

Microsoft Fax is an initiative, between Microsoft and its 3rd party partners, to create fax products that provide rich, secure messaging between any users over standard phone networks. As part of this initiative, Microsoft is enabling all future versions of Windows with software that will allow a user to send high-quality printed and editable documents securely via industry-standard fax modems, Microsoft Fax-enabled high volume fax boards, fax servers and Microsoft Fax-enabled enhanced fax services.

Microsoft Fax communications provides three important capabilities:

- Rich, secure transmission of digital documents (messaging) between Windows and Microsoft Fax-enabled devices.
- Strong feedback capability between Windows and Microsoft At Work-enabled devices.
- Windows Messaging API (MAPI) and Telephony API (TAPI) drivers and transports that integrate fax communications with the Windows desktop.

In addition to adding new end-user functionality, Microsoft Fax allows fax to integrate into a corporation's wide area communications strategy. The following are a few of the activities that could be automated using this capability:

Forms Entry: While forms software is experiencing strong growth in LAN environments, there has been no good way until now to extend these capabilities to individuals beyond the corporate LAN environment. A few companies have tried to transmit forms using traditional fax bitmaps, but this requires inaccurate OCR (Optical Character Recognition) software on the receiving side to convert the image back to its original binary form. By providing a binary transmission capability, Microsoft Fax eliminates this error-prone step. Moreover, by integrating with MAPI, the Messaging API for Windows, forms packages that are mail-enabled are automatically enabled with this wide-area forms automation capability.

The applications for this capability are broad. For example, an insurance agency could equip each of their offices with compatible hardware and, with the software built into Windows, automatically submit insurance claims to the claims processing center. Then they would be automatically entered into the claims database. While this capability previously required lots of special software development by special VARs, now this is accomplished with off-the-shelf hardware and software.

EDI: The security built into the transport also makes it an ideal EDI platform. Companies can automate billing, ordering, and other transactions using the standard capabilities built

into Windows. If customized software is required, this software can be sent to users as their first Microsoft Fax message.

Broadcasting Live Data to the Field: Today, time-sensitive information such as pricing and product information is often sent in printed form via fax, where it often must be reentered by the recipient. For example, loan rates are faxed to regional banks each week but must be manually reentered into the bank's own loan spreadsheets. Using the Microsoft Fax technology, the spreadsheet itself could be broadcast directly to the desktop in usable form. Product information could also be sent in this fashion. Using MAPI, an application could automatically pull the received information out of the inbox and integrated it into an on-line product catalog.

On-line databases: A rich document polling capability will also be built into the software being shipped with Windows. This will allow users to dial up a service, query for available documents, and retrieve documents of interest, either in printed or in editable form. All without the cumbersome voice prompts currently associated with today's fax-on-demand systems.

Mailboxes Accessible Anywhere: The architecture allows service providers to access servers remotely, so that users on the road can retrieve received messages.

Obviously this is only a small portion of the tasks that can be automated when vendors can count on a ubiquitous, anywhere-to-anywhere messaging system built into Windows. Microsoft will evangelize this capability to our third party ISVs as a standard part of our Windows evangelism. From their point of view, it's nothing new - just interface to MAPI and you can reach any Windows user anywhere.

The purpose of this document is to describe to fax server vendors the support we are offering to enable them to integrate Microsoft Fax technology into their product offerings. The following section describes the components that we are providing and the way they would be used in their service.

Send and Receive Faxes from your Desktop

Windows 95, in conjunction with Microsoft Exchange, provides PC users with the ability to send and receive faxes directly from their desktop. This capability, called Microsoft Fax, sets the standard for desktop fax as an easy to use messaging facility that integrated with Windows.

Microsoft Fax in Windows 95 provides the following key features:

- Fax high-resolution printed documents from within your favorite Windows applications using a fax printer driver.

- Microsoft At Work Binary File Transfer (BFT) capability sends original documents to users of Windows 95, Windows for Workgroups 3.11 and other Microsoft At Work-enabled platforms as e-mail attachments via fax.

- Secure exchange of confidential documents using encryption and digital signatures.

- High-speed communications with popular Class 1 fax modems, and the millions of traditional Group 3 fax machines worldwide.

Networked Windows 95 users can send and receive faxes through a shared fax modem on one of the Windows 95 workstations on the network.

A fax viewer that allows you to browse multi-page faxes using either ' thumbnails' or full-page view mode.

A cover page designer that lets you easily create new fax cover pages that incorporate graphics and text, or customize one of the predefined cover pages that are included with Microsoft At Work fax.

Connect easily to fax-on-demand systems using a built-in ' poll retrieve' feature that allows you to download faxes directly to your desktop.

Microsoft Fax is integrated into Windows 95 as a MAPI transport service provider. This leverages the Microsoft Exchange " universal inbox" , rich message creation, and browsing capabilities to deliver ease of use and consistency to the management of fax messages. The fax provider coexists with other information or messaging services that the user may have installed, and leverages Exchange' s common address book and inbox.

Windows 95 users can take advantage of Microsoft Fax innovations that provide the secure exchange of editable documents, where the majority of faxed documents are created.

Faxes can be sent from within Windows applications using the ' File/Send' menu option for mail-enabled applications such as Microsoft Word and Microsoft Excel. Additionally, a fax printer driver lets a user ' print' a document to their local fax modem either via ' File/Print' or by dragging a document onto the fax icon.

Microsoft Fax leverages the power of the Windows 95 operating system through the Win32 API. As a 32-bit application, fax integrates seamlessly with other Windows 95 applications through its support for the Windows Messaging System (MAPI), Windows Telephony (TAPI) and OLE 2.

In addition to tight integration with Windows 95, Microsoft Fax incorporates Microsoft At Work technologies that support Binary File Transfer (BFT), security and high quality document rendering. These technologies deliver powerful desktop fax messaging at the fingertips of the Windows 95 user.

When faxes are sent to other users of Windows 95 (or Windows for Workgroups 3.11 and other Microsoft At Work fax devices), the Microsoft At Work Binary File Transfer capability can be used to send the original file over the fax connection. For example, Suzan can attach a Microsoft Word document to an Exchange message and address the message to Dave' s fax number. If Dave receives the fax via Microsoft Fax, he will receive the Word document attached to an incoming e-mail message. By clicking on the Word icon, Dave can open the original document.

However, if the fax number that Suzan addressed is a traditional Group 3 fax machine then Microsoft Fax will automatically render the Word document into an appropriate Group 3 fax image. The highest speed and image compression that is supported by the recipient fax machine will be used when transmitting the fax.

Fax at your Fingertips

Microsoft Fax has been designed to allow Windows 95 users to exchange printed documents and binary files easily and with a minimum of setup. Since fax is provided in Windows 95 as a core system service, it is always available from within Windows 95 applications or via Microsoft Exchange. Faxes may be transmitted using Exchange' s e-mail paradigm, or by printing a document to a fax printer. Faxes that have been received from other sources are always delivered via the Exchange inbox.

A fax recipient can be identified by selecting a Fax Address from an address book (for example, the Personal Address Book), or addressed using a *one-off* address such as [fax: 555-1212]. The MAPI service provider architecture allows the Windows 95 user to mix

different types of recipients in the *same* message. For example, it is possible to send a message simultaneously to a Microsoft Mail, CompuServe, Internet and fax user as long as Microsoft Exchange contains profiles for these destinations.

The 'File/Send' menu item within any MAPI-enabled applications (for example, Microsoft Word or Excel) will activate the Info Center's Send dialog. The fax user can address the intended recipient within this dialog, and will see the faxed document attached as an icon in the message body.

The attachment of a document to an Exchange mail message is the easiest way to fax original or 'editable' documents from Windows 95.

An easy way to send traditional faxes to Group 3 fax machines is to print a document to the Microsoft At Work fax printer using either the 'File/Print' application menu item, or Drag and Drop a document onto the fax icon. Windows 95 fax will activate a dialog box asking the user to address the fax recipient and the rendered fax will be transmitted.

Rich Messaging Capabilities

Microsoft Fax in Windows 95 supports the rich text capabilities of the Microsoft Exchange and the advanced capabilities provided by Microsoft At Work Binary File Transfer (BFT) and Rendering technologies.

The Microsoft At Work capabilities are effective when a Windows 95 fax user connects to another user of a Windows 95, Windows for Workgroups 3.11 or Microsoft At Work-enabled device. Microsoft Fax will query and exchange its capabilities with the receiving devices to determine whether the receiving device is a Group 3 fax machine, or a Microsoft At Work-enabled device.

If the receiving fax device supports Microsoft At Work fax and the originating machine attached an editable document to the message then the file is transferred in its native format. In this scenario, fax works exactly like electronic mail between the originator and recipient. This fax capability in Windows 95 supports the universal inbox provided by Exchange.

If the receiving fax device is a traditional Group 3 fax machine then Microsoft Fax will convert the document to the most compact fax supported by the machine (i.e. MH, MR or MMR format) and transmit the image at the highest speed supported by the mutual connection. (i.e. up to 14.4 kbps).

However, if the receiving fax device is Windows 95 or Windows for Workgroups 3.11 and the originating machine sent a printed document, then the file will be transmitted between the two machines using a special Microsoft At Work rendered (printed) document format. The exchange of printed documents between Microsoft At Work devices is always faster than between Group 3 fax machines because the Microsoft At Work rendered image format achieves greater compression ratios than Group 3 MMR.

The following figure shows the fax property sheet that is activated from Exchange's Tools\Tools for Microsoft Fax\Setup menu item:

Workgroup Fax Features for MIS

Microsoft At Work fax supports Windows 95 users on local area networks by providing a shared modem fax capability. If a local fax modem is installed in one Windows 95 workstation, then all other Windows 95 users who are on the same physical network can send and receive faxes through the shared modem. The Windows 95 workstation that includes the modem is called the fax server.

Other Windows 95 users who are connected via the shared modem can have their incoming faxes routed directly to their desktops. Otherwise, faxes can be manually routed from the fax server to the final recipients by an administrator, using the Info Center.

In a similar way, Windows users can connect to Microsoft At Work-enabled fax servers and fax machines over a network connection. Microsoft is partnering with a variety of hardware and software vendors to develop fax products and services that incorporate Microsoft At Work technologies. These products and services will all be compatible with and leverage the capabilities of Microsoft At Work fax in Windows 95.

Easy Access to Fax Information Services

Microsoft At Work fax provides the capability to retrieve documents, software, binary files and fax images from Fax-on-Demand systems and fax machines that support the Group 3 'Poll Retrieve' capability. The ability to easily download information directly into a Windows 95 workstation via fax will help increase the popularity of fax on demand as a way for companies and information services to distribute information cost-effectively.

This distribution of information could include the automatic distribution of software updates. A Windows 95 workstation with Microsoft At Work fax could make a connection to a fax-on-demand server, and request the name of a binary file via its Poll Retrieve capability. The server would respond to the request by downloading the binary file to the Windows 95 workstation. This exchange can be accomplished on a single fax call to the fax-on-demand system.

The following figure illustrates how a Windows 95 user can request that a binary file be downloaded from a fax information service that supports 'Poll Retrieve' :

Figure: Poll-Retrieve Client

Fax Viewer and Cover Page Designer

Windows 95 includes two special tools that allow users to view incoming faxes and to create customized cover pages for faxes that they send to other users. These tools are provided in Windows 95 as accessories.

Fax Viewer

When a Windows 95 user receives a fax image (as opposed to an editable document), the fax viewer is automatically activated when the fax message is opened in the Info Center. The viewer allows the user to scale, rotate, print and visually enhance 'fuzzy' faxes.

For multiple-page faxes, the viewer provides a thumbnails view of the fax that makes it very easy to scan the contents of the fax very quickly. The following figure illustrates this capability:

Figure: Fax Viewer with 'thumbnails' view

Fax Cover Page Editor

The Microsoft At Work fax cover page editor allows users to create their own customized fax cover pages, or to modify one of the predefined cover pages that are included in Windows 95. The Cover Page editor is an OLE 2 application that makes it very easy for the casual user to create cover pages that visually get the attention of fax recipients!

Secure Faxing with Encryption and Digital Signatures

Microsoft At Work fax protects valuable and confidential documents through encryption and digital signature capabilities. The sender of a document, or traditional fax can encrypt a fax using either a simple password, or using sophisticated RSA public/private key security.

The fax software includes the capability to exchange public keys with other users. The public keys that a user receives from other users can be stored and maintained in their personal address book.

When an encrypted fax is transmitted to a recipient, it cannot be read unless the recipient knows the password that was used to encrypt the file, or the originator's public key, depending on the security mechanism that is used.

Figure: Encryption and Digital Signature Support

Faxed documents can be 'signed' with a digital signature to ensure that the fax data has not been modified during transmission. The sender uses their private key to 'sign' the fax. Anyone with that sender's public key can read it, but with the knowledge that only the owner of that specific private key could have sent the fax.

The ability to protect confidential documents in a fax environment is an extremely important feature that sets Microsoft At Work fax ahead of other desktop fax applications.

Compatibility with Popular Fax Modems and Fax Machines

Microsoft delivered the first Microsoft At Work desktop fax capability with Windows for Workgroups 3.11. This large installed base, along with the installed base of millions of Group 3 fax machines, has made compatibility a priority for fax in Windows 95.

In order to ensure fax connectivity with the widest possible variety of fax applications, fax machines and fax modems, Microsoft At Work fax in Windows 95 supports:

- The ITU (International Telecommunications Union, formerly the CCITT) T.30 standard for Group 3 fax. Microsoft At Work capabilities such as BFT are implemented as T.30 NSF (non-standard facilities), thereby maintaining compatibility with the installed base of G3 fax machines.

- The ITU V.17, V.29 and V.27ter standards for high-speed fax communications (up to 14.4kbps).

- Class 1 and Class 2 fax modems. A Class 1 modem is required for Microsoft At Work BFT and Security. Fax 'printing' to traditional Group 3 fax devices is available on both Class 1 and 2 modems. Microsoft is working directly with fax modem manufacturers to ensure excellent compatibility.

- MH, MR and MMR compression for Group 3 fax communication.

Coexistence with Windows Telecom Applications

The ability of the Info Center to support multiple simultaneous MAPI service providers in Windows 95 means that users will want to have connections to The Internet, CompuServe and fax at their fingertips. Well-behaved telecom applications in Windows 95 that support the Windows Telephony (TAPI) API will all coexist and share a local modem in a Windows 95 workstation.

The implication of TAPI support for Windows 95 fax is that fax can be listening to the phone line in auto-answer mode, while other telecom applications and Info Center providers dial out to information sources over the phone network. TAPI provides the call arbitration to ensure that physical modem resources are allocated to the appropriate telephony applications when they are needed.

Fax also leverages TAPI concepts such as 'locations' and the 'dial helper' common dialog, ensuring that fax calls are made consistently whether the fax user is on the LAN, at home or on the road.

MAPI Integrates Fax with Applications

Microsoft At Work fax evolves the fax capability in Windows for Workgroups 3.11 by creating a powerful and extensible integration platform for fax-enabled applications. The extensibility, through MAPI, of Microsoft At Work fax and the Info Center will make it easier for third-party software developers to deliver new fax-enabled applications and enhanced fax services.

Since fax is implemented in Windows 95 as a MAPI transport service provider, any MAPI-enabled application can fax information to other users using File/Share. In addition, fax features such as poll retrieve have been added to ensure that Microsoft At Work fax is an excellent client for enhanced fax services.