

Microsoft Exchange: E-Mail, Fax, and More

Personal computers today are being used for an increasingly wide range of tasks, beyond simply creating and editing documents. Electronic mail has become a primary communication vehicle, not only within many companies, but also among individuals, families, and the public at large. Additionally, usage of online information services has dramatically increased, due in large part to e-mail. Witness the astounding 15 percent *per month* growth rate seen by the Internet, in addition to the rapid growth in online commercial services, such as CompuServe and others.

The growing use of messaging and communication services has resulted in a plethora of software tools. A very real problem users face today is that each of these different information sources and services comes with its own unique software and user interface. Users often have software for an e-mail client such as Microsoft Mail, a groupware client such as Lotus Notes, an online services client such as CompuServe Information Manager, and perhaps some electronic fax software that came with their modem—all in addition to the basic File Manager they use for accessing and manipulating documents.

Windows 95 addresses this growing complexity by including an integrated messaging and workgroup communications system that provides universal e-mail, fax, and information-sharing solutions. These different services are all presented in Windows 95 with a single user interface called Microsoft Exchange. Microsoft Exchange includes the following features:

- The ability to send and receive rich-text e-mail messages over virtually any e-mail system, including public networks such as the Internet.
- The ability to send faxes directly from the desktop and receive incoming faxes directly in Microsoft Exchange's universal inbox.
- A complete, built-in e-mail system to quickly get workgroups up and running, including the Microsoft Mail Post Office. The system can be easily upgraded to a full Microsoft Mail Server or Microsoft Exchange Server to connect multiple workgroups or the entire enterprise.
- The ability to move messages and documents between the file system and mail folders, and to organize documents using sophisticated custom views with searching and filtering capabilities.
- Support for taking full advantage of MAPI-enabled applications, ranging from desktop productivity to workflow and document management.

This chapter introduces the Microsoft Exchange client and other components of the Windows Messaging subsystem, including Microsoft Fax software, MAPI, and the Microsoft Mail Post Office.

The Windows Messaging Subsystem

Microsoft Exchange is built upon the open Messaging API (MAPI) 1.0 architecture, so it can work with many different e-mail systems and information services simultaneously and provide a universal inbox for communication between individuals and workgroups. Because e-mail and other messaging-enabled applications are becoming so ubiquitous, Windows 95 includes a set of operating system–level components that provide built-in messaging services to any application that wishes to take advantage of them.

Windows 95 ships with a number of components that together make up the Windows Messaging subsystem. (The term *Windows Messaging subsystem* is sometimes used synonymously with MAPI 1.0, because Windows 95 represents the first complete implementation of the “extended” MAPI architecture.) These components include the following:

- **The Microsoft Exchange client.** The built-in universal inbox in Windows 95, which is used to send, receive, and organize e-mail, faxes, and other information, includes an OLE-compatible rich-text editor used for composing and reading messages, as well as powerful custom views, searching, and filtering. Through the use of MAPI drivers (described later), the Microsoft Exchange client can work directly with most public or private e-mail systems.
- **The Personal Address Book.** The Personal Address Book contains not only e-mail addresses, but names, phone/fax numbers, mailing addresses, and other personal contact information. Through the open MAPI interfaces, the Personal Address Book is accessible from a wide variety of applications, and through the use of MAPI drivers, it is also the user interface for corporate e-mail and information services directories. The Personal Address Book can store addresses for multiple e-mail systems at the same time.
- **The Personal Information Store.** This sophisticated local “database” file allows users to store e-mail messages, faxes, forms, documents, and other information in a common place. The Personal Information Store functions as the user’s mailbox and includes a universal inbox and outbox, as well as any other mail or document folders the user wishes to create. It supports long filenames, plus sorting and filtering on various fields of the stored objects. Custom views can be created and saved in the Personal Information Store.
- **The Messaging Application Programming Interface (MAPI) 1.0.** These core system components seamlessly connect the Microsoft Exchange client and other mail-enabled and workgroup applications to various information services. MAPI also defines a Service Provider Interface (SPI) that allows MAPI drivers to be written for nearly any messaging or workgroup service.
- **The Microsoft Mail drivers.** This set of MAPI drivers allows the Microsoft Exchange client to be used with a Microsoft Mail Post Office—either the “workgroup edition” that’s provided with Windows 95 or the “full” server edition that’s available separately.

- **The Microsoft Fax driver.** This MAPI driver allows the Microsoft Exchange client to send and receive electronic faxes in the same way as any other piece of e-mail. Documents can be exchanged as traditional ‘published’ facsimiles, or in their original ‘editable’ format using Microsoft Fax’s Binary File Transfer capability.
- **The Microsoft Internet Mail drivers.** This set of MAPI drivers lets the Microsoft Exchange client send and receive mail directly on the Internet using the built-in TCP/IP and PPP communications protocols provided with Windows 95.
- **Optional third-party MAPI drivers.** Drivers for other messaging systems are available separately from a large number of vendors. Examples of vendors working on MAPI drivers that integrate into the Microsoft Exchange client include the following:
 - America Online
 - Apple
 - AT&T
 - Banyan
 - CompuServe
 - DEC
 - Hewlett-Packard
 - Novell
 - Octel
 - RAM Mobile Data
 - Skytel

An Open Architecture for Open Connectivity

The Microsoft Exchange client is designed to work with virtually any messaging or workgroup system, whether it is LAN-based, host-based, or an online service. Transparent access to these various messaging systems is available to *any* application, not just Microsoft Exchange. The key to this open architecture is MAPI, which is illustrated in Figure 91.

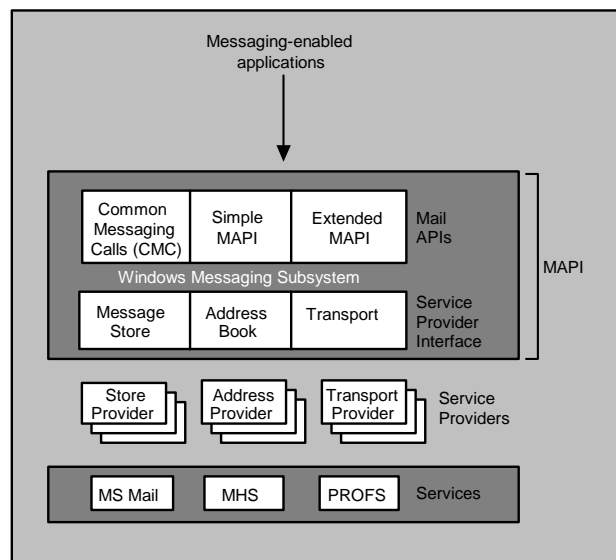


Figure 91. The open MAPI architecture

MAPI defines both an Applications Programming Interface (API) and a Service Provider Interface (SPI). The API is used by end-user applications, including Microsoft Exchange, whereas the SPI is used to write drivers (sometimes called *providers*). As Figure 91 shows, MAPI defines three different types of drivers:

- Transport drivers provide the ability to send and receive e-mail on any messaging system.
- Address Book drivers allow seamless access to any directory service, mailing list, or other name database.
- Store drivers let MAPI applications read and write to local or server-based message stores, mailboxes, and workgroup databases.

As Figure 92 shows, Windows 95 users can install any combination of drivers so that their Microsoft Exchange client can be used for multiple e-mail or workgroup systems at the same time.

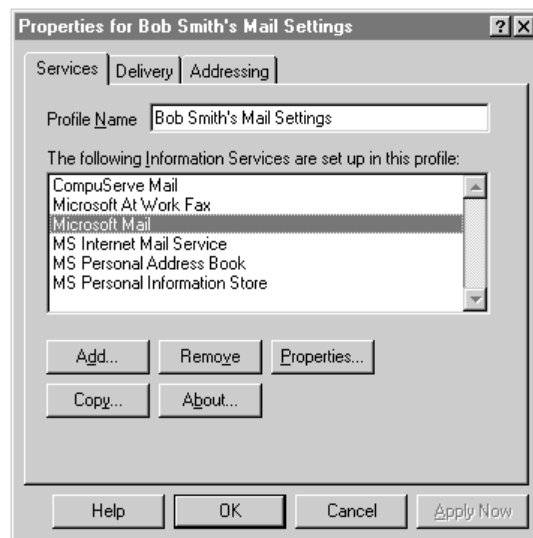


Figure 92. Configuring the Microsoft Exchange client for use with multiple services

Microsoft Exchange

As already mentioned, Windows 95 has a built-in advanced e-mail and workgroup client called Microsoft Exchange. Far more than a “basic” bundled e-mail client, Microsoft Exchange actually provides more features than almost all existing e-mail clients on the market, including the current version of Microsoft Mail.

Summary of Improvements over Current Microsoft Mail

Microsoft Mail is currently available as part of Windows for Workgroups and Windows NT, as well as separately for Windows 3.1 users. The Microsoft Exchange client goes beyond the current Microsoft Mail by providing the following features:

- Rich-text e-mail, including full use of fonts, colors, bullets, and so on, that supports drag-and-drop text editing and Find/Replace
- Full OLE support, including visual editing and cross-application drag and drop
- Built-in Remote Mail—no separate “remote” product is required—that uses TAPI and Remote Network Access to support all common modems and network protocols
- Full integration with the Windows 95 file system so that messages can simply be dragged to hard drive directories or files can be dragged into mail folders
- A customizable Toolbar with Tooltips and right-click “shortcut” menus for commonly used tasks
- A Blind Carbon Copy (BCC:) feature
- Intelligent message replies that are automatically indented and rendered with a personal font/color, for better tracking of who made which comments
- The ability to connect to multiple mailbox files simultaneously
- Custom views of any folder, with user-defined columns and sorting/filtering/categorization
- Integration with the Windows 95 Registry so that use can be made of Master Password logon

Working with Microsoft Exchange

Note: Microsoft Exchange and the other Windows Messaging subsystem components are optionally installed by selecting Custom setup and then selecting the components during the installation of Windows 95. After installation of Windows 95, Microsoft Exchange can be installed by opening the Control Panel, running Add/Remove Programs, clicking the Maintain tab, and selecting Microsoft Exchange.

Microsoft Exchange can be started in several ways. The simplest is to double-click the Microsoft Exchange icon and start viewing e-mail and messages from the inbox, as shown in Figure 93.

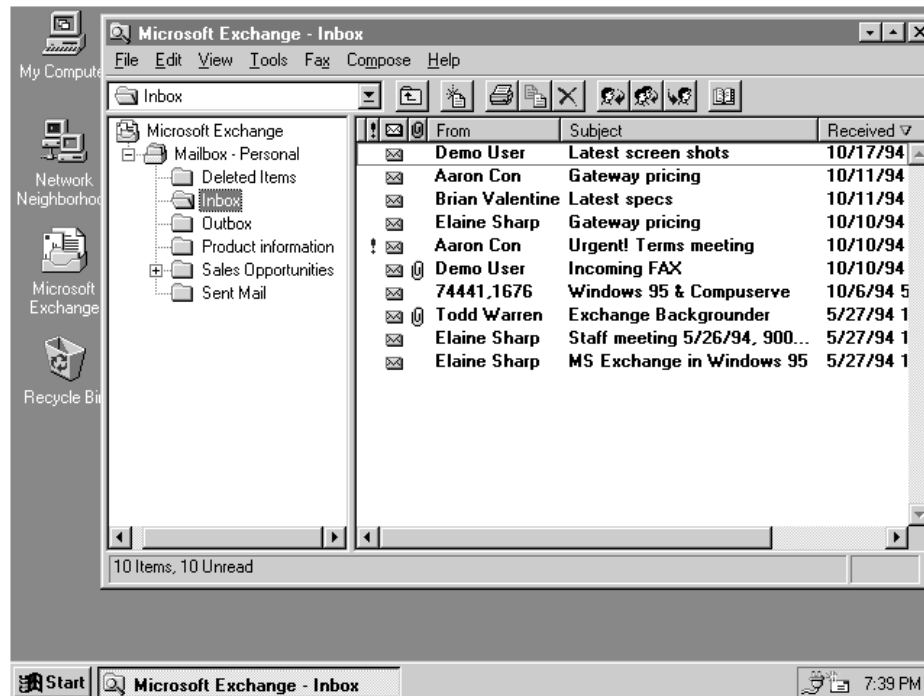


Figure 93. The Windows 95 desktop, showing the Microsoft Exchange client

To start Microsoft Exchange and read new e-mail, by far the easiest way is to choose Open Inbox from the Start button's Programs menu, as shown in Figure 94.

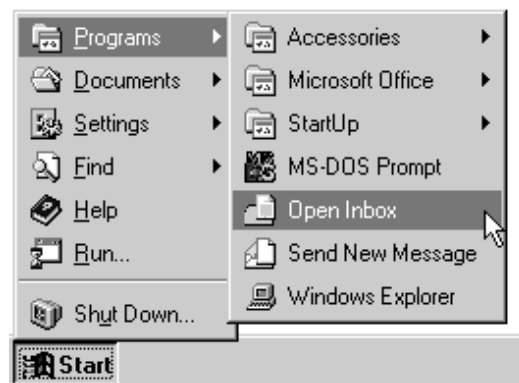


Figure 94. The Open Inbox item on the Start button's Programs menu

No matter what application is active in Windows 95, new e-mail is announced by a notification at the right end of the taskbar, as shown in Figure 95. Other notifications indicate whether the system is currently sending or receiving mail, in addition to standard system notifications, such as print status and the time, as well as the battery power indicator.



Figure 95. A new mail notification on the Taskbar

Rich-Text Mail Messages

When designing Microsoft Exchange, Microsoft conducted extensive activity-based planning research into how people actually use e-mail during their work day. One of the strongest findings was that people use e-mail six to eight times more often than their word processor for tasks such as sending memos to people. Customers expressed a strong desire to be able to combine the power and immediacy of e-mail with the expressive capabilities of their word processor, but most e-mail packages on the market limit messages to a single font. To accommodate this desire, the Microsoft Exchange client includes a complete rich-text editor that is fully compatible with OLE. Figure 96 shows a message composed in Microsoft Exchange.

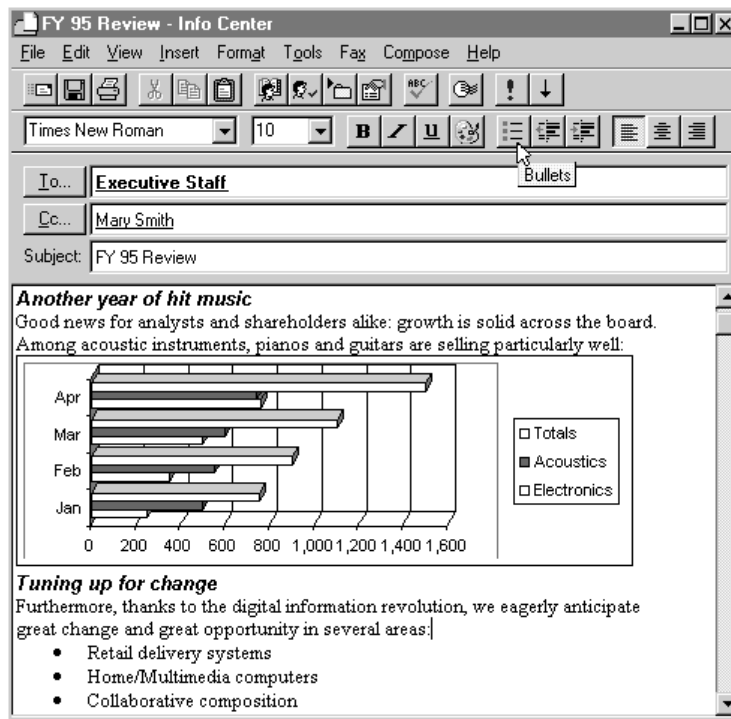


Figure 96. A rich-text e-mail message with an embedded OLE object

Because the Microsoft Exchange client works as a universal e-mail client, it has been designed to correctly transmit rich text and formatting over any mail system, even those that were not originally designed to handle rich text, such as the Internet. The rich-text information is automatically packaged as a separate compressed file attachment and is decompressed on the receiving end by another Windows 95 client. If the message is sent to someone who doesn't use Windows 95—for example, over the Internet—the “plain text” equivalent of the message is received, and any embedded objects are sent as binary attachments.

Messages received in the inbox can be saved for future reference by dragging the messages into any of the other folders (message stores) in the mailbox. Users can also drag a message to any directory on their local or network hard drives. In the latter case, the message becomes an .MSG file but maintains all of the messaging-specific fields, such as Sender, Recipient, and so on. At any time in the future, the user can still double-click the .MSG file to open it and then forward it to other e-mail users.

The Personal Address Book

A universal e-mail client needs to work with a universal address book—one that can seamlessly handle e-mail addresses of different types. Windows 95 includes a Personal Address Book that is implemented as a MAPI service. As a result, in addition to the local address book that the user maintains, Microsoft Exchange has transparent access to the address books and directory services of any other e-mail system that supports MAPI. For example, the same Personal Address Book could show a Microsoft Mail global address list or a corporate X.500 directory service.

For each new set of MAPI drivers installed, the Personal Address Book adds a new “template” to help the user in composing addresses of different types—for example, Internet e-mail addresses are typed on a predefined Internet template. After names have been entered, the user simply addresses e-mail to those people using their names, without having to remember complex addressing conventions.

As shown in Figure 97, the Personal Address Book also allows users to keep vital personal information about people, such as their telephone numbers, postal addresses, and office locations. Any phone number in the address book can be auto-dialed using the built-in Windows 95 TAPI services.

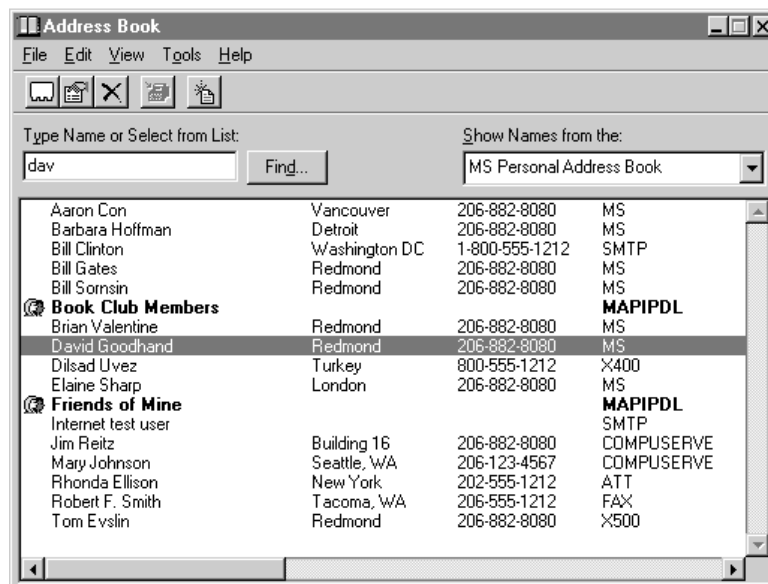


Figure 97. The Personal Address Book, showing entries for people on different e-mail systems

The Information Stores

Messages are typically stored in the user's Personal Information Store. Although the Personal Information Store is a single file, users see this file as sets of folders containing messages or documents. Normally, users have a single information store containing an inbox, an outbox, and perhaps other mail folders. However, Microsoft Exchange allows users to create as many “stores” as they like—for example, one store for current e-mail and another for backup or archive purposes. The built-in Personal Information Store is only one kind of information store. Any e-mail or workgroup system

can expose its mailboxes or databases to users as information stores by creating an appropriate MAPI driver.

Information stores can be physically stored in local files, or they can represent a database on a network server. For example, when the Microsoft Exchange client is connected to a Microsoft Exchange Server, users see sets of folders (information stores) that represent replicated databases or “groupware” applications on the server in addition to their standard mailbox folders.

In addition to storing mail messages, users can store files or documents in information stores by dragging the files or documents into these folders. (Additionally, any MAPI-compatible forms software can store its form data and form definitions in an information store.) Users might want to store these items in an information store, rather than in the regular file system, for the following reasons:

- **MAPI properties.** MAPI associates additional fields with items in information stores, such as Sender, Subject, Received Time, Size, Importance, and Sensitivity. These “properties” can be used for searching, filtering, and sorting.
- **OLE document properties.** Documents that are stored as OLE compound documents have many additional built-in properties, such as Title, Author, Keywords, Comments, Last Edited Time, and Number of Pages. When a document is placed in an information store, these built-in properties can be made available to the user through custom views.
- **Rich custom views.** Unlike the regular file system, which displays only a few standard views based on filename, date, size, and so on, information stores allow users to create rich custom views of information by defining the following:
 - Which columns to show, including any of the MAPI or OLE document properties just described
 - How to sort and filter the items to show only those of interest
 - Custom grouping, which allows for multilevel categorized (or “outline”) views of the information

Figure 98 shows a custom view of a folder created in an information store to display the OLE properties of the folder’s documents. This particular view uses the grouping feature to categorize the information by author.

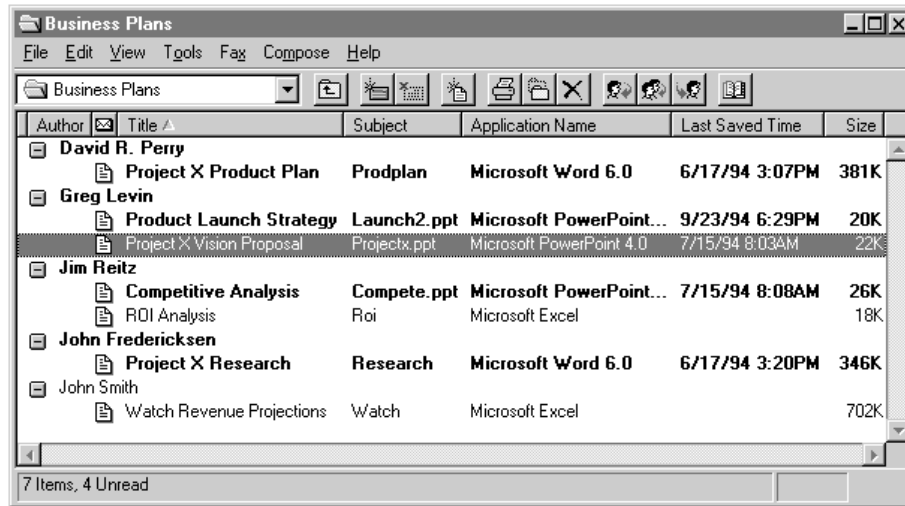


Figure 98. A custom view of a folder, showing OLE document properties

Users can create as many custom views of individual folders as they like, or they can create views that are shared among all folders. Custom views are useful in the universal inbox as well as in other folders. Two possible views are the following:

- View the inbox by Subject to create a “conversation thread” view, in which all the messages and responses on a particular topic are, categorized together.
- View the inbox by From to quickly locate and track all e-mail from a particular person.

Remote Mail

Windows 95 includes MAPI drivers for the Microsoft Mail e-mail system, so the Microsoft Exchange client can send and receive mail as a member of a Mail network—either a full, enterprise-wide mail system or a local workgroup mail system that uses the Windows 95 built-in Microsoft Mail Post Office. Microsoft Exchange users can fully interoperate with existing Microsoft Mail users on other platforms, although rich-text messages are converted to plain-text messages when sent to an existing Mail client.

To use mail on the road or from home, existing users of Mail typically purchase a separate product called Microsoft Mail Remote for Windows and dial into a special Mail remote gateway. They can then preview their waiting mail messages, decide which ones they really want to receive, and then download only the selected messages. They can compose new messages off line and have the messages sent automatically the next time they connect.

In keeping with the Windows 95 focus on facilitating mobile and remote computing, the Microsoft Exchange client is designed to provide the benefits of remote mail without requiring any additional client software or a special gateway to dial into. Mobile or remote users can easily send and receive e-mail using the following features:

- **Remote preview.** Using the built-in Mail drivers, Microsoft Exchange users can dial into their network and preview the headers of their new messages—that is, they can see who sent the new mail, what the subject is, how large the message is, and the estimated time it will take to download the message.

- **Selective download.** After the headers are retrieved, users can mark which messages they want to download and which messages should be deleted without downloading. Users can either download the selected messages immediately after retrieving the headers, or they can make another call later to download them.
- **Remote network access.** Rather than using a specialized e-mail gateway for remote mail, Microsoft Exchange relies on the standard Dial-Up Networking that is built into Windows 95. Users can dial into another computer running Windows 95, Windows NT Server, or a third-party remote access server such as Shiva LanRover. Remote e-mail then becomes protocol-independent, because RNA supports standard network protocols such as TCP/IP, IPX, and NetBEUI.
- **Offline use.** Microsoft Exchange users can compose messages while off line and have the messages queued up in the outbox until the next time they connect to the appropriate mail service. For example, a user can download new mail at an airport, read the messages and compose replies while on an airplane, dial in from a hotel, and then send the responses automatically.
- **Scheduled connections.** Users can dial in as needed to retrieve mail remotely, or they can set up scheduled connections to dial in at a specific time or on a regular basis—for example, if the computer is permanently remote.
- **Telephony API.** Microsoft Exchange uses the Windows 95 TAPI facilities to dial in and retrieve mail remotely, allowing for effective sharing of modem resources between applications. For example, if users set their modems to listen for incoming faxes while still making a call to get e-mail, TAPI handles the resource management between the relevant applications. Microsoft Exchange also uses the TAPI Dial Helper feature to easily handle multiple locations, hotel dialing prefixes, and credit card calls.

The Microsoft Mail Post Office

Windows 95 includes the workgroup edition of the Microsoft Mail Post Office, providing everything that is needed to set up and manage a complete e-mail system for a workgroup. Typically, one workgroup member, who is designated as the Mail Administrator, creates a Post Office by using the Workgroup PO applet in the Windows 95 Control Panel. The Post Office is simply a shared directory on the administrator's computer where e-mail is stored. A Wizard steps the administrator through the process of creating the Post Office, and is also used to add new users, delete users, and manage shared folders. After the administrator shares the Post Office directory, users can start Microsoft Exchange, enter the shared directory name, and connect to the Post Office in order to send or retrieve mail.

The Microsoft Mail Post Office included in Windows 95 is a workgroup edition, meaning that it is limited to exchanging mail with users of a single Post Office. A single Post Office can potentially support dozens of users, depending on the server performance of the Post Office computer. However, a large group may need to be split up into separate workgroups, each accessing their own Post Office. In that case, a full Microsoft Mail Server will be needed. The full edition of the Microsoft Mail Post Office allows mail to be routed between multiple Post Offices, as well as to other e-mail gateways.

The Microsoft Mail Post Office that comes with Windows 95 can easily be upgraded to a Microsoft Exchange Server, a client/server messaging system that provides not only e-

mail services, but also personal/group scheduling, information sharing applications (“groupware”), and forms and application design tools.

The Microsoft Internet Mail Drivers

Windows 95 includes a set of MAPI drivers that allows the Microsoft Exchange client to send and receive mail directly on the Internet. Because Windows 95 already includes great support for TCP/IP—including remote TCP/IP over PPP dial-up lines—everything needed to connect to the Internet and start sending and receiving mail is “in the box.” Users can make a LAN connection if their company has direct access to the Internet, or they can obtain access through one of many Internet service providers. MAPI enables configuration of the Microsoft Exchange client to simultaneously support Internet mail along with other e-mail systems, such as the built-in Microsoft Mail.

The following benefits are provided by the Microsoft Internet Mail drivers:

- Supports Internet e-mail standards, including SMTP and POP
- Leverages the great built-in TCP/IP support of Windows 95—a true Windows Sockets application
- Runs either via direct LAN connection or using Dial-Up Networking and PPP
- Supports the Multipurpose Internet Mail Extensions (MIME) to allow interchange of video, images, voice, text, and graphics with other Internet users in e-mail messages. (The MIME Associations Option allows association of multimedia elements with programs on PCs so that they can be directly “launched” from the programs.)
- Supports remote preview, including the Microsoft Exchange header and selective-download options, to make the most of users’ connect time on the Internet (see the earlier section titled “Remote Mail”)
- Automatically uses standard encoding (UUENCODE) to send and receive binary attachments to and from other Internet or UNIX mail users
- Provides great international support, including support for character sets of all countries that have rapidly growing Internet usage
- Can send rich-text e-mail over the Internet to Windows 95 users (other users receive plain-text messages)
- Provides complete integration with all other Microsoft Exchange client features, including custom views, filtering, searching, and so on
- As shown in Figure 99, provides simple, graphical configuration and management tools, including detailed troubleshooting and logging facilities



Figure 99. Graphically configuring the Microsoft Internet Mail driver

Microsoft Fax

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

Microsoft Fax provides the following key features:

- High-resolution printed documents are faxed from within Windows-based 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.
- The use of encryption and digital signatures makes the exchange of confidential documents secure.
- High-speed communications with popular Class 1 fax modems and the millions of traditional Group 3 fax machines worldwide is supported. Microsoft Fax supports Error-Correction Mode (ECM) and transmission speeds of up to 14.4kbps.
- Networked Windows 95 users can send and receive faxes through a network fax service on one of the Windows 95 workstations on the network.
- A fax viewer allows users to browse multipage faxes using either “thumbnails” or full-page view mode.

- A cover page designer enables users to easily create new fax cover pages that incorporate graphics and text, or to customize one of the predefined cover pages included with Microsoft Fax.
- Users can easily connect to “faxback” fax information services, using a built-in “poll-retrieve” feature that allows them to download faxes directly to their desktops.

Microsoft Fax is integrated into Windows 95 as a MAPI transport service provider, leveraging Microsoft Exchange’s universal inbox, rich-text 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 users may have installed, and leverages Microsoft 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. Users can send faxes from within mail-enabled Windows-based applications, such as Microsoft Word and Microsoft Excel, by using the File/Send command. Additionally, a fax printer driver lets users “print” documents to their local fax modems, either via the File/Print command or by dragging the documents to a Fax icon on the Windows 95 desktop.

Microsoft Fax leverages the power of the Windows 95 operating system through the Win32 API. As a 32-bit application, Microsoft Fax integrates seamlessly with other Windows 95 applications through its support for MAPI, TAPI, and OLE. 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 put powerful desktop fax messaging at the fingertips of Windows 95 users.

When faxes are sent to other users of Windows 95 (or Windows for Workgroups 3.11 and other Microsoft Fax devices), the Microsoft At Work Binary File Transfer capability can be used to send the original file over the fax connection. For example, a user can attach a Microsoft Word document to an e-mail message and address the message to a customer’s fax number. If the customer receives the fax via Microsoft Fax, the Word document is attached to an incoming e-mail message. By clicking on the Word icon, the customer can open the original document. However, if the customer receives the fax via a traditional Group 3 fax machine, Microsoft Fax automatically renders the Word document as an appropriate Group 3 fax image. The highest speed and image compression that is supported by the customer’s fax machine is used when transmitting the fax.

Working with Microsoft Fax

Microsoft Fax has been designed to allow Windows 95 users to exchange printed documents and binary files easily and with a minimum of setup. Because fax capabilities are provided as a core system service, they are always available from within Windows 95-based applications or via Microsoft Exchange. Faxes can be transmitted using Microsoft Exchange’s e-mail client or by printing documents to a fax printer. Faxes that have been received from other sources are always delivered via the Microsoft Exchange client.

Users can identify a fax recipient by selecting a fax address from an address book—for example, the Personal Address Book—or by directly entering an address, such as *[fax:555-1212]*. The MAPI service provider architecture allows users to mix different types of recipients in the same message. For example, users can send a message

simultaneously to Microsoft Mail, CompuServe, Internet, and fax users as long as the Microsoft Exchange client contains profiles for these destinations.

Attaching a document to a Microsoft Exchange e-mail message is the easiest way to fax original or editable documents from Windows 95. The Send command on the File menu within any MAPI-enabled application—for example, Microsoft Word or Microsoft Excel—displays Microsoft Exchange’s Send dialog box, in which fax users can address the intended recipient. The attached faxed document appears as an icon within the body of the message.

Microsoft Fax provides powerful features, as well as single-click ease of use. The Fax menu item under Accessories (shown in Figure 100) provides single-click access to most fax features. The ‘Compose New Fax’ selection activate a Wizard that quickly guides the Windows 95 user through the process of addressing, selecting a cover page and attaching documents to a fax. The ‘Cover Page Editor’ provides an easy way to create personalized fax cover pages. The ‘Retrieve File’ selection puts the power of ‘fax-back’ fax information services at your fingertips.

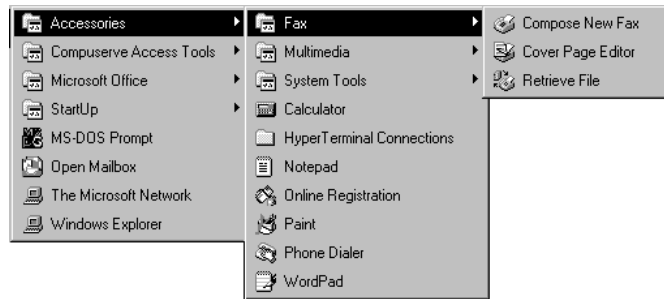


Figure 100. Fax item on the Accessory menu allows users to send and retrieve fax messages

Microsoft Fax also provides a ‘print to fax’ interface. Windows 95 users can fax documents from within their favorite Windows applications by printing to the Microsoft Fax printer driver. Microsoft Fax will then activate the ‘Compose New Fax’ wizard, which will guide the user through the addressing and transmission of the fax.



Figure 101. The Compose New Fax Wizard

Rich Messaging Capabilities

Microsoft Fax supports the rich-text capabilities of the Microsoft Exchange client 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 Microsoft Fax user connects to another Microsoft Fax user, or to any Microsoft At Work-enabled fax machine. Microsoft Fax exchanges information with the receiving device about their respective capabilities to determine whether the receiving device is a Microsoft At Work-enabled device or a Group 3 fax machine. It can then proceed as follows:

- If the receiving fax device supports Microsoft Fax, an editable document attached to an e-mail message is transferred in its native format. In this case, fax works exactly like electronic mail between the originator and recipient. This fax capability supports the universal inbox provided by Microsoft Exchange.
- If the receiving fax device is a traditional Group 3 fax machine, Microsoft Fax converts the document to the most compact fax supported by the machine—that is, MH, MR, or MMR format—and transmits the image at the highest speed supported by the mutual connection (up to 14.4 KB per second).
- If the receiving fax device is Windows 95 or Windows for Workgroups 3.11, and the originating computer sent a printed document, the file is transmitted between the two computers 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.

Figure 102 shows the property sheet displayed when Microsoft Exchange's File\Send Options command is chosen:



Figure 102. The Microsoft Fax Message property sheet

Workgroup Fax Features for MIS Organizations

Microsoft Fax supports Windows 95 users on local area networks by providing a simple network fax service.

If a local fax modem is installed in one Windows 95 workstation, 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 to which the modem is connected is called the “network fax server.” Incoming faxes are stored on the network fax server. An administrator can use Microsoft Exchange to manually route faxes from the fax server to the final recipients via e-mail.

In a similar way, Windows users can connect to Microsoft At Work–enabled fax servers and fax machines over a network connection. Microsoft and a variety of hardware and software vendors are in partnership 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 Fax in Windows 95.

Easy Access to Fax Information Services

Microsoft Fax provides the capability to retrieve documents, software, binary files, and fax images from fax-on-demand systems and fax machines that support Group 3 poll-retrieve. The ability to easily download information directly into a Windows 95 workstation via fax vastly improves the capabilities of fax-on-demand systems, as a way for companies and information services to cost-effectively distribute information.

For example, the distribution of information could include the automatic distribution of software updates. A Windows 95 workstation with Microsoft 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 could be accomplished using a single fax call to the fax-on-demand system. Figure 103 illustrates Microsoft Fax’s poll retrieve Wizard:



Figure 103. Retrieving a document from a fax information service that supports poll retrieve

The Fax Viewer and Fax Cover Page Designer

Windows 95 includes a Fax Viewer for viewing incoming faxes and a Fax Cover Page Designer for creating customized cover pages for faxes sent to other users. These tools are provided in Windows 95 as accessories.

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 Microsoft

Exchange. The viewer allows the user to scale, rotate, print, and visually enhance “fuzzy” faxes. For multiple-page faxes, the viewer provides a thumbnail view of the fax that makes it easy to quickly scan the contents of the fax. Figure 104 illustrates this capability.

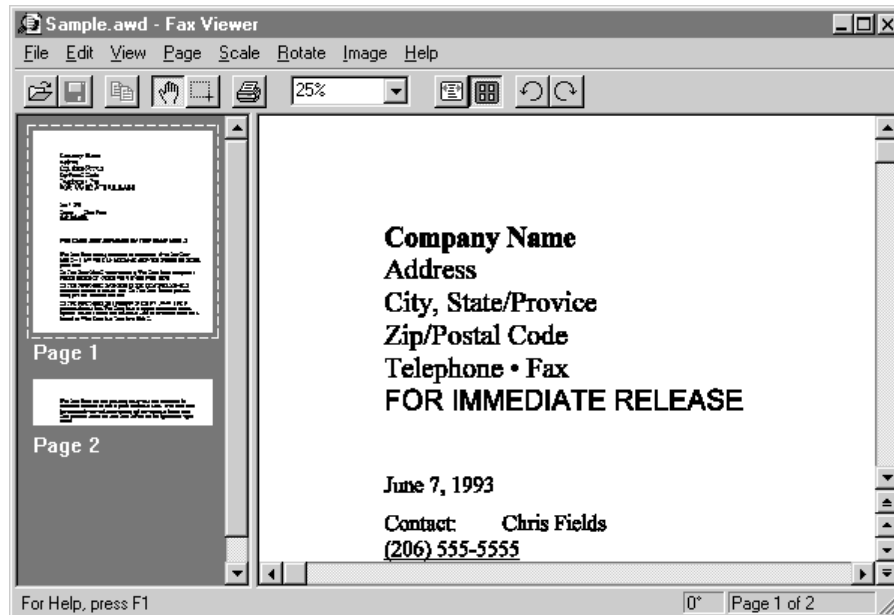


Figure 104. The Fax Viewer in “thumbnails” view

The Microsoft Fax Cover Page Designer allows users to create customized fax cover pages or to modify one of the predefined cover pages included with Windows 95. The Fax Cover Page Designer is an OLE application that makes it easy for the casual user to create attention-grabbing cover pages.

Secure Faxing with Encryption and Digital Signatures

Microsoft Fax protects valuable and confidential documents through encryption and digital signature capabilities. The sender of a document or traditional fax can encrypt the fax using either a simple password or sophisticated RSA public/private key security. The fax software includes the capability to exchange public keys with other users, and users can store and maintain the public keys they receive from other users in their Personal Address Book.

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

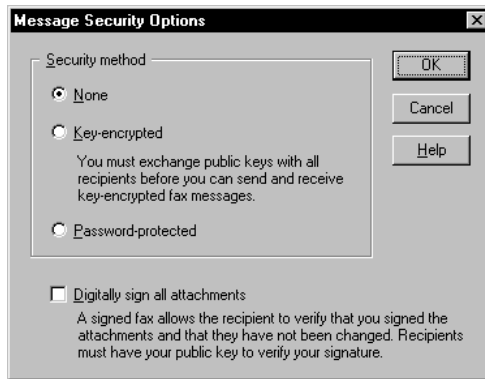


Figure 105. The Fax Security dialog box, showing encryption and digital signature support

Faxed documents can be “signed” with a digital signature to ensure that the fax data is not modified during transmission. A sender uses a private key to sign the fax, and 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 puts Microsoft Fax ahead of other desktop fax applications.

Compatibility with Fax Modems and Fax Machines

Microsoft delivered the first Microsoft 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.

To ensure fax connectivity with the widest possible variety of fax applications, fax machines, and fax modems, Microsoft Fax in Windows 95 supports the following:

- 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 nonstandard facilities (NSF), thereby maintaining compatibility with the installed base of Group 3 fax machines.
- The ITU V.17, V.29, and V.27ter standards for high-speed fax communications (up to 14.4 KB per second).
- 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 Class 2 modems. Microsoft is working directly with fax modem manufacturers to ensure excellent compatibility.
- MH, MR, and MMR compression for Group 3 fax communication. Microsoft Fax also supports Error Correction Mode (ECM) for reliable fax transmission over ‘noisy’ telephone lines.

Coexistence with Windows–Based Telecommunications Applications

The ability of the Microsoft Exchange client to support multiple simultaneous MAPI service providers in Windows 95 means that users will want to have available connections to the Internet, CompuServe, and fax. Well-behaved telecommunications applications that support the Windows Telephony API (TAPI) can coexist and share a local modem in a Windows 95 computer.

The implication of TAPI support for fax is that fax can be listening to the phone line in auto-answer mode while other telecommunications applications and Microsoft Exchange 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 dialog box to ensure that fax calls are made consistently, whether the fax user is connected to the network, is at home, or is on the road.

Integration of Fax and Applications

The fax capability in Windows for Workgroups 3.11 has evolved into Microsoft Fax in Windows 95, creating a powerful and extensible integration platform for fax-enabled applications. The extensibility, through MAPI, of Microsoft Fax and Microsoft Exchange makes it easier for third-party software developers to deliver new fax-enabled applications and enhanced fax services.

Because fax is implemented in Windows 95 as a MAPI transport service provider, users can fax information to other users from any MAPI-enabled application by using the File menu's Send command. In addition, fax features such as poll retrieve have been added to ensure that Microsoft Fax is an excellent client for enhanced fax services.

