Success Brief

Intel® technology

Energy-efficient IT

Manufacturing

Building a sustainable IT infrastructure

Intel® technology helps the BMW Group strike the right balance between efficiency, security and reliability

Reducing energy consumption and CO2 emissions in power-hungry areas like IT is becoming of paramount importance to companies all over the globe. Together with long-standing technology partner Intel, BMW Group set out a roadmap titled E^2IT (Energy Efficient IT) for improving the energy efficiency and effectiveness of its IT infrastructure. E^2IT outlines sensible and target-oriented energy use that does not endanger the reliability and security of IT operations. The major target of E^2IT is to significantly improve the utilisation of IT components and the related infrastructure by focusing on three key areas: clients, servers and data centre cooling.

"Working closely with Intel, we've been able to improve the energy efficiency of our infrastructure without compromising performance, security or reliability."

Wolfgang Haag,
Manager of Data Centre Solutions,
BMW Group

- **Environmental responsibilities.** Intel wanted to improve the utilisation and energy-efficiency of BMW Group's IT infrastructure, from the client right through to the data centre, without compromising security and reliability.
- **An efficiency roadmap.** E^2IT advises on improving client, server and data centre efficiency. It recommends: migrating hardware to the more energy-efficient Intel® Core™ microarchitecture; making default profiles for clients and servers more energy-efficient; increasing the notebook/ PC ratio; investigating benefits of virtualisation; ensuring new hardware is ENERGY STAR* compliant; and investigating more efficient data centre cooling methods.
- **Power savings across the board.** Implementing these measures is expected to reduce annual client energy consumption by more than 60 percent and annual server energy consumption by more than 50 percent (natural hardware growth not considered). In addition, data centre efficiency is anticipated to increase from 35 to 65 percent.

Intel found that the default profile for clients was never to go into SpeedStep mode, sleep or hibernation. SpeedStep is technology built into Intel® CPUs that allows the processor to run at a lower frequency, generating less heat and consuming less power. Now, machines are sent to sleep after one hour of inactivity; and put into hibernation after four hours of inactivity.

Intel has also started to deliver PCs that are powered by more energy-efficient CPUs and chipsets. Desktops running on the Intel® Core™2 processor with vPro™ technology reduce energy consumption during working hours from 120W to 80W per device. Notebooks powered by the Intel® Centrino® 2 with vPro™ technology reduce this even further to 60W.

In the data centre, Intel helped BMW Group to replace its server fleet based on Intel NetBurst® microarchitecture with servers based on Intel's more energy-efficient Intel® Core™ microarchitecture. This move alone reduces the energy consumption per server from 400W to 320W – when taking into account the company's total number of servers the potential savings generated by this move are enormous.

Intel® technology is enabling BMW Group to make significant energy savings

Together with Intel, BMW Group is investigating the energy-saving benefits of virtualisation to improve server utilisation by up to 60 percent. It is also running a proof of concept to measure the savings made through replacing rack servers with blade servers, which have a more efficient power supply.

In the past, organisations' primary focus when purchasing new hardware has been primarily on price and performance. Now energy efficiency is becoming increasingly important as an evaluation criterion. E^{2}IT, for example, ensures all servers and clients, including peripherals, are ENERGY STAR* compliant.

Intel helped to increase data centre infrastructure efficiency (DCIE) from 35 to 65 percent, yielding an overall reduction in energy consumption of more than 25GWh per annum. DCIE was developed by members of the Green Grid. It is calculated by dividing IT equipment power by total facility power and then converting to a percentage figure. The higher the DCIE percentage, the more total power is being used for the core task of running servers rather than cooling, heating or lighting and so on.

Spotlight: BMW Group

- BMW Group is the parent company of the BMW, MINI and Rolls-Royce car brands
- With production facilities in 12 countries and its on sales companies in 37 countries, BMW Group has 105,800 employees worldwide
- For the financial year 2007, BMW Group reported record sales revenue of EUR 56,018 million (USD 83,568 million), up 14.3 percent from EUR 48,999 million (USD 73,097 million) the previous year, making it one of the most profitable manufacturers of automobiles and motorcycles
- BMW Group adheres to strict environmental guidelines, striving to reconcile the interests of people and nature, technology and progress, with right of future generations to an intact environment

This increase in DCIE is primarily down to the fact that highly efficient cooling technologies using renewable energy resources have been made available. However, additional power savings have also been made through more efficient power supply and distribution sub-systems, new air-handler technologies and extensive housekeeping measures reducing uncontrolled airflow within the data centre.

Looking to the future, BMW Group is evaluating the potential of air flow control measures. Working together with Intel, it is using computational fluid dynamic software to examine the positive and negative effects of cold air housing on both the servers and the wider data centre.

Find a business solution that is right for your company. Contact your Intel representative or visit the Reference Room at: http://www.intel.com/references

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