

Data center reset: HP Apollo 8000 features water-cooled system

June 12 2014, by Nancy Owano



HP's announcement this week of its new Apollo 8000 system is certain to attract interest as a water-cooled supercomputer system with a special cooling technique designed to keep components cool and, as important, dry. Built on a scalable rack design with up to 144 servers per rack, the system, according to HP, can offer four times the teraflops per rack compared to air-cooled designs, and the energy-efficient design helps organizations eliminate up to 3,800 tons of carbon dioxide waste from their data center per year. (That, explained HP, is an internal estimate comparing HP Apollo 8000 to an air-cooled data center with 3 megawatts of IT. A standard sustainability formula was used, said HP, to

derive CO2 savings in tons using the KW-hr savings based on real-world data center analysis.). Mike Wheatley in Services Angle said the cooling technology, called "dry disconnect," involves water piped around the cores, "[soothing](#) those perspiring chips far more efficiently than any air-based cooling system can."

James Niccolai of the IDG News Service detailed how this system works. "The Apollo 8000 has two cooling systems that work in conjunction with each other. One is a water tower—or what HP calls a 'water wall'—that runs down the center of the server rack from top to bottom. Water circulates in the tower and draws heat [away](#) from server blades attached to the other side of the wall. Water also circulates in the blades themselves, through sealed copper pipes connected to the underside of each CPU via a heat sink. The copper pipes connect to the water wall, which carries the heat away and out of the rack."

The technique could mark a difference in managers' attitudes toward liquid cooling. HP said, "As a cooling medium, liquids offer 1,000 times the efficiency of air. However, design complexities and the risk of damage to expensive HPC systems have made liquid cooling unattractive." HP added that it has addressed these obstacles.

Alex Hamilton of IT Pro wrote Tuesday of another advantage to the HP design, involving recycling. "Instead of pumping cold water through the servers to cool them, which would result in a bucketload of lukewarm waste," he wrote, "warm water is used." He said the resultant byproduct can be siphoned off for use in the heating of the rest of the building. Enabling the reuse of hot water to heat facilities was also mentioned in HPCwire on Tuesday, noting that with HP's approach the cooled components [release](#) hot [water](#), which can be recirculated to provide building heat. "In fact, one of the prime sites to see the Apollo 8000 line in action is where it was conceptualized—at the NREL Peregrine [supercomputer](#) site." (The U.S. National Renewable Energy Lab

partnered with HP to build an HP Apollo 8000 System for the lab's HPC [data center](#).] The Lab (NREL) leveraged the supercomputer's design. They used the [waste heat](#) from their supercomputer to heat adjacent office and lab space.



"Leveraging the efficiency of HP Apollo 8000, we expect to save \$800,000 in operating expenses per year," Steve Hammond, director, Computational Science Center, NREL, said in the HP announcement. "Because we are capturing and using waste heat, we estimate we will save another \$200,000 that would otherwise be used to [heat](#) the building. We are saving \$1 million per year in operations costs for a data center that cost less to build than a typical data center."

More information: * [www.hp.com/hpinfo/newsroom/pre ...](http://www.hp.com/hpinfo/newsroom/pre...)

[ver2014/HPApollo.pdf](#)

* [www8.hp.com/hpnext/posts/annou...-family#.U5nnjfmSztu](#)

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