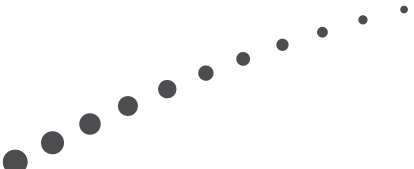




The Citrix guide to desktop virtualisation



Market overview

Desktop virtualisation is a relatively new technology that has been receiving a lot of press attention. Confusingly for those less familiar with the newest form of virtualisation, Gartner claims that desktop virtualisation is a terminology that can be applied to any one of four areas of PC virtualisation, namely client-side virtualisation software, hosted virtual desktops, application virtualisation and portable personality solutions. However, Gartner continues: “As of July 2008, the market most frequently labelled «desktop virtualisation» is for hosted virtual desktops, which provide mechanisms for centralising a thick-client desktop PC without the need to re-engineer applications for centralised execution”.

Although the desktop virtualisation market is still considered a relatively “new” technology, it is predicted that 2009 is the year that desktop virtualisation deployments are set to increase rapidly. It is likely that the desktop virtualisation model will account for a growing proportion of enterprise desktop users through 2013 and beyond.

What is desktop virtualisation and how does it differ from other types of virtualisation?

The promise of desktop virtualisation technology is to centralise the PC operating system at the data centre to make managing and securing desktops significantly easier. Hosted virtual desktops reside on servers in the data center, while end users remotely access these desktops from a variety of devices. No data or applications execute on the endpoint – everything is done centrally.

This is different from – and complemented by – both server and application virtualisation:

Application virtualisation isolates apps from each other and the OS, reducing conflicts, improving reliability and simplifying deployment. Virtual applications can be used from within a virtual desktop, providing for a very flexible, management environment.

Server virtualisation divides a single server hardware resource into multiple virtual machines, each one hosting a separate, server-class operating system. Server virtualisation provides the hosting platform for hosted virtual desktops and is part of a desktop virtualisation solution.

Gartner suggests that a hosted virtual-desktop implementation includes multiple components:

- Server virtualisation software to host desktop software
- Brokering/session management software to connect users with their desktop environment
- Tools for managing the provisioning of virtual desktops

Citrix believes that a fourth category is also important:

- Delivery infrastructure – including protocol, network optimisation, performance monitoring and reporting

Any organisation looking to deploy hosted virtual desktops requires all four components, and, to be considered a supplier of hosted virtual desktops, a vendor must offer all components in combination.

Why should the enterprise consider desktop virtualisation?

The current approach to desktop management involves providing end users with a hardware device upon which IT departments install a “standard” image. It has been estimated that desktop hardware and software acquisition expenditures typically account for only 20 – 30% of the total cost of the device, while the remaining 70 – 80% consists of IT maintenance. Furthermore, if local equipment is destroyed, lost or stolen, sensitive corporate or government data disappears along with the PC.

What are the key user and business advantages of desktop virtualisation?

Desktop virtualisation can, in theory, simplify desktop management and reduce total cost of ownership. Additional benefits include:

- Improved data security by centralising desktop lifecycle management in the data centre; an attractive feature for large enterprise in the ongoing battle to protect sensitive data as workers become increasingly mobile
- Easier management of desktops across the enterprise: desktop IT operations no longer need to repeat numerous, manual tasks to ensure all desktops within an organisation are up to date with the latest patches, updates, upgrades and refreshes to maintain desktop performance



- Improved desktop performance: a virtualised desktop doesn't falter and deteriorate over time as the Windows registry becomes cluttered with updates and new software installations. The latest virtual desktop and application updates are automatically installed from a central "master" operating system that is then streamed to each PC across the organisation
- Separating the desktop from applications eliminates application conflicts and optimises system performance by keeping applications and desktops in a pristine condition

What is the Citrix opinion on desktop virtualisation?

Although it is still a relatively new market, enterprises are fast realising the potential of implementing desktop virtualisation to enhance organisational efficiency and drive down costs. Globalisation, outsourcing and increased mobility are decentralising business processes. On the other hand, shrinking IT budgets, and increasing IT accountability for information security and service-level agreements underscore centralisation. IT system complexity hinders business agility and resilience – critical success factors in today's businesses. This need for simplified management systems is the first trend behind the interest in desktop virtualisation.

By the end of 2008, more than 300,000 user licenses for hosted virtual desktops were sold and sales are expected to more than double this year on a fast rise to 49million by 2013 (Source: Gartner). 2009 has already seen key improvements in the desktop virtualisation technology, allowing desktop virtualisation to become a viable option for knowledge workers on an enterprise scale.

Desktop virtualisation strikes a good compromise between the dedicated desktop machine and the efficiencies of a central system with dumb terminals. Each user still has his or her own machine, albeit a virtual one. The most critical hardware is inside a secure data centre, where it's also easier to manage. However, to be fully effective and exploit the full value of the infrastructure investment, desktop virtualisation should be driven to all office-based knowledge workers which implies scalability to 1,000s of users. The incremental cost of adding a new user in this scenario needs to be very low and the process needs to be consistent and repeatable.

The future of the desktop?

We've already established what desktop virtualisation is and how it is currently being used by enterprises. Citrix believes that the next generation of desktop virtualisation, the future of the desktop, will encompass two important advances in desktop technology: desktop as a service (DaaS) and client-side virtualisation.

Desktop as a service (DaaS)

The “desktop as a service” (DaaS) concept is about centralising and delivering desktops as a service to users anywhere, revolutionising desktop lifecycle management.

DaaS, using a manage once, deliver anywhere approach, offers operational scalability and a secure working environment on all devices. This market shift towards desktop virtualisation is driven by organisations looking to lower total cost of ownership and to increase overall IT effectiveness.

DaaS also offers increased performance and productivity by giving each user a ‘brand new’ desktop each time they login. Employees will no longer see their system deteriorate over time – the desktop will never get old. At the same time, the «Instant On» desktop will always be up-to-date and available at any location.

Citrix believes that to enable all these advances, organisations needs to look at desktops in a radically different way. Enable one image, one instance of data for one good user experience. By building once and leveraging infinitely, organisations can slash desktop management costs to each user.

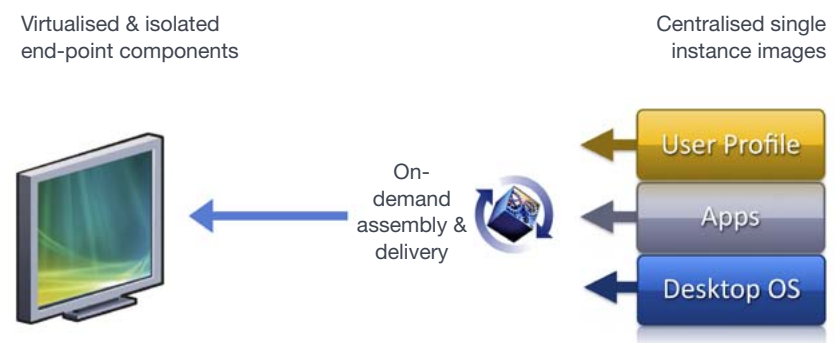
Client-side virtualisation

Hosted virtual desktops are great for office-based workers, but for growing groups of “global nomads”, or workers that are not office bound, it's important to offer application delivery technology that is not wholly reliant on a network connection. Being able to increase security and cut costs through central management and support of workers even when they're not connected is one of the big next steps for the desktop.

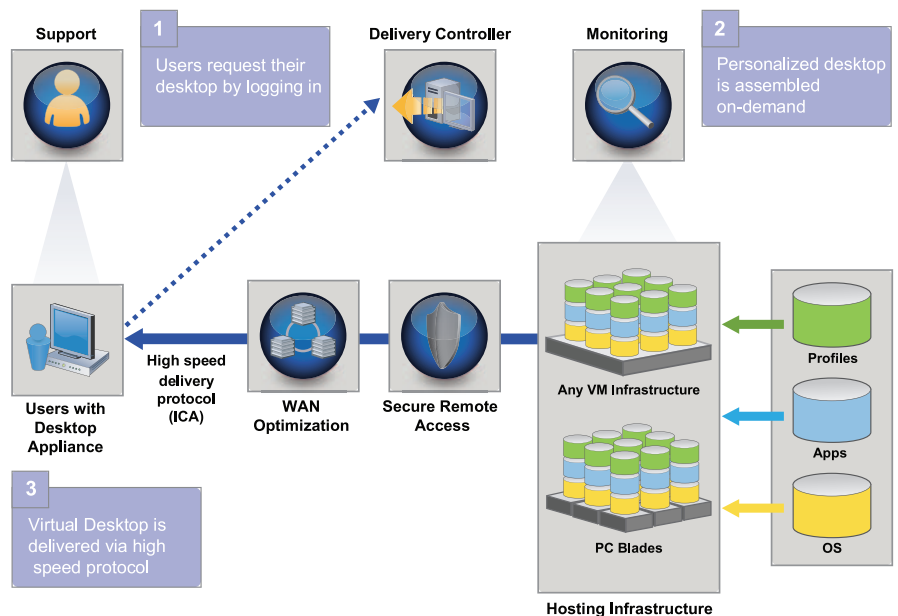
A key enabling technology is client-side virtualisation, which is when multiple desktop operating systems can coexist in complete isolation on single end user device. This layer of separation (abstraction) between the guest operating systems enables, for example, a “personal desktop” and a “corporate desktop” to reside on the same hardware, but completely protected from each other. Corporate IT could therefore place a standardised corporate virtual desktop will all requisite controls and policies, while still allowing for a personal space for the user. In addition, the virtualisation at the endpoint greatly simplifies image management and makes it easier to build, maintain and migrate desktop images from one machine to the next.

The client-based virtual desktop is maintained by a central server, which periodically checks the desktop to patch the operating system or update applications. This server also moves data created while users are offline to the data centre and sets policies for encryption, security and network connections. For example, specific instructions could be set to deal with laptops that do not check in periodically.

But unlike other forms of desktop virtualisation, it's not dependent on being connected by the network to that server. Disconnect the laptop, for example, from the network and the virtual desktop still functions enroute to its next networked destination.



Desktop as a service: a visual overview



Desktop as a service: a detailed overview

What products does Citrix offer to support desktop virtualisation?

In 2008, Citrix entered the desktop virtualisation market with the launch of XenDesktop 2.0. XenDesktop is an important component of the Citrix Delivery Centre (CDC). XenDesktop 3 FP1 was launched in May 2009. You can access further information here:

<http://citrix.com/English/ps2/products/product.asp?contentID=163057>

Citrix also recently announced XenClient, its project with Intel, to create a client-side hypervisor that runs directly on each end-user's PC or laptop computer. XenClient is designed to transform the mobile worker's experience of "offline" desktop computing completely. This approach caches and executes desktop and application software directly on the PC client, enabling high performance, rich graphics and full off-network mobility for laptop users.

What has Citrix achieved in the year since the launch of its XenDesktop product?

- More than a 1,000 enterprise customers worldwide in the first nine months selected XenDesktop
- Broad penetration across healthcare, education, government agencies, manufacturing, retail, telecommunications and financial services
- Many from the Global 2000 companies plan to deploy more than 10,000 virtual desktops by end of 2009

Worldwide Headquarters

Citrix Systems, Inc.
851 West Cypress Creek Road
Fort Lauderdale, FL 33309, USA
Tel: +1 (800) 393 1888
Tel: +1 (954) 267 3000
www.citrix.com

European Headquarters

Citrix Systems
International GmbH
Rheinweg 9
8200 Schaffhausen
Switzerland
Tel: +41 (0)52 6 35 77-00
www.citrix.com

European Subsidiaries

Citrix Systems GmbH
Am Söldnermoos 17
85399 Hallbergmoos/München
Germany
Tel: +49 (0)811 83-0000
www.citrix.de

Citrix Systèmes SARL

7, place de la Défense
92974 Paris la Défense 4 Cedex
France
Tel: +33 (0)1 49 00 33 00
www.citrix.fr

Citrix Systems UK Limited

Chalfont Park House,
Chalfont Park
Chalfont St. Peter
Gerrards Cross
Buckinghamshire, SL9 0DZ
United Kingdom
Tel: +44 (0)1753 276 200
www.citrix.co.uk

Citrix Systems Benelux

Clarissenhof 3c, 4133 AB Vianen
Netherlands
Tel: +31 (347) 324800
www.citrix.nl

Citrix Systems Nordic

Kalkbrænderiløbskaj 4
2100 Copenhagen Ø
Denmark
Tel: +45 39193400
www.citrix.dk

Asia Pacific

Citrix Systems Hong Kong Ltd.
Suite 3201, 32nd Floor
One International Finance Centre
1 Harbour View Street
Central, Hong Kong
Tel: +852 2100 5000
www.citrix.com

Citrix Online Division

5385 Hollister Avenue
Santa Barbara, CA 93111
Tel: +1 (805) 690 6400



www.citrix.com

About Citrix

Citrix Systems, Inc. (NASDAQ:CTXS) is the leading provider of virtualisation, networking and software as a service technologies for more than 230,000 organisations worldwide. Its Citrix Delivery Center, Citrix Cloud Center (C3) and Citrix Online Services product families radically simplify computing for millions of users, delivering applications as an on-demand service to any user, in any location on any device. Citrix customers include the world's largest Internet companies, 99 percent of Fortune Global 500 enterprises, and hundreds of thousands of small businesses and prosumers worldwide. Citrix partners with over 10,000 companies worldwide in more than 100 countries. Founded in 1989, annual revenue in 2008 was \$1.6 billion.

©2009 Citrix Systems, Inc. All rights reserved. Citrix®, Citrix Delivery Center™, XenApp™, XenServer™, NetScaler®, XenDesktop™, Access Gateway™, Branch Repeater™, HDX™ and Citrix Receiver™ are trademarks of Citrix Systems, Inc. and/or one or more of its subsidiaries, and may be registered in the United States Patent and Trademark Office and in other countries. All other trademarks and registered trademarks are property of their respective owners.