Cool solution for data center minimizes power consumption

DigiPlex has won the "Critical Environment Future Thinking Award" at the annual DCD (Datacenter Dynamics) Awards. The award recognises the innovation and thinking that is shaping the next generation of cutting edge data centre solutions. It was awarded for DigiPlex's Concert Control system, a proprietary control algorithm instrumental in delivering industry-leading power usage effectiveness (PUE) at DigiPlex's Stockholm and Fetsund data centres.

Air-to-air indirect evaporative cooling is the new generation of cooling solutions for DigiPlex data centers. The system provides considerable economic benefits and delivers cooling with exceptionally low power consumption.

"With Concert Control and air-to-air cooling, the energy efficiency is significantly better than in a traditional cooling solution. The system provides economic and environmental benefits as well," says Geoff Fox, Group Chief Technical Officer at DigiPlex.

Concert Control is a procedure that has been developed to optimize the performance of high-efficient air-cooled data centers. The controls are done by an algorithm that balances the data center heat load with evaporative cooling. The solution has exceptionally low power consumption. PUE (Power Usage Effectiveness) is a measure of how effectively data centers use power. A traditional water-cooled data center typically has a PUE of 1.6. With an air-to-air system, the PUE is less than 1.1.

The air-to-air solution consists of air treatment modules called Air Treatment Pod (ATP). The great advantage of ATP is that the source of cooling energy is the evaporation of water, unlike traditional energy-consuming mechanical cooling solutions that are based on chiller and CRAC units.

"The cooling system's environmental impact is minimized as its primary water supply consists of rainwater. If necessary, you can also use ordinary mains water."

At the heart of the evaporative cooling system is a heat exchanger which transfers heat between two streams of air, cold outside air, and warm indoor air.

"The Concert Control solution can calculate the exact amount of conditioned air that is needed to remove the heat generated by the servers. The algorithm is based on simple thermodynamics. What makes it unique is that it references actual power drawn by the servers and compares this to the fan curves, which has never been done before."

ATP modules can operate cost effectively in data centers anywhere in the world, but the system takes advantage of the cool climate in the Nordic region.