

Précis

Thoughts on IT in Business



Virtual Reality

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Virtual Reality

Virtualisation seems to be on everyone's lips these days. Manufacturers promise products that are "virtualisation-optimised". Software companies are shifting to provide utility-based computing models. Companies as unexpected as Amazon.com are staking a claim in the cloud computing space. And in the near term, IT departments are racing to implement server virtualisation in an effort to contribute Capex and Opex savings to business.

While the current frenzy is centred on servers and the data centre, virtualisation is certainly not new. Networks have used "virtual" architecture models for years and the concept of abstracting function from infrastructure is core to many science and technology disciplines.

What is new is the accelerating momentum of the virtualisation trend and the fundamental changes this will bring about in how we think about, buy and manage technology.

In this issue of *Précis*, we look at some factors characterising this new "Virtual Reality". We take a view on cloud computing, Cisco's new Unified Computing Strategy, and the impacts of virtualisation for business. We also review a business case for optimising your network to cope with the additional traffic and considerations for managing and securing a virtual environment.

Virtualisation is here and set to change your IT world. Get ready for your new Virtual Reality.

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There are many tangible reasons organisations choose to deploy a virtual desktop infrastructure (VDI). The benefit of centralised management, resource optimisation and the resultant reduction in hardware and maintenance costs are just a few. A large South African bank approached Dimension Data to build the IT infrastructure for its work area recovery (WAR) site to provide up to 1,500 employees with connectivity to its backbone. Dimension Data built a VDI to enable the bank to deploy desktops within minutes to ensure that business could continue as usual.

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Cloud computing – the journey begins



Many CIOs view cloud computing as their salvation in the current economic downturn, as it promises to deliver IT services to subscribers at a lower cost. Before signing up for 'services in the cloud', organisations should distinguish the hype from reality.

Ask a pool of IT professionals for a definition of cloud computing and you are more than likely to get several different answers. Some define it narrowly as 'accessing virtual servers over the Internet.' Others see it as a broader, encompassing term like Gary Middleton, Business Development Manager at Dimension Data, who defines it as 'a highly scalable method of delivering computing and application resources as a service over a network, which may be the Internet and infrastructure not owned by the organisation'.

The concept of cloud computing is not new. A variation of cloud computing, software as a service (SaaS), has been around for more than eight years. SaaS utilises cloud computing in its architecture and is essentially a single application delivered and licensed remotely by a cloud provider to subscribers for use as a service on demand.

Salesforce.com is a well known example of an enterprise application sold as a service. Other variations of cloud computing include platform as a service (PaaS), such as the SAP suite, and infrastructure as a service (IaaS), for example, Akami Video Network.

What's the hype all about?

The hype in the industry currently focuses mostly around PaaS and IaaS, which are key cloud platform offerings. Organisations can outsource their enterprise application processing to cloud providers without having to concern themselves any longer with idle CPUs or unused drive space. The cloud service provider charges only for services utilised on a 'pay per usage' basis.

The reality is that many vendors are selling themselves as cloud providers, especially PaaS and IaaS providers, but few are able to deliver on their promises. Service levels between providers and subscribers are for the most part non-existent. Also, issues around data security, vendor lock-in and privacy have not yet been answered.

Middleton believes that there is a lot of knowledge to be gained and education that needs to take place before cloud computing revolutionises and reaches a level of maturity.

He says, "Computing and networking are merging into seamless 'computing fabrics' where the network is critical to successful delivery of application services. Network traffic

patterns have changed more in the last five years than in the last twenty-five, but computing fabrics will place even more demand onto networks that are probably not ready to cope with the current traffic loads. Networks and network clouds will need ongoing investment to ensure that they are robust enough to handle cloud computing.”

Get ready to fly in the sky

The nirvana of true cloud computing is not a reality yet, but that doesn’t mean that potential cloud users cannot start with their preparations. Rather than jumping onto the bandwagon, consider the various stages of evolution of cloud computing and align your organisation’s strategy to it. For example, start by migrating basic services to SaaS.

Also, ensure that the basic building blocks in your infrastructure are in place to support cloud computing. The data centre is the focus area for this ‘cloud’ evolution. In the data centre, data is stored and processed and it is the hub from where applications are run and delivered. Data centres are already undergoing the next evolutionary step to deliver improved performance at lower monetary and environmental cost via server and storage virtualisation projects.

Most importantly, the network in the data centre is the foundation and it is critical to enable cloud computing. “10 Gigabit Ethernet is the answer to delivering increased performance. We are also already starting to see unified fabrics or the converging of networks within data centres to support data and storage traffic,” explains Middleton.

With a solid network in the data centre, organisations can then start building an internal cloud where applications move in a largely automated infrastructure. Moreover, with a true cloud-based business application architecture, organisations can begin to outsource less critical applications with low expectations on service quality to cloud providers.

Cloud heaven

The value proposition of true cloud computing is compelling. The efficiencies of a centralised computing infrastructure that can easily be accessed via the Internet will enable organisations, for example, to scale up or down applications on demand, to handle a higher or lower number of users.

This will change the data centre’s financial model from Capex to Opex as cloud computing users can avoid investments

The network is becoming even more critical

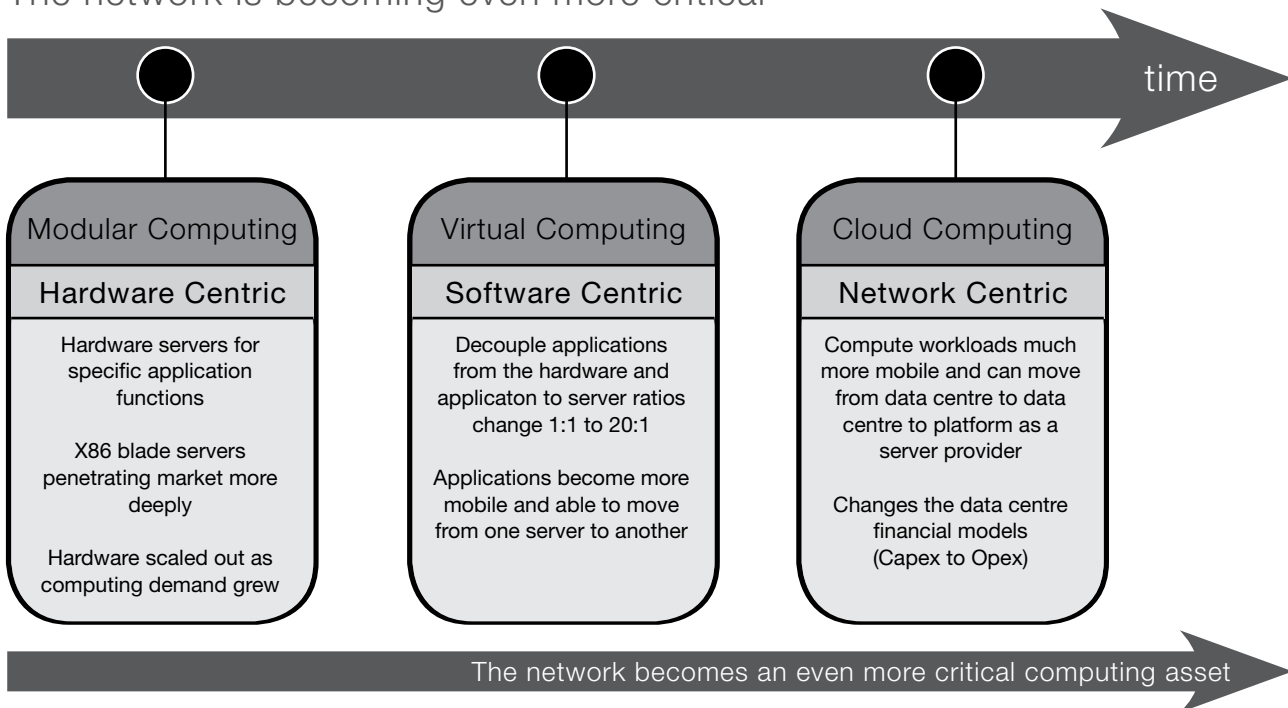


Figure 1: Computing changes over time make the underlying network ever more critical

in hardware, software and services, and rather pay a cloud provider only for what they use.

IT operations will be agile and mostly outsourced, which will lower costs and increase performance. Applications will be delivered to end-users much faster than they are today and information workers will be able to connect to their applications over any infrastructure, using any device, whether it be a phone, a PDA or netbooks.

Always wear a raincoat

Middleton warns that organisations that sign up for true cloud computing will be giving cloud providers the keys to their kingdom to run parts of their infrastructure.

Assess the ability of the cloud provider to deliver on their promises and fulfil your business requirements. The chosen cloud provider must also be able to meet your pricing and operational requirement SLAs. Assess their terms and conditions for risks. Determine whether your organisation will be able to continue working during outages, as well as how the cloud provider mitigates outages.

Carefully evaluate service providers from a technical, commercial and service level point of view, and keep options open for the possibility of using multiple cloud providers. Outsource computing to multiple clouds to avoid vendor lock-in and to optimise specific clouds for certain types of computing tasks, such as mission-critical financial applications.

Finally, cloud computing is more than a buzzword and it is set to transform the business landscape in the next decade. As with any new technology, organisations need to approach it with caution. So, while the industry is maturing, do not get caught in the rain. Start preparing the building blocks to ensure that you can plug into the clouds when cloud computing reaches mainstream status.

Cloud computing models defined

Traditional CPE (customer premise equipment) model: Applications and servers are owned and managed by the organisation and are hosted at their own data centre premises.

Hosted model (co-location): Applications and servers move from an organisation's premises to a third-party owned data centre. The assets are owned and managed by the organisation.

Fully hosted model: An organisation buys a license and runs applications on a service provider's hardware. Note that the hardware is still 'dedicated' to the organisation.

Private cloud models: Large enterprises build a 'corporate cloud' and run a shared service model across their business units with a more dynamic allocation of resources to optimise usage.

Public cloud models: Organisations utilise third-party cloud platforms that deliver dynamically provisioned software and servers computing resources and are billed on a utility basis.

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What Cisco's Unified Computing System really means

Cisco's latest offering promises to shape the data centre of the future and change the way organisations compute. The question everyone is asking: how will the Unified Computing System impact the IT organisations of today?

Cisco recently launched its Unified Computing System (UCS), a computing architecture that heralds a new era in next generation data centre design. Statements released by the vendor indicate that the value proposition of the UCS technology lies in that it unifies network, computing, storage access and virtualisation into a cohesive system.

The UCS announcement caused an uproar in the media, largely because Cisco, a staunch networking player, has broadened its data centre product set to include a blade server computing solution. At the time of *Précis* going to press, more specific product details are yet to be released. UCS is not expected to be generally available until late May in North America and Europe, with availability in other countries anticipated later in the year.

To give readers a preview of what to expect, *Précis* interviewed Greg Bowden, Group Vice President, Data Centre and Storage Solutions, at Dimension Data for a view of the announcement from a systems integrator's perspective,

UCS was launched in March and received rave reviews from (some) partners, analysts and the IT

community in general. It is even viewed by some as 'revolutionary'. Why the hype?

UCS breaks down the traditional barriers between the networking and computing environment in the data centre to provide a more responsive IT infrastructure. This is where the market is going and Cisco wants to be in the driving seat.

UCS's benefits read like the wish list of today's CIOs. In a nutshell, UCS provides a world-class platform for virtualisation; a level of network integration that provides end-to-end network management and security; and it also reduces the amount of cabling and connectivity requirements traditionally needed today. Importantly, it will allow organisations to provision services more rapidly than before. But what will organisations need to do to take advantage of UCS? Will they need to rip out and replace their entire infrastructures?

Not at all. UCS can be deployed alongside existing virtualised platforms. UCS will, however, drive clients to look at how they architect their data centre of tomorrow. They will need to look at their overall IT infrastructure and how they provision and manage their virtual infrastructure. As

an example, organisations will want to look at unified fabric as a way of delivering both traditional network and storage network services in their data centres. These architecture and organisational changes come with a range of benefits, from lower Capex costs, increased scalability, and improved management, to name a few.

UCS brings the elements of the network, compute layer, the storage infrastructure and virtualisation all together into a single platform. What is the best way for organisations to adopt UCS?

Decision-makers should spend time understanding how the solution can benefit their particular IT organisation. Importantly, it is best to have representation from the network, storage, server and operations teams to ensure the benefits and the integration process is understood by all. A good way to start is to choose a specific solution area, such as a particular business application and conduct a pilot.

What type of applications would typically run on UCS?

Most, if not all applications can benefit from Cisco's UCS. Firstly, UCS is a great platform to enable organisations to adopt much higher levels of virtualisation than ever before. Given its large memory, the next generation Intel processor and large input / output (I/O) bandwidth, it is also well designed for business applications such as database messaging and financial applications.

With UCS we will see better network and computing virtualisation and storage integration than has existed in the past. This naturally assumes that specialist skills are required for integration of the technologies?

UCS will require a variety of different skills sets to implement, as well as co-ordination of teams within a client environment that are traditionally siloed, i.e. the storage, network, computing teams will need to work together in a spirit of co-operation. Organisations need to understand how UCS will impact their IT operations and lower their costs. In many instances, organisations will need to call upon an external party such as Dimension Data, with skills across the IT spectrum, to help align the structures within the IT organisation to enable UCS.

Many of Cisco's partners did backward somersaults when UCS was announced. HP and IBM come to mind, as they have existing way-based computing systems with which Cisco will compete. In fact, IBM and HP have already responded to Cisco's entry into the marketplace with new and bundled offerings. To bring UCS to life, however, Cisco has formed closer alliances with the likes of VMware, EMC, APC and Microsoft. How will these partnerships benefit the platform?

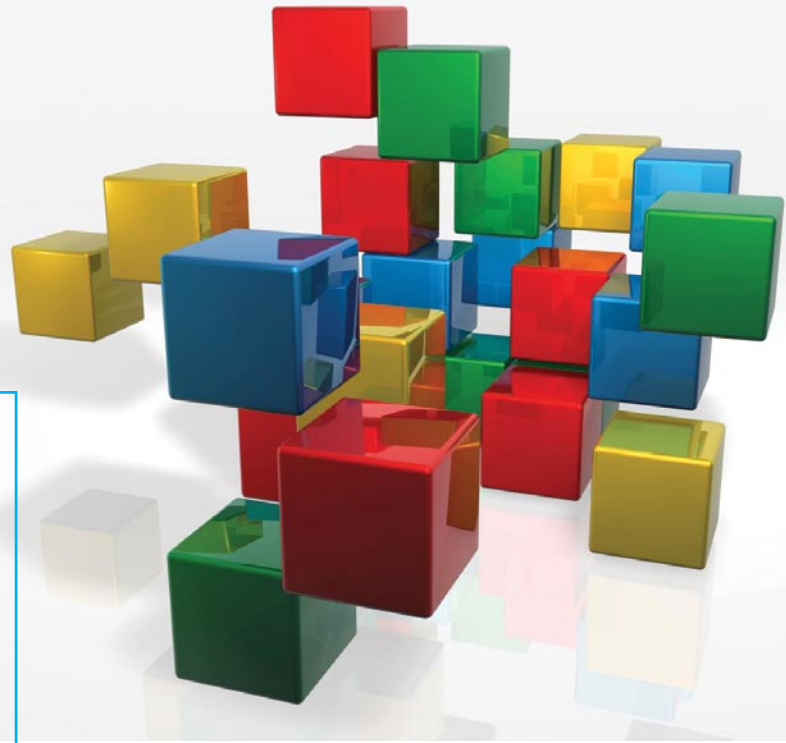
EMC is a leader in storage and has already aggressively adopted the unified fabric, which is a key element of UCS. VMware is critical for the UCS ecosystem as it promises to 'unleash the power of virtualisation'. APC will provide the power and cooling solutions required for the next generation data centre, and Microsoft will provide not only hypervisor technology, but also the operating system and messaging, database and management applications. Dimension Data already has strong relationships with all these partners ... and the know-how to integrate the various technologies.

Cisco is venturing into new data centre territory with UCS as it is best known as a networking company. What makes the organisation qualified to take UCS to market?

It is important to understand that with UCS, Cisco is not just introducing another server platform or typical computing layer infrastructure, in which case you could say that it doesn't have the experience to compete with HP and IBM. UCS is a unified computing platform of which the network and virtualisation are key elements. Cisco has strengths in both these areas.

Most, if not all applications can benefit from Cisco's UCS.

Virtualisation touches everything



The driving force behind the uptake of virtualisation has largely focused on consolidation, containment as well as the potential cost savings and 'green' IT benefits it brings. Other drivers are now emerging: virtualisation can improve business agility, assist in disaster recovery preparations and also has unique characteristics to position organisations for cloud and utility computing.

Consolidating the masses

Virtualisation became a hot topic of conversation about two years ago, owing to the benefits it brings in terms of server consolidation and containment. Virtualisation enables organisations to consolidate and control the explosion in growth of their open system servers, primarily Windows servers.

While travelling down the server virtualisation path, organisations soon discovered the inherent cost savings that could be achieved from using virtualisation, as well as its environmental benefits.

There are four costs associated with a physical device or server, namely: the cost of the box; maintenance on the box; the cost per square metre to house the box; and the cost of power to run and cool the box. For each physical box removed, these costs 'evaporate' in total or to some degree.

Take for example a Dimension Data client who recently embarked on a large-scale server consolidation project. The company started with 1,000 servers and, after consolidation, had successfully whittled this number down

to just 80 virtualised servers. The hardware cost saving from that project amounted to close on \$6,000 for each server removed from the data centre!

What's more, after removing the servers from the data centre the company's environmental costs had decreased dramatically. Thanks to the consolidation exercise, for every application the company starts running on a virtual machine, it is saving close to \$1,700 in power and cooling and \$400 plus in real estate on a three-year basis. So overall, the company is saving more than \$8,000 over three years for every application that it starts running in a virtual machine. The reality is that the bigger the environment, the greater the savings.

Cheaper disasters

Another advantage of virtualisation is that it can dramatically simplify disaster recovery. In the open systems world, traditional disaster recovery typically involves a string of servers: a single production server and an exact mirror in the disaster recovery centre ... which also implies duplicate costs.

Moreover, setting up a cluster is a complex and costly exercise that could take hours of a skilled administrator's time. Also, when setting up this fragile environment, organisations have no guarantee that it will perform as expected.

With virtualisation, organisations are no longer bound to expensive clustering software. By using site recovery tools from virtualisation software providers, it becomes easy to set up software so that the systems can detect an application failure and redirect to another location.

One-to-one correspondence between the production and disaster recovery hardware is also no longer a necessity, which means that less expensive equipment can be used in the disaster recovery facility (and less of it) to cover more applications.

Preparing for the new age in computing

There is much hype about and an increasing interest from IT in cloud computing, not so much around software as a service (SaaS), which has been around for more than eight years and is an aspect of cloud computing, but more around moving enterprise applications into the cloud.

Although this concept is still in its infancy stages, virtualisation will help organisations better leverage cloud computing. With virtualisation, the application stack is freed from physical limitations and IT may become much more responsive to changing business demands. Organisations are then in a position to move applications between internal and external clouds and can reap the benefits of an agile computing platform that moves applications easily between data centres electronically.

At the same time, virtualisation will also allow organisations to draw on a third-party hosting provider's cloud and only utilise resources as and when needed, for example, for peak workload capacity or disaster recovery management or to support the growth of the business.

Cisco recently launched its Unified Computing System, which provides a platform that becomes a physical foundation for the virtual infrastructure. Cisco says that its Unified Computing System delivers on the promise of virtualisation with "an architecture that bridges the silos in the data centre into one unified architecture using industry standard technologies".

This new product incorporates many technology enhancements which create an improved platform for virtual-

47% of organisations are involved in some kind of virtualisation exercise.

server infrastructure: Large memory footprint enables dense virtual machine integration, a stateless computing platform for easier virtual machine mobility, and consolidated high-speed networking to enable storage access. The administration interface is also designed to facilitate multiple operational teams: network, server, and storage.

Reality hits hard

David Cottingham, Director for Data Centre and Storage solutions at Dimension Data, warns that regardless of an organisation's business drivers for virtualisation, it's imperative that it plans strategically for the deployment, as a move to virtualisation 'touches everything' in the infrastructure – security, networking, backup and recovery, operational procedures, and so on.

Research indicates that 47% of organisations are involved in some kind of virtualisation exercise. Cottingham says that from his experience, only half of these companies are fully realising the benefits of virtualisation as they lack an understanding of how virtualisation is changing their business. For example, virtualisation has an effect on backups and, rather than preventing disaster recovery issues, organisations often create roadblocks that inhibit data protection.

There is no doubt that although virtualisation results in tangible benefits, its deployment and management could be complex. Companies often call on the assistance of virtualisation experts in order to ensure that they maximise the benefits that these technologies can offer. Choose a systems integrator that has experience in creating virtualisation roadmaps and solving virtualisation-related problems, as this is one journey that organisations cannot afford to travel alone.

Virtualisation a pervasive solution in an increasingly complex world

Précis recently spoke to Dr Stephen Herrod, Chief Technology Officer at VMware for his perspectives on the continued interest in and adoption of virtualisation technologies.



Virtualisation technologies are becoming increasingly pervasive in enterprises of all kinds.

Dr Stephen Herrod is Chief Technology Officer at VMware. Stephen formed part of the research team at Stanford University that led to the founding of VMware and has now been with the company for eight years. Stephen's role includes directing the overarching technical strategy for the company's three main business areas – the data centre, desktop and cloud computing. He is also responsible for driving VMware's collaboration with customers and partners as well as the company's technical strategy around product development.

In your opinion, to what extent do we operate in a virtualised world today? Where would you place virtualisation in terms of the market maturity curve?

From a virtualisation perspective we've moved incredibly rapidly from testing and development into production. Today we have more than 130,000 enterprise customers, and over 75% of them report that they are using VMware virtualisation in production (rather than pilot or test sites) in their operations. Virtualisation technologies are becoming increasingly pervasive in enterprises of all kinds and we have customers that are currently running over 10,000 virtual machines.

It is also interesting that many of our customers have implemented a 'virtualisation-first' policy. Back in the early days when we started VMware, one typically had to get special permission from the IT department to use a virtual machine. Today, in these organisations, the opposite applies – due to the cost and administrative issues associated with physical machines, one has to apply for special permission to not make use of a virtual machine. So I would say we are now at the point where virtualisation is moving very much in the mainstream and becoming the default for a large number of enterprises. If I had to plot virtualisation on the market maturity curve, I would estimate we're probably in the early-to-late majority phase.

Is the adoption of a 'virtualisation-first' approach amongst organisations today confined to the data centre or is it more widely spread?

While traditionally most of the focus has been on the data centre, there is also a large and rapidly-growing market in the virtualised desktop domain. In fact, at VMware we have been working in the desktop area even longer than in the data centre, but in terms of the delivery of virtual enterprise desktops, we are a lot earlier on the adoption curve. From VMware's perspective, the realm of the data centre actually extends to anyone running servers and our customer base includes a number of small and medium-size businesses which don't necessarily have a traditional data centre, as well as organisations which operate remote and branch offices. So overall, we're seeing growth in all areas of business where desktops and servers exist.

Apart from the cost savings associated with virtualisation, what are the other key drivers that have allowed it to become so widely-accepted and now make it almost the 'obvious' route to take?

In the early days, the drivers were primarily around avoiding capital expenditure in the data centre. It was very easy to do calculations that demonstrated costs savings, for example, by eliminating the need to buy X number of servers or spending X dollars a year on air conditioning systems. However, over the last 18 months or so the focus has shifted towards tying the case for virtualisation to more strategic values. For example, you can achieve much higher levels of availability of applications through virtualising, and disaster recovery also becomes a lot easier ... so overall, the business continuity benefits are compelling. Customers are

also finding that they can achieve higher levels of security in a virtualised environment as well.

And what's also interesting is that from a cost-savings perspective, the focus has shifted away from capital expenditure and more onto operational expenditure. This relates to the fact that it is possible to automate more of your operations and manage virtual machines a lot more efficiently than you can manage physical hardware. We do a regular survey with our customers, and they report that in the physical world, a typical administrator is able to manage between 30 and 75 workloads. Once they move to VMware, the same administrators report managing between 90 and 225 workloads.

What are some of the implications associated with moving in the direction of virtualised architectures? What are some of the things that companies now need to think differently about?

Many of the changes associated with virtualisation relate to the way IT departments are organised and somewhat of a psychological tie to the way things have traditionally worked. Firstly, people have become accustomed to there being a one-to-one correlation between applications and

The focus has shifted away from capital expenditure and more onto operational expenditure.

servers. What virtualisation has done is to break the bonds between applications and discrete servers. This has required some degree of cultural shift in order to get people to accept that this can and should be the case, as well as some management tool updates.

Secondly, the different areas that make up a corporate IT department – for example, the server, storage and networking teams – have traditionally operated in a very siloed fashion. Virtualisation creates a very fluid data centre and that fluidity means that different groups need to co-ordinate their activities more closely than they did in the past.

So virtualisation brings about changes in the way companies need to organise people – does it imply any significant changes from a strategic perspective?

Virtualisation has introduced the notion of a ‘strategic data centre architecture’. Essentially what it has allowed companies to do is use less of their time and budget on ‘keeping the lights on’ ... something that traditionally has consumed up to 70% of IT budgets ... and focus more on developing new applications and the differentiated value for the company. It’s also had a huge impact on business agility and the speed at which organisations can move forward. A great example is provisioning a server. Today, when companies provision a physical server, it can take up to six weeks from the time the server is requested until it is plugged into a rack, certified and tested. With virtualisation this can all be done in a matter of minutes. This has in turn accelerated business decisions, which is important at a strategic level.

Where to next with virtualisation? What about the further reaches of cloud computing?

There’s a lot of hype around cloud computing but really what it’s all about is efficiency and scalability and enabling organisations to pay according their usage. VMware has just launched our fourth generation of virtualisation technology called ‘vSphere’. We’re calling it the first cloud operating system that allows organisations to bring cloud computing to the enterprise and create ‘private clouds’, over which they can exercise substantial control. We believe this technology is especially significant in that it does not require that organisations re-write their applications, which up until now has been a requirement of cloud offerings.

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We also anticipate that virtual desktops will become extremely prevalent within the next 18 months or so and ultimately we see virtualisation becoming a mainstay of the desktop. This will be fuelled by the fact that the cost of operating traditional desktops has become very high and, in an increasingly mobile world, it’s hard to keep your data secure. Virtualisation is designed to solve these problems.

Cisco recently announced the launch of its Unified Computing Strategy (UCS). What are your views on this and other technology moves that IT vendors are making in the virtualisation space?

The amount of work that hardware vendors across the board have been doing to make virtualisation run better is very encouraging. The same holds true for companies who are developing virtualisation management tools. Across the entire vendor ecosystem it’s clear that everyone is accepting that virtualisation is here to stay and that going forward it is going to be the ‘way that things are done’.

It’s both humbling and amazingly exciting to consider where we are today versus where we were just a few years ago. It’s testament to the growing recognition that virtualisation is a good thing because it breaks apart bonds and barriers that don’t really need to be there. This in turn simplifies IT, which is what we all need right now. In short, it’s a pervasive solution in an increasingly complex world.

Virtualise, securely



Although virtual systems are not immune to harmful attacks, virtualisation opens up a world of opportunities for changing the way organisations build secure infrastructures.

While organisations realise the benefits of a virtualised world, they often neglect to consider the security implications. Virtualisation, by nature, facilitates a ‘fluid’ rather than a ‘static’ environment, often with an explosion of virtual machines across the enterprise. In this virtual reality, the age-old proverb, ‘out of sight, out of mind’ is apt, as IT personnel often forget to secure what they cannot see.

The virtualised world is no more resistant to security vulnerabilities than a traditional physical environment. The same challenges that plague physical environments also target the virtual world. Classic examples include mis-configurations, unsecured accounts and missing patches, all of which leave the door open to security vulnerabilities.

Securing the virtual world

While in theory it is possible for vulnerabilities to be exploited on virtual machines running on a hosted server, the threats against the virtual server are no different than potential attacks against a physical server environment. The same principles and best practices of security in the traditional physical environment apply to the virtual world.

Vulnerabilities in the physical environment need to be addressed prior to a virtualisation deployment, as these can cross over to the virtual world. Moreover, organisations

need to apply the same processes, policies and procedures of their physical environment to virtual systems to ensure protection, i.e. apply the same tools and processes to limit mis-configuration and address patch management.

Jonas Thulin, Chief Technology Officer for Security Solutions at Dimension Data, says that security best practices should be incorporated from the start, for example, in the lifecycle of virtual systems: from building and deploying a virtual machine to managing it and, finally, moving it out of production.

It is also recommended that organisations assess their current environment and plan virtualisation and security together. A ‘readiness assessment’ can provide an organisation with the knowledge needed to determine the magnitude of the impact that virtual technology will have on the environment. Such an assessment should also identify virtualisation security weaknesses and review best practices for people, process and technology.

When Dimension Data works with clients to understand their virtualisation needs, it incorporates security as part of a larger virtualisation assessment. The assessment investigates servers, storage and backup network facilities, as well as security, before recommending an architecture for virtualisation and consolidation.

Chief Technology Officer of Dimension Data in Australia, Gerard Florian, adds that cross-skilling of IT staff is essential, as virtualisation impacts various operational areas of the organisation, as well as the infrastructure and not only the data centre. "IT staff need an understanding of how the virtualised environment operates, to ensure that the entire eco-system is protected."

Solving security problems virtually

While virtualisation can add to complexities, it can also help organisations to solve security challenges at the same time. At a basic level, virtualisation allows for stronger protection of high-risk resources as it 'separates' programme resources and content. Separate hardware allocation and management of application interfaces of a trustable code base, allow for stronger protection of resources.

In addition, virtualisation technology offers unprecedented visibility into machine resources, providing new ways of strengthening security. Today's security solutions face a growing problem in that protection engines on the network do not get complete visibility into operating systems and applications. On the other hand, security tools running on the host operating system run in the same context as the malware they are protecting against. Virtualisation technology allows security engines to run separately from the hosted operating system, while being able to view all interaction previously unavailable, such as CPU, memory and network traffic.

Technology today has evolved to a level where protecting a virtual environment is easier than securing a physical world. However, it is important to involve security specialists from the outset in the planning phases of a virtualisation project. Experts with the appropriate skills can assess an organisation's current infrastructure and assist with the best deployment technologies.

Thulin concludes, "Security should never be an afterthought, because unlike other disruptive technologies, organisations can leverage virtualisation to enhance their security posture."

Explore the world of VDIs

Virtual Desktop Infrastructures (VDIs) are gaining momentum in the industry. The concept of a VDI is simple. Desktop environments and applications are hosted in the corporate data centre where they can be controlled and managed centrally, reducing costs associated with a traditional distributed model. End-users access virtual desktops remotely from a thin client.

VDIs address a major business issue as they provide support in remote locations as opposed to contractors bringing their machines into the organisation. This in turn avoids security breaches, i.e. at cash registers or bank tellers.

By nature, VDIs also hold other security benefits. A VDI requires a single image for the virtual machines that reside on a central server. Any updates, patches or signatures are applied to a single image only, and do not require the IT team to distribute the changes over the network to many machines, resulting in significant benefits in terms of change management and security.

Any changes attempted by the end-user to the virtual image, such as installing malicious software, will be null and void when the machine reboots as it always goes back to the base.

Virtualisation
technology offers
unprecedented
visibility into
machine resources,
providing new ways
of strengthening
security.

Mitigating the painpoints of virtual services operations

Deploying virtualisation can provide an interesting mix of benefits and liabilities. Despite its well-documented advantages, operating critical applications on virtual infrastructure brings a whole new set of considerations and challenges from an operations management perspective.

Given the imminent mainstream adoption of virtualisation, the importance of focusing attention on how one manages and integrates the management of virtual infrastructures into the overall operations centre cannot be underestimated. In this article, we'll consider some of the potential challenges virtualisation presents to IT operations during its pursuit to deliver quality IT services as well as the tactics and tools that are available to mitigate them.

Virtualisation — a technique for hiding the physical characteristics of computing resources from the way in

which other systems, applications, or end-users interact with those resources — is changing the way IT is delivering business benefits.

Today, most organisations are deploying virtualisation enthusiastically in order to realise the significant business benefits it promises, such as improved business continuity, faster software development, increased business agility, less downtime, and significant cost savings.

The downside

Because virtualisation fundamentally changes the architecture and processing structure of information technology, it can also bring with it some significant management challenges. To start with, there is added complexity. Now, in addition to physical servers, IT operations must contend with multiple virtual machines per physical server and their required resources, not to mention keeping track of resource pool constraints across multiple physical servers.

There is no way to ignore these issues, and it is inefficient and potentially detrimental to deal with virtualisation separately from one's existing infrastructure. This poses a fundamental question that CIOs need to address: How should I manage these new virtual systems as a part of my complete infrastructure, to make sure I can deliver and maintain high value IT services to my business users?

First, let's take a closer look at some of the overarching challenges virtualisation thrusts upon IT operations:



Organisational ownership and structure

Because virtualisation cuts through traditional organisational ownership and IT support structures, it mandates that parts of the organisation that were previously siloed – typically business units or technical domains – work together in a collaborative manner. Challenges may also arise due to the fact that the direct, one-to-one ownership of a ‘business service to infrastructure to business owner’ is now broken. And when problems occur, who is responsible for solving them? Accounting and chargeback also presents new challenges for virtual resources. While many organisations have well established chargeback policies for physical resources, the same cannot be said for virtual resource management. In virtualised environments, applications no longer run on dedicated hardware resources, and servers are no longer deployed on dedicated hardware elements.

According to Mark Van Bavel, who heads up Operations Management at Dimension Data globally, to effectively manage a virtual infrastructure, it’s critical that existing silos are broken down and that the virtual IT infrastructure is treated as a company-wide infrastructure, possibly with usage-based charge back systems. “New mechanisms for allocating resources also need to be considered. Importantly, companies need to ensure they put in place an integrated operations centre in order to manage their IT infrastructure from end-to-end,” he adds.

Understanding the business impact – infrastructure in motion

The increasingly dynamic nature of virtualisation is not without its drawbacks. While virtualisation’s advantages include the ability to manually shift ‘live’ virtual machines between physical servers and have them automatically moved in response to resource needs or physical server problems ... in many ways this presents a double-edged sword. How can you monitor and manage something if you don’t even know where it physically resides?

Fault isolation and mean time to restore and repair is heavily dependent on one’s ability to measure symptoms in order to deduce the root cause. Virtualisation introduces additional levels of abstraction which need to be tracked in real-time, in order to understand the relationships between the end IT business service and the actual infrastructure.

To prevent these problems spiralling out of control, you’ll need a configuration management database (CMDB) for your IT estate, together with an IT service catalogue that maps the business services to the IT infrastructure. This will go some way to help you understand the additional levels of abstraction, and to deduce the root cause of a service impacting failure. However, it’s unlikely to provide a comprehensive solution, given the non-static nature of virtual infrastructures – it may also be worthwhile considering additional tools that allow you to monitor or discover changes, and integrate them back to the CMDB. These tools include deep packet application-aware inspection tools as well as ‘integrated element managers’, which facilitate the publishing of virtual topology onto other systems.

Virtual machine sprawl

The role of IT service delivery team is to quickly and efficiently provision systems into service in response to changing business needs. Virtualisation adds the challenge of being able to quickly and efficiently provision virtual machines perhaps a bit too easily. You want to be responsive to changing business needs; you may even want to put control of virtual machine deployment in the hands of the department whose business function it specifically provides but what havoc might that wreak upon your infrastructure? Once you have established templates, or by making use of virtual machine cloning, controlling virtual machine provisioning can become a matter of concern. If the decision has been made to let a business unit provision its own virtual machines, it may ultimately become a thorn in the side of the IT operations team. Neil Louw, Dimension Data’s Chief Technology Officer, Europe cautions that lack of adequate rules and procedures around server provisioning can also translate into significant

The increasingly dynamic nature of virtualisation is not without its drawbacks.

unplanned costs. “Our view is that concerns relating to unrestrained virtual machine provisioning leading to chaos in IT operations due to virtual sprawl should be addressed via process and sound governance. Many clients recognise the importance of wrapping a process around provisioning and engage with Dimension Data to help them put in place a sound governance framework to control server provisioning within the enterprise”.

There are also a number of vendor tools available that incorporate an ‘approval’ step prior to a virtual machine being provisioned. With these tools you can effectively allow a business unit to manage the lifecycle of its own virtual machines, within the resource constraints defined by IT operations, without the fear of virtual sprawl running amok.

Compliance conundrums

CIOs overseeing their organisations’ transition to a virtual environment need to be vigilant that these initiatives do not compromise the organisation from a license management and compliance perspective. “Before moving forward with a virtualisation initiative, be sure to establish to what extent the company’s license agreement terms will be affected. Multiple, and easy to start, virtual machines - which can circumvent license locking mechanisms - will quickly breach your enterprise or ‘right to use’ (RTU) license agreements, if not kept in check,” cautions Van Bavel. “Another important consideration is whether your applications are certified to run on a virtual infrastructure, and how this may affect any support agreements you have for commercial applications. Companies need to implement mature change and release management processes and disciplines to prevent the virtual environment spiralling out of control from a compliance perspective. There are a number of useful tools available in the market that provide automated and controlled configuration, change and compliance management, which can enforce behaviour change while at the same time eliminating errors made in provisioning,” he adds.

It’s also not uncommon for virtualisation initiatives to founder if the organisation has not thoroughly researched and understood relevant country-specific legislation. Multinational corporations, particularly in the financial services industry, need to take into account laws that exist in certain countries around information management ... which may include the requirement that certain data not be moved beyond a

Before moving forward with a virtualisation initiative, be sure to establish to what extent the company’s license agreement terms will be affected.

country’s borders. This can potentially cause problems, for example if multiple branch office servers are consolidated to a central server situated in another geographical location.

Avoid availability, capacity and application performance headaches

In the virtual world, application performance and capacity issues are decoupled from the performance and capacity of the infrastructure itself...making application performance optimisation a potential challenge. Ensuring that the architecture changes and hardware bottlenecks flowing from better physical resource utilisation don’t drag down the overall performance of the business application, calls for performance baselining, at various levels. Ongoing application performance management in the form of active testing and passive observation is also a good idea, as it will ensure that the IT team is alerted to any signs of performance degradation early – and well before end-users are affected.

Capacity Management is another area that needs a slightly different approach in virtualised environments. Virtualisation provides for ‘on demand computing’, especially in cloud-based service architectures. The ability to effectively manage this ‘burst’ in capacity utilisation needs to be carefully modelled and correctly provisioned.

Virtualisation means there is an increased utilisation, and hence dependency, on hardware availability. “A well-designed solution will use the virtualisation capabilities of failover and high availability to mitigate this risk, however, because you are utilising infrastructure to a much higher capacity, the overall ‘headroom’ to take on more work

decreases,” explains Van Bavel. “In order to ensure availability and consistent performance of IT services, organisations need to be sure to put in place the right tools and processes to ensure that problems are detected and isolated far more quickly”.

Securing the invisible*

Security-related challenges can potentially arise with a move to server virtualisation. Security management is no longer about securing physical assets. Virtual hard disks, for example, could easily be copied to removable media and removed from a building without detection. Organisations now need to be a lot more vigilant in tracking and auditing access to virtual hard disks. “Companies need to be careful not to let security fall off the radar in virtualised environments.” says Darren Augi, vice president of IT at Dimension Data Americas. “Be sure to take pro-active measures to mitigate any vulnerabilities, for example by segmenting resources and keeping internet-facing servers separate from corporate servers.”

Given the myriad of challenges and potential pitfalls associated with virtual operations, what can IT decision-makers do to address them in a pro-active manner?

Virtualisation planning: never too much

The key to successful implementation and operation of virtual IT infrastructures lies in the planning. Plan and then plan some more. The objective is to explicitly define the expectation for the technology and assign the parameters in which the virtual environment is to perform. Remember that determining how server virtualisation will affect your network administration and automation procedures is not a simple task. Whether you’re designing an enterprise-wide virtualisation deployment or isolating adoption for select systems, a different approach is required from almost every perspective of infrastructure management.

According to Louw, “The importance of pro-active planning should not be underestimated. Without it, the virtual environment can quickly become an unmanageable problem rather than a powerful and enabling environment,” he says. In addition to sound planning, another critical success factor

for operations’ success over time is process management, that is, establishing a discipline of documenting how things should be done ... as well as what actually does get done. Engaging with an external service provider with the skills and experience in the virtualisation domain is highly advisable. These partners can work with you to plan an entire virtualisation initiative and undertake a detailed analysis of your entire environment taking into account not only workload constraints but technical, business and legal constraints as well.

According to Augi, when planning a virtualisation initiative it is important not just to understand the infrastructure requirements for the present, but also to accurately predict how the architecture will accommodate future growth. “It’s critical to build an environment that has the capacity to scale to meet the business’ future needs. You have to plan for the future from day one. Memory and CPU capacity are particularly important and organisations should ideally select the most powerful hardware that they can afford.” While the need for physical servers will never disappear entirely, Augi estimates that today around 90% of physical servers are potential candidates for virtualisation.

If it ain’t broke, fix it

Virtualisation offers far too many benefits (consolidation, improved availability, and system portability, to name a few) to be ignored. Even if IT operations are running well in a purely physical world, virtualisation’s benefits are far too valuable to be overlooked. Ultimately, organisations that add agility through virtualisation will see a competitive advantage over those that don’t. While significant management challenges are brought about by adopting virtualisation, keep in mind that solutions exist for each virtualisation management challenge. Also remember, you don’t have to go down this road alone... help is at hand in the form of specialist IT service providers who have years of experience in addressing the common painpoints associated with virtualisation initiatives, on both a small and large scale. Planning for and taking on each challenge armed with the right information is a sensible way to realise the benefits of the virtual infrastructure, improve IT agility, and retain your sanity.

* Further discussion on the topic of securing virtualised environments can be found in our article ‘Virtualise, Securely’ on page 14.

Going Virtual?

Ensure your network is ready with Performance Optimisation

Virtualisation and consolidation promises to cut IT costs, facilitate operations, drive Green IT objectives, ease compliancy requirements and increase data control. However, data centre consolidation and server and storage consolidation and centralisation dramatically affect traffic patterns – patterns that reflect the physical location of hosts and servers.

The majority of applications were not designed to be delivered over wide area networks (WANs); while protocols may previously have enjoyed unlimited bandwidth on the branch or campus network, they are now burdened by the constraints of the WAN and subject to bottlenecks and delays. Performance Optimisation can make the difference between your organisation achieving the expected success with virtualisation you had planned and sluggish application delivery, frustrated users and losses in organisational productivity.

At its most simple, Performance Optimisation is the addition of technology to a network, in order to accelerate the end-user's access to any given application. The primary objective is speed; delivering applications to users, irrespective of where the applications reside, and irrespective of where the users are connecting from, in the most efficient way possible.

The technologies fall under the broad categories of WAN optimisation and application acceleration and delivery. WAN optimisation features compression, data reduction and caching, traffic management and load balancing techniques, which improve link and bandwidth utilisation. Acceleration techniques improve the performance of applications by addressing the shortcomings of protocols and adapting the way data is delivered.

Building the business case

Performance optimisation technologies have a strong return on investment that is relatively easy to quantify. To illustrate the general principles of building a business case for the technology, here we look at the particulars for ACME, a fictitious - but typical - organisation.



The assumptions used to calculate ROI are:

- A T1 link costs \$400 per month.
 - A T3 link costs \$9,000 per month.
 - Average server cost of \$5,000 and server software licences of \$1,000 per server, per year.
 - Typical hardware maintenance cost at 15% of hardware purchase price per annum.
 - Leading industry analysts predict a 30% growth in bandwidth usage per year, but a reduction of 12% in bandwidth service costs. This amounts to a net growth of WAN bandwidth costs of 18% per year.
 - Each help desk support ticket costs an average \$100.
 - Fully loaded average salary costs for an employee is \$100 per hour.
 - Productivity lost due to poor network performance is up to 24 hours per employee per year, as per the Network Performance Frustration Research Report¹.
 - Conservatively assume a ten times improvement in WAN performance with WAN Optimisation technology installed. Provisioned in minutes from pre-built templates.
- ACME has operations in the United States, Europe and Asia-Pacific regions.
 - ACME has three regional headquarters with 400 employees, and 60 branch offices with 600 employees, giving a complete company headcount of 1,000 employees.
 - There are six data centres servicing ACME – two in each region – linked by T3 (45Mbps) leased lines for disaster recovery.

By reducing bandwidth usage, a business can decommission or downgrade a link or defer an upgrade for a longer time, without impairing application performance.

Adding up the direct savings

1. Bandwidth cost savings

IT managers are faced with a dichotomy: how to provide end-users with the speedy access to applications that they demand without purchasing more bandwidth and upgrading the organisation's WAN links. There are inherent limitations associated with WANs; latency occurs over long geographic distances and network congestion can lead to packet loss. Modern 'chatty' traffic patterns can cause slow application response even when bandwidth is not fully utilised, making further bandwidth purchases an unnecessary expense.

Optimisation solutions, including bandwidth management and allocation, compression and caching, and WAN link acceleration can realise significant savings for an organisation. By reducing bandwidth usage, a business can decommission or downgrade a link or defer an upgrade for a longer time, without impairing application performance.

- ACME has 16 T3 links between HQ offices, main branch offices and DR Data Centres, and 50 links for their smaller branch offices.
- This equates to \$1.97 million per year in bandwidth costs.
- Based on the analyst prediction of a nett increase in bandwidth costs of 18% annually, which translates to \$354,240 for ACME this year, performance optimisation would enable ACME to defer these upgrade costs and therefore realise near-term savings of that amount.

¹ Network Performance Frustration Research Report, July 2008. Commissioned by Dimension Data, sponsored by Blue Coat Systems and conducted by Datamonitor

2. Productivity cost savings

Performance optimisation solutions enable significant employee productivity boons. The 2008 Network Performance Frustration Research Report¹ calculated that the average user wastes as much as three days a year on network induced delays.

- For ACME, 1,000 employees wasting 24 hours per year at \$100 per hour will cost the company \$240,000.
- If performance were improved by a conservative ten times, the wasted time would be reduced to 2 hours 40 minutes per year.
- The saving of 21 hours 20 minutes at \$100 per hour across 1,000 employees would realise a saving of \$212,000 per year.

While it is possible to make costing calculations for unrealised employee time, the sunken costs of wasted application and network investment while harder to quantify, are no less important.

3. Help desk cost savings

Performance optimisation technologies dramatically reduce the amount of end-user frustrations and complaints. Fewer complaints reduce the amount of support tickets logged for performance related problems.

- The industry average cost to the company of each support ticket is \$100.
- If we assume that ACME is able to reduce their performance related tickets by at least five per week, this would result in savings of \$2,000 per month and \$24,000 per year.

In this situation, performance optimisation would improve both operational efficiency and operational expenditure.

4. Branch server cost savings

WAN Optimisation technology allows branch servers to be moved into central data centres, while the WAN optimisation

controller (WOC) device itself provides important branch level services. This allows servers to be redeployed for other uses and negates the need for the renewal of branch server software licences. Similarly, hardware maintenance on these servers will no longer need to be renewed annually. Furthermore, the capital cost for rolling out new branches is reduced providing the business with more flexibility when expanding their business.

- The average software licence renewal cost is \$1,000 per server.
- ACME will be able to take out the servers from their 50 smaller branches, resulting in software licence cost savings of \$50,000.
- Typical hardware maintenance is 15% of hardware purchase price per annum. This would also provide savings of \$750 per server in hardware maintenance, totalling \$37,500 for the 50 servers per year.

Total savings

As a direct result of implementing performance optimisation technologies, ACME will save a total of \$640,240 per year. A WAN Optimisation solution for ACME's headquarter sites, data centre sites and branch offices would cost around \$700,000. Consequently, ACME would be able to realise a return on investment of 13 months for this solution.

This excludes any potential indirect savings costs that would be derived from the solution. These would include a reduced cost to support remote branches due to the lower amount of IT infrastructure there, a reduced cost of deploying IT in new branches and the potential to reduce data centres and therefore significantly reduce facility costs. Additionally, reduced downtime due to faster restoration from remote DR data centres, reduced costs of rolling out new applications due to shorter troubleshooting times and the ability to effectively utilise cost saving technologies will not only save ACME money, but enable them to gain competitive advantage and accelerate their operational efficiency.

Case Study

VDIs go to WAR

There are many tangible reasons organisations choose to deploy a virtual desktop infrastructure (VDI). The benefits of centralised management, resource optimisation and the resultant reduction in hardware and maintenance costs are just a few.

A large South African bank approached Dimension Data to build the IT infrastructure for its work area recovery (WAR) site to provide up to 1,500 employees with connectivity to its backbone. Dimension Data built a VDI to enable the bank to deploy desktops within minutes to ensure that business could continue as usual.

Client overview

Our client is listed on the Johannesburg Stock Exchange and offers a complete range of banking, banking assurance and wealth management products and services. The bank has more than nine million customers, almost 8,000 automated teller machines and 37,000 permanent employees.

Business challenge

The bank signed up with a WAR service provider based in Johannesburg. To cater for the infrastructure of the WAR site, the bank's IT architecture department conducted an investigation into the solutions available in the marketplace. It recommended that a virtual PC / server environment needed to be set up to connect employees located at the WAR site with the bank's network. With VMware's virtual desktop infrastructure (VDI) it is possible to dynamically assign users a virtual desktop at any remote location, such as the WAR site, where they will have the same functionality as at their original workplace.

Quick Overview

- **Industry:** Financial Services
- **Country:** South Africa
- **Challenge:** A bank approached Dimension Data to build a virtual desktop infrastructure (VDI) for a work area recovery (WAR) site to enable employees to continue with business-critical services in the event of a major incident at one of its branches.
- **Solution:** Dimension Data used VMware virtualisation software to deploy a VDI to enable the bank's employees to connect to its backbone.
- **Results:** Employees can get complete desktop access from the WAR site. New desktops are also provisioned in minutes from pre-built templates.

Craig Hockley, General Manager for Data Centre and Storage Solutions at Dimension Data Middle East and Africa says, "Dimension Data has built close alliances with vendors, ensuring that we are empowered to facilitate virtualisation from the desktop to the data centre. Virtualisation touches many aspects of the infrastructure, and Dimension Data is able to provide organisations with unmatched competence in security, networking and backup, to name but a few."

Our solution

During phase one of the project, Dimension Data deployed a VDI solution consisting of VMware ESX 3.0 Enterprise Edition and Propero Connection Brokering software on 11 IBM x3850 servers with four dual-core 3.3 GHz Intel Xeon processors and 32 GB RAM.

By using VMware virtualisation software, Dimension Data was able to initially deploy 500 desktop virtual machines that run on Microsoft Windows XP. These desktop environments are accessed remotely from a thick or thin client via a remote desktop protocol (RDP).

“A virtual machine is like a server, but instead of electronics, it is a set of software files. Each virtual machine represents a complete system, with processors, memory, networking, storage and BIOS. A virtual machine runs operating systems and applications without any modifications just like a physical server. VDI leverages VMware and a remote control protocol such as RDP to provide users with access to a standardised remote desktop,” says Hockley.

The architecture of the WAR site spans over three distinct locations, namely the access environment located at the actual WAR site, a virtual hosting environment located at the bank’s disaster recovery site where virtual desktops are hosted, and a maintenance environment located at the bank’s head office. The maintenance environment is responsible for testing images and desktop templates prior to being deployed in the virtual hosting environment.



A virtual machine is like a server, but instead of electronics, it is a set of software files.

The WAR service supplier is providing the LAN connectivity within the WAR site in addition to WAN connectivity, which links the WAR site to the bank’s disaster recovery site.

Value added

One of the major benefits of Dimension Data’s solution is that the bank’s employees can get complete desktop access from the WAR site. New desktops can also be provisioned very quickly from the bank’s pre-built templates. “In the event of a disaster at one of its sites, the bank is now ensured of a speedy recovery. It can deploy desktops within minutes,” adds Hockley.

The VDI is also secure, as the VMware VDM software ensures that users are authenticated before they log on to the virtual machines. “Each desktop is fully isolated from other users and all the desktop virtual machines are hosted on server hardware,” explains Hockley.

Another benefit of the VDI is that it allows for centralised management. Virtual desktops are located in the data centre, which means that it is easier to make updates and maintain control of the PC fleet. The bank is also saving on hardware, power and cooling costs as its consolidated 1,500 desktops onto 26 servers.

“The consolidation ratio was 50 desktops for one machine. The reason we needed 26 servers was to cater for high availability. If one of the physical servers fail, VMware’s built-in high availability technology will have sufficient capacity to restart the desktops on the surviving servers,” concludes Hockley.

Research Notes

RIGOROUS ASSET PLANNING KEY TO KEEPING IT NETWORKS RUNNING. FAILING TO PLAN = PLANNING TO FAIL

Company managers are placing their organisations at commercial risk by failing to proactively address network asset management.

This is one of the key findings in the Network Barometer Report launched recently by Dimension Data. The Report presents the aggregate data from 152 Secure Network Infrastructure Assessments (SNIAAs) conducted by Dimension Data for organisations around the world during 2008, and provides an overview of networks' configuration, security vulnerabilities, and device lifecycle status.

According to the Report, 43% of network devices scanned had reached at least end-of-sale status, and 56% of that group was beyond either end-of-software-maintenance or last-day-of-support.

Rich Schofield, Global Business Development Manager, Network Integration at Dimension Data says, "These statistics translate to roughly a quarter of all network devices being beyond end-of-software-maintenance or last-day-of-support. Technology which is beyond end-of-sale is an ageing asset, and will become increasingly unsupportable and exposed to risk. Once the manufacturer stops providing further software maintenance, the organisation may be impacted by network availability problems and increased mean-time-to-repair – all of which cost the business in scarce resources and funds."

Additional commercial implications arise when an end-of-life device fails and must be replaced. Businesses may then have to buy expensive technology in compressed timeframes, without the customary due diligence which ought to be applied in such procurement decisions. Schofield explains: "Organisations will be pressed for time to restore

the network, and will probably not be able to negotiate the same discounts with suppliers. They may opt for like-for-like replacements or next-best alternatives. However, this could deny them the opportunity to strategically match the device's capabilities to support soon-to-be-deployed applications such as unified communications and video conferencing."

End-of-life related failures may even drive organisations to consider purchasing on the grey market. Schofield says: "At end-of-sale status, organisations will find it increasingly difficult to purchase spares and often have to resort to using grey market sources, even though the manufacturer may not support this equipment. Moreover, the black market is exploiting this situation by selling counterfeit spares via these grey market sources. Not only will these counterfeits not be supported by the manufacturer, it's unlikely they'll function as required, resulting in a complete waste of money and time."

According to Schofield, company managers who do not employ rigorous asset planning are not taking their business responsibilities seriously. "The network is a business-critical utility – almost as important as water and power," asserts Schofield. "Organisations don't ignore these utilities, yet the state of the equipment that connects their business to the outside world is often overlooked. We're not advocating an immediate replacement of end-of-life technology but it is imperative that businesses have a roadmap of which technology requires replacing down the line. Rigorous network asset planning can realise cost savings, streamline processes and improve productivity – all competitive advantages that are critical to organisations in the current economic climate."

For more information on the Dimension Data Network Barometer Report go to www.dimensiondata.com/networkbarometer

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