
Server Virtualisation beyond Consolidation

A North American perspective

By Jon Collins, September 2010

In a nutshell:

Many organisations have adopted server virtualisation to support their infrastructure consolidation activities, and are reaping the benefits. However, there is more to server virtualisation than simply supporting the consolidation of workloads onto a reduced set of hardware platforms. Is there life for virtualisation beyond server consolidation in North America, and what challenges need to be overcome?

Key points:

- *By way of background, it is important to appreciate the way data centres function today. Contrary to what some might think, most data centres are functioning reasonably well, even if traditional challenges of funding and responsiveness remain prevalent.*
 - *Server consolidation through virtualisation is seen as one of the most important initiatives in data centres today. Resulting virtualisation activity continues apace, with activity in the Windows environment running ahead of Linux and other platforms. However, activity may be slowing down in the future.*
 - *Workloads that are reported as being more of a target for virtualisation are application servers, Web servers, departmental apps and Web apps, whereas commercial applications and other workloads are of less interest.*
 - *Server virtualisation is seen as having a far greater impact on management, operations, architecture and procurement by those with extensive experience, compared to those starting down the track. The implication is that the actual level of impact is not being taken into account in advance, and may come as a shock when the full impact is felt.*
 - *The bottom line is that organisations may find moving beyond consolidation-by-virtualisation more of a challenge than predicted. To take server virtualisation seriously, and therefore reap the benefits that result, needs a mindset that views virtualisation as an integrated element of the dynamic data centre infrastructure, and not just as a consolidation tool.*
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Introduction

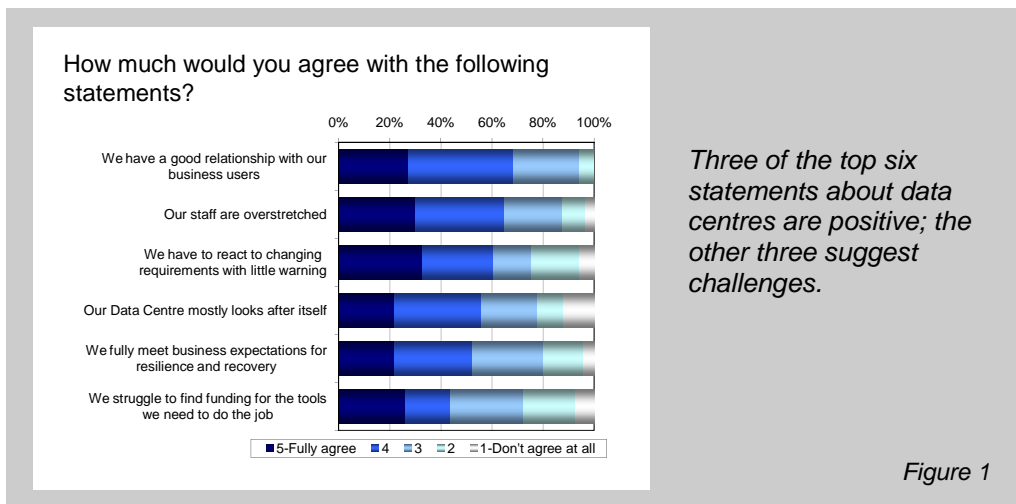
Much has been written about server virtualisation, its value and benefit. One theme in particular is that virtualisation is a journey, starting with using virtualisation to consolidate workloads onto a reduced pool of server hardware, and ending with virtualisation acting as a central element of dynamic allocation of data centre resources, or the so-called 'private cloud'.

While this is good theory, these are early days for the adoption of virtualisation and the complete journey has still to play out. This inside track reports on online research conducted in partnership with The Register, reflecting the views of North American (US and Canada) technical decision makers to determine how far down the track organisations are today, and what challenges they are having to overcome.

Given that the research was conducted online, we were particularly conscious of the potential for bias towards respondents who had more of an interest in virtualisation. To counter this, we structured the survey around the general theme of data centres. We have therefore been able to compare those with more extensive virtualisation experience, with respondents who have a more limited view.

The state of play

To kick things off, it is important to appreciate the context for server virtualisation with respect to the data centre as a whole. To understand what drives IT organisations today, we asked respondents whether they agreed or disagreed with a number of statements, the top six of which are shown in Figure 1.



So, what's the state of affairs? "Generally OK, but not without challenges" is the message we see here. The responses split roughly into two groups in terms of sentiment, the first of which are quite positive:

- We have a good relationship with our business users
- Our Data Centre mostly looks after itself
- We fully meet business expectations for resilience and recovery

Over half of the respondents agreed with all of the above statements, implying that this upbeat mindset is the norm rather than the exception. Indeed, only under a quarter disagreed with any statement – clearly, there are far more data centre environments where things are considered to be working well, than where things are working badly. Of course, business users might not give IT staff quite such high marks!

On this last point, the above doesn't mean data centres are a bed of roses. Other responses in this group give a good indication of what day to day life is like:

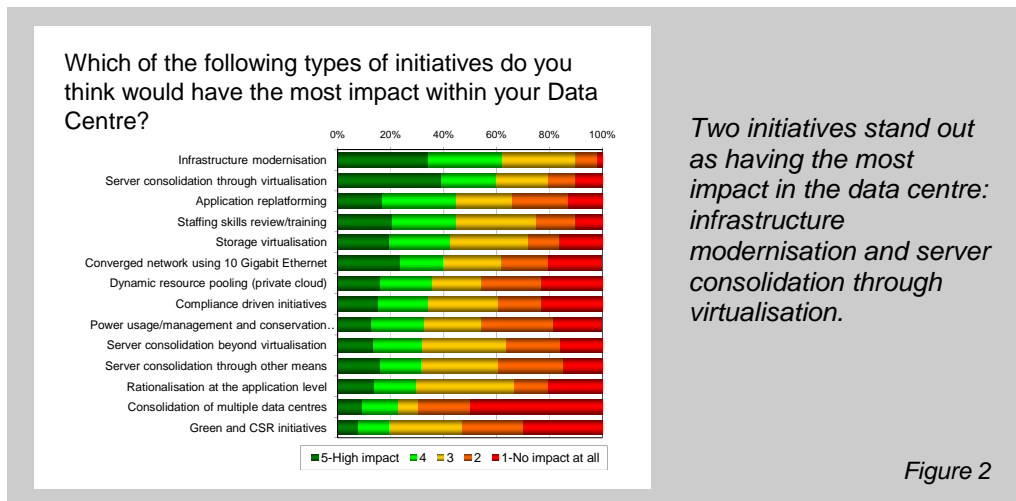
- Our staff are overstretched
- We have to react to changing requirements with little warning
- We struggle to find funding for the tools we need to do the job

In other words, it is common for data centre operations to act in a reactive, rather than a pro-active manner. Requirements change with little warning and, no doubt, the expectation is that IT will respond as quickly as possible and often with no increase in funding – however, staff are already overstretched and potentially ill-equipped to respond as effectively as they would like.

We should keep this in perspective – with respect to another question (not shown), less than a third of respondents felt they were fire fighting. It is important to recognise things could be better. All the same, when we look at initiatives, for most organisations we can review them in the light of improving things from a reasonable base, rather than trying to fix what is broken.

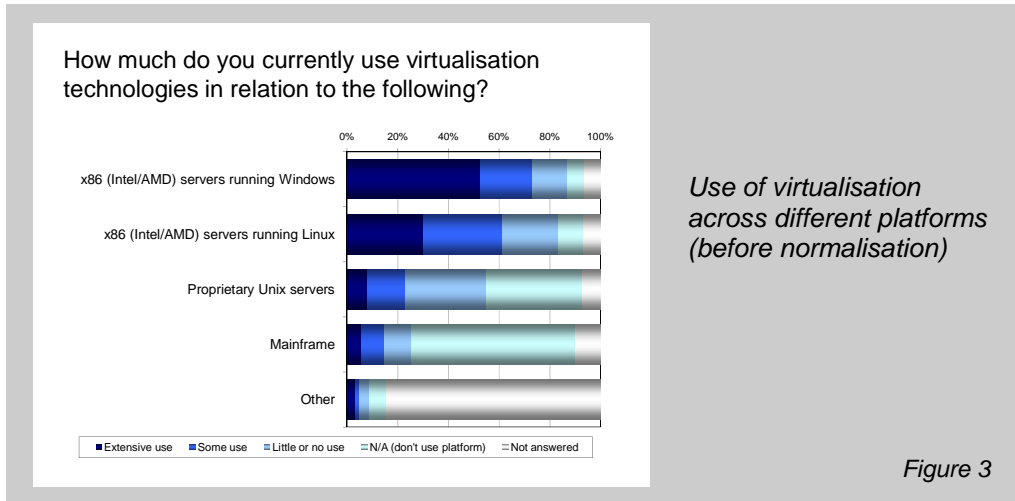
Ongoing initiatives and the virtualisation theme

Against this background, what activities do respondent organisations see as a priority? Two stand out as having the most potential impact - infrastructure modernization and server consolidation through virtualisation (Figure 2).

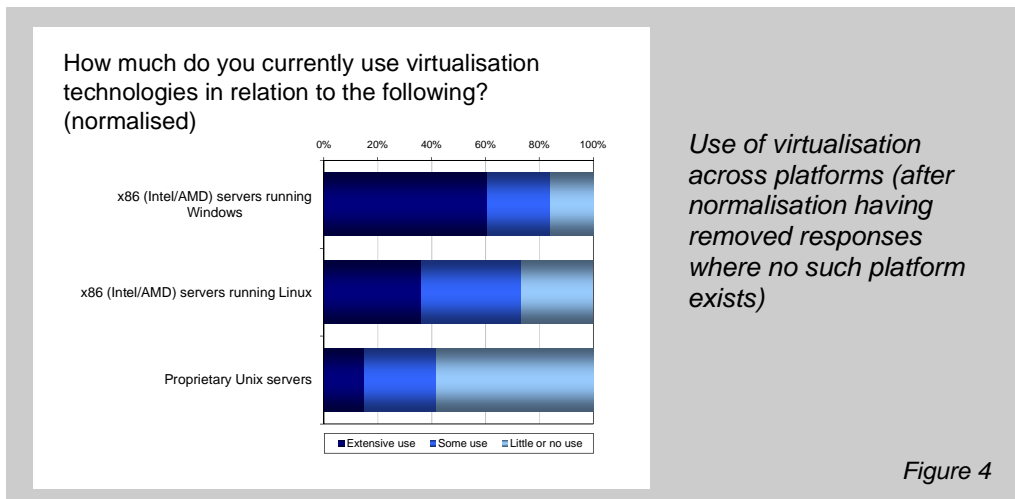


Infrastructure modernization – i.e. replacing older kit with more up to date technology – is a rolling challenge as equipment becomes less reliable, as it moves out of warranty and as workload sizes increase. As can be seen from the second bar on the chart, there is also much interest in server consolidation through virtualisation. Of course it is difficult to separate the two – modernization of infrastructure may also involve consolidation, and vice versa.

Given the prominence of virtualisation, let's drill down into this area and consider what impact it is likely to have. Plenty of server virtualisation is already in place – a cursory glance at Figure 3 suggests that over half of respondents are making extensive use of virtualisation in the Windows environment, for example.



To provide more clarity on the above picture, we can normalize the data based on the subset of respondents who use the platforms concerned. In Figure 4 we look at the top 3 platforms for virtualisation and rebalance responses to remove those that do not use the platform or did not answer the question.

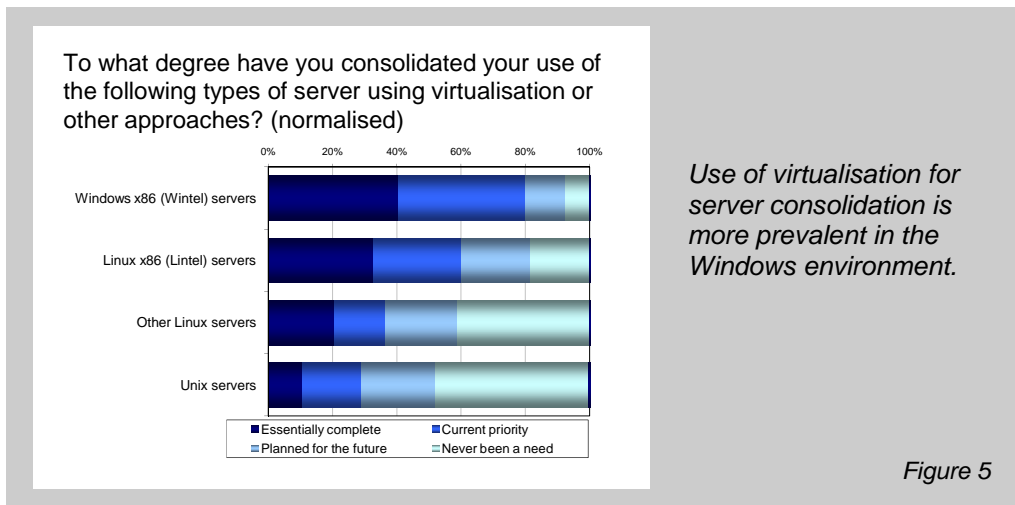


It is interesting to see from the figure how use of server virtualisation in the Windows environment is significantly greater than for Linux/UNIX. This may be for a number of reasons:

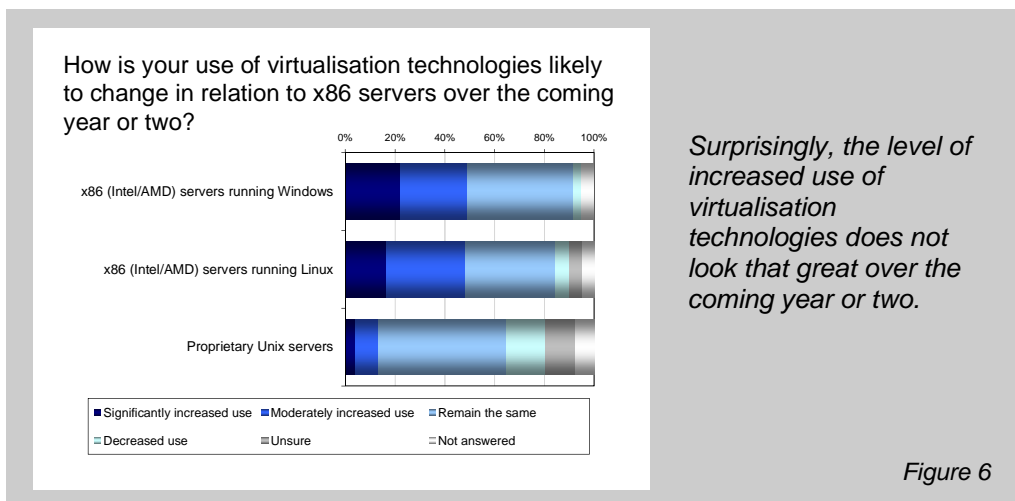
- That the number of servers running Windows is in general greater than the number running Linux, potentially making the former a more appropriate initial target.
- It could be easier to virtualize Windows applications than Linux/UNIX – while this is possible, we find it unlikely for reasons we shall discuss later in this report.
- The need may be greater for virtualisation in the Windows environment, particularly for applications that require specific Windows configurations, or a restricted set of dynamically linked libraries (DLLs). This is sometimes termed the one-application-one-server approach.
- In general, there may be more application candidates that are appropriate for virtualisation on the Windows platform – as well as configuration requirements, this could also be down to more applications being bespoke.

What about the question of server consolidation through virtualisation? Again, when normalised to remove those who don't use the platforms concerned, we can see increased activity in the Microsoft

environment. For Windows servers, activity is just under half way, while for Linux servers, about a third of respondents say that the work is essentially complete (Figure 5).



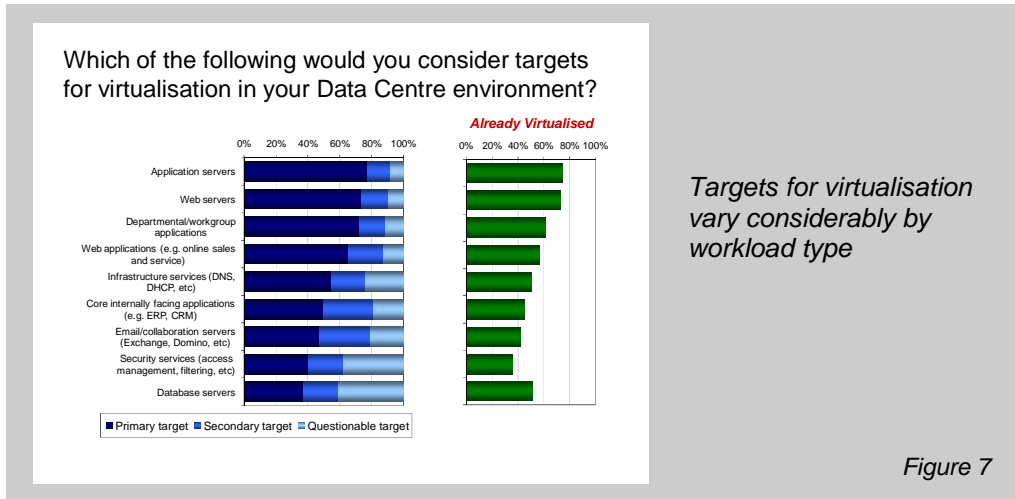
As mentioned, server consolidation is often seen as the first step in a journey towards more dynamic, 'private cloud' IT models of IT service delivery. When we look at planned virtualisation activity however, there is a home truth we need to face directly. When we asked how virtualisation use is likely to change, the proportion of respondents predicting significantly increased use is relatively small – no more than a quarter in the case of Windows servers, for example (Figure 6).



To be clear, if respondents did see a significant future for server virtualisation beyond consolidation within the next couple of years, we might expect these figures to be higher. Does this mean that the potential for virtualisation is tailing off, that it is already a mainstream technology, or is there some other reason? To answer these questions, we can look at what organisations are actually doing with virtualisation.

Digging deeper into server virtualisation

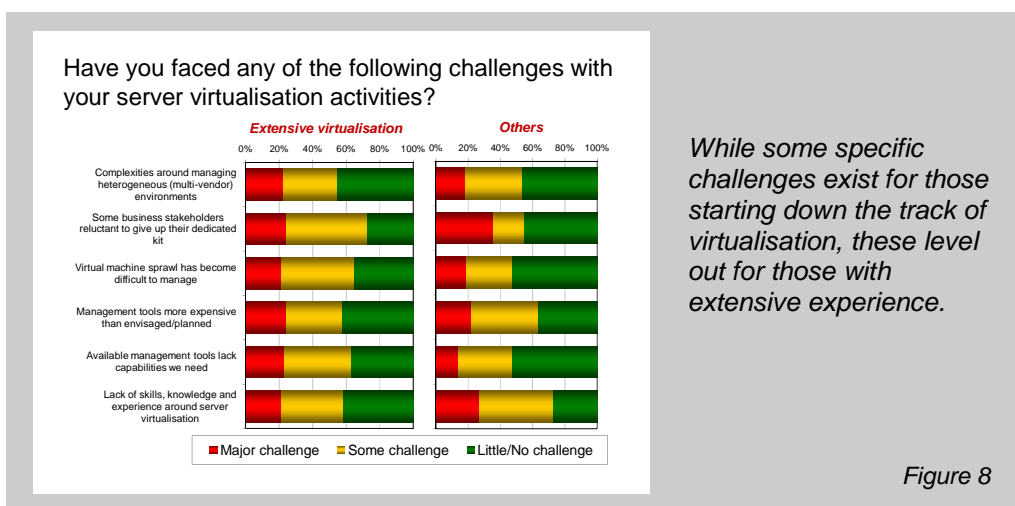
To gain an insight into where virtualisation is being used, we can look at responses to the questions of what types of workload it makes the most sense to virtualize, together with what workloads have already been virtualized. At the top of the list are web servers, application servers and departmental/workgroup applications (Figure 7).



What's interesting about these workloads is that they tend to be more bespoke or home grown, relying more on 'commodity' Microsoft technologies or open source packages. From the figure we can see far less interest in virtualizing packaged applications of any form, be they core apps, email or security related. A number of potential reasons exist for this – for example software vendors have not always helped to lower the hurdle, in terms of licensing rules, support criteria or configuration restrictions. Also some workloads, such as messaging servers, may be more business critical and therefore a source of migration risk, or they might demand a lot of hardware, such as I/O and memory, such that virtualisation could be counter-productive.

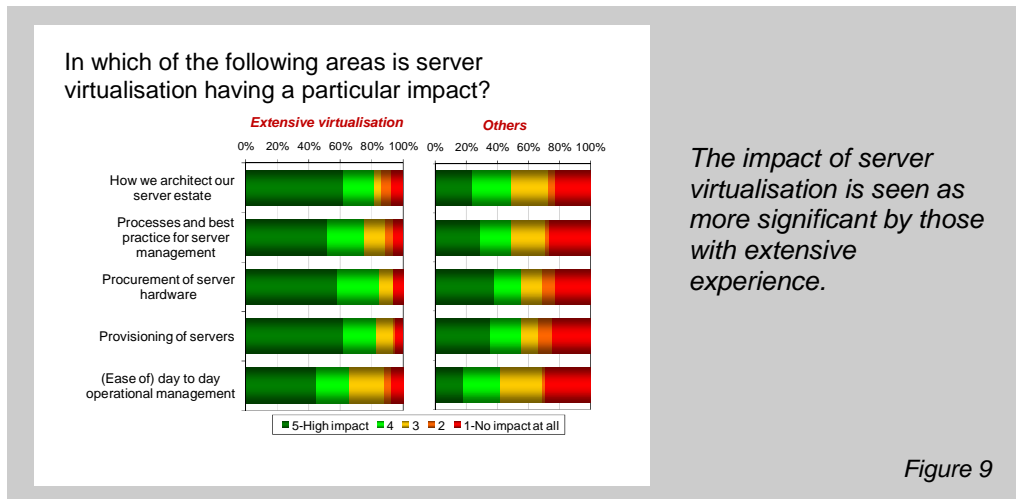
An interesting anomaly exists around database servers – while these are not seen as so much of a primary target, they are seeing higher levels of virtualisation than their lowly position might suggest – perhaps because they are pulled through by home-built applications as part of the stack; equally, some database platforms may exist for failover or recovery, and as such may be seen as appropriate virtualisation targets in practice, even if live or production databases as a whole are not.

We can understand better the realities of server virtualisation by considering the challenges respondents have faced when virtualizing, comparing the opinions of those with more extensive virtualisation experience with others who have less mileage under their belts (Figure 8).



The first thing we can glean from this picture is that two challenges emerge as important for organisations starting down the virtualisation track – firstly building up skills and experience, and secondly dealing with the organisational challenges such as wresting control of kit away from business stakeholders. This second point may link back to the conclusions reached after Figure 7 – namely that the more proprietary or risk-sensitive the platform, the less likely it is to be virtualized.

It is interesting to note that no challenges stand out for respondents with extensive virtualisation experience. However, three of these top six areas shown are around management, suggesting that this is an area of general concern. This is further reinforced when we look at where server virtualisation has had the most impact – two of the top five responses are management related (Figure 9). Note also the increased importance of architecture to those with more extensive virtualisation experience, as without rethinking how to change the design with respect to virtualisation, the benefits may not be fully realized.



Of greatest interest is the heightened level of impact experienced by those with extensive virtualisation experience, compared to those without. The implication is that levels of impact across the areas above turn out to be far greater than expected – as a consequence, such an impact may not have been fully planned for.

Conclusion

The idea that virtualisation is a journey, starting with server consolidation and then evolving towards use of virtualisation as part of dynamic IT and models such as private cloud, is sound in principle. However, the findings of this report imply a threshold that needs to be crossed, should organisations want to move beyond basic server consolidation of simpler workloads. This is not just because of the workloads themselves, but also because virtualisation has a greater impact on existing practices than is generally foreseen.

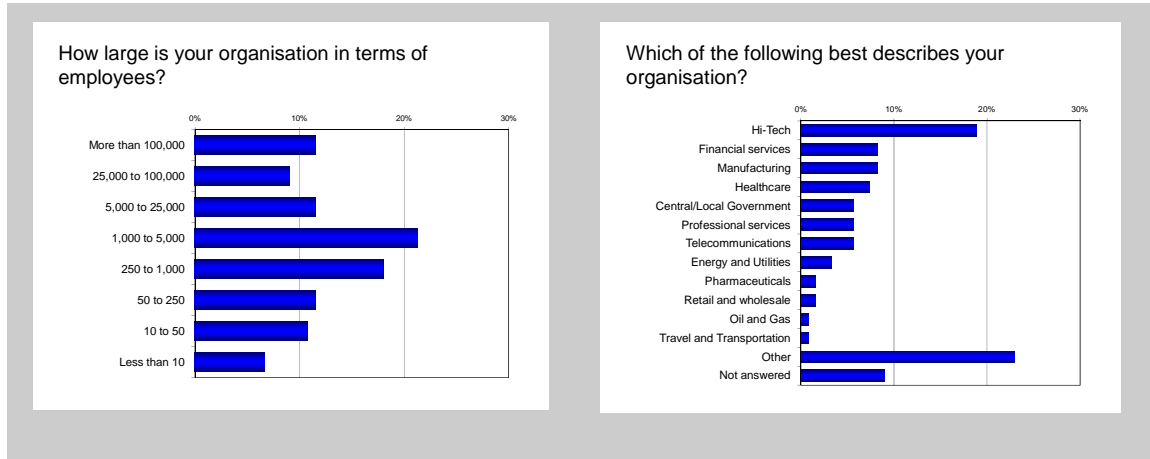
What happens if organisations are not prepared to cross this threshold? While virtualisation will still have served a purpose, all organisations will end up with are traditional systems, virtualized onto a smaller hardware footprint. Some benefits will be achieved in terms of hardware and systems software cost savings, space and power reductions, simpler maintenance and so on, but this must be balanced against the introduction of another level of complexity, dependency and abstraction. One thing is certain however – the resulting environment will be a long way from the ‘dynamic’ vision that has been envisaged for server virtualisation.

Organisations that want to take server virtualisation to the next level need to see it more than a consolidation tool. The effort required to do this may be greater than envisaged, but the challenges are not insurmountable. Without organisations fully embracing virtualisation as an integral element of the data centre infrastructure, it is unlikely that it will be able to achieve its potential as a technology.

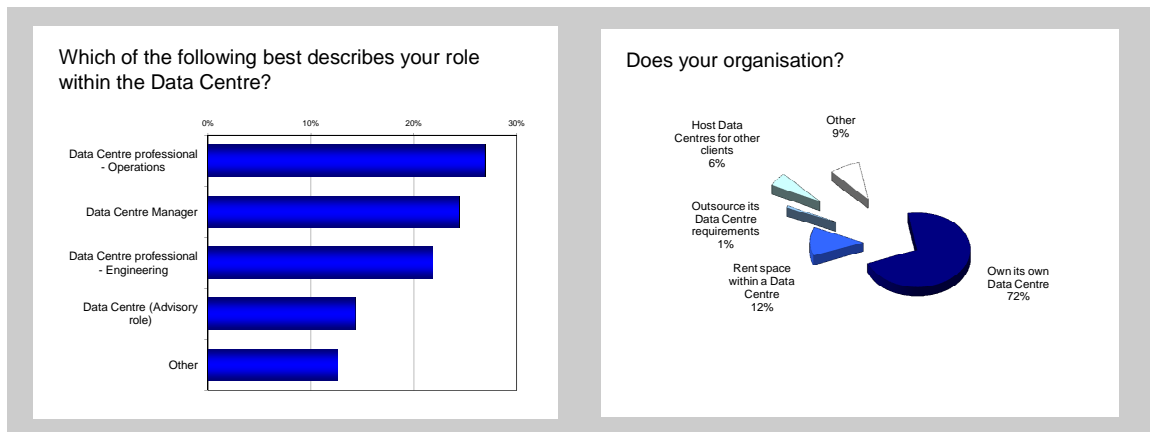
Appendix A

RESEARCH SAMPLE

The research sample was 117 respondents from the USA and Canada, distributed as shown in the figures below.



Respondents were drawn mainly from technical decision making roles with direct experience of data centres.



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