

## Creating a Greener Data Center Through Collaboration

Given the increasing cost of energy and the rising power load of IT equipment, IT departments are seeing their electricity bills skyrocket. According to the EPA, data center energy costs are projected by 2011 to be over \$7.4 billion—nearly half of which goes to data center cooling. To reduce these costs, companies are searching for systems that can improve data center cooling efficiency.

If airflow movement is optimized throughout the data center, then CRAC unit set points can be turned up. Although it can be tough in these hard economic times to justify an expense of an additional system that optimizes airflow, the return on investment is usually within a single year. By working closely with valued partners and utility companies, facilities and IT managers can secure rebates or other financial incentives to make these efficiency improvements.

“The economy is making everyone nervous, and it is sometimes easier to maintain the status quo than to take a little risk. However, the longer you wait to implement a solution, the more money you burn each month on the bills—the ROI on cooling optimization is worth it,” said Bob Hancock, founder and president of Instor, a value-added reseller specializing in green IT data center solutions.

Instor customer Marvell Semiconductor, a leader in the development of storage, communications and consumer silicon solutions, implemented several green IT measures within its data center. These measures resulted in a staggering energy-consumption reduction of 1.3 million kilowatt hours in the first year—saving over \$150,000. Marvell’s Director Thomas Irpan and Facilities Manager Walter Lepik worked directly with their local power supplier to determine whether a data center energy efficiency project would qualify for a utility rebate. With the utility signing off on a generous rebate, Marvell turned to researching other partners to create the customized solution.

After researching the various technologies, Walter and Thomas knew they wanted an airflow containment solution for Marvell’s approximately 10,000 square-foot data center. Lacking a raised floor, the data center’s air supply and return came from the ceiling plenum, making it hard for cool air to completely reach all 120 racks throughout the center. On the positive side, Marvell had already installed blanking panels in empty racks to stop the heated exhaust air from being returned into the air inlet, which can contribute to dangerous overheating conditions. Instor worked closely with the Marvell team to find the proper containment solution for hot and cold aisles. Instor installed Seal-Tech hot/cold aisle containment curtains on the eight cold rows within the data center. The curtains are made of anti-static, clear vinyl double polypropylene material that easily accommodate any aisle configuration, and meet ASTM E-84, NFPA Class A and UBC Class 1 flame spread and smoke density standards. The entire solution was installed within a month, with the majority completed in the first week. The curtains provided a flexible solution for the legacy data center by providing access to ladder racks, power cords, and other equipment.



*Aisle Containment Curtains easily conform to overhead obstacles*

In the design meetings, Instor suggested other green IT measures that Marvell went on to implement with other vendors. Marvell worked with HVAC engineers to put variable frequency drives (VFD) on top of the CRAC units. Without VFDs, CRAC units are either running full blast or are off, which is not optimal. With VFDs, IT managers are able to modulate the speed of the CRAC fan resulting in major efficiency gains. For example, because a fan's energy consumption is approximately proportional to the square of the fan speed, when the fan speed is turned down by 20% it can use up to 50% less energy. Marvell also followed Instor's suggestions to deploy an airflow monitoring solution as well as additional airflow containment solutions to the blanking panels.



*Curtains at the end of an aisle*

“This was our first significant airflow containment project and we were clear about this with Marvell from the outset. They understood that it would be a collaborative effort and they were willing to work with us. Throughout the project we relied mostly on common sense. After listening to the customer's suggestions, we made small adjustments to the original plan here and there. The end result was terrific for both companies—we learned a lot, and Marvell was able to substantially reduce its power consumption in the data center,” Hancock said.

The containment curtains and the VFD installation are key factors in the savings that Marvell sees each month in its electric bill. By working collaboratively towards finding the best solution for its customer, Instor helped Marvell to achieve significant savings and an immediate ROI.

“From this project with Marvell, we have gone on to implement several other airflow containment solutions for other data centers within the Bay Area. We continue to work closely with customers on each project, providing them the flexibility and customization needed for each data center. As a result, our expertise and solution set continue to increase tenfold,” Hancock concluded.