

UNIX Workstations vs. PC X Servers

Eleven reasons to choose Reflection X

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Enterprises today are under more pressure than ever to hold costs to the ground while increasing support for revenue-generating activities.

If you work in a heterogeneous environment that includes UNIX* workstations and X terminals, one way to tackle the problem is to standardize your department-specific or company-wide infrastructure—for example, by leveraging affordable, manageable, and highly secure PCs.

This white paper explains how PC X servers running on Windows® can easily meet all your requirements for complex graphical design and analysis applications. It also tells how Attachmate's X11R6.9-compliant PC X server—Reflection® X—can make life easier for users and IT alike. When you're done reading, you'll understand why organizations worldwide are finally deciding to replace their longstanding UNIX workstations and X terminals with Windows-based PC X servers.

Workstations: Once the Only Solution

Over the last thirty years, numerous industries—from financial services, medical services, and pharmaceuticals to engineering, aerospace, automotive, and manufacturing—have developed graphical applications that are critical to business operations. Built to render complex 2D or 3D graphics, these CAD/CAM, EDA, and other design applications must run on high-performance equipment. At one point in time, workstations were, by necessity, the solution of choice.

But despite their power, workstations have three major drawbacks:

- **Manageability**
Managing UNIX workstations in today's Windows-centric environments puts an extra burden on IT. In most cases, two separate IT groups are required—one for UNIX users and another for Windows users. Furthermore, Microsoft does not support authenticating to Active Directory from non-Microsoft platforms, so IT cannot take advantage of Active Directory services.
- **User isolation**
UNIX users are often disconnected from applications and data files that are based on Windows PCs and servers. But they are not the only user group affected. Windows users are unable to

use UNIX or Linux applications unless they have access to a workstation—and they usually don't.

- **Cost**
The purchase price of a UNIX workstation can range from below \$3,000 for a low-end machine to well over \$20,000 for a high-end machine that is fast, memory-rich, and capable of handling complex technical designs.

Whatever the initial cost, most workstations come with expensive maintenance agreements. To offset these costs, some vendors offer appealing licensing programs that allow organizations to lease, rather than purchase, their workstations. Any money saved through leasing, however, pales in comparison to the money that could be saved by standardizing all users on a single platform, such as Windows PCs.

Despite these issues, many of the original workstations remain in place due to habit and a general sense that relatively inexpensive PCs are incapable of running or supporting graphics-intensive programs. This perception has led to a dependence on workstations that is far from valid.

PC X Servers: The Modern Alternative

The high-performing PC of today is fully capable of running sophisticated graphics applications. Affordable, easy to manage, and configured for maximum security, a PC X server running on a Windows machine has emerged as a viable alternative to the UNIX workstation.

Windows-based PC X servers can now be optimized for environments that support the latest graphical cards, processors (including 64-bit), and OpenGL/GLX display routines. These technologies are often defined by the X.Org Foundation, which manages the X Window System standards worldwide.

In addition to being a long-time member of the X.Org Foundation, Attachmate has worked with the foundation to define many X Window System standards. These standards have been consistently implemented in Reflection X, Attachmate's PC X server. Reflection X complies with the X11R6.9 release of the X Window System, released on December 21, 2005. Figure 1 shows how Reflection X works.

*This white paper will refer to UNIX workstations because most of today's professional graphical applications were originally developed for UNIX environments.

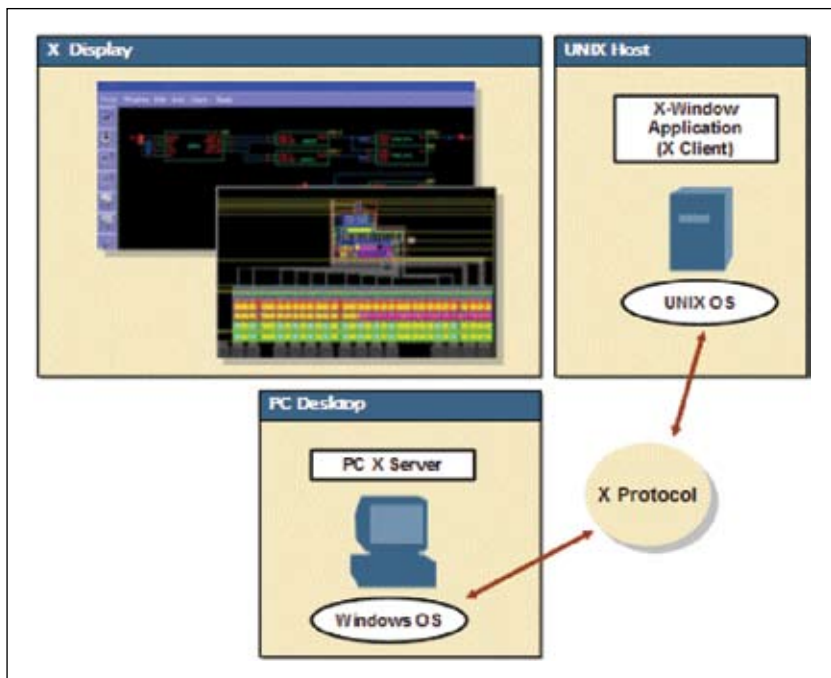


Figure 1. The X protocol defines a client-server relationship between an application and its display. The client (called an X client) runs on the host. The server (called an X server) provides the graphical display capabilities needed to run the X client (e.g., X terminal or PC X server).

The Merits of Reflection X

Modern Windows-based PC X servers, such as Reflection X, make it possible for administrators to finally replace their long-standing UNIX workstations—and improve life on the desktop for users and IT staff alike. Here are eleven good reasons to switch to Reflection X:

1. Native 64-bit support for Microsoft Windows XP x64 Edition

With native 64-bit support for Microsoft Windows XP x64 Edition, Reflection X simplifies migration to new desktop platforms and enhances performance of graphics-intensive applications.

2. Integration with Windows applications

With Reflection X, you can easily integrate X applications with other Windows applications, giving workstation users access to previously inaccessible capabilities. For example, being able to copy and paste between graphical applications and Windows applications, such as Microsoft Office, is critical when information needs to be shared.

3. Multiple sessions to multiple hosts

With Reflection X, users can work in multiple sessions with multiple hosts, including simultaneous X sessions. That means they can

quickly switch between the most critical applications or X sessions. Furthermore, the sessions can be configured as needed. For example, the keyboard layout can be remapped to support a number of different UNIX, Linux, and OpenVMS hosts.

4. Desktop switching

With Reflection X, the desktop can be configured to look and feel like a UNIX workstation or a Windows PC, depending on the user's preference. What's more, the user can switch freely between the two environments as needed.

5. Speed and accuracy

Attachmate has been developing Reflection X for more than a decade. Today, the product can render and display graphical X Window

applications as quickly and accurately as an X terminal.

6. Support for X clients over slow links

Reflection X supports Low Bandwidth X (LBX), an open protocol compression technology that improves the performance of X clients when they are launched over narrow, slow links (such as WANs) or through Internet service providers.

7. Greater application access

In addition to reducing support costs, a standard end-user platform makes it easier to provide broad-based access to UNIX, Linux, and OpenVMS applications—a capability that may become a requirement as more and more business applications are being ported to UNIX and Linux systems.

8. Easier installation

Reflection X works seamlessly with Microsoft Windows Installer®, which has become a standard method for installing and managing applications. Reflection X customers have been using Windows Installer package files since Installer was first introduced with Windows 2000. With Reflection X Installer support, you can:

- Control user access to features, settings, and commands.

- Repair major EXEs or DLLs that are unintentionally damaged by a user. Reflection X automatically repairs itself at startup. You can also perform a more thorough level of repair using the Windows repair function, which is available through the Add/Remove Programs option in the Control Panel.
- Quickly perform a workstation or network-based installation. Just choose the host product and features to install either locally or on the network. Then users can invoke the Install on Demand option to install a feature from the desktop. This option saves disk space on the user's computer until features are actually needed.
- Recover from incomplete installations and automatically repair files or registry entries if they are accidentally corrupted or deleted. You can even deploy Reflection X patches across the network via Windows Installer, speeding up desktop fixes.

In short, you can install and deploy Reflection X without having to learn a whole new set of tools.

9. Centralized deployment

Reflection X fully supports Windows Terminal Server, providing a centralized location from which to run connections to UNIX, Linux, or OpenVMS servers for graphical applications. Windows Terminal Server can enhance your software-deployment capabilities in ways that are not possible with traditional application-distribution technologies:

- When users run Reflection X on Terminal Server, application execution takes place on the server; keyboard, mouse, and display information is transmitted over the network. Users see only their own sessions, which are managed transparently by the server operating system and remain independent of any other client session.
- When Reflection X is managed on Terminal Server (instead of on each device), it is easy for IT administrators to determine whether users are running the latest version of Reflection X. Furthermore, minimal terminal-to-host communication requirements reduce the processing time needed to run multiple sessions.
- Remote users can access Reflection quickly and easily from a variety of desktop configurations.

In addition to being optimized for Terminal Server, Reflection X is also optimized for Citrix, which is a Terminal Server add-on.

10. Stronger security with protocol-based options

The designs created with graphical applications are often considered intellectual property that must be protected, especially when they are shared or transferred. Reflection X secures these valuable designs with a variety of protocol-based options (see Figure 2):

- **XDM Authorization:** By installing and configuring Reflection XDM Authorization support, you can make XDMCP connections using XDM-AUTHORIZATION-1. This method is similar to MIT-MAGIC-COOKIE-1 (which Reflection X uses when XDM Authorization support is not installed), but provides added security by encrypting the authorization code using 56-bit DES encryption. XDM-AUTHORIZATION-1 helps to further secure the authorization process. It does not encrypt subsequent data sent over the connection.
- **Secure Shell (SSH):** The Reflection X implementation of SSH—built to meet the stringent FIPS 140-2 and DOD PKI security requirements—provides encrypted communications over nonsecure networks. Reflection X SSH supports the following data encryption standards: DES (56-bit), Arcfour (40- or 128-bit), 3DES (168-bit), Cast (128-bit), Blowfish (128-bit), and AES/Rijndael (128-, 192-, or 256-bit). With SSH, passwords are never sent over the network in unprotected clear text as they are when sent via Telnet, FTP, rlogin, or rsh.
- **Kerberos:** Kerberos is a secret-key-based security service that prevents unauthorized access to network services. When Reflection X Kerberos support is enabled, Reflection X communicates with a security server, exchanging a series of encrypted messages with the server to prove the user's identity. Reflection X supports both 56-bit DES and 168-bit 3DES data encryption standards. The Kerberos authentication process does not involve sending passwords across the network, so an attacker cannot intercept this information and use it to breach network security.

Reflection X also includes an optional Kerberos Manager utility that you can use to create or

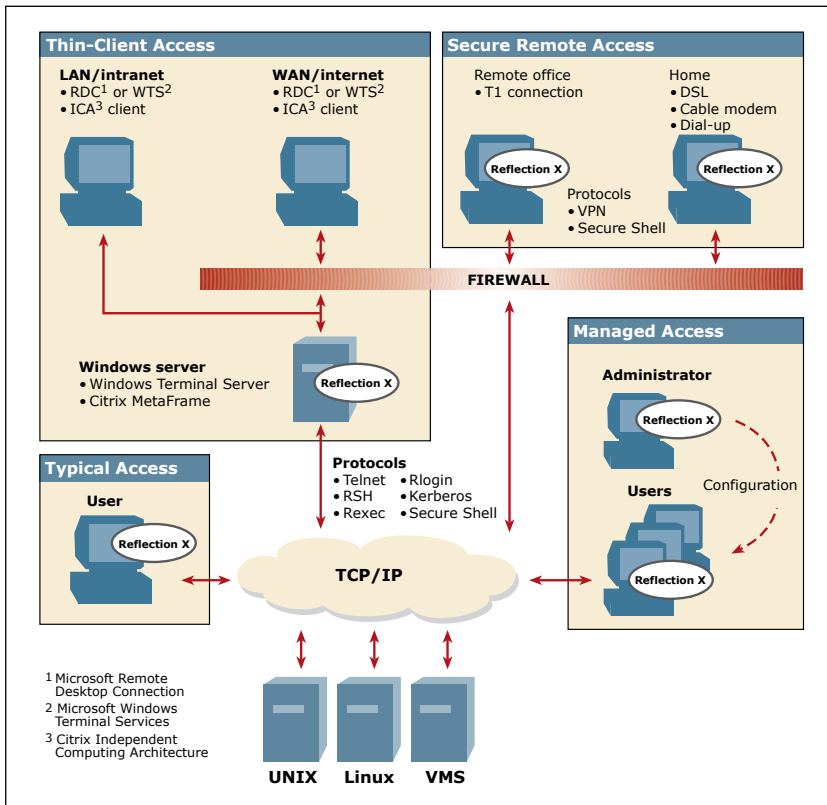


Figure 2. Reflection X security options ensure optimal security for a broad range of users, including those on remote and thin-client desktops.

users the ability to access authorized terminal sessions. Reflection X allows just read-only access to the directory server, so you don't need to make any changes on your Active Directory server.

You can even configure Reflection X sessions for specific users or groups who are defined in Active Directory. By ensuring that the right people are using the correct configuration of Reflection X, you can maximize productivity and minimize support calls.

Reflection X also uses Active Directory for access control, so you can comply with existing security policies while improving productivity for users.

– **Group Policy**

Group Policy is a Microsoft Windows administrative tool used to define and control

modify principal profiles, add or modify realms, and set ticket options.

11. Stronger security with Windows-based options

Reflection X supports the Microsoft technologies highlighted below, many of which have become the de facto standard for IT departments:

- **Active Directory:** Active Directory enables centralized management of users and computers (see Figure 3).

With Reflection X support for Active Directory, you can give authenticated

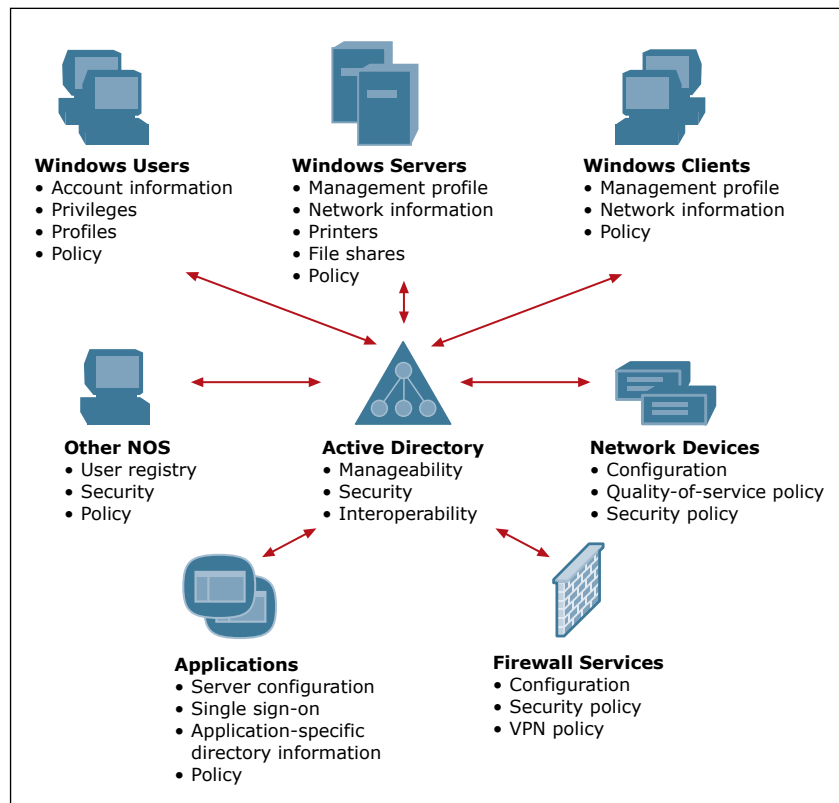


Figure 3. Active Directory enables centralized management of users and computers.

the way programs, network resources, and the operating system work for groups of users and desktops. Although it can be used alone, Group Policy is most effective when used with Active Directory.

In an Active Directory environment, Group Policy is applied to users or computers based on their membership in sites, domains, or organizational units. The Group Policy settings in Reflection X provide powerful customization, management, and security tools. For example, you can customize Reflection X to enable only secure, encrypted connections; you can disable macros; and you can remove a user's ability to transfer files to and from host computers.

Because Group Policy can define Reflection X settings and actions for users and computers, you can tailor desktops to users' job responsibilities and experience levels. In this way, you can reduce productivity losses typically attributed to user errors (such as modifying system configuration files and rendering a computer unworkable) or to complexity (such as the availability of nonessential applications and features on the desktop).

The Same Capabilities, and More

Once the only option for running sophisticated graphics applications, UNIX workstations have met their match when compared with today's high-powered, Windows-based PC X servers. Not only do PC X servers, such as Reflection X, typically cost less to acquire and maintain than a UNIX workstation, but because they support Windows, they also do everything a workstation does and more. For that reason, the question is not *if* you should replace your UNIX workstations, but *when*?

About Attachmate

Attachmate helps businesses extend, manage, and secure their IT investments. We offer a broad range of solutions—from terminal emulation, legacy integration, and PC lifecycle management products to innovative systems and security management tools. With our technology, more than 40,000 businesses worldwide are putting their IT assets to work in new and meaningful ways. Learn more at www.attachmate.com.



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