Gap Inc.
Gap
Banana Republic
Old Navy

Intel® Solution Services Bridges the Gap to Server Consolidation

Server Proliferation Leads to Complexity and Potential High Costs for Gap Inc.

Gap Inc. commands the retail apparel industry. Its 4,300 Gap, Old Navy and Banana Republic stores make it by far the largest fashion retailer anywhere and a household name around the world.

That kind of economic might does not come without serious computing power on the back end, but managing that power came at a price. Lisa Centoni, director of Gap's Intel Server Systems group, says, "For years, every time we added a new project, we added a server to accommodate it. Application vendors specified the server configuration, and we installed and supported them."

Gap's Intel Server Systems group now manages some 450 Intel® architecture-based servers, and because of the old one-application-per-server approach, average system utilization stood at less than 10 percent for more than 300 of the servers. Now, says Centoni, Gap is "paying the price of server proliferation, which includes low utilization and increased support complexity. We had a feeling that system utilization should be higher—perhaps an average of 40 to 50 percent utilization. The question was how to get there."

With increasingly aggressive business requirements and a continuously growing number of projects, Gap's IT staff was busy with new initiatives. But then in 2003, many of Gap's servers were coming off warranty coverage. Maintenance costs were set to more than double through extended warranty purchases. That became the impetus to evaluate server consolidation.

Intel Solution Services Brings Experience and a Proven Methodology

Based on Intel's central position in the server industry as well as its neutrality toward server vendors, Gap collaborated with Intel® Solution Services to evaluate alternatives and define how to consolidate servers. Intel Solution Services approached the project with a proven and repeatable methodology that included the following three focus areas:

1. **Business and Technical Assessment:** Intel Solution Services assessed Gap's business requirements along with information about its IT strategy and architecture. The Intel consultants documented current server configurations and measured current system utilization and other performance metrics.
2. **Analysis and Economic Analysis:** Intel Solution Services' consultants characterized Gap's workloads and performed simulations to evaluate alternative designs to achieve the best consolidation ratio for the data center. The modeling work was performed on Intel® Xeon™ processor-based servers at an Intel® Solution Center. The Intel Solution Centers are state-of-the-art facilities for designing and testing high-performance solutions using Intel best-known methods and technologies. After visiting the facility and meeting with expert staff members, Centoni was extremely impressed. "Why would we ever try to replicate this kind of environment on our own? We were amazed at the flexibility, the skilled and talented people at our disposal, and the wide range of hardware we could put our hands on to test and evaluate."

   Intel Solution Services recommended Gap start by consolidating up to one-third of its existing servers with just three 8-way IBM eServer xSeries* 440 servers employing virtualization software from VMware. IBM hardware was chosen due to its tight integration and optimization with VMware. Using three Intel® Xeon™ processor MP-based servers would provide an amazing consolidation ratio of up to 30:1, resulting in a significant reduction in complexity along with unprecedented cost savings. In addition, the consolidated servers would be configured for high availability, with the potential to boost uptime to greater than 99.99 percent.

   Then Intel Solution Services provided a detailed TCO and ROI analysis to show the overwhelmingly positive impact of the new design. ROI was projected to improve by more than 43 percent over the next two years. More immediately, the analysis demonstrated Gap could pay for the new hardware and software with the money that would otherwise have been spent on maintaining the old servers. In addition, lower costs associated with simplified manageability will afford Gap with

further cost savings. All this was presented in a detailed economic analysis document, which Intel Solution Services prepares for all its clients.

3. **Proof-of-Concept:** Intel Solution Services stress tested the recommended system at the Intel Solution Center and created a phased deployment plan that could be implemented by Gap's IT Department.

Virtualization Key to Consolidation

VMware ESX Server* virtualization software allows each server to support multiple workloads. Combining applications with complementary resource peaks can smooth workload demands, which can increase overall system utilization. The result is unprecedented utilization on Intel architecture-based servers, similar to what would otherwise be achievable only on a high-end mainframe or a large RISC-based UNIX environment.

The VMware enterprise-class ESX Server supports up to 64 concurrent virtual machines on a single Intel architecture-based server, but only half of the available partitions will be live at any given time. The other 32 will be available on standby in case of a hardware or software problem on another virtual machine. As a result, Gap gains the advantages of server redundancy without investing in additional hardware. This innovative approach provides considerable savings compared to traditional high-availability clusters.

Intel Solution Services Supports Gap's Migration Plan

Intel Solution Services provided a roadmap and platform to help Gap craft an orderly migration plan to the consolidated environment without disrupting day-to-day business operations. Once completed, Gap's infrastructure could consolidate up to 97 different applications in its first year—including BEA WebLogic*, Microsoft Internet Information Server (IIS), IBM Tivoli*, Lotus Notes* and numerous custom applications—all currently running on Microsoft Windows NT* and Windows* 2000 operating systems. System utilization levels will be tracked and managed to a target of less than 60 percent, allowing enough headroom for traffic spikes and periods of heavy use. Additional data centers and their servers will be transitioned to consolidated systems in future phases of the project.

Consolidation Leads to Lower Costs and Improved Reliability

The price of the hardware and VMware software has already been offset by the maintenance savings realized through decommissioning the old machines. And now Gap enjoys the advantages of server redundancy without investing in additional hardware.

Gap's Centoni calls the Intel Solution Services-led server consolidation project "one of the best consulting engagements I've ever been involved in." She adds, "The methodology was very helpful, including the technical assessment, the detailed TCO and ROI financial analysis, the testing and validating as well as the detailed recommendations for deployment." Centoni was pleased with the expertise of the Intel consultants and their dedication in ensuring the success of Gap's consolidation efforts, saying, "Intel Solution Services provided a very thorough, vendor-neutral analysis of our needs and helped make Gap's consolidation effort a great success."

Solution provided by Intel® solution services

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