A Customer Success
from the Experts in
Business-Critical Continuity™

US Internet

US Internet is an international provider of Internet connectivity, disaster recovery and data protection services headquartered in Minneapolis that provides Internet access to about 30,000 individuals and businesses via points of presence in more than 2,000 U.S. cities. US Internet operates colocation facilities in Minneapolis, Milwaukee, London and Sydney, and has more than 750 colocation customers, ranging from ShopNBC and ReMax to small companies. It also delivers broadband wireless Internet access for a 60-square-mile area covering the entire city of Minneapolis.

Background

In the highly competitive colocation business, maintaining continual operation of critical systems is not only important to the business, it is the business. Customers expect 24/7/365 availability of Internet services. When increasing density of data center equipment created power and cooling challenges that threatened availability, US Internet turned to Emerson Network Power.

Case Summary

Location: Minneapolis

Products/Services:

- Liebert Deluxe System Air-Cooled Computer Room Air Conditioning Units With Outdoor Air-Cooled Condensers
- Liebert XD System
- Liebert Interceptor TVSS Service Entrance Units
- Liebert Series 610 300 kVA UPS
- Liebert PPC Precision Power Centers
- Liebert FPC Power Distribution System with transformer
- Liebert FDC Power Distribution System
- ASCO ATS Automatic Transfer Switches

Critical Needs: Develop dynamic power and cooling architecture to support wide variety of high-density equipment.

Results

- Reduced air temperatures from more than 90F in hot spots to a uniform 65F.
- Created fully redundant, reliable and scalable power distribution system.
- Doubled data center capacity.
- Paved way for creation of new colocation facility.

Liebert

EMERSON
Network Power

The Situation

"A fundamental tenet of our business is that we never close," says US Internet co-founder and Chief Technology Officer Travis Carter. "Our customers expect continuous operation of their equipment in a secure, clean environment with ample cooling and redundant backup power."

Because the colocation business is dominated by much larger corporations, US Internet's success is based on providing superior services. "If we don't deliver, it's easy for our customers to find someone who will," Carter says.

US Internet's Minneapolis colocation center houses a variety of IT equipment. "Some customers lease racks and servers from us, while others bring in their own equipment for us to support," Carter says. "We have about 200 racks full of everything and anything—1U and 2U servers, blades, older servers—you name it, and we've probably got it."

Whatever their equipment, customers want to make the most of every square millimeter of space in their racks. US Internet managed power and cooling demands successfully until customers began using blade servers. "As they packed more powerful equipment into smaller spaces, the demands for power and cooling increased exponentially," Carter says. "Our power and cooling infrastructure just wasn't designed to support newer, high-density equipment."

The mix of equipment soon outstripped US Internet's support infrastructure. "Hot spots with temperatures greater than 90F developed two or three feet from a precision cooling unit," Carter says. "We had 50 tons of traditional, floor-mount cooling, and it was like squirting a water pistol on a campfire."

"The ability to direct cooling to the racks is exactly what we needed. When Emerson Network Power demonstrated a single Liebert XDV cooling unit, it took me only five minutes to place an order. My only question was, 'How soon can you get it here?'"

Travis Carter, co-founder and Chief Technology Officer, US Internet

The situation quickly became critical. "We were at the point of meltdown because we couldn't get our cooling under control and we were out of power," Carter says. "We had used the capacity of every circuit that we had at that time."

To make the situation even more challenging, there was no room to add additional precision cooling units and spreading out equipment to dissipate heat loads was not an option.

Lack of adequate cooling and capacity to grow directly threatened the company's business. "When you opened the door, it felt like a blast furnace," Carter says. "Who's going to colocate their equipment in a maxed-out facility that's 90F?"

The Solution

Because US Internet's business model calls for consistent growth, Carter sought a way to resolve immediate power and cooling issues and to support ongoing expansion. He turned to the Liebert group from Emerson Network Power for the solution. Liebert representatives worked with US Internet and its engineers to design a dynamic infrastructure that would comfortably support US Internet's current customers, double capacity, and provide flexibility and scalability to handle unpredictable power requirements and heat loads.

Cooling Down

A combination of traditional, under-floor cooling and Liebert XD supplemental cooling tripled the cooling capacity of US Internet's data center. All systems connect to roof-top, air-cooled condensers for heat removal.

Five, 20-ton Liebert Deluxe cooling units provide precise, reliable base-level cooling through the 12-inch raised floor as well as humidity control and air filtration. Since its introduction more than 40 years ago, the Liebert Deluxe (now updated to the Liebert DS) has become the industry standard in precision computer room cooling and is deployed in more Fortune 500 data centers than any other cooling system.

A 46-ton Liebert XDC chiller and 20 Liebert XDV rack-mounted cooling modules provide supplemental cooling at the source of the heat and improve air circulation throughout the room to dissipate any hot spots. The Liebert XD modules draw in heated air from the hot aisle and return chilled air to the cold aisle. As the newly added racks fill up and the cooling capacity grows further, US Internet plans to add a second Liebert XDC and 20 more Liebert XDV modules.

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The flexible and scalable Liebert XD cooling system has emerged as the preferred choice for cooling high-density computing environments in organizations of all sizes. The system can deliver sensible cooling of heat densities higher than 500 Watts per square foot.

Liebert XD modules use a special refrigerant that is more efficient than water and eliminates the risk of damage to sensitive computer equipment in the event of a leak. The environmentally friendly refrigerant pumps as a liquid, converts to a gas within the heat exchangers, and then returns to the chiller, where it re-condenses to a liquid. The pumped refrigerant technology is more efficient than chilled water,

which can deliver significant energy and operating cost savings during the equipment's lifespan.

Mounted on top of racks running down the center of the room, the Liebert XDV modules connect to a Liebert XDC chiller, which circulates the refrigerant through an air-cooled condenser on the facility's roof for heat removal.

Liebert XD flexible piping connects all components. US Internet installed Liebert factory pre-fabricated distribution piping in anticipation of its projected growth and dynamic operating environment. When needed, additional Liebert XD cooling modules can easily be added via quick-connect fittings on the piping.

Carter says the flexibility of the Liebert XD system is a key benefit. "In a colocation center, hot spots can develop almost overnight. The plug and play nature of the Liebert XD System allows us to adapt cooling capacity on demand."

Powering Up

A dynamic power infrastructure was equally critical to the success of the project. "Power and cooling are to a data center what an engine and tires are to an automobile. You can't run without both of them," Carter says.

The expanded power infrastructure brings distribution closer to the rack to ensure sufficient connectivity for new servers while simplifying cable management. Fully redundant 'A' and 'B' circuits connect to independent utility power feeds and backup generators. Dual-corded equipment connects to both circuits, allowing continuous operation of equipment if one circuit fails. In the event that either circuit loses utility power, an

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Emerson Network Power ASCO ATS automatic transfer switch manages the transfer of the critical load to the emergency generator.

Power conditioning and distribution for each service of incoming utility power (or two generators in case of an outage or brown-out) begins with Liebert TVSS surge protection units at the service entrances to protect against transient split-second overvoltages from utility or generator power. Downstream from the TVSS, a Liebert Series 610 300 kVA UPS provides 12 minutes of clean, reliable backup power to each circuit in the event of utility power loss. The new Liebert Series 610 UPS supplements the existing Liebert UPS units already present in the facility and provides "dual-bus" power to customers requiring it. Two battery cabinets and external wrap-around maintenance bypass with sub-feed distribution

provide for easy maintenance. The Liebert Series 610's enhanced fault current management capabilities provide immediate response to utility outages with high overload capacity.

Liebert PPC Precision Power Centers (126 pole with transformer) and an in-row Liebert FPC Foundation Power Center (168 pole with transformer) provide power isolation, distribution, and computer-grade grounding. In-row Liebert FDC (168 pole) power distribution units create plug-and-play flexibility in the power distribution and management system. Used together, they combine the convenience and cost savings of a prepackaged, factory-tested PDU with the flexibility of a custom-tailored power system. This packaged system reduces installation time and cost compared to a conventional custom system using multiple interconnected components.

Service Supports Success

Liebert representatives supervised the installation, testing and commissioning of all equipment needed for the expansion.

This personalized attention gave Carter added confidence in the company and its equipment. "Our success at US Internet is based on strong relationships with customers, who see us as a trusted partner," he says. "That's how we feel about our relationship with Emerson Network Power. The equipment is absolutely top-notch, and the people who stand behind it add an incredible amount of value."

Initially, only the new equipment was supported by an Emerson Network Power service contract. However, Carter was so impressed with the caliber of services that he expanded the contract to cover all of his Liebert equipment. The service business offers a wide variety of maintenance, repair and management programs

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designed to keep critical facilities operating continuously and smoothly. Emerson Network Power customers depend on the largest technical support and customer response system in the industry, which is equipped with more than 1,000 factory-trained and company-employed service professionals in more than 100 service centers worldwide.

"I'm completely comfortable staking my company on Liebert equipment, engineers and trained service personnel," Carter says.

The Results

The data center expansion allowed US Internet to double the number of racks supported in its data center from 100 to 200. It saw an immediate and continuing return on its investment. "We pre-sold about 25 percent of the racks, and within a few

months we had filled almost all of them," Carter says. "Our power and cooling systems have handled the additional load without a hitch."

No matter what equipment customers bring in next, Carter feels confident that Liebert technology provides the adaptive power and cooling support needed to ensure highly available and reliable operation of US Internet's colocation facility.

"I sleep well at night," he says. "Not one time in the last five years have I had to wake up in the middle of the night because there's a problem with our Liebert equipment."

The combination of the traditional and supplemental cooling provides the level of redundancy US Internet needs to maintain its equipment. "In testing, we found that the Liebert XD units alone can keep room temperatures within specified parameters for 15 to 20 minutes," Carter says. "Even in the extremely unlikely event that all of our floor-mount units shut down at once, we would still have time to perform an orderly shutdown before temperatures reached a critical level."

The power infrastructure provides the flexibility and scalability needed to support US Internet's dynamic business. "Bringing power distribution closer to the load makes adding or reconfiguring equipment much easier," he says. "It also reduces cable clutter and increases our airflow, which adds to the efficiency of the cooling system."

Finally, Carter believes that Liebert equipment helps him meet customer expectations for reliable operation. "It's the Cadillac or Lexus of power protection and precision cooling," he says. "Once I say we have Liebert equipment, potential customers stop asking questions. They know we have the best in the business."

For more information on Liebert technology, visit **www.Liebert.com**.