

Selecting Thin Clients for XenDesktop 4

Customer conversations confirm that organizations are moving beyond evaluation and proof-of-concept trials of hosted desktop virtualization to full production. With broader deployments, there is a corresponding growth in the use of thin clients.

Thin clients offer a number of benefits over PCs when used with hosted desktops:

- Total cost of ownership - Vast reduction in average annual maintenance costs
- Endpoint management - Simplification in configuration and deployment
- Security - Reduction in vulnerabilities due to viruses and malware; elimination of local storage
- Power consumption - Reduced device energy footprint

These represent key reasons for the strong interest in thin clients and attach rate with XenDesktop. And these benefits magnify as hosted desktop deployments expand through the organization. Recent analyst reports bear this out and predict that the thin client market is poised to grow at a brisk pace over the coming years. Given the value that thin clients provide, how can you identify the ones appropriate for your environment?

HDX Ready Thin Clients

The most frequent question IT managers ask Citrix regarding thin clients is: “Which devices do you recommend with XenDesktop?” Citrix established the [Citrix Ready](#) framework to answer this question. Citrix Ready is a verification program for partners to demonstrate interoperability between their products and Citrix products. The thin client category of Citrix Ready allows partners the option to test their devices to achieve basic *Citrix Ready* status or the more stringent *HDX Ready* status. Figure 1 provides a summary of the requirements of each.

	Verification Options	
	Citrix Ready	HDX Ready
HDX Broadcast	✓	✓
Out of the box Integration		✓
HDX Plug-n-Play: USB 2.0		✓
HDX Plug-n-Play: Printing		✓
HDX Plug-n-Play: True Multi Monitor Support		✓
HDX Plug-n-Play: Smartcard Support		✓
HDX Plug-n-Play: Isochronous USB 2.0 (Webcam)		✓
HDX RealTime: VOIP on LAN		✓
HDX RealTime: Client Audio Recording		✓
HDX MediaStream: CD Quality Audio on LAN (Server Rendered)		✓
HDX MediaStream: 480x360 Quality Windows, Flash, QuickTime & Silverlight Video on LAN (Server Rendered)		✓
HDX MediaStream: 480x360 Quality Windows Media and Flash Video on LAN (Client Rendered)		✓
HDX MediaStream: 1280x720 Quality Windows Media and Flash Video on LAN (Client Rendered) – Optional		✓

Figure 1 - Citrix Ready and HDX Ready Verification Requirements

The HDX Ready designation is reserved for thin client devices that have been verified to work with XenDesktop’s HDX features. [HDX](#) refers to High Definition User eXperience – a term coined by Citrix to describe capabilities in XenDesktop that optimize the user experience when accessing hosted virtual

desktops. The HDX Ready category assists IT managers to easily identify thin client devices that deliver the best possible high definition user experience with XenDesktop.

The most effective way to find the appropriate thin client(s) for your organization is to visit the [Citrix Ready](#) website. You can find both classes (Citrix Ready and HDX Ready) of thin clients there along with the results of the thin client partner testing. You can filter by 'HDX Ready Thin Clients' and 'Thin Clients' to find the appropriate device. Each thin client has a catalog landing page for additional information including a matrix specifying device capabilities relative to the HDX features of XenDesktop 4. Whether a device is able to achieve full HDX Ready status or not, you will be able to see which XenDesktop 4 capabilities work with a given device.

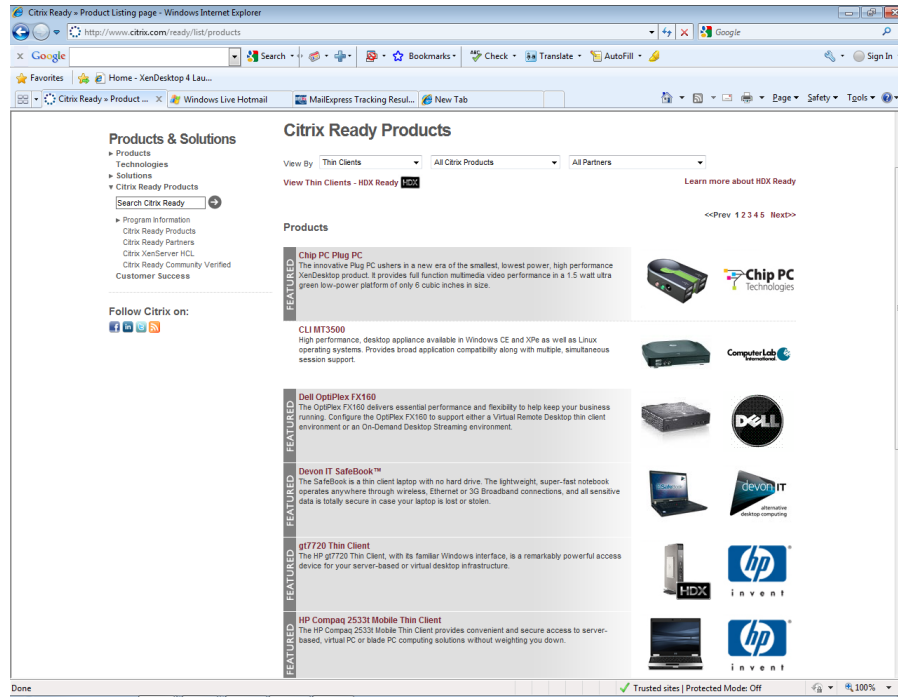


Figure 2 – HDX Ready

HDX Ready devices are easily identified by the logo shown below associated with the device on the Citrix Ready site:



Citrix Ready Thin Clients

There is a trade-off between a thin client's cost and its capabilities. Not all users require the functionality of all of XenDesktop's HDX features. Devices that are not deemed 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* thin client designation exists for those devices that support *some* XenDesktop HDX functionality. Devices successfully tested against Citrix Ready provide, at minimum, compliance with XenDesktop connectivity via [HDX Broadcast](#), to hosted virtual desktops from XenDesktop. Other HDX features *may* be supported by a device under Citrix Ready. Information regarding HDX coverage by a particular thin client device is available on the Citrix Ready website.

As an IT manager, there are **two key steps** you should follow to select the right *Citrix Ready* thin clients for your environment:

1. Segment end users:
 - Determine which users are candidates for hosted virtual desktops
 - Within your user population of hosted desktop users, identify different classes of users with varying user experience requirements
2. Choose a thin client operating system platform that most ideally addresses the needs of the respective hosted desktop users

Let's look at these two steps in greater detail.

Step 1: Segment Users of Hosted Virtual Desktops

Consider the following *sample* segmentation model. There are two dimensions: **end user segments** are on the X axis and **user experience requirements** on the Y axis.

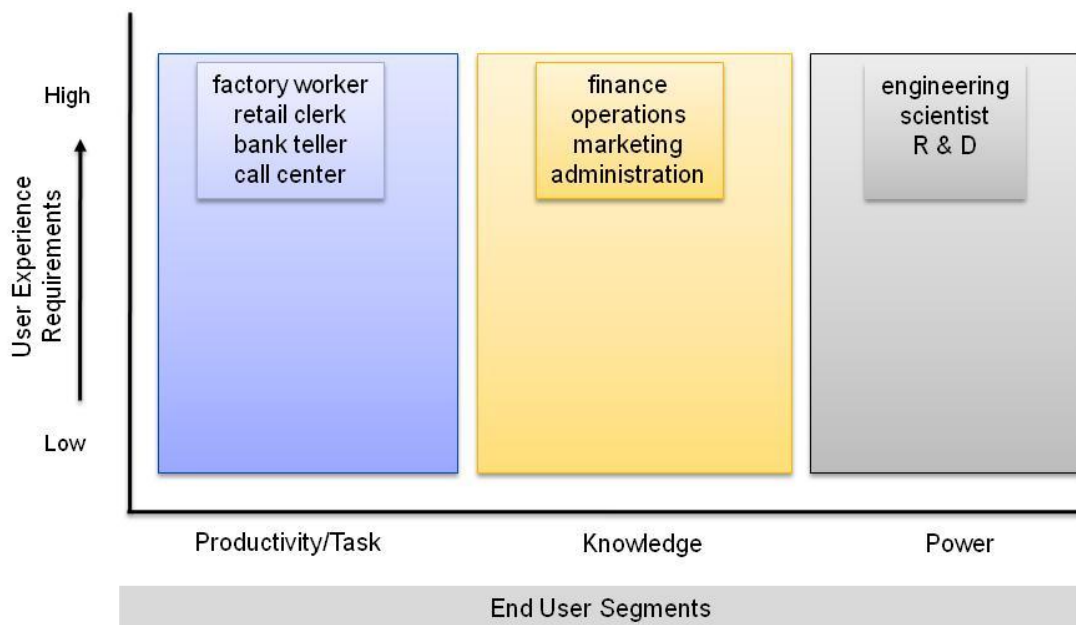


Figure 3 – User Segmentation

The end user segments in this example are productivity, knowledge and power users. Samples of typical users that fall into these segments are provided in Figure 3. The figure illustrates how an IT organization might segment their employees. Every company's mix of user types will vary so it is important for any prospective customer of thin clients to carry out this segmentation exercise. A certain class of thin client devices is oriented toward productivity workers. More powerful thin clients are usually reserved for knowledge workers and power users. Segmentation of the hosted virtual desktop population is a critical step in choosing the appropriate thin client devices. Most of Citrix' thin client partners provide a portfolio of thin client devices suited for varying user segment needs.

User experience requirements are on the Y axis of Figure 3. Knowledge workers expectations for their computing experience are greater than those of task workers in this example. As you move from knowledge workers to power users, their experience expectations grow further still.

Once the end user population is segmented, consider the requirements of those user segments. Requirements vary by industry and company. Figure 5 represents an example of segment requirements and is provided as a framework for analysis. If you are thinking about using Citrix Ready thin clients, consider building a similar table as it relates your environment.

It is useful to look at a specific example within Figure 5. Thin client **monitor** requirements are defined as follows in the first row of the figure below.

- In this example, task workers require a **single monitor** since they work in the context of one or two applications over the course of their work day
- Knowledge workers require **dual monitors** in order to improve their productivity as they tend to have multiple applications open at a time
- Power users require the ability to manipulate visual data models across **several monitors** simultaneously

Requirements	Task Worker	Knowledge Worker	Power User
Monitor (Single/Multiple)	1 monitor	2 monitors	4 monitors
Audio (VOIP, Headsets)	Call center	--	--
Multimedia (Media players)	--	Flash	Flash
High-End Graphics (GPU)	--	--	3D Apps
Peripherals (USB)	--	Webcam	--
Fixed/Mobile Form Factor	Fixed	Mobile	Fixed
Etc.			

Figure 5 – Sample End User Requirements

Consider a second example related to end users' computing **form factor** requirements:

- In this example, knowledge workers in a company's organization are **mobile**, routinely requiring access to their hosted virtual desktops as they travel to meetings across the wirelessly connected corporate campus.
- Task workers and power users tend not to require such mobility

Thin client models vary in their capabilities. Considering Figure 5 further, some thin client devices offer support for only a single monitor while higher end models offer multiple monitor support. Some thin client devices are available in fixed form factors and others in mobile form factors. These simple examples illustrate that a comprehensive analysis of end user segments and requirements by the IT organization prior to selecting a particular Citrix Ready thin client device provides the best chance at a successful implementation.

Step 2: Select the Thin Client Operating System

Most Citrix thin client partners offer a number of operating system choices. Popular choices include WinCE, Linux and XPe/Windows Embedded Standard (WES). An important decision you face as an IT manager is the selection of the right thin client operating system for your environment. There are a number of considerations when determining the right choice. Examples of operating system characteristics are provided with guidance regarding each. *This guidance is general in nature and Citrix suggests that you discuss each of these points further with Citrix's thin client partners.*

- **Use case / user types** - WinCE tends to be reserved for use on lower end thin client devices and use for productivity workers; Linux spans across user types; XPe/WES tends to be reserved for knowledge workers and power users
- **In-house expertise** - Your company's operating system knowledge and domain expertise must be considered prior to selection; For example, does your company have Linux proficiency?

- **License cost** - There is a licensing cost for WinCE as there is for XPe. Conversely, there is no license cost for Linux. One caveat to consider is that codecs are often included with Windows-based operating systems where they are not with Linux – an important point to keep in mind as you work through cost analysis related to the operating system licensing
- **Management cost** – Linux is traditionally viewed as an operating system that is less costly to configure and manage. This will be impacted by other factors like in-house expertise
- **XenDesktop feature support** – Some features of XenDesktop appear on Windows-based thin client operating systems before they appear in the Linux client. For example XenDesktop offers Flash optimization support on XPe-based thin clients, but not yet on Linux
- **Security** – There is a market perception that Linux is more secure than Window-based thin client operating systems; Recent advances may make this less true today, but each OS's security capabilities and vulnerabilities should be examined

IT organizations looking for the **best high definition user experience** should consider Windows XPe and Windows Embedded thin client devices. Citrix's initial implementation of end user experience optimizations initially arrive on Windows-based thin client devices (with the exception of WinCE). It is important to note that Citrix continues to make strides to bring Linux support to parity with XPe/WES.

IT organizations looking for the **best total cost of ownership** related to thin clients are best served to focus on Linux and WinCE based devices. Some Citrix thin client partners also offer scaled back versions of Linux that provide for faster boot up times, smaller security footprints and lower costs of ownership – these Linux derivatives may be a good fit for task workers as well.

Each IT organization's assessment of operating systems will vary. The guidance provided above is general in nature. You are encouraged to discuss this topic with Citrix' thin client partners for additional direction.

Conclusion

Thin clients represent a key component required to deliver on the promise of hosted virtual desktops. This makes selecting the appropriate thin clients for your organization a critical decision. To this end, Citrix has created the Citrix Ready and HDX Ready thin client verification designations. Their goal is to simplify the process of identifying devices that have been tested and shown to work with the HDX features of XenDesktop hosted virtual desktops.

If your aim is to deliver users the best possible high definition user experience with XenDesktop, use HDX Ready thin clients. If your focus is to have the lowest total cost of ownership with attention toward specific HDX features, then use Citrix Ready thin clients in conjunction with the steps outlined in this document. This approach will ensure that XenDesktop 4 meets your end users' computing experience expectations and that the organization reaps all of the benefits hosted virtual desktop delivery.