972, the company made the transition from wholesale to retail, opening its first coat store in Burlington. Over time, the company expanded by adding clothing, shoes, baby products, accessories, and home furnishings.

Today, Burlington Coat Factory has more than 375 stores in 44 states throughout the United States. It maintains a minimalist approach to merchandising, keeping stores modern and attractive without passing the cost of fancy décor on to customers. The strategy enables the company to offer merchandise at prices up to 60 percent below those of other department stores.

The high-value philosophy extends to the company's IT department, which has eschewed expensive proprietary technology for cost-effective Intel® architecture-based servers, in the process racking up numerous awards for innovation:

- *Computerworld Magazine* named Burlington Coat Factory one of the Top 100 Companies to Work for in IT in 1998, 2000, 2001, 2002, 2003, 2004, 2005, and 2006.
- *RIS News Magazine* named Burlington Coat Factory one of the top 50 retailers best at fusing technology solutions with the corporate vision in 2001.
- In March 2002, *Computerworld Magazine* awarded Burlington Coat Factory one of its top 10 "Best in Class" for engaging in one of the most innovative IT projects in business.

Database-Driven Decisions

At the heart of the industry acclaim—and the company's success—is the innovative way in which Burlington Coat Factory analyzes sales and customer data to determine how to expand its offerings, its pricing, new-store locations, product placement in stores, and every other aspect of its business. The company entrusts its crown-jewels business data to more than 40 Oracle databases running on Intel architecture-based servers and the Novell SUSE Enterprise Linux Server 9* operating system.

When the company moved its most business-critical (and massive) databases to Oracle Database 10*g*, it wanted a hardware platform that could provide outstanding performance, easy scalability, high availability, easy management and, of course, cost effectiveness.

"The IT department's number-one charter is to respond to the needs of the business as fast as possible, without complications. "We always have to do more with less. We're constantly trying to reduce the cost and maximize the value of our technology investments."

Bill Ubelacker
Director of System Services
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Solution

Long History with Intel

Burlington Coat Factory has run its datacenter on Intel architecture-based servers since the beginning. "We've been on Intel technology since the late 1980s; it's been key to our ability to innovate as quickly as we have," Ubelacker says. "We're able to roll out new technology solutions faster because of the higher market share and broader distribution chain for the Intel architecture. The proprietary people are struggling to keep pace. Plus, the Intel processing power treadmill moves at a faster pace than the proprietary world, allowing us to stay on the leading edge. We get the research win from an established company like Intel, which pours millions into processor innovations every year."

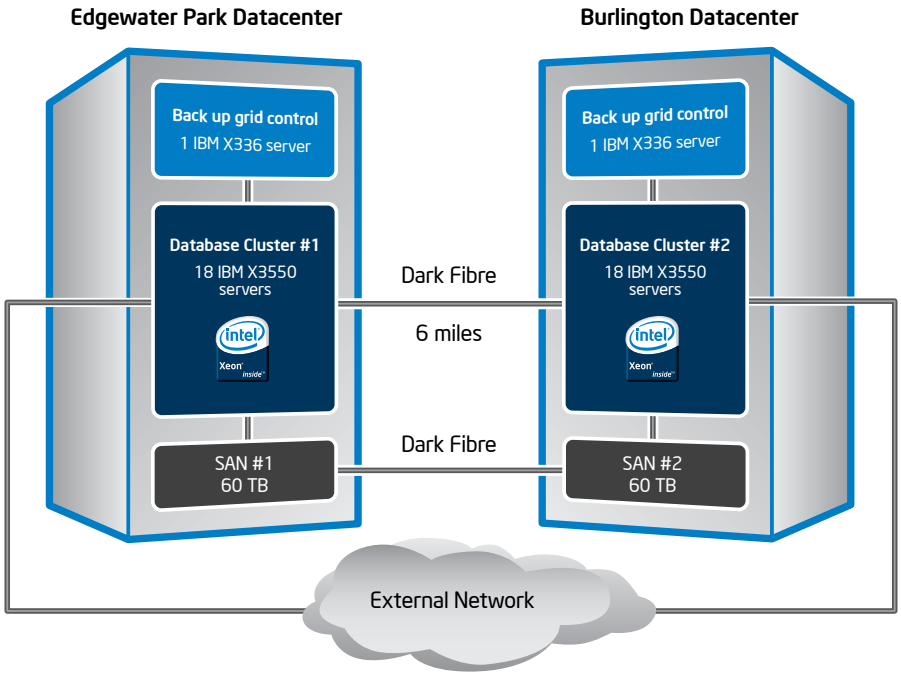
Burlington Coat Factory runs its Oracle Database 8*i** and 9*i** databases on clustered IBM System x* servers and decided to keep that solid hardware platform for its Oracle Database 10*g* databases. "IBM System x server is a well-made product line with a very low failure rate," Ubelacker says. "We've never had any issues with it. When there is a problem, the LightPath* diagnostics provides an LED light path to failed components, which reduces repair time. I can't even remember when one of these servers failed for any period of time."

Grid Computing with Automated Storage Management

With the move to Oracle Database 10*g*, Burlington Coat Factory was able to take advantage of grid computing and the Automated Storage Management (ASM) feature of Oracle Database 10*g*. When deployed with Oracle Real Application Clusters (Oracle RAC), Oracle Database 10*g* allows Burlington Coat Factory to run a single database instance across a cluster of servers, providing extremely high fault tolerance and performance.

ASM is a new feature in Oracle Database 10*g* that simplifies data management in a clustered environment. It combines a clustered file system and logical volume manager that is tightly integrated and embedded within Oracle Database 10*g*. ASM optimizes database performance and simplifies storage management by virtualizing storage hardware, automating tasks, and optimizing performance.

Burlington Coat Factory runs 24 Oracle databases across two 18-node grids located in separate datacenters. The grids back up one another with full data mirroring.



"We're one of the first companies to run Oracle ASM," Ubelacker says. "It allows me to create disk groups to which I can assign raw devices and data. It provides a much easier way of managing the disk space used by Oracle databases, which is valuable in a complex clustered environment."

Two Grids Six Miles Apart

Burlington Coat Factory configured its IBM x3550* servers (previously branded as the IBM x336 server) as two 18-node grids that run as an active-active cluster in separate datacenters six miles apart. The two grids back up one another, with full data mirroring. The company maintains roughly half of its databases and application servers in each location. The IT staff has the ability to fail over to the other facility item by item or in mass, providing interruption-free service to Burlington Coat Factory users. Ubelacker's staff uses Oracle Cluster-Ready Services, part of Oracle RAC, to implement grid computing.

Burlington Coat has a staggering 120 terabytes (TB) of data storage, maintained in a Hitachi storage area network. The company's 24 Oracle Database 10*g* databases range in size from 40 gigabytes (GB) to 6 TB.

Each node in the grid is a single-core Intel® Xeon® processor running at 3.8 gigahertz. "Our CPUs run at 80 percent utilization pretty consistently, though the workload is shared pretty evenly because of the dynamic grid environment," Ubelacker says. "We've been using Intel Xeon processors for years, even on our oldest servers, and the performance just keeps getting better."

Benefits

Burlington Coat Factory's Intel-based grid is delivering higher availability for business users, increased scalability, outstanding performance, and easy management for the IT staff.

Outstanding Availability

Its Intel Xeon processor-based grid has given Burlington Coat Factory outstanding availability for its most business-critical databases, spanning sales, inventory, and financials. "Availability of our Intel-based grid is outstanding, because we have so much redundancy built in," Ubelacker says. "This translates into less downtime for users and the business."

Increased Scalability

The grid configuration allows Ubelacker to distribute processing across more CPUs to keep database queries responsive and even add nodes at peak times of the month or year. "Retail is highly

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seasonal, with big spikes at Christmas and other times," Ubelacker says. "I keep one or two idle nodes that I can press into service at demanding times of the month or year, such as inventory or peak reporting times. Generally, I don't need to do this, because I have ample performance in the grid. But turning up the performance is very easy, and very cost-effective, to do."

Performance for Complex Queries

With the outstanding performance provided by Intel Xeon processors in a cluster configuration, Burlington Coat Factory business users are able to churn through complex database queries faster. "Users get answers faster, and I get yelled at less," Ubelacker says. "It's a win-win for everybody. Oracle Database 10*g* also provides better ability to tune queries, which helps performance, and the grid gives us a better ability to allocate more processing power where it's needed."

Easier Management

Ubelacker reports that while the management of the new Oracle Database 10*g* grid is more complex than its other Oracle database implementations, it's straightforward. "We have a lot less off-hours IT work than we did a year ago," he says. "We used to have one or two nights a week when someone on my staff would need to tend to a server; but with the grid, that's down to once or twice a month. That means more uptime for our systems and better quality of life for my staff. Because our systems are more reliable, my staff has more time during the workday to spend on tuning databases and taking on new projects."

Lessons Learned

- **Choose technology that allows easy scalability.** Agility is an overused but apt descriptor for today's business climate. Because of their lower cost, easy deployment, and configuration flexibility, Intel-based servers give companies the most agile IT infrastructure for keeping pace with rapidly changing demands and business growth.
- **Opt for open source environments.** "We think that there are more tools available for Linux* than for proprietary operating systems. There's also great functionality and reliability," Ubelacker says. "Plus, Linux is the primary development platform for Oracle, and Oracle is very important to us."
- **Ride the Intel TCO curve.** Because of the vast ecosystem of software companies and systems builders working with the Intel architecture, there is tremendous competition and innovation. Using these products in the data center opens the potential for ongoing savings as both Intel CPUs and price/performance continue to improve.
- **Select a vendor that designs for mission-critical workloads.** IBM incorporated the intellectual capital and product features culled from across the company—including mainframes and UNIX-based servers—to create the System x server product line. It achieves greater performance and availability than commodity-based servers offered by other vendors.

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For more information about Burlington Coat Factory, visit: **www.burlingtoncoatfactory.com**

For more information about Intel® Xeon® processors, visit: **www.intel.com/xeon**

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