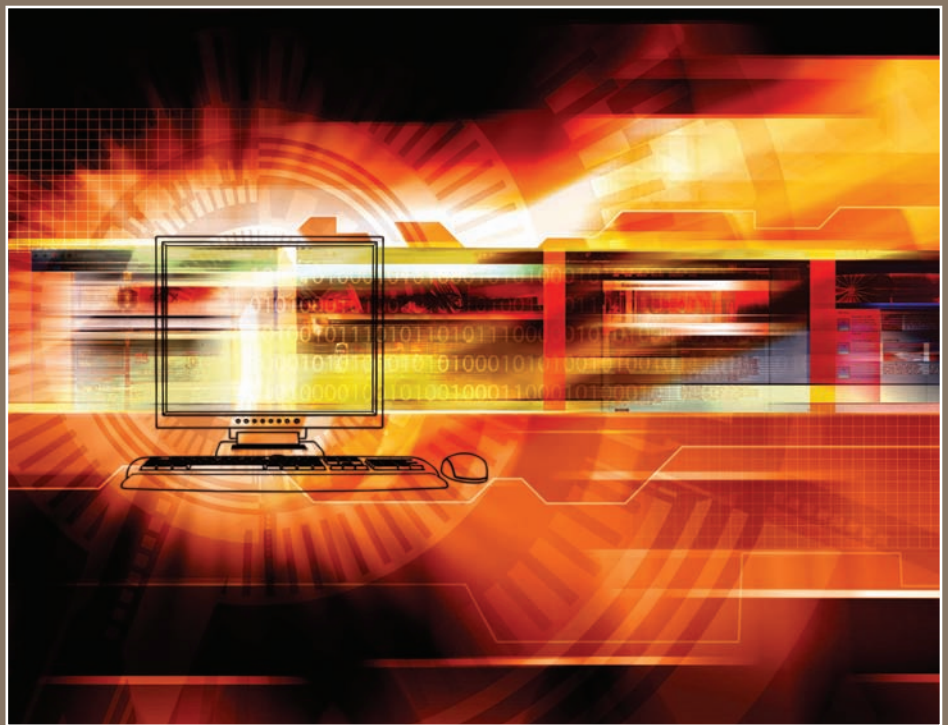


# RESEARCH REPORT

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## Virtual encounters

The challenges of deploying IT virtualisation

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# Driven to abstraction

**Server virtualisation is the hottest technology in the IT sector. But as it has proliferated, complexity is getting in the way of ROI**

Server virtualisation is facing its first real test of maturity. After the initial wave of euphoria and 'quick-wins', the rapid and widespread application of the technology – especially on x86 platforms – is presenting a whole new set of challenges.

None of those have yet dampened the enthusiasm for the core facility to run multiple, independent virtual machines on distinct physical servers. As the research in this report underscores, adoption of server virtualisation is generating major benefits:

- More efficient use of existing hardware resources resulting in decreased hardware spend.
- Reduced footprint and energy consumption as a result of consolidation, resulting in lower data centre costs.
- Greater business flexibility through the rapid provisioning of systems – freed from the hassle of purchasing and setting up physical servers, users say they can bring a new 'machine' on stream in less than half an hour.
- Higher availability as the result of the ability to create test environments within the same box and to freely move application workloads from one 'machine' to another
- Lower systems management overheads due to the increased number of servers each administrator can handle, with some claiming they can manage four to five times more virtual servers than physical servers.

Those benefits are well appreciated by IT management (and, increasingly, by business management too) and are fuelling "incredibly rapid" adoption of server virtualisation, say analysts at IDC. According to research by the industry-watcher, over half of all servers (both physical and virtual) deployed in 2008 will be virtual machines; that will be up from 35% in 2007.

However, that proliferation is not without its challenges, as the respondents to this *Information Age* research on virtualisation highlights. Based on a survey undertaken in conjunction with Computacenter and Sun Microsystems, it shows that organisations are encountering some tricky issues:

**Mixed environments** They are dealing with the task of monitoring and managing both physical and virtual environments. Only in recent months have systems management software vendors started to roll out tools that handle both dimensions.

**Software licences** The ease with which new servers can be created means that organisations are struggling to keep track of software deployment – and their associated licence commitments.

**Performance** They are encountering performance issues when moving applications to virtual servers – issues that were not evident when running the same application on a dedicated physical server.

**Multi-platform** They are looking at the wider application of server virtualisation

to handle more mission-critical applications, many of which run on Unix servers. That is creating demand for co-existence of Unix/x86 virtualisation.

**Political barriers** They are coming up against political barriers from 'server-hugging' departments, keen to maintain their ownership of a physical server.

**Migration** They are hitting problems when migrating between existing and virtualised environments.

**Back-up** They are finding back-up considerably more complex as a result of dealing with potentially thousands of more server images.

Without doubt, that 'virtual sprawl' needs to be taken under control. As Gartner analyst Cameron Haight recognises, the movement to virtualisation technology is showing its downsides and trade-offs.

"Few IT organisations have accurately accounted for the benefits as well as the added costs of moving to a virtualised environment," he says. Haight recommends that virtualisation implementers need to take into consideration this increased complexity – and cost – when setting expectations for virtualisation among senior management.

Despite such challenges, server virtualisation has whetted many organisations' appetite for virtualising other parts of the IT infrastructure: desktop and storage virtualisation are the next targets, according to the feedback from *Information Age* readers.

As that might suggest, there seems to be an unshakeable faith that virtualisation technology will mature as rapidly as it is adopted. ①



# Virtual success factors

**Few technologies have proved as effective as virtualisation. But deployment is not without some significant challenges**

Not many technology adoption curves resemble that of server virtualisation. For 30 years, it was a low flat line, fed by sales of hypervisors for mainframes and high-end servers. But in the last few years, it has soared upwards as organisations have sought to virtualise their estates of industry-standard x86 servers.

That enthusiastic take-up is all too evident in *Information Age's* latest reader research into the virtualisation experience, undertaken in collaboration with Computacenter and Sun Microsystems. Almost 60% of the 273 IT decision makers surveyed have server virtualisation in place. Moreover, a third of those boast that their virtualisation environments are "stable and mature".

But there is more to come: the largest single group in the assessment of adoption were new converts –

29% said they were in the planning/testing stage. Indeed, only one in five said they were not actually considering server virtualisation.

## VIRTUAL DRIVERS

The main business drivers behind that adoption are shared by most companies. IT costs, data centre space and energy, and business agility were all high on the agenda.

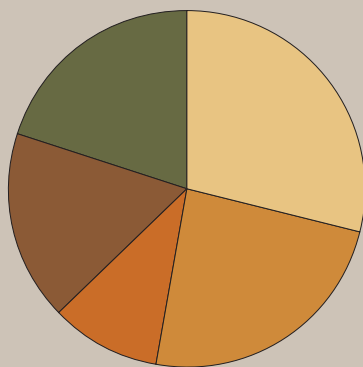
Just over half the sample identified "pressure to reduce costs" as a key reason for embracing virtualisation, and almost the same proportion identified the "need to cut footprint/energy consumption" and "demand for greater business agility".

While those were the key themes, there were plenty of other drivers: demand for greater availability and ensured business continuity; the need to reduce systems management overhead; and the ease with which testing environments can be created.

Increasingly, server virtualisation is now also being trusted for more demanding workloads. While many early implementations involved non-mission critical applications, those concerns are softening. Over

### ADOPTION

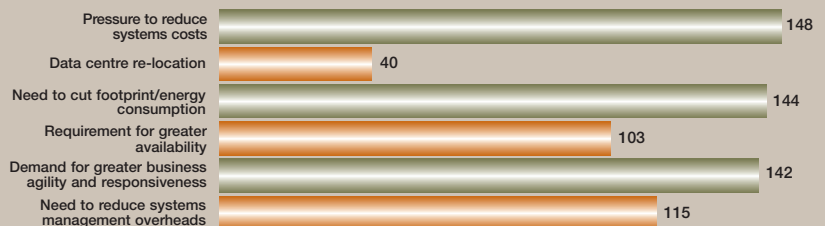
To what extent has your organisation adopted server virtualisation?



- Planning/testing stage (29%)
- Adoption underway on multiple platforms (24%)
- Implementation complete on multiple platforms (10%)
- Virtualisation environment is stable and mature (17%)
- Not considering virtualisation (20%)

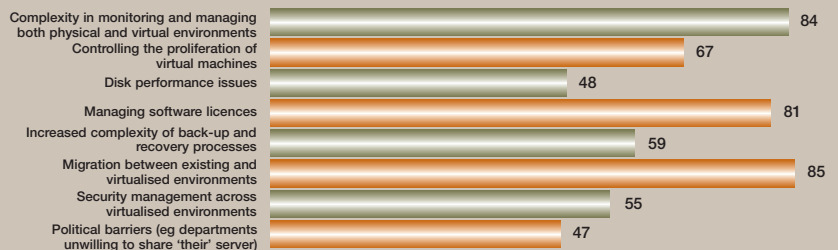
### BUSINESS DRIVERS

What business drivers are influencing the adoption of virtualisation within your organisation?



### CHALLENGES

What challenges has your organisation encountered when deploying and running virtualised environments?



two-thirds (68%) have applied the technology to run core applications.

That does not mean that deployment is without its challenges. Almost half of virtualisation adopters (45%) said they had problems migrating between existing and virtualised environments, and about the same number mentioned challenges involving the complexity of monitoring and managing both physical and virtual environments and the management of software licences in a virtual environment.

Other issues involve virtualisation governance – control of the proliferation of virtual machines, the increased complexity in the back up and recovery of virtual machines, and in security management.

Such concerns are likely to drive further demand for systems integrators and consultants with experience in handling more complex virtualisation projects.

## GREAT EXPECTATIONS

The extent of those challenges may also account for a slightly lower return on investment (ROI) than might

be expected. Only 8% of virtualisation users said the technology had exceeded their ROI expectations, and only a quarter thought it had met their expectations on all levels. The majority (56%) reported that they saw a return on investment at most levels. Only four companies (3% of virtualisation users) said the technology had failed to meet ROI expectations.

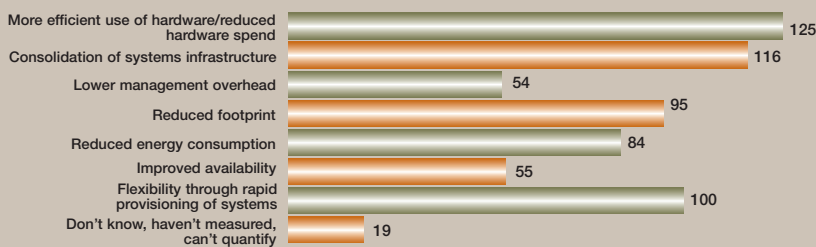
Those improvements, though, are across the board. The top five areas where organisations are realising benefits include more efficient use of hardware/lower hardware spend; the ability to consolidate systems infrastructure; flexibility through the rapid provisioning of systems; reduced systems footprints; and a lower energy bill.

There are plenty of metrics that can be used to assess the benefits of virtualisation – but the attitude of one respondent to the survey perhaps sums up the widely held belief that server virtualisation is a technology that over, rather than under, delivers. "It is not worth measuring the benefits; clearly it is making savings and we don't need to quantify them."

With the prevalence of views like these, the slope of virtualisation's adoption curve can only get steeper. ⓘ

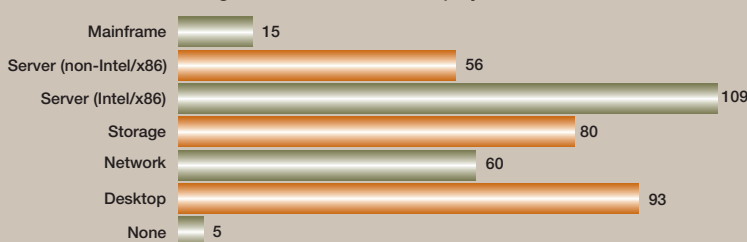
### BENEFITS

Where has your organisation realised benefits from its virtualisation deployments?



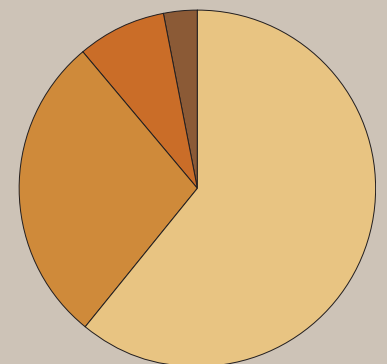
### VIRTUAL TARGETS

Where is virtualisation being considered for future deployment?



### ADOPTION

To what extent has virtualisation met your return-on-investment expectations (where adopted)?



- Met expectations, on most levels (61%)
- Met expectations, on all levels (28%)
- Exceeded expectations (8%)
- Failed to exceed expectations (3%)

# Hyper-visionaries

## What are organisations planning to do next in their pursuit of IT infrastructure virtualisation?

The virtualisation revolution is only just getting underway. To date, x86 server and storage environments have been the main targets but they do not represent the limit of organisations' ambitions in this technology area.

Canvassing IT decision makers at 273 mid-sized and large organisations, *Information Age* and survey partners Computacenter and Sun Microsystems found a growing trend for virtualisation that spans multiple server platforms.

Today, one in four companies has already deployed virtualisation on machines other than x86. And based on their plans for future deployment, that could rise to one in three in coming months.

The growth in the diversity of virtualised server platforms is a trend that analysts at IT industry advisor Gartner are picking up on.

"We think there is [going to be] a big emphasis on heterogeneous virtualisation – multiple virtualisation technologies with common services, common models and common approaches," says Phil Dawson, a UK-based Gartner research vice-president specialising in IT infrastructure and virtualisation. "Rather than just x86, which has had all the [recent] marketing behind it, we think that heterogeneous virtualisation is going to be the area of growth."

Four virtualisation technology vendors stand out as enablers of that multi-platform push, according to respondents to the survey: the market leader, VMware, its open source rival Xen, and virtualisation software

from two giants of the operating system world, Microsoft with Hyper-V and Sun Microsystems with Solaris Unix virtualisation, LDOMs and xVM.

Virtualisation has made all of those environments vehicles for consolidation.

"Prior to the [current] virtualisation bandwagon, consolidation was a strong Unix play," says Dawson. "It wasn't until virtualisation that the consolidation move kicked in for x86."

With the broadening of the market, he says, systems integrators will play a much more prominent role – especially among mid-sized organisations, where such partners will "bring virtualisation to the mass market".

### BEYOND SERVERS

Servers are not the only interest area for virtualisation, though. Over a third of all respondents said they are considering desktop virtualisation for future deployment. That is a sharp rise from the 21% who have some form of desktop virtualisation in place today.

Storage virtualisation is also on the rise. While 26% of those surveyed have already applied virtualisation technologies to their storage environments, that figure is set to rise to almost 30% if those considering future deployment act on their intentions.

Indeed, Gartner argues that networking the data storage infrastructure is a prerequisite to any significant virtualisation project. "You have to externalise storage to do any form of movement of the workloads for consolidation and virtualisation," says Dawson.

That highlights a level of growing interdependency between virtualised environments, says Computacenter solutions architect Richard Wilson. "Take up of virtualisation on x86 has been higher than on the Unix side simply due to complexity. Unix environments by their very nature tend to support high-availability and mission-critical applications with tighter integrations and dependencies on the operating systems."

"When you undertake a virtualisation project, it is essential that you look at virtualisation in its entirety – cross-platform, cross-technology – and also understand both the business and technical constraints within the organisations and design a process that works."

Among the *Information Age* readers, there is clearly an appreciation that further phases of virtualisation will be more complex. Only 13% said that virtualisation would be universally applied within their organisations, while 36% said it would be widely applied, but not for every business application.

With only 46 of the 273 decision makers surveyed reporting that they had no plans to adopt virtualisation, the message is clear. "We'll apply it anywhere we see a cost saving," as one survey respondent put it. <sup>①</sup>



### About this research

**INFORMATION AGE** reader research is undertaken via questionnaires at [Information-age.com](http://Information-age.com). Although the research may be sponsored by a supplier of IT products or services the research remains under independent editorial control. This research on virtualisation was sponsored by Computacenter and Sun Microsystems.