

**SERVER OPERATION
AND MAINTENANCE**

XEROX

Network Administration Library

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Purpose This booklet is an introduction to the general network administration techniques required to maintain the servers on your network. It describes the Services Executive environment which is generic to all servers, regardless of the server configuration. This booklet explains the commands available in the Services Executive environment, as well as the messages generated from this environment.

Intended audience This publication is intended for System Administrators who are responsible for operating and maintaining the servers on their network.

Before you read this booklet Before you use this booklet, it is suggested that you first read the *Introduction to Network Administration* booklet, which can be found in the *Network Basic Services* volume. The *Server Operation and Maintenance* booklet must be read for an understanding of basic server functions prior to performing installation procedures described in the *Server Software Installation* booklet, which is also part of the *Network Basic Services* volume.

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This booklet explains the basic server environment provided by the Services System Software and details techniques for manipulating that environment. It contains a full explanation of the conventions and characteristics of the Services Executive, and step-by-step procedures for accomplishing tasks that require use of the server commands.

Understanding the general System Administration techniques provided in this booklet is a prerequisite to accomplishing procedures presented in the service-specific booklets in the *Network Shared Services* volume. You can also use this booklet as a reference, since it includes a summary of server commands.

This booklet consists of five sections:

- **Services Executive** - Describes characteristics and input conventions you need to know when interacting with the Services Executive.
- **General operating techniques** - Describes techniques and step-by-step instructions necessary for effective administration of your server and the services it supports.
- **Server commands** - Describes the server commands available in the server context. These commands allow you to manipulate the server environment by changing, backing up, or restoring the server profile; and installing, activating, starting or stopping services.
- **Maintenance tasks using server commands** - Describes the most significant maintenance tasks that you may need to perform using these server commands. These server commands support a variety of functions that are needed for operation and maintenance of all servers, regardless of the specific services running on the server.
- **Messages** - Lists informational or error messages that are displayed by the Services Executive. These messages relate to the basic server environment regardless of which services are running there. Each message (or group of messages) is followed by a brief explanation or action pertinent to the message.

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2. Services Executive

All of the procedures that are described in this booklet and in the individual service booklets require that you interact with the Services Executive.

The Services Executive is the software that lets you observe the current activity of a server, or change its current configuration. The Services Executive is accessible directly at the server terminal and from the 6085/8010 workstation System Administration window.

Your organization may have purchased the asynchronous communication option of the External Communication Service. If so, you can access any server's executive from a terminal or computer that is remote from the Ethernet network.

Note: The *External Communication Service* booklet describes the procedure for defining incoming asynchronous ports. Once appropriately configured, the External Communication Service "Greeter" answers calls to these ports that originate from a personal computer configured with a modem and appropriate teletype communications software. After the remote personal computer dials into the ECS port, the "Greeter" presents an interactive interface that allows you to select the Services Executive option and then to choose a specific server's executive. Once you are connected with a particular server's executive, your mode of interaction is nearly identical to that of using the server terminal directly.

Read the following explanation of the Services Executive to familiarize yourself with its conventions.

Services Executive characteristics and conventions

Prompts and logged-on status

A prompt indicates that the Executive is ready to receive input. It always appears at the left-hand side of your screen.

- The > prompt appears when no user is logged on and the executive is awaiting input.
- The > prompt also appears when a user is logged on and has not enabled special administrative privileges.
- The ! prompt appears when a user is logged on and has enabled special administrative privileges.

To log on, type the **Logon** command. You are then prompted to supply your name and password. The server checks to see that you are registered in a Clearinghouse domain, and that your password is correct. This process is called "authentication."

If the authentication procedure succeeds, you are granted logged-on status. The prompt remains a >, but you can gain access to additional commands that are not available before logging on. These commands allow you to affect resources to which you "own" or have sufficient access. For example, when you are logged on, you can change your own password, change the access privileges on your own file drawers, or add people to user groups that you administer.

As a System Administrator, you should have "Domain Administrator" privileges to one or more Clearinghouse domains. This access privilege allows you to use the **Enable** command so that additional commands are available to you. These commands allow you to maintain the servers in your network.

The *Server Software Installation* booklet explains how registered users are initially given Domain Access through use of the Clearinghouse Service **Change Domain Access** command. As a System Administrator, you need to have this special access privilege for the Clearinghouse domain(s) that contain your site's resources and user entries.

The **Enable** command is used to access System Administrator-specific commands. When you type the **Enable** command, the server checks to see if you are an administrator of the server's Clearinghouse domain. The exclamation point prompt (!) indicates that this status has been validated. (Refer to the section entitled "System Security" in the *Introduction to Network Administration* booklet for an introduction to system security issues.) While you are not enabled, you can access only those commands available to ordinary users.

Note: A good rule for you to follow is to use your logged-on, non-enabled status when you are making changes to your own user entries. Do not make a habit of enabling yourself

every time you log on. If you do so, you may accidentally issue a command that impacts users of your server or services.

Note: The Clearinghouse Service applies access controls on all of its entries. Often you, as Domain Administrator, have the ability to manipulate these objects through use of commands that are available to you when you have not enabled special administrative privileges. This is because commands such as **Change Password** are available to all users.

Users can only affect objects that they own with these commands. You, on the other hand, can affect any object to which your Domain Administrator status gives you access. This is a characteristic of the Clearinghouse Service and not of the Services Executive.

The Services Executive uses the logged-on status to determine which commands to make available. Once the commands are available, their ability to affect a Clearinghouse object is determined by the access controls currently in force for that object.

Command syntax

In general, commands contain a verb and an object separated by a space. The verb portion of a command conveys the type of action that is to be applied (for example, **Delete**, **Add**, and **Change**); and the object specifies what is to be acted upon (for example, **Drawer**, **User**, **Mailbox**). Some objects are identified by multiple words which are also separated by spaces.

After typing the command, press <RETURN> and the resulting operation will begin. Often additional user input is needed to direct the operation. This input can be the specification of the three-part name of an object, selection of an item number from an option list or menu, confirmation in the form of **Y** or **N**, or entry of a text or a numerical value.

```
> List ServicesRETURN  
or  
> Show Logged on UserRETURN
```

Common verbs

Learning the Executive commands is simplified since many of the same verbs are used by the different services to operate on objects relevant to those services. Once you become familiar with these commonly used verbs and with the objects relevant to the different services, you will be able to identify the correct syntax.

The exceptions to the normal verb/object syntax are those commands which affect logged-on status, such as **Logon**, **Logoff**, **Enable**, and **Disable**. Since the object of these commands is always the user, it is implicit in the verb.

Automatic completion of command input

To assist your entry of commands, the Services Executive completes words within a command, or completes the entire command for you, provided you give it enough characters to uniquely identify a word or the entire command.

To indicate that you want the Executive to complete the rest of one word in a command, press the spacebar after entering the letters necessary for unique identification of the word.

Example If you type the letters "del," followed by a space, the Executive fills out the word "delete." Then you can enter the initial characters of the object that is to be deleted, followed by pressing <RETURN>.

The Executive completes the object name if you have uniquely identified it, and then it initiates the action indicated by the command. If there is only one object that can be affected by a verb, you need not specify the object at all. Rather, you can type enough characters for unique identification of the verb, followed by pressing <RETURN>. The Executive completes the full command for you and begins the operation indicated.

Alternatively, you can enter enough characters to identify the verb, followed by pressing the spacebar or the <ESC> key. The Executive completes the full command for you but does not execute it. You must press <RETURN> for the operation to begin.

Server commands

Regardless of the specific set of services that are installed and run on a server, there is a set of commands that are necessary to establish and manipulate the server's configuration. These server commands allow you to:

- install, run, stop, and restart services
- set software options
- view the current server configuration
- change your logged-on status
- manipulate the services volume
- change or view the server profile
- recover from file system inconsistencies
- view reports generated by the recovery software
- remove services from the server

Test commands

Some or all of the commands necessary to execute server hardware component tests are accessible whenever the server

has been booted and has completed initialization. There is a Test context in which the test commands can be accessed. The *Basic Troubleshooting of Network Services* booklet describes the use of these commands.

Service commands

When you have installed and run one or more services on a server, additional commands are available for each service. The Services Executive coordinates your input to the server and service commands, enforces the syntax requirements for these commands, and coordinates the messages and prompts directed to you by the server or services software.

Contexts

Since a particular server can support a number of services at one time, the Executive provides a context for each of the running services. Each context has a name and an acronym which corresponds to the service to which the operations apply.

Within a given context, a subset of all Executive commands is available. When no services are installed, but the server software has been booted and initialized, the *test* and *server* contexts are available. Each context has its own set of commands. Since the server commands are used in conjunction with many activities, they are available in every context.

When you need to affect a particular service by using one of the commands it supports, you must first set the Executive context to correspond to the service you want to affect.

Example If your server has the Print, File and Clearinghouse Services installed, you can switch among five different contexts: server, test, Print Service, File Service, and Clearinghouse Service.

To switch to a different context, type the number of characters necessary to distinguish its name, and press <RETURN>.

Example To set the Print Service context, you can type **Print** and press <RETURN> since no other context begins with "Print."

Once you have set the context to that of a particular service or to test, you can use the **Reset Context** command to return to the server context. You do not have to return to the server context to access the server commands, since they are accessible in any context.

When a context other than the server context is set, the > or ! prompt is preceded by an acronym that stands for that context. For example, the Print Service context is identified by PS> or PS!.

If you attempt to enter a command that is not currently available in the established context, the Executive cannot process the command. The Executive displays a question mark after your input to indicate that it does not recognize the command.

Server and service states

Server and service states affect the availability of commands within a given context. As you learn more about the configuration and maintenance of your server and services software, you will discover that some operations can be done only while the server or a service is in a particular state.

Example The Print Service cannot be printing when you are installing fonts. For this reason, the **Install From Floppy** command, which is used to install fonts from floppy disks to the rigid disk, is not available when the Print Service is started. If you set the context to Print Service and type the **Install From Floppy** command, you will find that the Executive will place a ? after your input, since that command is not valid input in the current state.

However, you can enter the **Stop Service** command, select the Print Service from the resulting option list, and stop the Print Service. Then, if you re-enter the **Install From Floppy** command, the Executive will be able to process the command.

The server also has states. By selecting a non-normal startup of the server after the boot process is completed, you can interrupt the server's initialization process and gain access to server commands that are useful in altering the server's initialization parameters.

"Interrupt" points, along with the commands that you can apply while the server is in this partially initialized state, are explained in the "General operating techniques" section of this booklet. Many server commands are available at one or more interrupt points as well as after the server initialization has been completed.

Other commands might be available at one or more interrupt points and after initialization has completed, but will not successfully function in all of these states.

Some commands, when used before the server completes initialization, will have an effect on the server configuration established during initialization. These same commands, when used after initialization has been completed, only affect the server after a subsequent boot and initialization.

Help features

You do not need to memorize all of the Executive commands. If you want help determining which commands you can use in a given context and state, type ? after the prompt and press <RETURN>. The Executive displays all of the verb portions of the currently available commands. Since server commands are accessible in all contexts, the Executive distinguishes between the verbs that apply specifically to the current context and those that are a part of currently available server commands. It does this by presenting the context-specific verbs first, followed by a blank line and then a list of the verbs that can be used to compose server commands.

Once you know which verb you need for your command, you can type the verb, followed by a ?. The Executive then displays

the objects that can be coupled with that verb to form a command. Once again, if the current context is other than the server context, the valid objects are displayed in two parts. Those relevant to the specific context are displayed first, and those relevant to the server commands are displayed after a blank line.

If you are not logged on after the server has completed initialization and the server context is set, the following display may result when you type ? after the > prompt:

```
>?RETURN
List, Logon, Show, External, Gateway, Interactive, Test
```

Note that there are three verbs currently displayed and that the first words of the available contexts are also displayed. In this case, the External Communication Service, Gateway Service, and Interactive Terminal Service have all been run, so their context names are also displayed.

If you are logged on and have set the context to Internetwork Routing Service, you can type ? and the following display may result:

```
IRS>?RETURN
List, Show
Enable, List, Logoff, Reset, Show, External, Gateway, Interactive
```

To find out which objects can be combined with the verb "list" to form a command, you can type List? and the following display may result:

```
IRS> List?RETURN
List Circuits, Routes, X25 Network
List Executives, Services, Volumes
```

From the example, there are six commands that begin with the verb "list" and can be used in this context while a registered user is logged on and the Internetwork Routing Service is started. These commands are:

List Circuits
List Routes
List X25 Network

List Executives
List Services
List Volumes

Remember, when you do not see the verb or object you are looking for, it may be that your current context, or the state of the server or service, is such that the command is not available. Also, your logged-on status may be such that you cannot access the command you are looking for. When this happens, type **Enable** and request help again by typing a ?. If the command you are looking for is still not displayed, you may

need to change the current state of the service (stop or start the service).

Note: This booklet contains a summary of server commands which details the required logged-on user status and server state so that the command is available. Each service-specific booklet in the *Network Shared Services* volume provides a command summary for that service.

Wild cards

List commands can result in the display of more than one object of a certain type.

Example You may want to list all of the files in the working directory, or all of the objects in a Clearinghouse domain, or all of the domains in an organization.

To accomplish this, the wild card symbol `*` can be supplied in place of one or more components of a fully-qualified name, or in place of some or all of the characters in a file name.

Example The **List Print Services** command (accessible in the Clearinghouse Service context) prompts for a three-part name of the Print Service that is to be listed. If you type:

***:domain name:organization name**

in response to this prompt, all Print Services in the specified domain are listed.

You can use the **List Files** command to see a list of one or more files in the working directory. The working directory is a sub-directory of the system files. You are prompted to specify the name of the file that is to be listed. In response to this prompt, you can supply the name of one file, or a pattern composed of the `*` (wild card) and a partial file name.

Example Typing `*` results in a listing of all files. Typing `*.bcd` results in a listing of all files that end with `“.bcd.”` Typing `Server*` results in a listing of all files with names that begin with `“Server.”` Typing `S*Profile` results in a list of all files that begin with `“S”` and end with `“Profile,”` regardless of the characters that fall in the middle of these beginning and ending characters.

The wild card symbol can also be used for other purposes.

Example When you are specifying the members of a user group in the Clearinghouse database, you can use the wild card to indicate that all users in a certain domain and organization are to be included. Alternatively, typing `*:*:organization name` indicates that all users in all domains of a specific organization are to be included in the group.

In these examples, the wild card saves you considerable typing time; otherwise, you would have to type each user's three-part name.

The wild card can also be used for establishing access controls at the File Service. You can specify which individuals are to

have certain types of access privileges by entering the wild card in place of one or more of the components of a three-part name. There are limitations in the use of wild cards in specific contexts. You should consult the command summaries and procedural information for each service when you need to know about using wild cards for a particular command.

Specifying pathnames

Many operations at the Services Executive or Interactive Terminal Service interface request pathname specifiers. For example, you must indicate the pathname of the file drawer in which the Server Monitor Service will store its log. The official pathname specifier syntax is:

(File Service Name:Domain name:Organization name) File drawer name/directory name or file name

The path can be truncated after the file drawer name, or have any number of nested directories in the file drawer. In any case, the last object in a pathname specifier is the name of the directory or file being specified.

File Service specifier:

(Tundra:Dallas:Acme)

File drawer specifier:

(Tundra:Dallas:Acme)Maindrawer

Directory specifier:

(Tundra:Dallas:Acme)Maindrawer/Maindir/Subdir

File specifier:

(Tundra:Dallas:Acme)Maindrawer/Maindir/Subdir/Afile

Deleting input errors

If you make an error while typing a command or responding to a prompt, you can:

- delete one character at a time by holding down the <CTRL> key and pressing <H>
- delete a full word by pressing <CTRL> and <W>
- delete a full line by pressing <CTRL> and <X>

Terminating a command

When you input a command and press <RETURN>, then find that you really do not want to complete the command, you can press <CTRL> and <C>. This cancels the command and returns the Executive prompt.

Executive messages

Periodically, the server or a service needs to inform you that an activity is either in progress or has been completed. Sometimes you may need to know the nature of an input error you have made so that you can correct your mistake, or determine why an operation you have initiated could not be completed.

There are two types of messages that the Executive displays, depending on the activity that causes the message. When the activity that generates the message is in the background (is not directly related to the operator's current input or is displayed while no operator is present), the message is prefaced by an acronym that indicates which software element is responsible for the message.

Example Your server might be running the Mail, File, and Clearinghouse Services. If an activity of the Mail Service requires that a message be displayed, but there is no operator, or the operator is currently engaged in an unrelated operation, the Executive attaches the "MS:" acronym before the message.

If the message that is to be displayed relates directly to the operator's current activity, the message is not prefaced by the acronym. In this way, the executive coordinates the output of multiple, concurrent activities to the screen so that the operator can understand which service or software element is responsible for the message.

This booklet contains a summary of common server messages. The booklets on the specific services contain summaries of the service-specific messages. Refer to these lists if you do not understand the implication of a message.

Terminating Executive sessions

If you are logged on to the Executive at the server terminal, you can terminate your session by typing **Logoff**. You should always remember to log off when you leave the terminal so that others cannot take advantage of your System Administrator identity and thereby initiate activities that can interfere with the current configuration of the server, or violate the security of your network resources.

If you establish a session with the Executive from a remote location, you must use the **Quit Connection** command to terminate the remote Executive session. Although the **Logoff** command is available to you, it does not terminate your remote connection to the Executive. The **Quit Connection** command automatically logs you off.

If you have established a session with the remote Executive by dialing into the External Communication Service Greeter, the **Quit Connection** command returns you to the Greeter.

3. Server commands

Server commands are available at any server, regardless of which services are installed on that server. You use server commands to establish or change your server's overall configuration, and to determine non-service-specific information about a server. You have to log on and enable to access the server commands that change a server's current configuration.

Each command summary describes the logged-on status and server state required to access the command.

Logged-on status and server state terms

- Any User:** Any user who has not logged on.
- Logged-on User:** A user who has issued the **Logon** command and has been successfully authenticated as a member of any Clearinghouse domain.
- Enabled User:** A System Administrator who is logged on and enabled as a result of having administrative access to the server's domain.
- Interrupt Points:** There are three interrupt points available during non-normal initialization of the server. The summary specifies the interrupt points at which a command can be accessed.
- After Initialization has completed:** Most commands are available, depending on the logged-on status, after initialization is completed. If a non-normal interrupt point is selected, initialization completes after you type **Proceed**. After a normal server startup, initialization is completed when the Executive prompt becomes available.
- Open/Closed/Online:** The terms *open/closed/online* refer to various states of volumes. The availability of commands that manipulate volumes depends upon these states. Every server has a primary volume, although servers configured with additional drives can have 1-4 volumes.

Commands

The commands are listed in alphabetical order, followed by a brief explanation.

Activate Service Available to the enabled user at the third interrupt point, and after initialization has been completed. Used to add a service to the active run list. It is the primary mechanism for controlling which services are run on a server. If this command is used before the server has proceeded from the third interrupt point, the changes are applied for the current boot.

If it is used after the server has completed initialization, the changes to the active list are applied after subsequent boots.

Change Profile Available to the enabled user at the second and third interrupt points and after initialization has completed. Allows individual entries of the server profile to be modified.

The server cannot apply changed values during the current boot unless the **Change Profile** command is used before the server has applied the profile value being changed. The non-normal startup mode can be selected after a boot, and the appropriate interrupt point can be selected so that a new value can be applied during the initialization phase.

If this command is used after server initialization has been completed, the new values are not applied until a subsequent boot occurs.

Change Volume Available to the enabled user when at least one volume is open. The volume that is to be changed must be in the open state. If the volume is registered as a File Service, the volume must be off-line. The command is used to alter the name of the services volume. After the command is used, the volume may be brought on-line again.

If this command is used to change the name of a service volume that has been registered with the Clearinghouse Service as a File Service, the name change requires that 6085/8010 workstation users retrieve new icons.

Close Volume Available to the enabled user on multiple drive servers. Used to close the volume before using the **Copy Volume** command or removing a disk pack from a drive.

Copy Volume Available to the enabled user on multiple drive servers. Used to make an exact copy of one services volume on another drive. Can be used to establish a backup copy of the File System.

Create Volume Available to the enabled user on multiple drive servers. Used to initialize a new services volume. All previously recorded information is lost. Prompts for a fully-qualified name, which is later registered with the Clearinghouse Service when the volume is brought on-line using the File Service **Online Volume** command.

This command is also available at interrupt 1 (interrupt before opening primary volume) for creating a primary volume.

- Deactivate Service** Available to the enabled user at the third interrupt point and after initialization has been completed. Used to remove a service from the active services list so when the server is booted, that service won't be run automatically. If this command is used before the server has proceeded from the third interrupt point, the changes are applied to the current boot.
- If it is used after the server has completed initialization, the changes to the active list are applied after a subsequent boot.
- Delete Files** Available to the enabled user. Deletes the files in the working directory that match the argument (for example: * Mail.bcd). The wild card (*) symbol can be used when providing the argument.
- Delete Remote Files** Available to the enabled user. Deletes the files in the remote directory that match the argument. The wild card (*) symbol can be used when providing the argument. The current remote directory is shown first. This command fails if the remote directory has not been set.
- Delete Scavenger Log** Available to the enabled user when the primary volume is open. You are prompted to select which log you want to delete (a log is created each time you run a scavenge).
- Disable** Available to the enabled user. Disables any exceptional privileges afforded by use of the **Enable** command and restores the > prompt character.
- Enable** Available to the logged on user. Enables access to the System Administrator commands if the user is a Domain Administrator for the server's domain. To indicate that the logged-on user is enabled, the Executive prompt character is changed to an exclamation point (!).
- Expunge Service** Available to the enabled user at the third interrupt point. This command is used when a service and its associated files, logs, or databases are to be permanently removed from a server. This command normally involves removal of all server profile entries associated with the specified service and de-registration of the service from the Clearinghouse Service. Refer to the section entitled "Expunging a service" for the expunge procedure.
- Install Service** Available to the enabled user. Copies the files required to execute a service from a floppy disk. This command prompts the user to approve activation of the newly-installed service(s). This should be approved if the service is to be always run at every server startup. If the service is only to be explicitly run on occasion after another service that cannot run concurrently with it is stopped, type **N** to the "Activate?" prompt.
- List All RS232C Ports** Available to the logged on user. Displays configuration information for all of the RS-232C ports configured on your server.
- List Executives** Available to any user. Lists the following information about each Executive currently in use on the server: the numeric host address, the time of Executive creation, time of the last activity,

the logged on user name, (if any), and an indication of whether that user is a System Administrator.

- List Files** Available to the logged on user. Displays the files in the working directory that match the argument. The name and creation date of each file are shown. You can use the wild card symbol * to specify a particular category of files.
- List Remote Files** Available to the enabled user. Displays the files in the remote directory that match the argument. The name and creation date of each file are shown. The current remote directory is shown first. This command fails if the remote directory is not set. You can use the wild card symbol * to specify a particular category of files.
- List Scavenger Logs** Available to the enabled user. Displays the existing scavenger logs on a particular volume. The time at which the log was generated is also shown.
- List Services** Available to any user. Displays a listing of the services currently installed on a server and indicates which services are activated and which services are currently started.
- List Software Options** Available to any user. Displays the software options that have been enabled on that server through use of the Customer Configuration Utility or the software options control feature of the server software.
- List Volumes** Available to any user. Displays the name, drive, and status of services volumes that are currently open. Fixed drive options support only one volume. Removable drives support one volume each.
- Logoff** Available to any user. Frees any resources acquired by the user while he or she was logged on. System Administrators should always log off after a session so that their administrative privileges are not available to other users.
- Logon** Available to the logged off user. Used to identify and authenticate a user. If the user is registered in a currently accessible Clearinghouse domain, and the password matches the password of that user, the command succeeds. Once logged on, the user has access to a number of commands that are not available to the logged off user.
- Open Volume** Available to the enabled user when at least one secondary drive is present. Used to open a volume so that it can be read by the system software. It can be subsequently placed on-line by the File Service **Online Volume** command.
- Proceed** Available at all initialization interrupt points. Used to leave an interrupt point and continue server initialization.
- Quit Connection** Available to the logged on user who is connected to the Executive from a remote location. Terminates the connection with the Executive. If the user is dialing in through an External Communication Service port, it returns the user to the Greeter.
- Register Server** Available to the enabled user. Registers or verifies the server's name and description with the Clearinghouse Service. Since these operations are done automatically by the server, this command is needed only when the user suspects that registration or verification did not succeed.

Reset Context	Available to any user when more than one context is available. Sets the executive context to the server context [for example, typing Reset Context when you are in the Mail Service context (MS>) will get you back to the server prompt (>)] .
Retrieve Files	Available to the enabled user. Used to copy files from the remote directory to the working directory. The name and length of each file are shown prior to copying the file. No confirmation is required. This command fails if the remote directory has not been set.
Run Service	Available to the enabled user. Applied when the user wishes to invoke a non-normal service startup, or when it is desirable to run and configure a service before other co-resident services are run.
Scavenge Volume	Available at interrupt point(s) 1-3. There are two kinds of scavenges: normal or non-normal. A non-normal scavenge has two options: page-level scavenge and extended scavenge (a normal scavenge hasn't any one option).
Set Remote Directory	Available to the enabled user. The user is prompted to specify a remote directory on a co-resident or remote File Service. This command is used before retrieving or storing working directory files to or from the File Service.
Set Software Options	Available to the enabled user. Allows you to reset software options. If this command is used before the server has proceeded from the third interrupt point, it applies to the current boot. If it is used after this interrupt point, it applies only to a subsequent boot.
Show Backstop Log	Available to any user. Accessible at the first interrupt point and at all subsequent stages of the server's normal operation. The backstop log displays the possible reasons for server failure. When a server failure occurs, the recovery software takes control of the server, records errors in the backstop log, and initiates a reboot.
Show Connection Statistics	Available to any user. Displays a listing of executive sessions established since the last boot. If users log on to the executive during a session, their names are displayed.
Show Files	Available to the enabled user. Shows the names and contents of all files that match the argument provided. Wild card characters (*) allowed.
Show Logged On User	Available to any user. Displays the name of the current logged on user and indicates whether or not he or she is a System Administrator.
Show Profile	Available to the enabled user. Displays information pertinent to the server and its services.
Show Scavenger Log	Available to the enabled user. Displays a listing of scavenger logs. The user is prompted to select the number corresponding to the scavenger log that he/she wants to examine.
Show Time	Available to any user. Displays the current time and date.

Start Service Available to the enabled user. This operation allows the user to select the currently loaded and stopped services that he/she wants to start. It is also used to undo the effects of a **Stop** command or to explicitly start a service after a service-specific failure of some sort.

Note: Using the **Start Service** command to start the Server Monitor Service will stop the user from restoring the Server Monitor Service database from a remote location. This will enable the Server Monitor Service to use only the local database file. If a database file is not found, then an empty database will be created. Refer to the *Server Monitor Service* booklet for the **Start** command found in the Server Monitor Service context.

Stop Service Available to the enabled user. This operation allows the user to select the services he/she wants to stop from the currently loaded and started services. It is used to reverse the effects of a **Start** command as necessary if certain parameters need to be changed. The Server Monitor Service cannot be properly stopped with this command. Server Monitor Service has its own **Stop** command within the SMS context.

Store Files Available to the enabled user. Used to copy files from the working directory to the remote directory. The name and length of each file is shown prior to its being copied. No confirmation is required. This command fails if the remote directory has not been set.

4. General operating techniques

This section describes general operating techniques you need to know so that you can effectively administer your server and the services it supports. In the "Maintenance tasks using server commands" section in this booklet, you can see how some of these techniques are applied to do specific tasks.

The techniques and general operating procedures covered in this section are:

- Powering the server up or down
- Booting the server, normal vs. non-normal server startup, initialization interrupt points, and Genesis Mode
- Preparing administration statistics drawers
- Using remote administration capabilities
- Saving the backstop log
- Using Server Monitor Service logs and messages
- Assigning domain administration privileges to others

Powering the server up or down

Advantages to keeping your servers running overnight

The nature of the 8000 Network System's distributed design is such that services are more effective if servers remain powered up through the night. The Clearinghouse and Mail Services work through the night to deliver mail and to verify the accuracy of Clearinghouse database entries. The special operation (called anti-entropy) done by the Clearinghouse Service to verify the validity of its database only occurs in the middle of the night. If you power your server down every evening, this operation will never occur automatically.

It is possible for you to invoke database validation manually through use of the **Compare Databases** command in the Clearinghouse Service context. However, it is much better for overall performance if this operation is done automatically during non-peak hours. The Clearinghouse Service relies on the Internetwork Routing Service to perform this anti-entropy operation with a Clearinghouse Service that is located on a different Ethernet network. It is necessary that both the Internetwork Routing Service and the Clearinghouse are operational in order for anti-entropy to occur.

If your organization has several interconnected Ethernet networks that span a large area, particularly multiple time zones, it is particularly important for your servers to be powered up through the night.

Procedure

CAUTION: If you do need to power your server down for any reason, be sure that you stop all the services first. Refer to the section entitled "Stopping one or more services" in the "Maintenance tasks using server commands" section.

1. Log on and enable.
2. Type **Stop Service** and press <RETURN>.
3. Type the range of numbers corresponding to all services and press <RETURN>.
4. You are prompted to decide whether to stop each service immediately, or whether you want to allow current client activities to complete. Be advised that electing to "Stop Immediately" terminates all sessions that users might have with the File Service or Mail Service. You can opt to enter **N** to this prompt if you wish to disallow new client sessions, but allow current sessions to complete. The specified services will be stopped after all client sessions are completed.
5. Flip the power switch, located at the extreme right of the maintenance panel. (When the server is on, the portion of the switch marked "1" is depressed. When the server is off, the portion of the switch marked "0" is depressed.)

Comment: A boot takes longer after the server has just been powered up because the disk drive must warm up, and diagnostics are run.

Booting the server, normal vs. non-normal server startup, initializing interrupt points, and Genesis Mode

Some of the tasks in this and other booklets in the *Network Administration Library* require that you boot the server. When you boot the server from a floppy disk, it is because you need to run a utility program that is not located on your server's primary volume. Examples of such utilities are: the Services System Software floppy disks used for installation of server software (documented in the *Server Software Installation* booklet), and the disk diagnostics procedures documented in the *Basic Troubleshooting of Network Services* booklet.

Booting from the primary volume runs the System Software. This type of boot prompts you to select either a normal or non-normal startup of your server.

Procedure

CAUTION: If your server is running and the services are started, you must stop all services before you boot. To accomplish this, follow the steps in the section entitled "Stopping one or more services" in the "Maintenance tasks using server commands" section in this booklet.

1. Locate the boot buttons to the left of the maintenance panel.
2. Press both of these buttons simultaneously.
3. Release the left button (labeled B RESET) while still pressing the right button (labeled ALT B).
4. While still pressing the ALT B button, watch the maintenance panel. If you are booting from the primary drive (rigid disk number 1), release the left button when the maintenance panel displays 0001. If you are booting from a floppy disk, release the button when the maintenance panel displays 0002. If you are booting from a diagnostic floppy disk, release the button when the maintenance panel displays 0005. On a multi-drive server, you boot from 0007 for the second drive, 0008 for the third drive, and 0009 for the fourth drive.
5. Type either Y or N to the "Normal Startup?" prompt and press <RETURN>.

When the server is booted from the primary volume, it displays the Services Executive banner, indicates the reason for the restart, and prompts you to select a normal or non-normal startup. If the server fails during normal operation, the recovery software (backstop software) automatically reboots the server after logging the error in the backstop log and displays the "System restart" message. (The backstop log can be accessed with the **Show Backstop Log** command.) After a system error, the server waits 60 seconds while displaying the "Normal Startup?" prompt. If, after 60 seconds, no user input is received, the server assumes a normal startup and begins initialization.

If you press the boot button to initiate a boot of the primary volume (a 0000 or 0001 boot), the restart reason is indicated as a "User Restart." If there is a power failure, the server cannot distinguish the restart reason from a "user restart" and will display the message "User Restart." In both cases, the server will wait indefinitely for you to answer the "Normal Startup?" prompt.

Comments: On rare occasions, the server will not be able to complete its normal or non-normal initialization phase because it cannot open the primary volume which contains the server profile and all of the services code files. If this happens, a message prompting you to scavenge the File System appears. Refer to the section entitled "Scavenging the services volume" in this booklet for recovery procedures.

Normally, the server can initialize itself if a normal startup is taken automatically or is specified by the user. During initialization, the server verifies its Clearinghouse Service registration, prepares to support the specified number of remote executives, and applies other configuration information from the server profile. Finally, the server runs all services that are currently in the active services list.

Since all of this can occur automatically after a system error, the server can re-establish its former working configuration without your intervention. However, you may have to issue some commands to some of the services in order to re-establish their working configuration. One example of this is when an Internetwork Routing Service has one or more circuits that are not configured to autostart.

If these circuits are configured with autodialer hardware, you can restart them from a remote location by using the **Start Circuit** command in the Internetwork Routing Service context. This command allows you to select the phone number to be auto-dialed. There may be other services that require your attention after a system error restart. To learn about the specific service requirements, refer to the "Maintaining your service" sections of the services booklets in the *Network Shared Services* volume.

While the server is initializing, either after a normal or non-normal startup is taken, the Services Executive is unavailable remotely until initialization has completed. Remain at the server terminal to make sure that the normal startup results in a successful initialization or to answer prompts and give commands in the case of a non-normal startup.

Non-normal server startup option

If you wish to change some value that the server will apply during initialization, you need to type **N** to the "Normal Startup?" prompt. You are asked to select one of the following interrupt points.

- Interrupt before opening primary volume
- Interrupt before processing profile
- Interrupt before running services

During a non-normal server startup (initialization), you can select one or multiple interrupt point(s). You decide which interrupt point to select on the basis of the activity you need to perform.

If you select the first interrupt point, a few administrative commands are available to you. You cannot log on or enable at this interrupt, but the commands that you need in order to scavenge or copy the primary volume or to examine the backstop log are available anyway. At the second and third interrupt points you can log on and enable. You must do so to access System Administrator commands unless your server is in Genesis Mode. (See Genesis Mode below.)

Not all server commands are available at all interrupt points. Normally, other contexts are not available at the interrupt points since their corresponding services have not been run yet. If you do run a service explicitly at the third interrupt point, its context becomes available after the service finishes initializing (see the section entitled "Explicitly running a service" in this booklet). Below are samples of occasions when you need to select the non-normal server startup option. Note that the appropriate interrupt point is specified for each kind of activity.

- Scavenging the server's primary volume. (Interrupt before opening primary volume, and Interrupt before running services-1,3.)
- Scavenging a secondary volume on a multi-drive server. (Interrupt before running services.)
- Copying the primary volume to an attached removable disk. (Interrupt before opening primary volume.)
- Examining the backstop log when the volume cannot be opened. (Interrupt before opening primary volume.)
- Installing one or more new services. (Interrupt before running services.)
- Upgrading the server with new services options software. (Interrupt before running services.)
- Explicitly running the Mail Service or Clearinghouse Service to change the database size. (Interrupt before running services.)

- Changing a service's initialization values by explicitly running it and selecting its non-normal startup mode. This approach is necessary when you need to change the Interactive Terminal Service's maximum number of concurrent users and maximum user workspace size. (Interrupt before running services.)
- Expunging a service. (Interrupt before running services.)

There are other procedures that can be done either at a non-normal initialization interrupt point or after the server has completed initialization. If you perform these procedures after the server has completed initialization, you must boot the server afterwards as the changes do not take effect until the next time the server has completed initialization.

- Changing current software options. (Interrupt before processing profile.)
- Changing one or more values in the server profile, such as server name or the number of concurrent executives. (Interrupt before processing profile.)
- Deleting and/or restoring the server profile from a remote file service. (Interrupt before processing profile.)
- Activating or deactivating one or more services. (Interrupt before processing profile, or interrupt before running services.)

Genesis Mode

When you select the third interrupt point, your server may enter the Genesis Mode. This mode is entered automatically when your server determines that there is no Clearinghouse Service available that serves its domain. The purpose of this mode is to make a limited set of System Administrator commands available even though you cannot successfully enable special administrative functions. With these limited commands, you can do certain administrative tasks, such as installing the first server on an Ethernet network, installing new services, running one or more services explicitly, and activating or deactivating existing services.

Genesis Mode is available only when a non-normal server startup and interrupt point 3 have been selected. After the first server is installed, Genesis Mode should never occur at servers that are on multi-server networks. If it does occur on a server in a multi-server network, some error condition is preventing the server that is initializing from accessing the Clearinghouse Service that serves its domain. If your server enters Genesis Mode when it should not, you should immediately take steps to resolve the problem that is causing the domain to be inaccessible. Check the Clearinghouse Service to ensure that it is running properly.

Genesis Mode is a normal occurrence on single-server networks when the non-normal server startup and interrupt point 3 have been selected. This is because the only instance of the Clearinghouse domain is resident on the server being initialized and the domain is not accessible until the Clearinghouse Service has been run. Normally, the

Clearinghouse Service is not run until server initialization completes and the services in the active services list are run. The only exception to this is if you run it explicitly after taking the non-normal startup and interrupt before running services options.

If you have a single-server configuration, there will be some activities that you may have to do while in Genesis Mode. These activities might include running a service explicitly in order to apply its non-normal startup mode, installing a new service, expunging a service, or activating or deactivating a service. Genesis Mode allows you to access the commands you need to accomplish these activities.

All other administrative activities can be accomplished while the server is at the first interrupt point, after it has completed initialization, or after you have explicitly run the Clearinghouse Service and logged on.

The "Server commands" chapter in this booklet indicates which server commands are available during Genesis Mode. Some commands (**Change Profile, Delete File, Retrieve File**) that you might want to use during a non-normal initialization are never available during Genesis Mode.

One alternative for accessing these commands is to explicitly run the Clearinghouse Service at the third interrupt point, log on, enable, and then use the command. The other alternative is to use the command after the server has been initialized and then boot the server, allowing the server to initialize again so that it can apply the new configuration information you have supplied.

Ending non-normal initialization (and Genesis Mode)

Once you have completed activities at an interrupt point, you must type **Proceed** so that the server can complete initialization.

Should your server enter Genesis Mode, do not leave it unattended after you have finished your administrative activities. Doing so leaves administrative commands available to any user who can physically access the server. Terminate Genesis Mode and non-normal initialization by typing **Proceed** and pressing <RETURN>. Then log off.

Preparing administration statistics drawers

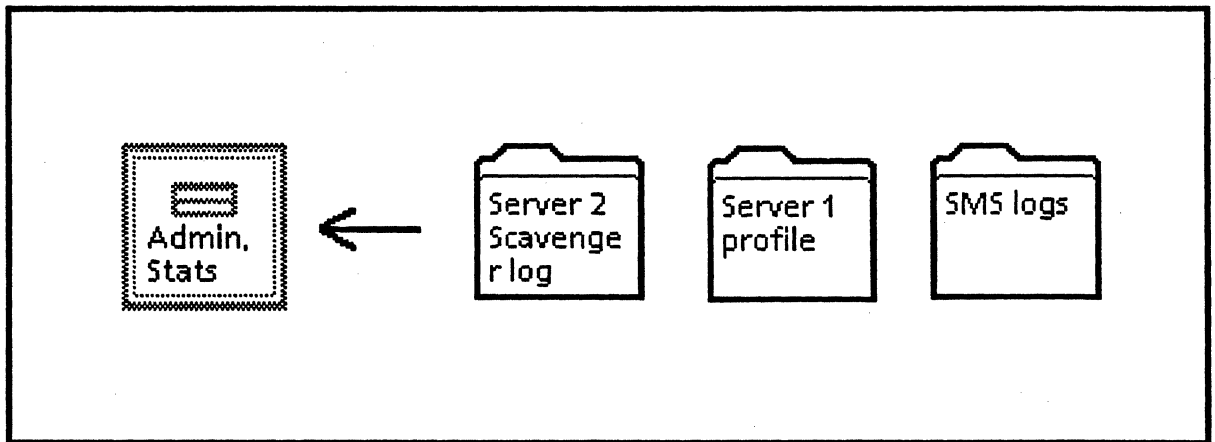


Figure 1: Storing information in your administration statistics drawer

To make your job easier, prepare in advance the proper File Service containers (drawers and folders) to store necessary reports, dialogues, and server profiles. Refer to the File Service booklet section entitled "Creating file drawers for users" for instructions on such procedures.

You should create a File Service drawer for System Administration use, and name it, for example, "administration statistics." You can direct Server Monitor Service logs, and store other items such as scavenger logs, backstop logs, configuration dialogues, and the server profile to folders within this drawer.

Your regular backup schedule will include backing up all services volumes. The contents of this drawer will be backed up as well. In this way you can always access relevant data on a server or the services it supports. This data can also be useful to your Systems Analyst when he or she is reviewing your server's performance.

Within your administration statistics drawer, you should create folders for each of your servers and distinguish them according to their function by name. This is particularly important when you are storing a copy of a server profile because once it is stored, you cannot change its name. If, for example, you directed the server to retrieve a server profile from a folder containing several profiles of the same name, it would retrieve the most recent profile, not necessarily the one that you specified.

You should set the access controls on your administration statistics drawer so that only you and your backup System Administrators hold access privileges.

Using remote administration capabilities

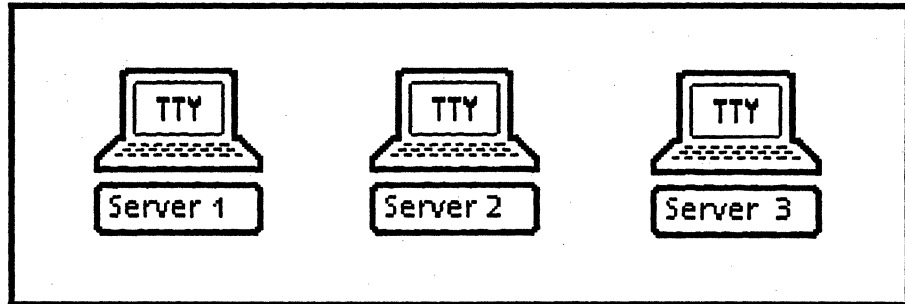


Figure 2: TTY icons

As System Administrator, you should be familiar with several conveniences. If you configure your server profile so that one or more remote executives are available, you can use the workstation Remote System Administration feature to interact remotely with the Services Executive. If you have the Asynchronous Communication option of the External Communication Service and you configure the ECS so that one or more of its ports can receive incoming asynchronous calls that are answered by the "Greeter," you can perform remote administration from your home personal computer.

The advantages of remote administration are twofold. You can execute commands at the Services Executive without having to be on site or without having to walk from server to server. Secondly, if you use the 6085/8010 workstation remote administration window, you can capture statistics reports and copies of your configuration dialogues and save them in a document.

Procedure

Note: Before you begin this procedure, make sure that you have the Remote System Administration application loaded onto your workstation, and the Remote Executive option set to greater than zero in your server profile.

1. Open the directory icon and then open the network management divider. You will see one TTY-terminal icon for each server in your domain (refer to the figure above).
2. Copy each TTY icon to your desktop. Each icon contains the name of your servers.
3. When you want to interact with a particular server's executive, open its corresponding icon and select [START] to begin the remote session. A window appears on your desktop.
4. Log on and enable just as you would if you were typing directly at the server's local terminal.

Note: The only tasks you cannot do from the remote administration window are those that involve physical manipulation of the server hardware and those that require the server to be at one of its initialization interrupt points. Remember, a server does not make remote executives available until the initialization process is completed.

Comment: If you have more than one server, you can open multiple remote administration windows, one for each of your servers if you like, at the same time. In this way, you can perform a series of activities that require interaction with services on different servers without leaving your desk.

Using the [MAKE DOCUMENT] and [MAKE SCREEN] features

[MAKE DOCUMENT] and [MAKE SCREEN] are two features of your 6085/8010 workstation remote administration window that are valuable as you administer your network. The [MAKE DOCUMENT] and [MAKE SCREEN] capabilities are activated when you select them. They are located at the top of your TTY window.

Selecting [MAKE DOCUMENT] creates a document containing everything that has appeared in the window since your session began or since the last time you selected [MAKE DOCUMENT]. This is particularly useful if you want to save a log of your configuration activities. If you need to configure the External Communication Service, Remote Batch Service, or Internetwork Routing Service, you follow the step-by-step procedures for these services in the *Network Shared Services* volume.

It is advisable for you to save a copy of the dialogue that resulted in configuration of these services. Later, when you need to configure the same services on a different server or make modifications to the same services, you can display the dialogue in a document window at the same time that you are using the remote administration window. The dialogue of a former configuration session can guide you in the subsequent configuration activity.

Even if your new configuration is somewhat different, you will benefit from knowing the sequence of commands you used on a previous occasion. You can also select input from the dialogue document and copy it to the remote administration window, which saves you keystrokes and minimizes input errors.

The [MAKE SCREEN] feature is particularly useful when you have displayed a statistics or status report in your remote administration window. Most of the services maintain one or more statistics or status logs that you should review from time to time. These reports tell you how heavily used a service is or how reliable the server has been.

Review the booklets on each of the services in the *Network Shared Services* volume to learn about the various statistics reports that are available to you. Each of these reports is displayed when you enter the appropriate command. Once the report is displayed, you can select [MAKE SCREEN] to make a document containing the exact content of one full screen of text.

When you have used [MAKE DOCUMENT] or [MAKE SCREEN], documents are created and stored for you on your desktop. They contain the name displayed on your server icon, plus the time and date that the report was made. You will want to select these documents, press <PROP'S>, and rename them with a more meaningful name, such as "Filing statistics June 24-31 1984." Then, once you have appropriately named these documents, you should store them in your administration statistics file drawer in the folder you created for that particular server.

Saving the backstop log

Each time a system error occurs, the server recovery software records the cause and time of the error in the backstop log. You should display and capture this log periodically as it is a useful indicator of your server's performance. The system automatically deletes the oldest entries in order to reuse the space in the file. Your Systems Analyst may want to review the backstop log periodically.

System errors should be rare occurrences. You should not need to show and save this log more than once a week. More than likely, once a month will be sufficient. However, if you begin experiencing frequent problems with the server, you should capture and print the log, and then contact your Systems Analyst. If the entries "unrecoverable disk error" or "disk label check" appear in the log, you will need to initiate recovery procedures before you attempt to operate your server again. Refer to the "Scavenging the services volume" section in this booklet for descriptions of the recovery procedures relevant to the error.

Procedure

1. Connect to the server from your 6085/8010 remote administration window and log on.
2. Type **Show Backstop Log** and press <RETURN>.
3. Select [MAKE SCREEN] to save a copy on your desktop.

Note: If the log is longer than one full screen of text, select [MAKE DOCUMENT] to capture the full log.
4. Store the copy in your administration statistics file drawer. (Refer to the section entitled "Preparing administration statistics drawers.")

An example of a backstop log appears below:

```

Show Backstop LogRETURN
Previous number of days error to report (1..999):7
19-Mar-86 7:55:43 reason: uncaught signal, pc: 4551B
gf: 124710B Module name: KeyStoreImpl
signal: 252404B => [gf: AuthinitiatorImpl, index-v:1] msg: 13665B
eval stack: 000002, 000001, 052404, 000001, 000000, 000004, 00000,
000003, 001404, 000000, 000004, 000000, 000004, 000000
Number of errors logged:1
done

```

Using Server Monitor Service logs and messages

If you have many servers it is a good idea to run the Server Monitor Service on one of them so that you can access information about each server's availability. All information obtained about a server's condition is recorded by the Server Monitor Service and can be examined at the server running SMS or via Remote System Administration. This information includes the server's present state, the amount of time that it was up and running, and the last time the Server Monitor Service communicated with it.

If a server goes down, the Server Monitor Service sends a message via the Mail Service (if you have it running) to inform you of this condition. This way, you can be informed of the current status of your servers without having to leave your desk. You can view the Server Monitor Server log by using the **Show Monitored Server Statistics** command. (Refer to the *Server Monitor Service* booklet for details on this command.)

Here are some tips on using these logs and messages.

- If you receive a message from the Server Monitor Service indicating that one of your servers is down, you can open a remote administration session with that server to see if it is still down. If you cannot obtain a remote session with the server, the chances are that the server is still down or is in the process of recovering automatically from the failure.

You may need to go to the server to verify that it is able to reboot and reinitialize itself. If you can connect to the server, it has successfully rebooted and initialized itself.

Check to see that all of the services you usually run on that server are actually started, and that Internetwork Routing Service circuits are connected to their respective remote Internetwork Routing Services. You may need to use the **Start Circuit** command to re-establish connections with the Internetwork Routing Service. (Details about Internetwork Routing Service circuits are contained in the *Internetwork Routing Service* booklet in the *Network Shared Services* volume.)

Having verified that the server is working correctly, you should display the backstop log and capture a copy of it. If you need to go to the server and initiate a scavenge operation, you should return to your desk once the server is back on-line, and capture a copy of the scavenger log. These logs will be useful to your Systems Analyst should you need to give him or her details of your server's past performance.

- The Server Monitor Service maintains data on your servers' up and down times. You can store this log directly in a File Service, using the appropriate Server Monitor Service commands. (Refer to the *Server Monitor Service* booklet for details.)

Assigning domain administration privileges to others

If you are temporarily off site, there may be a need for someone to gain access to the System Administrator commands at one or more of your servers. To allow for this possibility, you should make sure that at least one other person at your site is a Domain Administrator for the Clearinghouse domain in which your servers are registered.

Once a person is a Domain Administrator for the Clearinghouse domain in which a server is registered, he or she can use the **Enable** command successfully at that Server's executive and thereby gain access to special System Administrator commands, thereby making that person a Server Administrator.

You can grant and revoke domain administration privileges by using the **Change Domain Access** command in the Clearinghouse Service context. It requires you to specify the domain you want to grant/revoke access to and the fully-qualified name of the person who is to receive/lose Domain Administrator status. An example of the command appears below.

Comment: The backup Server Administrator will need to be trained to perform those activities that are likely to be needed in your absence.

```
CHS!Change Domain AccessRETURN
  Domain Name: Los AngelesRETURN
  Name: Bob MitchellRETURN
  Admin. Access? (Y/N): YRETURN
Done. Bob Mitchell:Los Angeles:GemSysCo granted Admin. access to Los Angeles:GemSysCo.
```

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5. Maintenance tasks using server commands

The tasks in this section are not required on a daily basis. However, it is likely that you will want to refer to this section when maintaining your server and services. You should read the "Services Executive" and "General operating techniques" sections in this booklet before following the procedures in this section.

The following tasks are included in this section:

- Activating and deactivating services
- Explicitly running a service
- Stopping one or more services
- Showing/changing the server profile
- Backing up and restoring the server profile
- Expunging a service
- Scavenging the services volume
- Managing secondary drives
- Restoring a primary pack containing Mail Service or Clearinghouse Service
- Monitoring your services volume
- Listing and configuring RS-232C port information

Activating and deactivating services

Generally, you want all services installed on a server to be run automatically each time the server completes initialization. This way, the recovery software can re-establish the previous working configuration of the server after a system failure. Normally, services are added to the active services list as a part of the installation operation.

There may be occasions when you want to deactivate a service temporarily so that it will not be run automatically the next time the server completes initialization (after a system restart or a user restart). Once you have deactivated a service, you can add it back to the Active Services list by using the **Activate Service** command.

CAUTION: Make sure that if you deactivate your Mail or Clearinghouse Services and then reboot, that you do not leave either service in a stopped state for an extended period of time. The effects of stopping either service for an extended period of time are described in the "Stopping one or more services" section.

Note: You can use the **Run Service** command to run a deactivated service after initialization completes. This may be a useful strategy if you have two co-resident services that you cannot run at the same time.

One exception is the Print Service. You can never use the **Run Service** command to run the Print Service after initialization has been completed. The Print Service has to be on the active services list prior to the time that the server completes initialization. This is because it requires allocation of server resources that cannot be made after the server has completed initialization.

Procedure

You can perform this procedure at the third interrupt point or after initialization has been completed.

1. Log on and enable.
2. Type **Activate Service** or **Deactivate Service** and press <RETURN>.
3. Type the number corresponding to the service that is currently activated or deactivated and press <RETURN>. An example appears on the next page.

```
!Activate ServiceRETURN
Select choices
1 Mail Service
2 Clearinghouse Service
3 File Service
Enter one or more choices: 1-2RETURN
Mail Service activated.
Clearinghouse Service activated.
```

Comment: The results of this modification to the active services list do not take effect until the next time the server completes initialization. If you perform this procedure at the third interrupt point, your modification takes effect as soon as you proceed from the interrupt point.

Explicitly running a service

There may be occasions when you need to explicitly run one or more services. You may want to run a service that was not on the active services list at the time initialization was completed, or you may want to run a service before the server completes initialization and runs the services on the active services list. You may also want to explicitly run a service because you need to apply the non-normal startup mode.

Each service has a normal and a non-normal startup mode. When a service is run automatically because its name is on the active services list, it is run with the normal startup mode applied.

To access a service's non-normal startup option(s), interrupt the server before it completes initialization. Boot the server, type **N** to the "Normal Startup?" prompt, and then select the "Interrupt before running services" option. After that, you can type the **Run Service** command to run the service and specify a non-normal startup.

The following are possible reasons why you might want to explicitly run a service and use the non-normal startup mode:

- To change the type of printer (printing device) that the Print Service will use.
- To expand the size of the Clearinghouse database.
- To expand the size of the Mail Service database.
- To prevent the Internetwork Routing Service from automatically starting its circuits because you need to reconfigure them.
- To change the Interactive Terminal Service workspace size and/or number of users.
- To restore or repair the Mail Service database.
- To initialize a new Mail Service database.
- To prevent the File Service from automatically opening or placing on-line auxiliary volumes because you need to scavenge one of them.

Procedure

1. Log on and enable.
2. Type **Run Service** and press <RETURN>. An option list of services which can be run is displayed.
3. Type the number(s) corresponding to the service(s) you want to run and press <RETURN>.

Note: If the service you wish to run is not listed in the choice list, the service is either not installed on your

server or has already been run. If the service has already been run, you need to boot the server (remember to stop all services first), take a non-normal startup, select the "Interrupt before running services" option, and then use the **Run Service** command. All installed services will now be listed in the choice list. Select only the service(s) you need to explicitly run.

4. Type **Y** or **N** to the "Normal Startup?" prompt of each service that you have specified you want to run and press <RETURN>. The services will be run in priority order, each using the normal or non-normal startup mode, as you have specified. The services will present their non-normal initialization prompts or menus if you have asked for a non-normal startup.

Refer to the booklet on the specific service you need to run non-normally to learn about its non-normal startup mode.

Stopping one or more services

Before you boot or power down your server, you should always stop all services. Otherwise, you risk interrupting one or more client sessions. For example, if you boot a server that is running the File Service and you do not stop the File Service first, you might interrupt a user's filing session. This interruption may leave your services volume in an inconsistent state.

CAUTION: Stopping the Mail Service makes most Mail Service operations unavailable to network clients. Mail cannot be posted or forwarded, and users cannot retrieve mail. This causes mail backup on other services, increased responsibility for the acceptance of posted messages by other Mail Services, repeated unsuccessful forwarding attempts, and returned messages.

A Clearinghouse Service that is co-resident with the Mail Service 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 Clearinghouse will become inconsistent with the rest of the Clearinghouse system. Refer to the section entitled "Stopping the Mail Service" in the *Mail Service* booklet for further details.

Note: The Server Monitor Service cannot be properly stopped with this command. The SMS has its own stop command within the SMS context.

Procedure

1. Log on and enable.
2. Type **Stop Service** and press <RETURN>. A menu of all currently started services is displayed.
3. Type the number(s) corresponding to the service(s) you wish to stop and press <RETURN>. (Enter a range of services to be stopped with a hyphen, separate each number with a comma, or enter only one number.)
4. Type **N** to the "Stop Immediately?" prompt and press <RETURN> if you do not want to interrupt any activity that may be in progress.

When you indicate that you do not want the server to stop a service immediately, the server does not allow any new sessions to begin and stops the service once the current activity is terminated.

If you specify that more than one service is to be stopped, you are asked for each service if it should be stopped immediately.

An example appears below:

```
!Stop ServiceRETURN
Select choices
1 Clearinghouse Service
2 Mail Service
3 Communication Monitoring Service
4 Print Service
Enter one or more choices: 1-2RETURN
CHS: Stop Immediately? (Y/N): YRETURN
Stopping Clearinghouse Service
Clearinghouse Service functions are now unavailable to the network.

MS: Stop Immediately? (Y/N): YRETURN
Stopping Mail Service.
Warning: The local Clearinghouse will suffer if the Mail Service is stopped for any length of time.
Continue? (Y/N): YRETURN
Stopping the Mail Service processes.
Stopping the Mail Gateway.
Mail Service has stopped.
```

Showing/changing the server profile

If you need to change your server name, description, number of remote executives, or service-specific values (covered in other booklets), you can use the **Change Profile** command.

This command is available at the second and third initialization interrupt points ("Interrupt before processing profile" or "Interrupt before running services"). It is also available after initialization has been completed. If you use the command at that point, your new values do not take effect until the next time the server is initialized.

Comment: The **Show Profile** command is available after initialization has been completed, and at the second and third initialization interrupt points. It allows you to view the existing profile, and is useful after you have changed the profile for viewing information that you just changed to ensure that you entered the changes correctly.

CAUTION: If you change the server's domain name, you are making a significant change that affects your ability to gain access to the System Administrator commands at that server. Do not change the server's domain name until you have created a Clearinghouse domain that matches the new domain name and have given yourself domain administration privileges for it. Otherwise, you will not be able to log on and enable yourself at the server with the new domain name.

Note: The Clearinghouse no longer allows System Administrators to specify whether clear text passwords can be looked up by clients. The field does not appear in the server profile.

Procedure

1. Log on and enable.
2. Type **Change Profile** and press <RETURN>. You are presented with an options list for the portions of the profile that you can modify.
3. Type the number corresponding to the service you wish to configure, and press <RETURN>. If you need to change the server portion of the profile, proceed to step 6.
4. Type the number corresponding to the option you want and press <RETURN>.
5. Press <RETURN> again to return to the top-level choice list.
6. Press <RETURN> to exit from the command if you have no other options to change.

```
Change ProfileRETURN
Section to be changed
1 Clearinghouse Service
2 File Service
3 Server
Enter choice number: 2RETURN
Entry to be changed
1 Validate desktops
Enter choice number: 1RETURN
Validate desktops
1 True
2 False
Enter choice number: 2RETURN
```

7. Type the number corresponding to the "Server" option if you want to change the "Number of remote execs," "Server name," or "Server description" fields.

Note: The server portion of the profile allows you to change the server name, server description, number of remote executives, and the active services list. Other fields are displayed when you select the server portion of the profile, but these fields are filled in automatically by the server software during initialization, and there is no particular advantage to be gained by changing them manually.

You can use the **Activate Service** and **Deactivate Service** commands to change the active services list. If you change this list directly in the profile by adding or removing services from it, your changes do not take effect on the current boot unless you use the **Change Profile** command at the second interrupt point. (Refer to the section entitled "Activating and deactivating services.")

8. Select the portion of the profile that you wish to modify. You are presented with a list of fields you can change.
9. Type the appropriate number and press <RETURN>.
10. Type the new value and press <RETURN>.
11. Type the number corresponding to another field that you wish to modify and press <RETURN>, or press <RETURN> twice to exit from the command.

```
Section to be changed
1 Clearinghouse Service
2 Server
Enter choice number 2 RETURN
Entry to be changed
1 Server Version
2 Network Number
3 Server Name
4 Server Description
5 Active Service
6 Number of Remote Execs
7 Local Terminal Type
8 Remote Terminal Type
Enter choice number 6 RETURN
Number of Remote Execs: 4RETURN
```

Backing up and restoring the server profile

Once you have completed initialization and configuration of your server and services, the server profile retains important information such as names, assignments, etc. so that you don't have to specify them each time the server is booted.

Your server and services obtain configuration information from this file each time they are run. If you have several services on a server and these services require considerable configuration information, it is advisable that you back up the profile each time you make major changes to it.

An example of a service that requires significant configuration information is the External Communication Service. Each port that the ECS uses must be configured to apply certain communication protocols and parameters.

To accomplish this, you respond to many External Communication Service command prompts. You should back up the server profile so that you do not have to repeat the server and service initialization and configuration phases in the unlikely event that your server profile becomes damaged due to a disk failure.

Note: Before you back up the server profile, create a file drawer for yourself. Give yourself and your backup System Administrator(s) full access to this file drawer. Also create a folder for each server for which you are responsible.

This is an important consideration since the backup procedure does not allow you to change the name of the server profile. All servers have the file called "Server.Profile," and you should not store more than one of these in a single folder.

Backing up the server profile

1. Log on and enable. You will be using the file management commands. They are available at the second and third interrupt points, as well as after initialization has completed.
2. Type **Set Remote Directory** and press <RETURN>.
3. Type the directory name and press <RETURN>.

Note: The proper format for specifying a directory name is:

(File Service Name:Domain Name:Organization Name)
Drawer Name/Folder Name

The domain and organization portions of the three-part File Service name are probably not necessary since the server applies its own default domain and organization names if you do not specify them. You can specify as many descendant folders (directories) to the right of the file drawer name as necessary to specify the folder in which your server profile is to be stored. The file drawer and folder components of the pathname are separated by

slashes (/). You do not need to supply a slash after the last directory name.

4. Type **Store Files** and press <RETURN>.
5. Type **Server.Profile** to the "File List" prompt and press <RETURN>.

```
!Set Remote DirectoryRETURN
  RemoteDirectory:(Foxdale:OurDomain:OurOrg)SASStats/Cambridge Stats/July
!BRETURN
!Store FilesRETURN
  File List: Server.ProfileRETURN
Server Profile . . . stored
```

Restoring a server profile

Note: Should your disk become damaged so that you must reinstall software, you can speed up the restoration process by restoring your old server profile. Talk with your Systems Analyst to determine whether you must repartition and reinstall software on the server.

1. Boot the server.
2. Type **N** to the "Normal Startup?" prompt and press <RETURN>.
3. Type the number corresponding to the "Interrupt before processing profile" option and press <RETURN>.
4. If you have just repartitioned your disk and reinstalled System Software, your server does not have a current value for its name and description. You will be prompted to supply that information. If the domain you enter for the server's domain is currently accessible, the server prompts you to log on.

After you log on, the server registers itself. If the server's domain is not currently accessible, the server enters Genesis Mode. In this case, you cannot retrieve the older profile until you have left Genesis Mode.

This means that you will have to take the steps necessary to make the server's domain accessible so that you can use the **Logon**, **Enable**, and **Proceed** commands.

Refer to the *Server Software Installation* booklet and follow the procedures relevant to this special situation. Then perform the following steps.

5. Log on and enable.
6. Type **Delete Files** and press <RETURN>. You are prompted to specify the file you want to delete.

7. Type **Server.Profile** and press <RETURN>. You will receive a message indicating that the server profile has been deleted.
8. Type **Set Remote Directory** and press <RETURN>.
9. Type the remote directory name and press <RETURN>.

Note: The format for specifying a remote directory is:

(File Service Name:Domain Name:Organization Name)
Drawer Name/Folder name

The domain and organization portions of the three-part File Service name are probably not necessary since the server applies its own domain and organization names if you do not specify them. You can specify as many descendant folders (directories) to the right of the file drawer name as necessary to specify the folder in which your server profile is stored. The file drawer and folder components of the pathname are separated by slashes. You do not need to supply a slash after the last directory name.

10. Type **Retrieve Files** and press <RETURN>. You are asked to specify which file you wish to retrieve.
11. Type **Server.Profile** and press <RETURN>.

```
!Set Remote DirectoryRETURN
  Remote Directory: (Foxdale:OurDomain:OurOrg)5AStats/Cambridge Stats/July 85RETURN
!Retrieve FilesRETURN
  File List: Server.ProfileRETURN
Server.Profile . . . retrieved
|
```

12. Reinstall service options if you are performing a complete recovery procedure and are at the third interrupt point.
13. Type **Proceed** to terminate the initialization phase and press <RETURN>.

Comment: At this point the server begins to apply the values from the restored profile. If you performed these steps after initialization was completed, you will have to boot the server again. The values from the restored profile will take effect during the subsequent initialization phase.

Expunging a service

As your network community grows and your user needs change, you may be required to add more servers to your network and move services from one server to another. Expunging a service from a server removes it permanently and frees up server resources for use by the remaining services.

Note: Refer to the *Gateway Service*, *Internetwork Routing Service*, *External Communication Service*, and *Server Monitor Service* booklets to determine how to delete current port and other configuration information relevant to these services.

CAUTION: If you are preparing to expunge one of the above-named services, you should not perform the following steps unless you have read and followed the specific procedures for deleting their port(s) and other configuration data.

Before you expunge a Mail Service, you might want to forward all of the mail on that server to another server. You do this by using the **Shutdown Mail Service** command. Refer to the section entitled "Removing the Mail Service from a server" in the *Mail Service* booklet for a description of this command. Before you expunge a File Service, all drawers must be deleted, or space will not be reclaimed.

1. Log on and enable.
2. Type **Stop Service** and press <RETURN>.
3. Type the range of numbers corresponding to all services listed and press <RETURN>.
4. Boot the server while the maintenance panel displays 0001.
5. Type **N** to the "Normal Startup?" prompt and press <RETURN>.
6. Type the number corresponding to the "Interrupt before running services" option and press <RETURN>.
7. Log on and enable (unless the only Clearinghouse resides on this server).
8. Type **Expunge Service** and press <RETURN>.
9. Type the number corresponding to the service you wish to expunge and press <RETURN>. Type **Y** to the confirmation prompt, and press <RETURN>.
10. Type **Proceed** and press <RETURN> to complete server initialization.


```
! Expunge ServiceRETURN
Select choices
1 Mail Service
2 Clearinghouse Service
3 Communications Monitoring 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.
```

Scavenging the services volume

One operation you may be required to do when maintaining a server is scavenging. Scavenging repairs inconsistencies in the Services Filing Volume, determines the cause of the problem, and the area where it occurred. There are different degrees and types of inconsistencies which require different types of recovery. Once you have determined the problem, you can then take the appropriate steps for recovery.

A Scavenge may have to be invoked for the following reasons:

- The server crashes and the backstop log indicates that the cause of the problem was an unrecoverable disk error. You must have already called in the Xerox Customer Service Engineer (CSE) to verify that the hardware is fully operational.
- The server crashes and the backstop log indicates that the cause of the problem was a disk label check (you do not need to verify hardware functionality in this case).
- The server reports that it cannot open a volume due to an inconsistency and requests that a scavenge operation be performed with the following message: "Inconsistent File System. Please Scavenge."
- You have performed a normal scavenge and the server continues to report that a volume cannot be opened because it is in an inconsistent state.
- Your server continues to crash during File Service operations.

Types of scavenge operations

There are two kinds of scavenges, normal and non-normal. A non-normal scavenge has two options, page-level scavenge and extended scavenge. When running a non-normal scavenge, the user may select either or both page level and extended scavenge options. A normal scavenge repairs inconsistent portions of the file system. The non-normal scavenge options are described below:

- **Page-level scavenge:** Repairs page-level inconsistencies in the file system.
- **Extended scavenge:** Completely rebuilds the file system so that all inconsistent parts are repaired, including those that were missed by a previous normal scavenge.

When a normal scavenge is applied, the volume is brought back to useful condition, if possible, through a minimum of automatic recovery procedures. It is best to ensure whether a page-level and/or extended scavenge is really necessary before you resort to these extensive procedures.

Occasionally, the normal scavenge operation will determine the need for a page-level scavenge and apply one automatically. When this happens, a message indicating this is displayed during the scavenge, and also recorded in the scavenger log.

Other times, a normal scavenge will fail to repair the volume because it does not detect a need for an extended scavenge. This situation is apparent when you retry the procedure that caused the problem or error message in the first place.

Note: It is highly recommended that an experienced person perform these procedures, as they are complex.

When to use the different types of Scavenges

CAUTION: Never invoke any kind of scavenge immediately after a server failure caused by an unrecoverable disk error (UDE). Unrecoverable disk errors are caused by hardware failures. Running a scavenge after a UDE when the hardware has not been checked out and proven to be completely operational can destroy large amounts of data.

- If the backstop log reports an "unrecoverable disk error" after a system restart, do a non-normal scavenge, and select the page-level scavenge option.

CAUTION: Select the page-level scavenge only after the Xerox Customer Service Engineer has certified that the hardware is fully operational.

- If the backstop log reports a "disk label check," do a non-normal scavenge, and select the page-level scavenge option.
- When the server cannot open a Service Filing Volume and reports that there is an inconsistency, do a normal scavenge. Sometimes the normal scavenge operation will detect a need for a page-level scavenge and invoke it automatically.
- If the server completes a normal scavenge and still cannot open a volume because of an inconsistency, or if the server continues to crash during normal operation, do a non-normal scavenge, and select the extended scavenge option.

Note: There are many variables that determine the correct recovery procedures, especially for an unrecoverable disk error and disk label check. Refer to the *Basic Troubleshooting of Network Services* booklet before continuing.

Procedure

Note: On a single-drive server, the primary volume is the only volume. Follow the appropriate step below.

1. Boot the server when the maintenance panel displays 0001 and select a non-normal startup.
 - If you are scavenging the primary volume, type the numbers corresponding to the "Interrupt before opening primary volume" and "Interrupt before running services" options and press <RETURN>.
 - If you are scavenging an auxiliary volume on a multiple drive server, the other drives can remain on-line while the damaged secondary drive is being scavenged. It is

best to do this especially if your server supports the only local Clearinghouse Service and has a co-resident Mail Service, although it slightly affects the server's performance.

If you want to stop all services before running the scavenger, select the first interrupt point, "Interrupt before opening primary volume" (keep in mind the consequences of stopping a Mail Service or Clearinghouse Service. Refer to the *Mail Service* booklet section entitled "Stopping the Mail Service").

If you wish to run co-resident services while running the scavenger, select the "Interrupt before running services" option. Log on and enable (type **Run Service** and run the Clearinghouse Service first if it is a co-resident service and is the only Clearinghouse serving your domain), type **Run Service**, run the File Service, and select a non-normal File Service startup.

Open the volumes that don't have to be scavenged, bring them on-line, and start the File Service. Run any other co-resident services normally.

```
Series 8000 Network Services Executive, Version 10.0 of (date)(time)
Copyright (C) 1981, 1982, 1983, 1984, 1985, 1986 by Xerox Corporation
All rights reserved.
Restart reason: User Restart
Normal Startup? (Y/N): NRETURN
Enter interrupt point
1 Interrupt before opening primary volume
2 Interrupt before processing profile
3 Interrupt before running services
Enter choice number: 1,3RETURN
```

2. Type **Scavenge** and press <RETURN>.
 - If you have a multi-drive server, you are asked which drive you want to scavenge.
3. Type **Y** or **N** to the "Normal Scavenge?" prompt, depending on which type of scavenge you are doing, and press <RETURN>.
 - If you typed **N**, enter the number(s) corresponding to Page-level scavenge or Extended scavenge.

This display shows a normal scavenge.

```
> Scavenge RETURN
  Normal scavenge? (Y/N): Y RETURN
The File System will be scavenged.
  Confirm (Y/N): Y Y RETURN
Scavenge started on 10-Apr-86 15:11:14
Scavenging directories...done
Building data structures...done
Rebuilding directories...done
Writing log...done
79 files found.
Total elapsed time for scavenge: 34 seconds
```

This display shows a non-normal scavenge.

```
> Scavenge RETURN
  Drive (1..4): 2 RETURN
  Normal scavenge? (Y/N): N RETURN
Additional scavenge option(s) to be applied
  1 Page-level scavenge
  2 Extended scavenge
Enter one or more choices: 1 RETURN
The File System on drive 2 will be scavenged.
The page-level scavenge option will be applied during this scavenge
  Confirm (Y/N): Y RETURN
Scavenging drive 2
Scavenge started 13-Apr-86 9:34:46
Scavenging each page...done
Scavenging directories...done
Building data structures...done
Rebuilding directories...done
Writing log...done
358 files found.
Total elapsed time for scavenge: 25 minutes 44 seconds
>
```

4. When the scavenge is completed, you may receive the following message: "Please see scavenge log for problems found." It is very important for you to view the scavenger log to determine whether you have to follow additional recovery procedures.

- If the primary volume was just scavenged, type **Proceed** and press <RETURN>. This brings the server to Interrupt 3, "Interrupt before running services." Stand by to make sure that the scavenge operation fixed the problem. If the server is now able to open the primary volume and continue with its normal initialization process, you have succeeded in fixing the problem. Go to step 5.

If the server is still unable to open the volume, you should try an Extended scavenge by repeating steps 1-3, until you are asked to specify a normal scavenge. Enter **N** in response to the "Normal Scavenge?" prompt, select the number corresponding to the "Extended scavenge" option, and confirm the

operation. If you are still unable to open the volume after this, call the Network Support Center at .

- If a secondary volume was just scavenged, type **Open Volume** to open the volume. Then go to step 5.

If the server is still unable to open the volume, you should try an Extended scavenge by repeating steps 1-3, until you are asked to specify a normal scavenge. Enter **N** in response to the "Normal Scavenge?" prompt, select the number corresponding to the "Extended scavenge" option, and confirm the operation. If you are still unable to open the volume after this, call the Network Support Center at .

5. Type **Show Scavenger Log** and press <RETURN>. Enter the last number listed in response to the prompt, as it would correspond to the log just created (an example of this command appears on the next page).

- If your server is running the Mail Service, check the log to see if there were bad pages repaired in any Mail Service database files (any file matching the pattern: MS*). If this is the case, you will have to invoke the "Repair Database" option of the Mail Service. Refer to the section entitled: "Repairing the Mail Service database" in the *Mail Service* booklet for the procedure. If there are other services on your server that were not damaged, start them first and then invoke the Mail Service repair operation.

- If your server is running the Clearinghouse Service, check the scavenger log to see if there were bad pages repaired in any Clearinghouse Service database files (any file matching the pattern: CHS*). If so, the Clearinghouse database must be deleted. Expunge the Clearinghouse Service with the **Expunge Service** command, and then re-install the Clearinghouse software. Refer to the section entitled: "Removing the Clearinghouse Service from a server" in the *Clearinghouse Service* booklet for the Expunge procedure.

Note: If your server is running a File Service, it is possible that the name of the volume that was repaired was changed to "Volume Root." Verify this by typing **List Volumes** in the File Service context. If this is the case, change it back to its original name by using the **Change Volume** command.

6. Type **Proceed** and press <RETURN> if there are no other problems.

An example of a scavenger log appears below:

```

Show Scavenger Log RETURN
Select Scavenger Log
1 Scavenge of 2-Feb-86 13:56:48
2 Scavenge of 21-Mar-86 9:34:46
Enter choice number: 2
Scavenge of 21-Mar-86 9:34:46
Total elapsed time for scavenge: 2 hours, 9 minutes 43 seconds
No page-level scavenge was requested.
No page-level scavenge was done.
The scavenge was complete
Total files on volume: 10369
Total problems on volume: 10
-----
Tests For Selection
File ID: 0 0 0 6645B 0
Type: Unknown Network Service file type - 4226
Total problems: 1
Error 8 - invalid attribute value
-----
CalendarEntityAlphaImpl.bcd
File ID: 0 0 0 6647B 0
Type: Unknown Network Service file type - 4101
Total problems: 1
Error 8 - invalid attribute value
-----
Landscape.Fields
File ID: 0 0 0 6650B 0
Type: Unknown Network Service file type - 100001
Total problems: 1
Error 8 - invalid attribute value
-----

```

Scavenger log messages

When an error is encountered during a scavenge, the system enters a message pertaining to the error in the scavenger log and attempts to correct the problem. Following is a list of possible entries that might appear in the scavenger log after a scavenge operation.

The problems indicated by the messages should have been corrected by the scavenge. If the problem was not resolved, restore the file or files represented by the error messages.

You will notice skips in the error number sequence. Errors 13, 14, 25, 26, 35, and 36 are no longer reported.

In the message descriptions that follow, you see these terms:

- *NSFile* - Any file (document, folder, file drawer) that is stored on a server. If the file can contain another file, it is referred to as a directory.
- *Leader page* - A part of the internal structure of the file that contains the attributes of the file.
- *Segment directory* - A list of the segments in a file.
- *Children* - Any file(s) contained in a file drawer, folder, or divider. For example, a document contained in a file drawer is the child of that file drawer.
- *Orphan* - The remaining contents of a file drawer, folder, or divider after the file drawer, folder, or divider has been deleted. The remaining contents are placed in an "orphan directory," which is called "Scavenge of <date>."

Message descriptions

- | | |
|--|---|
| Error 1 - changed to directory | An NSFile (file A) that was not a directory has been made one because another NSFile (file B) claimed to be contained within it. After scavenging, file A is a directory and contains file B. |
| Error 2 - duplicate page | During scavenging, several disk pages were discovered that claimed to be the same page of an NSFile; the scavenger arbitrarily chooses one of these pages as valid. The other is deleted. |
| Error 3 - duplicate segment ID | The contents of the segment directory within an NSFile indicated two segments with the same identifier (which must be unique for all segments of an NSFile); one of the two is modified to the value indicated to make it unique. |
| Error 4 - file deleted | No corrective action was taken to save a file because of other problems encountered, so the file was deleted; in all cases, at least one other problem accompanies this one. |
| Error 5 - illegal attribute value | An illegal value was encountered by the scavenging program; the value of the attribute is reset to a default (legal) value. |
| Error 6 - illegal attribute value for non directory | The reported attribute contained a value not allowed for an NSFile which is not a directory; the value of such an attribute is reset to a default (legal) value. |
| Error 7 - illegal segment ID | An entry of the segment directory within an NSFile contained an invalid value for a segment identifier; the scavenger changes the bad value to a valid and unique one. |
| Error 8 - invalid attribute value | The value encountered by the scavenging program for this attribute did not represent a valid value (for example, strings with illegal characters); the value of the attribute is reset to a default (valid) value. |
| Error 9 - deleted leader extension | Because of other problems, the leader extension of an NSFile had to be deleted. |

Error 10 - missing leader extension	An NSFile indicated that it had an extended leader but none was found; the indication of an extended leader is reset for this file.
Error 11 - reinserted leader extension	A leader extension file was detached from its primary NSFile and was re-attached by the scavenging program.
Error 12 - leader extension has wrong type	The leader extension file indicated by the content of an NSFile leader was not of the proper type; the bad leader extension file is deleted and the NSFile leader is changed to indicate that the leader is no longer extended.
Error 15 - loop in hierarchy	An NSFile was encountered which claimed to be a child of one of its descendants; the loop is broken.
Error 16 - missing pages	After reconstructing the mapping of files to the pages representing their contents, the indicated pages were not found; each such page is reinitialized with null values.
Error 17 - orphan file	An NSFile was encountered which had no valid parent; such a file is relegated to an orphan folder constructed to hold such files.
Error 19 - orphan page	During scavenging, a disk page was encountered which did not appear to belong to any file but appeared to contain data; the contents of the page are lost.
Error 20 - orphan segment	No NSFile could be found that contained a valid segment entry for the indicated segment, and the NSFile designated within the segment did not indicate a valid NSFile; the orphaned segment is deleted.
Error 21 - deleted segment	Because of other reported problems, it was necessary to delete the indicated segment.
Error 22 - missing segment	The segment directory of an NSFile indicated a segment file which could not be located; the entry for such a segment is deleted from the segment directory.
Error 23 - reinserted segment	The indicated segment was reinserted into the segment directory of an NSFile.
Error 24 - segment has wrong type	The file designated by the content of a segment directory entry was not of the proper type; the entry is removed and the file is deleted.
Error 27 - string is too long	The value of a string attribute exceeded the maximum allowable length for string values; the value is truncated to a length not exceeding the allowable maximum.
Error 28 - too many segments	The segment directory of an NSFile contained too many entries; the count of entries is reduced to the maximum allowed and extraneous entries are ignored.
Error 29 - unreadable pages	Certain pages representing the content of a file could not be read from the disk. An attempt is made to rewrite the contents of each such page to allow them to be read. If this fails, the file containing the pages is lost.

Error 30 - bad variable attributes

The storage area for variable-length attributes (string attributes such as name, owner, and so forth) was ill-formed and could not be recovered. Previous values for these attributes are lost, and their new values are nulled (appear uninitialized).

Error 31 - wrong number of children

The number of children indicated for a directory disagreed with the actual number found by scavenging. The value of this attribute is set to the correct value.

Error 32 - wrong segment ID

The segment identifier within a segment directory entry did not agree with that contained within the segment file itself; the identifier within the segment file is changed to agree with the segment directory entry.

Error 33 - wrong data size in bytes

The stored value for the data size of the file in bytes did not agree with the actual number of bytes found; the value of this attribute is set to the actual number of bytes found. This is reported when the contents of the file has incorrect information.

Error 34 - wrong stored size in bytes

The stored value for the size of the file in pages did not agree with the actual number of pages found; the value of this attribute is set to the actual number of pages found. This is reported when the stored size (content plus attributes) has incorrect length.

Error 37 - new root created

The root of the file system was lost and recreated.

Error 38 - orphan directory created

This directory was created to hold orphan files.

Managing secondary drives

The procedures in this task explain how to partition your secondary drives, create services volumes on them, and make them ready for use as File Services. If your server supports the File Service, each of its drives, including the primary drive, can be brought on-line and accessed by remote clients.

You manage the services volumes through the use of these server commands:

- **List Volumes**
- **Change Volume**
- **Create Volume**
- **Copy Volume**
- **Open Volume**
- **Close Volume**

Use Procedure A to create a services volume on a secondary drive, Procedure B to remove and replace a disk pack, Procedure C to copy complete volumes, and Procedure D to change the volume name.

Procedure A: Creating a services volume on a secondary drive

1. Insert the installation utility floppy disk labeled "Services System Software # 1 (Removable Disk)" and boot it while the maintenance panel displays 0002.
2. Type the drive number and press <RETURN>. You will normally be specifying 2, 3, or 4 since your primary drive has already been prepared for use by services and you have already installed software on it. (The instructions for accomplishing this are in the *Server Software Installation* booklet.)
3. Type the number corresponding to the "Partition for Services" option and press <RETURN>.
4. Type Y to confirm the partitioning operation and press <RETURN>. This operation takes about 10-15 minutes to complete.

CAUTION: The partitioning operation destroys the data on the disk. You should perform this step only if you are preparing a formatted, blank, removable, or fixed AMS 315 disk that is to be used for the first time as a secondary volume.

5. Boot the server, either by selecting the "Start System" option in the utility menu or booting while the maintenance panel displays 0001 or 0000, as described in the "General operating techniques" section of this booklet.
6. Type **Y** to the "Normal Startup?" prompt and press <RETURN>. Wait until the server has completed its initialization process and has displayed the executive (>) prompt.
7. Log on and enable.
8. Type **Create Volume** and press <RETURN>. You are asked to choose a drive number.

Note: When using the **Create Volume** or **Change Volume** commands, do not use the following characters in the File Service volume name:

Comma ","
left parenthesis "("
right parenthesis ")"
asterisk "*"
pound sign "#"

If these characters are used, the error message "name invalid -- may not contain any of these characters: , () * #" will appear.

9. Type the drive number and press <RETURN>.
10. Type the fully-qualified name that you want this volume to have when it is registered as a separate File Service and press <RETURN>.

Note: Remember, even though there is only one File Service code file installed on the primary drive, the software is able to manage up to four volumes at one time.

Your users will view each of these volumes as separate File Services. The fact that they are connected to a single server is significant only to you as System Administrator.

11. Type **File Service** and press <RETURN> to enter the File Service context.
12. Type **Online Volume** and press <RETURN>. You are shown a list of the currently open volumes. (Only the first part of their fully-qualified names is displayed.)
13. Type the number corresponding to the volume you wish to bring on-line and press <RETURN>.

Note: At this point that volume is registered with the Clearinghouse Service as a separate File Service and is brought on-line. It is now accessible to network clients. Before it can be useful to your co-workers, you must create file drawers. Refer to the *File Service* booklet for details.

Procedure B: Replacing a disk pack

1. Log on and enable.
2. Type **Offline Volume** and press <RETURN>. You are shown a list of all currently on-line volumes.
3. Type the number corresponding to the volume you wish to take off-line and press <RETURN>. It will no longer be accessible to remote clients.
4. Type **Close Volume** and press <RETURN>. You are shown a list of all currently open volumes.

Note: You cannot close the primary volume.

5. Type the number corresponding to the volume you want to close and press <RETURN>.
6. Remove the disk pack and replace it with a different one.

If this pack already has a services volume and has been registered as a File Service, you can bring it on-line as follows:

7. Type **Open Volume** and press <RETURN>. You are asked whether you want to open the volume on drive 1, 2, or 3.
8. Type the number corresponding to the volume you want to open and press <RETURN>.
9. Type **Online Volume** and press <RETURN>. You are asked which of the currently open volumes you wish to bring on-line.
10. Type the number corresponding to the volume you want to bring on-line and press <RETURN>. The volume's Clearinghouse Service registration is verified, and then the volume (File Service) is brought on-line for use by network clients.

Note: The disk packs you register as File Services can be configured by you to be used by your co-workers and dependent services as remote storage areas. They can also be used exclusively as backup packs.

Procedure C: Copying complete volumes

Note: This procedure can be performed only when both the source and destination volumes (the volume you are copying and the volume you are copying to) are closed. If you need to copy the primary volume, you must stop all services and boot the server while the maintenance panel displays 0001 or 0000. Then select a non-normal startup and select the first interrupt point, "Interrupt before opening primary volume."

The **Copy Volume** command cannot be used on the primary volume unless the server is at the first interrupt point.

If you are copying a secondary volume to a secondary volume, perform the following steps.

1. Log on and enable.
2. Type **Offline Volume** and press <RETURN>.
3. Type the number corresponding to the volume you wish to bring off-line and press <RETURN>.
4. Type **Close Volume** and press <RETURN>.
5. Type the number corresponding to the volume that you just brought off-line and press <RETURN>.
6. Insert the pack intended to be used as the backup pack in a drive.

Note: You may have to close, bring off-line, and remove another pack before you can do this, since you would not want to copy to a pack that is being used as a File Service volume.

CAUTION: Do not open the destination volume. Both the source and destination volumes must be closed during this operation.

7. Type **Copy Volume** and press <RETURN>.
8. Type the number corresponding to the volume to be copied and press <RETURN>. Since the destination pack now contains an exact copy of the volume on the source pack, you cannot bring it on-line at the same time as the source volume. Rather, the destination pack should be stored away in a different location and retrieved later, should you need to replace the source volume.

Comment: Since the destination pack is to contain an identical copy of the source pack, you do not have to bring it on-line, nor do you have to use the **Create Volume** command to create a volume on it. You do have to partition it before you can use it as a destination pack. Should you ever use it as a replacement for the source pack, you will be bringing it on-line. It will already have the appropriate File Service name.

The purpose of the **Copy Volume** operation is to create a complete backup of a volume so that the backup can be used in place of the source volume in the event that the source volume becomes damaged.

The *File Service* booklet explains how the **Copy Volume** and **Backup** commands can be used in an effective backup strategy in which a full copy of a volume is made once a week or once a month, and then an incremental backup of the recently added or modified files is made nightly, every other night, or less frequently.

Each time you use the **Copy Volume** command to back up a service volume, you have created an "epoch" copy of the file system. When backup runs, it only backs up files that were created or changed since the backup date.

If you have an exact copy of your primary volume which you made using **Copy Volume**, you can store the pack containing the copy, preferably off-site or in a vault. Then, in the case of loss of data on your primary drive, you can remove the damaged pack and replace it with the backup pack.

If this is the primary pack, you can then reinstall system software using the installation utility floppy disks. Once you have installed system software on the pack containing the copy of the primary volume, you can boot from this pack.

Comment: If you ever have to restore your primary pack in case of database damage, you should be aware that there is a special procedure for restoring a primary pack containing a Clearinghouse or Mail Service. It is possible that the out-of-date database can cause major inconsistencies in the rest of the distributed Clearinghouse system. Refer to the "Restoring a Primary pack containing Mail Service or Clearinghouse Service" section in this booklet for the procedure, and for further details on the consequences of such a restore.

CAUTION: This is the only copy of your data. In order to prevent the loss of data, immediately copy the volume using the **Copy Volume** command, then use the File Service **Restore** command to restore the incremental changes made to the primary volume since the **Copy Volume** command was used. In this way, you can quickly recover from a failure of your primary volume and allow your remote clients to resume their activities.

Procedure D: Changing the volume name

1. Log on and enable in the File Service context.
2. Type **Offline Volume** and press <RETURN>.
3. Type **Change Volume** and press <RETURN>.
4. Type the new fully-qualified name and press <RETURN>.

Note: When using the **Create Volume** or **Change Volume** commands, do not use the following characters in the File Service volume name:

Comma ","
left parenthesis "("
right parenthesis ")"
asterisk "*"
pound sign "#"

If these characters are used, the error message "name invalid -- may not contain any of these characters: , () * #" will appear.

5. Type **Online Volume** to bring the File Service up with the new name. The File Service will automatically register the new name and delete the old name from the Clearinghouse database.
6. Notify the users of the change. All 6085/8010 workstation users must retrieve new icons.

Restoring a primary pack containing MS or CHS

Using the **Copy Volume** operation to create a duplicate of a drive containing a Clearinghouse can be damaging to the distributed Clearinghouse database if it is later used to restore a damaged database.

A pack that has been off-line for an extended amount of time most likely contains out-of-date information. Depending on the types of updates which transpired since the **Copy Volume** operation was run, it is possible that restoring this pack would cause major data inconsistencies in the rest of the distributed Clearinghouse system as a result of update exchanges.

Extremely serious problems are prevented by the Clearinghouse Service because it rejects the database on the duplicate pack if its date is 30 or more days older than the current date.

Restoring from a primary pack containing a Mail Service can cause complications as well. Users will receive old mail again, and Clearinghouse updates which were in process at the time of the **Copy Volume** operation will be delivered throughout the internet when the Mail Service is back on line.

To avoid the complications stated above, follow the procedure below whenever a pack is to be brought up as a replacement for an inoperative primary drive pack that contains a Clearinghouse or Mail Service.

Procedure A

If you have a single-Clearinghouse Internet, do Procedure A. If you have a multiple-Clearinghouse internet, skip to Procedure B.

1. Compare the date on which the duplicate was created with the date of the last Clearinghouse Service backup.

If the Clearinghouse backup is recent and you are aware of making Clearinghouse changes since the **Copy Volume** operation which produced the data on the pack, it might be worthwhile to expunge the Clearinghouse, reinstall, and then restore from backup. Otherwise, you will have to re-enter all of the Clearinghouse updates which have been made since the last **Copy Volume** operation.

If you decide to expunge the Clearinghouse, be sure to give the new Clearinghouse the same name as the old one or you won't be able to restore the Clearinghouse database.

For the expunge procedure, refer to the "Expunging a service" section in this booklet. To restore from backup, refer to the "Restoring a damaged local database" section in the Clearinghouse booklet.

2. If the duplicate pack contains a Mail Service, compare the date on which the duplicate was made with the date of the last Mail Service backup to a File Service. If the Mail Service backup is more recent, restore your Mail Service

database using the last Mail Service backup instead of restoring the older one which is on the duplicate pack. Refer to the "Restoring the Mail Service" section in the Mail Service booklet for the procedure.

Procedure B

1. If the primary drive you are replacing contains a Mail Service, do this step before restoring the Clearinghouse, if there is one.

Compare the date on which the duplicate was made with the date of the last Mail Service backup to a File Service. If the last Mail Service backup is more recent, restore the Mail Service from its File Service backup rather than bringing the Mail Service back on line with the older database which is on the duplicate. You will be instructed to do this in step 11.

Continue with the next step if you are restoring a Clearinghouse and/or Mail Service database from the primary pack.

2. Install the primary pack. Refer to the *File Service* booklet for details.

Note: If your duplicate copy was created 30 or more days ago, the Clearinghouse will not accept the old database. You must rebuild the database by adding back all domains which were there before the server's primary pack failure. Refer to the Clearinghouse booklet for details about rebuilding databases after a complete loss of data.

3. Boot the server and specify a non-normal startup. Enter the number corresponding to "Interrupt before running services."
4. Log on and enable.
5. Type **Run Service**, and enter the number corresponding the Clearinghouse Service.
6. Specify a non-normal startup of the Clearinghouse Service, and then select the "Run but don't start" option.
7. Type **Clearinghouse Service** to get into the Clearinghouse context, and then type **Show Status**. Record the names of all the domains contained in the local database.

CAUTION: The next step assumes that you have replicated all domains at least once. If you haven't, you will be prompted with a second confirmation before the deletion can take place. Enter **N** to the second prompt and continue with the next domain. Step 12 instructs you to replicate and update these domains.

If the last copy of a domain is deleted, its name cannot be re-used for 30 days.

8. Type **Delete Domain**. Enter one of the domain names you just recorded. Repeat this step for each of the domains in the local database. Don't forget to specify the organization name if the organization is different than the current default.
9. Type **Compare Databases**. Specify the most up-to-date Clearinghouse as the target of the Compare operation.
10. After the **Compare** operation completes, type **Add Domain** and add all of the domains back again.
11. Do this step if you have a co-resident Mail Service, and step 2 resulted in your planning to restore the Mail Service database.
 - a. Type **Run Service**. Select the Mail Service to be run. Specify a non-normal startup.
 - b. Enter the number corresponding to "Restore Database from backup."
 - c. When the prompt reappears, enter Proceed and then log off.
12. Do this step if in step 8 you were unable to confirm deletion of one or more of your domains because it wasn't replicated.
 - a. Consult with other System Administrators to determine which Clearinghouses should receive copies of the domains that are not replicated.
 - b. The domains which were not replicated before you started this procedure are now out of date. Re-enter all of the Clearinghouse updates made to each domain since the date in which the duplicate pack was produced.

Monitoring your services volume

It is important to ensure that your services volume never reaches beyond 98% full. If this happens, your services undergo performance degradation, and in some cases become inoperative.

Example If you can no longer expand your Mail Service database because your services volume is full, the mail queue will continue to fill up, which results in slower performance, delayed Clearinghouse Service updates, and the inability to add mailboxes to the service.

A File Service that is too full will not be able to store any more backup copies, or hold any more new file drawers. Also, you may not be able to complete a scavenge on a volume that is close to being full. In most cases, you will receive an error message stating that the services volume is full each time you try a new operation requiring more disk space.

You can monitor the services volume on each of your servers by using the **List Volumes** command on a regular basis. The command lists the volume name, the drive number (if applicable), and the volume status (whether it is open or on-line). If the volume is open, the command also displays the number of pages used and available, and the percentage of volume pages utilized thus far.

If your services volume does become too full, one of your options is to move one of the services to a new server. If your file service is full, and you have another File Service on your network, you can move file drawers to the other File Service.

If your Mail Service is full and you have another Mail Service on your network, you can create space by moving mailboxes to the other server and informing users with many unretrieved mail messages to retrieve their mail.

Another option you have is to delete files that are not in use. Before doing this, you should consult the Network Support Center to ensure that you do not delete a file that is currently in use by one of your services.

Comment: You can monitor your Mail Service and Clearinghouse Service disk space usage with the **Show Status** command, which is a feature exclusive to those services (there is a **Show Status** command for the Print Service, but it does not display database information). Your Clearinghouse Service should always have about 25% free disk space. Your Mail Service should never reach above 95% full. You can use the non-normal startup "Expand Database" option of these services to keep them within these disk space requirements. Refer to the appropriate booklets for descriptions of the **Show Status** command and the "Expand Database" option.

Procedure

1. Type **List Volumes** and press <RETURN>.
2. If the percentage of disk space used is more than 95%, you should begin considering which recovery procedure is best for your server or network, and take action as soon as possible.

> List Volumes ^{RETURN}		
Volume name	Used/available (%)	Status
San Francisco	16968/12329	online

Listing and configuring RS-232C port information

The **List All RS232C Ports** command is useful for displaying the configuration statistics for all of the ports configured on your server. It displays such information as port names and descriptions, types of ports, and line speeds. Refer to the *External Communication Service*, *Internetwork Routing Service*, *Remote Batch Service*, and *Interactive Terminal Service* booklets for further information about port configurations.

Procedure

1. Log on to your server.
2. Type List All RS232C Ports, and press <RETURN>. An example of the command is shown below.

```
> List All RS232C PortsRETURN
Name: A2, Description: Call 232-3188
CIU port: A2, Port use: Asynchronous Dial-in, Preemption: forbidden.
Line speed: 300 bps, Synchronous capability: asynchronous.
Data bits/character: eight, Parity: none, Stop bits: one.
Access control: World.
Port Type: Terminal (DTE), Port duplex: full duplex, Echoing: application.
Autodialer: none, Flow control: none.

Name: B1, Description: Call 232-3122
CIU port: B1, Port use: Asynchronous Terminal Emulation, Preemption:
forbidden.
Line Speed: 1200 bps, Synchronous capability: asynchronous.
Data bits/character: eight, Parity: none, Stop bits: one.
Access control: World.
Port Type: Terminal (DTE), Port duplex: full duplex, Echoing: application.
Autodialer: none, Flow control: none.
```

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This section contains a partial listing of informative or error messages that may be displayed by the Services Executive. The messages contained in this section are initiated by the Services System Software. Other messages initiated by services that are running on the server are listed in the individual service booklets in the *Network Shared Services* volume.

The messages are listed in alphabetical order, and are followed by a brief explanation or action pertinent to the message. If the probable cause of the message is not obvious, it is given below the message under the heading: *Probable cause*. If the message is such that action can be taken to resolve the situation, the action is listed under the heading: *Action*. Many other messages may be displayed by the Services System Software, but their meanings are self-explanatory.

When you see an error or informative message you do not understand or want additional information about, write it down, then look it up in the following message list. If the listing does not provide the information you are looking for, contact the Network Support Center.

<Service Name>: Activated, but cannot find required files. Please re-install.

Informative message indicating that one of the files required to run a service cannot be found.

A directory is required for that operation.

Informative message reporting that the remote directory must be set before the **Store Files** or **Retrieve Files** command can be completed.

A file by that name already exists in the directory.

Informative message indicating that a file cannot be copied to the designated directory because a file by that name already exists there.

A new Clearinghouse entry was created.

Informative message. No action is required.

Authentication Problem.

Probable cause: This is an error message indicating that the credentials used for interacting with the Clearinghouse Service were invalid. In this case, the credentials referred to are those of the server and not the user. It generally indicates a software problem, as credentials are validated prior to beginning the self-registration process.

Action: You should verify that the server is registered in the clearinghouse by typing **Register Server**, and re-try the operation that caused the error. If the problem persists, verify that the Clearinghouse is running correctly.

Authentication Service cannot be reached.

Probable cause: The Clearinghouse Service may be down or too busy to authenticate you.

Action: Try again later. If this doesn't work, check the status of your Clearinghouse to determine whether it has gone down.

Cannot create/modify Clearinghouse server entry because of access violation.

Probable cause: This error message indicates that the server cannot perform the needed registration operation because it does not have access to the Clearinghouse database. It generally indicates a software problem.

Action: Go to the service running the CHS service and determine whether it is functioning properly. If it isn't, and you cannot pinpoint the problem, call the Network Services Center.

Cannot find Clearinghouse serving this domain.

Probable cause: This message usually precedes the messages indicating that the server is in Genesis Mode.

Action: If this message occurs during normal startup of the server, reboot, invoke a non-normal startup, select the third interrupt point (interrupt before running services), and take the necessary steps to make the proper Clearinghouse domain available.

Cannot run Print Service now. Please activate and reboot.

Probable cause: This message indicates that the Print Service was not on the active services list when initialization was completed. This message occurs when the user tries to explicitly run the Print Service (using the **Run Service** command) after initialization has been completed.

Action: Activate the Print Service and specify a normal startup.

Clearinghouse entry already in use as an alias.

Probable cause: This error message is generated when the current name of the service being registered is an existing alias in the Clearinghouse. No changes are made to stable data or any existing Clearinghouse entries.

Action: Enter a new name; otherwise registration is aborted.

Command Canceled.

Informative message indicating that the execution of the current command has been terminated.

Control Characters and "*" [] < > # , ; : @" not allowed.

This error message is displayed if a user specifies a server name that contains these illegal characters. The executive implements input error checking to ensure that the user does not enter a server name that cannot be registered with the Clearinghouse Service.

Deleting Clearinghouse entry for: <Fully-qualified Service Name>.

Informative message appears when the Clearinghouse is preparing to de-register a service.

Entry already exists in Clearinghouse.

Probable cause: This message indicates that the name currently being registered already belongs to another service that is currently active. No changes are made to stable data or the existing Clearinghouse entry. You are given a chance to enter a new name; otherwise registration is aborted.

This situation occurs if you fail to delete a Clearinghouse entry for a service that was recently expunged or moved to another server. This should only happen with services requiring RS-232C ports, as all other services are de-registered automatically during the expunge operation.

Action: Determine if it was your intention to reuse this name for the new object or if the name is currently needed for a different object. You can reuse a name that is currently applied to an object by deleting the entry from the Clearinghouse Service.

To do this, log on and enable, set the context to the Clearinghouse Service, type **Delete**, and specify the name of the object that you wish to delete.

Existing Clearinghouse entry was updated.

Informative message. This situation can occur when you desire to use a service name once assigned to another server that is no longer being used. No action is required.

Failure in trying to determine domain administratorship. Assuming non-SA.

Probable cause: This message occurs when the user types **Enable** but cannot be authenticated as a Domain Administrator.

Action: Try the operation again if you believe that you are a Domain Administrator for the server's domain. If the operation fails again, connect with a server running a Clearinghouse Service that supports the domain and use the **Show Domain** command.

If your name is not listed, get someone who is a Domain Administrator to assign you domain administration access, provided such status is appropriate for you. Only System Administrators and selected backup System Administrators should be given Domain Administrator privileges.

Illformed fully-qualified server name in profile.

Probable cause: An invalid name was entered for the Server Profile.

Action: The server treats this situation in the same way as it would a nil entry for this value, by prompting for a name. Re-enter the name in the correct format. After you do this, the server registers the name in the proper Clearinghouse domain. If it cannot do this, the server enters Genesis Mode.

Create the corresponding domain, or make it accessible either by installing and running the Internetwork Routing Service or by attending to the other local server that should be supporting this domain.

Inconsistent File System. Please Scavenge.

Probable cause: This message appears when the System Volume file system becomes inconsistent. It is likely that this message appeared because the server was not able to open the volume.

Action: Run a normal scavenge. Refer the section entitled "Scavenging the services volume" for a description of the recovery procedures.

Invalid service name.

Probable cause: This error message appears if you responded to a prompt with an improper server name, or if the Clearinghouse Service contains an invalid name. You are given the chance to enter a new name. If you don't enter a new name, the operation is aborted and no changes are made.

Action: Check the name you entered to make sure it is correct. If this doesn't work, check to see whether the name is registered in the Clearinghouse.

Locking.

Informative message tells you that the options indicated by the previously entered software serial number are now being locked. No other options can be installed until the user receives a new software serial number from the Software Control Center.

**Maximum allowable limit of remote connections exhausted:
<number of allowable connections currently set in profile>.**

Probable cause: This message occurs when a user attempts to establish a remote connection to the executive of a particular server, but the maximum number of allowed remote executives is currently exhausted.

Action: Try to connect later. If this message occurs too frequently, you may want to increase the value currently in the "Number of remote execs" field in the server profile.

Must be System Administrator.

Probable cause: This message occurs during server initialization, when the server needs to update or establish a new entry at the Clearinghouse Service but cannot do so because the current user is not a Domain Administrator for the server's domain. After this message is displayed, the "Logon" prompt appears again.

Action: A person who is a Domain Administrator for the server's domain must log on so that the server can successfully update or create the needed Clearinghouse Service entry.

Name and description deleted from the local parameter file. Clearinghouse not changed.

Informative message, generated at the end of de-registration, indicates that de-registration is complete, and that some error condition relating to user privilege issues prevented modifications to the Clearinghouse. No action is required.

Name and description stored in local parameter file. Clearinghouse not changed.

Probable cause: This message, generated at the end of the registration process, indicates that registration was aborted due to authentication problems, entry inconsistencies, user privilege issues, etc.

Action: Re-register the service again to update the Clearinghouse.

Network Number not available.

Probable cause: The network number cannot be determined because there is currently no other server on the same network and the network number field of the profile is nil.

Action: Enter the current network number.

No change to local parameter file or Clearinghouse.

Informative message, generated at the end of the registration process, indicates that registration was aborted due to problems such as authentication, entry inconsistencies, or user privilege issues, or due to aborting a process or command.

No open volumes.

Probable cause: This message appears when you use the **Close Volume, Change Volume, or Online Volume** command. It indicates that there are no volumes to present in the choice list since none are open. Only open volumes qualify for the current operation.

No open or online volumes.

Probable cause: This message appears when you use the **Close Volume, Change Volume, or Online Volume** command. It indicates that there are no volumes to present in the choice list since none are open or currently on-line. The volumes must be both open and on-line in order to qualify for the current operation.

Action: Open the volume(s) and retry the command.

No Services are available for Installation.

Probable cause: This message occurs after using the **Install Service** command. It indicates that no services are resident on the inserted floppy disk.

Action: Verify that you have the correct floppy disk.

No such command is available.

Probable cause: Used by the executive command processor to indicate that the characters typed do not match any currently available command. Either the command is not an existing command, or the current context, server or service state, or logged-on status do not allow the command to be accessed.

Action: Verify that the command is correct, and that you are in the correct context, and retry.

<file name> not found on <directory name>.

Informative message indicating that a file specified by a file management command cannot be found on the indicated remote directory.

<file name> not found on working directory.

Informative message.

< drive number > not valid.

Probable cause: This message indicates that a Services Volume is in an inconsistent state.

Action: The recovery procedure is scavenging the volume. Refer to the section entitled "Scavenging the services volume" for a description of the scavenge procedure.

No Volumes mounted or online.

Probable cause: Used by the **Offline Volume, Open Volume, Close Volume, Change Volume, Backup, and Mounted Restore** commands to indicate that no volumes are currently available in the choice list or on-line (packs are not in place, volumes have not been created, or no volumes are on-line). Only mounted or on-line volumes can qualify for the current operation.

Operator needed to perform current operation.

Informative message indicating that a logged on System Administrator is required to perform the task.

Remote Directory not set.

Probable cause: Indicates that a **Store Remote Files, Retrieve Remote Files, or List Remote Files** command cannot be completed because no remote directory is currently set.

Action: Set the remote directory and issue the command again.

Repeating server validation.

Informative message used during initialization to indicate that the server has detected that the domain in which the server is registered is now supported, after having been unavailable previously. As a result, another attempt is made at server registration.

Server cannot be started.

Probable cause: This message indicates that a previously reported error cannot be recovered at this point.

Action: Note the previously reported error message, and consult the appropriate service booklet for its message list. Perform the recovery procedure described.

Server name already exists as alias.

Action: The System Administrator should choose a different name for the server, or should change the alias using the **Change User** command in the Clearinghouse Service context.

Server Name not found or invalid.

Probable cause: This message appears when the server cannot find a name in the server profile. This is a normal message when initialization occurs for the first time, or after the System Administrator has deleted the server profile.

Action: The System Administrator must supply a fully-qualified server name at this point, even if a backup copy of an earlier profile is to be retrieved and used by the server. Otherwise, registration is aborted with no changes to stable data or the Clearinghouse.

Server not registered properly.

Probable cause: This error message indicates that the server was unsuccessful in validating its Clearinghouse Service entry. The reason for the failure is given prior to this message. The server will try to correct the problem, calling upon you to log on.

Action: Log on. You should be a Domain Administrator of the server's domain.

Standard Services Software option has not been set.

Probable cause: This message appears when the server is being initialized and cannot proceed until the software options have been set. This message occurs only when the server has never run services before. This is not an error message.

Action: You can recover by indicating that you wish to continue. Note the information on the screen. Call the Software Control Center and give them the software serial number. They will then give you a password which you will enter in response to the prompts.

System Administrator needed to perform current operation.

Probable cause: This error message is generated when an operation is attempted that modifies an entry in the Clearinghouse and the current user name and password do not belong to a System Administrator. No changes are made to the Clearinghouse, and registration is aborted.

Action: If you are the System Administrator, you should re-register the service and attempt to log on again.

This floppy disk contains mangled data and is unreadable.

Probable cause: This message can occur during installation or during any operation that involves a floppy disk. It indicates that the floppy disk currently inserted is in an inconsistent state.

Action: If this message occurs during installation, a new floppy disk must be obtained and used.

This floppy disk is incorrectly formatted.

Probable cause: This message can occur during installation or any operation that involves a floppy disk. It might occur if the inserted floppy disk uses a different disk format than that recognized by the server.

Action: Obtain a floppy disk in the correct format and try again.

Unexpected hardware error. Cannot continue installation.

Probable cause: This error message occurs during installation and indicates that there is a problem with the floppy disk drive or controller.

Action: The installation operation cannot continue until the floppy disk drive is repaired.

<volume number> unknown.

Probable cause: This message is generated by the **List Volumes** command to indicate that packs on these drives are not currently open and their names are therefore unknown.

Action: Open the volumes and then re-enter the **List Volumes** command. Their names will be displayed.

Unknown problem. Operation aborted.

Probable cause: This error message is generated when an unexpected event occurs while the Clearinghouse database is being updated.

Action: You should retry the operation that generated the error. If the problem persists, check the Clearinghouse to verify whether it is running correctly.

Validating Clearinghouse entry for: <Fully qualified Service Name>.

Informative message appears when a service is preparing to register itself with the Clearinghouse Service.

Volume is full. Cannot complete installation.

Probable cause: This message occurs during installation when additional software cannot be installed because the volume is full.

Action: The user needs to make space available on the volume.

Warning--Can't find Authentication Service. Proceeding.

Action: No immediate action is required, and data is initialized as necessary, but you should try registering the service again later to ensure that a valid Clearinghouse entry exists.

Warning--Can't find Clearinghouse. Proceeding.

No immediate action is required, but you should try the registration again later to ensure that a valid Clearinghouse entry exists.

WARNING---Network number in server profile does not agree with net number on the internet.

Probable cause: This message can occur if you have moved the server or its profile to a different Ethernet network. The server detects from another server on the new network that its profile contains a different network number value, assumes that the one being exported by the other server is correct, writes the new number into the profile, and displays it on the screen for the user's benefit.

Action: Make sure that this is the correct number. If it is, there is no action required. The Server automatically continues initialization.

If the server has been accidentally moved to a different Ethernet network, and the number is incorrect, immediately remove the server from the network which is incorrect, and place it on the correct one. Reboot the server.

CAUTION: After you complete these steps, make sure that the server profile displays the correct network number. If an incorrect number is displayed, the Clearinghouse Service will begin to propagate the wrong network number. This causes major damage to the network, and may result in Server failure for servers running Internetwork Routing Service. If this situation occurs, call your Systems Analyst immediately.

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- Anti-entropy** An operation run by the Clearinghouse (late at night during non-peak hours) to verify the validity of its database. It serves the same function as the **Compare Database** command, except that it is done automatically.
- Boot** Activating the software on a server or workstation by pressing the hardware "boot button" (B Reset on the processor maintenance panel).
- Domain** A logical grouping (usually geographical) of registered objects in the Clearinghouse database. Domains serve as units of name, scope, administrative responsibility, and replicated database configuration. The data maintained for a particular domain includes a list of administrators of that domain, plus the names and relevant information about all objects that are registered in the domain.
- Domain Administrator** The System Administrator-assigned access privileges that control the changes to entries within a given domain.
- Executive** A program that supports interactive, text-based access to server functions. (The software that allows the user to observe the current activity of a server, or change its current configuration.) The "local executive" is provided at the server terminal. ViewPoint Remote System Administration provides users with a remote executive interface.
- Genesis Mode** A state that a server enters when the Clearinghouse is not available to authenticate the user to enable System Administrator capabilities and server initialization has been stopped at Interrupt 3. In this case the user is enabled to access the limited set of System Administrator commands necessary for making a Clearinghouse domain available. Genesis Mode occurs during the installation of the first server on a network, and on single-server networks after a non-normal server startup and interrupt points 2 or 3 have been taken.
- Initializing** A process that occurs each time services are run for the first time after the server has been booted. The initialization procedure includes the determination of the service name, and configuration information specific to that service.
- Internetwork** A composite of interconnected networks in which network resources are shared. Any network can have multiple connections to other networks. (See **Internetwork Routing Service** for more information.)

Interrupt points Available after a non-normal server startup. Allow the user to change a value that the server applies during initialization. During initialization, the possible interrupt points are:

- Interrupt before opening primary volume
- Interrupt before processing profile
- Interrupt before running services

Refer to the "Non-normal server startup" section in this booklet for further information.

Interactive Terminal Service (*ITS*) Provides access to Mail, Print, and File Services for non-networked users of TTY-like terminals or personal computers emulating teletypewriters. The remote user communicates with the ITS through a modem and phone, and is validated through the Clearinghouse Service.

Internetwork Routing Service (*IRS*) Enables all users on a network to access all services (Mail, File, Print), and to communicate with users on other networks. Up to 15 IRSs can be linked together. Any change to an IRS is automatically broadcast throughout the internet.

Logoff The process of stopping a session on a computer system.

Logon The process of starting a session on a computer system.

Network The physical and logical connection of system elements. A network allows information exchange between workstations and servers.

Organization A high-level logical grouping of domains in the Clearinghouse database (usually corresponding to an entire company or equivalent). Most internetworks contain only a single organization. For each organization which it serves, a Clearinghouse Service maintains the following data: the list of administrators for that organization, the list of all domains contained by the organization, and the names of all Clearinghouse Services that serve each of these domains.

Reboot Restarts the software loaded on the system element by pressing the "boot button" (B Reset on the processor maintenance panel).

Replication Each domain in the database is stored on two or more servers, improving reliability, availability, and efficiency of access.

Scavenging A process invoked by the **Scavenge** command. It can also appear as a prompt after the system determines a file inconsistency. Scavenging repairs the filing system after a system failure by determining the cause of the problem, and the area where it occurred. The problems are reported in the scavenger log.

Server Monitor Service (*SMS*) Watches a group of servers from one location, monitors their availability, and reports problems to the System Administrator via mail messages.

<i>Server profile</i>	The data file used to retain information such as names and assignments after the initialization and configuration of servers and services is complete. This way, the user does not have to specify the information each time the server is booted.
<i>Service</i>	Software that performs a specific function which runs on a server.
<i>Services Executive</i>	The software that allows the user to observe the current activity of a server, or change its current configuration. (See <u>Executive</u> for more information.)
<i>Services System Software</i>	Provides an environment in which one or more of the Xerox 8000 Network System services can operate.
<i>System Administrator</i>	A user with specific network privileges who is responsible for setting up and maintaining the services and the organization of network services.

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