The Computerworld Honors Program

Honoring those who use Information Technology to benefit society

Final Copy of Case Study

YEAR:
2012

STATUS:
Laureate

Organization:
Vestas Wind Systems A/S

Organization URL:
www.vestas.com

Project Name:
Vestas Virtualizes and Consolidates IT Management Software to Produce and Support More Wind Turbines for Green Energy Projects around the Globe

What social/humanitarian issue was the project designed to address? What specific metrics did you use to measure the project's success?

Vestas is the world's No. 1 designer and manufacturer of wind turbines for electric power generation. Roughly every three hours, a new Vestas wind turbine is deployed. As of the end of 2010, Vestas' 21,000 employees in 34 countries had raised 44,000 turbines in 65 countries across six continents. These turbines produce more than 44,000 megawatts of power and reduce worldwide carbon dioxide emissions by 40 million tons annually. The world's energy consumption is expected to increase at least 36 percent from 2008 to 2035, according to a 2010 report from the International Energy Agency (IEA). Nobody can say for certain how long finite fossil fuel resources will last, but it's clear that in the near future, the world will need renewable energy sources such as wind, a clean source of energy that does not contribute to climate change. As Vestas worked to meet the high demand for its wind turbines, the company recognized that IT support for engineers, turbine monitoring software, and deployment teams would constrain Vestas' ability to serve the governments and power companies who desperately needed them. Simply put, Vestas did not have enough data center floor space, personnel, or physical servers to meet demand. Server virtualization eliminated this constraint. Virtualization allowed the company to reduce the number of physical servers it owned, increase the speed of deploying new IT services to the business, and reduce energy use. But the company also needed a streamlined process for managing its new virtual infrastructure (described in section 4). In 2009, Vestas

started an effort to virtualize 99 percent of its 2,200 servers in 60 locations across the globe. The project is 70 percent complete. Vestas expects to meet its goal by the end of this year.

Please describe the technologies used and how those technologies were deployed in an innovative way. Also, please include any technical or other challenges that were overcome for the successful implementation of the project.

Vestas is using VMware vSphere to virtualize its servers. The company was already using Microsoft System Center management software to control its physical IT infrastructure, and it did not want to deploy a separate management system to oversee the virtual infrastructure. Microsoft introduced Vestas to Veeam Software, whose Veeam nworks Management Pack (nworks MP) provides continuous monitoring and management of their extensive VMware infrastructure directly in Microsoft System Center. Vestas also deployed a high-performance computing (HPC) cluster from IBM, which enabled its virtualized infrastructure to crunch the enormous amount of data collected on the company's wind turbines.

Please list the specific humanitarian benefits the project has yielded so far.

In 2011, virtualization enabled Vestas to support more wind turbine projects than it would have otherwise been able to support without virtualization, and that had a substantial impact on reducing generation of greenhouse gasses. Last year, Vestas sold enough wind turbines to produce a total of 7400 megawatts. Generating this amount of power with traditional fossil fuels would have generated more than 20 million tons of carbon dioxide, plus millions of additional tons in other harmful pollutants. What's more, Vestas has been able to reduce its own energy use by 37 percent and reduce its data center footprint by 40 percent. Virtualization is helping Vestas create a greener world.

Please provide the best example of how the project has benefited a specific individual, enterprise or organization. Feel free to include personal quotes from individuals who have directly benefited from the work.

The benefits of virtualization have been felt on wind farm installations worldwide. This example highlights an Australian wind park, which is the largest in the southern hemisphere. To maximize uptime of the wind park management and monitoring systems, best practice is to physically separate the equipment in order to obtain better security and redundancy on the physical level. The virtual environment for this particular installation consists of two physical servers at different locations with a hypervisor installed. When maintenance and other activities are planned on one environment, such as the need to reboot the data collection virtual server or power off the physical server that hosts the virtual machines, daily operations can still take place on the second virtual environment by instantly and seamlessly moving the wind park data collection production server. But to instantly move the data collection virtual server from one environment to another, which includes the SQL databases, a common disk system between the two virtual environments must be available. In a traditional physical environment, this requires a dedicated SAN, which consumes a great deal of time and money to install and manage. Instead, Vestas has deployed an HP software product called Virtual SAN Appliance, which creates a virtual SAN across the two physical server's disks, thus providing SAN functionality without introducing new physical elements. It greatly reduces the resources required to manage the wind park's IT infrastructure. By running the data collection server in a virtual environment, Vestas gains fast recovery of a failed data collection server, and automatic and seamless failover to a redundant virtual environment in case of virtual server or physical host server failure. Because the installation costs less to deploy and manage, both in terms of financial and human resources, Vestas has greater IT capacity to support additional wind farms.