



The Reynolds and Reynolds Company

Founded in 1866, The Reynolds and Reynolds Company is one of the world's leading dealer service providers for the automotive retail industry. It provides information technology, software solutions and professional services to support every aspect of automotive retailing. More than 15,000 dealers worldwide rely on Reynolds to help run their dealerships.

Background

The Reynolds and Reynolds Company was moving its corporate headquarters to a new facility and needed to consolidate its 11 computing locations into one central, secure data center. To maintain its market-leading position as a developer of innovative technologies, the company needed to provide its associates with a highly available and reliable infrastructure.

Case Summary

Location: Dayton, Ohio

Products/Services:

- Liebert Series 600 UPS
- Liebert PDU power distribution unit
- Liebert Deluxe System/3 GLYCOOL™
- Liebert heat rejection drycooler

Critical Needs: Create adaptive, high availability power and cooling infrastructure to support consolidation of business-critical IT systems, including communications, shared applications and product development, for Reynolds' more than 6,500 employees worldwide.

Results:

- Consolidated computing from various locations into one reliable, secure data center.
- Eliminated frequent power-related downtime in distributed computing environments.
- Created adaptive cooling and power infrastructure that has enabled the company to improve its use of technology and extend its competitive advantage.
- Derived benefits of free cooling through drycooler technology for a more energy efficient data center.

The Situation

During the 1990s, The Reynolds and Reynolds Company (Reynolds) had grown into 11 different facilities across Dayton, Ohio. The company headquarters resided in a 120-year-old office building that was not equipped to meet the data center needs of an innovative, growing company that was increasingly dependent on new technologies.

As a result, the company was forced to rely on multiple, ad-hoc data centers that sprung up throughout the organization to meet short-term requirements. No single manager oversaw these data centers or made decisions on their capacity and performance.

“Given the situation, we were not in a good position to proactively manage technology to support our business objectives,” says Mark Wiley, manager, supply chain management, Reynolds and Reynolds. “The best we could do was reactively manage our uptime and expand our information technology resources within the space constraints of our aged facility.”

As the company continued to grow and invest in the development of new technologies to serve its customers, so too did its computing demands, which created continued challenges for the company’s IT infrastructure. Because of the limited space, Reynolds’ facility management team acted in a way all too common for businesses—it set up remote computing rooms in any available areas. It wasn’t uncommon to have servers stashed in closets or poorly lit and ventilated rooms.

“It was difficult for us to stay ahead of our network demands and adequately plan for any type of strategic capacity expansion,” says Wiley. “It was a laborious process to identify where certain data or applications



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were housed, and then figure out who managed that space.”

With computing and data storage scattered throughout the organization, each location presented its own set of power, cooling and security challenges. The rooms were neither secure nor adequately cooled. Switches were sometimes turned off, rooms were overheating, and at least once a week, one of the makeshift data centers would lose power.

“To maintain our market-leading position as a developer of innovative technologies, we needed to provide our associates with a highly available and reliable infrastructure,” says Wiley. “The good news was that our management recognized how important this was to the success of our long-term business strategy.”

The Solution

The company developed plans for a new Research Park campus in Dayton that would house corporate headquarters and a central data center to support its three buildings.

Wiley called on Sales Engineer Mark Neiheisel of Uptime Solutions Associates Inc., a provider of Liebert critical support systems and services for mission-critical operations, to help design a dedicated high-density environment that could house up to 2,000 servers in 152 racks. The servers were expected to generate 100 tons of air conditioning load when fully populated.

Neiheisel worked closely with Reynolds to understand exactly what was needed to consolidate the company's internal computing systems, including exact loads and sizing, and a more formal data center management process. They decided that the data center would be 8,500 square feet, feature an 18-inch raised floor and utilize a hot aisle/cold aisle configuration.

"Emerson Network Power treated us as a partner, worked closely with us to understand our power and cooling needs, and helped us design a data center that would meet those needs. For them, it was more than just selling us a long list of products," says Wiley. "We were also aware of the fact that Emerson's Liebert systems had a good track record in terms of reliability and performance."

The team decided that the corporate campus should have a redundant power supply with two separate feeds coming from two different utilities, as well as a 2,000 kW diesel generator with 72 hours of fuel. For power management, the data center would feature an N + 1 redundant design.

The Liebert Series 600 UPS was the UPS system that best fit Reynolds' current needs and anticipated growth. Two 225 kVA Liebert Series 600 UPS units feed into a single System Control Cabinet that provides N+1 redundancy. This design allows another 225 kVA UPS to be added, if needed, and still maintain the N+1 configuration.

"The Liebert Series 600 has proven itself to be the most durable UPS in the industry with year after year of continuous improvement since its introduction," says Neiheisel. "The reliability record of this product is unequalled in the power protection industry. At more than 2.8 million hours, its field-proven "mean time between failure" is the highest in the industry."

The Liebert UPS units support five Liebert PDU's (two at 200 kVA, two at 125 kVA, and one at 150 kVA) that deliver power isolation, distribution, monitoring and computer-grade grounding in a self-contained package. The PDU's are strategically located throughout the data center to facilitate shorter power distribution cable runs, keeping the cavity under the raised floor as large as possible for better air distribution.

Precision cooling is provided by seven Liebert Deluxe System/3 GLYCOOL precision air conditioners operating in an N + 1 configuration. These units take advantage of free cooling to increase cooling efficiency. The Liebert Deluxe System/3 units incorporate a conventional glycol-cooled unit along with the addition of a second cooling coil, control valve and temperature monitor. During colder months, the glycol solution returning from the outdoor Liebert drycoolers is colder and is routed to the second coil, which becomes the primary source of cooling for the room.

The Results

The new, consolidated data center opened in 2002. Since that time, Reynolds has reaped the rewards of the highly available, reliable data center it desired. And, the company's commitment to a world-class information technology environment has not gone unnoticed. Reynolds is a regular member of the *InformationWeek 500* list of the United States' most innovative companies and *Computerworld* magazine recognized Reynolds' top IT executive in 2004 as part of its prestigious "Premier 100 Leaders" list.

"We now have a more stable, structured, secure, and higher-density computing environment with adaptive power and cooling support to accommodate current and future computing capacity," says Wiley. "We also have a power system that can achieve five-nines availability, helping us easily exceed our objective of 99.9 percent uptime for the facility."

The data center supports business-critical operations such as communications, shared applications, product development and the robotic storage libraries that provide data backup. The data center even houses all applications and data for the company's training center, which is considered to be one of the top 50 programs in the country according to *Training* magazine.

And, with energy prices rising, Reynolds is getting an even higher than expected return on its free cooling system. "A fully loaded unit gets 100 percent free cooling anytime the temperature is below 35 Fahrenheit, and partial free cooling when the temperature is below 55 Fahrenheit," says Neiheisel. "Based on the weather data for the Dayton area, Reynolds is getting either 100 percent free cooling or partial free cooling 52 percent of the year."

Because Reynolds worked closely with Uptime Solutions and Emerson Network Power to design the data center, they are prepared to adapt as more servers are added and cooling and power management needs expand. Since the data center opened, they have increased the number of servers by more than 30 percent. Wiley estimates that the space has the capacity to support operations for at least 10 more years.

"It's a great feeling knowing that we now have an available and reliable cooling solution that will easily scale to our future expansion needs. This is light-years from where we were just a few short years ago," says Wiley. "The current infrastructure is even allowing us to adapt to new technologies. We recently added a few blade servers to the environment and the cooling systems have maintained their performance levels."

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