Six Myths of Zero-Client Computing

The move away from traditional PCs (fat clients) to thin clients has been happening for more than a decade; but in the last few years, the shift has solidified, and thin clients, as well as ultrathin clients or zero clients, are now the authoritative method to efficiently deliver powerful compute resources. Why?

- They offer easy access to a wide variety of applications.
- The hardware has an extremely long operational life span.
- Thin and zero clients use a low amount of energy and are less expensive to purchase and maintain.

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As the phenomenon of software as a service (SaaS) gains traction for many government, commercial, and educational organizations, thin and zero clients have already replaced desktop PCs.

A pioneer in zero- and thin-client software innovation, Citrix specializes in providing virtualization solutions to government, healthcare, and educational organizations that improve security, reduce IT expenses, and increase flexibility. When applied appropriately, Citrix applications and desktops can optimize the client to be a cost-effective solution for task-based workers, administrative staff, or even mobile users, anywhere, on any device—all without losing application performance.

What is the meaning of 'thin client' and 'zero client'?

"Thin client" refers to a computer that relies on a server to drive traditional computer tasks and therefore may not be equipped with standard hard drives, ports, or installed software. The thin client does not actually process data locally but acts merely as a user interface while running programs and accessing data from the data center. The best analogy for this process is residential satellite or cable TV service, where a signal is sent from a centralized location and the television set acts as a simple receiving device.

Thin clients require a network connection and are sometimes called network computers. In addition to a dedicated thin client device, users can employ a normal PC with thin-client software installed on it to send keyboard- and mouse-directed input to the server and get screen output back. This concept allows the user the flexibility to have compute power in multiple environments from a single location.

An ultrathin or "zero client" is one step "leaner" than a thin client. It, too, is not equipped with standard hard drives, ports, or installed software. In addition, a zero client often does not have an operating system or storage capabilities. It is typically a small box that serves to connect a keyboard, mouse, monitor, and Ethernet connection to a remote server.

In the marketplace, there is a fair amount of confusion around implementing these clients. Here are six of the top myths.

Myth No. 1: Putting thin or zero clients into place is labor-intensive

Building a thin- or zero-client system does not mean rebuilding infrastructure to support it. The period required for full implementation can be relatively short, with the system actually eliminating management time and labor. Furthermore, when the time comes to introduce all new desktops, users, applications, and services, no changes are needed. Merely set up thin or zero clients at the outset and use them repeatedly. You also spend less time managing networks because you only need to address software issues on one server as opposed to each individual machine.

Citrix XenApp offers one of the easiest ways to put a client system into place. XenApp is a Windows application delivery system that virtualizes, manages, and delivers applications on demand to office-based and mobile users anywhere from a secure central location. Quick and user-friendly product installation, role-based setup wizards, and simplified server deployment ease the rollout of any size deployment and reduce installation time by up to 50 percent. XenApp also simplifies the creation or provisioning of virtual images, freeing up IT departments to focus more time and effort on strategic planning.

Citrix XenDesktop also plays a central role in optimizing the thin- or zero-client experience. XenDesktop offers a desktop virtualization solution, delivering Windows desktops as an on-demand service to any worker, anywhere. Whether users are task workers, knowledge workers, or mobile workers, XenDesktop can quickly and securely deliver individual applications or complete desktops while providing a high-definition user experience.

Citrix products

The Citrix Workspace Suite product family is composed of virtualization and networking product lines for an end-to-end system that virtualizes servers, applications, and desktops, centralizes them in the data center, and broadcasts them to users over any network as an on-demand service:

- **Citrix XenDesktop** is a desktop virtualization solution that delivers Windows desktops as an on-demand service to any user, anywhere.

- **Citrix XenApp** is an on-demand application-delivery solution that enables you to centralize and manage applications in the data center and instantly deliver as a service to users anywhere.

- **Citrix XenServer** is an enterprise-ready, cloud-proven virtualization platform with all the capabilities needed to create and manage a virtual infrastructure at half the cost of other solutions.

- **Citrix NetScaler**, available as a network device or as a virtualized appliance, makes web applications run five times better by accelerating application performance, optimizing application availability, and enhancing web application security while substantially lowering costs.

- **Citrix Netscaler Gateway** is a secure desktop and application access solution that provides administrators granular application-level control while empowering users with access from anywhere.

- **Citrix Cloudbridge** is a branch optimization solution that provides a high-definition desktop and application experience to branch and mobile users while dramatically reducing bandwidth costs and simplifying branch infrastructure.

- **Citrix Receiver** is a high performance, universal client technology that enables on-demand delivery of virtual desktops, Windows, web, and SaaS applications and IT services to any device.

Myth No. 2: Thin and zero clients require system upgrades and higher costs

Transitioning to a thin or zero client does not mean you have to replace pre-existing equipment. Further, the organization can make any changes to its devices as part of a gradual evolution and not a large-scale overhaul. As for long-term cost savings, thin and zero clients can include less expensive hardware than a standard fat client, which cuts power consumption as well as the costs involved in adding more client terminals. The simple design of client computers involves no moving parts and is therefore low maintenance and long lasting, with little technical support needed during a typical lifespan.

Making the case: XenDesktop ROI analysis

An organization is considering virtualization for 600 desktops via hosted virtual-machine-based dedicated desktops (all thin clients).

Comparing the proposed costs and benefits of the Citrix XenDesktop solution versus staying with current "as is" opportunities, implementing a Citrix solution results in a projected total cost of ownership (TCO) savings of $869,874 over three years (see table).

To implement the proposed project will require a three-year cumulative investment of $846,606 including

• $549,000 in desktop infrastructure expenses

• $216,000 in desktop infrastructure maintenance costs

• $81,606 in server and storage power and cooling expenses

The implementation of one of these clients also streamlines a disaster recovery plan when compared to the standard fat-client environment. In the event that a client device goes down, you simply replace it with another unit and it reconfigures itself without the need for IT staff assistance. User preferences and settings reside in the data center so there is no need for tinkering with individual machines to restore them. A server-based system also is highly conducive to the growing popularity and implementation of mobility programs.

Savings from Citrix XenDesktop Solution Over Three Years Compared to Current Environment

TCO Comparison: Three-Year Cumulative	Current (As Is)	XenDesktop Solution	Savings	
Desktop Infrastructure (Capital Expenditures)				
Desktop infrastructure	$463,320	$549,000	($85,680)	-18%
Desktop infrastructure maintenance	$0	$216,000	($216,000)	0%
Desktop Infrastructure Management				
Desktop administration	$1,009,800	$369,000	$640,800	63%
Application administration	$295,920	$70,200	$225,720	76%
IT planning and system management	$437,040	$331,200	$105,840	24%
Standard utilities and office applications	$397,800	$324,000	$73,800	19%
Custom applications	$414,000	$338,400	$75,600	18%
Power and cooling	$144,000	$12,600	$131,400	91%
Server and storage power and cooling	$0	$81,606	($81,606)	0%
User training	$451,800	$451,800	$0	0%
TCO: Three-Year Cumulative	**$3,613,680**	**$2,743,806**	**$869,874**	**24%**
Cost per Device per Year	**$2,008**	**$1,524**	**$484**	**24%**
Total Direct Benefits	**$3,613,680**	**$2,743,806**	**$869,874**	**24%**

Myth No. 3: Use of thin and zero clients leads to compromised security

It is true that a client server constitutes a single point of potential failure. However, there is distinctly more risk posed to a network that involves data and applications housed at widespread, multiple endpoints as opposed to one data center that you can more easily protect. As such, the option of separately securing every single computer in a network—sometimes numbering in the hundreds or thousands or even more—is much less preferable.

Even in the more traditional fat-client environment, you can lose access to email and the Internet if the network fails. With thin or zero clients, access to desktop applications is more reliable on a daily basis due to better data center security and the ability to smoothly transition to a backup server in the event of an interruption. The clients are far less vulnerable to viruses, worms, and Trojan horses and even theft of the physical device. With no data residing inside, a thin- or zero-client computer is largely useless when disconnected from the network.

With Citrix clients, high-performance standards-based encryption secures all data transmission from the data center through the network to the user. It controls user access through a single point that ensures proper authentication for applications and data specific to their roles. Application-level security, as well as smart card support, is built-in and provides compliance with government regulations and protection from outside attacks, while policy-based password management and session monitoring provide additional layers of protection for intellectual property and assets.

Myth No. 4: Thin and zero clients lead to loss of performance

There is no loss of performance, and in many cases, just the opposite happens: Client computing can be faster than the old network. You can use less powerful clients to easily run new and larger applications than ever before without losing efficiency. Virtualized applications deliver a high-performance, high-definition user experience from any device, on any network, even for graphics-rich and multimedia content. They ensure users a seamless experience across devices, locations, and networks, with almost zero downtime and higher overall productivity. Users receive an experience as good as or better than that from locally installed applications, which improves user adoption.

Additionally, to simplify the question of which client devices align best with XenDesktop and XenApp, Citrix established the Citrix Ready framework. Citrix Ready is a verification program for partners to demonstrate interoperability between their products and Citrix products. The thin- and zero-client category of Citrix Ready allows partners the option to test their devices to achieve basic Citrix Ready status, or the more stringent HDX (high-definition user experience) Ready status. Citrix designed these options to address market needs based on user segments and user-experience requirements.

Citrix reserves the HDX Ready designation for devices it has verified to work with all of the XenDesktop and XenApp HDX features. HDX is a term to describe capabilities in XenDesktop that optimize the user experience when accessing hosted virtual desktops and applications. The HDX Ready category assists IT managers to easily identify client devices that deliver the best possible high-definition user experience with XenDesktop and XenApp.

There is, of course, a trade-off between a client's cost and its capabilities. Not all users require the full functionality of the HDX features of XenDesktop and XenApp. Devices Citrix does not deem HDX Ready may still be useful for certain user types and use cases, generally at a lower price point than HDX Ready devices. The Citrix Ready client designation exists for those devices that support connectivity to XenDesktop or XenApp but have only a subset of HDX functionality.

Myth No. 5: Mobile devices will render thin and zero clients obsolete

Thin- and zero-client technology can be adapted for use with mobile platforms including laptops, iPads, tablets, and notebooks and offers a heightened level of protection from outside threats. The explosion of mobile computing has greatly increased exposure to viruses, data theft, unauthorized user access, and device theft or loss—yet with thin- or zero-client computing, absolutely no data is at risk because applications and data reside on the server.

Myth No. 6: IT-based concerns pose the biggest barrier to client use

Even with the ease of thin- and zero-client planning and implementation, the biggest obstacle is actually user resistance based on culture shock. Workers have developed an emotional attachment to individual device control; yet once they become aware of the potential benefits of thin and zero clients, their outlooks tend to change. Misconceptions about convenience, access, security, and flexibility often drive these attitudes; but working in a thin- or zero-client environment actually affords more freedom and productivity than ever before. When the advantages of this shift in the computing landscape are evident, users more readily embrace it.

Conclusion

Over time, the traditional system for deploying applications on multiple servers and user devices has grown ever more costly and open to security risks. By housing and processing data within a centralized server, thin- and zero-client computing ensures the tight monitoring of sensitive information while reducing management expenses. Thin and zero clients also have unprecedented flexibility and efficiency. They make possible an incremental approach to adopting a server-based system that allows standard devices to act like client computers by using special software. Changes to infrastructure are limited; startup time is remarkably brief; and organizations can expect a lower cost of ownership going forward.

For more information, visit www.citrix.com/solutions/us-government or register for an event at www.citrix.com/events.

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Citrix (NASDAQ:CTXS) is leading the transition to software-defining the workplace, uniting virtualization, mobility management, networking and SaaS solutions to enable new ways for businesses and people to work better. Citrix solutions power business mobility through secure, mobile workspaces that provide people with instant access to apps, desktops, data and communications on any device, over any network and cloud. With annual revenue in 2014 of $3.14 billion, Citrix solutions are in use at more than 400,000 organizations and by over 100 million users globally. For over 25 years, Citrix has be working with federal, state, and local government organizations to improve performance and efficiency. By transforming the mobile workplace with secure application and data delivery solutions, Citrix provides agencies and departments mobile secure access to government applications, desktops, data, and communications they need on any device, network, and cloud.

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