INTELLIGENT SOLUTIONS NEEDED TO POWER HUNGRY IT BEAST

We live in a world where people are connected to one another like never before, and this level of connectivity seems to be reaching new heights every year. But the IT which powers it is a very thirsty beast, drinking up electricity at an alarming rate and forcing millions of companies across the globe to consider the damage their computer systems might be doing to the environment.

Fortunately, many of these top companies are giving serious thought to sustainable IT and are investing millions into ensuring their systems are as green as possible. Issues surrounding data centres, the recycling of office technology, the reusability of components, environmental accounting and the lengthening of product lifecycles are all being considered and solutions developed to tackle the pressing issues which face the sector.

Of course, all this fevered R&D does no harm when it comes to talking up a company's green credentials and it's no secret that 'going green' is having a positive effect on customer perception in all sectors. Still, if it means that companies take seriously their environmental responsibilities as well as boost their share price, that can be no bad thing.

In this exclusive Round Table for Eco Executive, some of the IT industry's leading figures speak about the issues outlined above and consider the impact that environmental concerns are having on the sector.

THE PANEL

Ian Brooks is director, innovation and sustainability, at HP Technology Solutions Group. He leads the Industry Marketing team for the UK and Ireland and manages the "OneHP" Executive Relationship programme for the UK Board of Directors. His cross industry role also includes major industry topics such as the "Green Agenda" and membership of the HP Environmental Council. He is a virtual member of the HP Labs team and set up the "Business Lab" facility in HP Bristol.

Steve Bowden is Chief Technology Officer for Green Computing at IBM, with a remit to promote sustainable, cost-effective, energy-efficient IT across Northern Europe. Drawing on his 20 years' industry experience as a Senior Consultant for IBM, Steve combines sharp insight into the business challenges that drive IT with a deep understanding of the underlying technology. In the course of his work worldwide with companies of all sizes and across all industry verticals – from financial services to local government – Steve has tackled every aspect of the IT infrastructure, always with a clear focus on how to make it produce tangible business benefits.

Andreas Vogel held a variety of executive positions at SAP until he joined the company's research team. He started the Green 2.0 programme which focused on reviewing and refining economic models for CO2 footprint management with focus on consumer accountability, software solutions for tracking environmental parameters over the entire life span of goods and services and software solutions for measuring environmental parameters and their analysis, and for decision support.

Question: Many organisations are falling over themselves to implement the latest green fad – but what's the best strategy for a sustained, long-term, technology-driven approach?

IB: HP believes that the best strategy is to have a long-standing commitment to the environment, with a design for the environment programme that covers the whole product lifecycle from materials and design, to manufacturing and supply chain, to use and end of life. Applying design for the environment principles results in innovative products and solutions that are focused on helping customers achieve their own environmental goals.

HP's approach is to implement products and solutions on its own operations. For example, consolidating the HP data centre using the latest cooling and virtualisation technologies, and streamlining printing using managed print services.

SB: Green is an interesting phrase and means many different things to different people. Fundamentally green is about using finite resources in the most effective way possible and minimising impact on the environment. It's key to understanding the impact of everything we do, embedding it into the business processes of the organisation. Just branding a product green doesn't make much of an impact on the problem. Without taking this holistic approach it is unlikely that a sustainable and energy efficient strategy can be developed and maintained.

AV: First measure, then analyse and find the biggest pockets for improvement and ROI, only then implement it.

Question: Some industry onlookers estimate that data centres are taking up to 40 per cent of all IT spending. Do you believe the related green innovations are keeping pace with this investment?

IB: The data centre is an area where HP has seen substantial green innovation recently, reflecting the importance that customers place on energy efficiency in the data centre. Dynamic smart cooling solutions in data centres reduce the cost of cooling by 25-40 per cent, while reducing CO2 emissions by intelligently re-tuning the air conditioning output in response to server demand, thus supporting a higher operating temperature. Additionally, companies are seeking to address the ever-growing complexity and energy demands of their computing environments. By consolidating applications, hardware and virtualising the remaining systems, they provide a considerably more efficient set up. Combined with intelligent power distribution and efficient architectures such as Blade servers, energy and resource use can be further reduced.

HP has considerable experience implementing business consolidation solutions. HP Consolidation solutions simplify, standardise and reduce the number of data centres, infrastructure (including hardware, networking and storage) and applications that make up the technology environment. This provides efficient resource management to cut energy use, cost and emissions.

SB: Together with traditional drivers for IT innovation such as security, availability, resilience, etc, the demand for energy efficient solutions is increasing. Vendors are making claim and counter claim on the energy efficiency of their servers and everyone in the industry knows that virtualisation of servers in the data centre is a key part of the answer.

However, how the systems are being used plays a more important role than the absolute energy efficiency of a specific IT product. For example, an x86 server running at 5 per cent utilisation is not an efficient use of energy! 'Greenness' is a factor of the productive workload completed for the energy used.

Of course, if 40 per cent of energy use is in data centres for IT, then 60 per cent must be in non data centre use, the vast majority of which is in Desktop PC use. In this arena, where business demands permit, a focus on a Virtual Thin Client solution makes drastic cuts in energy consumption.

Question: Enterprise mobility – mobile and wireless IT – is crucial to a modern business, but how does it impact upon the environment?

IB: Increased mobility reduces hardware and the need to travel. Both of these can have a significant impact on the environment. Previously mobile and wireless IT on a business scale were a less-than-attractive option: deployment of mobile devices was challenging, the distribution of new applications and updates was complex, support for mobile devices was expensive and mobile devices can pose a significant security risk. However HP's Enterprise Mobility Suite tackles these issues making them a more attractive prospect for large business enterprises. Through implementing a more mobile IT solution, energy and resource use can be cut so a business can reduce its environmental footprint.

AV: In my opinion, rather marginal.

Question: SAAS (Software As A Service) is another term that is receiving a great deal of attention for potential green benefits; do you see it becoming mainstream over the next few years?

SB: The use of SAAS has already begun and the usage will increase over time, to meet peak requirements. Where highly utilised, energy efficient servers can be used to provide software service to a large number of users, hence sharing workload and negating the need for many under utilised individual servers. The use of shared services within companion industries will also serve to increase the use of the SAAS model and the associated benefits.

AV: I think the claim is questionable.

Question: Thin clients and hosted desktops solutions are both attracting attention because of their reported green benefits. Can you enlighten us a little more?

IB: Thin client desktops provide an efficient hardware solution connecting over a network to a server where all processing and storage takes place. There is little duplication of applications, hardware, and processing, thus using less energy and resource investment and making them a greener solution. Some of the biggest benefits of thin client solutions are seen in overall cost savings and increased productivity. According to Zona Research, thin client Total Cost of Ownership savings have been measured as high as 80 per cent less maintenance per year, 25 per cent capital cost savings, 34 per cent less in maintenance, 23 per cent less to operate and a 25 per cent productivity increase.

Hosted desktops share the base server operating system among many users, providing a high degree of sharing of system resources. Hardware and power investment can be reduced this way, and they are a low cost, secure, and centralised solution for the IT organization to manage.

Both thin clients and hosted desktops can create a more efficient network set up, with lower investments in energy and resources, thus providing a greener solution.

SB: When considering how energy is consumed in an office environment and the efficiency of how the energy is consumed, desk top devices such as PCs and laptops consume as much as

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220w, generate considerable heat and, in many cases, are left on overnight or over a weekend needlessly. Their manufacture will consist of a significant number of components and release of CO2 as well, yet we typically expect to replace these items every 2-3 years.

Compared to a thin client device which will consume typically less than 20w and requires significantly less components to manufacture, both the direct energy being consumed and the supporting infrastructure energy consumption can be significantly reduced. Together with the use of a fully utilised server(s) in the data centre there will be an overall decrease in energy used.

This highlights a key point, in that when changes like this are made, you need to review the net benefit of the change, in this case replacing PCs with thin clients has a saving, but you also need servers to run the application. It's like squeezing a balloon, it sometimes pops out somewhere else. In this case though, the Virtual Client solution can have a net benefit of saving 60-70 per cent of the energy costs and last considerably longer than the three-year life of a typical PC. This has a secondary benefit in not consuming more resources to build a PC.

AV: Laptops instead of desktops seem to be a good move: better power management, CPUs which are less power hungry, and users who tend to shut laptops down when not in use.

Question: Office technology (printers, imaging, photocopiers) have a massive environmental impact upon a company – what sort of green innovations excite you in this arena?

IB: Printing is one of HP's core businesses and we are very excited about our green innovations. We are making the products more efficient and using them in a more efficient way to help customers' reduce their environmental footprint.

HP's Managed Print Service allows customers' to use HP printing products in the most efficient way. HP provides the best most efficient technology, reduces paper use and creates elegant, consolidated business solutions. A managed print service was installed for a UK public sector customer. After installing multi function printers and print management software, energy costs were reduced by 75.1 per cent.

HP is helping lower total energy consumption of individual devices. HP LaserJet printers and new HP Inkjet printers automatically reduce power consumption after a designated period of inactivity, and most require no more than 1 watt of power in off mode. Instant-on Technology in HP LaserJet devices, provides up to 50 per cent energy savings over traditional fusing. These innovations have led to many Blue Angel and Energy Star qualified products.

HP has developed the technology to use post-consumer recycled plastics in the production of new Original HP inkjet print cartridges. In addition to closing the design loop, using recycled content saves energy and keeps plastic out of landfills. The amount of recycled content in these HP inkjet cartridges may vary between 70 to 100 percent of the total plastic used, but the reliability results for each product are stringently tested and consistent across the line-up.

SB: For me, the most exciting and challenging aspect is changing individual behaviour. Technology can be an enabler to not just use energy but to save it too. Changing the way we work and the way we behave, is to me the most interesting change ahead of us.

AV: Electronic paper.

Question: Some will say that when it comes to thin clients and hosted applications, we've been here before. What's the difference this time and what are their specific environmental benefits?

IB: It is certainly true that the opportunity for ecological savings in a client virtualisation environment is largely untapped – IDC has reported that only one per cent of desktop environments are truly virtualised.

HP has concentrated development efforts on providing customers with the solutions for the inhibitors which have constrained deployment of virtualised client solutions.

HP's Client Virtualisation solutions address the five customer challenges of manageability, security, flexibility and adaptability, disaster tolerance and predictability of ROI. Client virtualisation solutions address manageability by simplifying software and hardware management and maximising resource utilisation. Sensitive data is secure in the data centre and helps companies meet regulatory compliance requirements and security concerns. By removing the requirement to be tied to a single computing paradigm or physical workplace, flexibility and adaptability is increased. Anytime/anywhere access of applications and data allows convenient business continuity and disaster recovery. Virtualisation solutions enable customers to accurately predict the potential savings of a virtualised environment and pinpoint how savings can be garnered for re-investment for a competitive advantage

HP believes that addressing these inhibitors by providing affordable software solutions will increase the take-up of Client Virtualisation solutions in 2008 and 2009.

SB: The proliferation of distributed computing systems was driven by businesses requiring individual applications to suit their business needs with little concern over the energy footprint. With the increasing need to be efficient in the use of energy, the Virtual Client approach really adds the ability to virtualise users on servers and drive a much more efficient utilisation of resources than the older implementations and, of course, with recent large rises in energy cost, a solution that saves money and the planet is something that is of increasing interest to businesses.

Environmentally there are two main savings; firstly the reduced energy consumption, and secondly, the reduced need to replace or upgrade desktop systems every 2-3 years as new software technology demands more performance.

AV: Not much.

Question: It seems that at last, the manufacture of IT equipment is being boosted by the use of recyclable materials and recycling schemes. Have we come far enough, or would you like to see yet another push in this arena?

IB: Through its Design for Environment programme HP is looking for innovation in the use of recycled materials that deliver the same uncompromising quality and reliability customers count on from HP.

HP has developed an engineering breakthrough that enables the use of post-

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consumer recycled plastics in the production of new Original HP inkjet print cartridges. In addition to closing the design loop, using recycled content saves energy and keeps plastic out of landfills. More than 200 million cartridges have been manufactured using the process thus far. HP used more than 5 million pounds (2,267,961 kilograms) of recycled plastic in its inkjet cartridges last year, and the company is committed to using twice as much in 2008.

The company's innovative recycling process facilitates the combination of multiple sources and grades of recycled plastics – from everyday water bottles to highly technical HP inkjet cartridges. In addition to closing the design loop, using recycled content saves energy and keeps plastic out of landfills.

SB: I think there are always ways we can look to technology to help us solve the challenge and that means looking to constantly improve our use of recycled and recyclable elements in every product, whether it's from an IT vendor or not. Looking for upgradeable products which can have extended lifecycles is something consumers can do to ensure they are optimising their benefit from the carbon and energy consumed. Our asset recovery service already recycles or reuses more than 99 per cent of the equipment returned to us, with less than 1 per cent being put into landfill.

AV: A lot of room for improvement.

Question: Even the most efficient of products can be run inefficiently – does a challenge still exist to educate end-users as to the best way to run your products?

IB: At HP we have invested in the tools to help guide our customers on how to optimise their investments and to drive better utilisation of the desktop equipment. Examples include power management tools to optimise power utilisation, security tools to ensure protection of data and to ensure isolation from disasters and performance tuning tools to drive best exploitation of the resources to enable better user productivity.

SB: We absolutely agree that companies need to look at their environmental impact and strive to meet environmental management standards like ISO14001. IBM started its environmental work in the 1970s and met this ISO14001 milestone globally in 1997, so we've been on this road for a long time. Even today employees are encouraged to look for new ways to improve our environmental sensitivity further. Recently we've designed new reusable shipping pallets to reduce weight when shipping systems and a whole new data centre in Switzerland that recycles the generated heat to warm the water in a local swimming pool.

We would agree that the way a system is used is the single most important factor in how energy efficient an IT system will be. Take for example the IBM System z ™, it has a design point of 100 per cent utilisation which is achieved through the use of long established virtualisation technology. Customers using these systems will typically do so at nearer 100 per cent, whereas a x86 server will typically operate at only 5 – 10 per cent utilisation - particularly inefficient. With Virtualisation technology now mature from 40 years of development, it's really a case of overcoming those emotional concerns of having your own server.

AV: Yes, we have worked for years to streamline and optimise SAP landscapes, i.e. reducing the number of servers.

Question: Moving forward, what developments or technologies do you see taking over the next few years (with regard to green IT)?

IB: HP has set environmental goals for its products and expects green IT developments to take place across the business.

One exciting area is the formation in March 2008 of a Lab within HP's research and development labs focused on eco-sustainability. Current areas of development include the data centre, displays, manufacturing, chips, conferencing, and in nanotechnology. Computer displays account for between 30 and 50 per cent of a device's total energy consumption. They also require lots of manufacturing resources. The Eco Sustainability Lab is exploring a variety of approaches to reducing power use and creating better displays. Researchers have come up with an answer for mobile devices that not only reduces power usage but enhances usability as well, developing an energy-aware solution that dims parts of the screen not in use.

There are so many possibilities in the growth area of green IT, making research a very exciting field. New discoveries constantly open new channels of research, and the HP eco labs will continue to apply them as sustainability solutions for the future.

Additionally, HP has invested in secure remote collaboration tools (both group and personal) which remove the need for travel. Groups and individuals can collaborate on projects, and review project designs, in a secure and high-fidelity medium.

SB: IBM is constantly developing new technologies, for use in individual chip design, systems design, even technologies like water filtration. So we're constantly making improvements in energy use, but how a system is used has a greater bearing in the short term on its efficiency than the direct energy consumed by a server, so it's about how we use systems as well. In the near future, expect to see more use of liquid cooling technologies within a server and data centre, lower energy consumption components and the design of a system to make highly efficient use of air flow throughout.

AV: Measurement, aggregation, analytics and optimisation of environmental data.

Question: Teleworking is being implemented by many organisations and the environmental benefits of reduced travel are clear. What are the primary enablers that allow this to become a seamless transition?

IB: HP can provide all the elements necessary to execute successful teleworking programmes. We provide teleworking solutions for many departments of the US government, saving energy in transportation and increasing morale. Security solutions help protect notebooks, data, and network connections including HP ProtectTools, HP Biometric Fingerprint Sensor, and the HP Privacy Filter. HP notebooks are robustly built, and there is software that lets the customer manage entire computer populations from a single point of control, providing enforcement of computer and data security policies. If a computer is compromised, it is possible to recover the device or remotely delete its data. Increased security of data and device management in remote worker situations make teleworking a viable option for many

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more organisations This can enable them to reduce their environmental impact.

SB: Good people management practices. This is not just a technology issue as there are proven networking products that enable individuals to work effectively whilst away from an office location, both thin client and PC. However, the enterprise embarking on a distributed workforce must have the management policies and processes to ensure it is a success and that its staff and business benefit from the change. IBM has had a large proportion of its staff working remotely for many years now, very successfully, and the right management skills were critical.

AV: Organisational set-up, change of culture, appropriate equipment.

Question: Virtualisation is transforming the data centre – will it do the same for the Desktop?

IB: 2008 is going to be the year when Client Virtualisation will drive the transformation of the office environment. Client Virtualisation will enable the user to enjoy the same high-fidelity, high-performance experience in a virtualised solution as in a fixed desktop solution. Client Virtualisation decouples the user from the fixed work environment, enables greater mobility and greater user productivity, while at the same time provides the enterprise with centralised manageability of user services, greater security, better adaptability, better disaster tolerance, and reduction of total costs over the lifetime of IT.

According to IDC, only 1 per cent of desktop environments have been virtualised, but this is poised for rapid change thanks to new Client Virtualisation solutions from HP.

SB: Many companies are now asking why do users need more than one device and for the work they do, do they even need a PC? In most cases the extra features and functions of a PC, as opposed to a thin client, can add complexity and cost to supporting them.

There will continue to be the need for some individuals to have the ability to use computing devices, laptops and PCs whilst way from the office. However, in general, office-based staff should expect to see the increasing use of thin clients and reduced number of devices per employee.

Question: Environmental Accounting is a hot topic at the moment – is this a sector you identify with? In what respect?

IB: Environmental Accounting presents a challenge to many customers. They know that opportunities for savings exist, but they don't have the tools to predict the savings and garner them. This is a "show me the money" challenge.

HP has responded to this challenge by developing the Client Virtualisation ROI Tool. The ROI tool enables customers to predict the savings opportunities in transitioning to a virtualised client environment. These opportunities include power and cooling savings, floor space and furniture savings, manageability and disaster tolerance savings, and can even estimate the user productivity benefits from operating in a virtualised environment.

HP's Client Virtualisation ROI Tool will guide customers to the savings opportunities and will help pinpoint their location so that they can be collected for re-utilisation as a competitive advantage elsewhere.

AV: Yes. SAP are building the software for it.

Question: Efficiency – be it via smart asset management or the lengthening of product life cycles – is being targeted across many organisations. Is the message getting through to the sector at large?

IB: Efficiency can help any level of organisation, from a domestic network to the data centres of multinationals, reduce their environmental impact. Through reduction of operations costs and resource consumption, efficiency solutions can benefit businesses in financial and productivity terms, and have positive implications for the environment.

Efficiency, through intelligent use of assets, is crucial in moving forward as a sustainable company. HP provides a number of services, particularly management solutions, to help in this area. Through consolidation of assets and virtualisation it is possible to reduce the energy costs, resource use and as such cut the environmental impact of a companies' IT.

Virtualisation takes IT out of physical boxes, through shared resources such as memory, processors and applications. With the high power consumption of corporate data centres, this technology could revolutionise the industry. The architecture and technology, such as blade servers, in these environments along with dynamic smart cooling and intelligent power distribution, make a centrally shared 'super data centre' an exciting prospect.

SB: Through a variety of methods the need to have a greater emphasis on sustainable computing is reaching a broader audience, especially with the rising energy costs in the UK. I'm sure there will be a greater acceptance and urgency to take action when legislation is introduced that will place a financial burden on CO2 emissions together with the increasing cost of energy. This clarity is key, so that businesses know the environment they are to work in.

AV: It's starting to. It depends very much of the class of asset.

Question: Do you believe that enough attention is being given to policy issues? i.e. what companies will need to do to comply with future regulations?

IB: There are already regulatory policies in the pipeline to improve the eco-design of energy using products, such as IT devices. These will certainly minimise the impact of technology products on the environment and establish a common performance level among manufacturers. More interestingly, the European Commission will soon launch a consultation package exploring the benefits of Information Technology as an enabler of climate change solutions. It is increasingly recognised that there needs to be a shift in investment from carbon intensive processes to a low carbon economy, and IT can play a big role that shift.

SB: Both the UK Government and EU will continue to introduce legislation and regulation that will affect how CO2 emissions are managed by business. That is certain. It would be wrong for me to comment on future, as yet unknown, legislation. What I believe is right for business though is that it's clear and consistent, so that it provides a stable business environment for all companies.

AV: I think the US government doesn't give enough attention to this topic. ■