

2X WhitePaper

SERVER BASED COMPUTING

An Introduction to server based computing,
its advantages and how it works.



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This whitepaper explains the concept of server based computing and defines the main components of its technology. It also describes the advantages of adopting a server based computing environment within an organization.

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| Introduction: What is server based computing?

Server-based computing (SBC) is a technology whereby applications are deployed, managed, supported and executed on the server and not on the client. Instead only the screen information is transmitted between the server and client. This architecture solves the many fundamental problems that occur when executing the applications on the client itself.

In SBC environments hardware & software upgrades, application deployment, technical support, and data storage & backup are simplified because only the servers need to be managed. Data and applications reside on a few servers rather than on hundreds or thousands of clients. PCs become terminals and can be replaced by simpler, less expensive and most importantly easier to manage devices called “thin clients”.

| The benefits of server based computing

1. **Management** - Administrators can deploy, manage and support applications much more easily because they are held on a central server farm and are managed from a single point, simplifying application access and administration.
2. **Device independence** - Users can access their desktop and indeed any enterprise application from any type of client device.
3. **Remote Access** - Users can access their desktop and enterprise applications from anywhere on the network, from home or on the road.
4. **Performance** - Server-based computing performs better than a web application or using a client server model. These types of applications require a lot of data to be sent back and forth between the server and the client. Because of advanced compression used by protocols such as ICA, NX and RDP, sending just the screen updates between the server and client is much faster.
5. **Security** - Server-based computing keeps all the data on the secure servers without it being ‘spread out’ onto the less secure client computers. Furthermore the server is in the server room, which is far more secure than on the user’s desk.
6. **Less prone to viruses and security breaches** - Since servers are by definition better managed and because the server OS is more secure, it’s far less likely a computer will be infected by a virus.
7. **Eliminates patch management of clients** - As clients are not running Windows, there is no need to patch the desktop computers on a regular basis.
8. **Reduces cost** - Total Cost of Ownership [TCO] reduced by as much as 50 per cent.
9. **Scalability** - New servers and clients can easily be added.
10. **Increased Availability** – It’s easy to make the terminal servers fault tolerant and to perform load balancing. In addition, servers are inherently designed to be more reliable than your average desktop.

What are thin clients?

A thin client is a general term for a device that relies on a server to operate. It provides a display device, keyboard and mouse and basic processing power in order to interact with the server. It does not store any of the data locally – it's very thin in features and functionality – hence the term 'thin client'

A thin client often does not have local storage and requires little processing resources. Thin client hardware can be a converted old PC, a new dedicated thin client device or simply a new low cost PC with a thin client OS installed. Since you don't need much processing power and since you can use the hardware for a longer period of time (on average 6 years instead of 3 years) the capital expense at the desktop is significantly reduced.

Most importantly, the overhead costs associated with administration, maintenance, support, security and installation are significantly lower than a traditional PC.

How does it work?

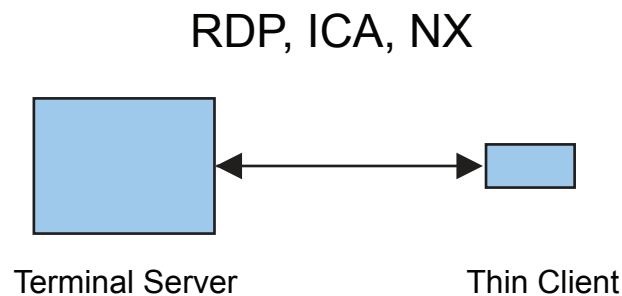


Illustration 1: Server-based computing

The server-based computing technology revolves around 3 main components:

1. A multi-user operating system that allows multiple users to log on and work concurrently, using applications in separate, protected sessions on a single server. Examples of terminal servers are Microsoft Terminal Services 2000/2003, Citrix Metaframe, 2X TerminalServer for Linux.
2. A thin client, which runs a minimal amount of software, but at least one program that connects to the terminal server. The thin client and the terminal server can be running completely different types of operating systems: For example Linux based thin clients are currently the most popular way to connect to a Windows terminal server! On the thin client there will be a program such as rdesktop (Linux) or remote desktop connection (windows) to connect to the terminal server.
3. A protocol to allow the terminal server and thin client to communicate and send only the keystrokes, mouse clicks and screen updates across the network. Of course this will be suitably compressed. Popular protocols are RDP (Remote Desktop protocol), ICA and NX.

| Server Based Computing: Advantages

Server-based computing is currently considered as the most efficient, flexible and cost-effective system for application delivery and administration. It boasts the following advantages:

- Reduces desktop hardware investment
- Significantly reduces administrator staffing costs
- Significantly reduces desktop maintenance costs
- Virtually removes the need for desktop upgrades
- Removes desktop software application upgrades
- Removes desktop operating system upgrades
- Removes viruses from the desktop
- Reduces training costs
- Reduces bandwidth costs
- Reduces or eliminates the need for remote office servers
- Reduces user downtime - waiting for help desk response
- Reduces system downtime through better redundancy and disaster recovery capabilities
- Applications available to all users anytime and anywhere
- Quick expansion through ease of deployment
- Enables standardization of corporate applications
- Reduces risk of data loss since data is centralized and can be more easily backed up
- End users will experience improved support
- Helps prevent theft of company data
- Reduces/Eliminates installation of non productive software such as games

| 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). Further information is available at <http://www.2x.com/thinclientserver/>.

| About 2X TerminalServer

2X TerminalServer for Linux is a server-based computing solution that provides users with a secure, personal Linux desktop, from anywhere in the world and over any connection speed. With it you can reduce PC administration and make big savings on Microsoft server, client access (CALs) and application (Office) licenses!

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ABOUT 2X | 2X Software Ltd - 2X - is a company developing software for the booming server-based computing market. Thin client computing controls skyrocketing 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 ApplicationServer for Windows Terminal Services, 2X VirtualDesktopServer, 2X LoadBalancer for Terminal Services/Citrix and 2X ThinClientServer. 2X is a privately held company with offices in the USA, Germany, France, UK, Australia and Malta. Its management team is backed by years of experience in developing and selling network infrastructure software. 2X is a Microsoft, VMware, IBM and RedHat partner. For more information visit: <http://www.2x.com>. All product and company names herein may be trademarks of their respective owners.

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