

Data centre asset planning Regaining control of the data centre

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After years of uncontrolled growth, many data centres face a crisis as they run into space and power constraints. While remedies exist, present business practices do not encourage the prioritisation of power reduction within one of the most power hungry areas of a business—the data centre

- **Operational issues have data centres at a breaking point**
The server sprawl that has been taking place for years is still continuing in a lot of companies, putting pressure on data centre managers who have to manage increasing numbers of servers with restricted budgets; the IT budgets of 87% of respondents are not growing in real terms.
- **Data centre management is suffering**
Under these pressures, data centre management is not as tight as it could be; 28% do not know the exact number of servers they have and 22% said it could take up to a day to find a server that had gone down, and another 20% taking longer than a day. In addition, space and power constraints are beginning to hit; 11% of data centres will run out of space this year, while 14% have already hit a power supply limit.
- **Organisational and human issues contribute to the problem**
Human factors, such as a lack of communication between different groups, contribute to the crisis. Groups such as facilities, commissioning, infrastructure etc. need to work together if the organisation is going to achieve common goals such as saving power. Organisational barriers also exist—less than one in five data centre decision makers have financial responsibility for data centre power consumption, and 55% are not even aware of what the power cost are.
- **Company executives need to act**
Companies need to ensure that corporate goals, such as carbon footprint reduction, are communicated to all employees and are passed on to power hungry areas of the business such as the data centre. In addition, the charging structure for power needs to be changed to incentivise the data centre to reduce power consumption.
- **IT management needs to invest in technologies that save power**
Power-saving approaches, including virtualisation and automation, exist in abundance but they require up-front investment before the savings can be realised. If data centres had to pay for their electricity consumption (and passed it on to the business through chargeback) it would be relatively easy to make a business case for these investments.
- **Data centre managers need to be given the proper tools to manage their domain**
Data centre managers need all the help they can get with managing the complex environments that exist today. They need to have a clear view of their entire server portfolio—mainframes, towers, racks and blades—as well as storage, networking gear, universal power supplies (UPS) and power distribution systems. They also need insight into the cooling capacity, electrical supply and floor space availability of the data centre. Good asset planning tools help take the guesswork out of managing IT assets and help with planning the future growth of the data centre in a controlled and optimised way. They need to be able to accurately predict when the data centre will run out of resources, whether that is space, electricity or cooling.

RESEARCH NOTE:

The information presented in this report was derived from 301 interviews with senior IT influencers and decision makers completed in November and December 2007 in the US, the UK and other European countries.

Respondents were from a mixture of large multinationals and medium to large national organisations, from across a broad cross section of industry sectors.

Quocirca would like to thank all the respondents to the survey for their kind help.

Conclusions

All parts of the organisation—from the board and executives through the IT Director and data centre manager to data centre operators—have a part to play in regaining full control of the power and real estate costs that are beginning to run out of control. With power costs rising sharply and increased public and corporate focus on environmental issues, such as carbon footprint, the techniques exist to tackle power inefficiencies in the data centre—it is more a question of if the will exists. The underpinning for all this is asset management tools that maintain good visibility and control of the data centre and all its assets.



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Introduction

After years of alternating decentralisation and recentralisation of information technology (IT) budgets and control, IT equipment has ended up spread all over the place in many organisations. Today, there is growing acceptance from IT and business management alike that, if they can be located there, the data centre is logically the best place for IT resources. Not only can they be better controlled and managed but the powering and cooling of IT equipment can be done more efficiently in a data centre than in an uncontrolled office environment. Centralising equipment also offers the opportunity to consolidate and rationalise; replacing multiple out of date servers with fewer, newer machines that require less power can result in big savings on maintenance.

However, all the good things that come from pulling equipment back into the centre are predicated on one assumption—that it is a well managed environment. If the office is the wild frontier of IT, then the data centre has to be one of the genteel cities back East where folk speak properly and mind their manners. However, all the evidence is that, typically, data centre management is haphazard—more like Dodge City than Boston or Baltimore. With the focus (quite properly) being on responsiveness to the business, there is a danger that IT organisations may lose sight of the future of their data centre. As each business unit gets to decide what applications it wants to implement, IT departments dutifully keep buying hardware for the new applications until eventually the data centre fills up or hits power supply problems. It is not unusual for large companies to have thousands of servers in several centres, each server being utilised on average at 10% to 20% capacity.

The aim of this report is to highlight the issues regarding data centre asset planning, including managing complexity in the data centre; how companies are dealing with space and power constraints; and the organisational and cultural barriers to the adoption of good practice regarding power saving and green issues. It also takes a look at some of the measures that companies are implementing to save energy in the data centre. As a background to this, interviews were conducted with people responsible for, or who have active involvement in, data centre management at 301 companies across the US, the UK, Germany, France and the Benelux countries (see APPENDIX A).

The report should be of value to business and IT managers who want to make better use of their data centres to drive business benefits, and yet, at the same time, improve energy efficiency and reduce their carbon footprint.

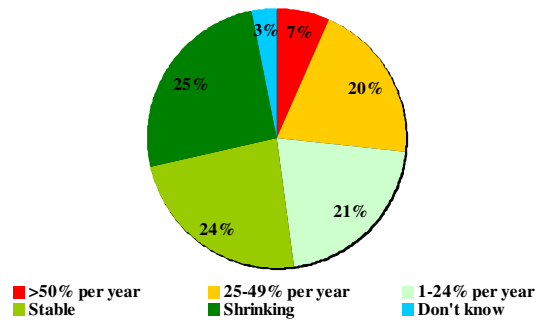
IT at a breaking point?

The old adage “The only constant is change” holds true for today’s data centre. As they respond continuously to business needs, stability is a luxury enjoyed by very few data centre managers.

Server sprawl is a well documented, if undesirable, aspect of the distributed computing revolution that has taken place since the early 1990s, yet it is one that data centres are still grappling with. Although a quarter of organisations are managing to shrink their server portfolio through consolidation, almost a half reported that server numbers are still growing, and for a significant number it is growing by more than 50% per year (Figure 1). This is more likely to be due to the management of the data centre being out of control rather than due to growth in their server load.

Figure 1

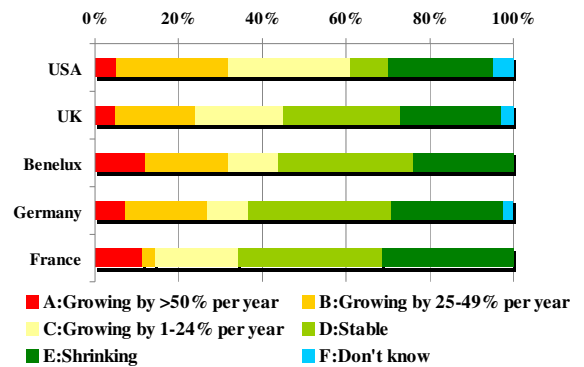
Is the number of servers under your control growing or shrinking?



This is even more marked in the US, where more than 60% of companies are experiencing server growth and only 9% have a stable server portfolio (Figure 2). However, France and Benelux reported the largest number of companies struggling with uncontrolled growth—over 10% of respondents here see growth of over 50% per annum.

Figure 2

Server growth by country

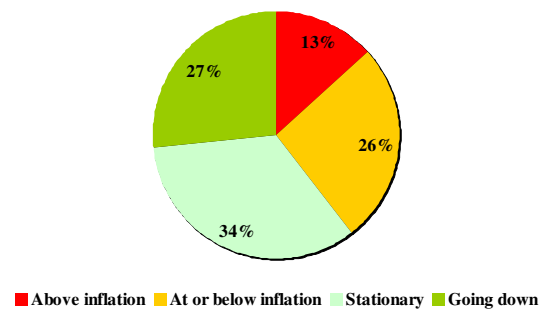


This shows that there are still a significant number of businesses that are failing to realise the benefits of virtualisation by consolidating multiple applications and operating systems on Intel-based servers.

At the same time as they are handling this growth, data centres are under the almost perennial pressure to deliver more for less. 87% of budgets are restricted in some way—either shrinking, stationary or not keeping pace with inflation (Figure 3).

Figure 3

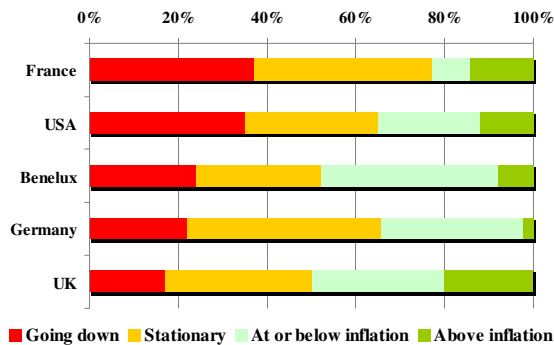
IT budget growth



The budgetary pressure appears greatest in France and, possibly as an early knee-jerk response to the current

economic meltdown in the USA, where over a third of data centres' budgets are shrinking (Figure 4).

Figure 4
IT budgets by country



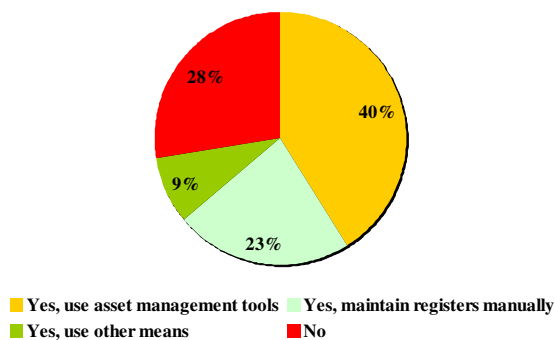
Typically, 75–80% of the IT budget is spent just on keeping the show on the road. Virtualisation and data centre automation can help to reduce this through consolidation and reduced labour costs. At the same time, they can increase agility by flexible use of resources and improve quality of service by means of automated, smarter responses to events, such as automatically moving business critical applications to another server in the event of a fault.

However, to get to this position requires up-front investment. Faced with the harsh reality of shrinking budgets, yet increased expectations, the instinctive reaction of tightening the already well-worn belt by yet another notch is the wrong one. Investing to save is a better way to do more with less.

A crisis of complexity

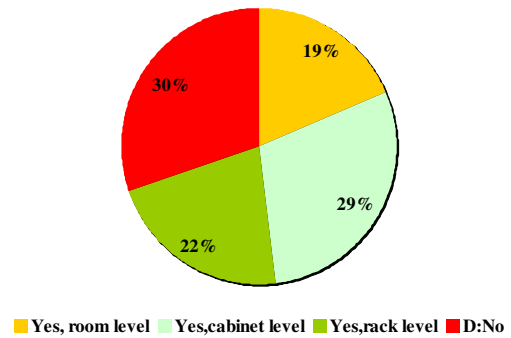
A fairly unsurprising result of the “throw another server at it” mindset is that once companies have a few hundred servers, it starts to become difficult even to count them, never mind keep track of them all. Well over a quarter of companies admitted to not knowing the exact number of servers under their control (Figure 5).

Figure 5
Do you know the exact number of servers under your control?



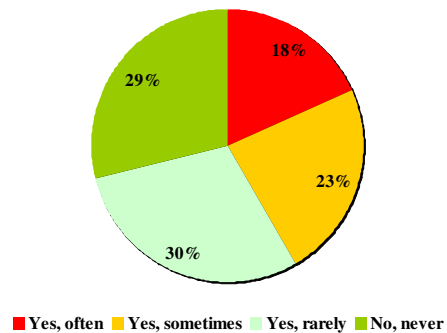
Only 40% of respondents have asset management tools, and thus are in a position to receive automated up-to-date asset reports. For the rest, it is no surprise that assets begin to get lost; almost a third admitted not being aware of all devices on their network, with a further 19% only knowing device location at room level (Figure 6).

Figure 6
Are you aware of all devices connected to your network?



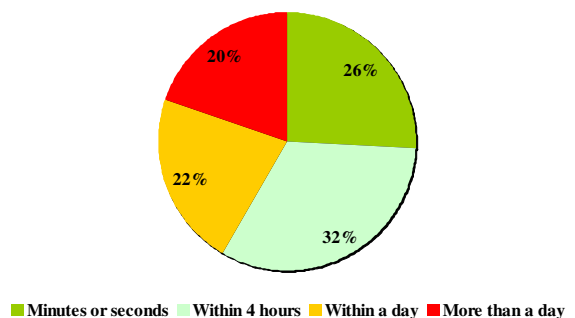
Perhaps an even more telling sign of the lack of control that is the legacy of data centre complexity is the extent to which companies have lost track of their server estate. Over 40% of companies have, at least sometimes, found a server they did not know they had, or looked for one without realising it had been retired; for 18% this was a common occurrence (Figure 7).

Figure 7
Have you ever “found” a server you did not know you had, or looked for a server only to find out it had been retired?



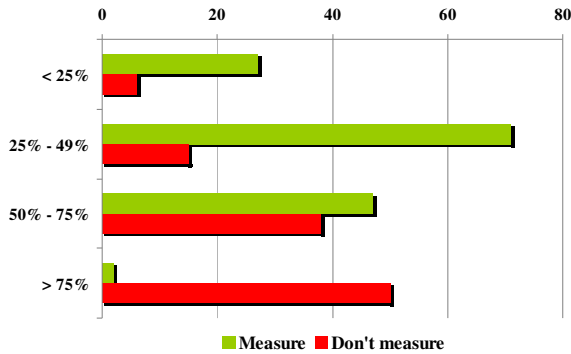
Although over a quarter expected to locate a server that had gone down within minutes, and a further third could do so within four hours, for a frightening 22% it could take up to a day and another 20% could take even longer (Figure 8). The impact of this on a business that is dependent on such a server could be massive—and the reputation of IT within the business will suffer further because it is seen as lacking the knowledge and ability to respond to the business’ needs.

Figure 8
How long could it take to find the location of a server that has gone down?



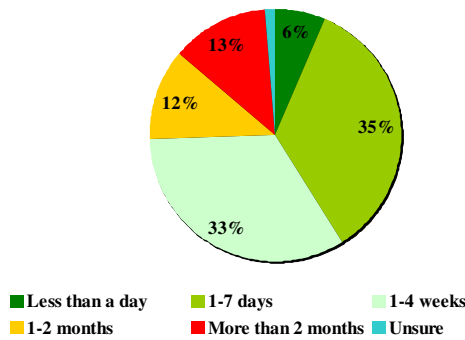
When it comes to monitoring the usage that they get out of their IT assets, only just over a half (53%) of respondents bothered to measure their server utilisation. Those who did not tended to be wildly over optimistic about their utilisation. Almost half thought their servers were over 75% utilised. They are almost certainly wrong, as the industry average figure is nearer to 10–15% (Figure 9).

Figure 9
Roughly what is the average percentage utilisation per server?



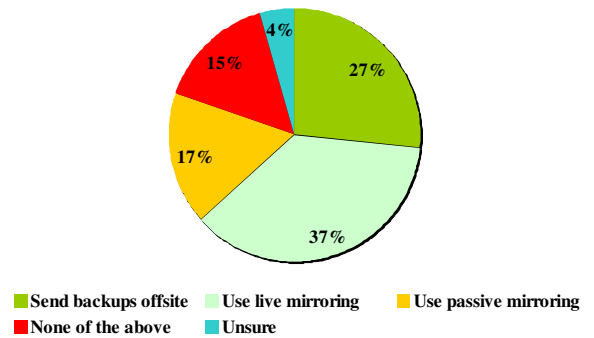
When it comes to providing a business with a workable application platform, one third of respondents said it could take up to four weeks to provision a server, with another quarter saying it could take two months or longer (Figure 10). Only 6% of respondents felt that they could respond to a requirement for a functional server in less than a day. This is in stark contrast to what is achievable with virtualisation; here, when the server—both operating system and software stack—is encapsulated in a single file, deployment time can be measured in minutes or hours, rather than days or weeks.

Figure 10
How long does it take to provision a physical server, from decision to commissioning?



When it came to disaster recovery plans, almost one in five companies either did not have one, or else did not know what it was—that means a lot of businesses are crossing their fingers and hoping for the best (Figure 11). The situation may actually be worse than these figures portray, as anecdotal evidence suggests that many companies with disaster recovery plans fail to test them regularly.

Figure 11
Disaster recovery plans



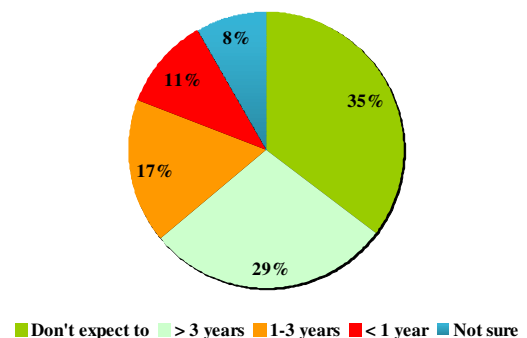
This all paints a picture that, rather than being the tightly run ship it should be, in many organisations the data centre is in a low-level crisis, with loose control of assets and best practise often falling through the cracks. As IT staff struggle to fix problems as they crop up, and with company executives concentrating on keeping up with competitors in an increasingly nimble global economy, it is likely that the long term strategic view of the data centre will be neglected. IT employees need their time freed from the more mundane maintenance tasks to focus on projects that can help the business achieve its goals; if this can be combined with budget saving and being more flexible, so much the better. There also needs to be a renewed executive focus on what, to many companies, is the powerhouse of their business.

Space and power constraints

Another unintended victim of server sprawl is the stressing of facilities; as the data centre fills up with boxes, both space and power can begin to run out. The consequences of hitting a facility's resource limit can be severe; placing restrictions on the ability of the business to be responsive to market forces and to grow. Building a new data centre in large metropolitan areas, where space and power are a premium, could cost tens of millions of pounds. Doing so may not even be possible in financial centres such as London and New York, where the local electrical grid infrastructure, originally designed to cope with normal domestic and commercial loads, is already under strain.

Space constraints are beginning to hit; 28% of companies expect to run out of data centre space within three years, including 11% of them that expect to this year (Figure 12). In the US, these figures were higher; 35% will run out of space in the next three years, and 14% will do so this year.

Figure 12
When will you run-out of data centre space?

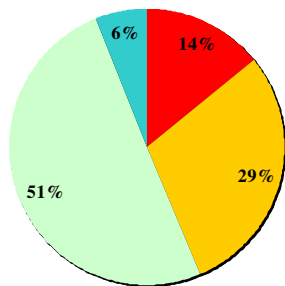


A worrying 8% did not have any idea when they will run out of space, indicating that organisations may not be giving this issue the attention it deserves. This brings forwards the idea of the \$100m server, where purchase of the next \$2,500 server requires a brand new data centre to be built to house it.

When it comes to power, things look no better. Approaching half (43%) of data centres are aware of an approaching power constraint, with 14% having already reached the limit (Figure 13). In the Benelux countries, nearly a quarter (24%) of companies have hit the power limit of their data centre, while nearly one in five (19%) US companies has.

Figure 13

Is your data centre power-constrained (i.e. you cannot get any more electricity into the building)?

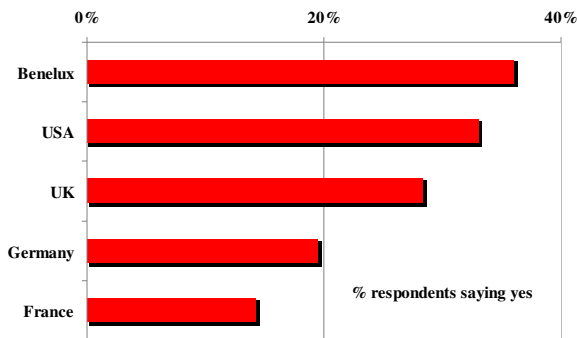


■ Yes, have hit limit ■ Yes, have not hit limit yet ■ No ■ Unsure

This was reinforced by the fact that over a quarter (28%) of companies have had a planning request for a data centre turned down due to a lack of power (Figure 14). Once again figures for Benelux and the USA were higher, reflecting shortages in generating and transmission capacity in some areas, such as parts of Belgium, California and New York.

Figure 14

Have you ever had a data centre planning request denied due to lack of available power?



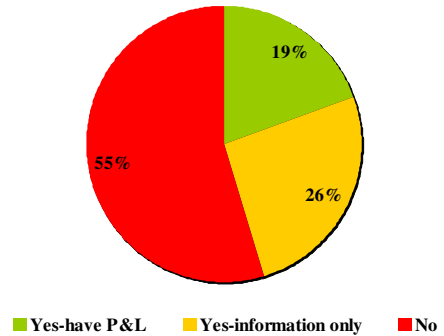
Saving power—organisational barriers and cultural attitudes

The growing requirement for data centre computer power, amid rising global power costs, is creating a pressing need for the industry to address energy efficiency. With the IT industry responsible for 2% of global CO₂ emissions—an amount equivalent to the aviation industry—companies are under a moral responsibility to maximise the energy efficiency of data centres to ensure that carbon emissions and energy consumption are minimised.

It is surprising then that, despite government initiatives to encourage reduction of energy use in data centres, and given the increasing attention being paid to energy costs and carbon footprint by boards, investors, and customers alike, less than one fifth of data centre decision makers reported that they have financial responsibility for data centre power consumption (Figure 15).

Figure 15

Do you receive the electricity bill for the data centre?



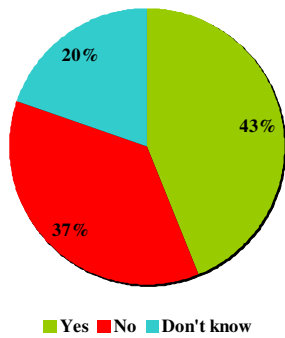
A common arrangement in many companies is for the facilities management department to divide the utility bill among departments based on a simple formula such as square footage of office space. This is an arrangement that heavily favours power-hungry data centre operations, and represents an organisational barrier to achieving power efficiency best practice in the data centre.

A lot can be done in the data centre to conserve electricity, from simple steps such as using variable speed motors in air handlers, to running equipment only when necessary, and sealing floor cut-outs and reducing lighting. Then there is hot aisle/cold aisle orientation, server virtualisation and consolidation, replacing old assets with new energy-efficient ones, and even retrofitting dedicated energy efficiency programmes or even designing new energy-efficient data centres. However, there is a lack of an incentive framework to take these steps. Since data centres do not have visibility into electricity outlay, power costs are not included in IT chargeback to the organisation. As a result, there is no real incentive for IT to reduce power consumption and also no pressure from the business to do so, as neither feels the pain of energy costs directly. If anything, the opposite is true—the current arrangement incentivises data centre decision makers to not take the steps necessary for saving energy as all of them require an investment but give no direct financial payback to the IT department. There may be other reasons to save energy—the data centre may be running out of power for example—but financial levers are generally the most effective way of achieving results in any situation.

While 44% of respondents say their organisation has a formal carbon footprint reduction policy (Figure 16), organisational barriers to power efficiency are also evident here because the research also showed that a third (35%) of these companies do not pass it on to IT as a formal objective. This is either a major oversight, as IT can be one of the major CO₂ producers in the organisation, or may be sign of a company merely paying lip service to environmental issues. That 20% of respondents do not know whether their organisation has a formal CO₂ policy points towards the latter being the case, otherwise they would ensure that at least a headline statement was propagated to all employees.

Figure 16

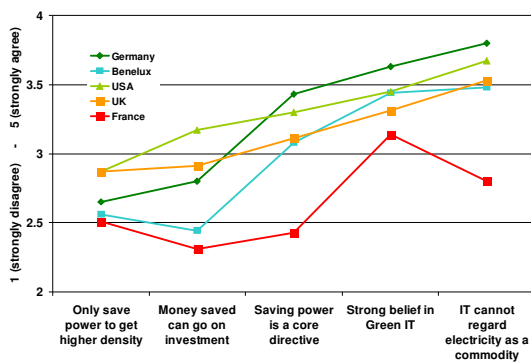
Does your company have a formal CO₂ footprint reduction policy?



The lack of an institutional framework to incentivise data centre efficiency means that action in this area is, to a large extent, dependent on corporate and personal attitudes. However, when questioned on these attitudes (Figure 17), what became evident was a failure to prioritise the reduction of power consumption, with 61% not seeing it as a key objective.

Figure 17

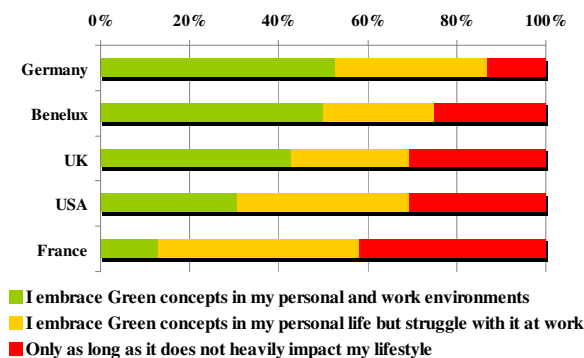
Views about saving electricity in the data centre



Some interesting cultural differences were revealed, reflecting differing national situations (Figure 18). Germany, which, together with the Benelux countries, came highest in green attitudes, has traditionally had a strong environmental lobby, whereas the US, although concerned with saving power, was more ambiguous when it came to green issues, reflecting perhaps attitudes that have their roots in an era of abundant low-price energy that the US enjoyed for so long.

Figure 18

What is your personal attitude to being green?



France was least concerned about saving electricity and green issues in general. With 79% of its power generated

Recommendations

There is a strong drive now to revisit the data centre. Uncontrolled growth of decentralised computer resource has led to unquantifiable costs when it comes to power and cooling, and this has to be reined back in. In order to manage this, Quocirca recommends the following:

- Company executives need to ensure that the data centre power costs are passed through to the IT organisation in order to ensure that the people who are best able to influence power usage are incentivised to act accordingly. Data centre power costs should, in turn, be included in calculations of chargeback to the business in order to accurately reflect the true cost of computing now that power is becoming a major component. Therefore, the CIO must ensure that they have visibility of the power costs of the corporate data centres, so that realistic targets can be set around power savings. This will have to be addressed where power bills are only seen by facilities management or by the purchasing department.
- If they have not already done so, IT and data centre managers need to establish a project to investigate the many benefits that virtualisation and automation could bring to the data centre, and how best to implement them in a strategic, rather than piecemeal, way. This does not necessarily mean that virtualisation has to be done as a one off, large infrastructural project, just that any virtualisation initiatives should be carried out with a long term aim in mind.
- Data centre managers need to ensure that they have the proper tools in place in order to control the physical assets of the data centre so that these complex environments do not get out of hand. This is especially important as virtualisation is introduced, as more virtual “eggs” are now in the one physical “basket”.
- Advanced heat management approaches will be needed to deal with the greater densities of server and network components caused by rationalisation, consolidation and virtualisation. Hot and cold aisles, spot cooling and natural air cooling (where applicable) should all be considered. Tools that can model this, using laminar and non-laminar flow models, are available and can ensure that suitable architectures are put in place.
- Further advanced approaches, such as outsourcing to shared data centres, or to data centres that are situated close to low cost power sources, are also valid where existing data centres are no longer capable of meeting the business’ needs.

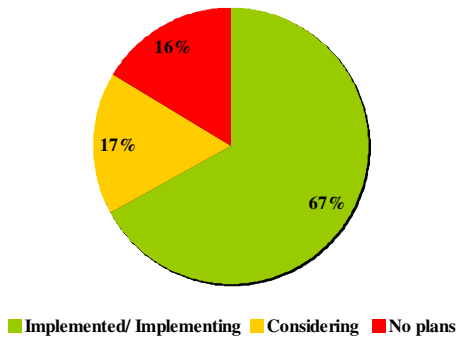
Overall, Quocirca recommends that organisations take the opportunity to create a data centre environment for the future. Here, external help may well be required to investigate and optimise various approaches to provide the best data centre for an organisation’s needs, but this could be an excellent investment when compared to the dangers of running out of space and/or power in an existing environment.

from nuclear energy, electricity costs are among the lowest in Europe, and carbon emissions per kWh are less than one tenth that of Germany and the UK. Nuclear power is generally well accepted in France, with 70% of the population expressing a “good opinion” of it in a recent poll, and is seen as clean even among some environmentalists.

Strategies to save energy in the data centre

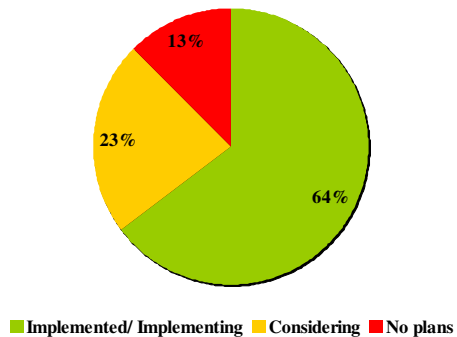
As discussed above, there are a number of things that companies can do to reduce power usage in the data centre, ranging from quick fixes to a more strategic approach. This research looked at the adoption of some of the different strategies that companies have at their disposal to reduce power consumption within the data centre. Topmost among these is server consolidation and virtualisation (Figure 19 and Figure 20).

Figure 19
Server consolidation



Rationalisation (the collapsing of numerous small servers into a larger system) used to be difficult to achieve except in a few cases, because the workloads being consolidated had to be very similar. That has changed with the advent of virtualisation. As each virtual server has its own operating system image, insulating it from others on the same machine, differing workloads can be consolidated onto one server without risk, and this has opened wide the door to server consolidation.

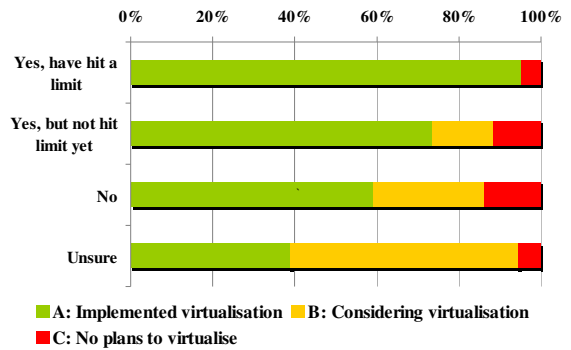
Figure 20
Server virtualisation



Virtualisation, as the de facto method for consolidation (86% of companies that have consolidated servers have implemented virtualisation), is almost certainly the biggest single step a company can take in saving both data centre space and power. For example, as part of its virtualisation strategy, UK telecoms group BT managed to reduce 700 racks of servers down to just 40, while at the same time

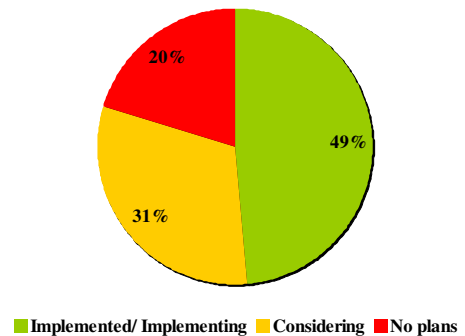
reducing power consumption from 2.1MW to 240kW (and that is just power to the equipment—it does not include savings in cooling and power distribution). This research also showed a strong (96%) alignment between virtualisation and being power-limited, demonstrating that companies are increasingly turning to virtualisation and consolidation to overcome data centre power constraints (Figure 21).

Figure 21
Correlation between virtualisation and being power-constrained



Blade servers are another way to consolidate and control large-scale computer complexes, offering savings in terms of valuable floor space and at the same time providing power efficiencies (Figure 22). Almost half the organisations were using blades and a further third were considering them, while 61% of the companies that had implemented virtualisation also implementing blades, with a further 21% considering this. This correlation is not surprising, as the two technologies tackle some of the same issues and, in many ways, are complementary.

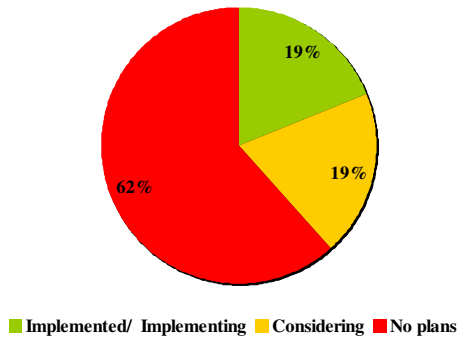
Figure 22
Blade computing



Among other approaches, 30% said that they were running their data centres hotter, with another third considering the same, while advanced cooling features such as hot aisle/cold aisle are being used by 29% (34% considering) and spot cooling by 34% (30% considering). The hi-tech & comms sector was ahead of the curve here, with 49% having implemented hot and cold aisles and 53% implementing spot cooling, while government & public sector were most likely to be running the data centre hotter (55% with 31% considering).

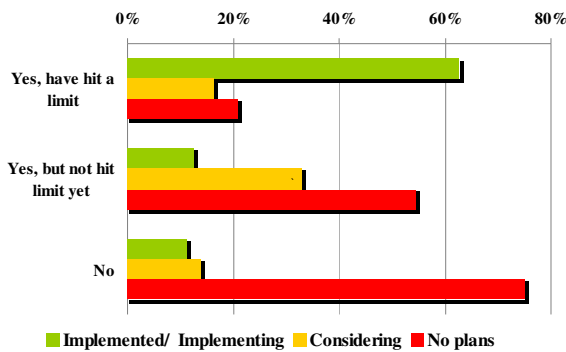
When it comes to the more radical step of moving their data centres either closer to an abundant power source or to a cheaper location, most companies were reluctant to consider these options, although, in both cases, approximately one in five said they had already done so or were in the process of doing so, and an equivalent number were considering it (Figure 23).

Figure 23
Moving data centre closer to a more abundant power supply



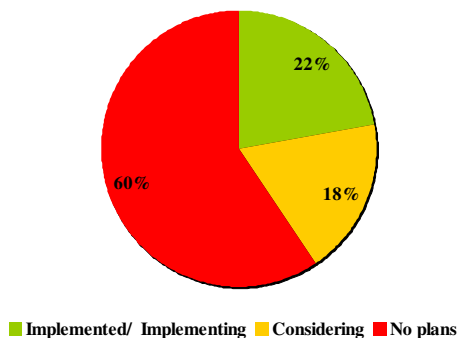
However, the appetite for relocating the data centre to a more abundant source of power was markedly higher among those companies that were experiencing power constraints (Figure 24).

Figure 24
Correlation between moving closer to a more abundant power supply and being power-constrained



Despite the benefits of lower land costs, cheap/abundant power, and possibly free air cooling (depending on climate), most companies still value local access to their data centres and are reluctant to consider remote locations (Figure 25).

Figure 25
Moving data centre to a cheaper location



Conclusions

Governments, company boards, investors, and customers have all begun to take an interest in the issue of power consumption and carbon footprints, and corporate data centres are significant power consumers. Most CEOs have their sights firmly fixed on business growth and expansion, but energy consumption and environmental concerns can take on a whole new meaning when a company’s reputation is at risk.

CIOs, who have to find ways to expand the capacity of the data operations so that the company’s ability to grow commercially is not impeded, are realising that environmental concern and business success can go hand in hand. A green, or environmentally friendly, data centre may actually be one of the best ways to both accommodate growth and make a positive impact on their business’s bottom line. IT could then be in a position to help the business with reducing overall carbon emissions, for example by offering green alternatives to travel, through web or teleconferencing.

Data centre managers need to have a clear view of their entire portfolio, from mainframes down to blades, without which good management is impossible and risks are multiplied. Today’s data centres are becoming so complex, that every decision—such as where to place the next server—affects the entire system. The delicate balance between power and cooling capacity, electrical supply, energy efficiency and overall system availability could easily be thrown off by one single misinformed change. This is far too risky to leave to chance or intuition, and is where good asset planning tools come in to take the guesswork out of managing IT assets. Not only should they be able to take a snapshot of the current situation and optimise it, but also incorporate trend analysis to help with planning future growth of the data centre in a controlled and optimised way. Above all, they need to be able to give an accurate indication, well in advance, of when the data centre will run out of resources. With lead times just to get additional power feeds into the building taking up to 18 months in some metropolitan areas in the UK, knowing you have a problem by hitting it is going to be far too late.

Quocirca therefore believes that only through a thorough and rigorous approach to data centre design and utilisation can the IT function regain full control of power and real estate costs that are beginning to run out of control. With power costs having risen sharply over the last 12 months and showing signs of rising further, rationalisation and consolidation, combined with advanced approaches to server architectures and data centre cooling, will provide the way forward. This all should be underpinned by tools or techniques that maintain good visibility and control of the data centre and all its assets.

APPENDIX A

Sample interview distribution

The information presented in this report was derived from 301 interviews with senior IT personnel responsible for, or who have active involvement in data centre management completed in November and December 2007.

Distribution of the sample by geography, industry, job title and company size was as follows:

Figure 26

Respondents by country¹

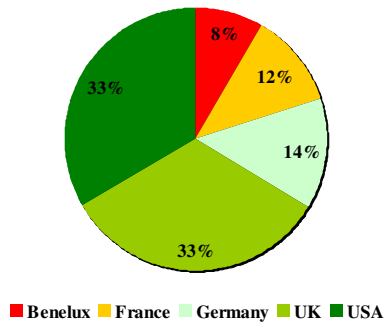
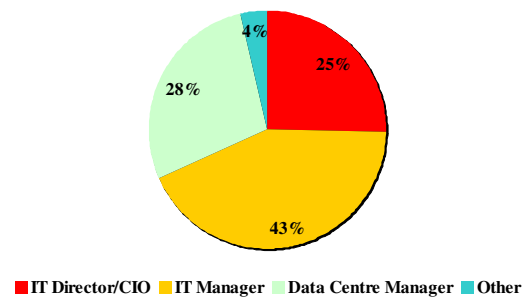


Figure 28

Respondents by job title



¹

Figure 27

Respondents by industry

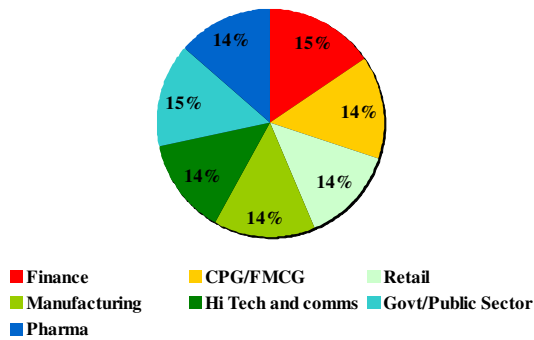
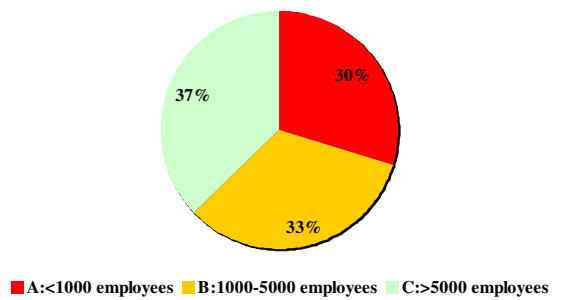


Figure 29

Respondents by company size



¹ Benelux is Belgium, Netherlands and Luxembourg

About Global DataCenter Management Limited (GDCM)

About Global DataCenter Management Limited (GDCM)

Global DataCenter Management (GDCM) was founded in 2003 with the aim of allowing organisations to increase efficiency and reduce cost within data centers - as well as to reducing power consumption and addressing environmental obligations. Today, GDCM provides data center software designed to help data center managers make the most of their IT investments while minimising complexity and costs. GDCM's flagship product, nlyte, is the only data center management tool to provide an intelligent and automated view of all physical and virtual assets and workgroups within the data center.

About nlyte

GDCM's nlyte system is the only comprehensive automated and intelligent data center management solution. nlyte is a sophisticated environmental and strategic management system, with reporting and business intelligence functionality, that determines how infrastructure and IT assets combine to create both the physical and virtual data center. End-to-end mapping provides a complete view across the infrastructure, from power and cooling, to virtual domains, hosts and business applications.

nlyte has been designed specifically to provide a second generation data center management solution. Second generation functionality focuses on automation and optimisation of elements such as heat, cooling, power and space as well as extensively mapping relationships. nlyte also has a centralised configuration management application that is designed to integrate with existing datacenter equipment and centralise disparate systems in one application.

nlyte uses a cutting-edge web-based application to provide an attractive and intuitive interface for all users. The system has been designed to enable powerful processes to be achieved quickly and easily. Wherever possible, steps have been automated to reduce user workload and inbuilt software rules maintain data accuracy and enforce data center best practice.

Intelligence and logic is built into nlyte to provide assistance similar to an experienced datacenter management professional on hand, highlighting areas or operations that could lead to issues, either now or in the future.

Main features

nlyte has the ability to model your existing data center assets as well as performing "What-if" analysis, Visualise your complete data center environment from Enterprise down to individual components, and optimise interdepartmental co-operation through an embedded Workflow engine.

<http://www.gdcm.com/>

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About Quocirca

Quocirca is a primary research and analysis company specialising in the business impact of information technology and communications (ITC). With world-wide, native language reach, Quocirca provides in-depth insights into the views of buyers and influencers in large, mid-sized and small organisations. Its analyst team is made up of real-world practitioners with first hand experience of ITC delivery who continuously research and track the industry in the following key areas:

- Business process evolution and enablement
- Enterprise solutions and integration
- Business intelligence and reporting
- Communications, collaboration and mobility
- Infrastructure and IT systems management
- Systems security and end-point management
- Utility computing and delivery of IT as a service
- IT delivery channels and practices
- IT investment activity, behaviour and planning
- Public sector technology adoption and issues
- Integrated print management

Through researching perceptions, Quocirca uncovers the real hurdles to technology adoption—the personal and political aspects of an organisation’s environment and the pressures of the need for demonstrable business value in any implementation. This capability to uncover and report back on the end-user perceptions in the market enables Quocirca to advise on the realities of technology adoption, not the promises.

Quocirca research is always pragmatic, business orientated and conducted in the context of the bigger picture. ITC has the ability to transform businesses and the processes that drive them, but often fails to do so. Quocirca’s mission is to help organisations improve their success rate in process enablement through better levels of understanding and the adoption of the correct technologies at the correct time.

Quocirca has a pro-active primary research programme, regularly surveying users, purchasers and resellers of ITC products and services on emerging, evolving and maturing technologies. Over time, Quocirca has built a picture of long term investment trends, providing invaluable information for the whole of the ITC community.

Quocirca works with global and local providers of ITC products and services to help them deliver on the promise that ITC holds for business. Quocirca’s clients include Oracle, Microsoft, IBM, Dell, T-Mobile, Vodafone, EMC, Symantec and Cisco, along with other large and medium sized vendors, service providers and more specialist firms.

Sponsorship of specific studies by such organisations allows much of Quocirca’s research to be placed into the public domain at no cost. Quocirca’s reach is great—through a network of media partners, Quocirca publishes its research to a possible audience measured in the millions.

Quocirca’s independent culture and the real-world experience of Quocirca’s analysts ensure that our research and analysis is always objective, accurate, actionable and challenging.

Quocirca reports are freely available to everyone and may be requested via www.quocirca.com.

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