

Green Proving Ground Test Bed Project

Technology Fact Sheet

Category:

HVAC

Technology Name:

Wireless Temperature Sensors for Data Center Cooling System Air Distribution Optimization

What is this Technology?

A wireless mesh sensor network supports active monitoring of temperature, humidity, air pressure, and electrical power in multiple locations, enabling continuous improvement in energy management of large enterprise data centers.

Why is GSA interested?

Energy Efficiency - Data centers are highly energy intensive. Demand for data center services – and associated energy costs – have exploded over the past decade. To address this issue, the Office of Management and Budget requires agencies to consolidate data centers and move to cloud based solutions. Remaining locations intend to achieve significant energy savings through best practices that reduce the proportion of energy expended on non-IT (e.g. cooling, power conditioning) loads. Savings on cooling loads of 20-35% through implementation of a dense network of wireless temperature sensors that provide real time monitoring and optimization of data center conditions are projected.

Cost effectiveness - Because data centers are highly energy intensive, even relatively modest energy cost savings can be life-cycle cost effective. Manufacturer cost data projects simple payback of under 4 years, even in markets with low energy costs.

Operations and Maintenance - Once initial findings are identified and implemented, the technology provides active monitoring data that supports taking preventative action before a problem occurs. The mesh network approach means it should be easy to modify or expand the monitoring system in response to changes in the data center. Monitoring and correcting hot spots should reduce IT failures and extend equipment life. This should reduce operations and maintenance (O&M) and improve IT reliability.

Applicability - The technology is specifically aimed at monitoring data centers for the purpose of identifying energy- efficiency opportunities and validating the result upon implementation. In theory, the technology could be applied to other building functions where active, real-time monitoring of environmental conditions would be of benefit.

Adapted from report by Pacific Northwest National Laboratory