

Faxing Documents in HP MPower

The ability to transmit documents via standard telephone lines is greatly enhanced with the HP MPower fax utility which provides automatic dialing, transmission, and delivery of fax documents from a workstation.

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Over the past ten years a revolution has occurred in telecommunications that has resulted in the capability to transmit documents easily and inexpensively using standard telephone communication channels. The fax machine has become pervasive on a global scale and is now a required tool for collaboration by all types of businesses. This success can be attributed to the standardization of fax communication and the introduction of low-cost, easy-to-use fax machines.

HP MPower fax provides a new level of refinement and capability in fax communication. HP MPower fax provides the following advantages and features:

- Client/server technology allows each HP MPower fax user access to fax capabilities at each user's desktop while sharing a fax modem at a remote location. This results in lower cost per user compared to multiple fax machines and more convenient access compared to sharing a single fax machine.
- Online documents can be conveniently faxed by dragging and dropping the document on the fax icon in the HP MPower user interface. This eliminates the process of printing and scanning the document into a fax machine. Document quality improves significantly since quality degradation occurs during the printing and scanning process.
- The problem of waiting for access to a fax machine is eliminated. Faxes sent from HP MPower fax are queued before being transmitted. If HP MPower fax is busy sending or receiving another fax, the fax waits in the queue and is automatically sent at a later time. Also, if the destination fax machine is busy HP MPower fax will automatically retry the fax transmission at a later time.
- Paper use is eliminated. Received faxes can be archived and viewed without printing. Online documents can be faxed directly without printing.
- Reliability is greatly improved since fax modems are inherently more reliable than fax machines.
- Costs are reduced by providing the capability to queue outgoing faxes for transmission when telecommunication rates are lower. Also, faxes that are being sent to the same number can be automatically batched together, saving the typically higher rate associated with the first minute of transmission.
- A palette of custom fax cover sheets can be conveniently created and accessed. Each custom cover sheet can include custom images such as corporate logos as well as fax sender information such as name, company, department, or any other information the user requires.
- A detailed log of all fax transmissions and receptions is kept. This can be used to monitor telecommunication charges and generate account billing information.

- Security of fax access is greatly enhanced. Different classes of HP MPower fax users can be created with varying privilege and security levels. Some classes could have the ability to send faxes to international fax numbers at any time of the day, while other classes might be restricted to local fax numbers and transmission times when telecommunication rates are discounted.
- Perhaps the biggest problem with a shared fax machine is the inability to route incoming faxes directly to the intended recipient. Incoming faxes can be viewed by anyone standing near the fax machine and are easily misplaced or lost. To avoid this problem, HP MPower fax can route incoming faxes directly to the recipient using a bar code on the cover sheet or the origination number of the fax.

HP MPower Fax Configuration

HP MPower fax uses a client/server configuration. Common functionality used by all HP MPower fax users resides on the fax server. Interaction with each fax user occurs at the fax client. Multiple fax clients are connected to a single fax server via a TCP/IP network connection. A fax client may also coexist on the same machine as a fax server. Up to 16 fax modems can be connected to a single fax server. Each fax modem supports a connection to one phone line. Fig. 1 shows a typical configuration in which HP MPower fax operates.

Major features at a fax client include an OSF/Motif graphical user interface, archival of received faxes, and a user-created directory services database of possible fax recipients. Major features offered by the fax server include fax modem communication, rendering, queuing and scheduling of outgoing faxes, temporary storage and routing of received faxes, and extensive databases for controlling server configuration, customization, and automation.

The process for transmitting a fax begins with the user selecting the file† to be faxed from the graphical user interface at the fax client. The file is then transferred to the fax server where it is combined with a cover sheet and rendered into the correct TIFF Class F format. The fax server then schedules the fax for transmission and stores it in a queue. When the appropriate time comes for transmission, communication with the fax modem begins and the fax is moved from the server queue to the fax modem and over the telephone line.

† Multiple files can also be sent to the fax server at the same time.

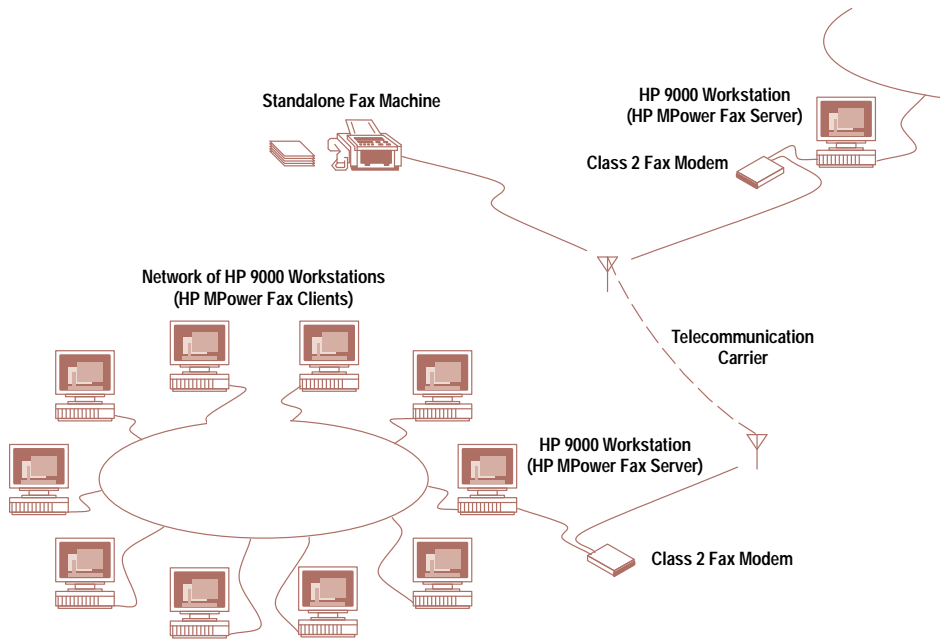


Fig. 1. A typical network configuration in which HP MPower fax operates.

When a fax is received, the fax server at the receiving end initiates communication with the fax modem and stores the incoming fax in temporary storage. If the fax can be routed, it is transferred to the appropriate fax client and the user is notified. Otherwise, the fax is stored in a general-delivery location on the fax server and all fax users are notified.

The process of transmitting a fax from a client and receiving a fax at a server is described in more detail in the following sections.

Fax Client

The primary component of the fax client is an OSF/Motif graphical user interface that allows sophisticated fax users to use the advanced functionality of the fax server while also enabling occasional users to send and receive faxes easily. The fax client's graphical user interface is integrated with HP VUE and other HP MPower components so that tasks such as dragging and dropping files to be faxed, printing received faxes, and scanning documents for inclusion in faxes are easily accomplished.

The user initiates a fax transmission by selecting the fax icon located on the HP VUE front panel or the HP MPower media panel. This causes the *Compose Outgoing Fax* window to appear (see Fig. 2). This is the primary window for creating, viewing, and sending faxes. An HP MPower fax user can send a fax by simply entering the fax number, dragging and dropping the fax attachments (files to be sent), and then selecting the *Send Fax* button. ASCII, PCL, PostScriptTM and EFS[†] files are automatically detected so the user does not need to know the file types of the attachments. The user can then select the *Fax Status...* button to monitor progress of the fax as it is being transmitted. The complete fax with cover sheet and attachments can be viewed before sending by selecting the *View Fax...* button. Since the cover sheets and rendering^{††} capability reside on the fax server, the fax client transfers

the attachments to the fax server for rendering and then moves the rendered fax back to the fax client for viewing.

Advanced features in the *Compose Outgoing Fax* window are configurable so that sophisticated users can easily use advanced features without compromising ease of use for occasional fax users. The default configuration for the compose screen is a simple interface in which the user can gradually expose and use advanced features as they are learned.

Advanced features include a directory service database, email confirmation of transmitted faxes, handwritten signature placement on a fax cover sheet, automatic fax transmission at a specified later time (to lower telecommunication costs), automatic printing of transmitted faxes, bar code generation, and selection of optional styles and classes. The style of a fax determines the cover sheet appearance and physical size of the fax. Class determines the priority and parameters for

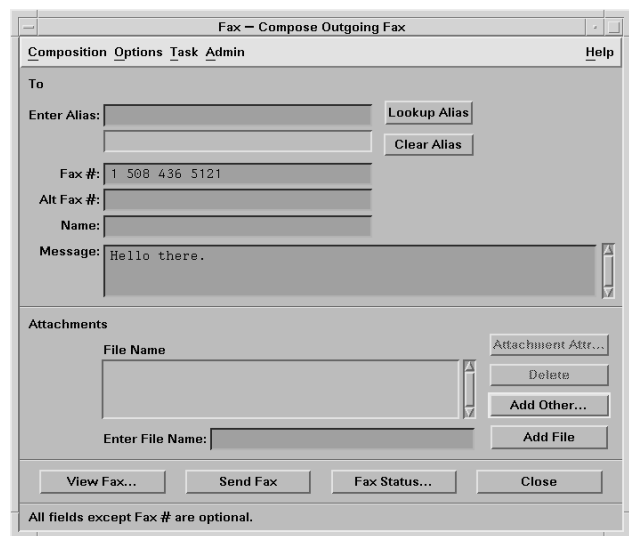


Fig. 2. The HP MPower fax window for composing fax messages.

[†] EFS, or extensible file support, is a part of the HP Image Library. EFS and the HP Image Library are described in the article on page 37.

^{††} Rendering is any form of drawing operation, including text, line, and raster output.



Fig. 3. The HP MPower fax window for browsing received faxes.

scheduling and transmitting the fax. A directory service database can be created and manipulated on the client that contains the fax number, an alias name, and other pertinent information about frequent fax recipients. After creating an alias entry, the user only has to enter the alias of a fax recipient, which will cause the fax number and other pertinent data to be automatically accessed from the database and placed on the fax cover sheet. Multiple fax recipients can be grouped together into a group alias and saved in the directory service database. The user can enter the group alias name to send a single fax to multiple destinations at once.

In addition to file data, two other types of fax attachments can be generated from the Compose Outgoing Fax screen. A document scanned in from a scanner attached to the client's machine can be attached as part of an outgoing fax. Also, a snapshot of any currently displayed window can be captured and included as part of a fax.

Received faxes are manipulated from the Browse Received Fax screen (Fig. 3). Faxes that have been received can be annotated, printed, replied to, and archived in user-created folders. Typically, a fax is received by the fax server and placed in a general-delivery area. All fax users are then notified by a change in the appearance of the fax icon symbol located on the HP VUE front panel. When the user selects this icon, the Browse Received Fax screen will appear instead of the Compose Outgoing Fax screen. The cover sheet of any fax in general delivery can be viewed from this screen. After viewing the cover sheet, a user can claim a fax that appears to be that user's own. Claiming a fax moves the fax from general delivery on the fax server to an in-box on the fax client where the entire fax can be viewed from the Browse Received Fax screen. For installations in which confidentiality is very important, access to general delivery can be limited to a single individual user or group. This privileged user or group can view the cover sheet of each fax in general delivery and route it to the appropriate in-box.

Received faxes that have a bar-code symbol on the cover sheet can be routed directly to the in-box of the recipients. The fax server has a bar-code symbol decoder that scans all incoming fax cover sheets for a bar code. If a user's bar-code symbol is detected, the fax is routed directly to that user's in-box without going through general delivery. A bar-code symbol can be generated on the cover sheet of a fax transmitted by HP MPower fax for reception and routing by other HP MPower fax servers. For reception and routing of faxes originating from fax machines, a return cover sheet

with the user's bar-code symbol can be generated. This return cover sheet is transmitted as the last sheet of a fax destined for the fax machine. The user at the fax machine can then use this return cover sheet as a fax cover sheet when replying. This allows faxes originating from fax machines to be routed when received by the HP MPower fax server. HP MPower fax can be set up to route all faxes that originate from a specified fax number to go to a specified fax user. This is useful if all faxes originating from a certain fax number are always destined to the same user.

Fax Server

The function of the fax server is to allow access to the fax resource from multiple fax clients simultaneously, while enforcing proper access control, accepting requests for fax transmission and scheduling, and receiving and disposing of incoming fax transmissions appropriately. To provide these services, the fax server is implemented as several programs that are run as separate processes. These processes maintain a set of databases and control some private directories and files. This complexity provides many of the advanced features offered by the fax server. A default configuration is provided with the product that allows any fax client to send and retrieve fax transmissions immediately after installation. With the default configuration, HP MPower fax is as easy to use as a standalone fax machine.

Fax Server Architecture

The HP MPower fax server is divided into three major functional components: the client-connection component, the fax-transmission component, and the fax-reception component. Eleven databases control the behavior of these three components. Fig. 4 shows the major components and databases of the fax server.

The circles in Fig. 4 represent programs, some of which are run as individual processes while others are invoked by the running processes as required. The parallel lines represent databases or storage areas.

The fax server components interact with the information in the databases to handle transmission and reception of faxes and communication with clients. The next few sections will discuss the databases shown in Fig. 4, and following that, the major functional components of the fax server will be described.

Fax Databases

The eleven fax server databases provide flexibility, configurability, expandability, convenience, and advanced features

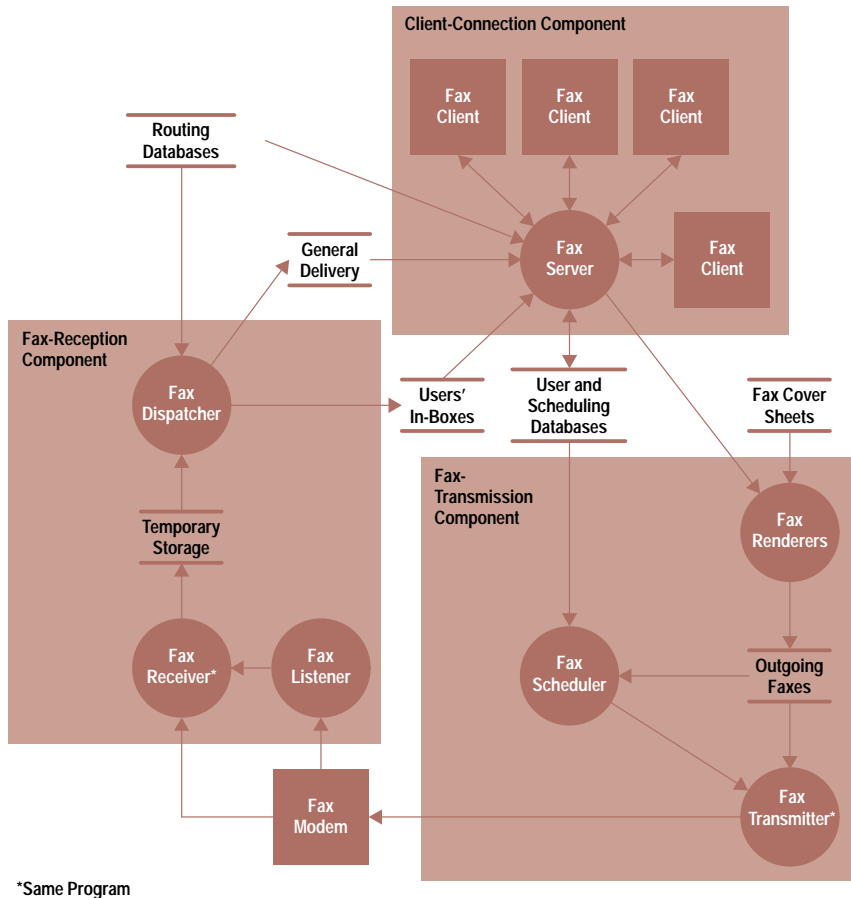


Fig. 4. The major components of the HP MPower fax server architecture.

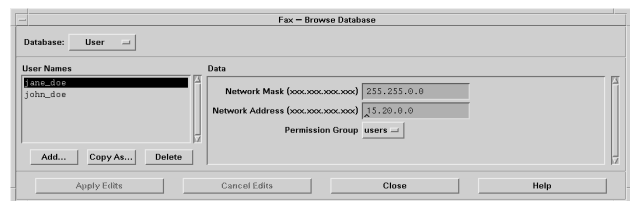
such as least-cost scheduling and incoming fax routing. These databases can be grouped into three major groups: user databases, scheduling databases, and routing databases.

User Databases. The databases used by the fax server to maintain access control information about HP MPower fax users include a permission database and a user database (see Fig. 5).

- Permission database. The permission database maintains a list of permission groups into which users can be placed. Capabilities such as access to general delivery and the ability to become a fax administrator can be given to specific permission groups. Permissions to connect to the fax server, to use specific accounts, classes, dialing rules, printers, and styles, and to register for a bar code or a caller identifier are all granted on a group basis. (Bar codes and caller identifiers are used for routing incoming faxes.)
- User database. To connect successfully from a fax client to the fax server, the user must be listed in the user database and belong to a permission group that has permission to connect to the fax server. The user database also controls the range of network addresses from which a user can initiate a connection request. With each user entry, a network mask and a network address are kept. When a user invokes the fax client, a connection request to the fax server is initiated. If the result of ANDing the network address of the user's workstation with the network mask listed in the database entry for that user matches the network address in that entry, the connection is accepted. Otherwise, the connection is rejected.



(a)



(b)

Fig. 5. Fax user databases. (a) Entries in a permission database. (b) Entries in a user database.

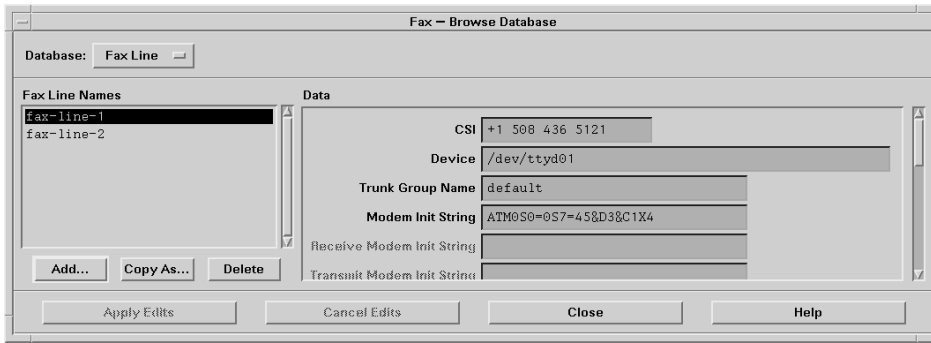


Fig. 6. Typical entries in a fax-line database.

Scheduling Databases. The following databases are used by the fax server when scheduling outgoing faxes:

- Account database. Each outgoing fax submitted by any fax client is required to specify an account to which the call will be charged. Each outgoing fax is logged in the account log together with the duration of the call and the account to be charged. The account database maintains the list of accounts available to users.
- Class database. One of the advanced features of the fax server is the ability to schedule an outgoing fax for transmission when the cost of the call will be least expensive. This feature is called least-cost scheduling, which is controlled by the specification of the class of service defined for the outgoing fax. The class of service also controls which phone lines, if there are more than one in the system, are allowed to be used for transmission. If a fax transmission should fail because of a busy signal or no answer at the receiving end, retry attempts will be made later. The class of service also controls the time between retries as well as the maximum number of retries permissible. The class database maintains the various features provided for each class of service.
- Style database. The style specified with each outgoing fax controls the resolution used for the transmission, the paper

length, and the appearance of the fax cover sheet. Such information is maintained in the style database.

- Fax-line database. The fax-line database tells the fax server how many fax modems have been configured for use by the fax server. It also contains information necessary for initializing the fax modems. If the system has more than one fax line, not all of them behave identically. For example, some fax lines might be connected to regular telephone lines and some to leased lines. Because of the different transmission lines, the fax-line database contains entries called trunk groups, which join together fax lines that have identical behavior. When an outgoing fax is eligible for transmission, the fax scheduler will pick the unused and least expensive fax line from among the trunk groups allowed by the particular class of service. Fig. 6 shows the entries in a typical fax-line database.
- Tariff database. Local telephone companies and long distance carriers charge different rates depending on the time the call is made and whether the call is local or long distance (see Fig. 7). The tariff database is used for maintaining such information about these rates. This information is required for the least-cost scheduling feature described above for the class database.



Fig. 7. Entries in a tariff database.

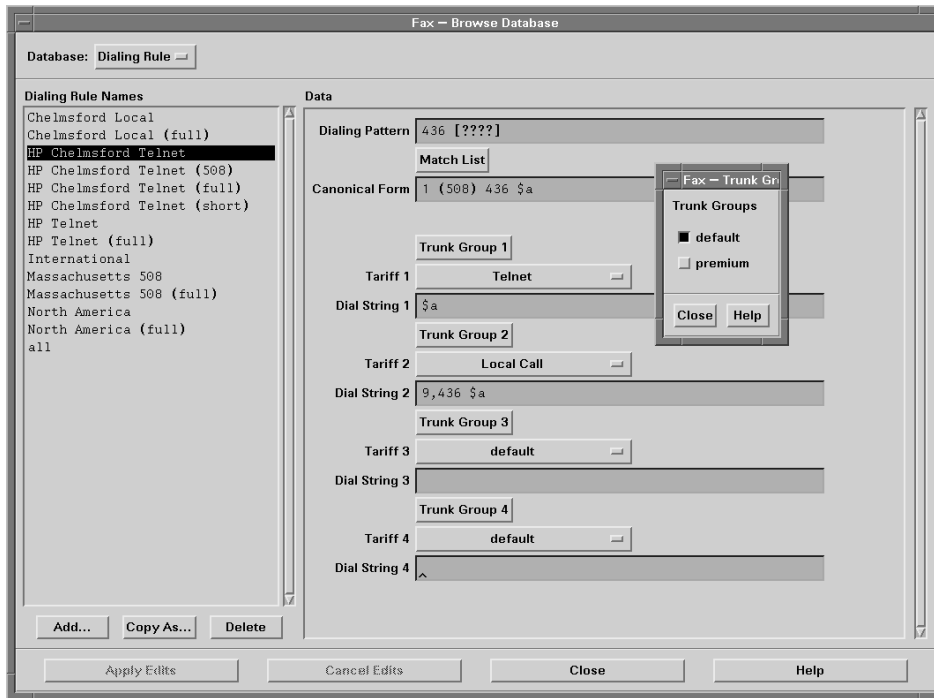


Fig. 8. Entries in a dialing-rule database.

- Dialing-rule database. Another advanced feature of the fax server is the ability to convert any given fax number into the appropriate string of numbers to be dialed. With a properly set up dialing-rule database, the fax server can determine if it can ignore the area code in a 10-digit fax number if the number represents a local call. The server can also determine if a fax number needs extra numbers to add a long distance access code. With pattern matching capability, the dialing-rule database has the flexibility to fulfill the dial string conversion needs of very different systems such as internal telnet systems that require outside line access codes, or systems that have different access codes for various long distance carriers. Another function of the dialing-rule database is to associate each converted dial string with a particular

trunk group and tariff entry. Through this association, the fax scheduler can determine the least-costly way to send a fax. Fig. 8 shows the entries in a typical dialing-rule database.

- Printer database. The printer database maintains the list of printers available to the fax server and the associated commands required to print the acknowledgment of an outgoing fax. When a fax is submitted, the user can select to print an acknowledgment of the fax.

The fax scheduling databases are summarized in Fig. 9.

Routing Databases. The routing databases are used by the fax server to control how incoming faxes are handled for each user.

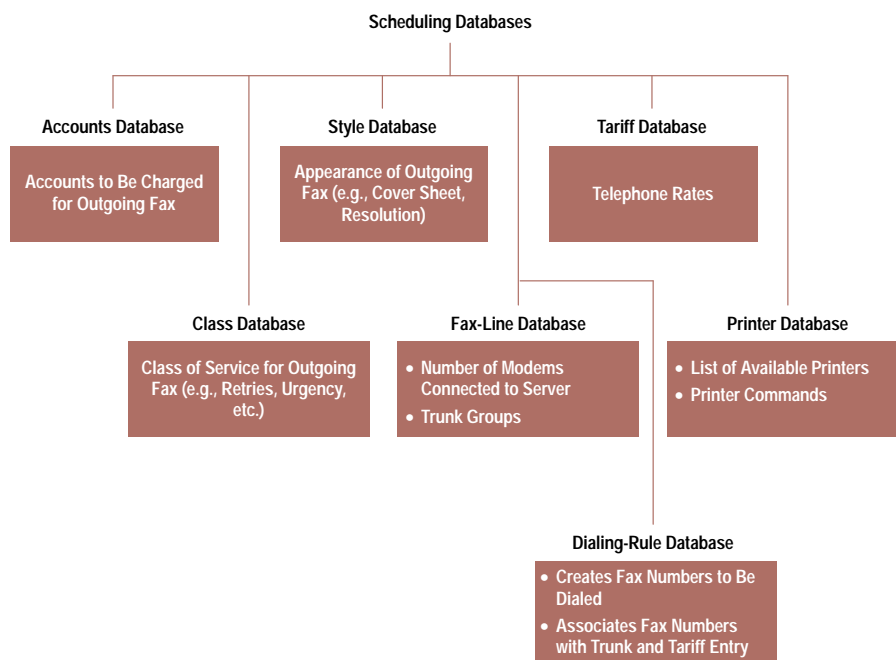


Fig. 9. The relationships between the scheduling databases.

- Action database. The action database maintains actions to be performed on incoming faxes on a per-user basis. Each user can specify a number of action entries, all of which are private to the user. Each action entry may include any or all of the following types of actions:
 - Queue the fax to the in-box of a particular user
 - Send email to an email address
 - Forward the received fax to a fax number
 - Execute some shell command.

The most commonly used action is queuing the received fax to the in-box of the user who owns the action entry.

- Dispatch database. The dispatch database is presented to the user as bar-code registration and caller-identifier registration. Bar codes are typically associated with faxes sent from workstations and caller identifiers are typically the telephone numbers associated with standalone fax machines. By registering a bar code or a caller identifier, the user defines an action entry to be performed by the fax server when an incoming fax has a bar code on the cover sheet or a caller identifier from a fax machine that is similar to what is being registered. The user may choose to allow other users to register for the same bar code or caller identifier if it has not been registered and disallowed by another user. Typically, bar codes are not shared, while caller identifiers may be shared.

Default Configuration. In the default configuration, the user database is empty. The fax server will accept any connection requests from any fax clients originating from anywhere on the network. Any user can submit outgoing fax requests using any of the accounts, classes, and styles present at the fax server. The default dialing-rule database has one entry that will match any fax number and dial it as is. The default action and dispatch databases are also empty. Thus, all incoming faxes will be left in the general-delivery area. Any user is allowed to access the general-delivery area to check for received faxes. In this default configuration, the behavior of the fax server is very much like that of a standalone fax machine.

Fax Server Components

The fax server components shown in Fig. 4 contain the processes that interact with the fax databases to handle communication with fax clients, the transmission of faxes, and the reception and distribution of incoming faxes.

Client-Connection Component. The client-connection component is the process that communicates directly with fax clients. It accepts or rejects connection requests from fax clients according to information stored in the user and permission databases. Once the connection has been established, the user at the fax client can submit outgoing fax requests as well as look at received faxes placed in the client's in-box folder. With the right permission, the user can also check and claim received faxes stored in the general-delivery folder. If the user is a fax administrator, a received fax can be routed from the general-delivery folder to the in-box folder of another user.

When an outgoing fax request is submitted to the client-connection component, the permission database is accessed to see if the user is authorized to use the account, class, and style specified in the request. The dialing-rule database is accessed to see if the fax number matches any of the dialing

rules the user is allowed to use. From the style specified, the cover sheet is located for the request. After these checks the appropriate fax renderers are invoked to render the cover sheet and attachments (if any) into TIFF Class F images. These images and a command file are kept in the fax spooling area under the directory `/usr/spool/fax/destinations`. The transmission component described below will scan this area and schedule the fax for transmission. Fax renderers provided with HP MPower support ASCII, PCL, and PostScript files, and all EFS file types supported by the HP Image Library, including TIFF, GIF, JFIF, JPEG, Xpm, Xwd, and Xbm images. The HP Image Library is described in the article on page 37.

In addition to submitting and retrieving faxes, other administrative operations such as access or modification to any entries of the databases are also executed over the connection between the fax client and the client-connection component. The user needs to be a fax administrator to request such operations.

The establishment of a connection between the fax client and the client-connection component is mediated by the internet daemon `inetd`. Appropriate entries are made in the files `/etc/services` and `/etc/inetd.conf` when HP MPower is installed to let `inetd` know how the connection can be established. If the NIS† (network information service) is used, the NIS master versions of these two files must be modified to include these entries.

Transmission Component. The transmission component consists of the processes that are responsible for scheduling outgoing faxes and transmitting the rendered images to the fax modem. The fax scheduler process is responsible for scheduling, while the fax renderer and fax transmitter processes are responsible for rendering and transmitting.

The fax scheduler is run as a background process. Only one such process should run on the system on which the fax server is running. It wakes up every minute and scans the fax spooling area where all the submitted and rendered faxes are kept. The command file of each outgoing fax contains the class of service information (defined in the class database) that the fax scheduler uses to determine whether a particular fax is eligible for immediate transmission or not. If the fax is eligible for immediate transmission, the fax scheduler checks to see if any of the fax lines that the user is authorized to use are free. If a free line is found, the fax transmitter is invoked to start the fax transmission on that line.

If the fax transmission fails because the destination fax number is busy or does not answer, the fax will not be eligible for retransmission until the `Busy_Retry_Interval` or `No_Answer_Retry_Interval` specified by the class of service for the transmitted fax elapses. If the fax transmission fails because of transmission error, the fax will not be eligible for retransmission until the `Tx_Failed_Retry_Interval` elapses. Fax transmissions that fail after the successful transmission of a number of pages will continue from the failed page when retrying transmission. If the fax transmission failure reaches the respective retry limit specified by the class of service, the fax will be put in the suspended queue. The user then has the option to send it again to the same fax number or to try a different fax number.

† The network information service provides global administration of large network systems.

Both successful and failed fax transmissions are logged in the account log together with the duration of the calls and the accounts used. This helps to rectify fax phone charges to specific cost centers. When accessing the account log, regular users will see only the fax transmissions they submitted, while fax administrators will see all the entries.

Other operation status information is also logged by the fax scheduler and fax transmitter in the system log for diagnostic purposes. Only fax administrators can access the system log.

Reception Component. The reception component consists of the processes responsible for monitoring incoming fax calls, receiving incoming fax images, and dispatching the received faxes. These tasks are accomplished by the fax listener, the fax receiver, and the fax dispatcher processes respectively.

The fax listener is run as a background process. Each fax line on the system is monitored by an individual fax listener. If an incoming call is detected, the fax receiver is invoked to receive the fax images on that line. The fax receiver and the fax transmitter are located in the same program.

When reception of an incoming fax is finished, the fax dispatcher is invoked to determine how to dispose of the newly received fax. The fax dispatcher provides one of the advanced features of the fax server called *incoming fax routing* in which an incoming fax will be automatically routed to its recipient if there is routing information available with the fax. This feature is described in detail later. If no routing information is available, the received fax is placed in the general-delivery folder. Users with general-delivery access permissions are able to view the first page of received faxes in the general-delivery folder and claim them or route them to the correct recipients. This mimics the behavior of a standalone fax machine.

Incoming faxes are logged in the account log. Only fax administrators can see the entries for incoming faxes in the account log.

HP MPower Fax Advanced Features

The advanced features currently provided in HP MPower fax include the ability to pull together several pieces of information to determine the most cost-effective way to schedule and transmit outgoing faxes and provide automatic routing of incoming faxes.

Least-Cost Scheduling. When an outgoing fax is submitted, the fax server checks the class specified for the fax to determine which trunk groups can be used for transmission. Next, the fax number is checked against entries in the dialing-rule database that the user has permission to use. The dialing-rule entry that matches most of the digits in the fax number (not counting those matched with patterns) is used if it can be used in at least one of the trunk groups found above. For each trunk group specified in the dialing-rule entry, the associated tariff is noted and used for determining the least expensive way to transmit the fax. The fax server then makes a table of time periods within which the fax is allowed to be transmitted, together with the costs associated with each time period. This information is stored in the command file for that fax.

When the fax scheduler checks the command file of each outgoing fax to see if the fax is eligible for immediate transmission, it first checks to see if the user selected the *Wait_to_Send* option. If this option is used and the specified time has not arrived yet, the fax is not eligible for immediate transmission. One reason for choosing the *Wait_to_Send* option might be to avoid transmitting when the receiving fax machine is busy. A fax can be delayed for up to 24 hours.

If the specified time arrives for the *Wait_to_Send* option or that option was not chosen in the first place, then the deadline for transmitting that fax is checked. The deadline for transmission is specified in the class for the fax. It is measured from the time specified in the *Wait_to_Send* option, or from the time when the fax is submitted if the *Wait_to_Send* option is not chosen. If the deadline for transmission passes, the fax scheduler will schedule the fax for immediate transmission, ignoring cost. If the transmission deadline has not passed, the fax scheduler will consult the table of time periods in the command file to see if the current time falls in the least-expensive time period before the deadline for transmission arrives. If the current time is in the least-expensive range, the fax is eligible for immediate transmission.

Incoming Fax Routing. When an incoming fax has been received, the first page, usually the cover sheet, of the received fax is scanned by the fax dispatcher for a bar code. If one is found, the dispatch database is checked to see if such a bar code has been registered by one or more users. If found, the actions associated with each bar-code registration will be performed. Next, the dispatch database is checked to see if the caller identifier of the received fax is registered to one or more users. If found, the actions associated with each caller-identifier registration will be performed. Such actions may include any combination of routing the received fax to the in-box folder of the user, sending email notification to the user, forwarding the received fax to a different fax number, or executing a user-specified shell script. Forwarding a received fax to a different fax number is very useful if the fax recipient is temporarily at a different site that can receive fax.

With incoming fax routing, faxes that are directed to a particular user, say by a bar code, can be placed in the user's in-box folder immediately without the delays usually involved when it is placed in the general-delivery area waiting for someone to dispatch it manually. Avoiding the general-delivery area also provides better confidentiality.

Other Interfaces to HP MPower Fax Server

Apart from sending and receiving faxes via the fax client, two other interfaces are available for submitting outgoing faxes. One of them is the fax email daemon, and the other is the simulated printer interface. Note that these interfaces provide only a small subset of the functionality and features of the fax client.

Fax Email Daemon. The fax email daemon is run as a background process on the machine on which the fax server is running. Users who are on a system that cannot execute the fax client can send email to `faxemd@<fax_server>`, where `<fax_server>` is the machine on which the fax server, and thus

the fax email daemon, is running. By providing the fax-specific header information in the beginning of the email, the body of the email will be sent as a fax by the fax email daemon. The following keyword-argument pairs are required in the fax-specific header:

Keyword	Argument
From:	Sender name, sender title
Style:	Style name
Class:	Class name
Account:	Account name
To:	Recipient name, recipient title
Fax#:	Fax number

Only the ASCII contents of the body of the email can be sent. File attachments are not supported.

Simulated Printer Interface

The simulated printer interface, `faxlp`, allows users to submit outgoing faxes as though they are queueing to a printer. The command to use is:

```
lp -dfaxlp -o'from: Jane Doe' -o'class: Standard' -o... the_file
```

where `the_file` is the file that will be sent as a fax. Here, `the_file` may be an ASCII file or a PCL file. This interface allows the addition of fax capability to applications that support a printer interface without having to make modifications to the applications to accommodate a fax machine.

Conclusion

The client/server architecture of the HP MPower fax product provides an easy-to-use but full-featured fax capability to HP 9000 computers. Its advanced feature of least-cost scheduling can save on telephone costs. By minimizing the need for human attention, productivity of everyone is increased. Finally, HP MPower fax enables users to use their fax resources more cost-effectively.

OSF/Motif is a trademark of the Open Software Foundation in the U.S. and other countries.
PostScript is a trademark of Adobe Systems Incorporated which may be registered in certain jurisdictions.