

## SIX QUICK TIPS

# Improve Your Data Center Cooling

## Expert Tips To Help Increase Efficiency

by Robyn Weisman

THE ITEMS IN YOUR physical data center generate a lot of heat. Steve Brasen, storage analyst at consulting firm Enterprise Management Associates ([www.enterprisemanagement.com](http://www.enterprisemanagement.com)), says that a former co-worker actually keeps his garage warm by using an old storage system with an antiquated power supply. "He said it works better than a commercial heating system!" Brasen says.

While garage bands and banished pets in Iceland may welcome this influx of unusual and often massive heating elements, the average IT manager is seeking out ways to keep the temperature down in the data center.

### Know What You're Cooling

Bob Blough, director of product marketing at Liebert Precision Cooling ([www.liebert.com](http://www.liebert.com)), says too often data center managers rely on a building's general air-conditioning system to cool their data rooms and then are caught off guard when a hot spot in the middle of the room generates a server failure.

"While comfort cooling from the building's basic air-conditioning system may keep parts of a small data center cool, it often isn't reaching the hot spots nearest the servers—the areas that really matter," Blough says. "Placing racks near air ducts is a temporary solution at best and unrealistic as you add servers and racks."

Andy Yother, engineering manager at Canvas Systems ([www.canvassystems.com](http://www.canvassystems.com)), suggests looking to new technologies for hot aisle containment and in-row cooling. "These technologies reduce the need to chill an entire data center and can make a huge impact on cooling requirements by reducing the total volume of air that must be cooled," he notes. At the same time, he says that using hot aisle containment technology is usually more cost-effective in new builds rather than in retrofit situations.

### Manage Your Airflow

John Consoli, vice president of sales at AFCO Systems ([www.afcosystems.com](http://www.afcosystems.com)), concurs that for increased efficiency, you must look beyond ambient room temperatures within a data center. "Many managers who believe they are 'out of cooling' may be surprised to find out how much cooling is actually being wasted," says Consoli. "Airflow must be measured along with power consumption and air temperature. Understanding the relationships and interactions of these different components will help ensure greater control."

According to Consoli, a good first step is to plug any leaks. "Many data centers have floors with tiles removed or holes that no longer serve a purpose and negatively impact airflow," he says. "The key is to be able to manage the flow of supply air as closely as you can to the computer inlet."

Consoli says equipment such as variable speed fans at the air-handler, or preferably at the rack level, and the use of chilled water

pumps can help manage the airflow at the cabinet level.

### Consolidate Your Infrastructure

"The greater the capacity of a disk, the less power it draws and the less heat it emits per byte, so from a cooling perspective, it is more beneficial to consolidate on larger disk capacity systems than to utilize multiple smaller disk storage solutions," says EMA's Brasen. He recommends you maximize the usage of your existing storage before investing in additional storage systems.

Meanwhile, both server and storage virtualization lessens the amount of cooling needed for your data center because you can consolidate your server load into a smaller number of physical machines, says Yother. "There are corollary benefits in maintenance costs and power consumption. When new servers are required, first consider a virtual machine before adding additional hardware," Yother says.

Brasen says that many vendors now offer energy-efficient storage solutions that emit less heat than their predecessors and also monitor temperature fluctuations.

### Automation Is Your Friend

Liebert's Blough says that because data centers at SMEs are not always occupied, you need to have reporting and notification capabilities available to warn you of any heat spikes or problems with your cooling setup.

"Many of these systems come with alarm capabilities that can notify you of problems that could cause a spike, such as a dirty filter or clogged condensate line," Blough says. "This allows you to find and fix the problem before the temperature goes up."

These systems often leverage automation capabilities, which can simplify monitoring these issues when companies lack the human resources to keep tabs manually. Ken Oestreich, director of product marketing at power management software provider Cassatt ([www.cassatt.com](http://www.cassatt.com)), acknowledges that automation is something people often need to get used to implementing.

"It can be scary for folks, and so they want to test it out and try it and see it really working in their environment," Oestreich says. "Everybody's data center is different, and they want to be sure things will come back on when [the software] says it will." ■

### Best Tip:

## Turn Off Servers When You Don't Need Them

"The way people have operated data centers is that you buy a server, you wheel it in, you plug it in, you turn it on, and it stays on for the rest of its life," says Jay Fry, vice president of marketing at Cassatt ([www.cassatt.com](http://www.cassatt.com)).

But newer cooling systems combined with automation software used within a data center ecosystem offer managers a new option: turn off their servers and storage devices whenever they are not being used.

Ken Oestreich, director of product marketing at Cassatt, says that the implementation of a system to turn off servers is something on the order of weeks or months. Moreover, you stand to save a lot of energy and money. "If you're able to save a lot on a server that's not being used, you save that watt, plus another watt or two on your cooling. It's got that multiplier effect, and it's essentially self-funding in a couple of months," he says.

### Easiest To Implement:

## Make These Low-Tech, Low-Cost Revisions

Bob Blough, director of product marketing at Liebert Precision Cooling ([www.liebert.com](http://www.liebert.com)), offers a plethora of suggestions that don't cost much and require a minimum of IT savvy.

- Pay attention to the way you manage your cables. "Tangled knots of cables can restrict airflow and trap hot air near the servers," says Blough. Rackmounted cable management systems can keep the cables under control and the air flowing freely.
- When choosing racks, make sure to look for features such as perforated doors, panels you can easily take off, built-in cable management systems, and the ability to add rackmounted cooling easily. "These features become more important with every rack you add," Blough says.
- Keep your room clean. According to Blough, contaminants can build up and trap heat within servers. He recommends regular cleaning and dusting, and if possible, a professional data center cleaning at least annually.
- Configure your racks into hot aisles and cold aisles. "This ensures your servers aren't pulling in hot air from other racks, and it's a must for managing heat," Blough says.

## BONUS TIPS

■ **Balance out your power and cooling system with your servers and storage.** According to Ken Oestreich, director of product marketing at Cassatt ([www.cassatt.com](http://www.cassatt.com)), the best data center efficiency numbers result when these two areas are in balance. "You want to avoid a situation where you're doing something smart with your servers—at night you turn half of them off—and you forget to turn off your air-condi-

tioning and your UPSes," Oestreich says. "Proportionally even less power gets to your servers than to your overhead, so having this dynamic data center metric is important."

■ **Maintain and monitor your overall data center cooling strategy.** "Planned and systematic enforcement of best practices is a vital part of keeping the data center environment efficiently in tune with

technology turnover," says John Consoli, vice president of sales at AFCO Systems ([www.afcosystems.com](http://www.afcosystems.com)). Keeping track of cooling trends can help offset the obsolescence of legacy infrastructure, he says. In addition, make sure you rebalance your air-handler systems after any significant IT configuration and properly configure redundancies and size systems to maximize your efficiencies, he says.