XEROX

Network Administration Library

Purpose

This booklet provides you with an understanding of Mail Service functionality, and describes the procedures required to set up and maintain your Mail Service and Mail Gateway. The commands for such procedures are defined and shown within the sections describing the configuration and maintenence tasks. In addition, messages generated during the operation of this service are listed and explained in terms of what caused them, and the recovery procedures available if applicable.

Intended audience

This publication is intended for System Administrators who are responsible for starting up and keeping the Mail Service running efficiently.

Before you read this booklet

There is some general information about services that you should be familiar with before you read this booklet. Read the "Services Executive" section in the *Server Operation and Maintenance* booklet, and the *Introduction to Network Administration* booklet. These booklets are contained in the *Network Basic Services* volume.

Before you can use this service

As part of the preparation for setting up the Mail Service, you need to perform the procedures described in the *Server Software Installation* booklet. This booklet is also part of the *Network Basic Services* volume.

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The Mail Service lets you send and receive brief messages or long documents in a variety of formats, including complex graphics, to any user or user group within the internetwork. It is a distributed system, which means that various Mail Services located around a given internetwork actively cooperate to form a unified Mail System. Just as the United States Postal Service uses multiple post offices, each Mail Service holds mail for the users it serves, and forwards mail to other Mail Services serving other users. Users retrieve mail from their "electronic post office."

The benefits of the distributed Mail System include increased availability and modular growth. Messages are delivered almost instantaneously, whether they are going to a user in the next office, or to another city. Documents with complex graphics created at a 6085/8010 workstation can be transmitted to remote locations, retrieved by users, and printed at a Print Service in minutes.

The External Mail Gateway option enables mail exchange beyond the local network. With this option, users on separate, geographically dispersed networks can communicate. Modular growth allows smooth expansion from a small initial configuration to a large system with many thousands of users.

When a message is sent, it is delivered to the appropriate Mail Service, then forwarded (if necessary) to the Mail Service holding the recipient's electronic mailbox.

For example, when you post a message from a 6085/8010 workstation, the workstation locates the Mail Services on the internet that will accept the message, selects one of them, and then sends the message to it. The "accepting" Mail Service then delivers the message to the Mail Service containing the recipient's mailbox. When the message is received in the user's mailbox, a letter icon appears in the desktop In-Basket icon. The letter icon remains visible until the In-Basket is opened and the mail is retrieved.

The example on the next page illustrates the message transfer process for a single network with multiple Mail Services and workstations.
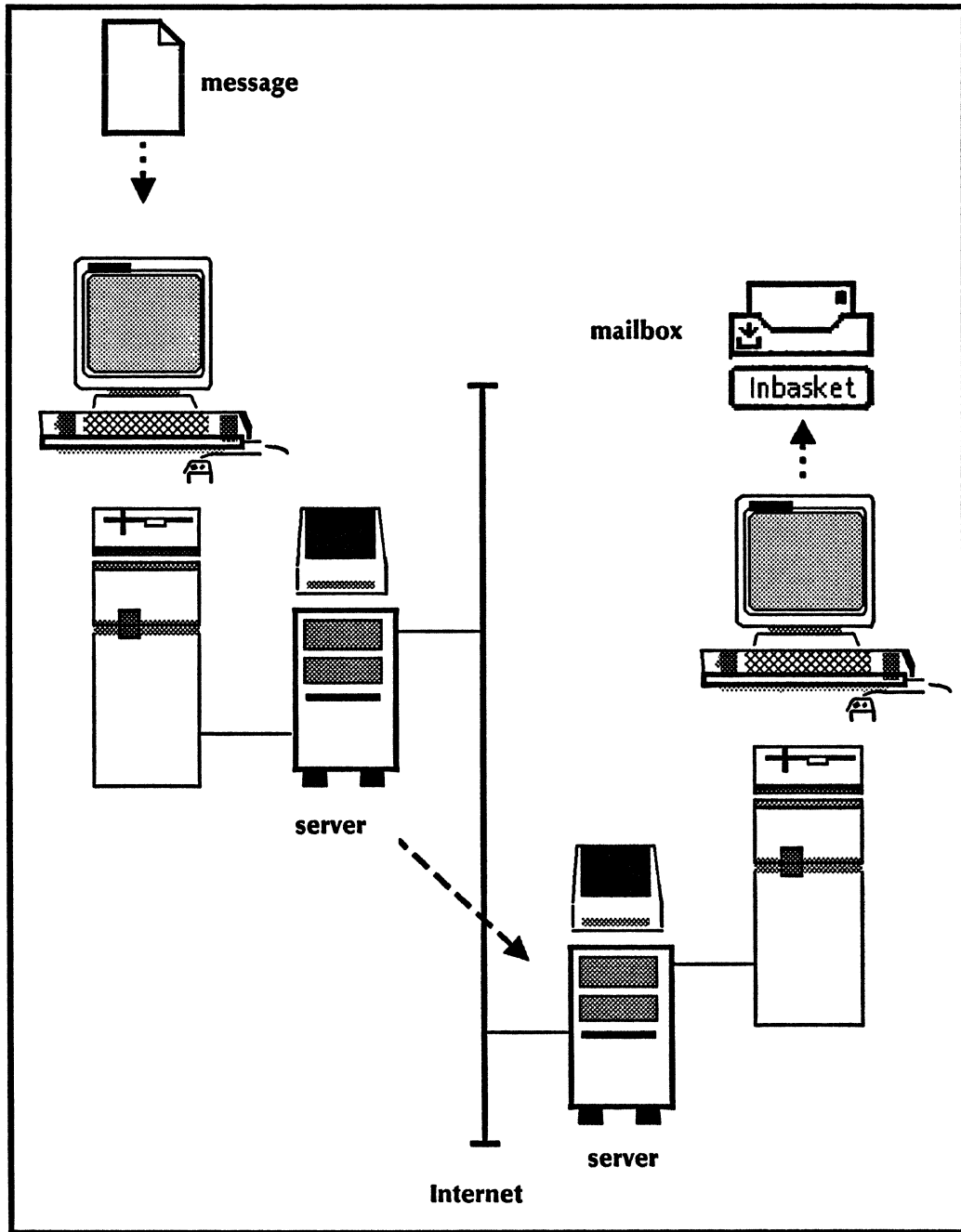
Figure 1: Message transfer

The Mail Service also provides an External Mail Gateway that allows the exchange of objects with other mail systems, while maintaining clear boundaries between the internets involved. The limited access between internets provided by the External Mail Gateway is ideal when there is a need to communicate without sharing other services. Thus, while access to resources such as Print Services and File Services may be restricted to a single internetwork, such objects as documents and folders can be mailed between internetworks.

Full internetwork integration is more costly and is less desirable when two companies or divisions within a company have an occasional need to exchange information and do not wish to share other network resources. An example of the mail exchange process appears below:
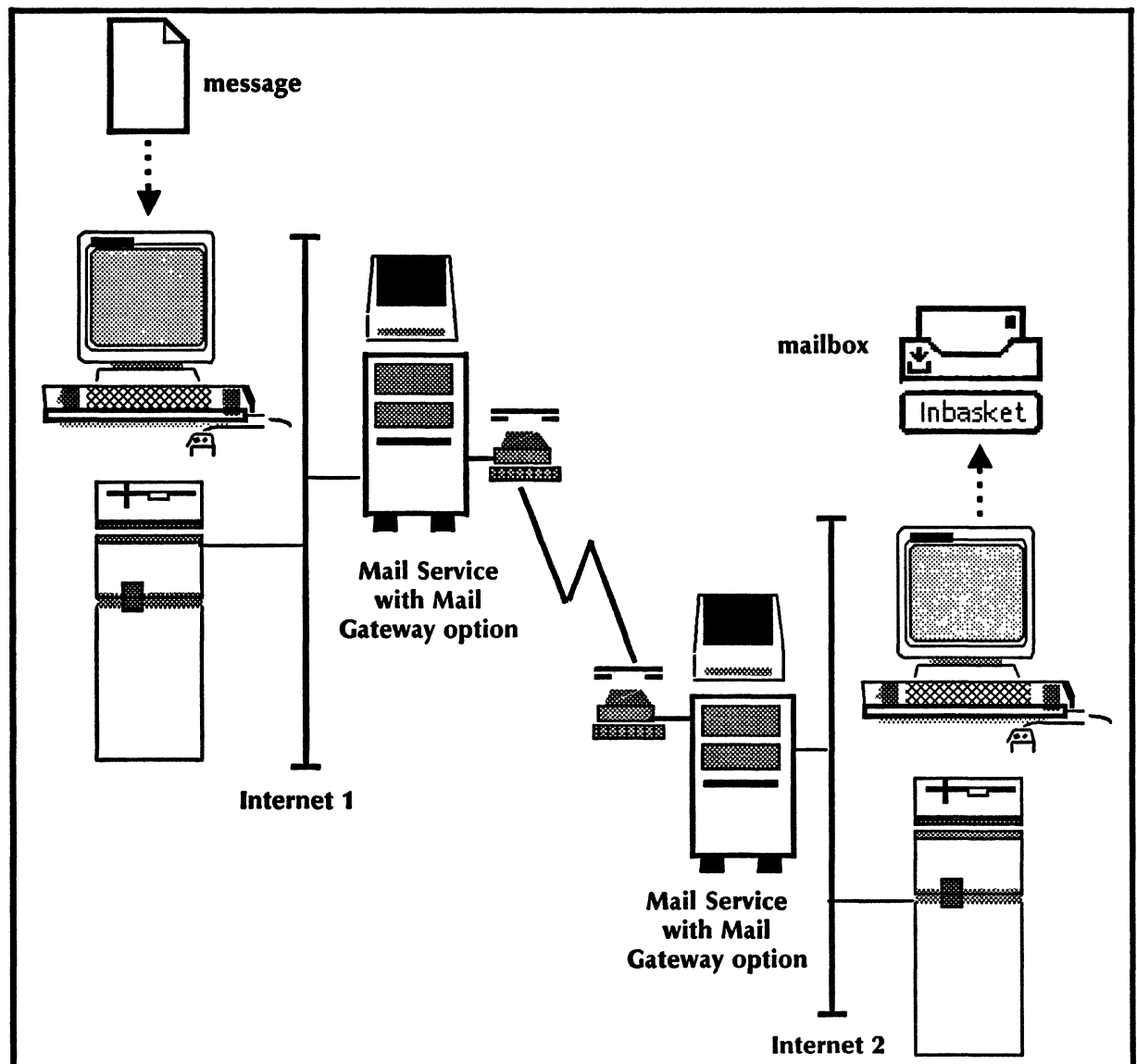
Figure 2: Mail Gateway configuration

The exchange of messages takes place over autodial phone connections according to an established schedule that you specify when you configure your gateway. When a user sends a message, it is routed to the Mail Gateway that provides service to the recipient's network. Then an attempt is made to establish a phone connection with the External Mail Gateway at the other network.

Once the connection is made, the message is transmitted to the other mail system, where it is forwarded to the recipient's mailbox. The "Choosing a configuration for the External Mail Gateway" section describes the considerations involved in setting up this option.

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2. _____ Commands

This chapter lists all of the Mail Service commands. The commands below are listed in alphabetical order, followed by a brief explanation. To access the Mail Service commands, you must be in the Mail Service context.

Comment: Once a Mail Service is stopped, all of the statistical commands are still provided, but none of the commands which modify information kept by the service (such as **Add** or **Delete Mailbox**) are available with the exception of **Set Backup Parameters.**

Add Foreign Domain Available to the enabled user. Allows you to add a specific foreign domain to the list of foreign domains accessible via the local Gateway Mail Service. The domain must not have been added to any other External Mail Gateway in the internetwork, since each foreign domain must be assigned to a single gateway. A foreign gateway must be added before this command is issued.

Add Foreign Gateway Available to the enabled user. Allows the specification of a foreign inbound gateway, as identified by its telephone number. It also allows the setting of a single calling interval for the new foreign gateway. (Additional intervals can be added using the **Change Foreign Gateway** command.) A calling interval specifies a period of time during which the local gateway is allowed to dial up the foreign gateway.

Add Mailbox Available to the enabled user. Adds a mailbox to the local Mail Service. If the mailbox did not previously exist on any other Mail Service, it is created and is initially empty. If the mailbox existed on some other Mail Service (anywhere in the internetwork), it is moved to the local Mail Service along with its contents (after a second confirmation).

Change Foreign Gateway Available to the enabled user. Used to change the phone number of a foreign gateway, or to change the calling intervals for a foreign gateway.

Change RS232C Port Available to the enabled user when the Mail Service is started or stopped. Used to set the phone number that will be dialed by foreign gateways to transfer mail to this gateway.

Delete Foreign Domain Available to the enabled user. Allows you to remove unwanted foreign domains if they are no longer needed, have been added to another foreign gateway, or are served by another Gateway Mail Service.

Delete Foreign Gateway Available to the enabled user. Allows you to delete an unwanted foreign inbound gateway. Typically, this is for one of two reasons: to move it (by re-adding it on a different Mail Service), or to discontinue Gateway Mail Service to the foreign domain(s) accessible via the specified foreign gateway.

Delete Mailbox	Available to the enabled user. Removes the mailbox from the local Mail Service. If the mailbox is empty, it is deleted following confirmation. If the mailbox contains messages, a second confirmation is required.
Force Backup	Available to the enabled user. Causes a backup to occur immediately, independent of the automatic schedule (if any). The backup parameters (file folder, file drawer) must be set with the **Set Backup Parameters** command before this command can be used.
List Foreign Domains	Available to the logged on user when the Mail Service is started or stopped. Allows you to view the set of mail domains served by the local External Mail Gateway. It does not represent a list of the foreign domains served by other Gateway Mail Services (if any) in the internetwork. This command also displays the foreign gateway to which each foreign domain is attached.
List Foreign Gateways	Available to the logged on user when the Mail Service is started or stopped. Allows you to view the set of mail gateways accessible from the local External Mail Gateway. It does not represent a list of the foreign gateways accessible via other Gateway Mail Services (if any) in the internetwork.
List Mailboxes	Available to the logged on user when the Mail Service is started or stopped. You can use the wild card asterisk (*) with this command to list all mailboxes on the local Mail Service whose distinguished names match the supplied pattern. Mailboxes on other Mail Services are not listed, even if they match the pattern. This command also displays the count of messages contained in each mailbox, and, if requested, how many pages of storage are used by the messages in each mailbox.
Set Backup Parameters	Available to the enabled user. Establishes the file service and file drawer to which the backup copies will be stored, as well as the time and frequency of the backup interval.
Show Activity	Available to the logged on user when the Mail Service is started or stopped. Lists currently active mailbox sessions.
Show Backup Parameters	Available to the logged on user when the Mail Service is started or stopped. Displays the established parameter settings.
Show Delays	Available to the logged on user when the Mail Service is started or stopped. Displays a histogram of time intervals between the posting of a message and the time that it is delivered, read, and deleted. (A message that has been read, but not deleted is counted only in the Delivered and Read columns.)
Show Foreign Gateway	Available to the logged on user when the Mail Service is started or stopped. Displays calling interval times, a listing of foreign domains, and information about the last mail transfer to the foreign gateway, as identified by its phone number.
Show History	Available to the logged on user when the Mail Service is started or stopped. Lists the current, minimum, and maximum values for queue statistics since the last server reboot.
	The input queue contains mail that was either posted to your Mail Service, or forwarded from another Mail Service for delivery to a mailbox on your Mail Service. The forward queue contains mail that is being forwarded to another Mail Service.

The pending queue contains mail that could not reach the target Mail Service because of failures in the Mail Service, network, or Clearinghouse. The Gateway queue contains mail to be transferred to a foreign gateway, and is only displayed if the Mail Service is a Mail Gateway.

Show Message Lengths   Available to the logged on user when the Mail Service is started or stopped. Displays a histogram of message lengths for messages posted to a Mail Service.

Show Other Servers   Available to the logged on user when the Mail Service is started or stopped. Lists the other Mail Services with which this Mail Service has had contact since it was last booted. The status of each Mail Service (as of the last time an attempted contact was made) is also listed. A status of "Invalid" means that the Mail Service is no longer listed in the Clearinghouse database or is listed improperly without the registered properties. The latter situation should not be a common occurrence.

Show RS232C Port Statistics   Available to the logged on user when the Mail Service is started or stopped. Displays information that may be used to isolate problems in transferring mail to and from foreign gateways. These statistics are common to all services that use the RS-232C port.

Show Status   Available to the logged on user when the Mail Service is started or stopped. Displays the current state of the Mail Service. Lists figures for local deliveries, the number of mailboxes, the size of the Mail Service database; and queue, backup, and gateway status information.

"Messages Received" indicates the total number of messages either posted to this Mail Service or forwarded from another Mail Service. The "Backup in progress" and "Transfer in progress" messages are printed only when a backup or gateway-to-gateway transfer is occurring.

Show Usage   Available to the logged on user when the Mail Service is started or stopped. Displays statistics for each of the mailing protocol operations.

Shutdown Mail Service   Available to the logged on user. It is similar to the **Stop Service** command for the Mail Service except that any mail on the Mail Service queues is forwarded to a Mail Service that you specify. If the Mail Service is a Gateway Mail Service, it returns any undelivered mail destined for foreign domains.

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3.   Setting up your Mail Service

This section contains procedures for initializing the Mail Service. You should create a mailbox for each user in your domain. This allows them to receive messages sent from any workstation on the internetwork. Users may also retrieve mail from non-networked personal computers or asynchronous terminals using Interactive Terminal Service.

In addition, a "Postmaster Mailbox" can be set up to collect mail that could not be delivered or returned to the sender. This feature enables the System Administrator to monitor problems causing mail delivery failures. It is important that you set up a backup schedule to protect your Mail Service from possible data loss.

This information is contained in this section:

- Choosing a configuration for External Mail Gateway

- Initializing the Mail Service

- Initializing the External Mail Gateway option

- Creating mailboxes for users

- Creating a postmaster mailbox

- Establishing Mail Service backup parameters

Choosing a configuration for the External Mail Gateway

To install the External Mail Gateway option, you need to perform some preliminary tasks. Primarily, you must coordinate with other System Administrators and decide which External Mail Gateway:

- Receives incoming foreign mail

- Serves as the corresponding outbound gateway

Review the following considerations before you initialize an External Mail Gateway. The Mail Service that you select to act as an inbound gateway depends on the telephone charges for the connection and the locations of the users' mailboxes in the domain. The System Administrators for a given internetwork are familiar with the relationship between the local domains and the location of the Mail Services, and are therefore best able to match up the domains with the inbound Mail Gateways.

Considerations

Each External Mail Gateway serves as a connection point for both incoming and outgoing mail. In these two roles, it is referred to as an *inbound gateway* and an *outbound gateway*, respectively. Since mail is routed between separate internetworks on the basis of the recipient's domain, a given External Mail Gateway serves as the outbound gateway for a set of foreign domains (in one or more foreign internetworks). It also serves as the inbound gateway for a set of local domains in its own internetwork.

It is the responsibility of the System Administrators to choose the assignment of domains to this service. Assigning domains is performed in five stages:

- *Assigning inbound gateways* - For inbound mail, the System Administrators in an internetwork should decide which domains are to receive incoming foreign mail, and, for each such domain, which Gateway Mail Service is to serve as its inbound gateway. Generally, the inbound gateway should be the Gateway Mail Service closest to the mailboxes of the users in the domain.

  Note: Make sure that any local domain from which recipients send mail to a foreign domain is included in the inbound list. This ensures that the individuals in the foreign mail system can reply, and that the foreign mail system can send back error information when mail cannot be delivered.

  This should also be taken into account when new local domains are added to the Clearinghouse Service. In this event, the System Administrators on the foreign internetwork should be notified as to which new foreign domains they should add to the External Mail Gateway. Domains excluded from the inbound list will not be registered with any outbound gateways in the foreign internets, causing reply messages to be rejected as having invalid recipients.

- *Generating inbound lists* - A register of Gateway Mail Services should be constructed, listing all inbound gateways in the internetwork. For each listed Mail Service, use MS Form 1, Inbound External Mail Gateways in Appendix A to list its phone number, geographic location, and the set of domains for which it is an inbound gateway.

- *Exchanging inbound lists* - When mail exchange with a foreign internetwork is to be established, the System Administrators of the two internetworks should exchange their inbound lists.

- *Assigning outbound gateways* - For each foreign inbound gateway on your list, you must decide which of your External Mail Gateways will serve as the corresponding outbound gateway. The main consideration is geographic proximity of the two gateways to reduce phone charges.

- *Adding foreign gateways and domains to the outbound Gateway Mail Services* - At each outbound gateway, you must use the **Add Foreign Gateway** and **Add Foreign Domain** commands to inform that Mail Service that it is to serve as the outbound gateway for the specified foreign domains.

  Note: The commands for adding foreign gateways and domains to a Mail Service affect the Mail Service in its role as an outbound gateway. Use MS Form 2, Registering External Mail Gateways, located in Appendix A, to record outbound gateway information.

Initializing the Mail Service

You must have activated and run the Mail Service using the **Run Service** or **Proceed** commands before following the procedures below. The installation procedures are explained in the *Server Software Installation* booklet.

Procedure

Note: The first time the Mail Service runs, you are prompted to configure the initial Mail Service database size according to the number of users within your mailing community. It is best to underestimate the database size. You can later expand it to accommodate growth. (Currently, it is not possible to reduce the database size.)

1. Type the number of disk pages to be configured in your Mail Service database size and press <RETURN>. To calculate this figure, allocate approximately 100 disk pages per mailbox.

    Note: In the example on the following page, the lower limit of the database size is 1500 disk pages. Databases of about 30,000 disk pages are considered the norm. The upper limit is variable and is determined by the amount of free storage on the server disk.

2. Type **Y** and press <RETURN> to confirm the database size. The number of disk pages displayed may vary slightly from the desired database size. Database size automatically adjusts to a multiple of six pages.

3. Type the one-part name (a name that isn't fully qualified) for the Mail Service and press <RETURN>. The name must be different from other Mail Services and all other names in the domain.

4. Type a description at the "Enter description" prompt if you want and press <RETURN>. (For example, type "MS for Building 1 domain," or "MS for names from A-K," etc.)

5. Type **Y** to confirm and press <RETURN>. The Mail Service now takes a few moments to register itself with the Clearinghouse Service.

    -   If you are adding an External Mail Gateway, continue with the next procedure, "Initializing the External Mail Gateway Option."

    -   If you are not adding an External Mail Gateway, the prompt will display "Mail Service started." Skip to the "Creating mailboxes for users" procedure.

    Note: The Mail Service will not start if the name cannot be recognized or registered in the Clearinghouse Service. If this happens, you can try again using the **Start Services** command. (This also applies during normal Mail Service startup.)

```
No existing Mail Service database found.
    Specify Mail Service startup option.
    1    Initialize new database
    2    Restore old database
    Enter choice number:  1
Initializing Mail Service database.
    Number of pages for new database (1500..70,000):  30000RETURN
Database size will be 30,000 disk pages.
    Confirm (Y/N):  YRETURN
    Service name and description unknown.
        Enter Service name:  SpeedyRETURN
        Enter description:  Los Angeles Mail ServiceRETURN
    Confirm (Y/N):  YRETURN
Validating Clearinghouse entry for Speedy:LosAngeles:GemSysCo
A new Clearinghouse entry was created.
Done
Mail Service started.
```

Initializing the External Mail Gateway option

The External Mail Gateway is an option for internetworks that wish to exchange mail without exchanging resources such as filing or printing. Mail is exchanged through autodial phone connections with established calling intervals that can be set to various times and durations. Posted messages remain at the Mail Service until the calling interval begins.

Currently, the External Mail Gateway option only supports Xerox Network Mail Systems. The term *foreign* means another internetwork served by another Xerox Network Mail System accessed only by the External Mail Gateway option.

Comment: The External Mail Gateway requires the following communication equipment, which must be installed and tested before it can be used.

- RS-232C kit on the server's local port

- Full duplex, synchronous medium-speed modem (1200 to 2400 baud). Recommended modems are Attis 212A and Codex 224. Other usable modems are Codex LSI 24/24, Racal 4400.

- RS366 autodialer (Racal VA 811, Codex 2207)

- Phone line

Note: If an Internetwork Routing Service connection is ever established between two internets, the External Mail Gateway cannot be used to connect the two internets.

In this procedure, you initialize the RS-232C port that is used to forward mail to foreign gateways.

Use Procedure A to initialize the External Mail Gateway. Use Procedure B to enable inbound mail reception. Use Procedure C to enable outbound mail transmission. (Refer to the "Choosing a configuration for the External Mail Gateway" section before you perform these steps.) Use MS Form 2, Registering External Mail Gateways, to supply the information to the following prompts.

After you run the Mail Service, you will receive the "Mail Gateway RS-232C port not initialized" message. You will then be prompted to select a line speed.

Procedure A. Initializing the External Mail Gateway

1. Type the number corresponding to your modem's line speed and press < RETURN >.

2. Type the local gateway number and press < RETURN >. (This is the number that will be dialed by foreign gateways when they forward mail to this gateway.) The messages "Mail Service started," then "Mail Service run" will be displayed.

```
Mail Gateway RS232C port not initialized.
Select line speed:
    1    1200 bps
    2    2400 bps
    3    3600 bps
    4    4800 bps
    5    7200 bps
    6    9600 bps
Enter choice number:  1 RETURN
Local gateway phone number:  555-1212 RETURN
```

Procedure B. Enabling inbound mail reception

1. Generate an inbound list using MS Form 1, Inbound External Mail Gateways, to list all inbound gateways in the internetwork. This information should include the Mail Service phone number and geographic location, as well as the set of domains for which it is the inbound gateway.

2. Exchange this information with the System Administrator(s) of the other internetworks when you are ready to establish mail exchange with a foreign internetwork. Use MS Form 2, Registering External Mail Gateways, to fill in the information you receive from the other System Administrator(s) for use in Procedure C.

Procedure C. Enabling outbound mail transmission

1. Log on and enable in the Mail Service context.

2. Type **Add Foreign Gateway** and press < RETURN >.

3. Type the phone number of the foreign inbound gateway and press < RETURN >.

   Note: The **Add Foreign Gateway** command does not validate the phone number that you provide. Be sure that the characters entered are in the correct format, and that the number is correct.

4. Type the start time of the calling interval and press < RETURN >. You might consider setting the calling intervals for at times when phone rates are cheapest.

5. Type the length of the calling interval and press < RETURN >.

   A calling interval specifies a period of time during which the local gateway is allowed to dial up the foreign gateway. During this interval, autodial connections are made approximately every 15 minutes if mail is waiting to be delivered to the foreign gateway. You can add additional calling intervals by using the **Change Foreign Gateway** command. Refer to the "Changing Mail Gateway information" section in the next chapter.

CAUTION: The server will lock up if one calling interval has a starting time of midnight, and you attempt to add another calling interval that starts before midnight, and ends after midnight.

```
MS!Add Foreign GatewayRETURN
    Phone number: 415-494-4748RETURN
    Start time of calling interval: 23:00RETURN
    Length of calling interval: 4:30RETURN
Done
```

6. Type **Add Foreign Domain** and press <RETURN>. This adds a specific foreign domain to the list of foreign domains accessible through the local mail gateway.

    Note: The domain must not have been added to any other External Mail Gateway in the internetwork unless you are in the process of moving it. Each foreign domain must be assigned to a single gateway only. The foreign gateway is specified by its phone number and must have been already added to the Mail Service.

7. Type the fully qualified foreign domain name and press <RETURN>.

8. Type the foreign gateway phone number and press <RETURN>.

9. Repeat steps 6-8 for each foreign domain.

```
MS!Add Foreign DomainRETURN
    Foreign Domain name: Boston:MutualRETURN
    Foreign Gateway (phone number): 617-964-2933 RETURN
Done
```

Creating mailboxes for users

Once you have installed and activated the Mail Service on your network, you can create a mailbox for each authorized user. Electronic mail is held in these mailboxes until it is retrieved by users. A user can have a mailbox on any Mail Service. However, there are some basic guidelines you should consider.

Mailbox configuration guidelines

The System Administrators in an internetwork should jointly choose a suitable configuration of mailboxes for the user community. It should be distributed among an appropriate set of Mail Services making up the Mail System.

- Keep the user's mailbox on the Mail Service that is closest to his or her workstation.

- For large installations, multiple Mail Services on a single Ethernet network may be necessary. You can move existing mailboxes to other more lightly loaded Mail Services. Or you can install a new Mail Service if all nearby existing Mail Services are already heavily loaded.

Procedure

1. Make certain that all users have been registered in the Clearinghouse database.

2. Use CHS Form 1, Directory of Users on Your Network, located in the *Clearinghouse Service* booklet, to gather information you need to create mailboxes for each user.

3. Log on and enable at the server supporting the Mail Service.

4. Enter the Mail Service context by typing **Mail Service** if the server is not already in that context.

5. Type **Add Mailbox** and press < RETURN >.

6. Type the name or alias of the user for whom you wish to create a mailbox on the local network and press < RETURN >

7. Type **Y** to the confirmation prompt and press < RETURN >.

   - If a mailbox did not previously exist, the Mail Service creates one automatically for you.

   - If the mailbox exists on some other Mail Service anywhere in the internetwork, it is moved to the local Mail Service after you type **Y** to the second confirmation and press < RETURN >.

   - If the mailbox exists locally, this operation will validate the entry of the user's mailbox in the Clearinghouse Service.

It will not affect the existing mailbox in any way. If the mailbox is moved, the unretrieved mail messages are forwarded to the local Mail Server.

8. Continue this process until you have created mailboxes for all users listed on CHS Form 1.

```
MS!Add Mailbox RETURN
      Name: McNeley RETURN
Adding Mailbox James M. McNeley:Los Angeles:GemSysCo
      Confirm? (Y/N): Y RETURN
Done
```

```
MS!Add Mailbox RETURN
      Name: Harrison RETURN
Adding Mailbox Joseph P. Harrison:Los Angeles:GemSysCo
      Confirm? (Y/N): Y RETURN
Warning: Mailbox is registered on another server.
      Do you want the mailbox moved to this server? (Y/N): Y RETURN
```

CAUTION: It may take 48 hours for the move to complete. Do not delete the mailbox from the original Mail Service. It will be deleted automatically once the move has been completed. There also may be a period of time when mail cannot be retrieved, and when the mailbox appears on both servers.

Creating a postmaster mailbox

The postmaster mailbox is a monitoring tool for the Mail Service. It is a repository for mail messages that could not be delivered or returned to the sender. Notifications of undelivered mail to a member of a distribution list are also deposited in the postmaster mailbox.

The notification process allows you to be aware of problems which prevent mail delivery so that you can take appropriate action to correct them. To protect the privacy of the intended recipient and of the sender, message contents are removed before it is deposited in the postmaster box.

Undelivered mail

If a message waits longer than two working days in a Mail Service's pending queue (due to faulty IRS links, inoperative Mail Services, etc.), or if a message is addressed to an unknown or invalid recipient, the Mail Service stops trying to deliver the message and tries to return it to the sender. Sometimes the same conditions which prevented the message from being delivered to the recipient will prevent it from being returned to the sender. In this event, the Mail Service holds onto the message and attempts to return it at regular intervals.

If the return attempt doesn't succeed within two days, the Mail Service may remove the contents from the message and make another two-day attempt to return the message heading (the subject, recipient list, and other information that will help the sender identify the original message). If these return attempts are unsuccessful, the message heading is placed in the local postmaster mailbox.

A message may be addressed to a valid user group which contains an invalid member. If the message crossed an external mail gateway en route to the invalid recipient, the sender is notified of the nondelivery. Otherwise, the message is discarded and a "Bad Group Member" notification is delivered to the postmaster.

Procedure

The procedure for adding a postmaster mailbox is identical to adding a user mailbox. The only requirement is that a special name be used. You can access the postmaster mailbox by logging on as the postmaster, and retrieving mail in the usual way. The special name for the user entry is:

> **Postmaster of** *Mail Service Name:Mail Service Domain:Mail Service Organization*

If the entire name is longer than 40 characters, only the first 40 characters should be used.

Note: Before you add the mailbox, you must add the entry to the Clearinghouse.

1. Log on and enable at the Clearinghouse service.

2. Type **Add User** and press <RETURN>.

3. Type the name exactly as it is shown on the previous page and press <RETURN>.

4. Log on and enable in the Mail Service context.

5. Type **Add Mailbox** and press <RETURN>

6. Next to the "Name" prompt, type **Postmaster of Mail Service name:your Domain name:your Organization name** and press <RETURN>.

7. Type **Y** to the confirmation prompt and press <RETURN>.

```
MS!Add MailboxRETURN
        Name:  Postmaster of Speedy:Los Angeles:GemSysCoRETURN
Adding Mailbox Postmaster of Speedy:Los Angeles:GemSysCo
        Confirm? (Y/N):  YRETURN
```

Establishing Mail Service backup parameters

It is a good idea to backup your Mail Service in case of data loss caused by a server crash, a power failure, or any other such condition. Your Mail Service database can be backed up to a File Service on a regular basis according to a schedule that you set. Nightly backup is recommended. The backed-up information can then be retrieved to restore any missing information to the Mail Service when necessary.

You can set parameters for manual, automatic, or mixed backup strategies. To back up manually, use the **Force Backup** command. This command causes a backup to occur immediately, independent of the automatic schedule (if any). It also causes the automatic backup schedule to start from the day of the forced backup. If you try to force a backup when the parameters are not set, you will receive the "Error: Backup parameters not set" message.

The Mail Service will only store the actual data from its database. It will not store a file the total size of the database. Under normal circumstances, the Mail Service deletes the old copy of the backup file after it writes the new copy. However, it is possible for two backup files to be on the file server at a given time.

Set the backup frequency to accommodate the amount of traffic the Mail Service receives. Set up the backup file drawer to accommodate the size of the Mail Service database. It is a good idea to run backup on a daily basis, although you can select other schedules according to your needs.

If the Mail Service finds that the designated backup file drawer is full, it will delete the previous backup copy to obtain space. If there is still insufficient space, the backup will fail, and the backup copy will have already been deleted.

Routinely use the Mail Service **Show Status** command to make sure that backups are completing normally, and to check the size of the Mail Service database. Enter the **List Volume** command at the server which receives the backup to make sure that there is sufficient room for the backup.

If an upper limit is placed on the drawer which receives the backup copies of the Mail Service database, use the **List File Drawer** command to ensure that the limit will not be exceeded by a backup attempt.

Comment: Before you continue with the procedure, you must have already created a backup file drawer on the File Service to which you wish to back up the Mail Service. You must have full access privileges to this backup file drawer (including permission to change the access list). Refer to the "Creating file drawers for users" section in the *File Service* booklet for instructions on this procedure.

Note: If you create a file drawer with any of these characters: /! # ,()' you will have to use an apostrophe before the character when specifying the pathname. For example, the name **MS/backup** would have to be specified as **MS'/backup**.

Procedure

1. Log on and enable in the Mail Service context.

2. Type **Set Backup Parameters** and press <RETURN>. This command sets up the parameters to be used for the backup process.

3. Type the name of the File Service to which you want to back up the Mail Service and press <RETURN>.

   Note: It is recommended that you back up to a File Service on a different server if possible. Loss of the server disk usually destroys both the database and the backup copy.

4. Type the file drawer name (for example, **Mail Backup Drawer**) and press <RETURN>

5. Type **Y** or **N** to the "Automatic Backups?" prompt and press <RETURN>.

   - Typing **Y** enables the backup to run automatically at a fixed time, indicated by the backup frequency. Continue with step 6.

   - Typing **N** means the backup must be run manually, using the **Force Backup** command. Type **Y** to confirm this choice. Refer to the "Backing up the Mail Service manually" section in the next chapter for the **Force Backup** procedure.

6. Type the time you wish the backup to start after the "Hour of the day" prompt and press <RETURN>. It is recommended that you set the time to early morning or late evening, when the workflow is light.

7. Type the number of days you wish between backups after the "Frequency" prompt and press <RETURN>. It is strongly recommended that backup be done *every day.*

8. Type **Y** to the confirmation prompt and press <RETURN>.

```
MS!Set Backup ParametersRETURN
   File Service: Everest:Detroit:GemSysCoRETURN
   File Drawer: Mail Backup DrawerRETURN
   Automatic Backups? (Y/N): YRETURN
   Hour of the day (0-23): 3 RETURN
   Frequency (in days) of backup (1-10): 1RETURN
   Confirm? (Y/N): YRETURN
   Done
```

Comment: You can examine parameter settings established in the **Set Backup Parameters** command using the **Show Backup Parameters** command.

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4.   Maintaining your Mail Service

Use the instructions in this section to keep your Mail Service running smoothly. Some typical Mail Service maintenance activities are monitoring the Mail Service (for example, checking database utilization), and deleting or moving mailboxes.

Other tasks, such as removing unwanted Mail Services and expanding the size of the Mail Service database, are done on an as-needed basis. If you have External Mail Gateways, you may need to change calling intervals, or adjust the configuration of the Mail Gateway.

Comment: Refer to the "Setting up your Mail Service" section if you wish to add mailboxes or set up automatic backup procedures for the Mail Service.

These procedures are in this section:

- Listing mailboxes

- Deleting mailboxes

- Moving mailboxes

- Monitoring Mail Service statistics

- Stopping the Mail Service

- Expanding the Mail Service database

- Backing up the Mail Service manually

- Restoring the Mail Service

- Repairing the Mail Service database

- Removing the Mail Service from a server

- Moving the Mail Service

- Changing Mail Gateway information

- Deleting foreign gateways

- Monitoring External Mail Gateway and domain activity

- Reconfiguring foreign Mail Gateways and domains

- Moving a foreign domain

- Removing the Mail Gateway option

Listing mailboxes

Use the **List Mailboxes** command to list all mailboxes on the local Mail Service. The command also displays the count of messages and storage space used in each mailbox, if specified.

Comment: The number of messages in a mailbox does not indicate how much space the mailbox occupies in the database. For example, 99 two-page messages take up much less space than a single 1000-page message.

When you specify the "Show sizes" option of this command, don't be confused if the sum of all the mailbox sizes adds up to a number that is larger than the total size of the database. This can happen if multiple recipients of a message share only one copy of that message. In this situation, each mailbox claims the storage for the message. Deleting any one person's mail may not free any storage space since all recipients of a shared message must delete the shared message before it is deleted from the database.

Procedure

1. Log on and enable in the Mail Service context.

2. Type **List Mailboxes** and press < RETURN >.

3. Press < RETURN > after the "Pattern *:*:*" prompt.

4. Respond with a **Y** or **N** to the "Show sizes" prompt and press < RETURN >.

```
MS > List MailboxesRETURN
        Pattern: *:*:*RETURN
        Show sizes (this takes longer) (Y/N): y
Albert Smith:Some Domain:Xerox; Messages: 69  size:  179
Barbara Jones:Some Domain:Xerox; Messages: 1  Size:  1
Barbara Wu:Some Domain:Xerox; Messages: 2  size:  442
Brian T. Moore:Some Domain:Xerox; Messages: 20  size:  1989
Marilyn Bass:Some Domain:Xerox; Messages: 0  size:  0
Brenda Lee:Some Other Domain:Xerox; Messages: 14  size:  142
```

Note that Brian T. Moore should be encouraged to read his mail.

Deleting mailboxes

Use the **Delete Mailbox** command to remove a user from the Mail System. Mailboxes can only be deleted by a System Administrator of the domain on which the Mail Service exists.

Procedure

1. Log on and enable in the Mail Service context.

2. Type **Delete Mailbox** and press < RETURN >.

3. Type the name or alias of the user for whom you wish to delete a mailbox from the Mail Service and press < RETURN >.

4. Type **Y** and press < RETURN > to confirm the deletion. If the mailbox is not empty, a warning message appears, prompting you to confirm the command a second time before the messages are destroyed.

5. Log off from the Mail Service context.

```
MS!Delete Mailbox RETURN
    Name: Citizen RETURN
Deleting Mailbox John Q. Citizen:Detroit:GemSysCo
    Confirm? (Y/N): Y RETURN
Warning: Mailbox is not empty; mail will be lost
    Are you sure you want to delete this mailbox? (Y/N): Y RETURN
Done
```

Moving mailboxes

To move an existing mailbox and its contents from another Mail Service to your Mail Service, use the **Add Mailbox** command. Once the mailbox and data are transferred, the old site server removes the mailbox from its database.

Although the moving process takes place automatically, it may take up to two days to transfer the old mailbox messages to the new mailbox, for all Clearinghouse Services to learn of the change in the user's mailbox location, and for the old mailbox to be deleted from the Mail Service database. Do *NOT* delete the mailbox from the old site. The mailbox will be deleted from the old site automatically when the contents have been moved.

During the forwarding process, users might think that some of their mail messages are being lost. It is possible that some mail messages are being directed to the old mailbox and some to the new one, depending on which Clearinghouse is contacted for the address of the user's mailbox. Eventually, all messages will be forwarded to the new mailbox.

Procedure

1. Log on and enable in the Mail Service context.

2. Type **Add Mailbox** and press <RETURN>.

3. Type the name or alias of the user for whom you wish to create a mailbox on the local Mail Service and press <RETURN>. The mailbox will be transferred to the local Mail Service after you type **Y** to the second confirmation.

   Note: If the mailbox does not exist, the Mail Service creates a new mailbox automatically.

4. Log off from the Mail Service context.

```
MS!Add MailboxRETURN
    Name: ThomasRETURN
Add Mailbox James Q. Thomas:LosAngeles:GemSysCo
    Confirm: (Y/N): YRETURN
Warning: Mailbox is registered on another server.
    Do you want the mailbox moved to this server? (Y/N): YRETURN
```

Monitoring Mail Service statistics

The commands below display the current state and past history of the Mail Service. (Refer to the "Commands" section for definitions.)

Show Activity

Show Delays

Show History

Show Message Lengths

Show Other Servers

Show Status

Show Usage

Note: You should carefully monitor and take corrective action as necessary to prevent Mail Service databases from exceeding 95% full. Such a condition prevents mail reception, and causes messages destined for a Mail Service to be returned to their sender. This can slow mail delivery throughout the entire internet as other Mail Services continue to attempt mail delivery to the affected Mail Service. Use the **Show Status** command to display the database size.

Note: Ensure that your Mail Service database never exceeds 65,535 pages. If this happens, there will be no way to save the database if it is in need of repair. If this situation occurs, you should consider installing a new Mail Service on a different server (making sure to specify a database that is smaller than 65,535 pages), and then moving the mailboxes to the new Mail Service. Refer to the section entitled "Moving a Mail Service" in this booklet for this procedure.

Procedure

1. Log on and enable in the Mail Service context.

2. Type the **Show** command you wish to use (for example, **Show Activity**, or **Show History**) and press <RETURN>.

```
MS > Show Activity RETURN
User Name                              Start Time            Last Action
John Q. Citizen:Detroit:GemSysCo       2:30:12               2:32:44
Susan B. Smith:Detroit:GemSysCo        2:28:22               2:31:01

MS > Show Delays RETURN
Time Until                    DELIVERED        READ          DELETED
0-2 min:                      3%               3%            3%
2-10 min:                     22%              12%           12%



3-7 days:                     1%               3%            3%
Longer:                       1%               4%            4%
```

```
MS > Show History RETURN
                              CURR.            MIN.              MAX.
Database used:                12               12                24
% Database used:              1%               1%                2%
Queue History:
     Input:                   0                0                 0
     Forward:                 0                0                 0
     Pending:                 0                0                 0
     Gateway:                 0                0                 0

MS > Show Message Lengths RETURN
0-1 pages:                    50%
1-2 pages:                    41%
2-4 pages:                    5%
4-8 pages:                    3%
8-16 pages:                   1%
32-64 pages:                  0%
64-128 pages:                 0%
128-256 pages:                0%
Longer:                       0%

MS > Show Other Servers RETURN
SwiftMS:Detroit:GemSysCo:  Up
BlueMS:Detroit:GemSysCo:  Down
Noteworthy:Boston:GemSysCo:  Up
FirstMS:Boston:GemSysCo:  Invalid
```

```
MS > Show StatusRETURN
Database:  765 disk pages used out of 4000 total, 19% full
Booted:  June 15, 1984 7:57:29PM
Uptime: 765:22:19
Messages Received:  4093
Local Deliveries:  2911
Mailboxes:  178
Queue Status:
    Input:  8
    Forward:  13
    Pending:  15
    Gateway:  9
Gateway Status:
    Transfer in progress.
    Last Attempted Transfer:  July 2, 1984 2:57:29 AM
    Last Successful Transfer: July 2, 1984 2:57:29 AM
Backup Status:
    Last Attempted Backup:  None
    Last Successful Backup:  None

MS > Show UsageRETURN
                              CURR.        HIGH        REJECTED     TOTAL
Inbasket Poll:                0            0           0            0
Slot Poll:                    1            3           0            40
Post:                         0            0           0            0
Deliver:                      0            0           0            0
Logon:                        0            0           0            0
List:                         0            0           0            0
Retrieve:                     0            2           0            5
Interserver Forward:          0            0           0            0
```

Stopping the Mail Service

Stopping the Mail Service is necessary in order to reboot the server (in which case you stop all services), expunge the Mail Gateway, or run diagnostic tests on the RS-232C port of a Gateway Mail Service. Stopping the Mail Service makes it appear to be unavailable to the network--that is, mail cannot be posted or forwarded to it, and users cannot retrieve mail from it.

In all cases, you must stop all services before you reboot a server.

Note: If a Mail Service is part of a distributed system of Mail and Clearinghouse Services, this process should only be used when absolutely necessary.

Stopping a Mail Service for any length of time causes mail backup on other Mail Services, increased responsibility for accepting posted messages by the other Mail Services, repeated unsuccessful forwarding attempts, and returned messages. Mail Services in other parts of the internetwork that receive re-routed mail are forced to request user information from non-local domains, which is a time-consuming process.

If there is a Clearinghouse that is co-resident with the Mail Service, the Clearinghouse relies on the Mail System to keep its database consistent. If the co-resident Mail Service is stopped for a long period of time, the local Clearinghouse will become inconsistent with the rest of the Clearinghouse system. Also, if the server is rebooted for any reason after the Mail Service has been deactivated, a co-resident Clearinghouse will create its own,"invisible" Mail Service which uses the same database as the previous Mail Service. This will result in the loss of the previous Mail database if it has to be scavenged for any reason.

You have the option of stopping the service immediately, or waiting until the last users log off. If you decide to stop immediately, users logged on to the Mail Service will be logged off immediately. Otherwise, users will be allowed to log off at their leisure.

If the latter is the case, the Mail Service prints a list of users who were logged on at the time the **Stop Service** command was typed, and notifies you as each user logs off. In addition, as long as there are users logged on, you can cancel the command by pressing the < BREAK> key. These two methods of stopping the Mail Service are illustrated on the next page.

Note: The Mail Service cannot stop completely while it is processing its pending queue. You may notice a long delay between the time the Mail Service indicates that it is stopping its processes and the time when the Mail Service is reported as actually stopped. This delay could last an hour or more. If this happens, *do not interrupt the server.* You must wait until the "Mail Service is stopped" message is displayed.

Procedure

1. Log on and enable in the Mail Service context.

2. Type **Stop Service** and press < Return >.

3. Select the number corresponding to the Mail Service.

   If there are co-resident services on the server, and you will be rebooting, stop those services as well. Simply type a dash between the first and last numbers to stop all services. (Example: 1-3.) If you want to stop a few services without stopping all of them, type a comma after each service you wish to stop. (Example: 1,3.)

4. Enter **Y** or **N** to the "Stop Immediately?" prompt and press < RETURN >.

5. If the Mail Service is co-resident with a Clearinghouse, a second confirmation is required. Enter **Y** or **N** to the prompt and press < RETURN >.

```
Stop ServiceRETURN
[select Mail Service in choice list]
MS: Stop Immediately (Y/N): NRETURN
Stopping Mail Service.
The local Clearinghouse will suffer if the Mail Service is stopped for any length of time.
Confirm (Y/N): YRETURN
Press BREAK to Abort.
Mail Service will stop when last user logs off.
Outstanding Mail Service sessions:
        Jane Citizen:Los Angeles:GemSysCo
        John Citizen:Los Angeles:GemSysCo
Sessions Ended:
        John Citizen:Los Angeles:GemSysCo
        Jane Citizen:Los Angeles:GemSysCo
BREAK is disabled for the duration of this command.
Stopping the Mail Service processes.
Stopping the Mail Gateway.
Mail Service has stopped.

Stop ServiceRETURN
[select Mail Service in choice list]
MS: Stop Immediately (Y/N): YRETURN
Stopping mail service.
The local Clearinghouse will suffer if the Mail Service is stopped for any length of time.
Confirm (Y/N): YRETURN
Stopping the Mail Service processes.
Stopping the Mail Gateway.
Mail Service has stopped.
```

Expanding the Mail Service database

When your mail community grows, you need to expand the Mail Service database to accommodate it.

This procedure requires a non-normal startup. This means that you cannot reverse your decision once you have selected this type of startup. If you need to backtrack, rebooting the server is the safest recovery.

Note: Remember to stop all services before you reboot.

Procedure

1. Stop all services.

2. Boot the server running Mail Service.

3. Type **N** to the "Normal Startup?" prompt and press < RETURN >.

4. Type the number corresponding to the "Interrupt before running services" option and press < RETURN >.

5. Log on and enable in the Mail Service context.

   Note: If your Mail Service is co-resident with the only Clearinghouse serving the domain, you will have to run the Clearinghouse Service first by typing **Run Service** and selecting the number corresponding to Clearinghouse Service. You will be able to log on after the Clearinghouse opens its database.

6. Type **Run Service** and press < RETURN >.

7. Type the number corresponding to the Mail Service and press < RETURN >.

8. Type **N** to the "Normal Startup?" prompt and press < RETURN >.

9. Type the number corresponding to the "Expand existing database" option and press < RETURN >.

10. Type the number of additional pages for the database and press < RETURN >.

    Note: When the database is expanded, the upper bounds are computed from the available disk space. The size is rounded down to the nearest multiple of six, just as in setting the initial database size.

11. Type **Y** to the confirmation prompt and press < RETURN >. When the database is expanded, the Mail Service automatically starts.

12. Type **Proceed** to start any other services on your server.

```
Run ServiceRETURN
[select Mail Service in choice list]
MS: Normal Startup? (Y/N): NRETURN
Specify Mail Service startup option:
     1) Initialize new database
     2) Restore database from backup
     3) Repair existing database
     4) Expand existing database
     Enter Choice: 4RETURN
Current database size is 4002 pages (23% of the disk).
     Number of additional pages for database (0..3890): 1600RETURN
Database size will be 5598 disk pages.
     Confirm (Y/N): YRETURN
Restarting and expanding Mail Service database
Validating Clearinghouse entry for Speedy:Detroit:GemSysCo
Mail Service started.
Mail Service run.
```

Backing up the Mail Service manually

You can back up the Mail Service manually with the **Force Backup** command. This causes a backup to occur immediately, independently of an automatic schedule. When you use the command, the backup File Service and file drawer that you specified when setting backup parameters will appear automatically.

The backup process protects your Mail Service by making a copy of the Mail Service database at specific intervals. Use this backup information to restore the Mail Service in the event that information is destroyed. Normally, you would set backup parameters with an automatic backup schedule as described in the previous chapter.

Refer to the "Establishing Mail Service backup parameters" section in the previous chapter to set backup parameters, if you have not done so already.

Procedure

1. Log on and enable in the Mail Service context.

2. Type **Force Backup** and press <RETURN>. The File Service and file drawer will appear automatically if they have been previously specified via the **Set Backup Parameters** command.

3. Type **Y** to the confirmation prompt and press <RETURN>.

```
MS!Force BackupRETURN
Manual backup to:
    File Service: Everest:Detroit:GemSysCoRETURN
    File Drawer: Mail Backup DrawerRETURN
    Confirm (Y/N): YRETURN
MS: Backup started.
MS: Backup finished.
```

4. Type **Show Status** and press <RETURN> if you wish to see the backup progress.

The backup is completed when the "Backup finished" message appears on your screen, although the MS:! prompt does not return. To see if the backup has finished, type ?. If it has, a list of available commands will be displayed, and the MS! prompt will return.

Restoring the Mail Service

You can recover from database damage or loss by using the restore option of the non-normal server restart sequence. This restores a relatively up-to-date copy of the Mail Service database that was saved on the File Service after an automatic backup.

Comment: Restoring the Mail Service database may result in the loss of some recent mail, and the duplication of some recently received mail. You may wish to alert users prior to the restore operation.

Note: Do not attempt to restore the Mail Service while the server is in Genesis mode. The Restore operation deletes the existing database and then consults the Clearinghouse Service to find the address of the File Service containing the backup copy. If the Clearinghouse Service is inaccessible, the restore operation can't occur, and the database will have already been deleted.

Make sure that you are on the access control list of the File Drawer which contains the backup copy of the database. You must have at least READ access.

Procedure

1. Stop all services.

2. Boot the server supporting the Mail Service.

3. Respond **N** to the "Normal Startup?" prompt and press < RETURN >.

4. Type the number corresponding to the "Interrupt before running services" option and press < RETURN >.

5. Log on and enable in the Mail Service context.

   Note: If your Mail Service is co-resident with the only Clearinghouse serving the domain, you will have to run the Clearinghouse Service first by typing **Run Service** and selecting the number corresponding to Clearinghouse Service. You will be able to log on after the Clearinghouse opens its database.

6. Type **Run Service** and press < RETURN >.

7. Type the number corresponding to Mail Service and press < RETURN >.

8. Type **N** to the "Normal Startup?" prompt and press < RETURN >.

9. Type the number corresponding to the "Restore database from backup" prompt and press <RETURN>.

CAUTION: Canceling the command after you select the "Restore database from backup" option will result in the loss of the local database. This is because the restore operation deletes the Mail Service database first to make room for the restored database.

10. Type the Mail Service name and press <RETURN>.

11. Type the File Service name on which the backup data is stored and press <RETURN>.

12. Type **Proceed** and press <RETURN> to run the other services on your server (if any).

```
MS: Normal Startup? (Y/N): NRETURN
Specify Mail Service startup option:
    1) Initialize new database
    2) Restore database from backup
    3) Repair existing database
    4) Expand existing database
    Enter Choice: 2RETURN
Name of this Mail Service: SpeedyMailRETURN
    File Service: Everest:DetroitRETURN
    File Drawer: Mail Backup DrawerRETURN
Done.
```

Note: The Mail Service and File Service prompts use the default server organization and domain if you do not specify it.

Repairing the Mail Service database

Certain forms of database damage can be repaired by the Mail Service software by using the "Repair Database" option during the server restart sequence. If the repair fails, you have three choices:

• Restoring the database from a copy backed up on the File Service.

• Making a second attempt to repair the database using specific procedures found in this section and the Appendix.

• Completely reinitializing the database, which erases all information stored by the Mail Service.

Database damage warning messages

During startup, the Mail Service attempts to determine whether or not its database has been damaged. If the Mail Service suspects that its database has been damaged, based on the fact that the server was rebooted during its last restart attempt, it issues this warning message and waits for confirmation before continuing.

```
Opening Mail Service database.
Warning: The last Mail Service restart attempt failed; this may indicate a damaged database.
         Continue with startup?(Y/N): Y<RETURN>
         Validating Clearinghouse entry for Speedy:Detroit:Acme
         Done
Mail Service started.
```

```
Opening Mail Service database.
Either Mail Database needs to be repaired, or Mail database was being repaired, please finish.
         Specify Mail Service startup option:
         1 Initialize new database
         2 Restore database from backup
         3 Repair existing database
         4 expand existing database
```

The Mail Service always prompts you to confirm its restart if the previous restart was interrupted by a server crash or by pressing the boot button. This can sometimes result in a confusing situation if there is a co-resident Clearinghouse Service on the server.

If the Mail Service is interrupted during restart, and there is no operator is attendance when the server tries to start again, the Clearinghouse runs automatically, and the Mail Service prompts for a confirmation of its restart. If the restart is not taken right away, the Clearinghouse Service begins to send warning messages indicating that the Mail Service is not started.

Sometimes the number of warning messages might cause the confirmation prompt to scroll off the screen. After entering **Y**, you should stand by to make sure the restart succeeds, and check the Backstop Log to determine the cause of the server restart interruption.

Procedure

1. Stop all services and boot the server supporting the Mail Service.

2. Respond **N** to the "Normal Startup?" prompt and press < RETURN >.

3. Type the number corresponding to the "Interrupt before running services" option and press < RETURN >.

   Note: If no other services co-reside on your server, or if you don't want the other co-resident services to run while the repair operation is running, continue with step 4. If you want other co-resident services to run while the repair operation is running (especially if a Clearinghouse is co-resident), type **Deactivate Service** and select only the Mail Service for deactivation. Type **Proceed** after this step. Continue with step 4.

   It is important that you recognize the effects of stopping or deactivating a Mail Service that is co-resident with a Clearinghouse Service. A co-resident Clearinghouse is dependent on the Mail Service for regular updates to its own database and other Clearinghouse databases with which it may come into contact. When a co-resident Mail Service is stopped, these updates are not possible. This causes a backup in information propagation.

4. Type **Run Service** and press < RETURN >.

5. Type the number corresponding to Mail Service and press < RETURN >.

6. Type **N** to the "Normal Startup?" prompt and press < RETURN >.

7. Type the number corresponding to the "Repair existing database" option and press < RETURN >.

   Note: The Mail Service will need a minimum of 300 pages and a maximum of 7% of the database size in which to store data during the repair. If it is successful in allocating the space it needs, the procedure will continue on its own from this point (an example of a normal repair operation is shown at the end of this section). If the Mail Service is unsuccessful in allocating all of the space it needs, it aborts the operation and prompts you to try again with this message:

```
Not enough room on the volume. Reboot and retry the repair.
```

You should repeat the steps above to invoke the repair operation again. This time, the system will remember that it has already made one incomplete attempt and will display this prompt:

```
Did last repair attempt fail due to a space shortage?
```

Type **Y** and press < RETURN >.

Once again, the Mail Service will try to gain access to sufficient free pages. Stand by to ensure that space allocation occurs. Watch to see that the first and second data structures are created, and that the "Rebuilding database" message is displayed. You can leave the server and return later to verify that the scavenge operation has completed successfully, and that the Mail Service is functioning. Be sure to activate it again if you deactivated it before the repair procedure. If, however, the Mail Service does not gain access to sufficient free space during the second or subsequent try, it will display the message:

```
Not enough room on the volume, re-boot, create more room, and retry the repair.
```

Or it will display the message:

```
The repair cannot be completed due to an insoluble space problem.
```

If you are told that the space problem is insoluble, you have no recourse but to restore the database from backup, or reinitialize it. Refer to the appropriate sections of this booklet for the option you choose to take.

Comment: After step 7, you should see the "Repairing Mail Service database" message. If the database cannot be found, you will see the "Database file can't be opened" message. This happens in the rare case that your database was deleted due to a problem in the file system. You must either restore the most recent backup, or reinitialize the Mail Service to restore Mail Service functionality.

It is normal for one or more of the characters "H, B, E, or M" to appear on the screen during the repair. These characters mean that the repair operation discovered an abnormality in a message. The character that is printed shows the nature of the abnormality. Normally, these characters should be of no consequence to you unless the screen is full of them. If this happens, you should contact the Network Support Center.

After the repair is completed, messages that the Mail Service delivered just prior to the repair might appear as duplicates in recipient's mailboxes.

```
Run ServiceRETURN
[select Mail Service in choice list]
MS: Normal Startup? (Y/N): NRETURN
Specify Mail Service startup option:
      1) Initialize new database
      2) Restore database from backup
      3) Repair existing database
      4) Expand existing database
      Enter Choice: 3RETURN
Repairing Mail Service database.
Creating data structures.
Data structure creation took 350 seconds.
Checking the database contents for completeness.
Rebuilding database.
Rebuild took 90 minutes.
The database now has 24335 pages of actual data.
Database repair finished.
Opening Mail Service database.
Validating Clearinghouse entry for Speedy:Los Angeles:GemSysCo
Mail Service started.
```

Removing the Mail Service from a server

To remove a Mail Service from a server, execute the **Shutdown Mail Service** and **Expunge Service** commands, in that order.

When you shut down the Mail Service (as opposed to simply stopping the Mail Service), any mail in transit on the Mail Service queues is forwarded to a Mail Service that you specify. If the Mail Service is a Gateway, it returns any undelivered mail destined for foreign domains. Refer to the section entitled "Stopping the Mail Service" for the implications of deactivating or stopping the Mail Service.

This command can also be run when you anticipate that a Mail Service will be unavailable for a long period of time.

If the Mail Service is being prepared for deletion, you should move all mailboxes that you would like to remain active to another server. Do not move the Postmaster mailbox, as it would be invalid on another Mail Service with a different name. The Mail Service to which you are moving the mailboxes should already have its own Postmaster. You will be instructed to delete the Postmaster entry from the Clearinghouse Service. Refer to the "Moving mailboxes" section in this chapter for the procedure.

If there are any mailboxes on the Mail Service you are deleting, you must confirm to continue the operation. If the Mail Service has the External Mail Gateway configured, you should also move the foreign mail gateways and domains that still need to be served to another External Mail Gateway before deleting this Mail Service. Refer to the "Reconfiguring foreign Mail Gateways and domains" section for this procedure.

Note: Moving mailboxes is a time-consuming process. You must ensure that all messages are forwarded to the other server before you use the **Expunge** command. Take note of the number of messages in each mailbox before you begin to add the mailboxes to another server. It is also a good idea to tell users to retrieve their mail. Ensure that all mailboxes are forwarded by typing **List Mailboxes** on the Mail Service that you will be expunging. If none are listed, all of the mailboxes have been forwarded, and you can begin the process of shutting down the Mail Service.

If there is any mail on the queues after the **Shutdown** command stops the Mail Service, you will be prompted for the name of another Mail Service to which the mail can be forwarded. A dot will be printed for each forwarded message so you can track the progress of the operation. If the specified Mail Service becomes unavailable or fills up during the transfer, you will be prompted again for another Mail Service to which messages can be forwarded.

Procedure

Shutting down the Mail Service

1. Log on and enable in the Mail Service context.

2. Type **Shutdown Mail Service** and press <RETURN>.

3. Respond with **Y** or **N** to the "Stop Immediately" prompt. Confirm.

   Note: If you decide to stop immediately, users logged on to the Mail Service will be logged off immediately. Otherwise, users will be allowed to log off at their leisure. If the latter is the case, the Mail Service prints a list of users who were logged on at the time the **Shutdown Mail Service** command was typed, and notifies you as each user logs off. In addition, as long as there are users logged on, you can cancel the command by pressing the <BREAK> key.

4. Respond to subsequent "Confirm" and "Continue" prompts.

5. Specify the name of a Mail Service to which the queued messages can be sent and press <RETURN>.

6. When the shutdown is finished, reboot the server. Remember to stop other services running on the server before you reboot.

Expunging the Mail Service

1. Type **N** in response to the "Normal startup?" prompt and press <RETURN>.

2. Enter the number corresponding to the "Interrupt before running services" option.

3. Log on and enable in the Mail Services context.

   Note: If your Mail Service is co-resident with the only Clearinghouse serving the domain, you will have to run the Clearinghouse Service first by typing **Run Service** and selecting the number corresponding to Clearinghouse Service. You will be able to log on after the Clearinghouse opens its database.

4. Type **Expunge Service.** Enter the number corresponding to Mail Service.

5. Reboot the server.

6. Go to the Clearinghouse Service, log on and enable in the Clearinghouse context, and delete the postmaster mailbox entry by typing **Delete.** Enter the name, domain and organization of the postmaster mailbox.

7. Delete the old backup copies of the Mail Service database from the backup file drawer.

Note: Occasionally, the Mail Service does not de-register itself from the Clearinghouse Service after the expunge. To verify whether this has occurred, use the **List Mail Service** command at each Clearinghouse Service which serves the Mail Service's domain. If the expunged Mail Service name is still displayed at each of these Clearinghouse Services, the error has occurred.

The recovery for this situation is to enter the **Delete** command at a Clearinghouse Service in the same domain and specify the name of the expunged Mail Service as the object to be deleted. The deletion will be propagated automatically to the other Clearinghouse Services which serve the same domain.

An example of the entire shutdown process appears below.

```
MS]Shutdown Mail ServiceRETURN
MS:  Stop immediately (Y/N):  NRETURN
Preparing for Mail Service Expunge
        Confirm? (Y/N):  Y NRETURN
There are still Mailboxes on this server (5 of them)
        Continue? (Y/N):  YRETURN
The local Clearinghouse will suffer if the Mail Service is stopped for any length of time
        Confirm? (Y/N):  YRETURN
Press BREAK to Abort.
Mail Service will stop when last user logs off.
Outstanding Mail Service sessions:
        Jane Citizen:Los Angeles:GemSysCo
        John Citizen:Los Angeles:GemSysCo
Sessions Ended:
        John Citizen:Los Angeles:GemSysCo
        Jane Citizen:Los Angeles:GemSysCo
BREAK is disabled for the duration of this command.
Stopping the Mail Service processes.
Stopping the Mail Gateway.
There are queued messages which must be moved to another MS (23).
        Name of a MS that this mail can be sent to:  Other MS:Other domain:AcmeRETURN
........The specified MS is no longer available.
        Name of a MS that this mail can be sent to:  Another MS:Other domain:AcmeRETURN
................
MS Shutdown finished.  Reboot and Expunge.

> Expunge ServiceRETURN
        Select choices
        1 Mail Service
        Enter choice number:  1RETURN
        MS:Confirm? (Y/N):  YRETURN
Expunging Mail Service.
        Deleting Clearinghouse entry for: Speedy:Los Angeles:GemSysCo
        Done.
Mail Service expunged.
```

Moving the Mail Service

Occasionally, you may need to move a Mail Service from one piece of hardware to another because of a hardware deficiency, or co-residency problem. You can easily do this by installing a new Mail Service (with a new name), moving the mailboxes to it, waiting for the mail movement to complete, and then expunging the original Mail Service.

Note: Give yourself adequate time for this process. It is strongly recommended that you wait for two days after installing the new Mail Service before adding the mailboxes from the other Mail Service to it. This delay allows for complete propagation of the new Mail Service entry to all Clearinghouse Services which serve the new Mail Service's domain. If you add mailboxes before propagation occurs, and users start sending mail, mail may be returned with the "No Such Recipient" message. The Mail Service is automatically deleted during the move.

The steps required for this procedure are noted in previous sections of this chapter or in other *Network Basic Services* booklets. You are instructed to refer to these sections in the following procedure.

Procedure

Installing the new Mail Service

1. Obtain the Mail Service floppy.

2. Go to the server on which you will be installing the new Mail Service and type **Stop Service**. Select all services listed, and press <RETURN>.

3. Reboot the server, specify a non-normal startup, and select the "Interrupt before Running Services" option.

4. Type **Install Service** and press <RETURN>.

5. Enter the number corresponding to Mail Service and press <RETURN>.

6. Type **Y** to the "Activate?" prompt and press <RETURN>.

```
> Install Service RETURN
        Installation Choices
        1 Mail Service
        Enter one or more choices:   RETURN
Installing Mail Service .... done.
        Mail Service: Activate? (Y/N): Y
```

Running the new Mail Service

1. Log on and enable in the Mail Service context.

    Note: If your Mail Service is co-resident with the only Clearinghouse serving the domain, you will have to run the Clearinghouse Service first by typing **Run Service** and selecting the number corresponding to Clearinghouse Service. You will be able to log on after the Clearinghouse opens its database.

2. Type **Run Service** and press <RETURN>.

3. Enter the number corresponding to "Initialize new database" and press <RETURN>.

4. Refer to the procedure in the "Initializing the Mail Service" section in the previous chapter to complete the initialization process.

5. Type **Proceed** and press <RETURN> to run the other services on your server (if required).

    Note: It is strongly recommended that you wait two days to allow complete propagation of the new Mail Service entry to all Clearinghouses serving the Mail Service's domain. If yours is a small network, propagation may occur in less than two days. This can be verified by use of the **List Mail Service** command at every Clearinghouse Service that serves the new Mail Service's domain.

Moving mailboxes to the new Mail Service

1. Make a list of the mailboxes that reside on the Mail Service you will be moving.

2. Go to the server on which you have installed the new Mail Service, log on and enable in the Mail Service context.

3. Refer to the "Moving mailboxes" section in this chapter for the procedures to move a mailbox. Move all the mailboxes on your list.

Expunging the old Mail Service

Note: Before you continue with this section, ensure that all mailboxes have been moved to the new Mail Service by typing **List Mailboxes** on the old Mail Service. If the message "None found" is displayed, you are ready to continue. If mailboxes are still listed, wait a while and try again. *Do not Expunge the old Mail Service until all the mailboxes are forwarded.* Expunging the Mail Service before then will result in the loss of mailboxes and their contents.

1. To **Shutdown**, then **Expunge** the old Mail Service, refer to the "Removing the Mail Service from a server" section.

Changing Mail Gateway information

You can update the calling intervals and change foreign gateway phone numbers by using the **Change Foreign Gateway** command. Calling intervals are periods during which the External Mail Gateway is allowed to send outgoing mail to the specified domain. Typically, a foreign gateway will have a single calling interval assigned, although multiple intervals may be assigned if desired.

Note: Only outbound mail transfer is controlled by the schedule. Inbound mail arrives via phone connections established by the outbound gateway in the foreign internetwork.

Procedure

Adding, changing, or deleting calling intervals

1. Log on and enable in the Mail Service context.

2. Type **Change Foreign Gateway** and press < RETURN >.

3. Type the phone number and press < RETURN >.

4. Enter the number corresponding to "Add, change or delete calling interval" and press < RETURN >.

5. Type the start time and press < RETURN >.

   • If the starting time matches that of an existing interval, the existing interval is modified.

   • If the starting time does not match an existing interval, a new interval is added.

6. Type the length of the calling interval and press < RETURN >. If the length is changed to 0, the interval is deleted.

7. Type **Y** or **N** to confirm the calling interval and press < RETURN >.

The following example shows the three conditions described in steps 5 and 6.

```
MS!Change Foreign GatewayRETURN
    Phone number: 415-492-5346RETURN
    Calling Intervals:
        Start time: 23:00; Length: 4:30
        Select one of the following:
        1. Add, change, or delete calling interval
        2. Change foreign gateway phone number
        Enter choice number: 1RETURN
    Start time of calling interval: 23:00RETURN
    Length of calling interval: 3:00RETURN
        Changing calling interval. Confirm? (Y/N): YRETURN
Done.

MS!Change Foreign GatewayRETURN
    Phone number: 415-492-5346RETURN
    Calling Intervals:
        Start time: 23:00; Length: 3:00
        Select one of the following:
        1. Add, change, or delete calling interval
        2. Change foreign gateway phone number
        Enter choice number: 1RETURN
    Start time of calling interval: 04:00RETURN
    Length of calling interval: 2:00RETURN
        Adding calling interval. Confirm? (Y/N): YRETURN
Done.

MS!Change Foreign GatewayRETURN
    Phone number: 415-492-5346RETURN
    Calling Intervals:
        Start time: 4:00; Length: 2:00
        Start time: 23:00; Length: 3:00
        Select one of the following:
        1. Add, change, or delete the calling interval
        2. Change foreign gateway phone number
        Enter choice number: 1RETURN
    Start time of calling interval: 23:00RETURN
    Length of calling interval: 0:00RETURN
        Deleting calling interval. Confirm? (Y/N): YRETURN
Done.
```

Changing a gateway phone number

Note: This command is used only if the foreign gateway phone number has changed. If the phone number of your gateway changes, use the **Change RS232C Port** command.

1. Type **Change Foreign Gateway** and press < RETURN >.

2. Type the phone number and press < RETURN >.

3. Enter the number corresponding to "Change foreign gateway phone number" and press < RETURN >.

4.   Enter the new number and press <RETURN>.

5.   Confirm that the new number is correct by typing **Y** to the confirmation prompt.

```
MS!Change Foreign GatewayRETURN
    Phone number:  415-492-5346RETURN
    Calling intervals:
        Start time: 4:00; Length: 2:00
        Select one of the following:
        1. Add, change, or delete calling interval
        2. Change foreign gateway phone number
        Enter choice number: 2RETURN
        New Number: 415-494-4749RETURN
        Change phone number.  Confirm (Y/N): YRETURN
Done.
```

Deleting foreign gateways

Delete an unwanted foreign gateway by using the **Delete Foreign Gateway** command. Typically, this is done for one of two reasons:

- To move it by re-adding it to a different Mail Service.

- To discontinue Mail Gateway service to all of the foreign domains accessible via the specified foreign gateway.

Procedure

1. Log on and enable in the Mail Service context.

2. Type **Delete Foreign Gateway** and press < RETURN >.

3. Type the phone number and press < RETURN >.

4. Type **Y** to the confirmation prompt and press < RETURN >.

   Note: A second confirmation must be given if a foreign gateway is still the connection point for one or more foreign domains. In this case, the command may be canceled and the domains reassigned to other foreign gateways before you retry the **Delete Foreign Gateway** command. (Refer to the "Moving a foreign domain" section in this chapter.)

```
MS!Delete Foreign GatewayRETURN
    Phone number: 415-493-4765RETURN
    Confirm? (Y/N): YRETURN
Warning: Foreign Gateway still has Foreign Domain attached.
    Confirm? (Y/N): YRETURN
Done
```

Monitoring External Mail Gateway and domain activity

Use the **Show Foreign Gateway** command to examine a particular foreign gateway. Use the **List Foreign Gateways** and **List Foreign Domains** commands to view the set of mail gateways and/or domains accessible from a local Gateway Mail Service.

Note: The state of the gateway's queue for outgoing mail is included in the **Show Status** command. (Refer to the "Commands" section for a description of this and other statistical commands.)

Procedure

Examining a particular foreign gateway

1. Log on and enable in the Mail Service context.

2. Type **Show Foreign Gateway** and press < RETURN >.

3. Type the telephone number of the foreign gateway you wish to examine and press < RETURN >. A listing of calling intervals, foreign domains, and transfer information will follow.

```
MS!Show  Foreign GatewayRETURN
    Phone number:  415-494-4749RETURN
Calling intervals:
    Start time:  3:00;  Length:  2:00
    Start time:  23:00;  Length:  3:30
Foreign Domains:
    Boston:Bigelow
    Portland:Bigelow
    Seattle:Bigelow
Outgoing mail queued for transfer.
Last attempted transfer:  May 19, 1986  4:30
Last attempted transfer failed:  Connection rejected.
Last successful transfer:  May 18, 1986  2:40
```

Viewing the set of Mail Gateways or Mail Domains

1. Log on and enable in the Mail Service context.

2. Type **List Foreign Gateways** or **List Foreign Domains** and press <RETURN>. The list reflects service available through this Mail Gateway only. It does not represent a complete list of the foreign gateways or domains accessible or served by other Gateway Mail Services (if any) in the internetwork.

   For foreign domains, the command also displays the foreign gateway to which the foreign domain is attached.

```
MS > List Foreign GatewaysRETURN
415-495-4549
617-963-2931
213-451-8149


MS > List Foreign DomainsRETURN
Boston:Acme; Foreign Gateway:  617-963-2931
Los Angeles:Acme; Foreign Gateway: 213-451-8149
San Jose:Acme; Foreign Gateway:  415-495-4549
```

Reconfiguring foreign Mail Gateways and domains

You can rearrange established gateway configurations by following this procedure.

- If the existing External Mail Gateway is *local* (on a single Mail Service) - use the **Change Foreign Gateway** command to change the phone numbers and calling intervals. Refer to the "Changing Mail Gateway information" section for the procedure.

- If the existing External Mail Gateway is *global* (spanning multiple Mail Services) - you might need to reassign inbound/outbound gateway roles among the various Mail Services (for example, when a new External Mail Gateway is added to an existing internetwork). If you are moving a gateway, you must add the gateway and its associated domains at the new Mail Gateway first, then delete them from the old Mail Gateway. This task is described in the following procedure.

Comment: Obtain the inbound list from the System Administrator of the foreign internetwork you will be reconfiguring before you supply the telephone number necessary for this procedure.

CAUTION: Do not use the **Delete Foreign Gateway** or **Delete Foreign Domain** commands while there is mail on the gateway queue (as shown by the **Show Status** command). Using these commands with mail waiting to be processed by the Mail Gateway may cause server failure. Wait until the **Show Status** command shows zero items in the gateway queue. Also, be sure to avoid using these commands during any of the calling intervals associated with the local Mail Gateway.

Figure 3 on the following page illustrates a gateway reconfiguration where a gateway is added, and another gateway is deleted.

Add Foreign Gateway

Delete Foreign Gateway

Internet 2

Internet 1

Internet 3
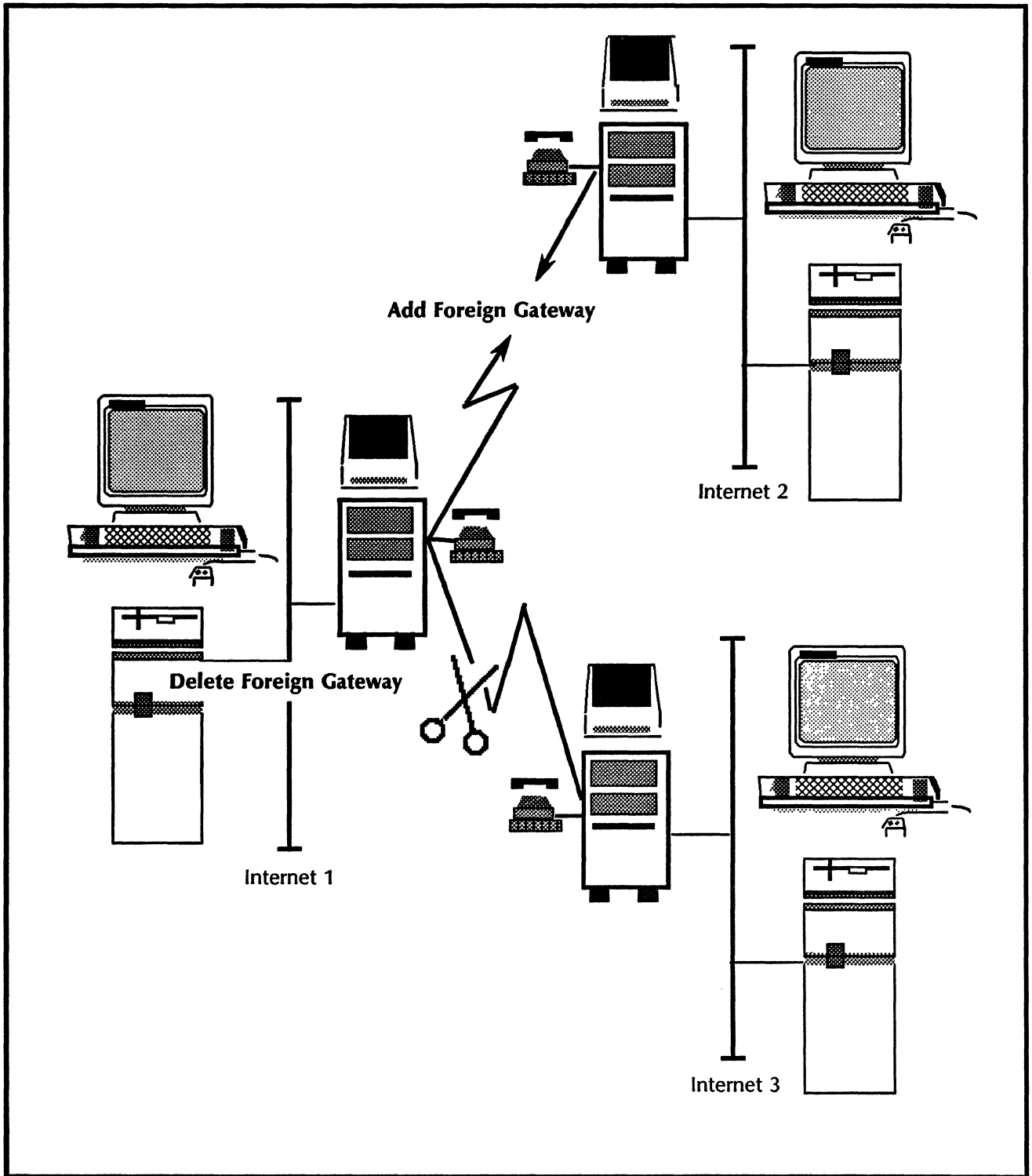
Figure 3: Reconfiguring your Mail Gateway

Procedure

If you are moving a foreign gateway to a new server, you will be issuing the following commands at the new gateway site.

1. Log on and enable in the Mail Service context.

2. Type **Add Foreign Gateway** and press < RETURN >.

3. Type the new phone number (listed on the inbound list) and press < RETURN >.

4. Enter the calling interval start time (the period of time during which the local gateway is allowed to dial the foreign gateway) and press < RETURN >.

5. Enter the length of the calling interval and press < RETURN >.

```
MS!Add Foreign GatewayRETURN
   Phone number: 415-494-4748
   Start time of calling interval: 23:00RETURN
   Length of calling interval: 4:30RETURN
Done
```

Note: Additional intervals can be added using the **Change Foreign Gateway** command.

6. Type **Add Foreign Domain** and press < RETURN >. (This adds a specific foreign domain to the list of foreign domains accessible through the local Gateway Mail Service.)

7. Type the name of the foreign domain and press < RETURN >.

    The domain must not have been added to any other External Mail Gateway in the internetwork, since each foreign domain must be assigned to a single gateway. The exception to this rule is when you are moving a foreign domain. If you are in the process of doing this, you will have one domain on two gateways for a short period of time until you delete the foreign gateway from the other server.

8. Type the phone number in response to the "Foreign Gateway (phone number)" prompt and press < RETURN >. The foreign gateway is specified via its phone number and must be known to the Mail Service.

```
MS!Add Foreign DomainRETURN
   Foreign Domain name: Boston:MutualRETURN
   Foreign Gateway (phone number): 617-964-2113RETURN
Done
```

If you are deleting a discontinued foreign gateway, move to the server on which it resides and continue.

9. Log on and enable in the Mail Service context.

Note: Before issuing the following command, check the gateway queues with the **Show Status** command.

10. Type **Delete Foreign Gateway** and press <RETURN>.

11. Type the telephone number corresponding to the foreign gateway you wish to discontinue and press <RETURN>.

12. Type **Y** to the confirmation prompt and press <RETURN>. A second confirmation is required if a foreign gateway is still the connection point for one or more foreign domains.

    You may need to cancel the command and reassign the domain to other foreign gateways before retrying the **Delete Foreign Gateway** command. Refer to the "Moving a foreign domain" section for the procedure.

Note: If you try to delete a foreign domain soon after you added it, you may see the error message: "Unexpected problem with Clearinghouse" because the information about the new foreign domain has not yet propagated to the copies of the Clearinghouse Service domain which was consulted by the delete operation. The recovery is to repeat the operation later on after the information has propagated.

```
MS!Delete Foreign GatewayRETURN
    Phone number: 415-494-4749RETURN
    Confirm? (Y/N): YRETURN
Warning: Foreign Gateway still has Foreign Domain attached.
    Confirm? (Y/N): YRETURN
Done
```

Moving a foreign domain

You can move a foreign domain from one Mail Gateway to another by using the **Add Foreign Domain** command to add it to the new Mail Gateway, and the **Delete Foreign Domain** command to delete it from the old Mail Gateway. You are changing the *route* information--i.e., moving service to a domain from one piece of hardware to another. You would use this procedure while bringing up a Mail Gateway which is geographically closer to foreign gateways.

Another situation in which you would move a foreign domain (although unlikely) is server overload. For example, if your Mail Service is handling too much gateway traffic, you can move a few domains to another Mail Service on your local net that has been configured for the Mail Gateway.

Note: The **Delete Foreign Domain** command should not be issued while there is mail on the gateway queue. Use the **Show Status** command to ensure that the queues are empty before you proceed. It is also important that you proceed with moving the foreign domain in the order specified. Do not delete the foreign domain first, and THEN add it to the new gateway, as this will cause Clearinghouse complications.

It is suggested that you wait for two days for the new domain to registers itself in the Clearinghouse before deleting the old domain to ensure proper Clearinghouse propagation.

Procedure

1. Log on and enable in the Mail Service context on the server to which you wish to add the existing foreign domain.

2. Type **Add Foreign Domain** and press < RETURN >.

3. Enter the name of the foreign domain that you are moving and press < RETURN >.

4. Enter the foreign gateway phone number that serves this domain and press < RETURN >.

    Note: You will receive a warning message stating that the foreign domain is already served by another Mail Service.

5. Enter **Y** to the confirmation prompt and press < RETURN >.

```
MS!Add Foreign DomainRETURN
    Foreign Domain name:  Boston:MutualRETURN
    Foreign Gateway (phone number):  617-964-2113RETURN
Warning: Foreign Domain already served by some Mail Service.
    Add Foreign Domain. Confirm(Y/N):  YRETURN
Done.
```

Note: It is strongly suggested that you wait two days before completing the following steps.

6. Go to the Mail Service served by the domain you are moving, and type **Delete Foreign Domain**. Press < RETURN >.

7. Enter the foreign domain name that you previously added above and press < RETURN >.

8. Enter **Y** to the confirmation prompt and press < RETURN >.

```
MS!Delete Foreign Domain RETURN
    Foreign Domain name:  Boston:Mutual  RETURN
    Confirm? (Y/N):  Y RETURN
Done.
```

Removing the Mail Gateway option

If the Mail Gateway option is no longer useful for a Mail Service that will remain in use, you can remove all foreign gateways and domains from the service with the **Expunge Mail Gateway** command. This command is only available after the Mail Service has been stopped. Please read the "Stopping the Mail Service" section at the beginning of this chapter to review the implications of such a procedure.

Note: It is important that you follow the procedure exactly. After expunging the Mail Gateway, you must immediately disable the Mail Gateway software option by using the **Set Software Options** command, and booting the server. Failure to follow these steps results in mail destined for the Mail Gateway accumulating in the Mail Gateway queues and remaining there indefinitely.

Refer to the *Server Software Installation* booklet for the procedure to set software options.

Procedure

1. Log on and enable in the Mail Service context.

2. Type **Stop Service** and press <RETURN>.

3. Select the number corresponding to "Mail Service" and press <RETURN>.

4. Enter **Y** or **N** to the "Stop Immediately?" prompt. Wait until a message appears stating that the Mail Service has stopped.

5. Type **Expunge Mail Gateway** and press <RETURN>.

6. Type **Y** to the confirm? prompt and press <RETURN>.

```
MS!Expunge Mail Gateway RETURN
    Expunge Mail Gateway. Confirm (Y/N): Y RETURN
MS!
```

7. Type **Set Software Options** and press <RETURN>. (Refer to the procedure in the *Server Software Installation* booklet.) Make sure to disable the External Mail Gateway option.

8. If there are co-resident services on this server, *stop all services* and boot the server.

   Note: After the Mail Gateway is expunged, you may notice that the External Mail Gateway message file is still present in the working directory. Do not attempt to delete it. The Mail Service cannot load and run without it.

You may also notice symptoms indicating that the Mail Gateway hasn't been completely removed. For example, mail which is destined to a foreign domain that was formerly served by the expunged gateway is returned; or, the message "that foreign domain already exists" might display when you try to configure a different mail gateway to serve a foreign domain formerly served by the expunged gateway.

To recover, enable the External Mail gateway option again, reconfigure it with the same set of foreign domains, and expunge it again.

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This section contains all error or informational messages that you might come across during the operation of your Mail Service. They are listed in alphabetical order. If the probable cause of the message is not evident by the message text, it is given next to the heading: *Probable cause.* If the message is such that action can be taken to resolve the situation, the action is listed next to the heading: *Action.* Messages not requiring action are called informative messages.

You will see the words <problemType> in some of the messages. The words entered between the angled brackets (< >) vary according to the problem encountered, and are significant to the recovery procedure required.

Cannot access the mailbox.

The mailbox is currently being accessed either by a user or by the Mail Service so that no other operations on the mailbox can currently be permitted.

Communication Service messages

The following messages are common to services that use the RS-232C port and autodialer. The Network Support Center should be able to assist in interpreting these failure reasons.

Connection rejected
Connection suspended
Connection timed out
Dialer format error
Dialer not present
Dialer transmission error
Dialout line occupied
Dialout transfer timeout
HDLC link failed
Invalid address
Invalid RS232C line number
Link failed
No route to destination
No RS232C hardware
No service at destination
Protocol error
RS232C channel in use
Timeout while dialing
Too many connections
Unexpected dialout problem
Unexpected problem

Database file can't be opened.

Probable cause: The database was deleted, most likely due to a problem in the file system.

Action: The only recovery for this situation is to restore from the most recent backup copy, or to reinitialize the Mail Service.

Database is too large to repair.

Probable cause: Database repair failed because the database was too large (greater than 65,535 pages) when the repair was started.

Action: You can restore from the most recent backup, or reinitialize the Mail Service.

Database too full to complete the repair.

Action: You can restore from the most recent backup, or reinitialize the Mail Service.

Done.

Informative message indicating that a command was completed successfully. If a command is aborted by the user or terminated with an error message, the "Done" message is not printed.

ERROR: Authentication problem.

Probable cause: Some problem was found with the logged-on user's credentials. Since the user must have been authenticated by the Clearinghouse Service in order to execute the command, this should not happen. An exception would be if the user had been deleted from the Clearinghouse Service after having logged on to this Mail Service.

Action: Log off and then try to log back on. This should provide information as to whether the user still exists on the service. If not, and an operation that contacts a remote server (such as **Set Backup Parameters**) is being attempted, check the server's time against that of the remote server. If they differ by more than 10 minutes, correct that condition.

If this message persists, notify the Network Support Center.

ERROR: Backup database is damaged or in wrong format.

Probable cause: While restoring its database, the Mail Service discovered that the backup database stored on the File Service did not have the proper information format. This could be due to damage to the file, or by an attempt to restore a file that was not generated by the Mail Service backup facility.

Action: Try the operation again. If it fails, ensure that the name of the file that you are trying to restore from is correct.

ERROR: Backup database not found.

The backup database needed for the restore operation was not found in the specified file drawer.

ERROR: Backup parameters are not set.

Probable cause: During a forced (manual) backup or a restore, the Mail Service found that the backup parameters had not been set.

Action: Use the **Set Backup Parameters** command to fill in the missing parameters, and try the failed operation again. Do this by rebooting the server and using the **Run Services** command with a non-normal startup.

ERROR: Calling interval overlaps another interval.

Probable cause: A **Change Foreign Gateway** command has attempted to add or change a calling interval in such a way as to overlap another existing interval.

Action: Calling intervals cannot overlap. Refer to the other intervals listed to determine the cause of the error.

ERROR: Cannot contact Clearinghouse.

Action: Check the state of the Clearinghouse Service(s) and try the operation again.

ERROR: Cannot contact File Service <problemType>.

Action: Check the state of the File Service and try the operation again. If this message persists, note the <problemType> before contacting the Network Support Center.

ERROR: Cannot determine access rights for backup database.

Probable cause: An attempt to restore the Mail Service database was unsuccessful. The File Service was unable to derive membership information from the Clearinghouse Service in order to determine access rights to the backup database.

Action: Check the Clearinghouse Service and try the operation again.

ERROR: Cannot run Mail Service now. Activate Mail Service and reboot.

Probable cause: The **Run Service** command was used to start a Mail Service on a server that is already running a co-resident Clearinghouse Service.

ERROR: Database too full to store parameters.

Probable cause: A **Set Backup Parameters** command was invoked when the database was too full to allocate the small amount of space needed to store the parameters. This happens only when the database is already very full, which suggests that it is overdue for expansion.

Action: Try to expand the Mail Service database by rebooting the server, selecting a non-normal startup, typing **Run Service**, and indicating a non-normal startup. Select the "Expand database" option and enter a larger database size.

ERROR: File drawer not found.

Probable cause: The file drawer specified by the current backup parameters or restore command was not found, making it impossible to perform the requested backup or restore the Mail Service database.

Another possibility is that the file drawer contains characters that cannot be recognized by the File Service, such as ( ) - #
+ * '.

Action: Verify that the file drawer exists on the File Service, and that it can recognize the name.

ERROR: File service data transfer problem.

Probable cause: The file transfer was aborted due to a problem which cannot be readily determined. This situation may arise momentarily during a backup or restore operation.

Action: If this message persists, contact the Network Support Center.

ERROR: Foreign Gateway already known to this Mail Service.

Probable cause: While processing an **Add Foreign Gateway** command, the Mail Service has discovered that the specified phone number already identifies a foreign gateway previously added to this Mail Service.

Action: In general, this means that you can skip the **Add Foreign Gateway** command since the needed foreign gateway is already known to the local Mail Service.

ERROR: Incompatible version of backup database.

Probable cause: While restoring its database, the Mail Service discovered that the backup database stored on the File Service was not in the proper file format. This could be caused by an attempt to restore a file that was not generated by the Mail Service backup facility.

Action: Check to ensure that the backup copy you specified is correct.

ERROR: Insufficient access rights for backup database.

Probable cause: An attempt to back up or restore the Mail Service database was unsuccessful because the logged-on user is not privileged to access the file drawer in which the backup database is stored.

Action: Check the file drawer specified by the **Show Backup Parameters** command at its home File Service. Update its access list there, if necessary. Alternatively, a user with sufficient access to the file drawer may log on and then try the restore operation again by rebooting the server and implementing the **Run Services** command with a non-normal startup.

ERROR: Mail Service cannot be renamed.

Probable cause: It is likely that the wrong backup file has been restored to the server, or that a Mail Service that was previously served by this server was decommissioned improperly.

Action: If the server is booted, the Mail Service will change its name to that of the Mail Service that created the backup. If it is the wrong backup file, restore the correct backup file to the server. You can verify whether a Mail Service previously served by this server was decommissioned properly by going to the Clearinghouse server (or entering the Clearinghouse context at this server) and typing **List Mail Services.** If it is still listed, type **Delete** and delete the entry.

ERROR: Name cannot be a pattern.

Probable cause: A pattern (such as B*:GemSysCo:LosAngeles) has been entered where only a literal name (Bill Mitchell:GemSysCo:LosAngeles) is allowed.

Action: Try the command again using a literal name.

ERROR: No such calling interval exists.

Probable cause: A **Change Foreign Gateway** command was entered, specifying a calling interval with a length of zero, in an apparent attempt to eliminate an existing interval. However, no interval with the specified starting time was found.

Action: Refer to the existing intervals listed and try the operation again.

ERROR: No such File Service in Clearinghouse.

Probable cause: A **Set Backup Parameters** or **Restore** command specified a File Service that is not registered in the Clearinghouse database.

Action: In most cases, this simply means that the name is incorrect. Less likely is the possibility that the self-registration process of the File Service was unsuccessful for some reason. If this message persists, go the the Clearinghouse Service and

verify whether the File Service is registered by typing **List File Services.**

ERROR: No such File Service with that name on machine at address given.

Action: The state of the File Service should be checked, and the operation tried again. If the File Service has recently moved, try the operation again after the Clearinghouses are consistent about the new File Service address.

ERROR: No such Foreign Domain is served by this Mail Service.

Probable cause: A **Change Foreign Gateway** or **Delete Foreign Domain** command specified a foreign domain name that did not correspond to one previously added to this Mail Service. Either the name is incorrect, or the foreign domain is served by some other Mail Service in the internetwork.

ERROR: No such Foreign Gateway is known to this Mail Service.

Probable cause: A **Change Foreign Gateway, Delete Foreign Gateway,** or **Add Foreign Domain** command specified a foreign gateway (a phone number) not previously added to this Mail Service.

Action: Verify that the phone number is correct, or if the foreign gateway simply needs to be added to the Mail Service.

ERROR: No such mailbox exists.

Probable cause: A **Delete Mailbox** command specified a mailbox that does not exist. In most cases, this is caused by incorrect spelling of the name, or confusion over which Mail Service holds the mailbox in question.

ERROR: No such recipient.

Probable cause: This message appears when a Clearinghouse entry for a newly installed Mail Service has not been propagated to all Clearinghouse Services serving its domain.

Action: You should always wait two days after installing a new Mail Service to allow complete propagation of the new entry to all Clearinghouse Services which serve the Mail Service's domain. Verify propagation by using the Clearinghouse Service **List Mail Services** command at every Clearinghouse service that serves the new Mail Service's domain.

ERROR: No such user in Clearinghouse.

Probable cause: An **Add Mailbox** command specified a user name that was not found in the Clearinghouse database. Most likely, the name was either incorrectly spelled, or not registered in the Clearinghouse.

Action: Make sure that the user is registered in the Clearinghouse and try the command again.

ERROR: Not a file drawer.

Probable cause: A **Set Backup Parameters** command specified a nested file folder or file instead of a file drawer.

Action: Make sure that you are entering the correct file drawer name and try the command again.

ERROR: Not enough disk space for Mail Service.

Probable cause: In the attempt to figure the maximum possible size of its initial database, the Mail Service discovered that there was insufficient disk space available to create the database.

Action: Release some disk space (for example, by removing files from a co-resident File Service). Try database creation again using the **Run Service** command after a non-normal server startup.

ERROR: Not enough disk space on File Service.

Probable cause: An attempt to back up the Mail Service database was unsuccessful because there was insufficient free space on the File Service disk.

Action: Make space available (for example, by moving some files off the File Service) and try the operation again.

Note: Before this message is displayed, the Mail Service will have already deleted the previous backup database in an attempt to make room for the new one. Because of this, the Mail Service backup operation is not automatic when used with a nearly full File Service. A subsequent Mail Service backup should be done to ensure that a backup database always exists.

ERROR: Not enough disk space to expand database.

Action: Release some disk space (for example, by removing files from a co-resident File Service). Try the expansion again using the **Run Service** command after a non-normal server startup.

ERROR: Not enough disk space to restore backup database.

Probable cause: The backup database stored on the File Service is larger than can be accommodated in the free space on the local server's disk. Generally, this occurs only when restoring a backup file generated on another server.

Action: Obtain additional free space on the server's disk. Otherwise, the specified backup file cannot be restored onto the local server.

ERROR: Problem communicating with File Service <problemType>.

Action: Check the state of the File Service and try the operation again. If this message persists, note the message <problemType> before contacting the Network Support Center.

ERROR: The local gateway has been expunged.

Informative message indicating that the operation being attempted cannot be completed because the local gateway no longer exists.

ERROR: The Mail Service option has not been enabled.

Probable cause: The software option that allows a server to run a Mail Service has not been set.

Action: Enable the Mail Service software option by using the **Set Software Options** command. Refer to the *Server Software Installation* booklet for details on using the command.

ERROR: Unexpected Problem.

Probable cause: This message can appear in response to the **Show Status** command, or in response to an External Mail Gateway command.

Action: Try again to get a more descriptive error message. If this message persists, notify the Network Support Center.

ERROR: Unexpected problem with Clearinghouse.

Action: Check the state of the Clearinghouse Service(s) and retry the operation. If this message persists, notify the Network Support Center.

ERROR: Unexpected problem with database expansion.

Probable cause: There may not be enough disk space left on the Services volume to expand the database.

Action: If this message persists, contact the Network Support Center.

ERROR: Unexpected problem with File Service <problemType>.

Probable cause: A problem that occurred in communicating with the File Service was not anticipated by the Mail Service software.

Action: Check the state of the File Service and try the operation again. If this message persists, notify the Network Support Center.

Failure Reason: <problemType>.

Probable cause: This message is printed via the **Show Status** command. It indicates that a problem occurred in an attempt to back up the Mail Service database to a File Service.

Action: Review the other error messages containing the words <problemType> to best determine the recovery procedure from the information given.

Mailbox not empty; Forwarding mail to new mailbox.

Probable cause: A **Delete Mailbox** command specified a mailbox containing one or more items of mail. The existing mail is forwarded to that mailbox before the local one is deleted. No action required.

Mail database needs to be repaired.

Probable cause: Some of the Mail Service database files have been damaged or are missing.

Action: Scavenge the database using the Mail Service non-normal startup option "Repair Database." Refer to the "Repairing the Mail Service database" section.

Mail Database was being repaired, please finish.

Probable cause: The Mail Service was interrupted before it finished repairing the database.

Action: Continue the repair operation by using the Mail Service non-normal "Expand Database" option. Or you can restore or reinitialize the database.

Mail Service database full.

Probable cause: There was not enough space in the Mail Service database to successfully complete the transfer of mail.

Action: Users should be urged to delete their mail from the Mail Service. If this does not suffice, the database should be expanded by rebooting the server. Use the **Run Services** command with a non-normal startup, and select the "Expand Database" option.

Not enough disk space on the specified MS.

Probable cause: The remote Mail Service is not accepting any more mail messages because its database is too full.

The database now has "n" pages of actual data.

Informative message. After the database has been repaired, the amount of data it contains may be smaller than the amount it contained before the repair. This is true for two reasons. First, if the repair is done because pages have become bad, messages written on those pages are discarded. Second, useless data is also discarded during the repair. No action is required.

The repair cannot be completed due to an insoluble space problem.

Probable cause: Even though there may be many pages available on the Services volume, the database repair operation requires that a small amount of space be available on the System volume.

Action: You can release disk space on the System volume by expunging co-resident services, but this should be done with forethought and care. Your other options are to restore from the most recent backup copy, or to reinitialize the Mail Service.

There are still mailboxes on this server ("n" of them).

Informative message that occurs during a Mail Service shutdown procedure.

Action: If the shutdown is being done in preparation for a Mail Service expunge, move these mailboxes before continuing the operation. Otherwise, they will be automatically deleted.

There are queued messages which must be moved to another MS ("n").

Informative message that occurs during a Mail Service shutdown.

Action: Specify a nearby Mail Service with sufficient space in its database to receive the "n" messages from the Mail Service being shutdown.

The specified MS is no longer available.

Action: Check the state of the remote Mail Service and try the operation again.

The specified MS is too busy.

Probable cause: The remote Mail Service is not accepting any more input requests at this time.

Action: This error is transitory. After a pause of a minute or two, try again.

Warning: Foreign Domain already served by some Mail Service.

Probable cause: An Add Foreign Domain command specified a foreign domain that is already served by another Mail Gateway.

Action: Continue this operation only if you are moving a foreign domain to this Mail Service. Otherwise, make sure that you are adding the correct domain. If you are moving a foreign domain to this service, use the **Delete Foreign Domain** command to delete it from the old Mail Gateway.

Warning: Foreign Gateway still has Foreign Domain attached.

Probable cause: A **Delete Foreign Gateway** command specified a foreign gateway that still has one or more foreign domains attached to it.

Action: Confirm again to complete the operation.

Warning: Interval split in two at midnight.

Probable cause: An **Add Foreign Gateway** or **Change Foreign Gateway** command specified a calling interval that overlapped midnight. The interval was split into a late-night interval and an early-morning interval, and will be displayed in this way when you use the **Show Foreign Gateway** command.

Action: None required.

Warning: Mailbox is registered on another server.

Probable cause: An **Add Mailbox** command specified a name already in use for a mailbox on another Mail Service. The mailbox and its contents are moved to the local server if a second confirmation is given.

Warning: Mailbox not empty; mail will be lost.

Probable cause: A **Delete Mailbox** command specified a mailbox that contained one or more items of mail. A second confirmation will destroy the mail.

Note: If a new mailbox was added to another Mail Service, it could be that the mailbox move has not yet been completed. Do not delete the mailbox from the old site, as this will occur automatically.

Action: Do not continue to transfer mail to the remote Mail Service until the condition is addressed.

Warning: The last MS restart attempt failed, this may indicate a damaged database.

Action: You may continue the restart procedure, but this restart attempt may fail. If so, refer to the "Repairing the Mail Service database" section.

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Database	The permanent stored data.
Distribution list	A list of recipients for electronic mail, represented by a user group registered in the Clearinghouse.
External Mail Gateway	An optional feature of the Mail Service which enables mail exchange between two Xerox mail systems residing in separate networks.
Foreign internetwork	A Xerox internetwork that is separate from your internetwork.
Foreign mail domain	A domain in a foreign internetwork that is accessed via the External Mail Gateway option of the Mail Service.
Foreign Mail Gateway	A Gateway Mail Service in a foreign internetwork which can be contacted by a Gateway Mail Service in the local internetwork for exchanging mail between mail systems.
Forwarding	The passing of a message from one Mail Service to another to deliver it to the mailbox of its intended recipient.
Forward queue	Contains mail that is being forwarded to another Mail Service.
Gateway Mail Service	Provides a non-networked 850/860 workstation with access to the network through a modem and phone line.
Gateway queue	Present if the Mail Service is a mail gateway. It contains messages awaiting the start of a calling interval so that mail can be forwarded to intended recipients' mailboxes in a foreign domain.
Inbound Mail Gateway	A Gateway Mail Service which handles incoming mail from foreign internetworks for a selected set of domains in its own internetwork.
Initializing	A process completed after a service has been installed on a server for the first time. The initialization procedure includes the determination of the service name, and configuration information specific to that service.
Input queue	Contains mail that was either posted to a local Mail Service or forwarded from another Mail Service.
Mail Service	(MS) The Mail Service is directly accessible to all networked workstations, and to any non-networked device that can dial-up the appropriate compatibility service. There are two compatibility services: 850/860 Gateway and the Interactive Terminal Service. The Clearinghouse provides address information and distribution lists for mail delivery. The Internetwork Routing Service routes messages to other networks.

Mail Service database	The permanent data stored by the Mail Service on the server disk, including mailboxes, their contents, and messages queued for forwarding and delivery.
Mail system	The global system made up of all the Mail Services in an internetwork. The Mail Services cooperate to provide a single, unified mail transport system.
Mailbox	The repository in which mail resides while awaiting delivery to a client.
Outbound Mail Gateway	A Gateway Mail Service which handles outgoing mail from its own internetwork for a selected set of domains in a foreign internetwork.
Pending queue	A list of messages waiting to be forwarded to intended recipients.
Server	A processor on which one or more services can run.

Mail Service Forms

This section contains the forms you will need to configure your Mail Gateway. You may want to make copies of these forms and fill them out by hand. It is important to update the forms with service or network configuration changes as they occur. These forms are:

- MS Form 1, *Inbound External Mail Gateways* - used to list all inbound gateways in the internetwork according to their phone number, geographic location, and set of domains for which they are the inbound gateway.

- MS Form 2, *Registering External Mail Gateways* - contains a list to be completed when setting up the External Mail Gateway. It is set up to correspond to the prompts that appear during initialization. Use Form 2 to fill in the information you receive from the System Administrator(s) of the other networks when you are ready to establish mail exchange with a foreign internetwork.

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