Sarasota County

A leader in innovative environmental management and sustainable living, the County of Sarasota lies in the middle of Florida's western coast, 60 miles south of Tampa Bay. The county government serves a population of more than 379,000 residents.

Background

Sarasota County IT professionals realized they could cut costs and trim the operating budget by consolidating existing data center spaces into a new facility and shrinking the footprint. The new facility needed to deliver scalable capacity and efficient operation throughout the lifecycle of the data center, while assuring continuous operation of government functions.

Case Summary

Location: Sarasota County, FL.

Products/Services:
Room-based infrastructure design aligned with the SmartDesign™ approach, which simplifies data center design by applying power, cooling and monitoring technologies from Emerson Network Power to create an integrated, highly efficient infrastructure. Sarasota County's SmartDesign infrastructure includes:

- Liebert DS Precision Cooling Systems
- Liebert Series 610 UPS Systems
- Liebert FPC Power Conditioning and Distribution Cabinets
- Liebert SiteScan Monitoring Software
- Alber Battery Monitoring System
- Avocent KVM Switches with DSView Management Software

Critical Need: A data center design that would effectively and efficiently use the technologies and best practices available today to provide high availability, scalable capacity and efficient operation.

Results

- Reduced data center equipment by 20 percent through an intelligent, integrated design approach that optimized efficiency, capacity and availability.

- Minimized IT footprint by incorporating server virtualization along with innovative power and cooling technologies.

- Eliminated additional single points of failure through use of a comprehensive N+1 power design

- Reduced cooling costs by directing all cooling units to work together, dynamically balancing and eliminating conflicts.

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The Situation

At a time when many local and municipal governments were dealing with rising costs and budget shortfalls, Sarasota County administrators realized there was an opportunity to reduce energy costs and increase efficiencies within its computing environment. The county decided to consolidate its data centers into a new facility that would offer a reliable and up-to-date data center infrastructure to support its critical needs.

The county operated two data center environments; a 5,000 square foot facility that served as the primary data center and a smaller one located in an administration building. The data centers housed all of the functions for the county government, as well as applications that supported the offices of elected officials, the clerk of county courts, the public defender's office and the sheriff's department.

Consolidating into one of the existing data centers was not an option. The infrastructures of both environments were about 15 years old, and the integration of new technology to enhance computing performance would be difficult.

"Our primary data center facility, leased in 2003, was built to be aesthetically pleasing. Not enough focus was placed on ensuring it was an ideal and functional space for a growing, critical data center," said Ken Watson, IT director for Sarasota County. "For example, one whole wall of the facility was basically glass windows that provided an outside view of the data center. This was not the best design for a data center in Florida. Being close to the coast, we experience a number of storms, some often severe. And the Florida sunshine beaming through the wall of windows put a strain on our cooling infrastructure."

The Solution

While Watson realized he needed a new facility, he was not sure about the best design approach to take with the new data center to meet his needs. He turned to Emerson Network Power for the answer.

"I'm an IT person with a basic understanding of the facility. I needed to work closely with a partner who understood data center design, as well as the power and cooling infrastructure," said Watson. "We had a number of Liebert power and precision cooling units in our existing facilities, so we were familiar with Emerson Network Power's expertise and experience. I was confident they could help us identify the best approach for increasing efficiency, availability and capacity."

To maximize the return air temperature at the cooling units, Sarasota County adopted an airflow management strategy that included placing all cabling overhead and raising all electrical cables off the floor in tray systems, to maximize airflow.

When Emerson Network Power works with data center professionals and consulting engineers to design data centers, the company frequently employs a SmartDesign approach to the infrastructure. The design configurations optimize the data center's performance by utilizing intelligent, integrated infrastructure systems that are efficient, economical, interoperable and controllable.

"As part of our consolidation effort, we planned to aggressively shrink our footprint through the use of server virtualization and blade servers," said Watson. "Everything we implemented needed to utilize a high-density configuration. For example, we created a framework that allowed workloads to be shifted away from underutilized assets, while those assets could be cycled on and off to improve operational efficiency."

To enable data center infrastructure management and monitoring, Sarasota County deployed Avocent KVM Switches and employed web-based Liebert SiteScan to provide real-time monitoring and centralized oversight of the Liebert power and precision cooling equipment.

To meet the county's cooling infrastructure needs, a number of infrastructure best practices were observed. For instance, to maximize the return air temperature at the cooling units, Ken and his team adopted an airflow management strategy that included placing all cabling overhead and raising all electrical cables off the floor in tray systems, to maximize airflow.

Liebert DS precision cooling units utilize Liebert iCOM controls, which take advantage of the variable capacity technology to allow the units to communicate and operate dynamically as a system, providing maximum control of temperature and humidity across the room.

The team also worked with Emerson Network Power and Carastro & Associates, the mechanical / electrical consulting engineer involved in the project, to conduct a computational fluid dynamics (CFD) study prior to construction. Utilizing the results of the test, they discovered efficient ways they could adequately cool the load without utilizing containment. Using the CFD analysis, the team was able to model several scenarios that helped them establish the maximum potential load on the raised floor with the available cooling capacity. The team also performed a complete failure analysis and demonstrated satisfactory cooling coverage in the event that any one of the cooling units was to fail.

To help match cooling capacity and airflow with the IT loads, they installed four 20-ton and two 30-ton Liebert DS precision cooling units. The direct expansion (DX) cooling unit uses Emerson's industry-leading Digital Scroll™ variable capacity compressor technology. The cooling units utilize Liebert iCOM controls, which take advantage of the variable capacity technology to allow the units to communicate and operate dynamically as a system, providing maximum control of temperature and humidity across the room, while eliminating unit conflicts of operation. Together, these technologies offer significant energy savings while ensuring reliable performance and availability.

"The cooling units in our old facility did not work together. It wasn't uncommon to have one unit cooling a part of the room while another one would be dehumidifying and heating another part of the room," said Watson. "With Liebert iCOM, our units can now work as a team and we can cycle one system on as we cycle another one off, maximizing our cooling efficiency and extending the life of components."

On the power side, one of the main priorities was to eliminate the single point of failure that existed in the earlier primary data center.

"At our previous data center, we had one UPS system, one transfer switch and one generator – and every one of those presented a single point of failure," said Watson. "Working with Emerson Network Power on the design of the new data center, we made sure everything was designed for a dual bus system at N+1. This meant two UPS systems, two generators and two separate strings of batteries."

Along with installing Liebert Series 610 UPS systems at 400 kVA and Liebert FPC power conditioning and distribution cabinets, the county deployed an Alber Battery Monitoring System to monitor the strings of batteries and help prevent premature battery failures. Prior to the data center going operational, Ken and his team conducted a load test of the entire facility. The battery monitoring system identified a few batteries that needed replaced before they could cause any unplanned downtime.

The Results

The new Sarasota County Tier 4 data center was fully provisioned in February 2011. Using the SmartDesign room-based approach, the new infrastructure smoothly supports the high-density configuration, and consumes a much smaller footprint than the power and cooling systems in the previous data center.

"We went from 5,000 square feet in our previous primary data center to now occupying about a 2,000 square foot raised floorspace," said Watson. "We currently have virtualized about 60 servers, which has helped us go from 90 cabinets to about 25. Every time we put in a new system, the first question we now ask is: Can it be virtualized?"

The Sarasota County data center has become one of the strongest and most advanced data centers in the region, with plenty of capacity and floorspace for growth. For instance, the blade center cabinets are capable of supporting three HP c7000 blade centers while the traditional server cabinets can handle up to 20 HP DL380 servers. Both cabinets and rows can be easily modified for containment cooling if the need arises.

This extra capacity for growth has allowed Watson and his team to approach outside partners and local government operations about leasing space in the data center, which is recognized as one of the best data centers in the area. The data center recently signed a hosting agreement with the Sarasota school board to house their applications and systems in the facility.

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Ken Watson, IT Director, Sarasota County

"Emerson Network Power has been an invaluable partner through this whole process," said Watson. "With its guidance we were able to reduce our data center equipment by about 20 percent, minimizing the total cost of ownership of our data center infrastructure without adversely impacting the availability of critical systems and our ability to grow to meet future needs."

For more information on Emerson Network Power and Liebert solutions, visit: **www.liebert.com**

For more information on the Sarasota County, visit: **http://www.scgov.net**

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