Desktop Virtualisation
Early days for mainstream adoption

Martin Atherton and Jon Collins, Freeform Dynamics Ltd, September 2009

It is early days for virtualisation in the desktop realm, but already there are some important lessons to be learned from organisations which have incorporated it into their IT strategy. This report provides a view of the latest state of play and offers up some practical advice to anyone considering how and where desktop virtualisation may benefit their organisation.

KEY FINDINGS

Virtualisation is here, but we're not all on the same page yet. Research carried out with readers of The Register tells us that virtualisation has permeated into the consciousness of the mainstream IT user and buyer community. However, as we move from x86 server to desktop virtualisation we find varying levels of understanding. 'Desktop virtualisation' can be taken to mean client partitioning, 'traditional' Windows Terminal or Citrix-based thin client activity or virtual desktop infrastructure (VDI).

The benefits of desktop virtualisation are as advertised. Virtualised desktops address some of the major IT department's headaches, namely securing and provisioning desktops. The relative happiness of business management and impact on end-users' productivity is seen as less of a benefit. These, and cost, are tricky to gauge at a generic level and must be considered in relation to your existing desktop environment.

Desktop virtualisation needs a 'horses for courses' approach. Significant differences exist in uptake of the different flavours of desktop virtualisation, for example in VDI the shared-server approach is more prevalent than 'one server per client'. It is likely that more organisations will seek the economies of scale offered by the shared server approach than those looking at the one server per desktop approach to deliver 'higher performance' desktops. However, there will be situations where centralising the management and other operational elements of a desktop estate by employing a one server per desktop approach are appropriate.

Selective targeting removes some of the major blockers to desktop virtualisation. Understanding the requirements from an end-user and operational management perspective, and targeting the right audience for a roll out are critical success factors. Power users, creative staff and highly mobile professionals can represent a challenge from a performance, requirements fulfilment and satisfaction perspective. However, the needs of transaction workers and general professional users with lighter and more predictable requirements can benefit from the standardisation benefits of desktop virtualization. With such groups typically accounting for a high proportion of the user base, there is a clear opportunity to deploy virtual desktops selectively.

Early best practice: be sure to build a complete business case. It is very early days for desktop virtualisation. Uptake could be hampered in many organisations if collateral impact and costs in areas such as the server, storage and network infrastructure are not fully understood and factored in alongside solution acquisition and roll out costs. The relative importance of all these areas depends very much on your own existing desktop and broader IT infrastructure.

Microsoft®

Introduction: desktop virtualisation – what do you *really* mean?

In general terms, virtualisation is undoubtedly gaining traction in mainstream businesses but it would be easy to get ahead of ourselves and assume that major vendor reference projects are 'the norm'. Indeed, although we are seeing the technology being adopted quite broadly, it is important to appreciate the relatively shallow depths it has reached compared to better established technologies[1].

For most organisations, and as illustrated in the companion report to this one ("Server Virtualization in Context") the entry point to virtualisation has been x86 server consolidation. If we look beyond this, we can appreciate just how undeveloped 'the rest' of the virtualisation landscape really is. Application and storage virtualisation fall into this category, as does desktop virtualisation, the subject of this report. Just how nascent this area is became very clear to us in July and August 2009 when we ran a workshop with readers of The Register website on the topic of virtualisation.

This report is intended to provide an objective review of where things stand today regarding the current uptake, general levels of understanding and the mainstream view of the benefits and drawbacks of implementing, using and managing virtual desktops.

There are currently two principal ways of thinking about desktop virtualisation. Client partitioning, which is essentially about running virtual machines on a desktop, and thin client/VDI. In the former, a server runs a single OS and management layer, which delivers a desktop image to multiple clients (or more often, a specific application). In the latter, a server running a hypervisor can deliver multiple different desktop images to remote clients.
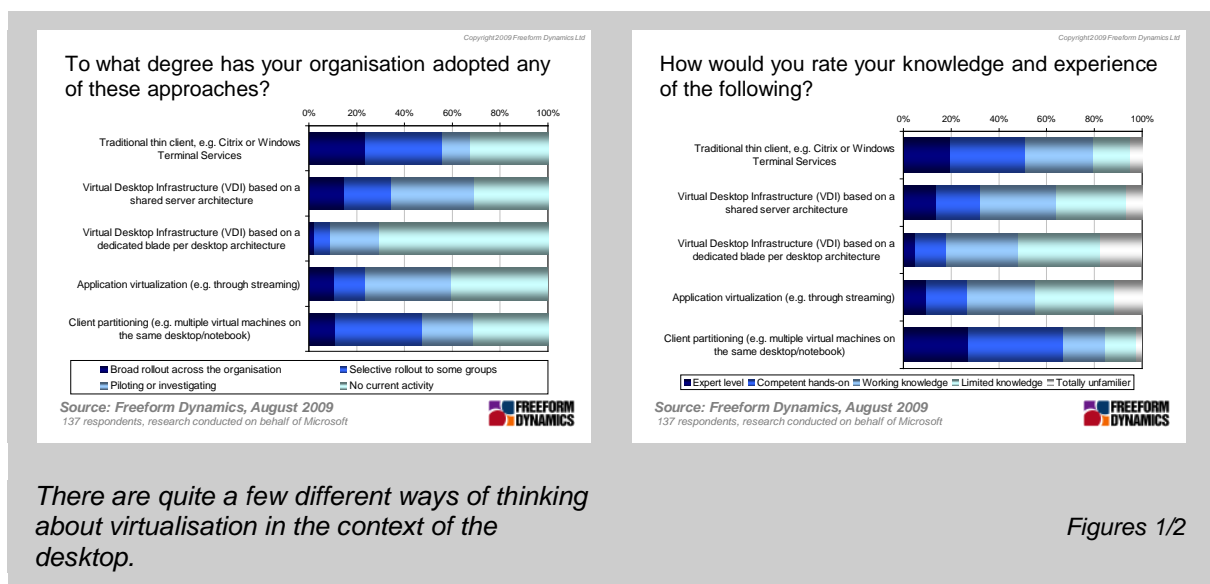
There are quite a few different ways of thinking about virtualisation in the context of the desktop.

Figures 1/2

Figure 1 shows the degree of adoption from respondents to the online survey. We can also see quite clearly (Figure 2) that levels of knowledge of the different types of desktop virtualisation tracks very closely the levels of adoption. While, as always, we need to recognise the self-selecting nature of online surveys such as these, we can nonetheless use this sample to explore how this level of knowledge translates into action, and also discuss some of the areas which are seen to be preventing organisations from moving forwards in this area.

Despite the same term – 'desktop virtualisation' – being used to describe both thin client/VDI and client partitioning (and thus a possible source of confusion when conversations are started without any definitions being offered) they can be deployed to achieve quite different goals.

For the purposes of his report we shall concentrate on the former – that is, the use of server infrastructure to deliver virtualized desktops to end-users.

How is it working for those that have deployed virtual desktops?

So there is indeed life beyond server virtualisation. Moving on then, what benefits have those organisations which have already deployed desktop virtualisation gained?

There are some loud and clear answers to this question. Desktop virtualization addresses some of the major IT department headaches such as securing and provisioning desktops[2] (Figure 3). Indeed, we might ask what would the point of desktop virtualisation *be* if not for these sorts of gains? However, there is a comfort factor in that the promise of VDI is indeed upheld, from the point of view of freeing up resource and reducing overheads.
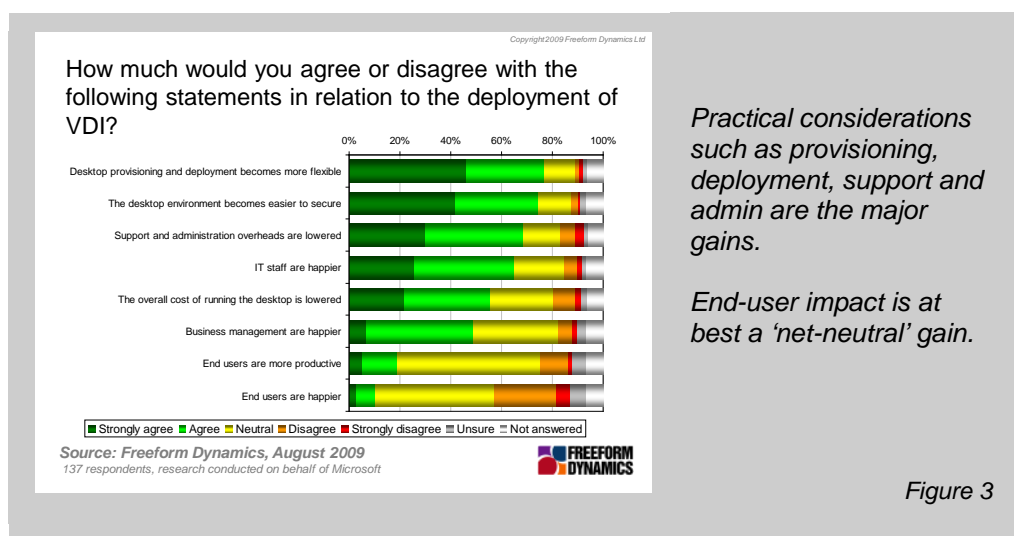

Copyright 2009 Freeform Dynamics Ltd

How much would you agree or disagree with the following statements in relation to the deployment of VDI?

Practical considerations such as provisioning, deployment, support and admin are the major gains.

End-user impact is at best a 'net-neutral' gain.

Source: Freeform Dynamics, August 2009
137 respondents, research conducted on behalf of Microsoft

Figure 3

The relative happiness of business management and impact on end-users' productivity is less prominent. This is a tricky one to gauge, and must be considered in relation to the existing or previous desktop environment. At worst, we might hope that a move from traditional desktops to VDI would go virtually un-noticed from the point of view of the user's experience.
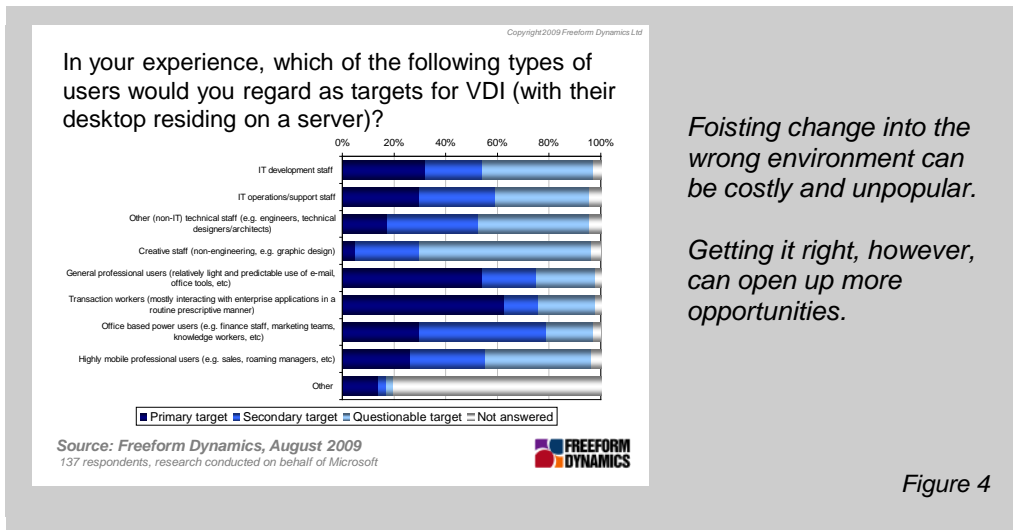
Similarly, the overall cost of running the desktop estate can only be properly assessed on an individual basis. We see that over 50% of the research sample agreed that the overall cost *is* lowered. As with any new initiative, guidance should be taken from those that have 'been there and done that' and tested as rigorously as possible in your own environment.

Indeed, it is important to acknowledge that the rationale behind different approaches being taken by organisations only makes complete sense when the context in which they are being used is considered. There are indeed, lots of ways to skin this particular cat. So what about making sure that a VDI initiative stands the best chance of success?
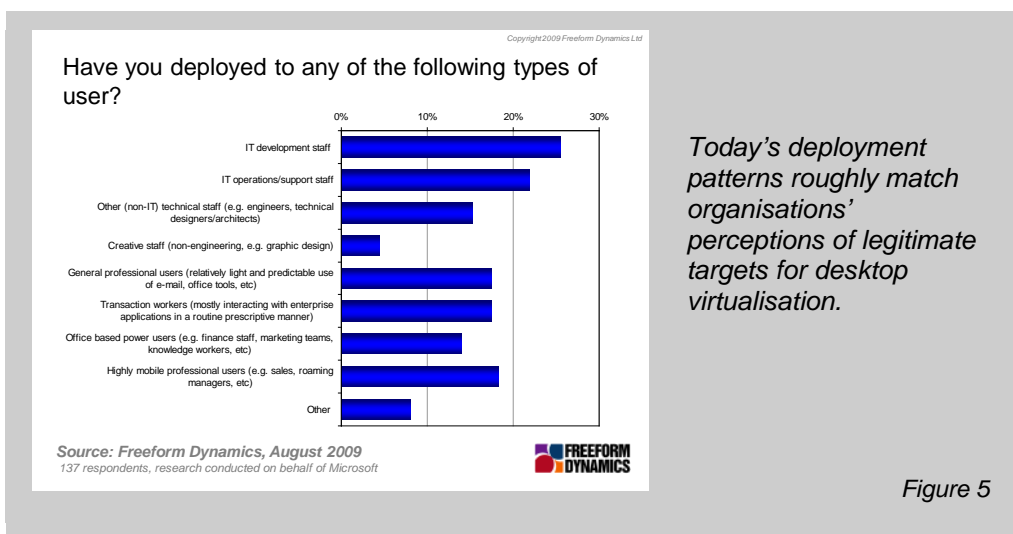
Avoiding roll-out crises: finding legitimate targets

While traditional desktop provisioning may lie somewhere in between 'one size fits all' and 'anything goes', there is value in segmenting and defining the requirements of different user groups and providing services and applications to meet them as specifically as possible.

A critical consideration, then, is audience (Figure 4). When it comes to targeting different user groups for desktop virtualisation, we see that expectations lie most strongly in favour of 'general professional users' and 'transaction workers'. We have seen this pattern emerge in previous studies[4], and it makes a lot of sense.

Foisting change into the wrong environment can be costly and unpopular.

Getting it right, however, can open up more opportunities.

Figure 4

Essentially, when starting something like desktop virtualization, it makes sense that selective deployment based on objective targeting will yield the highest ROI and acceptance. For example, rolling out virtual desktops to power users, creative staff and highly mobile professionals can represent a challenge from a performance, requirements fulfilment and user satisfaction perspective. However, the needs of transaction workers and general professional users with lighter and more predictable requirements can be met without running into the same user acceptance issues. Such principles align pretty closely with adoption reality (Figure 5).

Today's deployment patterns roughly match organisations' perceptions of legitimate targets for desktop virtualisation.

Figure 5

With groups such as transaction workers and general professional users typically accounting for a high proportion of the user base, there is a clear opportunity to deploy virtual desktops selectively. Indeed, anecdotal feedback we picked up during the workshop suggested that desktop virtualisation could be as useful when locking down a standard operating environment for the many, as when offering a more customised experience for the few:

> *"Maintaining a SOE desktop environment in an organisation of any size is a huge challenge. With virtualisation, an absolutely standard environment can be deployed on every desktop. Where staff need to do something different -- such as running non-standard software, then a virtual machine can be created to support their needs. If a whole group has a particular need, then a virtual image can be deployed for that group. In both cases, the standard desktop environment is maintained."*

There are clear operational benefits on offer, but some respondents also highlighted ancillary gains, for example in security.

"We are moving to thin client virtual developments and deployments because it's easier and cheaper to deploy that kind of environment securely, which for us is important, yes we lose the flexibility of PCs, but we gain in ease of accreditation, segregation of duty, and governance, it's very difficult to lose a laptop full of payroll/medical and so on details, when you don't have one."

One user group that it is important to draw out is the IT users. While the fact that 'techies' will undoubtedly want to play with technology, a major factor is the need for developers and operations staff alike to work with multiple different machines, for example to set up different environments for development, test, etc and to mimic different configurations in the user base. As described by respondents:

"I consider it essential in a development environment, without which I would need access to several PCs at the same time. It is also a life-saver when supporting multi-platform and multi-configuration environments, again without which means several PCs littering the office. As it is, I have just one PC and simply boot into whichever VM in whatever configuration I need. Brilliant stuff."

"Having multiple development configurations that I can snapshot & roll back without having to uninstall & reinstall various bits of software / versions all the time; having a reference baseline build that I can quickly replicate to build new clean development instances without starting from scratch each time. Just by copying a few file; running a corporate standard desktop on a non-standard laptop build – i.e. running XP on Linux; having a throw-away windows sandbox machine that can be used for dodgy software / media downloads and then totally erased from disk after to eliminate viruses etc."

Key to this usage model (which incidentally is as true for VDI as for client partitioning), is the flexibility that virtualization brings. It's worth recalling what is at the heart of virtualization – while it may add a layer of technology (though this is quickly being subsumed into the operating system and chip architecture alike), it enables workloads to be abstracted from the physical machine – which allows for far more straightforward configuration, movement and so on than when the two are tightly linked.

What's stopping people getting started?

We've looked at what organisations are getting from their VDI initiatives, so what about the negative perceptions?

If we look at the issues that are considered to be 'major blockers' (those attracting scores of 4 and 5 in figure 6) we can see two groups emerging: 'Cost of acquiring and implementing virtual desktop solutions', 'server and storage infrastructure stress and upgrade costs', and the perennial 'more pressing priorities for use of budget' are seen as the biggest challenges to address, according to around half the IT professionals which took part in the survey.

There are a number of blockers to implementing desktop virtualisation, all of which will carry different weighting depending on the nature of your own business
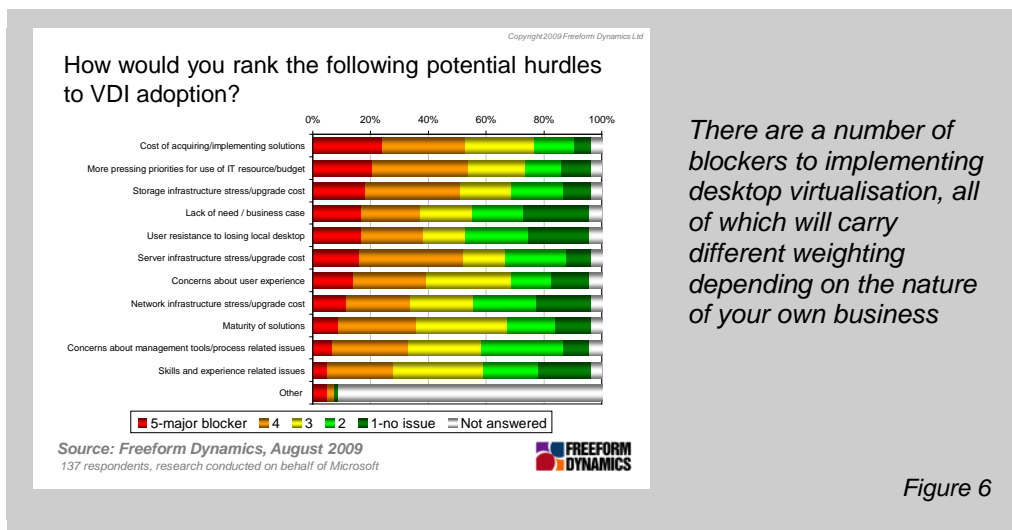
Figure 6

The second group essentially accounts for the rest of the options presented to the respondents, as they pretty much attracted the same scores across the board, and include business case justification, user resistance / experience concerns, network impact, solution management, and skills.

We could address each of these individually, but there is more value in pointing out that these factors offer a list of considerations that should not be ignored. Their relative importance will differ, perhaps considerably, depending on the nature of your own organisation, the number of users and the different requirements categories they fit into, and of course, the current state of the desktop and IT infrastructure in general.

So, there is no one-size-fits-all with desktop virtualization – and indeed it does seem a shame given the flexibility of the technology, to miss the opportunity to understand the real needs of the user base and respond to them accordingly. From a practical point of view, we expect that more organisations will seek to benefit from the economies of scale offered by the shared server approach to service the needs of multiple users, than those looking at the one server per desktop approach to deliver 'higher performance' desktops.

We would particularly warn against under-specifying the infrastructure required to support desktop virtualization. One respondent offers an illustration of what life could be like:

> *"The performance is terrible - sometimes it can take 20 seconds just to repaint the screen. I have a VM which is configured with 512mb, which is pathetic. I cannot understand why anyone wants to foist this charade on users. I have a real PC, which is reasonably powerful, but I am condemned to use it as a thin client to an underpowered server."*

Discussion and conclusion

Where does all this leave us? The first thing to remind ourselves is that it is still very early days for desktop virtualisation when we consider the mainstream use of IT. There remain a significant number of hurdles to be overcome, despite the benefits reported by organisations which have already deployed it – as with server virtualisation, we would expect to see the next big leap to be in terms of management practice and tools.

The early evidence is that desktop virtualisation will be a 'slow burn' rather than an overnight revolution. The clear cost-benefit of server virtualization is not directly applicable to desktop virtualization, whose benefits are more in terms of flexibility and operational efficiency. While these do translate into financial savings, they are not yet sufficiently compelling to make the desktop the next default target for virtualisation. However, it will undoubtedly find its place. – and with VDI placed next to Thin Client, the increased options that result should make desktop virtualisation more applicable on the whole.

We suspect that rather than there simply not being a business case for virtual desktops in any business, it is more likely that organisations are having difficulty pulling all the different threads together to build the complete picture, and without it, there is little chance of any business being happy about signing something like this off. A cost analysis needs to include the possible impact on the storage, server and network infrastructure. Once these factors are taken into account, wrapping them up into a fully rounded business case should provide clearer answers.

Today however, we can glean some rudimentary elements of best practice guidance. Several areas currently seen as obstacles can be relatively easily dealt with. User experience and acceptance is a good example. As we stated earlier, taking an in-depth look at different user groups from the point of view of functional and performance requirements, location and skill sets is the way to ensure that only the 'right' targets are selected for an initial roll out. Not only does this make sense in regard to virtual desktops, but creating a complete view of the user base in any business could have huge cost saving implications across the board, especially when we consider that traditional desktop provision has often followed a one size fits all approach.

Appendix

Sampling and Methodology

The information and discussion presented in this report is derived from a research study completed in August 2009 as part of a broader 'workshop' engagement conducted on the Register.com on the topic of virtualisation. The data was gathered from a 'mini poll' taken during the workshop in which a series of articles sought to engage in an ongoing discussion with the readership of the Register. Input was gathered from 137 IT professionals, from a balanced range of company sizes.

Figure 7
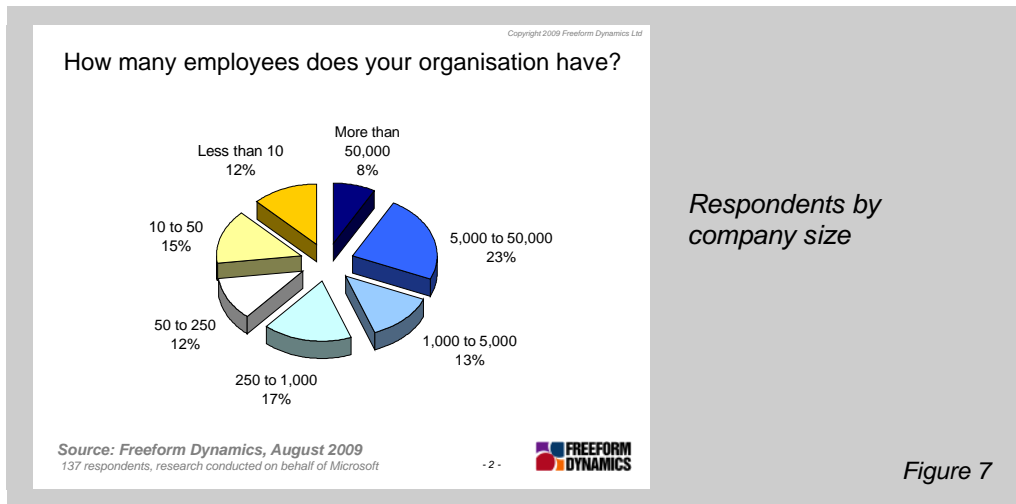
In terms of methodology, participants were asked to complete a Web based survey based on a mix of multiple choice and open questions, the latter allowing respondents to express themselves freely in key areas. The workshop was sponsored by Microsoft, but was designed, executed and analysed on an independent basis by Freeform Dynamics under its Community Research Programme.

If you are interested in looking at the discussions that took place in the workshop, please visit the workshop summary and navigation page at www.theregister.co.uk/software/virtualization_workshop/.

References

All the reports referenced here are available for free download at www.freeformdynamics.com

[1] The Great Virtualization Debate   Freeform Dynamics, 2008

[2] Server Virtualization in Context   Freeform Dynamics, 2009

[2] Relieving the Systems Management Burden   Freeform Dynamics, 2008

[3] IT Delivery in the Downturn   Freeform Dynamics, 2008

[4] Linux on the Desktop   Freeform Dynamics, 2009

About Freeform Dynamics

Freeform Dynamics is a research and analysis firm. We track and report on the business impact of developments in the IT and communications sectors.

As part of this, we use an innovative research methodology to gather feedback directly from those involved in IT strategy, planning, procurement and implementation. Our output is therefore grounded in real-world practicality for use by mainstream business and IT professionals.

For further information or to subscribe to the Freeform Dynamics free research service, please visit www.freeformdynamics.com or contact us via info@freeformdynamics.com.

About Microsoft

Founded in 1975, Microsoft (Nasdaq "MSFT") is the worldwide leader in software, services and solutions that help people and businesses realise their full potential.

For more information on Microsoft's virtualization solutions, please visit http://www.microsoft.com/virtualization/.

.

Terms of Use