

HP Offers a Cool Solution for Data Centers Feeling the Heat

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HP's Dynamic Smart Cooling system will dynamically adjust air conditioning to meet changing IT equipment power loads. In Gartner's view, this approach marks a major advance in addressing the data center cooling challenge.

Event

On 29 November 2006, HP announced the future availability of Dynamic Smart Cooling (DSC), a software-based air-conditioning-management system that will automatically adjust air distribution based on changing IT equipment loads and heat gain. Using a network of sensors located throughout the data center facility, the system will detect temperature changes resulting from variable workloads and redirect chilled air automatically throughout the raised-floor area. HP maintains that the system — designed to work with all standard air-conditioning systems and with multiple IT vendor products — will achieve cooling-related cost reductions of 20% to 45%, or enable computing capacity to be added without increased cooling infrastructure. HP also states that a new network of partner firms will provide planning and installation support for the new system. The company also announced that it will release a 3-Phase Power portfolio — including rack-mounted uninterruptible power supply (UPS) and 100-kilovolt-ampere power distribution units — to enable the creation of a modular, highly scalable power-and-cooling infrastructure. HP says the DSC and 3-Phase Power offerings will be available in 3Q07; pricing has not yet been disclosed.

Analysis

In Gartner's view, the approach described by HP for its DSC system represents a major advance in addressing the power-and-cooling challenge caused by increasing heat gains from high-density IT equipment. This innovative approach addresses two significant issues associated with legacy cooling systems. First, traditional air-conditioning systems operate at a constant level and do not respond dynamically to changing workload and power demands, and associated heat gains, across the data center rack population. The result is high cooling-related electrical costs — in some cases, 1.5 to 2 times the cost associated with the power load of the IT equipment itself. If HP's claims hold up when DSC is deployed in user data centers, and the system proves successful at enabling the dynamic adjustment of airflow where it is needed, this system could significantly improve the efficiency of the cooling plant and reduce the energy costs associated with cooling.

The second issue is that of limited capacity. As IT equipment density increases, traditional under-floor cooling becomes ineffective. The DSC system is designed to mitigate this problem by providing additional headroom through more-efficient cooling, without necessarily increasing energy costs. For rack densities that exceed 10 to 15 kilowatts per rack, however, supplemental cooling approaches, such as in-row or in-rack cooling units, may be required. Because the new HP system can be readily adapted to legacy air-conditioning systems with minimum disruption to operations, Gartner believes it will likely be particularly applicable in data center retrofit projects.

RECOMMENDATIONS

- Assess the power and cooling demands of your data centers. If the ratio between cooling-related and connected-system power loads and exceeds 1-to-1, there may be an opportunity to successfully deploy DSC when it becomes available.
- Consider the HP solution for new data center projects, and incorporate budget contingencies for its installation.

- Consult with your air-conditioning vendors to ensure product compatibility with the HP system. Also ensure that the installation will not create warranty or service contract issues.
- Because deploying DSC will require significant design and planning effort, engage early with HP in anticipation of the 3Q07 release date.
- Compare the HP solution to other specialty solutions, such as in-rack or in-row liquid cooling.

RECOMMENDED READING

- "The Impact of High-Density Server Growth on Data Center Power and Cooling Metrics" — Gartner models the effect of high-density server growth on data center parameters such as power, cooling and floor space. **By Rakesh Kumar, Michael Bell and Jonathon Hardcastle**
- "Guidelines for Dealing With Data Center Power and Cooling Issues" — We offer tips to help data center managers address increasingly problematic power and cooling issues during the next five years. **By Rakesh Kumar and John Enck**

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