Construction Company Changes Data Center Economics

Tutor Perini Corporation built its new data center with Unified Computing System, reducing device count by 60 percent.

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EXECUTIVE SUMMARY

TUTOR PERINI CORPORATION
- Construction
- Sylmar, California USA
- 7000 Employees

CHALLENGE
- Reduce data center operating costs
- Simplify management
- Ensure application availability

SOLUTION
- Consolidated servers, switches, and storage access from multiple data centers onto a single Cisco Unified Computing System
- Engaged Cisco Advanced Services for planning and deployment

RESULTS
- Reduced device count by 60 percent
- Reduced power consumption by 38 percent
- Minimized thin client costs by supporting up to 30 users per server

Challenge

Tutor Perini Corporation is a leading civil and building construction company offering diversified general contracting and design/build services to private clients and public agencies throughout the world. Its services include general contracting, pre-construction planning, and comprehensive project management. Tutor Perini also offers self-performed construction services, including excavation, concrete forming and placement, steel erection, electrical and mechanical services, plumbing, and HVAC. The company is recognized for its major complex building project commitments as well as its capacity to perform large and complex transportation and heavy civil construction.

Through mergers and acquisitions, Tutor Perini had acquired five data centers. The company decided to build a brand-new data center to be shared by all entities. Motives for consolidation included reducing operating costs, simplifying management, helping to ensure application availability, and expanding the thin client environment. "Our main requirements for a new computing platform were low costs, low energy consumption, and efficient management," says James McGibney, data center lead, Tutor Perini.

Solution

After evaluating three leading platforms, Tutor Perini selected the Cisco® Unified Computing System (UCS), which unifies network, compute, storage access, and virtualization into a single, cohesive system. "When we did a side-by-side comparison, every person on our technical team agreed that the Cisco solution best met our business needs," says Jason Morgan, senior network engineer, Tutor Perini. Unique advantages of the Cisco UCS included built-in support for VMware and the fact that Cisco was already a trusted vendor for all of Tutor Perini's business divisions. "The Cisco UCS pricing was surprisingly competitive and the technology integrates very well with our storage area network and Cisco switches," says Edward Quiroz, director of infrastructure and help desk services, Tutor Perini.

The world's first organization to deploy the Cisco UCS, Tutor Perini configured it with four chassis, 22 server blades, and two Cisco 6120 Fabric Interconnects. The system currently connects to 83 terabytes of data in an Ethernet environment.

The Cisco UCS can still be managed as a single entity when configured with up to 40 chassis. To size it correctly, Tutor Perini's IT department added up the compute requirements for all of its member companies and then added another 30 percent to account for expected growth over three years. "Cisco Advanced Services minimized risk by looking over our design and collaborating with us to validate our sizing assumptions for server blades and memory," says Morgan. "Working with Cisco Advanced Services gave us the confidence that we could implement a new technology and meet our strict deadline."

Tutor Perini has already moved three data centers' applications to the new data center, using VMware products to transfer servers, virtual machines, and data over the network. "The deployment was very smooth, which is unusual for a brand-new technology," says McGibney. "Cisco Advanced Services worked side-by-side with us to deploy the Cisco UCS and was instrumental in our success. They also made sure that the Cisco UCS operated well with our network infrastructure and storage."

Results

Ongoing Cost Savings

Tutor Perini compared the five-year costs of purchasing and operating a Cisco UCS to upgrading its existing systems, calculating that the investment will pay for itself in 36 months. Factors contributing to lower costs include:

- **Equipment consolidation:** "In data centers, less is more, and the Cisco UCS requires less cabling, less power, less cooling and, most important, less overhead," says McGibney. Tutor Perini is consolidating from 230 servers and 75 network devices to four Cisco UCS chassis with integrated switching and management, reducing its hardware footprint by 60 percent. Just two data center rows support up to 7500 users.

- **Increased server utilization:** "With Cisco UCS, we anticipate being able to deploy four times as many virtual machines per VMware ESX host as we did previously, and to achieve 90 percent CPU utilization," says McGibney.

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> **—James McGibney, Data Center Lead, Tutor Perini Corporation**

- **Simplified cable management:** The Cisco UCS has only four cables. Cable management was an ongoing challenge in the previous environment. "With its integrated network and storage access, Cisco UCS required the fewest cables to purchase and manage of any platform we evaluated," McGibney says. Having fewer cables also improves airflow, which reduces power and cooling costs.

- **Lower energy consumption:** The Cisco UCS uses 38 percent less power than Tutor Perini's previous equipment, which the company says will result in significant ongoing savings.

Simplified Management

"Cisco technology is stable and well understood, reducing management burden," says McGibney. "I have worked with Cisco routers and switches for 17 years, both in the Department of Defense and in private industry." Using Cisco UCS Manager service profiles, the IT department provisioned 22 new VMware ESX hosts and their I/O properties in just three hours. Ongoing management is simpler as well, because IT staff can manage the Cisco UCS chassis,

blades, and Cisco 6120 Fabric Interconnects from one interface. "It saves me time to use the same interface for tasks ranging from creating virtual machines to investigating if a processor overheats," says Morgan.

High Performance

In a virtual environment, the application experience for employees depends more on memory than processing power, according to Morgan. "The Cisco UCS uses two instead of three memory slots per channel, which results in steady application performance even when demand is high," he says. In fact, the slowest processing speed for the Cisco UCS is 33 percent faster than it is with the other servers (1066 MHz instead of 800 MHz.) "The Cisco UCS can support 30 users per server in our environment with good performance, far more than the other platforms we evaluated," McGibney says.

High Availability

The redundancy built into the Cisco UCS helps to ensure that critical business applications and a customer web portal remain available. That's important in the construction industry, where teams working to finalize a bid before a deadline can't afford for a server or network link to be down. Tutor Perini employees have experienced uninterrupted application access since the system was deployed. In the event of a future failure, automatic failover will help ensure that users can continue working while the IT department works to fix the issue.

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Support for Thin Clients

Thin clients are appealing in the construction industry because of short laptop life in dusty environments and concerns about theft on construction sites. Currently, about 20 percent of Tutor Perini employees use thin client devices instead of PCs. Tutor Perini allocated some Cisco UCS blades to virtual machines and others to thin client applications. "The Cisco UCS will enable us to take advantage of the favorable economics of thin clients because of its scalability and the high performance of the Intel Xeon processor 5500 series," says McGibney. As more employees use thin clients, performance will remain steady because blade memory can scale up to 384 GB.

On-Time Deployment

"Cisco knew we were on a tight schedule and they delivered," says Kenneth Stringer, vice president of information services, Tutor Perini. "My team and I are very pleased with the product and the company." Quiroz adds, "The Cisco Advanced Services team took our project to a level of partnership I have not seen before."

Next Steps

Tutor Perini is continuing to migrate existing applications and data to the new consolidated data center. The IT department plans to more than double the number of thin-client users, begin using VMware View, and convert 90 percent of its servers to virtual machines. The company is also planning a disaster recovery site.

For more information about the Cisco Unified Computing System, visit: http://www.cisco.com/go/unifiedcomputing.

For more information about Cisco Advanced Services, visit: http://www.cisco.com/go/advancedservices.

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