computing research

RESEARCH PAPER

Virtual desktops: do the economies work at SME scale?

SMEs need to select carefully if the benefits of VDI are to be realised

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Executive summary

Virtual desktop infrastructure (VDI) is attractive to companies of all sizes because it promises to deliver lower desktop cost of ownership. By hosting multiple desktop environments on a server, individual users are freed from desktop configuration issues, the burden of client-side upgrade and support is eased, and a modern desktop environment can be delivered to users on legacy PCs and existing workstations.

Economic pressures, the drive to extract more value from IT and the withdrawal of support for Windows XP in April 2014 have brought renewed focus on VDI.

However, the majority of VDI deployments are among large enterprises with desktop estates that run into the many hundreds or thousands. Can VDI also benefit small and medium-sized enterprises (SMEs)?

This paper draws on a recent survey of 195 respondents among the readership of *Computing*. While the main focus was on those firms with between 100 and 5,000 employees (with most at the lower end of that spectrum), larger and smaller organisations were also polled for the sake of comparison.

The majority of organisations represented have yet to take their first steps into VDI. Of those that have or plan to, reducing total desktop ownership cost, reducing the desktop support burden and reducing overall IT cost were the three top reasons cited for adoption.

Our findings reveal that SMEs have resisted VDI for a number of good reasons. High among them is the surprising cost of storage that accompanies what should be a cost reduction project.

When we investigated further, it becomes apparent that these negative impressions have been often formed when IT organisations tried unsuccessfully to adapt large scale VDI tools aimed at 1000s of users to much smaller environments.

Clearly, SMEs looking to reduce their desktop costs will have to look more closely at VDI offerings and take careful account of the costs involved.

New VDI technologies specifically designed for SME-scale VDI deployments are now available. These are especially appealing because they don't place costly infrastructure demands on the organisations, as have the large-scale alternatives.

This paper aims to help SMEs understand what to look for in a truly cost effective VDI solution.

Introduction

There are a number of drivers behind the rise of virtual desktop infrastructure (VDI). Foremost is that in the current straitened economic circumstances, VDI holds out the promise to reduce desktop ownership costs.

Primarily VDI simplifies the management of an organisation's desktop estate. It removes from the user any issues about administering their desktop PC, and eases the burden of desktop support on the IT department.

With VDI, desktops are hosted in the datacentre, enabling organisations to provide users with modern desktop services on their legacy PCs and existing workstations, tablets or laptops. Processing and storage are performed on central servers instead of locally at the desktop. The server delivers full-use desktops to meet the needs of individual users.

Users want VDI desktops that can run a "normal" OS and "normal" applications. By deploying VDI, vastly different application sets can be made available to meet different users' needs. VDI can provide greater centralised control over users, but users can still have admin rights, and in effect, can do everything they do with a conventional desktop, but with the benefits of centralised computing.

Users should see no difference in performance between a virtualised desktop environment and a conventional PC, and desktop configuration issues should be a thing of the past.

Users are only too aware that the new PC, laptop or tablet they buy today is out-dated immediately. However, virtual desktops allow users to keep up with fast-moving technological innovations, but avoid the complexities, time and effort required to perform upgrades, migrations or refreshes which usually fall on the IT department.

Furthermore, migrations from previous versions of an OS, such as XP, to Windows 7 (or even Windows 8) can be prohibitively expensive, requiring an extensive hardware refresh and server/storage upgrades.

The attraction of virtualised desktop infrastructure (VDI) to the IT function is two-fold. It promises to greatly reduce the costly hardware/software upgrade cycle that goes with conventional desktops, freeing budget for more valuable tasks. And it promises to ease the desktop support burden, freeing IT staff for more valuable tasks.

While virtualising servers is a largely mature concept with known advantages for businesses of all sizes, virtualising the desktop estate is still seen as cost-effective and making sense only for large enterprises, for example, those with 1,000 seats or more. However, faced with the prospect of continuous desktop upgrade cycles, SMEs are also attracted by desktop virtualisation.

SMEs want to adopt desktop virtualisation for the same reasons large enterprises do – to reduce desktop management costs, improve productivity and increase business agility, but they often find enterprise-class solutions overkill for smaller environments.

Is there a role for VDI in SMEs, specifically for organisations needing 100 or 200 seats?

Clearly the aim of any VDI deployment is to deliver desktop computing services to end users at a cost the business can sustain. Any discussion about the merits of competing technologies comes down to this: does it lower total cost of ownership while maintaining an acceptable level of service?

Desktop OS

Windows 7 is the most prevalent client operating system among respondents to *Computing*'s survey (55%), followed by Windows XP (32%) and Windows 8 (5%), with earlier versions of Windows, Linux and Apple coming in below that. Three percent said that no one OS is dominant.

When we drill down on these figures by size of company, we find that the larger the number of users the organisation supports, the greater the proportion are still using Windows XP (Fig. 1).

Fig. 1 : Which is the dominant desktop operating system in your organisation?

	Fewer than 100	100 to 500	More than 500
Windows 7	47%	61%	44%
Windows XP	28%	30%	37%
Windows 8	5%	5%	3%
Windows 2000/ME or earlier	2%	2%	1%
No single desktop OS is dominant	8%	2%	7%
Apple	3%	0%	0%
Linux	3%	0%	1%
Other	2%	2%	1%
Don't know	2%	0%	4%

60 respondents worked in organisations with <100 employees; 64 with 100-500; 70 with more than 500

Microsoft's support for XP ends 8 April 2014 and companies still using it will have to make a decision about how they handle the migration. Consequently, this is reflected in the level of impact the cessation of support for XP will have on an organisation

On average 38 percent of respondents say the cessation of support for XP will have a small impact for a few users and require a small budgetary outlay; while 18 percent say it will have a large impact for many users and result in a large expenditure.

Upgrade frequency

There was a time when companies maintained a regular client upgrade frequency with the majority of the desktop estate replaced every three to five years, depending on a number of factors, such as the release of new operating systems, processors and major updates to popular applications, for example Microsoft Office; or the chosen amortisation period over which desktops could be written down.

However, restraints on spending and the increased capability of hardware mean that fewer companies now stick rigidly to an upgrade.

The largest proportion of respondents (26%) say their organisations upgrade individual desktops as required, with budget allocated. Fourteen percent upgrade clients every three years, 13 percent every four years, and 11 percent upgrade clients as required but without a pre-allocated budget plan.

However, if we drill down by company size, we can see that the smaller the company, the more likely they are to fall into that last category of upgrading desktops as required but with no budget allocated (Fig. 2).

Fig. 2 : What best describes the desktop upgrade plan in your organisation?

	Fewer than 100	100 to 500	More than 500
Desktop assets are upgraded every five years for which budget is allocated	4%	6%	10%
Desktop assets are upgraded every four years for which budget is allocated	7%	11%	19%
Desktop assets are upgraded every three years for which budget is allocated	7%	16%	19%
Desktop assets are upgraded more frequently than every three years for which budget is allocated	12%	5%	9%
The cessation of XP support is forcing us to upgrade	4%	6%	9%
We upgrade individual desktops as required and the cost is budgeted in advance	32%	33%	15%
We upgrade individual desktops as required but the cost is unplanned	25%	17%	3%
Don't know	9%	5%	12%
Other	2%	2%	3%

57 respondents worked in organisations with <100 employees; 64 with 100-500; 67 with more than 500

One in four organisations (25%) with fewer than 100 users upgrade desktops as required but without a budgetary plan. That can expose them to costly shocks which have the potential to divert money that could be spent on more valuable business tasks.

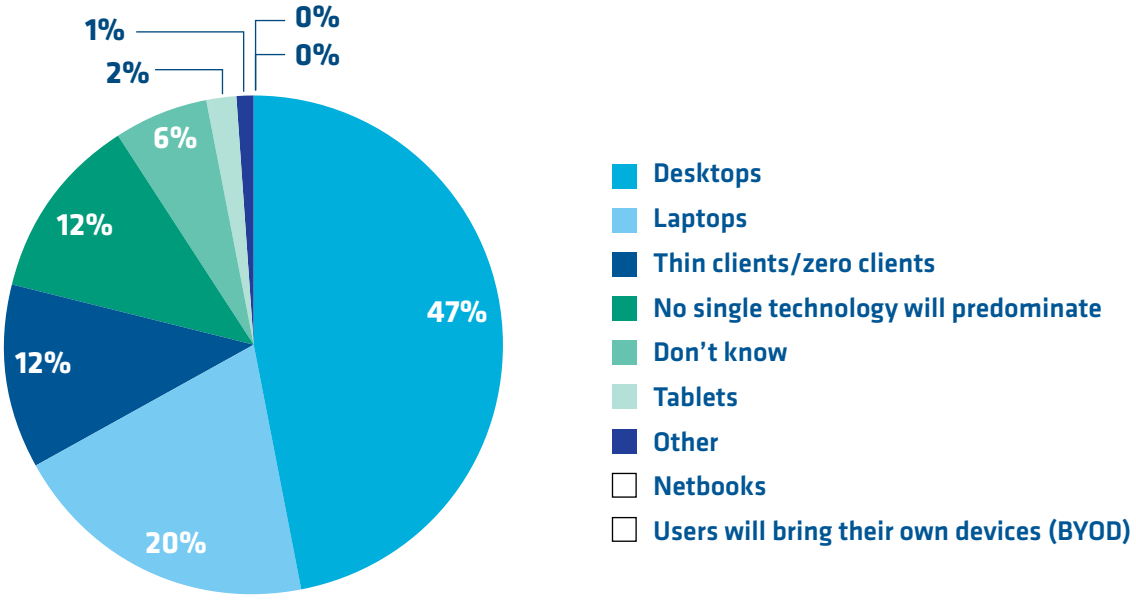
Only small proportions of companies with fewer than 100 users stick to upgrade frequencies of three, four or five years.

Hardware choice

There was also a time when the majority of users would be upgraded from one desktop machine to the next generation. Laptops were reserved only for road warriors and home workers were a rarity.

Perhaps surprisingly, given the rise of flexible working practices, desktops will still be the hardware device of choice for nearly half of the respondents (47%) when it comes to upgrade time (Fig. 3).

Fig. 3 : When you next purchase new desktop devices, what are you most likely to select?

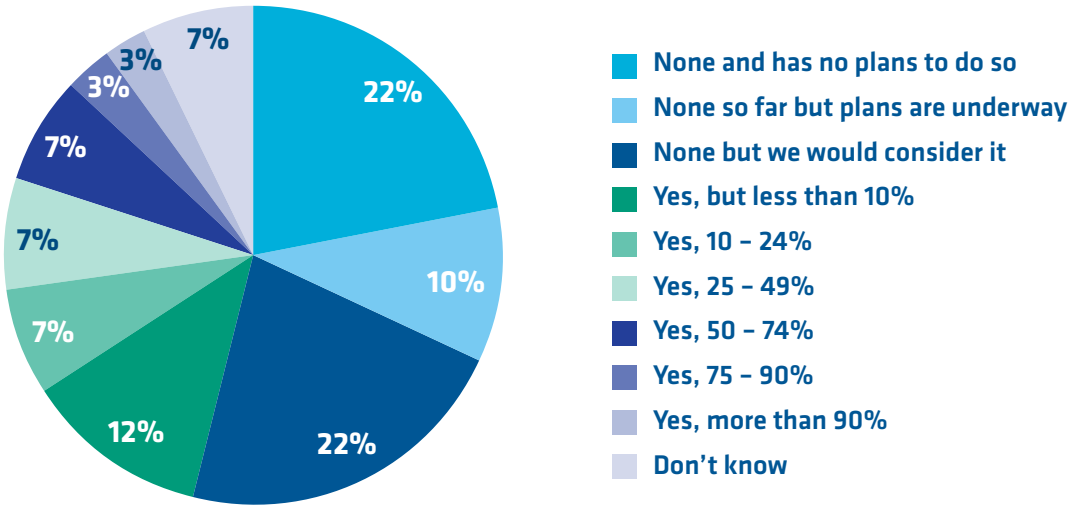


However, 20 percent will choose laptops when it comes to upgrading clients. Upgrading to thin clients, or to a mix of technologies (no single technology dominates), are the next most popular choices at 12 percent each. Few show an interest in tablets as desktop replacements (2%).

Virtual plans

Few SMEs have virtualised a significant number of their desktops (Fig. 4).

Fig. 4 : Has your organisation virtualised any part of its desktop estate?



110 respondents SMEs

The majority of SME respondents (54%) say their organisations have yet to take their first steps. The same proportion as have done nothing so far but would consider VDI as an option for the client estate.

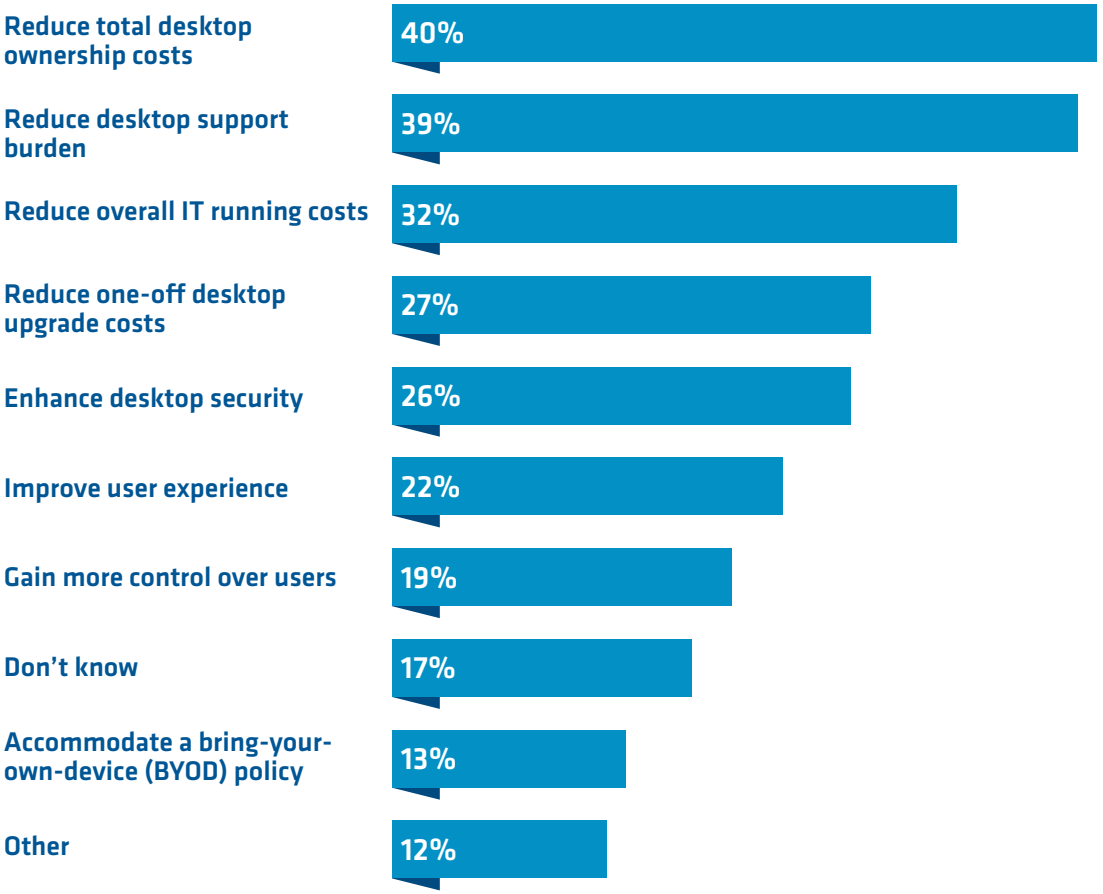
Again, the smaller the number of users an organisation supports, the more this trend is exaggerated.

In many ways this is unsurprising as for years VDI has been identified with large enterprises and many smaller companies will feel it has little to offer them. However, things are changing as we will see.

Benefits of VDI

So what were/are the aims of those who virtualised or plan to virtualise their desktop estates (Fig. 5)?

Fig. 5 : What were the aims of virtualising desktops in your organisation, or what would be the aims if the organisation is considering doing so?



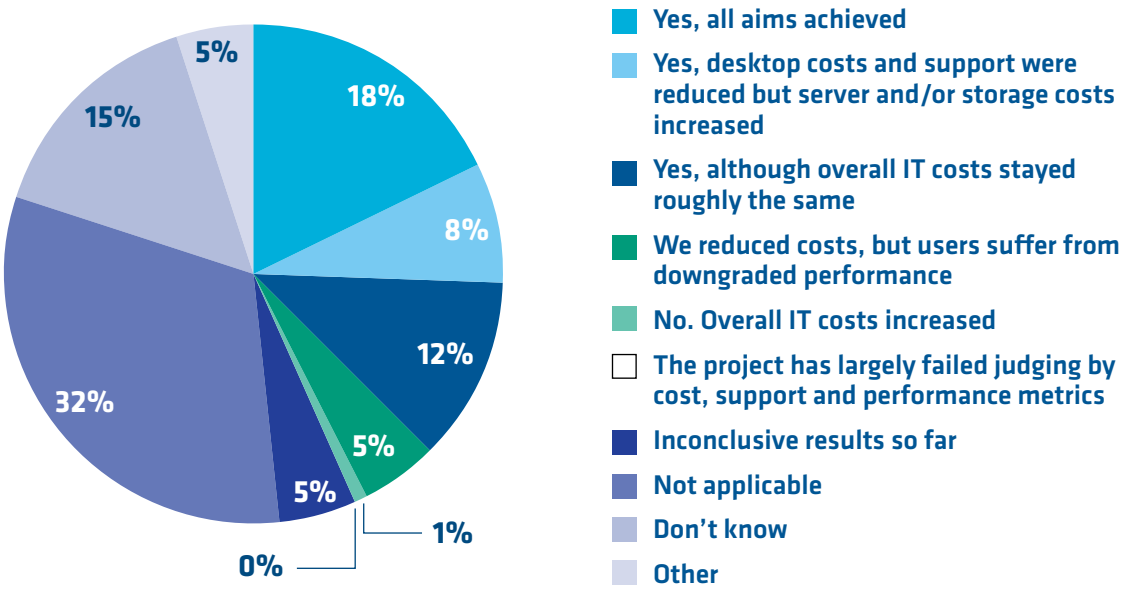
Respondents could select multiple answers

Reducing desktop total ownership costs is the aim cited by the largest proportion of respondents (40%) closely followed by reducing the desktop support burden (39%). It is tempting to think of these two as synonymous, but as we shall see shortly, that is not necessarily true.

Reducing the cost of a one-off desktop upgrade was cited by 27 percent; 26 percent cite increasing security and 22 percent cite better user experience. The desire to gain more control over user was a factor for 19 percent.

Reducing overall IT costs was cited by 32 percent. Again, reducing desktop costs may or may not result in lowering overall IT costs. For some deployments, costs reduced at the desktop may reappear, or even multiply, in the server room (Fig. 6).

Fig. 6 : If your organisation did virtualise some or all of its desktops, were the aims achieved?



Base: 105 SMEs

Twelve percent of respondents said that, although they had achieved their aims for VDI deployment, overall IT costs stayed much the same. And eight percent said that although desktop costs were reduced, server and storage costs increased.

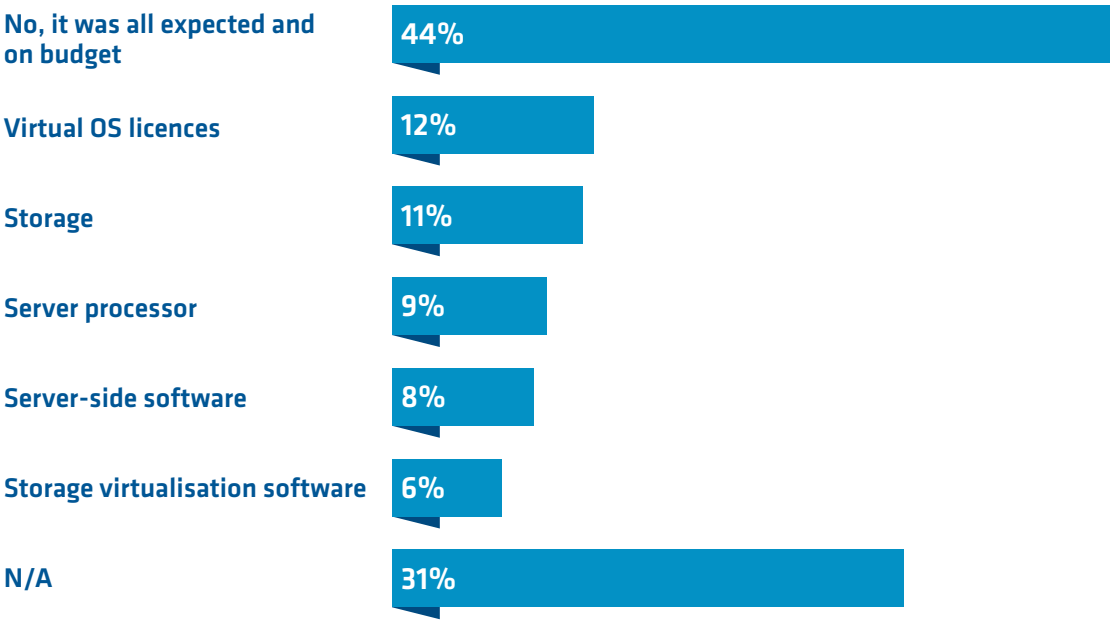
Historically, storage has been the major barrier and cost factor to VDI deployment. Current VDI approaches have had to use expensive storage networks, enterprise storage arrays, fast disks, or even expensive solid state disks (SSDs) to achieve sufficient performance. This is why, traditionally, VDI offerings are seen as big company solutions, because only large companies deploy many thousands of desktops to justify and amortise the high costs involved.

The cost of a single enterprise storage array often exceeds the cost of hundreds of physical desktop computers. In this scenrio the economics do not make sense for SMEs and thus the cost of storage has limited VDI deployments only to large companies with big budgets.

Some vendors deal with this issue by virtualising the underlying storage infrastructure in order to bring down the total cost while maintaining performance. Virtualised storage also brings benefits in the shape of better control and the ability to scale up to accommodate peak loads (for example when many users boot up at once) without investment in expensive specialised hardware.

However, most SME respondents were using systems designed for larger organisations. These VDI deployments can throw up some unexpected costs (Fig. 7).

Fig. 7 : If your organisation did virtualise some or all of its desktops, what were the extra costs which came as a surprise?



Base: 105 SMEs

Increased storage costs ambushed 11 percent of their investments.

As discussed, VDI solutions are often aimed at organisations with desktop estates running into the multiple thousands. Smaller companies will have to examine the costs involved carefully, including:

- How many users can be supported per processor (or CPU core)? Will you have to buy new servers or upgrade server CPUs to support the current and projected number of users in a virtual desktop environment?
- How much server memory is required to support the current and projected number of users?
- What storage volume is required to support the current and projected number of users?
- What configuration of storage is required? This will also affect storage costs. Can you, for example, use local, low-cost direct attached storage (DAS), ie in the server storage bays?
- Can the storage handle the peak volume of input/output operations per second (IOPS) without significant degradation of performance? IOPS fundamentally impacts virtual desktop performance.

When Windows 7 boots, it triggers a high volume of reads and writes. A local hard drive on a single PC can handle this, but if multiple virtual desktops are booted at more or less at the same time using networked storage with poor IOPS performance, users will experience intolerably sluggish responses.

Excess functionality

Because virtual desktop environments were designed to reduce the costs of large desktop estates they often include features for automating the administration of thousands of users. SMEs with smaller requirements should check carefully the specification of any VDI system they consider to ensure they are not paying for functionality they will never use.

Furthermore, some VDI solutions use per-user pricing models that are most heavily discounted for customers with multiple thousands of users. SMEs should check the price per user for their requirements.

Conclusion

There are a number good reasons that SMEs have felt that VDI is not for them. High up-front costs and a perception that specialised storage infrastructure will be needed, combined with a lack of in-house skills have put existing VDI systems firmly off limits.

This is reflected in the experience of our SME survey respondents, many of whom are deploying systems designed with larger organisations in mind.

While it's tempting to jump to the conclusion that reducing the desktop support burden will lower IT costs overall, the survey shows this is not the case. IT costs can be like a partly inflated balloon: clamp down on one area and the costs pop up in another.

Traditional VDI environments were designed for large enterprises and the economies of scale which apply to an estate of 1,000 desktops may not translate directly for 200.

There are three main pitfalls which SMEs should be wary of when considering virtual desktop solutions:

1. Costs which are shifted to another part of the IT infrastructure (especially storage), rather than genuinely reduced
2. Functionality for which they pay but are never likely to use
3. Pricing models geared to volume deployment discounts for which they are ineligible due to the small number of users.

There are on the market, VDI solutions which are specifically geared to smaller desktop estates. SMEs should carefully consider these options when making decisions about whether to deploy VDI, what technologies to adopt, and how much they can potentially save.

About the sponsor, Datacore

DataCore Software develops storage virtualisation software for high availability, fast performance and maximum utilization from storage in virtual and physical ITenvironments. DataCore SANsymphony™-V storage hypervisor is a comprehensive, hardware-independent solution that fundamentally changes the economics of provisioning, replicating and protecting storage in large enterprises and small to midsize businesses.

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