

Nominee: Schneider Electric

Nomination title: StruxureWare Data Center Operation: Cooling Optimize : Automated cooling control in dynamic data centres

- What are your product's/solution's key distinguishing features and/or USP?

A module of Schneider Electric's class-leading DCIM suite, StruxureWare Data Center Operation: Cooling Optimize continuously optimizes airflow in the data centre, delivering improved reliability and availability. Cooling Optimize is a closed-loop system that reacts to real-time data, automatically identifies and eliminates hot spots and helps diagnose potential facility risks. The application balances the need for cooling with the lowest possible energy expenditure, delivering immediate cost savings and the right amount of cooling within the data centre. The application enables control over desired temperatures together with visibility into thermal conditions. It employs intelligent software which constantly adjusts cooling as environmental conditions change. This real-time response to temperature-affecting events, such as equipment moves, upgrades or IT load swings, stabilizes air flow and solves the complex puzzle of cooling resource allocation.

StruxureWare Data Center Operation: Cooling Optimize provides the following benefits:

- Cost Savings
 - o Energy savings

Delivers up to 40% cooling energy savings through optimized use of existing cooling equipment.

- o Extend equipment life

Efficient use of cooling equipment reduces the need for maintenance and extends equipment life.

- Manageability
 - o Intelligent control

Temperature data is wirelessly transmitted to network gateways, aggregated, and analyzed by control software, which determines appropriate control demands delivered directly to the cooling equipment.

- o Influence mapping

Provides great insights into the influence of individual cooling units on the temperature in every part of the data centre.

- o Reclaim cooling capacity

Continuously optimized cooling capacity allows for additional IT load and increased IT capacity in the data centre.

- o Dynamic optimization

Thermal airflow is constantly adapted to match real-time needs created by the dynamic environment in a data centre.

- Availability

- o Uptime protection

Immediate identification and elimination of hot spots protects uptime and ensures business can continue as planned.

- o Risk mitigation

In the event of an emergency, cooling units will automatically run at maximum capacity and ensure a cool facility, even if Cooling Optimize is unable to connect to and control the cooling units.

- o Manual override

Provides operators with the ability to manually exert control over their cooling resources and override the system.

- o Existing cooling infrastructure

Works with your existing infrastructure; direct expansion (DX), chilled water, economizers and evaporative cooling methods, and under floor, overhead, ducted and unducted airflow environments.

- o Benchmark report

Verifies energy and cost savings, as well as greenhouse gas reductions, achieved through the use of active cooling control.

- o Temperature compliance report

Identifies if rack temperatures have complied with required set points, and the time period that racks have been in violation of the set point limits, enabling easy detection of potential physical infrastructure irregularities.

o Wireless temperature sensors

Utilizes a range of wireless temperature sensors to determine the exact position of the heat load within the data centre.

- What tangible impact has your product/solution had on the market and your customers?

During a recent Proof of Concept (PoC) at a large Pacific Telco Provider, Schneider Electric's Data Center Operation: Cooling Optimize module immediately enabled the customer to turn off 13 out of 25 CRAC units, and provided energy savings of £35,000 per annum – providing payback on the management solution in less than a year. The savings on average power use was 37%. This PoC was carried out on one room only, but needless to say the customer is planning on rolling this solution out to the rest of its sites.

Data Center Operation: Cooling Optimize provides customers with an alternative to updating all of their legacy perimeter cooling units, which can be a costly affair. It helps customers dynamically manage cooling units, by making use of Intelligent Analytics technology to gather data in real time and produce the necessary Influence Maps.

These in turn allow the Cooling Optimize module to react to this data in a closed-loop system, automatically identifying and eliminating hot spots and helping to diagnose potential overheating risks.

Cooling Optimize makes use of a dense array of temperature sensors to determine exactly where the heat load is within a data centre. This temperature data is aggregated and transmitted wirelessly to a purpose-built appliance where it is analysed by control software, which then sends adjustment commands to the cooling equipment. As the server and storage load changes, the built-in machine learning automatically adjusts cooling output to match the requirements of the data centre.

The module balances the need for cooling with the lowest possible energy expenditure, allowing the ambient temperature of the facility to rise while delivering sufficient cooling to where it is needed, resulting in immediate cost savings.

- What are the major differentiators between your product/solution and those of your primary competitors?

The intelligent control provided by Cooling Optimize improves the manageability of a data centre with its automatic closed-loop adjustments making the necessary changes in real time and the influence maps providing greater insight to operators of the systemic effects of those adjustments.

Energy savings are achieved from day one, immediately after the Cooling Optimize system has been implemented and is turned on following a 1-2 week installation.

SynapSense (Active Control), the major competitor for Cooling Optimize, cannot be implemented until air flow has been optimized. This means the monitoring system has to be implemented first, then data collection will follow and finally analysis based on the collected data. Optimization of air flow is based on findings of the analysis. Implementation of SynapSense airflow optimization typically takes 6 - 12 months significantly delaying when energy savings can be realized. Thermal airflow is constantly adapted to match the cooling needs created by the data centre's changing characteristics. The continuously optimised cooling capacity allows operators to increase both the load and capacity of IT equipment in their data centres, confident that the cooling infrastructure deployed is sufficient to keep the facility operating. Other competitors define a zone for each CRAC/CRAH unit. The influence of each CRAC unit on the racks' inlet temperature can only be studied in its associated zone not on the entire data center space.

Cooling Optimize does not require zoning. The influence of each CRAC/CRAH unit is studied on the entire data center space.

The constant collection and aggregation of temperature data helps mitigate risks to the safe operation of the IT equipment in a data centre. Up to 95% of hotspots are automatically resolved and data is also provided to help operators diagnose trickier issues. In the event of an emergency, cooling units will automatically run at maximum capacity and thereby ensure a cool facility until such time as the issue can be resolved and the data centre can return to optimal efficiency. This safety feature applies even if the Cooling Optimize module is unable to connect to or control the cooling units in question.

Providing optimal control of cooling equipment, tailored dynamically to the changing load, can dramatically reduce the running costs of a data centre. As much as 40% of cooling energy costs can be eliminated by directing cooling effort only where it is needed and removing redundancy. Further cost savings in the long term are delivered by efficient use of cooling equipment. The more optimally it is used, the less unnecessary wear and tear is experienced and therefore the equipment requires less maintenance yet lasts longer.

The Cooling Optimize Module provides operators with rich and detailed reports of the operations of the cooling equipment, allowing greater fine tuning and long-term planning based on the insights delivered. A Benchmark Report verifies energy and cost savings as well as greenhouse-gas reductions achieved through the use of active cooling control. A Temperature Compliance report determines whether rack temperatures have complied with required set points, and if they have not, it also records the time period for which racks have been in violation of these limits. This allows easy detection of potential problems within a data centre so that they can be addressed before they become critical.

Why nominee should win

- Cost Savings - Delivers up to 40% cooling energy savings through optimized use of existing cooling equipment. Efficient use of cooling equipment reduces the need for maintenance and extends equipment life.
- Availability - Works with existing infrastructure, and verifies energy and cost savings, as well as greenhouse gas reductions, achieved through the use of active cooling control. In the event of an emergency, cooling units will automatically run at maximum capacity and ensure a cool facility, even if Cooling Optimize is unable to connect to and control the cooling units.
- Influence map - Provides great insights into the influence of individual cooling units on the temperature in every part of the data centre. The module makes use of Intelligent Analytics technology to gather data in real time and produce the necessary Influence Maps. This allows the Cooling Optimize module to react to this data in a closed-loop system, which automatically identifies and eliminates hot spots and helps to diagnose potential overheating risks.