

# Is Your Network Ready for Desktop Virtualisation?



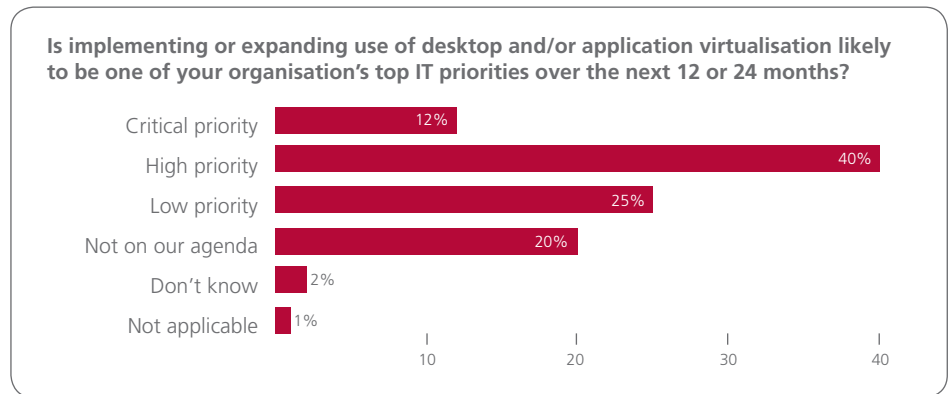
Tactics for building networks that unleash the power of new computing models

Today, a number of compelling factors are converging to propel desktop virtualisation towards mainstream adoption. These include the ever-growing pressure on businesses to support employee-owned devices, reduce costs and the longer-term vision of becoming device- and operating system-independent.

The Client Virtualisation Imperative, 2011, a commissioned study conducted by Forrester Consulting on behalf of Dimension Data, provides new insights into the global desktop virtualisation market, uncovers the principal drivers and restraints to adoption, and explores the timelines that businesses have assigned to their desktop transformation journeys. The study was conducted among 546 senior IT decision makers in 16 countries.

The study confirms that organisations across all industries and geographies are prioritising their investment in desktop virtualisation. Overall, 40% of organisations view investing in and/or implementing desktop and application virtualisation as a 'high priority', while 12% deem this an area of 'critical priority' over the next 12 to 24 months.

**Figure 1: For more than half of organisations, client virtualisation will be a critical or high priority over the next one to two years**

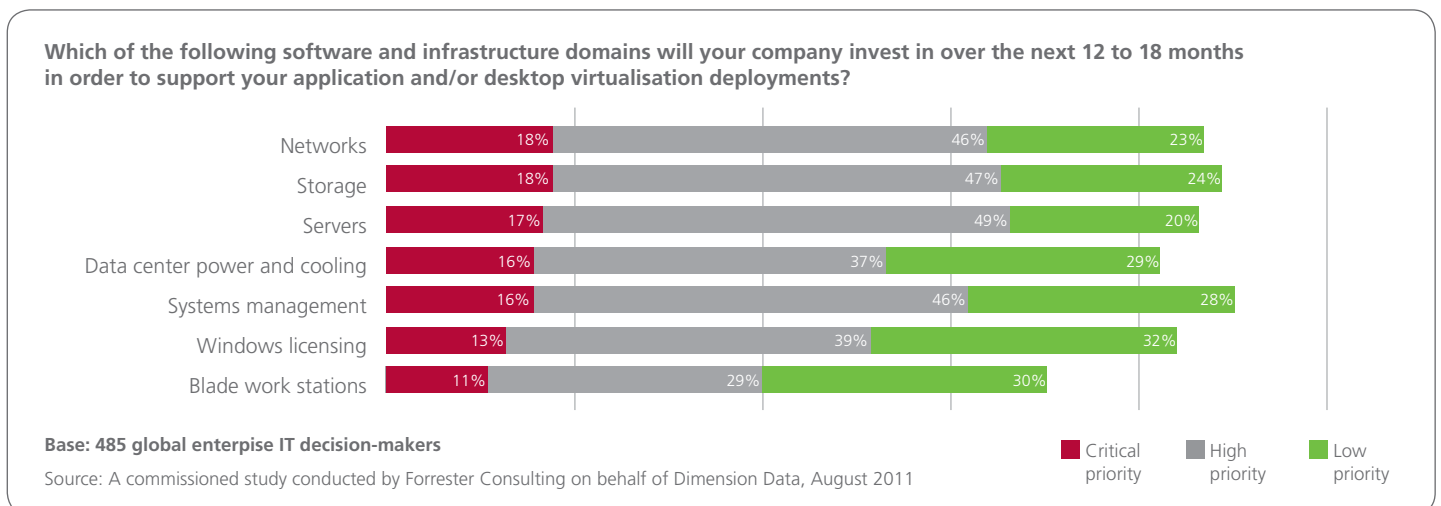


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Those setting off down the desktop virtualisation path need, however, to be mindful that such an initiative has a myriad of touchpoints beyond the desktop. Like any hosted technology, desktop virtualisation requires infrastructure upgrades across the server, storage, network and systems management environments. Fail to thoroughly assess the impact of the technology on these domains and you run the risk of your migration running into snags, thus compromising your chances of a positive return on your investment.

Of all the considerations that need to be taken into account with respect to desktop virtualisation's impact on the larger IT estate, the network is arguably the most significant. Encouragingly, the results of the study point to a high level of awareness among IT decision-makers of this reality. Two-thirds of respondents deem investment in network infrastructure to support their desktop virtualisation initiatives to be a high or critical priority over the next 12 to 18 months.

**Figure 2: Desktop virtualisation has broad implications on networking, data centre and storage environments**



## Networking – or not working?

According to Gary Middleton, Dimension Data’s (Business Development Manager), the importance of adopting a proactive stance to ensuring your network is geared to support desktop virtualisation shouldn’t be understated.

“The network is the foundation for modern business and new computing models. With data, voice, video and storage traffic all converging on network, ensuring your underlying infrastructure is braced to support these traffic volumes is essential, or business continuity will be jeopardised. A thorough assessment of, and appropriate investment in, the network is a critical first step for those who have set their sights on rolling out a desktop virtualisation solution that meets both business and end-user expectations. This will put them in a position to make informed decisions regarding the appropriate optimisation and upgrade paths that need to be followed.”

A move to desktop virtualisation ushers in a host of new architectural considerations. The major desktop virtualisation vendors – which include Citrix, Microsoft and VMware – each has different protocols, all of which must be interpreted, carried and accelerated by the network. Then there’s the issue of network capacity – does your network have the ability to support the additional traffic load? How do you optimise, prioritise and ‘mix’ the traffic flow to achieve the best possible experience? Remember, success is ultimately about user experience – your employees won’t use an application if it performs poorly, they’ll simply abandon it.

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**Figure 3: Desktop virtualisation demands high levels of network performance**

Metric	Definition	Performance Requirements
<b>Bandwidth</b>	The capacity of a network between two endpoints	100-200 kilobits per second to per session
<b>Latency</b>	The amount of delay between two endpoints	Less than 150 milliseconds
<b>Packet Loss</b>	The amount of acceptable packet loss between two endpoints	Less than 1% packet loss, 0.1% for high definition video

According to Middleton, herein lies the rub: “Desktop virtualisation traffic is fairly demanding; it’s what we call ‘bursty’ traffic. Typically, the demands of desktop virtualisation on the network will be negligible for a period of time, but once a group of users begins using devices (for example, at the start of the working day) virtual traffic suddenly floods the network.

Additionally, virtual desktops require greater levels of performance from the perspective of end-user experience. For instance, if it takes several seconds for text to appear on a user’s screen after he’s typed on the keyboard, frustration will quickly ensue. Virtual desktops need to be prompt and highly responsive.

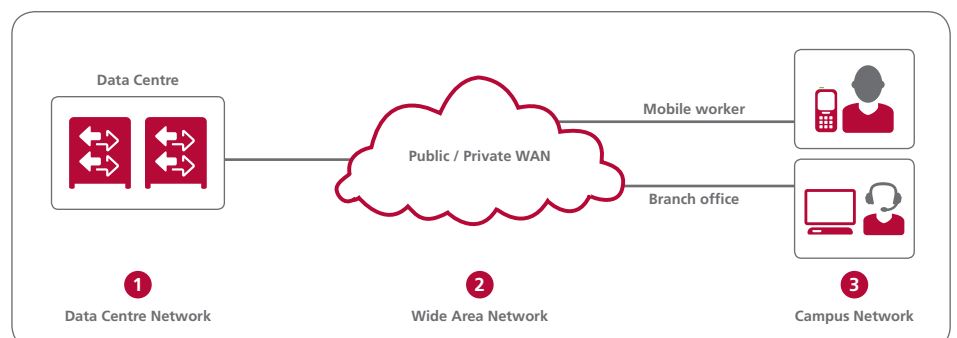
Then there’s the issue of bandwidth. Research indicates that virtual desktop streams require between 100-200 kilobits per second, while latency needs to be lower than 150 milliseconds or less to be effective. Furthermore, packet loss even as low as 1% will degrade the desktop virtualisation experience to the extent that it’s rendered unusable.

Middleton believes that organisations need to focus on three discrete areas of the network platform when charting their desktop virtualisation journeys: the data centre network, the wide area network (WAN) and the campus network.

The requirement to apply a sharp focus on the data centre network is due to the fact that desktop virtualisation initiatives involve centralising and consolidating hundreds, maybe thousands of desktops – together with their associated infrastructure and computing power – from various branch offices other locations into the data centre. The data centre network needs to be adequately geared to cope with this additional burden. Bandwidth needs to be higher, latency lower and applications need to be accelerated as they leave the data centre.

The flood of users that will need to connect from remote and home offices has significant implications on the WAN. Campus network infrastructures are also impacted and need to be considered in order to wring maximum return from an organisation’s investment in desktop virtualisation technology.

**Figure 4: Three key areas where the network must provide support for desktop virtualisation**



Let's take a closer look at the tactics and technologies available to organisations to ensure they optimise their networks' performance in each of these three key areas:

### 1. Data centre network

Within the data centre, Middleton believes that something of a revolution is underway in terms of **server-side networking** and the associated architectures. For example, 'top of rack switching', which involves a switch being appended to the upper end of each server rack can significantly improve air flow and reduce both cabling requirements and the cost of driving out new capacity. To cope with the increased bandwidth requirements within the data centre, organisations should consider upgrading from traditional 1G connectivity. Today, it's not uncommon for data centres to put in place capacity of between 10 and 40G, and 100G gigabyte networking products will be available in the near future. **Storage-side networking** in the data centre also requires attention. Today, unified fabric technology is growing

in popularity. Many organisations are beginning to use their 10G ethernet foundational networks as the platform for storage traffic.

A range of **network services** are available to assist organisations better co-ordinate IP address management. These enable network managers to become more agile in the way they support virtual environments. For example, while provisioning new virtual machines can be effected very quickly, the process of obtaining an IP address from an administrator can be lengthy. Thanks to new IP address toolkits, IT teams can ensure that IP addresses are swiftly issued and that virtual machines are operational in the shortest possible time.

**Application services** that accelerate the speed at which applications leave the data centre can add value to organisations implementing desktop virtualisation solutions. They can also assist with load balancing across servers and virtual machines by intelligently informing the network when new virtual machines are being provisioned so that it may adapt accordingly.

### 2. WAN

From a WAN perspective, desktop virtualisation introduces significant performance hurdles that need to overcome in order to provide end users with the experience they expect. The first and most significant of these is bandwidth management. "Corporate WANs typically accommodate traffic of many different kinds – voice, video, backup, applications and desktop virtualisation – yet they're not inherently 'intelligent' in terms of being able to identify which traffic should be prioritised, under what circumstances," explains Middleton. Organisations therefore need to apply appropriate bandwidth technologies and approaches in a way that different traffic streams can be coherently managed. **Quality of service** capability can be embedded within the core network while ancillary tools may be added to the network perimeter to ensure that streams of traffic have access to the appropriate resources. For example, if you require 100 megabits per second to support your desktop virtualisation traffic, you can allocate and 'protect' that bandwidth so that if a telepresence session is initiated, for example, the network performance is not degraded.

Application delivery represents an additional concern. Performance optimisation needs to be managed from end to end, from the application server all the way to the application user. Today, the location of applications themselves is also becoming more complex and diverse; oftentimes organisations' applications are not housed exclusively within their own data centres, some may reside in a co-located data centre or in a cloud-hosted environment. These trends are making network performance management a growing challenge. In addition to **application delivery tools**, organisations should consider **WAN optimisation technologies** which apply techniques to compress and accelerate traffic, cache content closer to users and optimise vendor protocols.



### 3. Campus network

While the tools are still emerging, significant potential exists for organisations to optimise the performance of campus networks to better support desktop virtualisation traffic and maximise the return on their investments. Cisco is leading the charge in this domain and has ploughed significant investment into **evolving the standard of power over ethernet**, and today is able to provide up to 60 watts of power per port on a switch (compared to the traditional standard of 40 watts). This improvement renders the connection sufficient to power a thin client, which ushers in the potential for virtual desktop devices to be powered by the network, rather than the traditional electrical supply.

#### Steering for success

With the excitement and promise of desktop virtualisation, many organisations are hastening to implement a solution to realise the expected benefits. Unfortunately, this exuberance has resulted in some disappointing results due to improper planning and design. Regardless of the flavour of virtual desktop being implemented, calculating the impact of the solution on your network should not be considered as an afterthought. Success requires a thorough understanding of the overall network topology – particularly the data centre, WAN and campus environments – and the type of work users are performing. This will ensure you're in a position to make informed decisions and investments to bolster your network to support your desktop virtualisation journey.

The advantages of putting in place an appropriately-architected network for desktop virtualisation are compelling:

- Higher levels of availability and scalability of virtual desktop infrastructure servers
- Improved performance:
  - 22x improvement in Microsoft® Office document downloads
  - 10x improvement in desktop virtualisation image backup
  - 21x improvement in application streaming
- Enable higher numbers of users for a given desktop virtualisation infrastructure
- Balance network resources appropriately
- Improved quality of experience for users
- Higher levels of success for desktop virtualisation projects

#### About the the client

##### **Virtualisation Imperative Report, 2011:**

The Client Virtualisation Imperative, 2011, is a commissioned study conducted by Forrester Consulting on behalf of Dimension Data. In this study, Forrester conducted an online survey of 546 organisations, across all industries in Australia, Belgium and Luxembourg, Brazil, China, Czech Republic, Germany, Hong Kong, India, Kenya, Netherlands, New Zealand, Singapore, South Africa, the United Kingdom and the United States evaluate the adoption of desktop and application virtualisation and the desktop transformation journey on which organisations are embarking. Survey participants included decision-makers in managerial roles and above for enterprise companies (1,000+ employees in developed economies and 500+ employees in developing economies). The study commenced in July 2011 and was completed in August 2011.

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