Semper Paratus: Ensure Your Data Center is Always Prepared for an Environmental Disaster

Even after closing numerous data centers to increase efficiency and meet federal targets, the Defense Department still manages hundreds of data centers across the globe. Each remaining data center is critical to mission continuity and success; it's where mission-critical data is stored, transmitted and protected. Yet, many are missing a key tool that is critical to protecting the data—automated environmental monitoring.

Agencies have taken many positive steps to increase capacity, bolster security and improve storage resources. Often, however, they have not yet given the same attention to environmental factors, such as heat, moisture and smoke. Any of those factors—not to mention other disasters, like wildfires or earthquakes can cause equipment failure or loss of human life.

Despite the benefit of automating environmental monitoring, many are still using manual methods as simple as visually checking thermometers taped to walls or identifying excess humidity by how much staff are sweating. According to the OMB, less than 27 percent of federal data centers and 30 percent of DOD data centers use automated energy metering technology today.

In addition to being inaccurate and labor-intensive, manual approaches to environmental monitoring make it very difficult for data centers to meet the Data Center Optimization Initiative (DCOI) mandate. The most current iteration of that mandate requires agencies with large data centers over 100KW to replace manual collections and reporting of operational data, systems, software and hardware with automated monitoring, inventory and management tools.

Some data centers are finding that if they don't have proper environmental monitoring, access controls and audit mechanisms, they can't pass audits. According to GAO, most of the 24 agencies participating in the DCOI program report limited progress against targets for automated monitoring, energy metering, and power usage effectiveness.

An automated approach to environmental monitoring

All of these pressures are leading more DOD installations to adopt more automated, software-based methods of monitoring environmental factors. With this approach, data center managers can monitor critical and environmental data via a consolidated dashboard, even if they are working at home because of the current pandemic crisis.

"The idea is to be able to continuously monitor temperature, humidity, motion, smoke as simply as possible," explained John Esparza, a Data Center Software Consultant for APC's Schneider Electric's Secure Power Business Unit. "If you can do it all with one system, from one console, you can stop problems before they become bigger problems."

One approach revolves around a network-connected hardware

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device, connected to various sensors and cameras for temperature, water, motion, dust particles, smoke and other environmental hazards. Sensors also can be added for chillers, generators, window breaks, chemical processes and other factors specific to that data center. To detect motion, cameras are added. This can help determine whether human error was a factor. The data center manager can customize the thresholds that signify concern for each individual factor, and apply the data center's specific policies and escalation processes.

Data from all sensors is collected every five minutes and sent to a centralized management console. When a hazard is detected, the data center manager is immediately notified. At that point, it's up to the data center manager whether to dispatch someone to check out the situation in person or manage the risk remotely.

The same technology also can be applied to network closets, which can experience the same types of environmental hazards. For network closets, it's a numbers game; it's not uncommon for a DOD site to have hundreds of these closets, all which need the same type of environmental monitoring as data centers.

In addition to preventing large-scale data center failures, a system like APC's can go a long way toward reducing meantime to repair, maximizing uptime and improving efficiency. For example, if the software sends an alert about a bad UPS, the data center manager saves the time and expense of sending a technician to the data center to diagnose the problem and wait for a replacement. Instead, the technician can go to the data center once with the replacement product. The same thing is true with environmental alerts. If the software sends an alert about a leak in the water main, a manager can immediately dispatch a technician to close the water main before it further damages equipment.

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—Jeffrey Chabot, Segment Director, Public Sector Secure Power, APC Schneider Electric

A software-based approach to environmental monitoring can be particularly helpful for older data centers housed in buildings built before or during World War II. Even though many of these data centers have been modernized, they are often housed in old buildings with substandard plumbing, roofs or ventilation. There are even cases where military bases and the data centers on those bases are located in flood zones.

Automated environmental monitoring also can be valuable for challenging cases, such as monitoring data centers on forward operating bases overseas. Whether it's a military exercise, actual wartime situation or simple expansion of a base, these operating bases often include standing up a data center. When those data centers are in areas with environmental extremes, such as very humid areas or deserts, environmental monitoring becomes critical.

The technology also can improve more than environmental monitoring. With the right sensors and video surveillance, for example, the system can monitor and send security-related alerts. One military installation in the southern United States, for example, which implemented the system in part to comply with DCOI, found that it could be used to improve physical security as well. All it took was including additional sensors and cameras for motion detection. That way, data center managers could be alerted immediately if unauthorized personnel entered the data center or opened the cabinet.

"Using an automated, software-based tool to monitor your critical and environmental data takes the guesswork out of the process," said Jeffrey Chabot, Segment Director for Public Sector Business in the Secure Power Business Unit at APC's Schneider Electric division. "The key to success is simplicity; with a single solution that can integrate all of these different types of monitoring, agencies can remain confident that things are on track and meet compliance mandates at the same time."

To learn more about how Affigent and APC can help meet your mission IT needs and ensure your critical data is prepared for environmental disasters, please visit affigent.com.

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