

Reflection® Suite for X offers a PC X server, terminal emulation software, and file transfer clients—all in one deployment package. With this multipurpose solution, you can connect Windows users to graphical and character-based applications on UNIX, Linux, OpenVMS, and IBM systems. Built to safeguard data, boost user productivity, and simplify desktop management, Reflection Suite for X easily meets all your host access needs.



With Reflection Suite for X you can:

- Deploy a single product that meets the full spectrum of host access needs.
- Connect Windows users to graphical and character-based applications on UNIX, Linux, OpenVMS, and IBM systems.
- Display highly graphical and 3D X applications via OpenGL 1.5 and GLX 1.4.
- Ensure secure communications with a Secure Shell (SSH) client that offers X11 forwarding, interactive and batch session capabilities (ssh), and secure file transfer (sftp and scp).
- Enable user-driven and automated file transfers with drag-and-drop, command line, and API file transfer interfaces that support a broad range of protocols, including FTP, FTP/S, and SFTP.
- Provide access to X applications over the most popular desktop virtualization environments, including Windows Terminal Server and Citrix XenApp.

Product Highlights

UNIX apps and Windows desktops—a seamless relationship.

Reflection Suite for X seamlessly integrates UNIX applications and Windows desktops. For example, you can easily launch a graphical UNIX application using a desktop shortcut; the UNIX application appears to be running in Windows. You can minimize, maximize, restore, and close your UNIX application just like you can with a Windows application. You can also copy and paste text and images from Windows to UNIX, and vice versa.

Time-saving configuration wizards and templates.

You can easily set up your PC server environment with Reflection Suite for X's built-in configuration wizards and

templates. The Reflection X Client Wizard steps you through the configuration process—gathering information on the target host system, security settings, and client command line. It even generates a startup shortcut for future use. Reflection Suite for X also offers quick-start templates for configuring your X server.

Multiple solutions rolled into one.

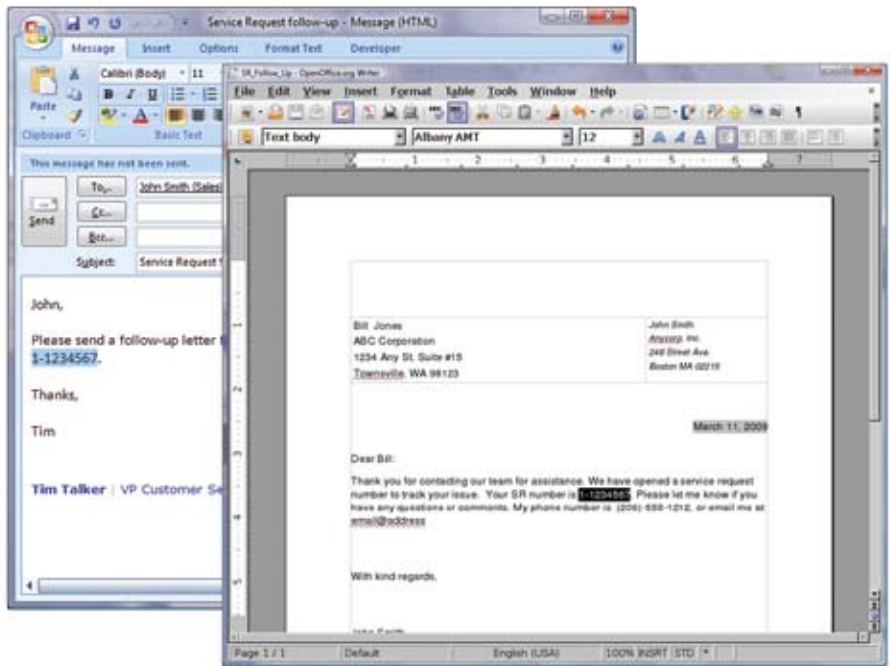
Reflection Suite for X covers the full spectrum of UNIX-based host access needs with a powerful PC X server; VT, 3270, and 5250 terminal emulators; and a secure FTP client. This multipurpose solution provides connections to both graphical and character-based applications. It also safely transfers the files that keep your business running.

Precise 2D and 3D graphics with OpenGL support.

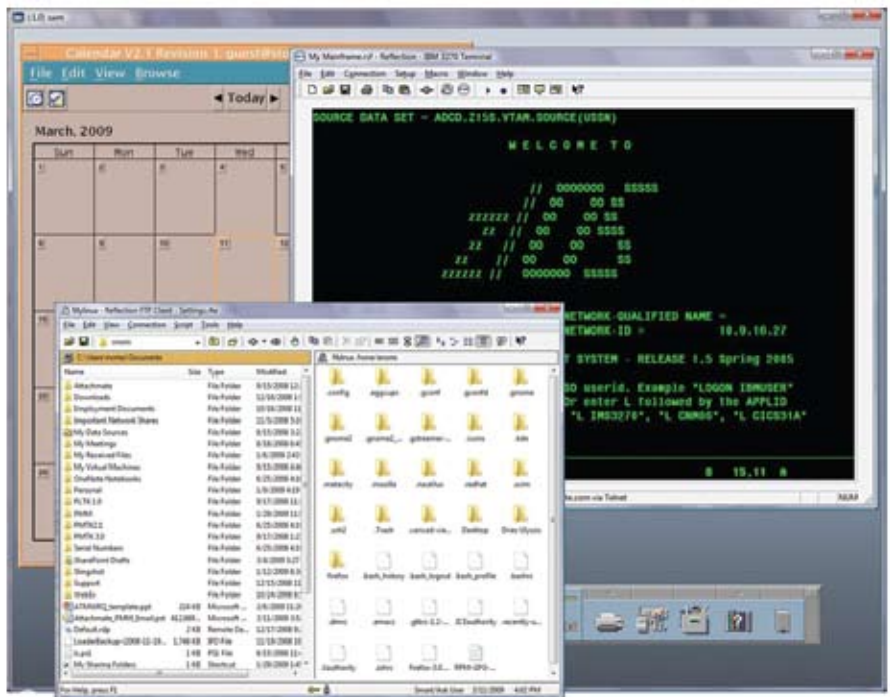
Reflection Suite for X supports CAD/CAM, modeling, animation, and simulation applications that leverage the OpenGL API. That means Windows users can access powerful graphical applications that deliver high-quality 2D/3D color images and use functions such as modeling, transformations, color, lighting, smooth shading, and texture mapping.

High-level security. High-level compliance.

Reflection Suite for X is designed to help you meet both internal and external security requirements. In addition to providing all the latest SSH, SSL/TLS, and Kerberos encryption and authentication technologies, Reflection Suite for X is validated for FIPS 140-2 and certified for DoD PKI—the U.S. government’s top security standards. This high level of security helps you comply with mandates driven by PCI audits, Sarbanes-Oxley, HIPAA, and Basel II.



You can seamlessly copy and paste text and graphics between Windows and UNIX-based applications.



You can access graphical X Window environments, run terminal-based applications from UNIX and IBM hosts, and transfer files—all with a single product installation.

TECHNICAL SPECIFICATIONS

PRODUCT COMPONENTS

- PC X server
- UNIX and OpenVMS terminal emulation
- IBM terminal emulation

PC X SERVER

Product Components

- PC X server
- UNIX and OpenVMS terminal emulation
- Secure file transfer application

X Server Display

- X11 compliance
- Support for multiple X displays and X screens
- Multiple monitor support
- Color depths: 1, 8, 24, and 32
- Broad server visual support, including TrueColor, PseudoColor, GrayScale, StaticColor, and StaticGray
- Support for local and remote window managers, including GNOME, KDE, and CDE
- Sun X server compatibility settings
- Backing store and save under support
- Native 64-bit support for Microsoft Windows
- IPv4 and IPv6 support

Session and Client Launching

- XDMCP (direct, indirect, and broadcast)
- Extensive client connection options, including SSH, Telnet, Kerberized Telnet, rexec, rsh, rlogin, and PCX\$SERVER

Copy and Paste

- Copy and paste both text and graphics between X clients and Microsoft Windows applications
- Copy and paste text between X clients
- Text, area, and window selection modes
- Copy to Windows printers and graphics editors

Font Support

- X11R5/X11R6 font server with local font caching
- Automatic connection to font server
- Support for TrueType, Unicode, and international fonts
- Automatic font substitution

Keyboard Support

- Graphical keyboard mapping
- International keyboard support
- Host keyboard emulation for Sun, HP, IBM, SCO, and DEC (including LK450)

Mouse Support

- NEW** • SpacePilot support
- 3Dconnexion SpaceBall 5000 and SpaceMouse Plus support
- 3-button emulation
- Wheel-mouse scroll support for buttons 4 and 5

X Extensions Support

- NEW** • RENDER
- DAMAGE, XFixes, BIG-REQUESTS, GLX, MIT_SUNDRY_NONSTANDARD, SHAPE, XTEST, MIT-SHM, SYNC, DEC-XTRAP, DOUBLE-BUFFER, EVI, GP-MIT-SHM, LBX, MBX, SECURITY, TOG-CUP, WRQ_XPRINT, WRQ-ADMIN, XC-APPGROUP, XC-MISC, XDIRECTACCESS, XF86_BIGFONT, XINPUT, and XKB

OpenGL/GLX

- OpenGL 1.5 and GLX 1.4 support
- Overlay plane support
- Accelerated 3D hardware support

Security

- FIPS 140-2-validated cryptographic module (Certificate #1027)
- NEW** • Adheres to FDCC security policy requirements
- PKI support built to meet DoD standards:
 - PKCS #11 support
 - U.S. DoD Common Access Card (CAC support)
 - Online Certificate Status Protocol (OCSP) support
 - Certificate Revocation Lists (CRL)
 - Intermediate certificate storage through LDAP
 - Reflection Certificate Manager
- Reflection Key Agent accepts SSH keys and certificates for single sign-on authentication
- SSH encryption:
 - SSH X client launching
 - X11 forwarding
 - Command line SSH utilities (ssh, scp, and sftp)
 - Port forwarding (tunneling) for TCP/IP ports through secure channel
 - Integrated multihop SSH configuration support
 - Password, keyboard interactive, public key (user key and X.509 certificates), and Kerberos authentication
 - Smart card support through PKCS #11 interface
 - SSH key agent
 - Key generation and conversion (RSA-1, RSA, and DSA) utility
 - Easy uploading of users' public keys to SSH servers
 - SSH connection reuse
 - Standard SSH configurations

PC X Server Version 14.1 Highlights

- X11 RENDER extension support.
- Microsoft Windows 7 support.
- Microsoft Windows 64-bit platform support.
- FIPS 140-2-validated cryptographic module (Certificate #1027).
- Reflection Certificate Manager for easier use of certificates.
- Tested against Federal Desktop Core Configuration (FDCC) security standard.
- Reflection Key Agent, which accepts SSH keys and certificates for single sign-on authentication.
- Enhanced support for certificates—PKCS #11, U.S. DoD Common Access Card (CAC), Online Certificate Status Protocol (OCSP), Certificate Revocation Lists (CRL), and intermediate certificate storage through LDAP—for strong authentication.

- Reflection Kerberos Client:
 - Secure authentication
 - Datastream encryption (DES and 3DES) for Telnet and FTP
 - Support for ticket forwarding and renewal
 - Compatible with Microsoft and Leash32 credentials caches
 - Standard Kerberos configurations
 - Support for Kerberos KDCs using TCP or UDP
- SSL/TLS Telnet encryption:
 - Integrated SSL/TLS Telnet encryption

Printing

- Windows or host control
- Network, local, or print to disk
- Print logging
- Fixed pitch TrueType and printer font
- Line-drawing characters

Administrative Tools

- X Manager:
 - Multiple X client and server management from a single tool
 - Consolidated view of all configuration settings
- X Profiler:
 - Default value configuration for each Reflection X setting
 - End-user configuration lockdown
- Quick-start tools:
 - X Client Wizard
 - Client-connection and server configuration templates
- X protocol trace and replay utility with custom filters for troubleshooting, user training, or presentation

TECHNICAL SPECIFICATIONS (continued)

- Support for Windows administration features:
 - Windows Installer (MSI)
 - Active Directory
 - Roaming user and multiple user profiles
 - Group Policy

International Support

- English, French, German, and Japanese languages
- Japanese inline input
- XIM (I18N and XIMP), Microsoft-IME, and LocalFEP
- Support for double-byte fonts, including Chinese

UNIX AND OPENVMS TERMINAL EMULATION

Host Types

- UNIX (including Linux)
- OpenVMS (including Itanium)
- Data General

Emulation Types

- UNIX and OpenVMS:
 - VT terminals, including Japanese
 - Support for numerous host character sets, including UTF-8 (Unicode)
 - TVI 950/955, Wyse 50+, Wyse 60, ADDS VP2, SCO-ANSI, and BBS-ANSI
 - Linux console, AT386, IBM 3151, xterm, and VT-UTF8
- Data General:
 - Dasher 215
- All host types:
 - IPv4 and IPv6 support (Telnet, SSL/TLS, and SSH)

Network Protocols

- SOCKS client support
- Extensive Telnet options with support for threaded I/O; Line mode; NAWS (option 31); Local Echo, including Telnet option 45 (Suppress Local Echo)
- Rlogin, TCP/IP, and network-based modems
- Full support for serial connections, including automatic serial-port detection and USB

Printing

- Windows or host control
- Network, local, or print to disk
- Print logging
- Fixed pitch TrueType and printer font
- Line-drawing characters

Programming and Automation

- Microsoft Visual Basic for Applications
- Reflection Basic and Reflection Command Language
- VBA macro output available in VB.NET and C# (.NET)
- VBA macro sharing
- Macro recorder for VBA and Reflection Basic
- Programmatic access to over 400 properties and methods via Reflection API
- Microsoft OLE Automation Controller and server capability
- Run Reflection as an ActiveX control within a VB or VB.NET application
- Programmable events

User Interface

- X11 mouse-style support
- Connection wizard

UNIX and OpenVMS Terminal Emulation Version 14.1 Highlights

- Microsoft Windows 7 support.
- Microsoft Windows 64-bit platform support.
- FIPS 140-2-validated cryptographic module (Certificate #1027).
- Reflection Certificate Manager for easier use of certificates.
- Tested against Federal Desktop Core Configuration (FDCC) security standard.
- Reflection Key Agent, which accepts SSH keys and certificates for single sign-on authentication.
- Enhanced support for certificates—PKCS #11, U.S. DoD Common Access Card (CAC), Online Certificate Status Protocol (OCSP), Certificate Revocation Lists (CRL), and intermediate certificate storage through LDAP—for strong authentication.

- Customizable toolbars and menus
- Dynamic hotspots
- Full-screen terminal mode
- Graphical keyboard mapping
- Mouse mapping (2- and 3-button)
- Resizable terminal keyboard
- Full color editing
- HTML Help in the customization tools

Browser Support

- Run Reflection as an ActiveX control in supported browsers

Security

- FIPS 140-2-validated cryptographic module (Certificate #1027)
- NEW • Adheres to FDCC security policy requirements
- PKI support built to meet DoD standards:
 - PKCS #11 support
 - U.S. DoD Common Access Card (CAC) support
 - Online Certificate Status Protocol (OCSP) support
 - Certificate Revocation Lists (CRL)
 - Intermediate certificate storage through LDAP
 - Reflection Certificate Manager
- Reflection Key Agent accepts SSH keys and certificates for single sign-on authentication
- SSH encryption:
 - SSH X client launching
 - X11 forwarding
 - Command line SSH utilities (ssh, scp, and sftp)
 - Port forwarding (tunneling) for TCP/IP ports through secure channel
 - Integrated multihop SSH configuration support

TECHNICAL SPECIFICATIONS (continued)

- Password, keyboard interactive, public key (user key and X.509 certificates), and Kerberos authentication
- Smart card support through PKCS #11 interface
- SSH key agent
- Key generation and conversion (RSA-1, RSA, and DSA) utility
- Easy uploading of users' public keys to SSH servers
- SSH connection reuse
- Standard SSH configurations
- Reflection Kerberos Client:
 - Secure authentication
 - Datastream encryption (DES and 3DES) for Telnet and FTP
 - Support for ticket forwarding and renewal
 - Compatible with Microsoft and Leash32 credentials caches
 - Standard Kerberos configurations
 - Support for Kerberos KDCs using TCP or UDP
- SSL/TLS Telnet encryption:
 - Integrated SSL/TLS Telnet encryption

Administrative Tools

- Centralized management of settings files using group policy
- Customization tools for:
 - Settings and installation files (including MSI)
 - Online Help
- Web console for centralized administration of settings files
- Web-based deployment of settings files and updates
- Support for Windows administration features:
 - Windows Installer (MSI)
 - Active Directory
 - Roaming user and multiple user profiles
 - Group Policy
- Microsoft Windows Terminal Server support
- Citrix XenApp support

International Support

- English, French, German, and Japanese languages
- Localized keyboards, displays, and printers
- Japanese PC-9800 series
- Support for Asian input-method editors

IBM TERMINAL EMULATION

Host Types

- IBM mainframe (3270)
- IBM AS/400 (5250)

Emulation Types

- IBM mainframe (System z):
 - 3179, 3179-G, 3180, 3192-G, 3196, 3197, 3270, 3278, 3279, 3472-G, 3476, 3477, 3486, and 3487
- IBM AS/400 (System i):
 - 5250, 5251, 5291, and 5292

Network Protocols

- IPv6 support
- IBM mainframe:
 - 802.2 (DLC)
 - Coax DFT
 - IBM Communication Server
 - LUA
 - Microsoft SNA Server
 - NetWare for SAA via IPX/SPX
 - NetWare for SAA via TCP/IP
 - SDLC
 - LU 6.2 (APPC)
 - TN3270 and TN3270E
- IBM AS/400:
 - 802.2 (DLC)
 - IBM Communication Server
 - Microsoft SNA Server
 - MPTN (AnyNet)
 - NetWare for SAA
 - LU 6.2 (APPC)
 - TN5250 and TN5250E

Printing

- 3287, 3812, 3912, and 5553 printer emulation
- Pre-printed form support
- Print screen with consolidated screen-printing utility
- Host Print Transform
- Duplex printing

Programming and Automation

- One session file for settings and macros
- Microsoft Visual Basic for Applications
- VBA macro output available in VB.NET and C# (.NET)
- VBA macro sharing
- Reflection Basic
- Macro recorder support for VBA and Reflection Basic
- Programmatic access to over 400 properties and methods via Reflection API
- DOS HLLAPI, HLLAPI, eHLLAPI, WinHLLAPI, IMAPI, CPI-C, and WinAPPC
- Microsoft OLE Automation Controller and server capability

IBM Terminal Emulation Version 14.1 Highlights

- Microsoft Windows 7 support.
- FIPS 140-2-validated cryptographic module (Certificate #1027).
- Reflection Certificate Manager for easier use of certificates.
- Tested against Federal Desktop Core Configuration (FDCC) security standard.
- Easy access to Internet addresses from within host sessions.
- Enhanced support for certificates—PKCS #11, U.S. DoD Common Access Card (CAC), Online Certificate Status Protocol (OCSP), Certificate Revocation Lists (CRL), and intermediate certificate storage through LDAP—for strong authentication.

- Programmable events
- Run Reflection as an ActiveX control within a VB or VB.NET application
- Microsoft Dynamic Data Exchange (DDE)

User Interface

- Clickable Internet addresses (URLs) in host sessions
- Option to hide OIA
- Simplified batch-file transfers
- Customizable screen sizes (3270 only)
- Font sizing
- Removable title bar
- 3270 word wrap
- FTP toolbar button
- Connection wizard
- Customizable toolbars and menus
- Dynamic hot spots
- Graphical keyboard mapping
- Mouse mapping (2- and 3-button)
- Resizable terminal keyboard
- Full color editing
- HTML Help in the customization tools

Browser Support

- Run Reflection as an ActiveX control in supported browsers

Security

- FIPS 140-2-validated cryptographic module (Certificate #1027)
- NEW • Adheres to FDCC security policy requirements
- IBM Express Logon Feature (ELF) support
- Automatic Kerberos sign-on for IBM AS/400
- PKI support built to meet DoD standards:
 - PKCS #11 support
 - U.S. DoD Common Access Card (CAC) support
 - Online Certificate Status Protocol (OCSP) support
 - Certificate Revocation Lists (CRL)

TECHNICAL SPECIFICATIONS (continued)

- Intermediate certificate storage through LDAP
- Reflection Certificate Manager
- Integrated SSL/TLS Telnet encryption

Administrative Tools

- Auto-update of device names
- Centralized management of settings files using group policy
- Customization tools for:
 - Settings and installation files (including MSI)
 - Online Help
- Web-based deployment of settings files and updates
- Support for Windows administration features:
 - Windows Installer
 - Active Directory
 - Roaming user and multiple user profiles
 - Group Policy
- Microsoft Windows Terminal Server support
- Citrix XenApp support

International Support

- Support for the Chinese Simplified code page
- English, French, German, and Japanese languages
- Localized keyboards, displays, and printers
- Japanese PC-9800 series
- Support for Asian input-method editors

COMMON SPECIFICATIONS

File Transfer

- Reflection Secure FTP Client:
 - SSH, SSL/TLS, SOCKS, and Kerberos security protocols
 - Extensive firewall support
 - File browsing on z/OS hosts with TSO data sets
 - Save FTP client sessions in Layouts
 - Management of FTP settings via Reflection Administrator
 - IPv4 and IPv6 support
 - Change UNIX file permissions with FTP client
 - SFTP downloads resume after interruption
 - Support for a wide variety of FTP servers, including IBM System z, IBM System i, UNIX, NetWare, Unisys, HP 3000, and OpenVMS
 - FTP site wizard
 - Site-to-site transfer between FTP servers
 - Export/import settings in XML format
 - Wildcard filters
 - Automation tools (script recorder and Microsoft OLE Automation)
 - Drag-and-drop file transfers directly to the desktop
- WRQ Reflection proprietary protocol, FTP, Kermit, Xmodem, and Zmodem
 - ASCII, binary, and labels/image support
- IND\$File, DISOSS, SQL data query, batch-file transfer, and APVUFILE (IBM terminal emulator only)

- SSL/TLS encryption for AS/400 LIPI file transfers (IBM terminal emulator only)

System Requirements

- Any system that meets the recommended requirements for the Microsoft Windows operating system (an additional 64 MB of memory is recommended for better PC X server performance)
- Disk space requirement varies depending on the features installed (typically 45–120 MB)
- 256-color or higher video-card resolution (for PC X server, 24-bit color recommended; accelerated OpenGL video card recommended for 3-D CAD/CAM applications)
- Network interface card
- 100 Mbps network speed for 2D and 3D CAD/CAM applications
- 2-button mouse, 3-button mouse, wheel mouse, 3Dconnexion SpaceBall 5000, SpaceMouse Plus, or SpacePilot

Operating Systems

- NEW • Microsoft Windows 7
- Microsoft Windows Vista
- Microsoft Windows XP
- Microsoft Windows Server 2008
- Microsoft Windows Server 2003
- Microsoft Windows Terminal Server
- NEW • Citrix XenApp

About Attachmate

Attachmate delivers advanced software for terminal emulation, legacy modernization, and managed file transfer. Our NetIQ business provides solutions for automating IT processes and managing performance, security, and compliance of distributed IT. With our technologies, more than 65,000 businesses worldwide are putting their IT assets to work in new and meaningful ways.

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