

## 2X ThinClientServer: How it works

### **> An introduction to 2X ThinClientServer, its features and components**

---

2X ThinClientServer provides a complete solution for the central deployment, configuration and management of thin clients and provides load balancing and redundancy of terminal servers. This White Paper explains how the product works as well as describing its features and the components.

## ➤ Introduction: What is 2X ThinClientServer

---

2X ThinClientServer provides a complete solution for the central deployment, configuration and management of thin clients and provides load balancing and redundancy of terminal servers.

A small footprint Linux distribution is deployed to thin clients (all popular thin clients are supported) OR to normal PCs, allowing you to convert existing PCs to thin clients. Thin client settings (screen size, which terminal servers to log into, etc.) can be controlled centrally.

2X ThinClientServer is thin client vendor independent: You can use old computers, new low cost computers and dedicated thin client devices from different vendors - and manage all these thin clients through one consistent and open interface.

Rather than have to commit to one particular thin client vendor and be forced to buy all your hardware from that vendor, you can get flexibility to choose what's best for you and the possibility to re-use your old computer hardware.

Introduction: What is 2X ThinClientServer.....	2
How it works .....	2
2X ThinClientServer components.....	4
2X ThinClientServer features .....	5
About 2X ThinClientServer .....	6
About 2X TerminalServer .....	<b>Error! Bookmark not defined.</b>
About 2X .....	6

## ➤ How it works

---

In a nutshell, 2X ThinClientServer serves out the 2X ThinClientOS to the thin clients. After the 2X ThinClientOS has booted, it obtains its connection settings from the 2X ThinClientServer. These settings are then used to connect to the terminal server.

The 2XThinClientOS itself can be retrieved from the TFTP server (included with 2X ThinClientServer) via PXE or Etherboot (which does not rely on the network card's ROM to load the PXE stack), or it can be booted from a storage device (Hard disk, CD-Rom). The exact process by which the thin client boots and presents the desktop to the user is explained in the following steps:

### Step 1: Booting the thin client:

- 1 The thin client/computer is switched on. Based on the BIOS setting, the thin client/computer now boots either via the hard disk, PXE, Etherboot, or CD-Rom.

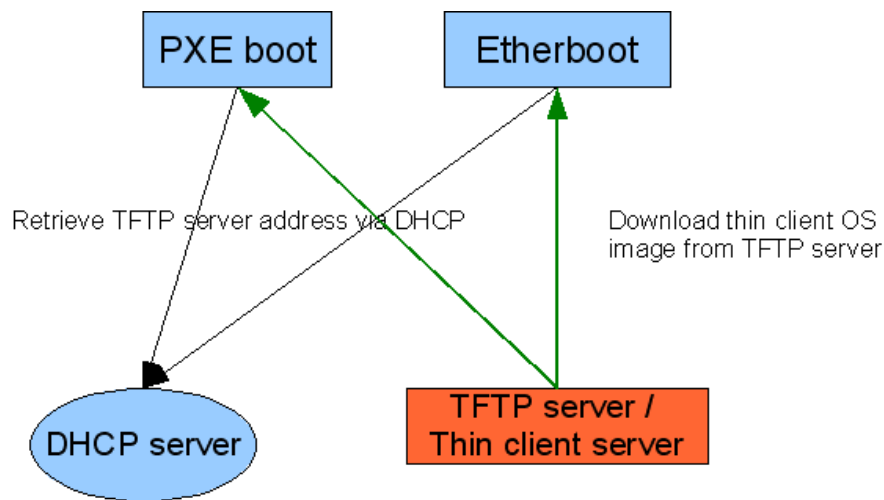
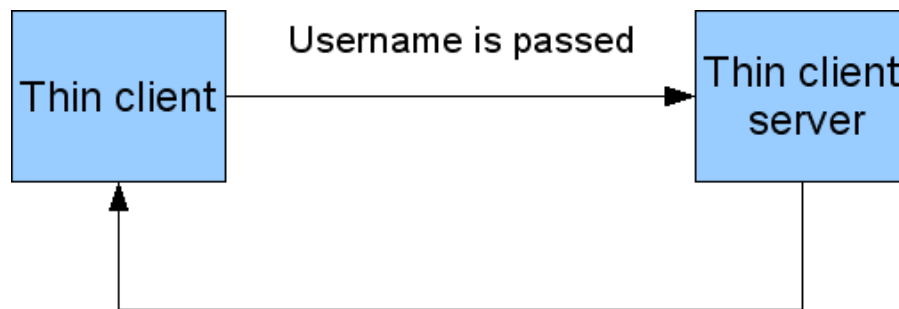


Illustration 1: PXE booting

- 2 If you have selected PXE booting OR Etherboot, the thin client/computer will obtain the IP address of the TFTP server via a DHCP broadcast. (In most installations the TFTP server will be installed on the same server as 2X ThinClientServer). The thin client will then download the 2X ThinClientOS image from the TFTP server and proceed to boot up the thin client using that Operating System image. Because the 2X ThinClientOS image is small (approx 15 MB) this will be very fast.
- 3 If you chose to boot 2X ThinClientOS from CD-Rom, or hard disk, the operating system will boot up directly from that image without retrieving the image from the TFTP server.

### Step 2: 2X ThinClientOS connects to 2X ThinClientServer

- 1 After 2X ThinClientOS has booted, it obtains the IP address of 2X ThinClientServer from the network settings returned by the DHCP server. Alternatively, the IP address can also be obtained by querying the DNS Server for a host named 'thinserver'.



### Connection settings are sent back thin client

Illustration 2: Connection settings are retrieved from thin client server

- 2 2X ThinClientOS now prompts for the username and password. The username is passed to 2X ThinClientServer, which then looks for the user in the local users' database, LDAP or Active Directory server. It finds the associated user profile and matches this user profile with connection settings for that user in the 2X ThinClientServer database. These connection settings are passed back to 2X ThinClientOS.

- 3 2X ThinClientOS now runs the appropriate remote desktop client (RDP, ICA, NX) with the required settings, including username and password, and connects the user to the correct terminal server.

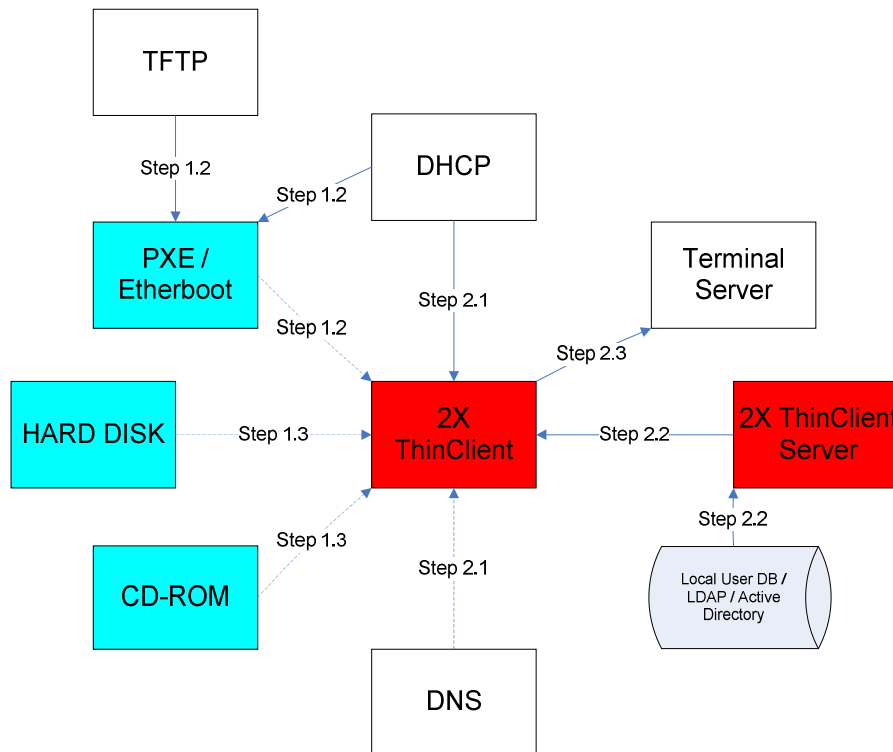


Illustration 3: The complete thin client boot and connection process

## ➤ 2X ThinClientServer components

2X ThinClientServer consists of a number of components:

- 1 The 2X ThinClientOS image – the actual Operating System that the thin client will boot. This image is either written to the hard disk or CD-Rom, and booted from there, or it is downloaded via TFTP and booted after download.
- 2 The 2X ThinClientServer program, which interacts with the actual thin client.
- 3 A TFTP server – to serve out the 2X ThinClientOS image to the computers booting via Etherboot or PXE.
- 4 A Management Console – to allow for web based configuration of all the connection settings. This is provided via a web server, namely Apache. Apache is one of the world's most widely used web servers. Originally developed in 1995 by a group that went on to become the Apache Group, the Apache HTTP Server is Open Source Software, and considered by proponents to be fast, scalable and secure.
- 5 A MySQL server – this is a light-weight SQL database server that stores all the connection settings for the users.
- 6 The PHP environment – PHP hypertext pre-processor is a widely-used general-purpose scripting language that is especially suited for web development.

## 2X ThinClientServer features

---

### **Thin client vendor independent**

Use thin clients from different vendors, old/existing computers, or new low cost computers - and manage all these thin clients through one consistent and open interface. Rather than having to commit to one particular thin client vendor from whom to buy all your hardware, you get the freedom to choose and the possibility to re-use your existing computer hardware.

### **Web-based management interface**

Thin client devices and users' connection settings can be managed centrally via the web management interface. It shows currently active thin clients and user sessions, generates reports and includes a centralized database of thin client Syslog events, for easy troubleshooting.

### **Easy updates of thin client operating system & software**

Updates to the thin client OS are easily deployed: Just download the latest version from the 2X website and copy it to the Thin Client Server: Thin clients booting from PXE will use the new OS at next boot-up. Thin clients booting from the hard disk can be remotely updated via the web-based interface!

### **Manage user's connection settings centrally**

Centrally configure user's connection settings such as Terminal server name, type (RDP, Citrix ICA or NX), screen resolution and more. There is no need to push out these connection settings to the thin client devices, since they are retrieved when the user logs on.

### **Supports local media and printers**

Locally connected printers or storage devices are supported seamlessly. Printers will show up in the list of printers on the user's desktop, and local media will appear in Windows explorer just like other media.

### **How it works**

2X ThinClientServer deploys a small footprint Linux-based OS to old PCs, new low cost PCs and to popular thin client devices (HP, Neoware, Wyse, Maxspeed and more). Thin clients always boot the latest version of the OS from the ThinClientServer. Hardware & connection settings (including resolution, logging and more) are retrieved from the server when the client logs on, making thin clients easy to manage.

### **Connection settings are managed based on username, department or thin clients**

Most thin client management software can only configure connection settings based on device. 2X ThinClientServer links connection settings to Active Directory/LDAP usernames, groups or OU's (organizational units). This reduces the administration involved with adding users and managing roaming users!

### **Convert old PCs to powerful thin clients**

2X ThinClientServer allows you to extend the life span of your current computers by converting them to thin clients. Re-using your old PCs or extending the life span of your current ones adds up to considerable savings over time.

### **Server runs on Windows or Linux**

2X ThinClientServer is available for both Windows or Linux servers. The Windows version includes a TFTP server for deployment of the OS!

### Use low cost thin clients

Because 2X ThinClientServer includes a thin client OS and a centralized management interface for all thin client devices, you can opt for low-cost thin clients without OS & management software. This is the most expensive part of a thin client and can increase the per thin client cost from \$200 to \$500.

### Thin client computing: reduced administration and end user support

Administrators can enjoy greatly reduced support and administration: Thin clients are far easier to manage since the thin client OS is deployed centrally and only includes a remote terminal client. Only the servers need to be managed, meaning that deploying patches, applications and virus updates is far easier. Enforcing desktop settings and backing up user files is easier too. Better security and fault tolerance is achieved by using RAID, load balancing and housing the Terminal Servers in a secure, air-conditioned server room. Helping users is simple too: Just shadow their session in real time and find out exactly what is happening without getting off your chair!

### Other features:

- Thin clients can boot via PXE, CD ROM, floppy or hard disk
- Thin clients can be configured to log to Syslog for easy troubleshooting
- Thin clients can be discovered via SNMP, allowing you to use other network management software if desired
- Reports on sessions and user usage
- Customize logon screen with your own logo
- Supports RDP, ICA and NX protocols.

## About 2X ThinClientServer

---

2X ThinClientServer is complete solution for the central deployment, configuration and management of thin clients & user's connection settings. Both PCs (converted 2 thinclients) & thin client devices from any vendor are supported via 2XThinClientOS. Thin client settings (RDP / ICA / NX), screen size, Terminal server type (Windows/Citrix/Linux etc) and name can be controlled centrally by user, group or department (Active Directory/LDAP).

## About 2X

---

2X Software Ltd - 2X - is a new company developing software for the booming server-based computing market. Thin client computing controls spiraling PC management costs, centralizes application and desktop management, improves security and performance and allows users to work remotely. The company's product line includes: 2X ThinClientServer for Windows/Linux, 2X LoadBalancer for Windows Terminal Services, 2X FullControl for Windows Terminal Services, 2X ApplicationServer for Windows Terminal Services and 2X SecureRDP for Windows Terminal Services. 2X is a privately held company with offices in Frankfurt, Cyprus and Malta, Europe. Its management team is backed by years of experience in developing and selling network infrastructure software. 2X is a Novell, RedHat and IBM ISV partner.

© 2005 2X Software Ltd. All rights reserved. The information contained in this document represents the current view of 2X on the issues discussed as of the date of publication. Because 2X must respond to changing market conditions, it should not be interpreted to be a commitment on the part of 2X, and 2X cannot guarantee the accuracy of any information presented after the date of publication. This White Paper is for informational purposes only. 2X MAKES NO WARRANTIES, EXPRESS OR IMPLIED, IN THIS DOCUMENT. 2X, 2X ThinClientServer and 2X TerminalServer and their product logos are either registered trademarks or trademarks of 2X Software Ltd. in the United States and/or other countries. All product or company names mentioned herein may be the trademarks of their respective owners.