The Evolution of the Win 32 ICA Clients
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**Introduction**

MetaFrame servers made the Citrix reputation, but the Win32 ICA Client is absolutely vital if you want to reach any information published on any MetaFrame servers. To directly access applications published on MetaFrame servers, users can launch the ICA Win32 Program Neighborhood to browse for application sets or create custom ICA connections to Citrix servers or published applications.

The paragraphs below cover an overview of the ICA Win32 Program Neighborhood Clients from Version 4.20 up to the latest one, Version 7.100 currently available from the following link:

2. Evolution of the Win32 Clients

2.1 ICA Client Version 4.20

When connected to a Citrix server, the Citrix ICA Win32 Client has the following features:

- **Program Neighborhood:**
  Server-based applications can now be pushed to the Program Neighborhood Client, integrated into the local 32-bit Windows desktop, or pushed directly to the client’s **Start** menu.

- **TAPI support:**
  It includes TAPI modem support for dial-up connections to Citrix servers. TAPI support allows the Win32 Client to detect the presence of TAPI Version 1.4 or greater modems on the client device.

- **Seamless windows:**
  It supports the seamless integration of local and remote applications on the local Windows 95 or Windows NT 4.0 desktop.

- **Client device mapping:**
  **Client device mapping** allows a remote application running on the Citrix server to access printers, disk drives, and COM port devices attached to the local client device.

- **Client drive mapping:**
  **Client drive mapping** allows drive letters on the Citrix server to be redirected to drives that exist on the client device.

- **Client printer mapping:**
  **Client printer mapping** allows a remote application running on the Citrix server to access printers attached to the client device. Any printers detected when connected to a Citrix server are automatically added to the Print Manager.

- **Client COM port mapping:**
  The ICA Client COM port redirector gives Citrix ICA Client users access to virtually any peripheral that requires a COM port for operations.

- **Sound support:**
  ICA Client sound support allows a client device with a Sound Blaster 16-compatible sound card to play sound files on the server and present them on the client device’s sound system.

- **Encryption**
  The Citrix ICA Clients support encryption using Citrix SecureICA Services. This server extension (available in North American and Global versions) adds advanced RSA RC5 encryption to the Citrix server and clients.
**Client auto update:**

The Client Auto Update feature allows administrators to update ICA Client installations from a central location instead of having to manually install new client versions on each client device. New versions of Citrix ICA Clients are stored in a central *Client Update Database*. ICA Client Auto Update works with all transport types supported by ICA (TCP/IP, IPX, NetBIOS, and serial).

**Windows clipboard integration:**

Users can cut and paste data between ICA sessions and local applications using the Windows clipboard.

**Low bandwidth requirements:**

The highly efficient Citrix ICA protocol typically uses 20K of bandwidth for each session.

**Disk caching and data compression:**

These features increase performance over low speed asynchronous and WAN connections. *Disk caching* stores commonly used portions of your screen (such as icons and bitmaps) locally. *Data compression* reduces the amount of data sent over the communications link to the client computer.

### 2.2 ICA Client Version 4.21

This client version integrates the same functionality as the ones above from Version 4.20 as well the two new ones below:

**Business Recovery:**

The Citrix ICA Client includes the additional intelligence to support multiple server sites (such as a primary and a backup) with different addresses for the same published application name.
Wheel Mouse support:

If you run applications that take advantage of a wheel mouse, the ICA Win32 Client transmits the wheel mouse movements in the same manner that it transmits other mouse data. It requires MetaFrame 1.8 Service Pack 1 or later and a local client device that supports wheel mouse functionality.

2.3 ICA Client Version 6.00

When connected to a Citrix server, the Citrix ICA Win32 Client has the following features:

- Program Neighborhood
- TAPI support
- Seamless windows
- Client device, drive, COM port, and printer mappings
- Sound support
- Client auto update
- Windows clipboard integration
- Low bandwidth requirements
- Disk caching and data compression

New Features:

Dialing prefixes:

The Citrix ICA Clients support dialing prefixes. Dialing prefixes allow a user to easily add special dialing codes as required by different telephone systems for dialing out and accessing a remote Citrix server.

SpeedScreen Latency Reduction®:

SpeedScreen Latency Reduction is a collective term used to describe functionality that enhances the user's experience on slower network connections. SpeedScreen Latency Reduction functionality includes:

- Local text echo
  This ICA Client option accelerates the display of the input text on the client device.
- Mouse Click Feedback;
  This ICA Client option provides visual feedback for mouse clicks to show that the user's input is being processed.

SpeedScreen latency reduction is not available when connecting to MetaFrame for UNIX 1.0 and 1.1 servers.

TCP/IP+HTTP Server Location:

TCP/IP server location allows you to retrieve Citrix server and published application information across network configurations that restrict broadcast and UDP packets. It allows you to locate Citrix servers across a firewall.

Multiple-Monitor Support:

The Citrix ICA Win32 Client supports multiple monitors connected to a single computer.
Pass-Through Authentication:
Pass-through authentication provides the ability to pass the user’s desktop password to the server, eliminating the need for multiple system and application authentications.

Panning and Scaling:
Panning provides scroll bars that allow you to scroll an ICA session image configured at a higher resolution than your local client desktop. Scaling provides controls that enable you to shrink an ICA session image to fit your desktop.

Encryption:
The default level is Basic. Select RC5 128-bit Login only to use encryption during authentication. To enable encryption levels higher than Basic, the Citrix server must support RC5 encryption. This support is included with SecureICA Services and Feature Release 1.

2.4 ICA Client Version 6.00.931
This client contains the same feature as Version 6.00 and it corrects the following issues below:

- Hotkeys did not work in a Win32 connection launched with Wfica32.exe.
- When running certain applications in 256 color mode, such as Microsoft Help or Centura’s Multiwin, the display refreshed every two seconds within the application.
- Undocked toolbars did not resize in seamless mode.
- Program Neighborhood icons disappeared.
- Loading a Visual Basic DLL add-on to the client desktop during an active ICA session failed.
- ICA asynchronous dialup connections sometimes failed with a 1069 error. After the error occurred, the ICA asynchronous port on the server would not answer any new calls until the port was reset.
- PeopleSoft 7.51 windows opened in the background when in seamless mode on MetaFrame for Windows 2000 Servers.
- Seamless applications sometimes lost window focus soon after being launched. The seamless ICA window was sending an event to the host that was causing the client-side window to lose focus.

2.5 ICA Client Version 6.20.985
This was distributed with Feature Release 1 of MetaFrame XP Version 1.0.

Version 6.20 of the ICA Win32 Clients includes performance enhancements in the following area:

- ICA display and client printer management

The client requires 8.3MB of space on the hard drive.
When connected to a Citrix server, the Citrix ICA Win32 (6.20.985) Client has the following features:

- Program Neighborhood
- TAPI support
- Seamless windows
- Client device, drive, COM port, and printer mappings
- Sound support
- Client auto update
- Windows clipboard integration
- Low bandwidth requirements
- Disk caching and data compression
- Dialing prefixes
- SpeedScreen Latency Reduction
- Business Recovery
- TCP/IP+HTTP server location
- Wheel mouse support
- Multiple-monitor support
- Pass-Through Authentication
- Panning and Scaling

Features that are marked with the symbol (*) require the MetaFrame XP server to be licensed for Feature Release 1.

Features that are not so marked require that Service Pack 1 for MetaFrame XP be installed.

**Universal Print Driver support ( *):**

The Citrix Universal Print Driver is a standard Windows 2000 or Windows NT print driver that encapsulates print jobs in PCL4 format. The Universal Print Driver renders print jobs in monochrome at up to 300 dots per inch on a standard set of forms.
Auto Client Reconnect (*):

The *auto client reconnect* feature is triggered when the ICA Client detects a disconnected session. When this feature is enabled on a MetaFrame XP server, users do not have to reconnect manually or reenter logon credentials to continue working.

Published Content Support (*):

Citrix administrators can now push content files, including documents, Web pages, video presentations, and sound files, to users. You publish content files on the MetaFrame XP server in the same manner as applications. Users view or play the published content files with a content viewer or player stored locally on the client device.

Novell Directory Services Support (*):

When users launch ICA Win32 Client software, they can log on and be authenticated using their NDS credentials. Supported NDS credentials are user name (or distinguished name), password, directory tree, and context.

NDS support is integrated into the following:

- Program Neighborhood and Program Neighborhood Agent
- Pass-Through Authentication
- Custom ICA connections

DNS Name Resolution (*):

You can configure the ICA Win32 Clients that use the XML Service to connect to the MetaFrame farm to request a Domain Name System (DNS) name instead of a server IP address.

Secure Sockets Layer support for ICA:

Citrix SSL Relay provides the ability to secure data communications using the Secure Sockets Layer (SSL) protocol.

You can now use Citrix SSL Relay to secure communications between an SSL-enabled ICA Win32 Client and a MetaFrame server. Citrix SSL Relay uses Version 3.0 of SSL.

Extended parameter passing:

With extended parameter passing, you can associate a file type on a client device with an application published on a MetaFrame server. When a user double-clicks a locally-saved file, the file is opened in the application associated with it on the MetaFrame XP server.

Windows Installer packages for ICA Win32 Clients:

The ICA Win32 full Program Neighborhood Client and the Program Neighborhood Agent are now available in Microsoft Windows installer packages (.msi files), so you can use Windows Installer technology to deploy and install them.

Per-user time zone support:

This feature allows the user, when logging on to a Citrix server in a different time zone, to have the ICA session reflect the time zone of the client device.
2.6 ICA Client Version 6.20.986

This client version has the same features as the 6.20.985 client and all the technical issues below were resolved in that version.

The client requires 8.4MB of space on the hard drive.

- If a session was disconnected with the Num Lock, Caps Lock, and/or Scroll Lock LEDs on and the session later reconnected, the LEDs and the functions sometimes turned off unexpectedly.
- The right-click menu did not appear correctly when a seamless application was minimized on the taskbar. The menu popped up momentarily and immediately disappeared.
- Caps Lock failed when the client connection option Queue mouse movements and keystrokes was enabled.
- Auto update of the 6.20.985 client continuously asked users to restart their Windows 95 workstation if pass-through options were selected before the update began.
- Session sharing did not work in seamless sessions when in a workgroup.
- If a user on a client device was running a minimized seamless application and moved an icon on the desktop, the server did not recognize that the icon had moved.
- Client drive mapping on the pass-through client was restricted to the drives on the client device. The client could not map local or network drives configured on the MetaFrame server in a pass-through session.
- Synchronization of handheld devices failed sometimes on the Version 6.00.910 Client. This caused 100% CPU utilization.
- Selecting Alt+PrintScr while running an application in a seamless session caused the File menu to be highlighted.
- The Verisign-issued Global Server Certificate could not be used when running ICA over SSL on a Windows XP computer.
- When using SSL, Windows XP produced error 15: “The SSL security context is invalid or has expired.”
- On Windows 95 computers, ICA files configured with HTTP browsing failed when using IP addresses instead of NetBIOS or DNS names.
• The user password appeared in clear text when using Process Explorer from Sysinternals.
• Could not launch a second instance of a seamless application when the TWI flag was set other than on.
• The auto-created printer option failed when using a pass-through client because the pass-through client routed all users to the same network printer.
• When a single sign-on user had the Novell client installed and authenticated, only the Novell credentials were sent to the server. Users could not choose to use Windows credentials.
• When users attempted to connect, they sometimes received the following error message: “Error adding to custom ICA connection or error creating application set.”
• ICA error log messages did not contain month, day, year, or hour in the time-stamp fields.
• When logging off, users could not close an application running in seamless mode using a pass-through client.
• Pressing Alt+Tab to change focus did not work in certain scenarios for applications running in seamless mode.
• ICA session scroll bars hid the application scroll bars.
• When switching focus among seamless and non-seamless windows, the up or down state of the Alt, Shift, and Ctrl keys sometimes did not synchronize between the server and the client device.
• The universal printer driver did not change paper size as required. The paper always remained as 8-1/2 x 11 letter size.
• The client produced a Dr. Watson error when SLR was enabled.
• The appearance of the start up logo was corrupted on the Win 95/98 client.
• ICA files were subject to incursion by a malicious user (eventual security hole).
• A newly-launched application sometimes lost focus.
• Mouse button configuration did not work correctly within an ICA session when using left-handed mouse settings on the MetaFrame server and the client device.
• The Ctrl and Alt keys sometimes became locked in the down position in a seamless application.
• (This pertains only to the English and German versions of the Win32 Client.) A “Transport Driver Error” message incorrectly appeared when no licenses were available.
• In Windows 95 OSR2, a brush handle leak occurred every time a new window was created.
• A client error message appeared when running an ICA session embedded in a Web page. This occurred with Internet Explorer Version 5.0.
• Minimized windows of Delphi-based applications disappeared when the parent was minimized and then restored.
• When an application called for the Empty Clipboard function on the server, the function did not synchronize with the clipboard channel on the ICA Client device.
2.7 ICA Client Version 6.30.1050

This introduces a wide range of new features and performance improvements, and is fully backward compatible with earlier versions of Windows and MetaFrame.

Improved in this release:
- Enhanced printer support and management
- Program Neighborhood Agent usability improvements

The client requires 7.70MB of space on the hard drive.

Existing features:
- Program Neighborhood
- TAPI support
- Seamless windows
- Client device, drive, COM port, and printer mappings
- Sound support
- Client auto update
- Windows clipboard integration
- Low bandwidth requirements
- Disk caching and data compression
- Dialing prefixes
- SpeedScreen Latency Reduction
- Business recovery
- TCP/IP+HTTP server location
- Wheel mouse support
- Multiple-monitor support
- Pass-Through Authentication
- Panning and Scaling
Features that are marked with the symbol (▲) require the MetaFrame XP server to be licensed for Feature Release 2.

User-to-user shadowing (▲):
Shadowing is the process of monitoring a user’s session remotely and, optionally, participating in the session using your own keyboard and mouse. Previously reserved for MetaFrame administrators, this feature no longer requires administrative rights. You can now make shadowing available to users.

Smart card support (▲):
The ICA Win32 Clients offer support for a number of smart card readers. If smart card support is enabled on both the server and client sides, you can use smart cards for the following purposes:

- **Smart card logon authentication support**
  Use smart cards to authenticate users to MetaFrame XP servers:

- **Smart card application support**
  Allow users to digitally sign email within smart card-aware published applications. The following applications are smart card-aware:
  
  Microsoft Outlook 2000
  Microsoft Outlook XP
  Microsoft Internet Explorer 5.5 and 6.0

Content redirection (▲):
Using MetaFrame XP server-based file type association, you can redirect application launching from server to client or from client to server. As a result, the server controls whether a published or a local application is invoked when a user opens a particular file. MetaFrame XP supports the following types of content redirection:

- **Server-to-client content redirection**
  Using server-to-client content redirection, you can leverage local applications to offload MetaFrame server resources. Server-to-client content redirection forces Web or multimedia links embedded in published applications to invoke the associated client-side application.

- **Client-to-server content redirection**
  Double-clicking a client-side file invokes the associated published application. Opening a local text document, for example, invokes the associated published application.

Roaming user reconnect (▲):
This feature adds roaming capabilities to ICA sessions. Previously, ICA sessions were identified by the name of the client device from which they were initiated and limited to that device.
Enhanced content publishing:

You no longer need to download published content to the client device and open it with a local application. Instead, you can associate and open published content with a published application on the MetaFrame server.

Support for Citrix NFuse®:

All ICA Win32 Clients provide full support for Citrix NFuse Classic Version 1.7 and for Citrix Enterprise Services for NFuse.

Support for TLS encryption of ICA traffic:

The ICA Win32 Clients now support TLS 1.0, the successor to SSL 3.0, for environments that demand it. TLS (Transport Layer Security) is the standardized form of SSL (Secure Sockets Layer). Both are cryptographic security protocols designed to ensure the integrity and privacy of data transfers across public networks. SSL and TLS are functionally equivalent.

Support for Citrix Secure Gateway 1.1:

The ICA Win32 Clients provide full support for Citrix Secure Gateway Version 1.1.

Enhanced Internet Proxy Support:

As an alternative to SOCKS proxy, the ICA Win32 Clients also support Secure proxy (also known as Security proxy, HTTPS proxy, and SSL-tunneling). Proxy authentication is also supported.

2.8 ICA Client Version 6.31.1051

This client version has the same features as the Version 6.30.1050 Client and all the technical issues below were resolved in that version.

The first 11 items pertain only to the English ICA Win32 Clients.

The client requires 7.65MB of space on the hard drive.
• The client now properly tracks the GDI brush resource, releasing its allocated memory when windows are closed.
• In seamless mode, sections of an application window usually disappeared from view if you made the window size larger than the desktop.
• On an ICA Client running without the Windows Explorer desktop, sessions froze when users moved minimized icons of seamless application windows around the desktop.
• Seamless applications launched with pass-through authentication disappeared if minimized.
• On a computer with an existing ICA session to a MetaFrame server farm, if a published application was launched connecting to the same server farm with a user principle name (for example, user@citrix.com), session sharing was allowed and the application launched in the existing ICA session, regardless of the user name used to start the existing session.
• When using key combinations with the ALT key to display a menu (such as ALT+F to display the File menu), the menu appeared and then quickly disappeared.
• While installing the ICA Win32 Web Client self-extracting executable (Ica32t.exe), users received a “File Copy Failed” error message for the Npican.dll file.
• An issue is now fixed by verifying the Num Lock and Caps Lock states between the client and server. After installing the new ICA Win32 Client, Num Lock and Caps Lock remain synchronized between the client and server.
• When connecting to a MetaFrame server without going through a proxy server, connection time degraded from three seconds (using ICA Client Version 6.20.986) to 15 seconds (using ICA Client Version 6.30.150).
• An unintended string was added automatically to the URL string that a user specified as the Citrix NFuse Classic server, because a memory buffer was not being initialized. The buffer is now initialized to zero and the extra string is not added to the NFuse server URL.
• Users could not interact by keyboard with the Program Neighborhood user interface dialog box. Users could interact successfully with a mouse.
• If an ICA Client's DNS server was configured to use round-robin DNS to map to a set of MetaFrame XP servers, the client did not cycle through the list of resolved addresses.
• Users who want to switch the current right- or left-handed behavior of their mouse devices can select **Swap Mouse Buttons** in the **ICA Settings** dialog box.
• When attempting to open a custom ICA connection using the Program Neighborhood Client, users received the following error message: “The c:\WINNT\WFCLIENT.INI file is missing or corrupt (cannot find the [WFClient] section). The connection is aborted.”
• On client devices running Windows 95 or 98, an error occurred with the Wfica.ocx file while running the ICA Client Update Utility if a Web browser was left open during the auto-update.
• This ICA Client now provides functionality to create an event log for an ICA file running in a remote desktop window.
• On an ICA Client for Windows 95 or 98, when a user pressed CTRL+ALT+DELETE to display the Close Program dialog box, and then pressed the ESC key to return keyboard focus to a published seamless application, the CTRL and ALT keys remained virtually "stuck" in the DOWN position. All subsequent key pressing acted as if the CTRL and ALT keys were still pressed.
When the ICA Client File Security dialog box opened for an application being launched in seamless mode, users could still interact with other seamless windows running in the background, causing modality to be lost from the dialog box.

If the dialog box was open and the user minimized another seamless application running in the background, the minimized application window could not afterward be maximized, used, or closed. The application running in the minimized window had to be reset by an administrator or closed in the Connection Center.

After the Client Auto Update feature updates the Program Neighborhood Client for a user who is not an administrator and is using Windows NT with pass-through authentication, two Program Neighborhood shortcut icons appear on the user's desktop after restarting the client device.

If the Client Auto Update feature attempted to update a version of the ICA Client previous to Version 6.20.985, Windows NT non-administrator users with pass-through authentication received errors messages when connecting to a MetaFrame server.

The ICA Win32 Client could not connect to any published application if you changed the TCP/IP port number on the server and then specified that same port number in the properties of a custom ICA connection on the client. The port number was changed on the server using the ICAPORT utility.

NEC PC98 keyboards did not work in an NFuse Classic session. The ICA Win32 Client was modified to support the NEC PC98 keyboard.

Pass-through authentication for a desktop connection did not work, requiring users to enter a password for every application. This issue occurred because the pass-through mechanism attempted to open a required file, Wfapi.dll, with its full path name, WINNT\system32\wfapi.dll.

Connecting to a published application from a Linux Client using the pass-through client on a MetaFrame server with 128-bit encryption generated the following error message: “The application is enabled, but is not available. A higher encryption level is required, which the client does not support.”

Some applications that enumerate printers responded slowly when run from an ICA session if the default printer on the client device was a network printer. Users who specified a Novell Distributed Print Services (NDPS) print queue experienced a slow print rate when printing reports. Users also reported that logging on to an ICA session was slow if the default printer on the client device was a network printer.

After auto-updating the Web Client, the Program Neighborhood shortcut icon showed up on a user's desktop even if the Program Neighborhood executable file (Pn.exe) didn't exist.

If Secure Sockets Layer (SSL) was used, the Program Neighborhood Agent used up to 97% of available CPU when running four or more applications.

Users experienced incorrect processing of mouse clicks after reconnecting to a disconnected session. In some applications, users needed to click three times to achieve a double-click operation.

If IntelliPoint mouse software was installed on a device running a Windows 2000 or previous operating system, and **Hide pointer while typing** was selected in the IntelliPoint settings, the mouse pointer disappeared while typing but did not reappear again when the mouse was moved.

In a seamless session with only one window, if you minimized the window and then opened another window, the new window could lose keyboard focus.
When using content redirection with the Program Neighborhood Agent, associated file types displayed the Program Neighborhood Agent icon rather than the icon for the associated program.

Program Neighborhood user-specified credentials for custom connections were ignored when pass-through authentication and **use local credentials to log on** were enabled. The user-specified credentials were overridden by the local user credentials.

By default, the Program Neighborhood Agent client uses Internet Explorer’s proxy settings for access to the NFuse Classic Web server. However, if the client is directed to a proxy server that requires authentication or the Web server itself requests HTTP authentication for the NFuse content, the client cannot download configuration settings or enumerate applications.

If proxy auto-detection was enabled and Netscape Version 6.2.1 or higher was used as the default Web browser, the ICA Win32 Client failed to use the proxy server settings set in Netscape.

On client devices running Windows 95, 98, or ME, the ICA Client did not use the Netscape proxy server settings as expected when proxy auto-detection was enabled and Netscape 6.0 or higher was set as the user’s default Web browser. The client could not find the Netscape proxy settings and used Internet Explorer settings instead.

Pass-through authentication of Windows NT credentials does not work on a Windows NT workstation that belongs to a workgroup and has the Novell client installed.

A silent-user installation was not entirely free of user interaction when installing the ICA Win32 Web Client (Ica32t.exe); a message box requiring a user response appears at the end of Setup (“Setup completed successfully. You may need to restart your Web browser to activate changes”).

When using the pass-through client, users were unable to log off from the MetaFrame server if an ICA session was open. All pass-through ICA sessions had to be closed before users could log off from the server.

The Program Neighborhood Agent passes incorrect credentials if the Novell Client is installed on the client device and pass-through authentication is being used so that users cannot obtain a list of applications from the Citrix NFuse Classic server.

Application icons and shortcuts that were placed on the desktop or in the Start menu by the Program Neighborhood Agent on one client device were copied to the user’s roaming profile and appeared on the desktop and in the Start menu when the user logged on to another client device where Program Neighborhood Agent was not installed. As a result, the application shortcuts did not work because the client software was not installed on the client device.

When using a pass-through ICA Client, client printers were not always auto-created with the correct name, causing some applications to fail to print. The pass-through client retrieved its name from a registry setting that is writable by any other ICA Client running on the same system.
2.9 ICA Client Version 7.00.17534

Version 7.100 of the ICA Win32 Clients is currently shipped with MetaFrame XP Server for Windows with Feature Release 3.

The client requires 9.37MB of space on the hard drive.

This version introduces a wide range of new features and performance improvements, and is fully backward compatible with earlier versions of Windows and MetaFrame XP feature releases:

- **LUNA theme support:**
  Support for rounded corners on seamless windows LUNA (Windows XP theme and custom application window design).

- **Dynamic client name support:**
  The ICA Win32 Clients now support dynamic client names. When selected during installation, the client name is set to the machine name when the client software is installed and is updated if the machine name changes.

- **SpeedScreen browser acceleration:**
  This version introduces major performance improvements for users connecting to Internet Explorer published on a MetaFrame XP server. SpeedScreen browser acceleration is available only for Internet Explorer Version 5.5 or later running inside a MetaFrame session.
SpeedScreen browser acceleration requires less bandwidth and allows users running Internet Explorer as a published application to interact with the browser while graphically-rich pages or large images are being downloaded.

- **Background image delivery**
  Users can now work while images are being downloaded from Web sites.

- **Progressive drawing**
  JPEG images begin to appear in the browser before they are completely downloaded, allowing users to interact with them without having to wait until they are completely downloaded.

- **Responsive scrolling**
  Users can now scroll Web pages before any image content is served. Images continue to be downloaded while users interact with the browser.

**Universal print driver:**

Users printing with the universal print driver can now print to color and high-resolution printers (600 dots per inch). Print drivers can be automatically installed for network printers and a driver compatibility check is enforced for all methods of printer creation.

**Windows NT Challenge/Response (NTLM) supports:**

Version 7.0 of the ICA Win32 Clients provides support for networks using Windows NT Challenge/Response (NTLM) for security and authentication.

**Certificate revocation list checking support:**

When connected to a MetaFrame XP server, the ICA Win32 Clients can check whether or not the server's certificate has been revoked. This feature improves the cryptographic authentication of the MetaFrame XP server and improves the overall security of the SSL/TLS connections between an ICA Win32 Client and a MetaFrame XP server.
3. ICA Client Version 7.100.21825

The client requires 8.54MB of space on the hard drive.

The first nine items pertain only to the English ICA Win32 Clients.

- Users could not launch published applications using the Program Neighborhood Agent if the published application name contained an ampersand (&).
- Using auto proxy detection in an ICA file with Netscape caused the ICA Client to experience a fatal error. This update ensures the ICA Client does not experience a fatal error in an ICA file with Netscape.
- If a user changed pass-through authentication and used local credentials to log on to the ICA settings and then logged on as an administrator, the character “a” or the string “aksitoa” was improperly appended to the following registry value:

  HKLM\SYSTEM\CurrentControlSet\Control\NetworkProvider\Order
  Provide Order; REG_SZ
  LanManWorkstation (Expected)
  LanManWorkstationa (Actual)

  LanManWorkstationaksitoa (repeating on and off for both settings; one new string was added).

- When a user drags an application icon in Program Neighborhood on Windows NT 3.51, a shortcut is created in the Main group of Program Manager. This was caused by insufficient mounting of the Drag and Drop function for Windows NT 3.51. The icon was disabled from dragging when using the ICA Client on Windows NT 3.51.
• The email address did not get passed properly to the server for the published mailer (Outlook or Outlook Express) when there was a space between “mailto:” and the email address. A special case was added to the Program Neighborhood Agent to remove the space between “mailto:” and the email address.

• Wfica32.exe caused an access violation if the proxy settings exception was too long. The length of the string buffer overflowed the destination buffer if the source string was too long. This problem was resolved by setting the destination buffer length to a reasonable number.

• On Windows XP, users could not always restore windows in the seamless session when clicking the taskbar icon associated with a minimized seamless window. Windows XP could create a situation where clicking a taskbar icon did not generate WM_SYSCOMMAND. Because the seamless client engine relied on this message to send window restore requests to the server, the server became unresponsive when the user clicked an icon on the taskbar.

• From a certain type of client device, when a user connected to an ICA session and accessed server drives through My Computer within the ICA session, the session was disconnected and the following error message appeared: “WFICA has experienced an unhandled exception.”

• If a user accepted the custom connection as default, different icons appeared in different views as the icon for the custom connection. The icons for different views did not change (old icons appeared). The icons were replaced by newer ones. All views have unique icons when the custom connection is accepted as the default.

• When a published application was launched by double-clicking the icon on the desktop using Program Neighborhood Agent whose logon mode was set to pass-through authentication, the application was not active and its taskbar icon flashed. On Windows 98/Me and Windows 2000/Windows XP, the system restricts which processes can set the foreground window. The resolution is to bring the background Program Neighborhood Agent launched at start-up into the foreground before sending a message to it.

• **Note:** This item applies to English, Japanese, and German only.

When an .ica file with the setting ScreenPercent=100 or an ICA connection with a screen size of 100% was launched, the actual screen size was slightly larger than the screen work area. This occurred because the ICA Client did not correctly calculate the work area for the session.

• A new application window sometimes lost focus if the foreground window was minimized just before the new window was created. This occurred because the seamless client engine sent a focus change even when the change was initiated from the server side. This update ensures that the new window is always in the foreground in a seamless session.

• The ICA Client had a flaw that caused it to take a long time to make an ICA connection.

The problem occurred when the current directory was the drive root. When the current directory was the drive root, such as c:\, a string variable could have an invalid file path like c:\\appsrv.ini. That caused the ICA Client to search for a network resource for that file. This update adds a check so that there is always a valid file path.
• A second ICA session was sometimes started on a MetaFrame server to launch an application when Novell NDS was used with a pass-through client. This occurred when the credentials for the user and the application were not the same. With this update, the Novell NDS credentials are correctly verified.

• Getting information from a card reader (mapped through client COM port mapping) took over one minute on a 64K line. This occurred because of timing issues in the interaction between the server and the client.

• The **Never ask me again for this application** option in the ICA File Security dialog box did not work with Secure Gateway for MetaFrame-based connections. Connecting the same published application after selecting the checkbox through a Secure Gateway connection brought up the same dialog box.

  The ICA Client compared identifiers containing ticket-based addresses that were different each time a connection was made even if it was to the same published application.

• The Blackberry handheld device failed to synchronize when using client COM port redirection. This occurred when using Version 3.6 of the Blackberry Desktop software.

• The ICA Client COM port read operation failed to complete. The COM port character interval time-out was inadvertently disabled when the client sent pending read data to the server during an eventwait reply. If the device had no more read data, the time-out event never occurred and the read operation never completed.

• The Program Neighborhood Agent deleted all icons to MetaFrame shared applications that users copied or moved to the desktop whenever the Agent performed an application view refresh (that is, automatically retrieved the configuration from the server). The icons were also deleted if the user restarted or logged off from the Program Neighborhood Agent.

  This is not a defect. This behavior is consistent with Program Neighborhood Agent functional requirements. The revision of this feature is in response to a request for custom modification.

  With this modification, any icons to shared applications that users move or copy to the desktop and/or to the Windows QuickLaunch bar remain visible until the application is disabled or the server no longer publishes the application. The Program Neighborhood Agent does not delete the icons during logon, logoff, or when performing refresh application actions.

• Wfica32.exe was consuming all available CPU on the ICA Client.

  IdlePollDelay is an ini file entry used to change the poll time-out value on the client. The default value is 1 ms. In this case, the value was mistakenly set to IdlePollDelay=n instead of a numeric value. While reading the values from the ini file, Wfica32 set the poll timer value to zero.

  Now if the poll time-out value is zero, Wfica32.exe sets the value to its default of 1.

• When using the example Name Enumeration Script documented in the ICA Client Object Guide but installing only the Web Client, you could get an error message saying that the Ntcpn.dll file could not be loaded. This occurred because a dll was missing from the Web Client plug-in.
• When comment lines in a Proxy Auto Config (PAC) file were written in Japanese (double-byte characters), a script error occurred and the ICA session was not established.
• In a seamless session, ICA Clients were using system fonts from the server instead of the fonts from the client device. This occurred when the system fonts and the client fonts did not match. The ICA Client lacked a check for comparing system and client fonts.
• With content redirection enabled, trying to launch a URL longer than 274 characters caused the ICA Client to experience a fatal error. A buffer overrun occurred on the client. The buffer size was increased from 256 bytes to 1024 bytes and the buffer overrun no longer occurs.
• In an ICA session, pressing the Tab + Alt Gr hotkey combination was interpreted by the server as a command to move to the next field. This occurred because the ICA Client was sending an erroneous Tab key release code to the server.
• This item is a request for enhancement.

Users were not being notified when inactive seamless applications were disconnected from the server. This occurred under the following scenario:

A. Users were hosting an application that displays trade prices to external customers.

B. The client auto-reconnect feature was disabled.

C. Normally the users utilize multi-monitors and this application remained running out of focus. It updated itself continuously with prices.

The problem arose when the connection was lost to the server. The user received no alert, the window still appeared, and the user was unaware that the information was not being updated.

This enhancement introduces a setting in the Appsrv.ini file that, if set to On, enables a timer in the ICA engine. This timer checks every \( n \) milliseconds (where \( n \) is the number of milliseconds) to determine if any data was sent by the server. If no data was sent, the timer pings the server from which it expects a response after \( n \) milliseconds. If the server responds, the connection is still present. If there is no response or the ping request fails, the ICA Client displays an error message and the connection is terminated.

To enable this enhancement, add the following two values to the [WFClient] section of the Appsrv.ini file:

```
ICAPingEnabled=On
ICAPingInterval=<time in ms for an ICA ping>
```

If the connection to the server is lost and the above values are added to the Appsrv.ini file, the user receives an error message and the session terminates. The user must then reconnect manually to the session.

• If a starting program was specified under the Environment tab in user account Properties, and if the ICA pass-through client on the MetaFrame server had pass-through authentication enabled, Ssonsvr.exe ran in the user’s RDP session. When the user exited the application, the RDP session could not be logged off. The administrator had to log off manually to stop the Ssonsvr.exe process.
Sonsvr.exe should not be started in such a session. MetaFrame single sign-on is supported for RDP sessions running as a desktop, but is not supported for RDP sessions running as an application.

- Users could not open a write-protected Excel file from the floppy diskette drive on the ICA Client. This occurred because the incorrect error code was returned during set file time.
- **User-specified credentials** was the default in the Version 6.20 Client; however, when users upgraded to the Version 7.00 Client, Local user erroneously was set as the default. This occurred because the UI flag was uninitialized.
- In an ICA session using a German keyboard layout, the German extended characters (for example, ö, Ä, ü) could be entered without any problems. However, when trying to print the document using the new Universal Print Driver (PCL5c), the extended characters did not appear in the printout. Only the dots above the letters were present in the printout, the letters themselves were missing.
- The following error message appeared under the conditions described below:

  "Cannot connect to MetaFrame Server. Protocol Driver Error."

The user was trying to establish an ICA session using Secure Gateway with ICA Client Version 7.00 on Windows NT4/9x.

The user was employing the Appsrv.ini file created automatically by the Version 7.00 ICA Client.

This update accomplishes the following:

A. The SSLCertificateRevocationCheckPolicy entry is removed from Appsrv.ini.

B. The ICA Client checks SSLCertificateRevocation only when the underlying operating system is Windows 2000 or later. When the SSLCertificateRevocationCheckPolicy setting is NOT configured in the Appsrv.ini and .ica files, NoCheck is used as the default value for Windows NT4/9x; CheckWithNoNetworkAccess is used as the default value for Windows 2000/XP. When the SSLCertificateRevocationCheckPolicy setting is configured in Appsrv.ini or the .ica file, the value in Appsrv.ini or the .ica file is used.

C. A more user-friendly error message has been added for when the client does not have the required certificate revocation list (CRL).

- Printouts from Zetafax fax machines appeared in white on black. A monochrome (fax) bitmap inserted into a Microsoft Word document printed all black. This occurred because of improper handling of bitmaps in the PCL library.
- With a Japanese PS/2 keyboard (106/109 Key Ctrl+Eisuü), the Caps Lock state was sometimes altered when the Eisuü key was pressed with the Ctrl key down. When Ctrl+Eisuü (Caps Lock) was configured to lock Kana on/off, the status change of the Kana lock on the server-side initiated the Kana lock state change request to the client. When that request arrived at the client before the Eisuü key was released, the client altered the Caps Lock state.
• Auto updating to the ICA Version 6.31.1051 Client caused a problem with single sign-on. The single sign-on COM objects registration code was moved to install Setup, but not to the client auto update code. When users utilized auto update to upgrade to a new client, single sign-on COM objects were not correctly registered.

The single sign-on COM objects registration code was moved to MigrateN.exe, where both install and client auto update run. To activate this update, run MigrateN.exe, log off, and then log on.

• **Warning!** This item requires you to edit the registry. Using Registry Editor incorrectly can cause serious problems that may require you to reinstall your operating system. Citrix cannot guarantee that problems resulting from the incorrect use of Registry Editor can be solved. Use Registry Editor at your own risk.

Users with a network interface card set to Auto Select and connected to a Cisco Catalyst switch, sometimes saw 100% CPU consumption when transferring large amounts of clipboard data. This was caused by a problem with the Cisco Catalyst switch and the settings in the network interface card.

A new registry value is required to detect the 100% CPU consumption. Navigate to the following registry key and create the key with the values indicated:

Key: HKEY_LOCAL_MACHINE\SOFTWARE\Citrix\ICA Client
Value: DetectRunawayThread
Type: REG_DWORD
Possible Value: 1 or 2

If you set the value to 1: When an infinite loop occurs, the code stops this loop and restarts the loop again.

If you set the value to 2: When an infinite loop occurs, the code terminates the entire process and the session is disconnected.

• A log file appeared on the user’s desktop after an ICA session was launched from the Web Interface if a path was not specified for persistent cache. If the path was not specified, the client defaulted to the user’s desktop (Windows 2000/Windows XP) or the root system drive (Windows 9x). This update ensures that the cache files are written to a folder instead of the user’s desktop.

• When a new user logged on to a MetaFrame server and ran the Program Neighborhood Client in that session for the first time, the pass-through authentication credentials for an application set were stored after the user authenticated to the application set. Therefore, if the user attempted to use pass-through authentication credentials the first time, the user was prompted for the credentials instead of them being passed automatically. This issue also occurred if a utility was used to delete users’ profiles after they logged off from a MetaFrame server.

The pass-through authentication credentials are saved in the client file, PN.ini, which is stored in the user’s profile. Because a user was logging on for the first time, the credentials were not written to the file until after the user authenticated to an application set.
A check routine has been updated to correctly return the user information. Now, when a new user logs on to a MetaFrame server and runs the Program Neighborhood Client in that session for the first time, the logged on user’s credentials are used.

- Sometimes the icons for the Program Neighborhood Agent shortcut file on the desktop and from the Start menu were shown as [x] or were corrupted when the Program Neighborhood Agent was configured to delete icons at logoff or exit. In some cases, corrupted icons were restored when the user refreshed the desktop by pressing F5 after logging on but corrupted icons often persisted for the Program Neighborhood Agent shortcut files.

The Program Neighborhood Agent implements a custom “icon handler” that is registered with the local Windows shell on the client. The Windows shell then invokes this custom handler to determine the icons that will be associated with the published applications. Usually the Windows shell caches these icons after they are retrieved from the Program Neighborhood Agent icon handler. The cached icon is not guaranteed to be available and can get deleted depending on user interaction with the application and shell. If the icon is not found in the shell’s cache, it uses a default icon bitmap, [x], any time the desktop is refreshed.

The Program Neighborhood Agent icon handler now registers with the Windows shell with explicit instructions to disable caching of the icons in the shell. The shell retrieves the current icon from the local Program Neighborhood Agent icon handler.

- When printing a document containing Japanese characters using the new UPD driver (PCL5c), character colors were inverted (if it was black on white, the printout was white on black).
- When printing a Word document written in Portuguese using the new UPD driver (PCL5c), some of the Portuguese characters were changed during printing and printed incorrectly or not at all.
- When a user employed automatic configuration for a URL (.ins file) in Internet Explorer, the ICA connection failed. The ICA Client expected a linefeed (\n) preceding the [URL] section in the .ins file. If the [URL] section was written as the first line in the .ins file, the ICA connection failed.

This update ensures that the ICA connection will be established when a user employs automatic configuration for a URL in Internet Explorer.
## 4. ICA Win 32 Client Matrix

<table>
<thead>
<tr>
<th>Features</th>
<th>4.20</th>
<th>4.21</th>
<th>6.00</th>
<th>6.20</th>
<th>6.30/6.31</th>
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※ (▲) MetaFrame XP servers need to be licensed for Feature Release 1 to get that feature working on the client side.
(▲) MetaFrame XP servers need to be licensed for Feature Release 2 to get that feature working on the client side.