

ADSTAR Distributed Storage Manager
for OS/2



Quick Start

Version 2

Note!

Before using this information and the product it supports, be sure to read the general information under Appendix F, "Notices" on page 85.

This book is also available in a softcopy form that can be viewed with the IBM BookManager READ licensed program.

First Edition (September 1996)

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Before You Begin

ADSTAR Distributed Storage Manager (ADSM) is a client/server program that provides storage management services to customers in a multivendor computer environment. ADSM provides an automated, centrally scheduled, policy-managed backup, archive, and space-management facility for file servers and workstations. The term *workstation* will be used in this book to denote workstations, file servers, and PCs.

This publication helps you to get up and running with a usable, practical ADSM system. It explains how to:

- Install the server on OS/2
- Define the communication network for server and clients
- Customize ADSM for your environment

What You Should Know before Reading This Publication

Before using this publication, you should be familiar with:

- OS/2 operating system
- Devices that will be available to ADSM
- Workstation operating systems on which backup-archive clients reside
- Workstation operating system on which the administrative client resides
- Communication protocols required for the client/server environment

You also need to understand the storage management practices of your organization, such as how you are currently backing up your workstation files and how you are using disk and tape storage.

This section provides an overview of the tasks covered in this book. It also presents an overview of ADSM concepts that are useful in performing those tasks. The steps for each task are described in detail beginning with Chapter 1, "Installing ADSTAR Distributed Storage Manager" on page 1.

Conventions Used in This Book

This section describes the conventions used in this book to make finding and understanding information easier.

Note: If you are viewing this book online, identifying text appears instead of icons.

Types of Information

The following conventions help you to identify types of information.



Important tips or cautions



Detailed information that is useful, but not essential, in performing a task



Tips to help you avoid or correct problems

Where Tasks Are Performed

The following conventions identify where to perform the associated tasks:



OS/2 command line



OS/2 System Folder



ADSM Server Utilities



ADSM administrative client command line



ADSM administrative client graphical user interface



ADSM end user client command line



ADSM end user client graphical user interface

How to Use This Book

This book takes you through the tasks for setting up a basic, practical ADSM system. The approach is to take advantage of most defaults supplied by the ADSM commands or graphical user interface.

Installation and Setup Results

After you complete the tasks in Chapter 1, “Installing ADSTAR Distributed Storage Manager” on page 1, Chapter 2, “Setting Up ADSM for OS/2 Clients” on page 9, and Chapter 3, “Setting Up the Server” on page 13, your ADSM system will look like this:

Database and Recovery Log

Sized to fit your needs.

Disk Storage Pools

Three default disk storage pools for backup, archive, and space-managed client data with volumes sized to fit your needs.

Clients

Installed and registered administrative and backup-archive clients. The ADSM installation includes one OS/2 administrative client and one OS/2 backup-archive client with the following defaults:

Administrative Client

Name *admin*
Password *admin*

Backup-Archive Client

Name *client*
Password *client*

Standard Policy

Objects for a default storage policy are defined (all are named STANDARD). This policy specifies the following:

- When a backed up file is no longer associated with a backup copy group, it remains in server storage for 30 days.
- When an archived file is no longer associated with an archive copy group, it remains in server storage for 365 days.
- Client files are not space managed.
- For backup operations:
 - Files are backed up to the default disk storage pool, BACKUPPOOL.
 - An incremental backup is performed only if the file has changed since the last backup.
 - Files cannot be backed up while they are being modified.
 - Up to two backup versions of a file on the client’s system are retained in server storage. The most recent backup version is retained for as long as the original file is on the client file system. All other versions are retained for up to 30 days.

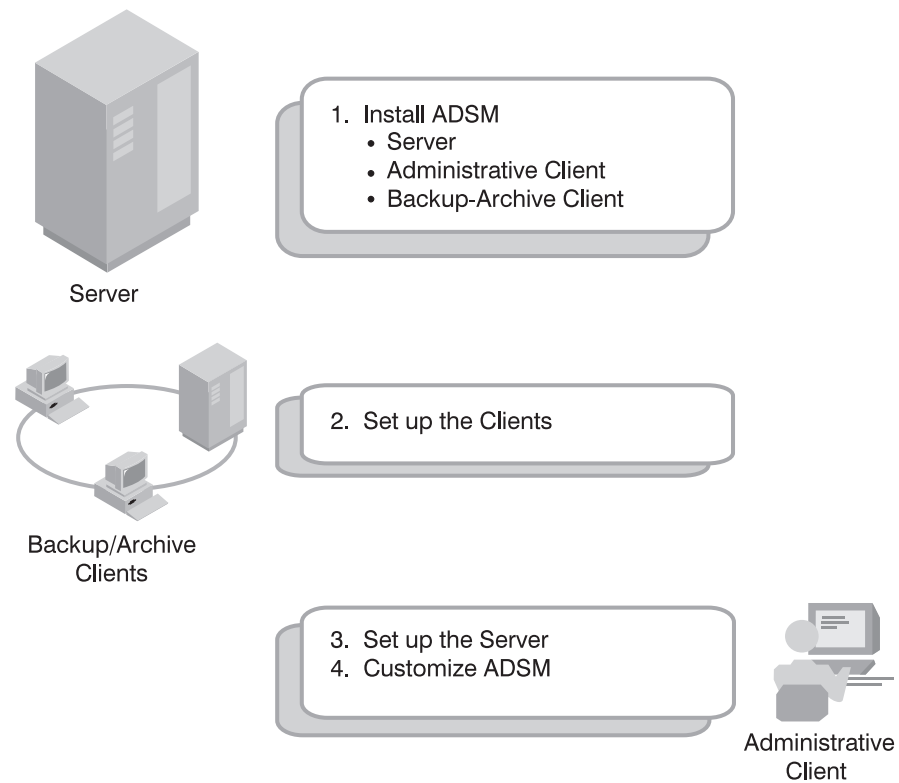
- One backup version of a file that has been deleted from the client's system is retained in server storage for 60 days.
- For archive operations:
 - Files are backed up to the default disk storage pool, ARCHIVEPOOL.
 - Files cannot be archived while they are being modified.
 - An archive copy is kept for up to 365 days.

Chapter 4, "Customizing Your ADSM System" on page 23 describes how to do following:

- Add manual tape devices and automatic tape libraries
- Add storage pools for tape volumes
- Arrange disk and tape storage pools in a hierarchy so that client data migrates from disk to tape based on criteria that you specify
- Create a new storage policy to meet the needs of a specific group of users in your installation
- Create an include/exclude list template that clients can use to exclude specified data from policy operations
- Define schedules to automate client operations such as backup and archive.
- Define schedules to automate commands issued from the administrative client.

Basic Tasks

The following figure presents an overview of the tasks of installing, setting up, and customizing ADSM.



The following list names each task and points to the details of the procedures:

- 1** Installing ADSM, which includes the server, one OS/2 administrative client and one OS/2 backup-archive client (page 1).
Information on installing additional clients can be found in *ADSM Installing the Clients*.
- 2** Setting up the OS/2 client (page 9)
- 3** Setting up the server (page 13)
 - a** Starting the server (page 13)
 - b** Starting an administrative client session (page 14)

- c** Stopping the server (page 15)
- d** Stopping an administrative client session (page 16)
- e** Creating additional database and recovery log volumes (page 16)
- f** Creating additional disk storage pool volumes (page 18)
- g** Registering ADSM licenses (page 20)
- h** Assigning administrators (page 20)
- i** Registering client nodes (page 21)
- j** Verifying server installation (page 7)

4 Customizing ADSM (page 23)

- a** Using tape devices with ADSM (page 23)
- b** Verifying storage management (page 31)
- c** Creating a new policy (page 33)
- d** Automating Client Operations (page 38)
- e** Automating Administrative Commands (page 41)

Advanced Tasks

To take greater advantage of the power of ADSM, you may want to perform other tasks described in the *ADSM Administrator's Guide*, including the following:

Server and storage pool protection

You can:

- Mirror your database and recovery log
- Back up your database and storage pools
- Recover lost or damaged database and storage pool data

Drives and libraries

You can:

- Add automated libraries to ADSM
- Support ADSM with your media management system

Storage Pools and Volumes

You can:

- Enhance your storage pool definitions
- Move files from one volume to another

Storage Policies

You can enhance your storage policy definitions to:

- Customize policies for groups of clients
- Provide clients on some platforms with space management services
- Provide additional functions to backup and archive services

Automation of Client Operations and Administrative commands

You can:

- Enhance your schedule definitions
- Optimize the timing of scheduled operations

Security

You can:

- Let clients access ADSM without requiring passwords
- Modify the password expiration interval
- Assign levels of administrator authority

Server Operations

You can monitor and control:

- Server processes
- Client sessions
- ADSM activity log
- ADSM accounting records

Server Data

You can copy all or part of the server data to removable media and transfer it to a second server.

Before You Continue

Here are some questions that you should answer before you start to install and customize your ADSM system:

- Which workstations in my network will require ADSM services and what communications method will they use to attach to the server?
- Who will I need to administer ADSM?
- What devices do I want to include in my ADSM system?
 - What are the device types of each?
 - What are the capacities of the device media?
 - Which devices are in automated libraries and which require operator intervention?

- What are the backup, archive, and space management needs of the ADSM users? Are there groups that have different needs? Within groups should some files be managed differently? For example:
 - How often should client files be backed up?
 - How many versions of client files should be retained?
 - How long should those versions be retained?
 - What types of data require quick access and what types do not?
- Which client operations do I want to automate and when should they be scheduled?
- Which administrative commands do I want to automate and when should they be scheduled?

ADSM Concepts

The rest of this section describes some basic ADSM concepts that can help you in your installation and customization. If you are already familiar with ADSM, you can go directly to Chapter 1, “Installing ADSTAR Distributed Storage Manager” on page 1.

How ADSM Can Change the Way You Work

This book introduces you to a different way of managing your data storage. ADSTAR Distributed Storage Manager (ADSM) provides centrally administered services based on a set of defined policies. Many services can be automated and scheduled to make the best use of your data processing resources.

After you tailor your ADSM system to the needs of your installation, it will run with a minimum of intervention from you. Your initial effort will be to define to ADSM the devices and media it has access to, the clients it will supply services to, the policies that will govern those services, and schedules for automating your operations.

The benefits of this effort include increasing your productivity, eliminating error-prone, repetitive tasks, and providing a flexible, consistent set of policies to govern many types of data owned by a wide variety of user groups.

This section introduces you to some ADSM concepts that will help you perform the tasks described in the rest of the book. It also includes an overview of those tasks and the more advanced tasks described in the ADSM Administrator’s Guide. Finally, this section provides some questions to consider when you are planning the installation and customization of ADSM.

System-Managed Storage

ADSTAR Distributed Storage Manager (ADSM) includes the following components:

Server

Provides ADSM services to client workstations. The server maintains a database and recovery log for ADSM resources, users, and user data.

Server Storage

Consists of storage pools of random and sequential access media. The storage pools contain files that are backed up, archived, and migrated from client nodes.

Server Utilities

Provides an interface to help configure the ADSM server.

Administrative client

Provides an interface for controlling the ADSM server.

Backup-archive client

Provides backup-restore and archive-retrieve services to workstations and file servers.

Hierarchical storage management (HSM) client

Provides space management services for workstations on some platforms.

Server Storage Migration

One goal of system-managed storage is to ensure the most efficient use of your storage resources. You can structure server storage into a hierarchy. You can then define criteria by which data is migrated from faster, more expensive storage pools (disk, for example) to slower, less expensive storage pools (tape, for example).

ADSM Policy

ADSM policy governs storage management, including:

Backup

Copying files from client workstations to server storage to ensure against loss of data. Copies of multiple versions of a file can be stored.

Archiving

Copying files from client workstations to server storage for long-term storage.

Space Management

Freeing client storage space by copying a file from client workstations to server storage. The original file is replaced with a much smaller file that points to the location of the original in server storage. This is also called **migration**.

Policy is defined by administrators in policy objects: policy domains, policy sets, management classes, and backup and archive copy groups.

Figure 1 on page xvi shows an overview of the ADSM process for storing client data.

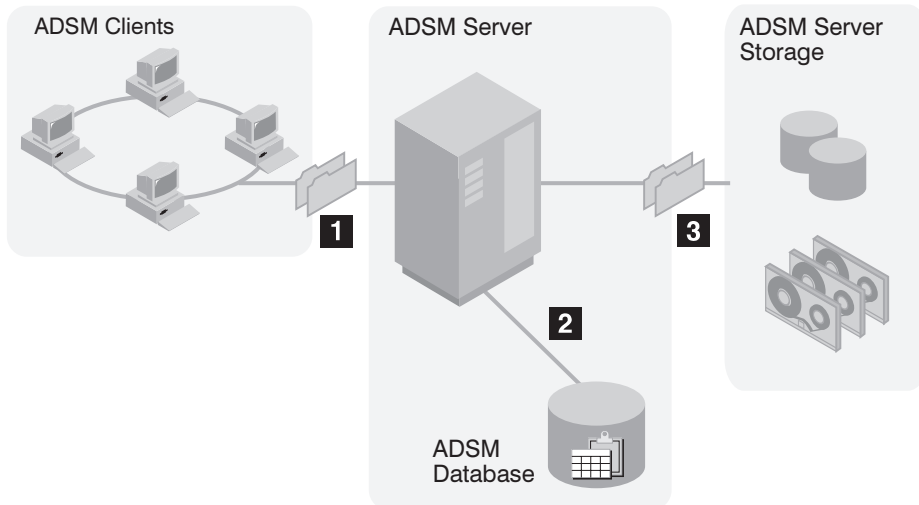


Figure 1. Overview of How ADSM Stores Client Data

When clients back up, archive, or migrate files, ADSM:

1 Determines where to store the file

ADSM checks the management class bound to the file to determine the destination of the file, that is, where the file should be stored. A destination might be a group of disk or tape volumes. These groups of volumes are called storage pools. Copy groups, which are within management classes, specify destinations for backed up and archived files. Management classes specify destinations for space-managed files.

2 Stores information about the file in the ADSM database

ADSM saves information in the database about each file in server storage. For example, ADSM saves the name and location of the file.

3 Stores the file in ADSM server storage

ADSM stores the client files in disk or tape storage pools.

Figure 2 on page xvii shows the interaction between ADSM policy objects and ADSM backup, archive, and space management services.

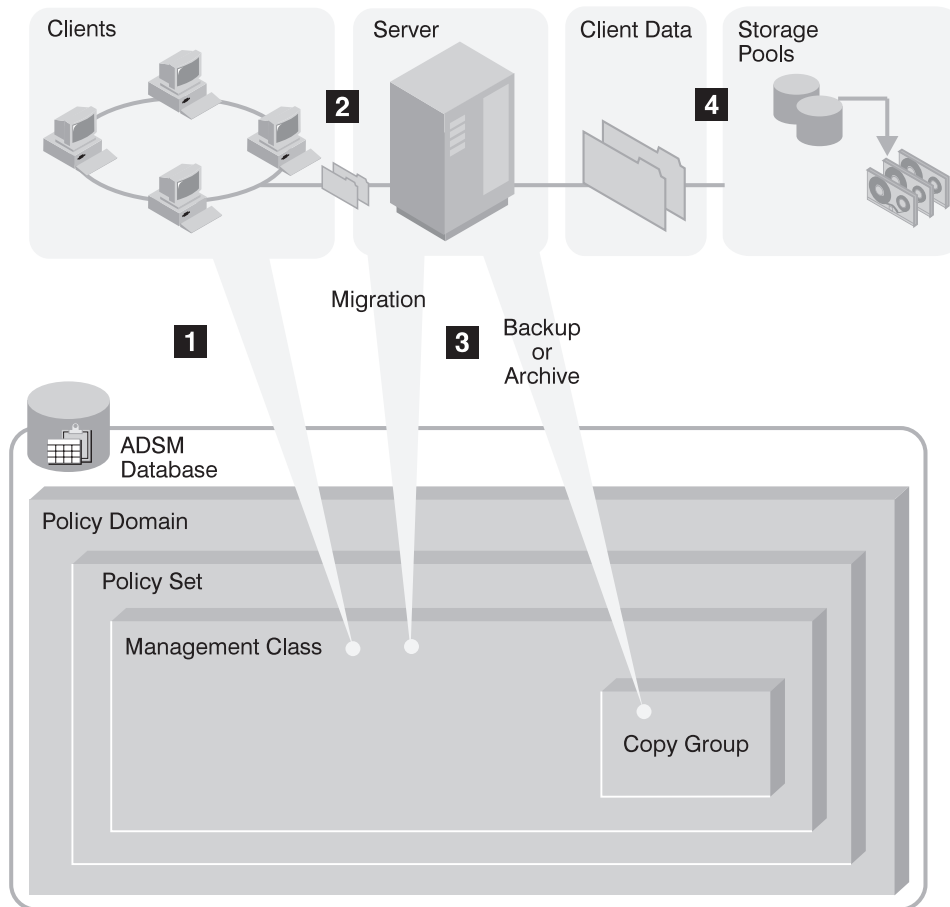


Figure 2. How ADSM Controls Backup, Archive, and Space Management

- 1** An ADSM client backs up, archives, or migrates a file. The file is bound to either the default management class or a management class specified in the client's include-exclude list.
- 2** If, according to the management class, the file is eligible for backup, archive, or space management, the client sends the file and file information to the server.
- 3** The server checks the management class or copy group to determine where in server storage to store the file initially.
- 4** The server stores the file in the appropriate storage pool and information about the file in the database.

When files in server storage are migrated from one pool to another, the server updates the file information in the database.

Expiration

Files remain in server storage until they expire and expiration processing occurs. A file expires based on criteria set in ADSM policy. For example, backup policy may specify that up to two backup versions of a file can be kept in server storage. If a third backup version of a file is created, the oldest version in server storage expires. Backup policy may also specify that if a file is deleted from a client file system, it expires after 60 days.

During expiration processing, ADSM deletes from the database those files that have expired.

Storage Devices and Media

ADSM represents physical storage devices and media with the following administrator-defined storage objects:

- Device class
- Library
- Drive
- Storage pool
- Storage volume

Device Class

Each device is associated with a device class that specifies the device type and how the device manages its media. ADSM has a predefined device class (DISK) for random access devices. Administrators can also define device classes for sequential access devices, such as 8mm tape drives. If the sequential device is a tape drive, the device class is associated with a library and a drive.

Library

An ADSM library is an administrator-defined collection of one or more drives (and possibly robotic devices) that share similar media mounting requirements.

Drive

Each drive mechanism within a tape device is represented by an ADSM drive. For devices with multiple drives, including automated libraries, each drive is separately defined to ADSM.

Storage Pools

A storage pool is a named collection of storage volumes that are associated with one device class. Each storage pool represents a collection of volumes sharing the same media type. For example, an 8mm tape storage pool contains only 8mm tape volumes.

Storage Pool Volumes

A storage pool volume is associated with a specific storage pool and represents a unit of space available for ADSM client data.

Figure 3 summarizes the relationships among the physical device environment, ADSM storage objects, and ADSM clients. The numbers below correspond to the numbers in the figure.

- 1** When clients are registered, they are associated with a policy domain. Within the policy domain are the other ADSM policy objects.
- 2**, **3**
When a file is backed up, archived, or migrated from a client, it is bound to a management class. A management class and the backup and archive copy groups within it specify where files are stored and how they are managed when they are backed up, archived, or migrated from a client (space-managed files).
- 4**, **5**
Storage pools are the destinations for backed up, archived, or space-managed files. Copy groups specify storage pools for backed up or archived files. Management classes specify storage pools for space-managed files.

Storage pools are mapped to device classes, which represent devices. The storage pool contains volumes as indicated in the device type associated with the device class. For example, a storage pool that is mapped to a device class with a device type of 8MM contains only 8mm tapes.

All devices require a device class that specifies a device type. Tape devices also require a library and drive for management of media, including the mounting of that media.
- 6** Files that are initially stored on disk storage pools can migrate to tape storage pools if the pools are set up in a storage hierarchy.

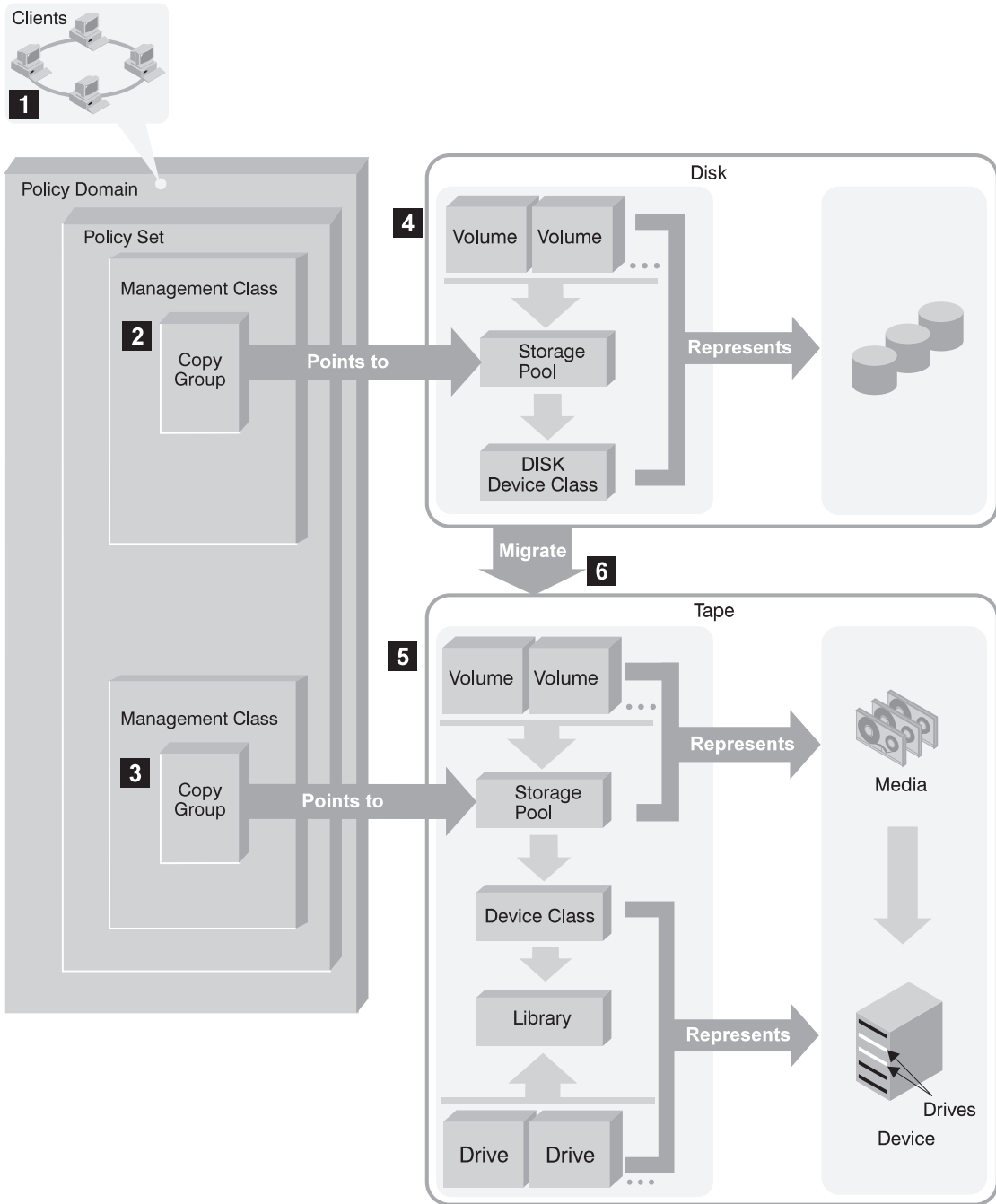


Figure 3. Putting it All Together

Automating Client Operations

You can automate client operations, such as backup and archive. Figure 4 on page xxii shows the ADSM objects that may be involved in automated client operations. They are:

Include-exclude criteria on each ADSM client

Determines which files are backed up, archived, or space-managed, and binds files to management classes

Management class

Determines where client files are stored and how they are managed

Schedule

Determines when client operations such as backup occur

Association defined between client and schedule

Determines which schedules are run for a client

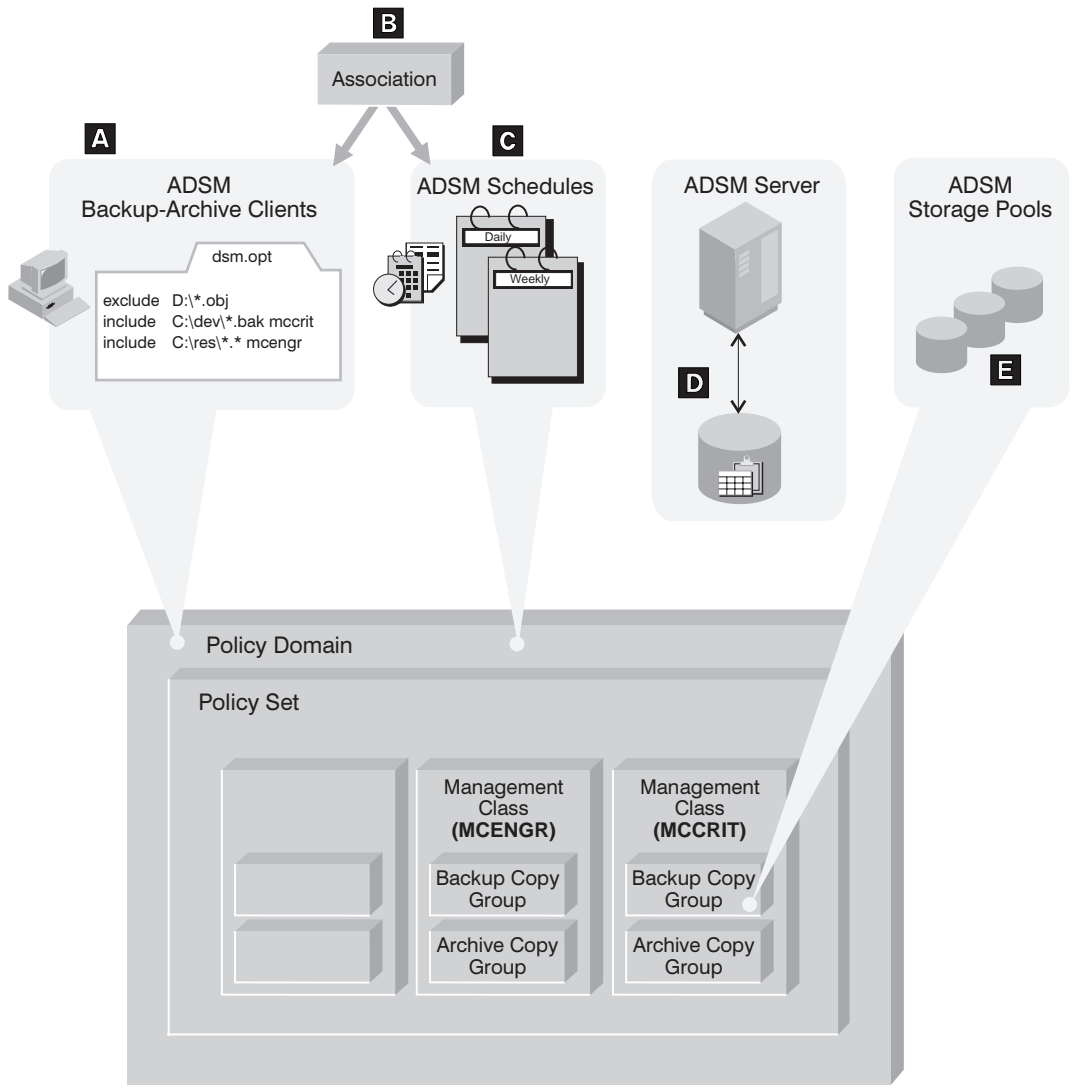


Figure 4. Automating Client Operations

The client can specify a management class for a file or set of files, or can use the default management class for the policy domain. The client specifies a management class by using an INCLUDE option in the client's include-exclude list or file. (See **A** in Figure 4 on page xxii.)

The management class contains information that determines how ADSM handles files that clients backup, archive, or migrate. For example, the management class contains the backup copy group and the archive copy group. Each copy group points to a *destination*, a storage pool where files are stored when they are backed up or archived. (See **E** in Figure 4 on page xxii.)

Clients are assigned to a policy domain when they are registered. Schedules that can automate client operations are also associated with a policy domain. (See **C** in Figure 4 on page xxii.) To automate client operations, you define schedules for a domain. Then you define associations between schedules and clients in the same domain. (See **B** in Figure 4 on page xxii.)

For a schedule to work on a particular client, the client machine must be turned on and must be running the client scheduler.

The scheduled client operations are called *events*, and information about events are stored in the ADSM database. (See **D** in Figure 4 on page xxii.) For example, you can query the server to determine which scheduled events completed successfully and which failed.

Chapter 1. Installing ADSTAR Distributed Storage Manager

When you install ADSM, you install the following components:

- The ADSM server
- One administrative client, named **admin**
- One backup-archive client, named **client**

Before You Install



- Ensure that you have an appropriately configured 80386 or higher machine with at least 70MB of free disk storage and 12MB of memory.
- Ensure that your OS/2 system has REXX and WARP 3.0 or later installed.
- Ensure that the ADSM server is halted before installing the Version 2 code.
- Ensure that you have a CD-ROM device available for installation.
- If you are installing ADSM over a previous ADSM for OS/2 server code, the basic installation automatically dumps the existing database, installs the new code, and performs the DSMSERV UPGRADEDB command. The database and log files remain in the ADSM Version 1 server directory. If you want to delete ADSM Version 1 from your system, use the ADSM Version 1 installation program to do so.

This installation creates a new folder on your desktop for ADSM Version 2 server. Your Version 1 folder remains on your desktop. If you had a previous version of ADSM Version 2, this Version 2 installation overrides the previous folder.

Notes:

1. The default installation directory for the ADSM Version 2 server is **ADSMV2**.
2. The ADSM for OS/2 installation program includes the ADSM Utilities, the OS/2 client, and the Lotus Notes Backup Agent.

Installing the ADSM Server Program

Use this procedure to install the ADSM server program on OS/2.

- 1** Insert the CD into a CD-ROM drive. (In this example, the H drive is used.)

2 Read the **readme.1st** file in the CD-ROM directory **h:\server** before you install ADSM.

3 Enter the following command:



4 Click on **Continue** after reading this instruction screen:

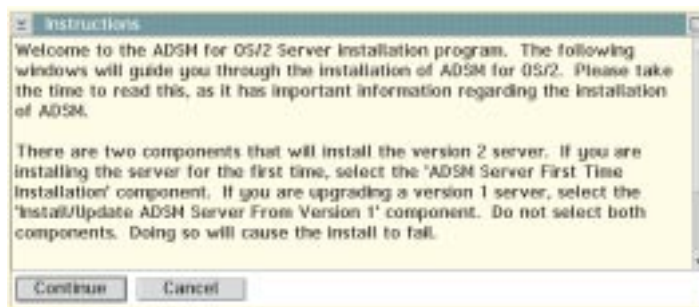


Figure 5. Instruction Screen

5 Click on **OK** at this screen.

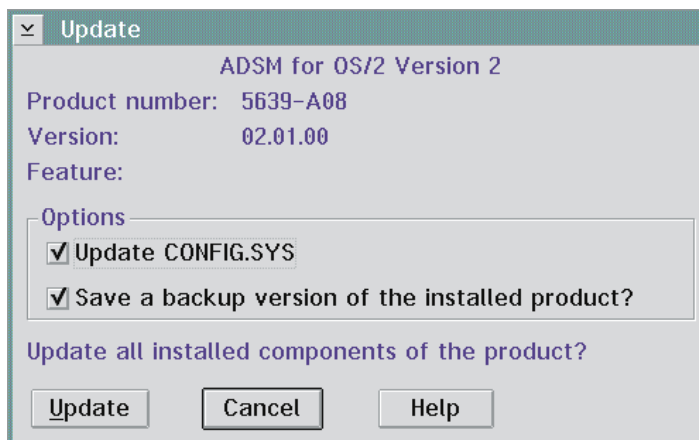


Figure 6. Update CONFIG.SYS

Note: If you decide to not automate the CONFIG.SYS update, the installation automatically places a file called CONFIG.ADD in the root directory on

the drive from which OS/2 was booted. See Appendix B, "CONFIG.SYS Updates and Installation Return Codes" on page 69 for more information.

6 Mark your selections for installation from the following screen:



DO NOT select ADSM Server First Time Installation AND Install/Update ADSM Server from Version 1 simultaneously because these are two separate installation programs. **Selecting both causes the installation to fail.**

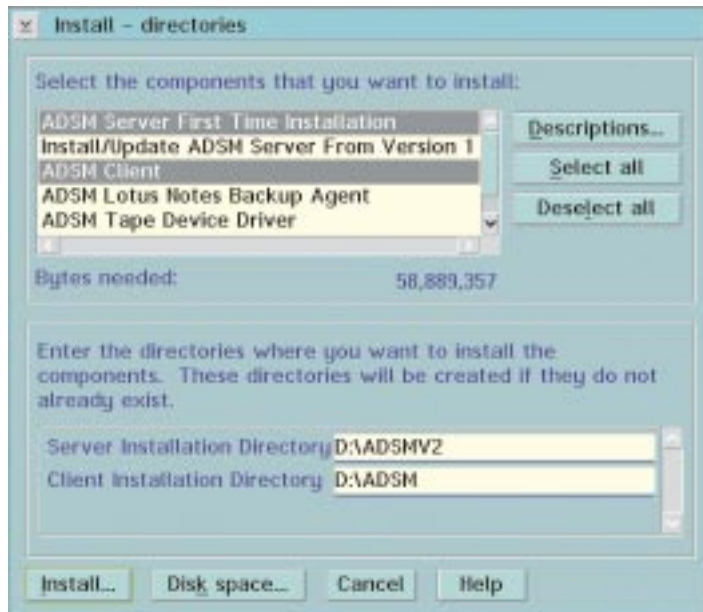


Figure 7. Installation Screen

The example shown here shows selections for an initial ADSM server and ADSM client installation.

Here is a brief description of the installation selections:

- **ADSM Server First Time Installation**

Use this selection if you do not have a Version 1 ADSM server installed.

- **Install/Update ADSM Server from Version 1**

When you choose this component, the installation program attempts to perform a DUMPDB on the database used by your Version 1 server. This

is done because the installation program performs an UPGRADEDB on the Version 1 database. Dumping the Version 1 database allows you to restore the database back to a Version 1 level if required. The DUMPDB process dumps the database to the disk and directory in which you have the Version 1 server installed.

The amount of space required is dependent on the size of the Version 1 database and the number of pages that are in use. To determine the number of pages in use, perform a QUERY DB command from the server console and look at the "Used Pages" column. To approximate the disk space required to perform the DUMPDB multiply the pages used by 4096. This results in a very conservative estimate.

If the required space cannot be made available on the disk, you should perform the database dump as specified in *ADSM Administrator's Reference* (see DSMSERV DUMPDB). You can then install the Version 2 server by selecting the "ADSM Server First Time Installation" component. Following the steps below allows you to use the Version 1 database and recovery log files with the Version 2 server:

- a. Open an OS/2 window and change to the Version 2 server drive and directory.
- b. Delete the following files:
 - log.dsm
 - db1.dsm
 - backup1
 - archive1
 - dsmserv.opt
 - dsmserv.dsk
- c. Copy the following files from the Version 1 server directory:
 - dsmserv.opt
 - dsmserv.dsk
- d. Issue DSMSERV UPGRADEDB from the OS/2 command prompt.

- **ADSM Client**

This selection installs the ADSM administrative and backup-archive clients.

- **Lotus Notes Backup Agent**

The ADSM Client selection must be installed or selected for installation to install the Lotus Notes Backup Agent. See *ADSM Using the Lotus Notes Backup Agent* for additional information.

- **ADSM Tape Device Driver**

This component installs the ADSM tape device drivers. Select this component when you have a SCSI card and a tape device that is supported by ADSM attached to your machine.

- **Autochanger Device Driver**

This component installs the autochanger device driver. This component requires that the tape device driver component is installed or selected for installation.

- 7 Click on **Disk space** for the bytes available for drives and select the directory for installation. In this example, we are using D:\ADSMV2 for the server files and D:\ADSM for the client files.



- Do not install the Version 2 server into the same directory as the Version 1 server.
 - After installation, your directory choice cannot be changed if you return to add an additional component.
-

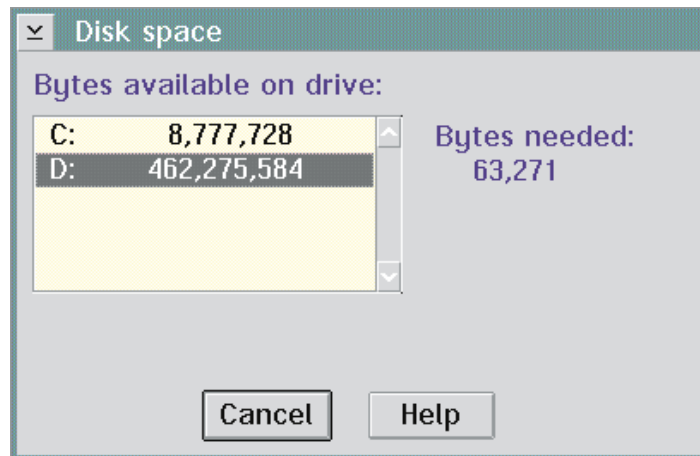


Figure 8. Disk Space Screen

- 8 Click on **OK**. This returns you to the installation screen.
- 9 Click on **Install**.
Progress screens appear with the installation data.
- 10 Exit from the installation screens when the installation completes.
- 11 Reboot your system (Ctrl–Alt–Delete) to have your updated CONFIG.SYS file changes take effect. If you chose NOT to have the installation program update the CONFIG.SYS file for you, make the changes now and reboot your system.

Two icons appear on your desktop for this example, one folder labeled **ADSM for OS/2 Server V2R1** (Figure 9 on page 6), and one folder labeled **ADSM Client** (Figure 10 on page 6).

Double-click on the icons to view the folders' contents. Most of the icons are self-explanatory (for example, double-click on the **Server** to start the server). The **adsm.htm** icon gets you to hints, tips, and maintenance through the Web Browser.



Figure 9. Server Folder Icons



Figure 10. Client Folder Icons

12 Read the **readme.1st** in the server folder and the **README** in the client folder for the latest product updates and licensing information.

13 Double-click on **ADSM Server** in the server folder to initialize the server.

14 Your installation is complete.

The installation program:

- Installed the necessary files for server operation.
- Registered one client node named CLIENT with a password of CLIENT.
- Registered one administrative node named ADMIN with a password of ADMIN.
- Created and defined a 15MB backup storage pool called BACKUP1.
- Created and defined a 6MB archive storage pool called ARCHIVE1.
- Created a 13MB recovery log called LOG.DSM.
- Created a 5MB database called DB1.DSM.
- Created a dsmserv.dsk file that contains database and recovery log information in your **\ADSMV2** directory.

See the *ADSM Administrator's Reference* for instructions on installing additional ADSM servers on an OS/2 system with the DSMSEV INSTALL command.

Verifying Your Installation

If you selected the client component, you can now verify the installation by doing the following:

- 1 Start the backup-archive client command line or GUI. When you start the backup-archive client, you must enter a node name and password. The defaults for the backup-archive client created at ADSM installation are:

Name *client*
Password *client*

There are two ways to start the **backup-archive client GUI**.

- Double-click on the backup-archive GUI icon:



- Issue the following command:



`start dsm`

To start the command line interface, issue the following command:



`dsmc`

- 2 Back up several files.



A drive must be labeled before files on that drive can be backed up.

For example, to back up all the files in the **c:\devel** directory that begin with **proj**, do the following:



`dsmc selective c:\devel\proj*.*`



END USER

1. From the **Drives for Backup/Archive** section of the **Drive Information**, select drive c: by clicking on the drive (you can also deselect a drive by clicking on it)
2. Click on **ADSM**
3. Click on **Backup, File specification** from the pull-down menu
4. From the **Backup by File Specification** window, enter **c:\devel\proj*.***
5. Click on the **List Files** push button to see the selected files
6. Click on the files you want from this list, or click on the **Select All** push button
7. Click on **Backup** push button
8. You will receive a message indicating if the backup has completed successfully.

Chapter 2. Setting Up ADSM for OS/2 Clients

This chapter describes setting up the ADSM for OS/2 client and provides some information on setting client communications options. The OS/2 administrative and backup-archive clients are installed when you select **ADSM Client** from the Installation Screen (see Figure 7 on page 3).

To install ADSM for clients on other workstations, see *ADSM Installing the Clients*.

Minimum Requirements

- OS/2 2.0 or later
- Intel 80386 or higher hardware platform
- 10MB disk storage with 12MB of memory

For information about installing clients other than the OS/2 administrative and backup-archive client, see *ADSM Installing the Clients*.

Updating the CONFIG.SYS File

If you do not allow the installation program to update your CONFIG.SYS (see Figure 6 on page 2), ADSM creates a CONFIG.ADD file in the root directory during the installation. This CONFIG.ADD file contains all of your CONFIG.SYS entries plus the changes that would have been made to the file if you had chosen to update during the installation.

After reviewing the CONFIG.ADD file, you can rename your original CONFIG.SYS file to another name, and rename CONFIG.ADD to CONFIG.SYS.

See "Client CONFIG.SYS Updates" on page 70 for client CONFIG.SYS statements.

Updating the Client Options File

The client user options file identifies the servers you can connect to and specifies the communication method and associated options.

The installation program creates DSM.OPT and DSM.SMP files for you. Use the DSM.SMP file as a sample when updating your DSM.OPT files.

Note: Read the OPTIONS.DOC file in the ADSM client folder on your desktop before updating your own options file, and refer to it as necessary.

To update your client options file:



Change the current directory to **d:\adsm** (or where you installed the ADSM client) and enter:

```
e dsm.opt
```

OS/2 System

1. Double-click on **Drives**
2. Click on **D:** (or where you installed the ADSM client)
3. Click on the **ADSM folder**
4. Click on the **DSM.OPT** folder.
5. Type your updates (communication method and node name required). Read “ADSM for OS/2 Client Communications Options” on page 10, “Your Node Name” on page 11, and “Your Include-Exclude List” on page 11.

Use the DSM.SMP folder to assist you in your updates.
6. Close your folders.

Note: The (*) is a comment character in your options file. Removing it from the beginning of the line activates that line.

ADSM for OS/2 Client Communications Options

ADSM for OS/2 clients use the communication methods shown here to communicate with the server: See Appendix A, “Configuring Server and Client Communications” on page 45 for communications information.

Table 1. Supported Communication Methods for Administrative Clients

Communication Method	Supported Clients	Servers
SNALU6.2 (APPC) See Note 1	AIX, MVS TSO, OpenEdition MVS, OS/2, VM CMS	AIX, AS/400, MVS, OS/2, VM, VSE
TCPIP	AIX, AT&T UNIX, Bull DPX/2, Digital UNIX, DEC ULTRIX, DOS, HP-UX, NEW EWS-UX/V, MVS TSO, OpenEdition MVS, OS/2, SCO UNIX 386/Open Desktop, Sequent PTX, Siemens Nixdorf SINIX, Silicon Graphics IRIX, Sun Microsystems SunOS or Sun Solaris, VM CMS, Windows, Windows 32-bit	AIX, AS/400, HP-UX, MVS, OS/2, Sun Microsystems Sun Solaris, VM, Windows NT
NETBIOS	DOS, OS/2, Windows, Windows 32-bit	AIX, OS/2, Windows NT
IPXSPX	DOS, OS/2, Windows, Windows 32-bit	AIX, OS/2, Windows NT
SHARED MEMORY See Note 2	OS/2, AIX	OS/2, AIX
NAMED PIPES See Note 2	OS/2, Windows 32-bit	OS/2, Windows NT

Note:

1. Application programs communicate with each other using a layer of SNA called advanced program-to-program communication (APPC), which is also known as LU6.2.
2. Shared Memory and Named Pipes are only available when the client and server are on the same system.

See *ADSM Installing the Clients* for additional information.

Your Node Name

Use the NODENAME option in the dsm.opt file to indicate the name of your node so that you can register with the ADSM server.

If your installation uses closed registration, the ADSM administrator must register you with the server and may select a name for you to use. See "Registering Additional Backup-Archive Client Nodes" on page 21 for the procedure to name your node.

If your installation uses open registration, you can register your node with the server and choose your own name. See *Using the OS/2 Client* for information on open registration.

NODENAME	CLIENT
----------	--------

Figure 11. Example of NODENAME in Client Options File

Your Include-Exclude List

An include-exclude list contains statements that identify any files that you want to specifically include or exclude from backup services.

This list is included in the **dsm.opt** file and is recommended for recovery purposes. Refer to *Using the OS/2 Client* for more information.

If you do not have an include-exclude list, ADSM considers all files for backup services and uses the default management class. Figure 12 shows an example of an OS/2 include-exclude list.

```
exclude ?:\...\swapper.dat
exclude ":\ea data. sf"
exclude c:\ibmbio.com
exclude c:\os2ldr
exclude c:\oskrnl
exclude ?:\ibmdos.com
exclude ?:\msdos.sys
exclude ?:\io.sys
exclude ?:\...\spart.par
exclude ?:\...\386spart.par
```

Figure 12. Example of OS/2 Include-Exclude List

For more information on the include-exclude list, see "Creating a Client Include-Exclude List" on page 37.

Chapter 3. Setting Up the Server

This section describes how to set up and start your server.

Here are some ADSM terms in this chapter:

- archive** To copy a file to a storage pool for long-term storage.
- client node** A file server or workstation on which the backup-archive client program has been installed, which has been registered to the server.
- incremental backup** A backup of client files or directories that are new or have changed since the last incremental backup. An incremental backup is governed by policies specified in the management class associated with the file.
- selective backup** A back up of specific client files or directories.
- storage pool** A named set of volumes for storing client data.

Starting the Server

The ADSM server must be running before any client can connect. There are several ways to start the server:

- Issue the following command:



`dsmserv`

- From the ADSM for OS/2 Server folder on your desktop, double-click on the **ADSM Server** icon.

You can now issue commands from the server console, or you can work from the OS/2 administrative client GUI or command line.



If you selected the “Install/Update ADSM Server from Version 1” component, you may get this error message when you start the server:

```
ANR0902W: Unsupported keyword found in file dsmserv.opt
Line No. 63:
Statement: LICense 10 0 Error: | .....
```

You receive this error because the Version 1 options file is copied to the Version 2 directory. Remove the license statement from the options file to prevent this message from appearing.

Starting the OS/2 Administrative Client

This section describes how to start the OS/2 administrative client. For information on starting all other clients, see the *ADSM Installing the Clients*.

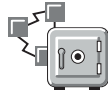
When you start the administrative client, you must enter an administrator name and password. The defaults for the administrator client created at ADSM installation are:

Name *admin*
Password *admin*

To change these values see “Changing the Administrative Client Password” on page 15.

1 There are two ways to start the OS/2 administrative client GUI.

- Double-click on the administrative GUI icon:



- Issue the following command:



2 To start the OS/2 administrative client command line interface, issue the following command:





The command line examples in this book are for the OS/2 administrative client. OS/2 requires continuation characters when a command is on more than one line. Other clients may not accept continuation characters. Check the requirements for your command line client.

You can perform most tasks from either the command line or the GUI (for example, registering client nodes). The description of these tasks includes both command line and GUI; choose whichever one is more convenient for you. You can perform some tasks only from the command line (for example, defining libraries). For information about the administrative client interfaces, see Appendix D, “Using ADSM Administrative Interfaces” on page 77.

Changing the Administrative Client Password

If you wish, you can change the password of the administrative client (ADMIN) at this point. To change the password to TUCSON, for example, do the following:



```
update admin admin tucson
```



1. Double click on **Administrators**
2. From the list of administrator names, click on ADMIN
3. Click on **Selected**
4. Click on **Open as properties** from the pull-down menu
5. Click on the **Password** tab
6. Enter the following:
New password TUCSON
Reenter new password TUCSON
7. Click on the **Apply** push button

Stopping the Server

You can halt the server without warning if an unexpected problem requires you to return control to the operating system. To avoid losing administrative and client node connections, stop the server only after current sessions have completed or been canceled.



For most tasks in this book, your server must be running. This procedure is explained here only if an unusual situation requires that you stop the server.

To stop the server, do one of the following:



halt



1. Double click on **Server**
2. Click on **Server** from the menu bar
3. Click on **Halt** from the pull down menu

This shuts down the server immediately and cancels all client sessions, even if activity has not completed.

Ending an Administrative Client Session

To end an administrative client session do one of the following:



From a command line client in interactive mode:

quit



From a GUI client, one of the following:

- Double click on the system menu symbol

OR

- Click on the system menu symbol, and click on **Close** from the pull down menu

Creating Additional Database and Recovery Log Volumes

At installation, a 5MB database volume (db1.dsm) and a 13MB recovery log volume (log.dsm) are created. The database size is largely determined by the number of client files being stored on server storage. The database should be at least large enough to hold one day's worth of client backups. As you add clients, you may need to increase your database size. The recovery log size may need to be increased depending on the current utilization.

To increase the size of the database or recovery log, do the following:

- 1** Format the database and recovery log volumes.



1. From the ADSM Utilities window, double click on the **Volume Formatter** icon.
2. From the ADSM Volume Formatting window, complete the required information. For example to format a 5MB database volume enter the following:

Path	d:\adsmv2\
File	DB2.DSM
File type	Database
Units	MB
Size	5
3. Click on the **Add** push button.
4. Click on the **Begin Processing** push button.
5. Repeat the same process to format a recovery log volume.

- 2** From an administrative client, define the database and recovery log volumes. For example, to define volumes DB2.DSM and LOG2.DSM, use either the command line or the GUI:



```
define dbvo1 db2.dsm  
define logvo1 log2.dsm
```



Define the database volume:

1. Expand **Database**
2. Double click on **Database Volumes**
3. Click on **Edit** from the menu bar
4. Click on **Add Volume** from the pull down menu
5. Enter the following:
Mirrored volumes
Volume 1 DB2.DSM
6. Select **Show Extend window next** check box
7. Click on the **Add** push button
8. Click on **Extend** push button

Define the recovery log volume:

1. Expand **Recovery Log**
2. Double click on **Recovery Log Volumes**
3. Click on **Edit** from the menu bar
4. Click on **Add Volume** from the pull down menu
5. Enter the following:
Mirrored volumes
Volume 1 log2.dsm
6. Select **Show Extend window next** check box
7. Click on the **Add** push button
8. Click on **Extend** push button

Creating Additional Disk Storage Pool Volumes

At server installation, three default disk storage pools are created: BACKUPPOOL, ARCHIVEPOOL, and SPACEMGPOOL. BACKUPPOOL contains one 15MB volume (BACKUP1.DSM), and ARCHIVEPOOL contains one 6MB volume (ARCHIVE1.DSM). To increase the size of BACKUPPOOL and ARCHIVEPOOL, do the following:

- 1** Format the volumes:



1. From the ADSM Utilities window, double click on the **Volume Formatter** icon.
2. From the ADSM Volume Formatting window, complete the required information. For example, to format two 4MB storage pool volumes named BACKUP2 and ARCHIVE2, enter the following:

Path	d:\adsmv2\
File	backup2
File type	Repository
Units	MB
Size	4
3. Click on the **Add** push button.
4. Click on the **Begin Processing** push button.
5. Repeat the same process to format ARCHIVE2.

- 2** From an administrative client, define each of the volumes to the storage pools. For example, to define volumes BACKUP2 and ARCHIVE2, use either the command line or the GUI:



```
define volume backuppool backup2
```

```
define volume archivepool archive2
```



1. Expand **Storage Pools**
2. Double click on **Storage Pool Volumes**
3. Click on **Edit** from the menu bar
4. Click on **Add** from the pull down menu
5. Enter the following:

Storage pool	BACKUPPOOL
Volume name	BACKUP2
6. Click on the **Add** push button, which also returns you to the **Storage Pool Volumes** menu
7. Click on **Edit** from the menu bar
8. Click on **Add** from the pull down menu
9. Enter the following:

Storage pool	ARCHIVEPOOL
Volume name	ARCHIVE2
10. Click on the **Add** push button

Registering Your ADSM Licenses

When you install ADSM for OS/2, your system is licensed for the base ADSM support, which provides the following:


- An unlimited number of administrative clients
- One DESKTOP backup-archive client
- Removable media devices not in automated libraries

Note: For current information about supported devices, check with your authorized reseller. You can also call the IBM Information Support Center at 1-800-IBM-3333 and ask for STAR 20, or you can send an E-mail note to askibm-rsvp@info.ibm.com with STAR 20 in the body of the note.

License certificate files are included with your server package in the server installation directory. Each license certificate file licenses the server for a single option or feature. The file names are:

1CLIENT.LIC	1 backup-archive client
10CLIENT.LIC	10 backup-archive clients
50CLIENT.LIC	50 backup-archive clients
NETWORK.LIC	Clients requiring a communications method other than Shared Memory or Named Pipes
DESKTOP.LIC	Desktop clients (Windows, Apple, Novell NetWare, and DOS)
UNIX.LIC	Unix clients
SPACEMAN.LIC	Space management feature
DEVM2TO3.LIC	Upgrade from Device Module 2 to 3
DEVM3TO4.LIC	Upgrade from Device Module 3 to 4
DEVMOD3.LIC	Device Module 3
DEVMOD4.LIC	Device Module 4

To register any ADSM licenses beyond the base support, issue the REGISTER LICENSE command to read in a license certificate file. For example, to read in the files that license a total of 50 clients, add the UNIX environment to your base DESKTOP environment, and allow attaching devices in Device Support Module 3, issue the following commands:

```
register license file(50clients.lic)
register license file(unix.lic)
register license file(network.lic)
register license file(devmod3.lic)
```

Assigning Additional Administrators

If you have installed any additional administrative clients, you should register them and grant an authority level to each. For details about the other authority levels, see the *ADSM Administrator's Guide*.



The name SERVER_CONSOLE cannot be used by another administrator.

For example, register an administrator with a user ID of MARK and a password of MISSOURI and grant system authority.



```
register admin mark missouri  
grant authority mark classes=system
```



1. Double click on **Administrators**
2. Click on **Edit** from the menu bar
3. Click on **Add** from the pull-down menu
4. In the **Administrator name** field, enter MARK.
5. Click on the **Privilege** tab, and in the **Privilege class** field, click on the SYSTEM radio button
6. Click on the **Password** tab, and in the **Password** and **Reenter password** fields, enter MISSOURI
7. Click on the **Add** push button

Registering Additional Backup-Archive Client Nodes

You are now ready to register any additional backup-archive clients that you have installed. For example, register a node named MERCEDES with the password MONTANA.



```
register node mercedes montana
```



1. Double click on **Nodes**
2. Click on **Edit** from the menu bar
3. Click on **Add** from the pull down menu
4. Enter the following:

Node name	MERCEDES
------------------	----------
5. Click on the **Password** tab, and enter the following:

Password	MONTANA
Reenter password	MONTANA
6. Click on the **Add** push button

Chapter 4. Customizing Your ADSM System

At this point you have installed, set up, and started the ADSM server, and one or more administrative clients and backup-archive clients. This chapter describes customizing ADSM by doing the following:

- Adding tape drives to your ADSM system
- Automating some client operations and administrative commands

The customization described here still does not take advantage of all the options available to you as an ADSM administrator. However, it does provide a flexible, powerful ADSM system that can meet most customers' needs.



The ADSM server must be running to perform the tasks described here. Start the server if it is not running (see "Starting the Server" on page 13 for the procedure).

Here are some ADSM terms that you will find in this chapter:

collocation	A process by which the server attempts to keep all files belonging to a client on a minimal number of tape volumes.
device class	A group of storage devices of the same type, for example, disk or cartridge.
expiration	The process by which files in server storage are marked for deletion because their retention period has passed.
library	A collection of one or more drives with similar mount mechanisms. For ADSM to use it, a device must be assigned to a library. There are two types of libraries: manual Volumes are loaded by a human operator. automated Volumes are loaded by a robotic autochanger device.
validation	The process of ensuring that the active policy set contains a default management class and reporting on copy group definition errors.

Using Tape Devices with ADSM

Before you can use tape with ADSM, you must do the following:

1. Determine the device names
2. Define the following: a library for the drives, the drives, a device class, and a storage pool associated with the device class
3. Include the storage pool in your hierarchy

To perform these tasks you use the ADSM Utilities, the administrative command line and, the administrative GUI.

This section describes the following tasks on the pages indicated:

Task	Page
Start the device drivers	25
Determine the device names	26
Add a manual tape library	26
Add an automatic tape library	27
Prepare tape volumes for use	28
Verify the use of the tape devices.	31

If you want to use a tape management system with ADSM see the *ADSM Administrator's Guide* for details.

The examples in this section set up the following configuration:

- A manual library consisting of two IBM 3532-023 (8200) 8mm tape drives
- An Exabyte EXB-210 8mm automatic tape library with two drives
- A tape storage pool associated with these libraries. All the ADSM disk storage pools migrate data to this tape storage pool.



Here are some concepts that can help you to set up your tape environment:

Storage pool migration

To prevent disk storage pools from becoming filled with client data, you can specify that client data be automatically migrated to the tape storage pool.

A disk's *high migration threshold* (default value: 90%) determines when data is migrated. The *low migration threshold* (default value: 70%) Determines when migration stops. Thus data migration from the default backup disk storage pool begins when the pool is 90% full and continues until it is at 70% full or less.

Another default is to cache data (leave the data on the storage pool) even after the data has been migrated. Cached data stays on disk for quick access until the space is needed for new data.

See *ADSM Administrator's Guide* for details.

Mount limit

Mount limit (the number of drives available in a device class) has a default value of 1. The mount limit should be equal to the number of drives of the same type in that library.



Here are some concepts that can help you to set up your tape environment:

Scratch volumes

A scratch volume is a volume that is available for ADSM use. The volume is labeled, is either blank or contains no valid data, and is not defined to ADSM. You can specify the number of scratch volumes that ADSM can request for this pool (MAXSCRATCH parameter in the command or the **Maximum scratch volumes** field in the GUI). If you do not specify a value, no scratch volumes can be requested, and you must define each volume to be used.

Collocation

Collocation is turned off by default. Once clients begin storing data in a storage pool with collocation off, you cannot easily change the data in the storage pool so that it is collocated. To understand the advantages and disadvantages of collocation, see the *ADSM Administrator's Guide*.

Setting Up Devices

Ensure that your devices are physically attached to your system according to the manufacturer's instructions. Two ADSM device drivers are installed on your system as part of the server installation and must be used for all devices:

ADSMTAPE For tape devices

ADSMAUTO For automatic library devices

The drivers are started when you start OS/2. The devices must be powered on for OS/2 recognize them.

Determining Device Names

Determine the device names of your tape drives and autochangers. ADSM device names must be in the format TAPEyz\$. (for tape drives) or AUTOyz\$. (for automated libraries) where,

y The number of the SCSI adapter

z The number of the SCSI ID

For example, tape01\$ represents the tape drive with SCSI adapter 0 at SCSI ID 3.

The SCSI Device Detector utility searches for connected devices and displays information about them:



1. Double click on the ADSM Utilities icon
2. Expand the ADSM Server Utilities icon
3. Double click on the SCSI Device Detector.

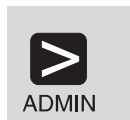
For each powered-on device, you can see a number for the SCSI adapter and a number for the SCSI ID.

Adding a Manual Tape Library

The commands, in the order entered, for defining a manual tape library are:

1. DEFINE LIBRARY
2. DEFINE DRIVE
3. DEFINE DEVCLASS
4. DEFINE STGPOOL

- 1** Define a manual library and two drives associated with it. The library is named MANUALLIB. The two drives, named TAPE01\$ and TAPE02\$, are at SCSI adaptor 0 and SCSI IDs 1 and 2.



```
define library manuallib libtype=manual
define drive manuallib tape01$ device=tape01$
define drive manuallib tape02$ device=tape02$
```

- 2** Classify the devices by device type. It is helpful to choose a device class name that identifies the type of device for which it is intended (in this example, TAPECLASS).



```
define devclass tapeclass devtype=8mm -
format=8500 library=manuallib mountlimit=2
```

- 3** Define a storage pool named TAPEPOOL for the device class.



```
define stgpool tapepool tapeclass -
maxscratch=20
```



1. Double click on **Storage Pools**
2. Click on **Edit** from the menu bar
3. Click on **Add Primary Storage Pool** from the pull-down menu
4. In the **Storage pool name** field, enter TAPEPOOL
5. Click on the **Device class** tab, and enter the following:
Device class TAPECLASS (from the drop-down list)
Maximum scratch volumes 20
6. Click on the **Add** push button

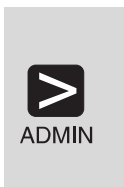
Adding an Automatic Tape Library

The commands, in the order entered, for defining a manual tape library are:

1. DEFINE LIBRARY
2. DEFINE DRIVE
3. DEFINE DEVCLASS
4. DEFINE STGPOOL

1 Define an automated tape library and its two internal drives.

The library is an Exabyte EXB-210, named AUTOLIB, whose SCSI library mechanism is at SCSI ID 3. The two drives, named TAPE05\$ and TAPE06\$, are at SCSI IDs 5 and 6. The element numbers for the drives in an EXB-210 are 82 and 83.



```
define library autolib libtype=scsi device=auto03$
define drive autolib tape05$ device=tape05$ -
  element=82
define drive autolib tape06$ device=tape06$ -
  element=83
```



Element address

The element address is a number that indicates the physical location of a drive within an automated library. ADSM needs the element address to connect the physical location of the drive to the drive's SCSI address. When you define a drive, the element address is required if there is more than one drive in an automated library.

2 Classify the drives in the library by device type. It is helpful to choose a device class name that identifies the type of device for which it is intended (in this example, AUTOCLASS).



```
define devclass autoclass devtype=8mm -
  format=8500 library=autolib mountlimit=2
```

3 Define a storage pool named AUTOPOOL for the device class.



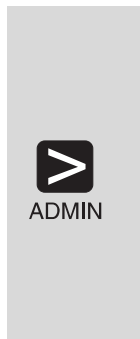
```
define stgpool autopool autoclass -
  maxxscratch=20
```



1. Double click on **Storage Pools**
2. Click on **Edit** from the menu bar
3. Click on **Add Primary Storage Pool** from the pull-down menu
4. In the **Storage pool name** field, enter AUTOPOOL
5. Click on the **Device class** tab, and enter the following:
Device class auto8mm_class (from the drop-down list)
Maximum scratch volumes 20
6. Click on the **Add** push button

Displaying Information About Your Devices

Before continuing, you can view the results of your definitions. If necessary, you can update these definitions by using update commands.



- To query the libraries:
query library
- To query the drives:
query drive
- To query the device classes:
query devclass format=detailed
- To query the storage pools:
query stgpool

Preparing Tape Volumes

All tape volumes must have standard labels before ADSM can use them. You can use tapes as scratch volumes, up to the number of scratch volumes specified for the storage pool. Using scratch volumes allows ADSM to acquire volumes as needed.

You can also use private volumes in a storage pool. You must define any private volumes to ADSM, assigning each to a specific storage pool. However, if a storage pool contains only private volumes and runs out of them, storage operations for that pool stop until more volumes are defined.

Prepare Tape Volumes with a Manual Drive

If you are using only one tape drive, consider labeling several tapes at this time.



You cannot label tapes while the server is writing to or reading from the drive.

- 1 If the tape volumes do not already have standard labels, label them. From an OS/2 command prompt, go to the ADSM server directory (for example, d:\adsmv2):



1. Enter the following command:
`dsmlabel -drive=tape01$`
2. When prompted,
 - a. Insert the new volume into drive **TAPE01\$**
 - b. Type a 1 to 6 character volume name (for example, DSM001).
 - c. Press Enter

- 2 Define any volumes that are to be used as private volumes. For example, define the volume you just named DSM001.



```
define volume tapepool dsm001
```



1. Expand **Storage Pools**
2. Double click on **Storage Pool Volumes**
3. Click on **Edit** from the menu bar
4. Click on **Add** from the pull-down menu
5. Enter the following:
Storage pool name TAPEPOOL (from the drop-down list)
Volume name DSM001
6. Click on the **Add** push button

Prepare Tape Volumes with an Automated Library

To label tapes with an automated library, remove any tapes that you do not want to use with ADSM and load the tapes to be labeled.

- 1 If the tape volumes do not already have standard labels, label them. From an OS/2 prompt, go to the ADSM server directory (for example, d:\adsmv2):



OS/2

1. To specify TAPE05\$, which is at element address 82 in library AUTO03\$, enter the following command:

```
dsmlabel -drive=tape05$,82 -library=auto03$ -
-search -keep
```

The library searches for available tapes and loads them into the drive one at a time.

2. When prompted,
 - a. Type a 1 to 6 character volume name (for example, DSM001).
 - b. Press Enter

2 Check the tape volumes into the automated library.



ADMIN

Ensure that the volumes are in their slots, and issue the CHECKIN LIBVOLUME command:

```
checkin libvolume autolib status=scratch
search=yes
```

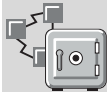
The library checks in each volume automatically.

3 Define any volumes that are to be used as private volumes.



ADMIN

```
define volume autopool dsm001
```



ADMIN

1. Expand **Storage Pools**
2. Double click on **Storage Pool Volumes**
3. Click on **Edit** from the menu bar
4. Click on **Add** from the pull-down menu
5. Enter the following:

Storage pool name	AUTOPOOL (from the drop-down list)
Volume name	DSM001

6. Click on the **Add** push button

Including Tape in the Server Storage Hierarchy

Now that ADSM can use your tape drives, you can update your disk storage pools so that client data can be migrated to tape. This section describes how to change BACKUPPOOL so that data migrates to AUTOPOOL and how to change ARCHIVEPOOL so that data migrates to TAPEPOOL.



```
update stgpool backuppool nextstgpool=autopool  
update stgpool archivepool nextstgpool=tapepool
```



1. Double click on **Storage Pools**
2. Click on **BACKUPPOOL**
3. Click on **Selected**
4. Click on **Open as properties** from the pull-down menu
5. Click on the **Migration** tab, go to page 2, and for **Next storage pool**, do the following:
 - a. Deselect (by clicking on) the **None** check box
 - b. Click on AUTOPOOL from the **Next pool** drop-down list
6. Click on the **Apply** push button
7. Click on **ARCHIVEPOOL**
8. Click on **Selected**
9. Click on **Open as properties** from the pull-down menu
10. Click on the **Migration** tab, go to page 2, and for **Next storage pool**, do the following:
 - a. Deselect (by clicking on) the **None** check box
 - b. Click on TAPEPOOL from the **Next pool** drop-down list
11. Click on the **Apply** push button

Verifying the Tape Device Environment

Do the following to verify that the tape devices have been integrated into your ADSM system.

1 Migrate data from a disk storage pool.

Migration from a storage pool requires tape mounts. The mount messages are directed to the console message queue and to any administrative client that has been started with either the mount mode or console mode option.

Trigger migration from a disk storage pool (BACKUPPOOL, for example) by setting the high and low migration thresholds to 0. After migration occurs, reset the thresholds to their original settings.



```
update stgpool backuppool highmig=0 lowmig=0
```



1. Double click on **Storage Pools**
2. Click on **BACKUPPOOL**
3. Click on **Selected** from the menu bar
4. Click on **Open as properties** from the pull-down menu
5. Click on the **Migration** tab, go to page 2, and enter the following:

Migration Thresholds Low	0
Migration Thresholds High	0
6. Click on the **Apply** push button

2 After migration occurs, reset the thresholds to their original settings.



```
update stgpool backuppool highmig=90 lowmig=70
```



1. Double click on **Storage Pools**
2. Click on **BACKUPPOOL**
3. Click on **Selected** from the menu bar
4. Click on **Open as properties** from the pull-down menu
5. Click on the **Migration** tab, go to page 2, and enter the following:

Migration Thresholds Low	70
Migration Thresholds High	90
6. Click on the **Apply** push button



Controlling when migration occurs

Because migration from a disk to a tape storage pool uses resources such as drives and operators, you may want to ensure that migration occurs at a time that is best for your situation. You can control when migration occurs by leaving the high migration threshold set to 100 most of the time, and lowering it when you want migration to occur.

In the preceding step, you lowered both migration thresholds to 0 to verify that migration occurred. You may not want to empty the disk storage pool by setting the low migration threshold to 0 every time you want migration to occur. Normally, you may want to keep the low threshold at 40%, and vary the high threshold from as high as 90% to as low as 50%. See *ADSM Administrator's Guide* for details.

Creating a New Policy

The ADSM default policy specifies how ADSM manages client files. For example, it specifies that ADSM retains up to two backup versions of active client files (files that exist on the client). Two versions may be satisfactory for most clients. However, assume that a group of clients needs the last ten versions to be kept. You can do either of the following:

- Create a new policy domain and assign these clients to that domain (described in this section).
- Create a new management class within the default policy domain. Then the include-exclude lists for all the affected clients must be updated.



Storing Directly to Tape

The default policy directs that client files are stored directly to disk. You have just defined a tape storage pool, and updated your disk storage pools so that they migrate the client data to that tape pool. If you wished, you could define policies that store client files directly to tape by specifying in a copy group a tape pool as the destination.

However, it is usually preferable to store client files to disk and let server migration move the data to tape. When you store directly to tape, the number of available tape drives limits the number of concurrent client sessions that can do meaningful work.

To create a new policy, you can start by copying the policy domain, STANDARD. This operation also copies the associated policy set, management class, and copy groups. You then assign clients to the new domain.

- 1** Copy the default policy domain, STANDARD, to the new policy domain, NEWDOMAIN.



copy domain standard newdomain



1. Double click on **Policy Domains**
2. Click on the STANDARD policy domain
3. Click on **Edit** from the menu bar
4. Click on **Add Using** from the pull-down menu
5. Enter the following:
Policy domain NEWDOMAIN
6. Click on the **Add** push button

This operation copies the policy domain, and all associated policy sets, management classes, and copy groups. Within the policy domain named newdomain and the policy set named STANDARD, you have:

- Management class named STANDARD
- Backup copy group named STANDARD
- Archive copy group named STANDARD

For our example, you update only the backup copy group.

2 Update the backup copy group by specifying that ten versions of backed up files are to be kept.



```
update copygroup newdomain standard standard standard -  
type=backup verexists=10
```



1. Expand **Policy Domains**
2. Double click on **Backup Copy Groups**
3. Select the copy group from policy domain NEWDOMAIN and policy set STANDARD (you cannot update a copy group from policy set ACTIVE)
4. Click on **Selected** from the menu bar
5. Click on **Open as properties** from the pull-down menu
6. Click on the **Copy control** tab, go to page 2, and enter the following:

Number of backup versions to keep if client data exists	10
--	----
7. Click on the **Apply** push button

3 Validate the STANDARD policy set in NEWDOMAIN.



```
validate policysset newdomain standard
```



1. Expand **Policy Domains**
2. Double click on **Policy Sets**
3. Click on the STANDARD policy set in NEWDOMAIN
4. Click on **Selected** from the menu bar
5. Click on **Validate** from the pull-down menu (**Policy Sets - Validate** is displayed)
6. Click on the **Validate** push button (**Policy Sets - Validate Results** is displayed)
7. Click on the **OK** push button



The following conditions result in warning messages during validation:

- A destination storage pool is not a defined storage pool.
- The default management class does not contain a backup or archive copy group.
- The current ACTIVE policy set names a management class that is not defined in the policy set being validated.
- The current ACTIVE policy set contains copy groups that are not defined in the named policy set.
- A management class specifies that a backup version must exist before a file can be migrated from a client node, but the management class does not contain a backup copy group.

4 Activate the STANDARD policy set for the NEWDOMAIN policy domain.



`activate policysset newdomain standard`



1. Expand **Policy Domains**
2. Double click on **Policy Sets**
3. Click on the STANDARD policy set in NEWDOMAIN
4. Click on **Selected** from the menu bar
5. Click on **Activate** from the pull-down menu (**Policy Sets - Activate** is displayed)
6. Click on the **Activate** push button (**Policy Sets - Activate Results** is displayed)
7. Click on the **OK** push button

To verify that the modified backup copy group is now active, do the following:

8. Click on **Backup Copy Groups**
9. View copy group STANDARD for policy set ACTIVE in NEWDOMAIN by double clicking on that line
10. Click on the **Copy control** tab, go to page 2, and verify that the number of backup versions to keep if client data exists is set to 10

5 Assign client nodes to the NEWDOMAIN policy domain by either updating existing client nodes or registering new nodes. For example, to update client node **chloe**, do either of the following:



update node chloe domain=newdomain



1. Double click on **Nodes**
2. Click on **CHLOE** from the list of node names
3. Click on **Selected** from the menu bar
4. Click on **Open as properties** from the pull-down menu
5. Select NEWDOMAIN in the **Policy domain** field from the drop-down list
6. Click on the **Apply** push button

ADSM will now keep up to ten versions of backed up files for client node **chloe** because it is assigned to the NEWDOMAIN policy domain.

Invoking Expiration Processing

Expired files are not deleted from server storage until expiration processing occurs. You can invoke expiration processing in a number of ways:

- The expiration interval server option can specify that processing be invoked at a set interval from the time the server is started. The default is a 24 hour interval.
- You can issue the EXPIRE INVENTORY command manually whenever you wish (see the following example)
- You can schedule the EXPIRE INVENTORY command to be issued regularly at a specific time (see “Automating Administrative Commands” on page 41). If you schedule expiration processing, set the expiration interval server option to 0. See “Using the ADSM Server Utilities Interface” on page 77 for information on setting server options.



```
expire inventory
```

Creating a Client Include-Exclude List

To make the best use of ADSM storage and policies, each client can exclude certain files from some policy operations and include certain files in other operations. A client includes and excludes files with statements in an include-exclude list (called an include-exclude file on UNIX clients). For example, clients come with a default include-exclude list that exclude system files that, if recovered, could corrupt the operating system. Consult the appropriate ADSM client user’s guide for details.

To help clients get started, you can supply them with additional include-exclude statements tailored to your installation. Users can include these statements in their client options file (dsm.opt). For example:

- A user may want all files with the extensions **sct** or **drw** in the **spec** directory included for backup services but all other files in that directory excluded. The user could add the following statements to the include-exclude file:

```
exclude d:\eng\spec\*.*
include d:\eng\spec\*.drw
include d:\eng\spec\*.sct
```



An include-exclude list is read from the bottom up until a match is found. In the preceding example, no match is found on either include statement for a file in the d:\eng\spec directory with an extension of **obj**. The exclude statement is read, a match is found, and the file is excluded.

- For a file or group of files, the user can also override the default management class.

```
exclude d:\eng\spec\*.*
include d:\eng\spec\*.drw monthly
include d:\eng\spec\*.sct
```

In this example,

- Files in the **spec** directory with an **sct** extension are bound to the default management class.
- Files with the **drw** extension are bound to the management class **monthly**.
- All other files in the **spec** directory are excluded from backup or archive.

Automating Client Operations

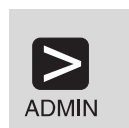
You can automate client operations such as backup to ensure that the clients' data is protected by ADSM. You can automate the following on most clients:

- ADSM backup, archive, restore, and retrieve operations
- Operating system commands
- Macros (files that can contain operating system and ADSM commands)

In this section, you are guided through the steps necessary to automate backup and archive operations for clients by creating schedules. The example assumes that have registered three client nodes named **bill**, **mark**, and **mercedes**.

- 1** Define a schedule for an incremental backup operation and associate the schedule with clients **bill**, **mark**, and **mercedes**. The schedule, named **DAILY_INCR**, is for the **STANDARD** policy domain. The **STANDARD** policy domain is the ADSM default policy and specifies backup to the disk storage pool **BACKUPPOOL**. This schedule calls for a schedule window that:

- Begins on the date the schedule is defined (the default) at 11:00 p.m.
- Lasts for 1 hour (the default)
- Is repeated daily (the default)
- Stays in effect indefinitely (the default)



```
define schedule standard daily_incr action=incremental -
starttime=23:00
```

```
define association standard daily_incr bill,mark,mercedes
```

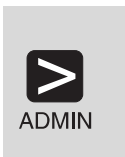



1. Expand **Central Scheduler**
2. Double click on **Backup/Archive Schedules**
3. Click on **Edit** from the menu bar
4. Click on **Add** from the pull-down menu
5. Enter the following:

Policy domain	STANDARD (from the drop-down list)
Schedule name	DAILY_INCR
6. Associate nodes by doing the following:
 - a. Click on the **Add nodes** push button
 - b. Click on the **Include** push button
 - c. Click on BILL, MARK, and MERCEDES
 - d. Click on the **Add** push button
7. Click on the **Operation** tab, and click on INCREMENTAL from the **Action** drop-down list
8. Click on the **Timing** tab, and specify the **Start time** as 23:00
9. Click on the **Add** push button

2 Define a schedule for an archive operation and associate the schedule with clients **bill**, **mark**, and **mercedes**. The schedule, named ARC, is for the STANDARD policy domain. The STANDARD policy domain is the ADSM default policy and specifies archive to the disk storage pool ARCHIVEPOOL. This schedule calls for a schedule window that:

- Applies to all files in the c: and d: file spaces
- Begins on the date the schedule is defined (the default) at 11:00 p.m.
- Lasts for 1 hour (the default)
- Is repeated every Friday
- Stays in effect indefinitely (the default)



```
define schedule standard arc action=archive -  
  objects="c:\* d:\*" starttime=23:00 -  
  period=1 perunits=weeks dayofweek=friday
```

```
define association standard arc bill,mark,mercedes
```



ADMIN

1. Expand **Central Scheduler**
2. Double click on **Backup/Archive Schedules**
3. Click on **Edit** from the menu bar
4. Click on **Add** from the pull-down menu
5. Enter the following:

Policy domain	STANDARD (from the drop-down list)
Schedule name	arc
6. Associate nodes by doing the following:
 - a. Click on the **Add nodes** push button
 - b. Click on the **Include** push button
 - c. Click on BILL, MARK, and MERCEDES
 - d. Click on the **Add** push button
7. Click on the **Operation** tab, and do the following:
 - a. Click on ARCHIVE from the **Action** drop-down list
 - b. In the **Objects** field, specify c:* d:*
8. Click on the **Timing** tab, and enter the following:

Start time	23:00
Period	1
Period units	WEEKS (from the drop-down list)
Day of week	FRIDAY (from the drop-down list)
9. Click on the **Add** push button

- 3** Start the client scheduler. For the schedules to become active for a workstation, a user must start the scheduler from the node.



```
dsmc schedule
```



To help ensure that the scheduler is running on the clients, clients can include the SCHEDULE command in their system start-up commands.

The include-exclude list (file on UNIX clients) on each client also affects which files are backed up or archived by the two schedules defined in the preceding steps. For example, if a file is excluded from backup with an EXCLUDE statement, the file will not be backed up when the DAILY_INCR schedule runs.

- 4** Because the DAILY_INCR schedule is to run daily, you can verify that the automation is working as it should on the day after you define the schedule and associate it with clients. If the schedule has run successfully, the status will be *Completed*.



```
query event standard daily_incr begindate=today-1
```



1. Expand the **Central Scheduler** object
2. Double click on **Backup/Archive Events**
3. Look for the DAILY_INCR schedule and check its status



You can limit the query of events to display only schedules that did not run as expected. For example, you can use the following command daily to see which clients did not run the DAILY_INCR schedule the previous day:

```
query event standard daily_incr begindate=today-1 -  
exceptiononly=yes
```

Schedules that did not complete successfully have a status of *Failed*, *Missed*, or *Severed*.

- 5** Check the results of the schedule DAILY_INCR on one of the clients that was associated with that schedule. For most clients, including OS/2 clients, information about what happens when a schedule runs is stored in the file dsmsched.log.

Automating Administrative Commands

You can automate ADSM administrative tasks by scheduling administrative commands. For example, you can automate commands that need to be run regularly or that require significant processing or other system resources. In this section, you define a schedule to run expiration processing.

- 1** Define a schedule named EXPPROC that invokes expiration processing every night at 2:00 a.m.

This schedule calls for a schedule window that:

- Begins on the date the schedule is defined (the default) at 2:00 a.m .
- Lasts for 1 hour (the default)
- Is repeated every day
- Takes effect immediately

- Stays in effect indefinitely (the default)



```
define schedule expproc type=administrative -
cmd='expire inventory' active=yes starttime=02:00
```



1. Expand the **Central Scheduler** object
2. Double click on **Administrative Command Schedules**
3. Click on **Edit** from the menu bar
4. Click on **Add** from the pull-down menu
5. Enter the following:

Schedule name	EXPPROC
Administrative Command	expire inventory
6. Click on the **Timing** tab, and specify the **Start time** as 02:00
7. Click on the **Add** push button

2 Because the EXPPROC schedule is to run daily, you can verify that the automation is working as it should on the day after you define the schedule. If the schedule has run successfully, the status will be *Completed*.



```
query event expproc type=administrative -
begindate=today-1
```



1. Expand the **Central Scheduler** object
2. Click on **Administrative Command Events**
3. Check the status of the EXPPROC schedule

Protecting ADSM and Client Data

The database, recovery log, and storage pools are critical to the operation of the server. If the database or recovery log is unusable, the entire server is unavailable. If a database is lost and cannot be recovered, the backup, archive, and space-managed data for that server is lost. If a storage pool volume is lost and cannot be recovered, the data on the volume is also lost.

ADSM provides a number of ways to protect your data, including backing up your storage pools and database. For example, you can define schedules so that the following operations occur:

- After the initial full backup of your storage pools, incremental storage pool backups are done nightly.
- Full database backups are done weekly.

- Incremental database backups are done nightly.
- See the *ADSM Administrator's Guide* for details.

Appendix A. Configuring Server and Client Communications

This section offers communications information for your system.

Enabling Server Communications

The ADSM for OS/2 server uses TCP/IP, IPX/SPX, NetBIOS, SNA Lu6.2 (APPC), Named Pipes, or SHARED MEMORY as the communication method to the clients. SHARED MEMORY and TCP/IP are default communication methods.

Setting Server Communications Options

To enable server communications, use the ADSM Utilities.



1. Double-click on **ADSM Server Utilities**
2. Double-click on **Server Options File Editor**
3. Click on **Communications**
4. Reset the value or accept the default for each communication method. See the communication method options listed under each communication method in this chapter.
5. Close the Properties window.



For details about other options, such as date and time formats, buffer sizes, and message queues, see *ADSM Administrator's Reference*.

This section describes setting server options *before* you start the server. When you start the server, the new options go into effect. If you later modify your server options, you must stop and restart the server to activate the updated options.

TCP/IP Communication Method

Figure 13 displays an example of a TCP/IP communication method setting.

COMMETHOD	TCPip
TCPPort	1500
TCPWindowSize	0
TCPNODELAY	YES

Figure 13. Example of TCP/IP Communication Method Options

- TCPPort** Specifies a port address of a server when using TCP/IP. The default value is 1500. You can specify a value from 1024 to 32767.
- TCPWindowSize** Specifies the amount of data to send or receive before TCP/IP exchanges acknowledgments with the client node. The actual window size used in a session is the minimum size of the server and

client window sizes. Larger window sizes use additional memory but may improve performance.

TCP/IP window size is specified in kilobytes. You can specify a value from 0 to 2048. 0 indicates that the default window size set for OS/2 should be used. Values from 1 to 2048 indicate that the window size ranges from 1KB to 2MB.

The default window size is 0, indicating that ADSM should accept the OS/2 default window size.

TCPNODELAY Specifies whether the server should send small amounts of data or allow TCP/IP to buffer the data. Disallowing buffering may improve throughput but more packets are sent over the network.

The default value is YES.

YES Specifies that TCP/IP should not buffer small ADSM messages

NO Specifies that TCP/IP should buffer small ADSM messages

NetBIOS Communication Method

Figure 14 displays an example of a Network Basic/Input Output (NetBIOS) communication method setting.

COMMMETHOD	NETBIOS
NETBiosname	ADSMSESV1
LANAdapter	0
NETBIOSSessions	16
NETBIOSBuffersize	32

Figure 14. Example of NetBIOS Communication Method Options

NETBiosname Specifies the name to be used for communications on the network. This name must be unique across the network that includes the LAN requestors and other NetBIOS applications. This name can be a maximum of 16 characters and is case-sensitive. The first character cannot be an asterisk (*), and the first three characters cannot be the letters IBM. The defaults are ADSMSERV1, ADSMSERV2, ADSMSERV3, and ADSMSERV4 (depending on the number of LANAdapter statements you have). For example, if you have LANADAPTER 0 and LANADAPTER 1, the defaults are ADSMSERV1 and ADSMSERV2.

LANAdapter Specifies a network adapter number on which the server communicates when the NetBIOS communication method is specified. A maximum of four adapters may be specified with up to four LANAdapter statements. The default value is zero. You can specify a value from zero to three. You must specify a LANADAPTER option for each adapter card you are using with NetBIOS.

NETBIOSsessions Specifies the number of NetBIOS sessions that are reserved for this process per adapter. The minimum number of sessions is 1 and the maximum number of sessions is 255.

This is independent of the MAXSESSION parameter, other than MAXSESSION is the default number of NetBIOS sessions. THE MAXSESSION limit overrides the NETBIOSSESSIONS limit for allowing a session to start.

NETBIOSBuffersize Specifies the size you want to use in kilobytes for the NetBIOS communications buffer. This parameter is optional and the default buffer size is 32KB, with a minimum of 1KB and a maximum of 32KB. A larger buffer size improves communication performance but requires more memory.

NetWare IPX/SPX Communication Method

Figure 15 displays an example of Internetwork Packet Exchange/Sequenced Packet Exchange (IPX/SPX) communication method setting.

COMMETHOD	IPXSPX
IPXSocket	8522
IPXBuffersize	32

Figure 15. Example of IPX/SPX Communication Method Options

IPXSocket Specifies the socket number (hex value) on which the server SPX communication driver is to wait. The default is 8522. You can specify a value from 0 to 32767. Contact your system administrator for this value.

Note: The default socket number is registered with Novell.

IPXBuffersize Specifies the size you want to use in kilobytes for the IPX/SPX communications buffer. This parameter is optional and the default buffer size is 32KB, with a minimum of 1KB and a maximum of 32KB. A larger buffer size improves communication performance but requires more memory.

Shared Memory Communication Method

Figure 16 displays an example of a Shared Memory communication method setting.

COMMETHOD	SHAREDMEM
SHMQUEUENAME	\QUEUES\ADSM\DSMSERV

Figure 16. Example of Shared Memory Communication Method Options

SHMQUEUENAME Specifies the Shared Memory queue name used for the client/server handshake. The default is \QUEUES\ADSM\DSMSERV.

This communication method is ideal when running the server and

client on the same OS/2 machine because Shared Memory support is internal to the OS/2 base system and is faster than Named Pipes.

Named Pipes Communication Method

Figure 17 displays an example of a Named Pipes communication method setting. This communication method is ideal when running the server and client on the same OS/2 machine because Named Pipes support is internal to the OS/2 base system.

COMMMETHOD	NAMEdpipe
NAMEDPIPENAME	\pipe\dsmserv

Figure 17. Example of Named Pipes Communication Method Options

NAMEDPIPENAME Specifies the Named Pipes name. The default is \PIPE\DSMSERV.

SNA LU6.2 (APPC) Communication Method

Systems Network Architecture (SNA) defines various sets of rules for data to be transmitted in a network. Application programs communicate with each other using a layer of SNA called advanced program-to-program communication (APPC), also known as LU6.2.

Figure 18 displays an example of a SNA LU6.2 communication method setting.

COMMMETHOD	SNA1u6.2
LUname	DSMSERV1
SNABuffersize	15

Figure 18. Example of Server SNA LU6.2 Communication Method Options

LUname Specifies the name ADSM uses for APPC communications on the network. The default LU name is DSMSERV1. A maximum of four LU names can be specified. The maximum length of an LU name is eight characters.

SNABuffersize Specifies the size of APPC send/receive buffers in kilobytes. The default buffer size is 15KB. The minimum size is 1KB and the maximum size is 31KB.

You will need to configure your Transaction Program Definition. Use Communications Manager/2 or directly edit the configuration file.

NONE as a Communication Method

To bring up the server with no communication method, specify in the dsmserv.opt file:

```
COMMMETHOD NONE
```

If COMMMETHOD NONE is included in your set of communication method options, it overrides all other communication options. This option does not allow users to connect to the server, and it is useful for experimenting with policy commands.

Supporting Multiple Network Adapters

Multiple network adapter support lets an administrator increase server throughput by providing multiple connections to the same network or to several physically distinct networks with the same server:

- TCP/IP

No additional server configuration is required for TCP/IP support of multiple adapters. Each adapter must have a separate TCP/IP address. Clients are given one address for their client options file. The server accepts sessions from each of the adapters. The session limit is placed on the accumulated count from all of the adapters.

- NetBIOS

A LANADAPTER statement is specified for each NetBIOS session. LANAdapter statements range from LANADAPTER 0 to LANADAPTER 3, allowing you to specify up to four network adapters on which to accept sessions. The NETbiosname statement then specifies up to four server names, one per adapter on which the ADSM server accepts sessions. Clients use the NETBIOSservername statement to name the corresponding name on the server. This process also directs the session request to a specific adapter.

- SNA LU6.2 (APPC)

Separate LUNames must be configured for sessions from each of the adapters to be used. The LUName statement in the dsmserv.opt file must be specified so that the server knows the LUNames on which to accept sessions. Up to four LUNames can be specified on the LUName statement to provide an LUName for each of the adapters. Only one TP profile need be configured for the multiple adapters. Clients are given a single network address (networkname.LUName) with which to communicate with the server, meaning they can establish a session with the specific adapter that corresponds to the LUName in their options file.

Configuring Client Communications

The ADSM client uses TCP/IP, IPX/SPX, NetBIOS, SNA LU6.2 (APPC), Named Pipes, or SHARED MEMORY to communicate with the OS/2 server.

If you copied the **dsm.smp** file to **dsm.opt**, the COMMMETHOD options are already written in the file. You need only remove the comment character (*) from the beginning of any line to activate that line.

TCP/IP Communication Method

Figure 19 on page 50 displays an example of a TCP/IP communication method setting.

COMMETHOD	TCPip
TCPServeraddress	tcp_address
TCPPort	1500
TCPBuffsize	31
TCPWindowSize	16

Figure 19. TCP/IP Communication Method Options

TCPServeraddress

Specifies the Internet server address for communication using TCP/IP. This address can be a TCP/IP Internet Domain Name (for example, gldvm.end.ibm.com), or a dot address (for example, 9.103.21.200).

TCPPort

Specifies a port address of a server when using TCP/IP.

The default value is 1500. Specify a value from 1000 to 32767. Contact your system administrator for this value.

TCPBuffsize

Specifies the size of the internal TCP communication buffer, which is used to transfer data between the client node and the server. A larger buffer size can improve communication performance but requires more memory.

Specify the size of the buffer in kilobytes. The default value is 31KB. Specify a value from 1 to 31.

TCPWindowSize

Specifies the size of the TCP window for your client. The actual window size that is used in a session is the minimum size of the server and client window sizes. A larger window size can improve communication performance, but uses more memory.

Specify a value from 0 to 24KB. The default is 0 which indicates that ADSM should accept the OS/2 default window size.

NetBIOS Communication Method

Figure 20 on page 51 shows an example of a NETBIOS communication method setting used by an OS/2 client.

COMMETHOD	NETBIOS
NETBIOSServername	ADSMSESV1
NETBIOSName	ADSM
NETBIOSBuffersize	32
NETBIOSTimeout	0
LANAdapter	0

Figure 20. Example of NetBIOS Communication Method

NETBIOSservername

Specifies the NetBIOS name for an ADSM server. The default for this option is **ADSMSEV1**.

NETBIOSName

Specifies the NetBIOS name for your workstation. The default for this option is **ADSM** concatenated with a time-of-day value. Normally, the default value should be used because it causes a unique name to be generated for each session.

NETBIOSBuffersize

Specifies the size you want to use, in kilobytes, for the NetBIOS communications buffer. The default is 32KB and the maximum is 32KB. The recommended size is 32KB.

NETBIOSTimeout

Specifies the number of seconds that must elapse before a timeout occurs for a NETBIOS send or receive. The default is 60 seconds. The recommended value is 0 seconds.

LANAdapter

Specifies the communication adapter number. The default is 0.

IPX/SPX Communication Method

Figure 21 shows an example of an IPX/SPX communication method setting used by an OS/2 client.

COMMETHOD	IPXSPX
IPXServeraddress	000000208005a30bee98
IPXSOcket	8522
IPXBuffersize	32

Figure 21. Example of IPX/SPX Communication Method

IPXServeraddress

Specifies a 20 digit hexadecimal number address for an ADSM server. The first 8 hexadecimal digits are for the ADSM server IPX network address. The next 12 digits are for the ADSM server node IPX address. This address is obtained by running the getipxad utility on the system to be used as a server. This file can be found in the **ADSMV2** directory.

If you do not specify an address, ADSM assumes the server resides on your client workstation.

IPXSOcket

Specifies the socket number on which the server SPX communication driver is to wait for requests. The socket number is a hex value on which the server listens. The default is 8522.

Note: The socket number is registered with Novell.

IPXBuffersize

Specifies the size you want to use, in kilobytes, for the IPXSPX communications buffer. This parameter is optional and the default buffer size is 32KB, with a minimum of 1KB and a maximum of 32KB.

Shared Memory Communication Method

Shared Memory communication is supported between OS/2 clients and servers on the same machine. This communication method is ideal when running the server and client on the same OS/2 machine because Shared Memory support is internal to the OS/2 base system and is faster than Named Pipes.

Figure 22 shows an example of a Shared Memory communication method setting used in OS/2.

COMMETHOD	SHAREDMEM
SHMQUEUEENAME	\QUEUES\ADSM\DSMSERV

Figure 22. Example of Shared Memory Communication Method

SHMQUEUEENAME

Specifies the Shared Memory queue name used for the client-server handshake. The default is \QUEUES\ADSM\DSMSERV.

Named Pipes Communication Method

Named Pipes communications is supported between OS/2 clients and servers on the same machine. This communication method is ideal when running the server and client on the same OS/2 machine because Named Pipes support is internal to the OS/2 base system.

Figure 23 on page 53 shows an example of a Named Pipes communication method setting used in OS/2.

COMMETHOD	NAMEdpipe
NAMEDPIPEENAME	\PIPE\DSMSERV

Figure 23. Example of Named Pipes Communication Method

NAMEDPIPEENAME

Specifies the Named Pipes name. The default is \PIPE\DSMSERV.

SNA LU6.2 (APPC) Communication Method

See “Configuring APPC for OS/2 Clients with Communications Manager” on page 55 for a step-by-step example of configuring APPC.

Systems Network Architecture (SNA) defines various sets of rules for data to be transmitted in a network. Application programs communicate with each other using a layer of SNA called advanced program-to-program communication (APPC), which is also known as LU6.2.

There are two sample settings for SNA LU6.2. See “SNA LU6.2 (APPC) Using Transaction Program” and “SNA LU6.2 (APPC) Using Symbolic Destination” on page 54. Use one or the other of these settings.

SNA LU6.2 (APPC) Using Transaction Program

Figure 24 shows an example of a SNA LU6.2 communication method setting using a transaction program to identify the server.

COMMETHOD	SNA1u6.2 (APPC)
TPName	DSMSERV
PARtnerluname	USIBMSU.D068LM16
CPICModename	QADSM
CPICBuffersize	31

Figure 24. Example of SNA LU6.2 Communication Method Options

TPname

Specifies a symbolic name for a transaction program in a SNA network. The transaction program name identifies the ADSM server.

Specify the TPname with a 1–64 character transaction program name of the target logical unit, which is the ADSM server. Contact your system administrator for this name. Also see “SNA LU6.2 (APPC) Communication Method” on page 48.

PARtnerluname

Specifies a logical unit name used by the transaction program to identify the ADSM server in the SNA network.

Specify a partner LU name with a 1–64 character LU name that identifies the remote target in a SNA network. Contact your system administrator for this name.

CPICModename

Specifies the mode name for communications with the server. The mode name identifies a mode profile that contains communications attributes for sessions with the server.

There are a number of predefined modes you can choose from, or you can define your own. See Step 13 on page 65. The mode name must be known on both the client

and the server systems. Contact your system administrator for the mode name for the SNA session that connects to the server LU.

CPicbuffersize

Specifies the size of the CPIC buffer, which is used to transfer data between the client node and the server. A larger buffer size can improve communication performance but requires more memory.

Specify the size of the buffer in kilobytes. The default is 31KB. Specify a value from 1 to 31.

SNA LU6.2 (APPC) Using Symbolic Destination

Figure 25 shows an example of a SNA LU6.2 (APPC) communication method setting, using a symbolic destination to identify the server.

COMMMETHOD	SNA1u6.2
SYMboIicdestination	ADSM
CPICBuffersize	31

Figure 25. Example of SNA LU6.2 Communication Method Option

SYMboIicdestination

Specifies a symbolic destination name that SNA LU6.2 or CPIC uses to connect to the server. The CPIC Communication Side Information Profile defines the symbolic destination as well as its associated TPname, Partner (server) LU, and mode name. See Step 14 on page 66 and Step 15 on page 67.

Specify the symbolic destination with a 1–8 character name of the server. Contact your system administrator for this name.

CPicbuffersize

Specifies the size of the CPIC buffer, which is used to transfer data between the client node and the server. A larger buffer size can improve communication performance but requires more memory.

Specify the size of the buffer in kilobytes. The default is 31KB. Specify a value from 1 to 31.

Configuring APPC for OS/2 Clients with Communications Manager

There are two possible ways to configure APPC for OS/2: by using Communications Manager or by editing the configuration file. If you use the edit configuration file method, you must verify the modified configuration file and update SNA resources with the following command:

```
cmverify config_filename /e
```


This section contains an example of the steps required to configure APPC or SNALU6.2 for OS/2 3.x and later using Communications Manager. The windows and menus may vary depending on your level of OS/2. Ensure your client COMMETHOD is defined as SNALU6.2. This example is for a token-ring adapter.

To begin, double-click on the **Communications Manager/2** icon on an OS/2 desktop. Then complete the following procedure:

- 1** In the **Communications Manager** window, double-click on the **Communications Manager Setup** icon.



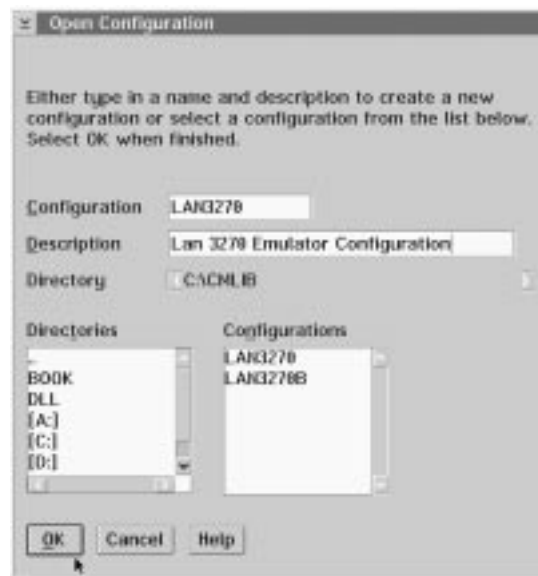
- 2** If the **CMSETUP** window appears, click on **OK**.



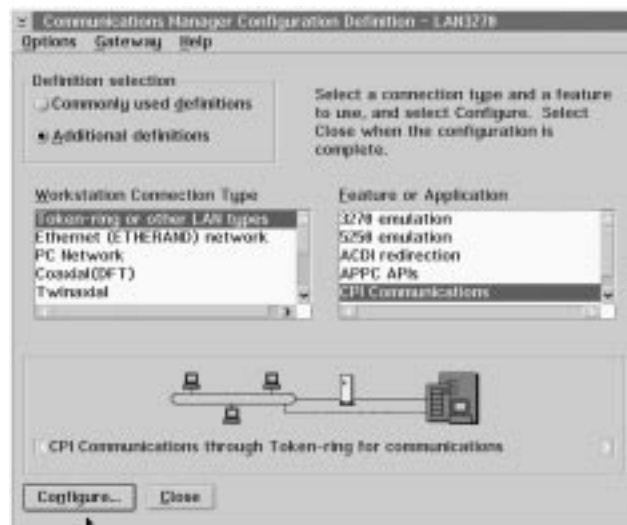
3 In the **Communications Manager Setup** window, click on **Setup**.



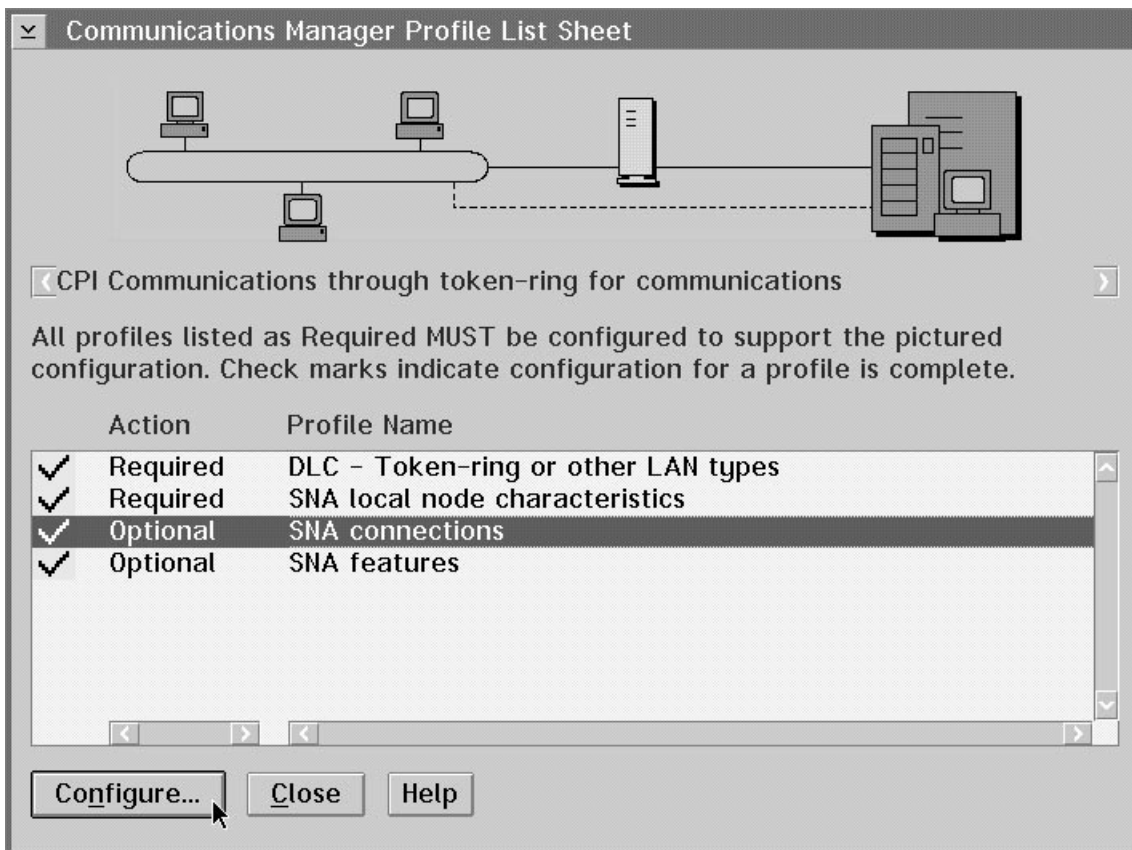
- 4** In the **Open Configuration** window, keep the configuration file name or supply one in the entry field. Then, click on **OK**.



- 5** In the **LAN3270** window, select **CPI Communications** in the **Feature or Application** entry field and click on **Configure...**



- 6** In the **Communications Manager Profile List Sheet** window, select **SNA connections** in the **Profile Name** entry field and click on **Configure...**



7 In the **Connections List** window, select **To peer node** (for this example) in the **Partner Type** entry field, and click on **Create...**

Note: If your server OS/2 system is configured as a network, select **To network node**.



- 8** In the **Adapter List** window, select **Token-ring or other LAN types** in the **Adapter Type** entry field and click on **Continue...**



- 9** In the **Create a Connection to a Peer Node** window, fill in the following blanks:
- Supply a name in the **Link name** field, or keep the current name.
 - Type the OS/2 server adapter address in the **LAN destination address (hex)** field.
 - Type the OS/2 server network ID in the **Partner network ID** field.
 - Type the OS/2 server control point name in the **Partner node name** field.
 - Supply a comment if desired in the **Optional comment** entry field.
 - Click on **OK**.

The screenshot shows a dialog box titled "Connection to a Peer node". It contains the following fields and controls:

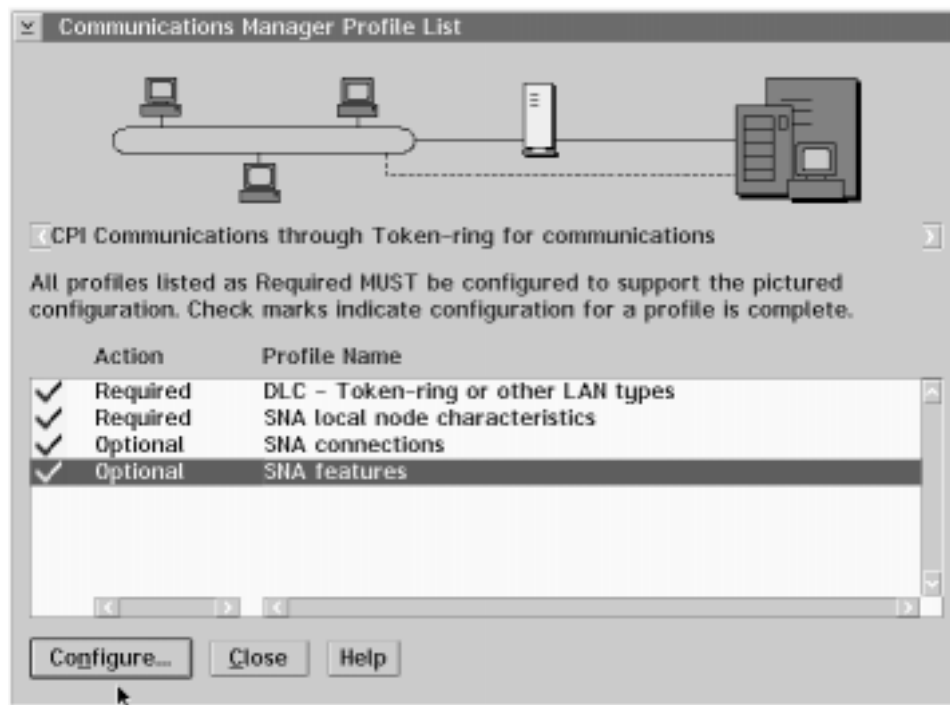
- Link name:** LINK002
- Activate at startup**
- LAN destination address (hex):** 40004397001
- Address format:** Token Ring
- Remote SAP (hex):** 04
- Adjacent node ID (hex):** (empty)
- Partner network ID:** USBMSU
- Partner node name:** D068LN16 (Required for partner LU definition)
- Optional comment:** ADSM OS/2 Server

Buttons at the bottom: OK, Define Partner LU..., Cancel, Help.

10 In the **Connections List** window, click on the **Close** push button.



- 11** In the **Communications Manager Profile List** window, select **SNA features** in the **Profile Name** entry field and click on **Configure...**



12 To create a mode, select **Modes** in the **Features** entry field and click on **Create...** in the **SNA Features List** window.

Note: #INTER is recommended if you are NOT creating your own mode name.



- 13** In the **Mode Definition** window, change the **Mode name** to **QADSM**, change the **Receive pacing window** to **63**, change the **RU size** to **Maximum RU size** and enter a value of **16384**.

Note: These values offer improved performance.

Then click on **OK**.

Mode Definition

Mode name: QADSM

Class of service: #CONNECT

Mode session limit: 8 (0 - 32767)

Minimum contention winners: 0 (0 - 32767)

Receive pacing window: 63 (0 - 63)

Compression

Compression need: PROHIBITED

PLU->SLU compression level: NONE

SLU->PLU compression level: NONE

RU size

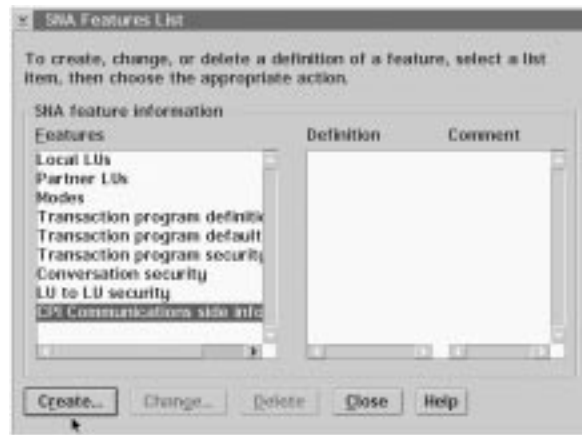
Default RU size

Maximum RU size: 16384 (256 - 16384)

Optional comment

OK Cancel Help

- 14** In the **SNA Features List** window, select **CPI Communications side information** in the **Features** entry field and click on **Create...**



15 In the **CPI Communications Side Information** window, create your CPIC side information file by filling in the following blanks:

Note:

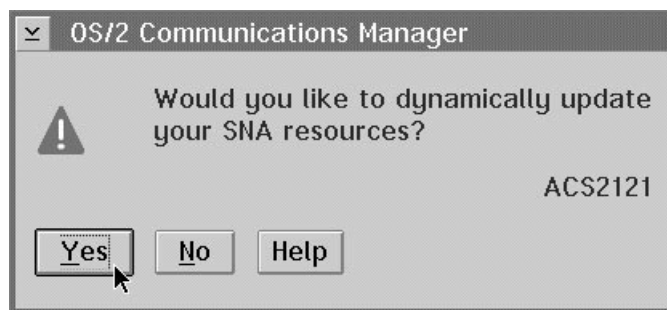
- a. Supply a name in the **Symbolic destination name** field. It is recommended that you use ADSM. The name corresponds to the SYMBOLICDESTINATION name of the server located in the client options file.
- b. Select **Fully qualified name** in the **Partner LU** list box. Type your local network ID followed by the OS/2 server local control point name.
- c. Select **TP name** in the **Partner TP** list box. Type the OS/2 TP name **DSMSERV**
- d. Select **None** in the **Security type** entry field.
- e. Type **QADSM** in the **Mode name** entry field.
- f. Supply a comment if desired in the **Optional comment** entry field.
- g. Click on **OK**.

The screenshot shows the 'CPI Communications Side Information' dialog box. The fields are filled as follows:

- Symbolic destination name: ADSM
- Partner LU: Fully qualified name (selected), USIBMSU, D068LM15
- Partner TP: Service TP (unchecked), TP name: DSMSERV
- Security type: Same (unchecked), None (selected), Program (unchecked)
- Mode name: QADSM
- Optional comment: ADSM OS/2 Server

16 Close all configuration windows.

You are prompted to dynamically update your SNA resources. Select **Yes**.



Appendix B. CONFIG.SYS Updates and Installation Return Codes

This section offers information on CONFIG.SYS updates and installation return codes.

Server CONFIG.SYS Updates

If you do not choose to allow the installation program to update your CONFIG.SYS file, ADSM creates the CONFIG.ADD file in the root directory during installation. CONFIG.ADD contains all of your original CONFIG.SYS entries plus the changes that would have been made to it if you selected to have it updated during the installation.

Compare your CONFIG.SYS to the CONFIG.ADD file. Identify the changes that are in the CONFIG.ADD file and add them to the CONFIG.SYS file, or rename your original CONFIG.SYS file to another file name, and then rename the CONFIG.ADD file to CONFIG.SYS.

If you select only the server component during installation (either First Time Installation or Upgrading from Version 1 to Version2):

- An entry is added to both the LIBPATH and PATH statements that references the directory in which you installed ADSM Version 2. This entry is added in front of any entries that specify LAN-attached drives. For example:

```
SET PATH=D:\ADSMV2... (adds directory where executable files are)
SET LIBPATH=D:\ADSMV2\DLL; ...
                        (adds directory where dynamic linked libraries (DLL) are)
```

- The following set statements are added for ADSM Version 2 licensing if your machine has no other applications that utilize the iForLS licensing utility. DO NOT modify or remove these statements.

```
REM *** iForLS statements ***
SET DEVICE=H:\IFOR\LS\BIN\I4NODOS2.SYS /B:H:
SET I4_INSTALL_DRIVE=H:
```

- The following set statements defining the environment variables are added:

```
REM *** ADSM Version 2 Server statements ***
SET DSMSERV_DIR=H:\ADSMV2
SET DSMSERV_CONFIG=H:\ADSMV2\DSMSERV.OPT
```

Notes:

1. The DSMSERV_DIR set statement tells ADSM where to find the data files it needs for operation.
 2. The DSMSERV_CONFIG set statement tells ADSM where to find the server option file.
- The following statement loads the adsmtape device driver:

```
REM *** ADSM Version 2 Server device statements ***
DEVICE=H:\ADSMV2\ADSMTAPE.SYS
DEVICE=H:\ADSMV2\ADSMID.SYS
```

- The following statement loads the adsmauto device driver:

```
REM *** ADSM Version 2 Server device statements ***
DEVICE=H:\ADSMV2\ADSMAUTO.SYS
```

Note: If you are installing on a Warp Server system and you installed Personally Safe and Sound (PSNS) when you installed the Warp Server, the device driver statements for PSNS will be commented out of the CONFIG.SYS file. PSNS uses a down-level version of the ADSM tape device drivers.

Client CONFIG.SYS Updates

If you install the client from the server install program, an entry is added to the LIBPATH and PATH and DPATH statements that references the directory in which you installed the client. The following set statements are added when you install the client: See *ADSM Installing the Clients* for additional information on these environment variables.

```
REM *** ADSM Version 2 Client statements ***
SET DSM_CONFIG=H:\ADSM\DSM.OPT
SET DSM_DIR=H:\ADSM
SET DSMG_CONFIG=H:\ADSM\DSM.OPT
SET DSMG_DIR=H:\ADSM
SET DSMG_FONT=10.He1v
SET DSMI_CONFIG=H:\ADSM\API\DSM.OPT
SET DSMI_DIR=H:\ADSM
SET DSMI_LOG=H:\ADSM
```

Lotus Notes Backup Agent CONFIG.SYS Updates

If you install Lotus Notes Backup Agent from the server installation program, entries are added to the LIBPATH, PATH, and DPATH statements.

The Lotus Notes Backup Agent is installed in the DSMNOTES subdirectory. This directory is below the directory in which the client is installed. For example, if you installed the client in C:\ADSM, the Lotus Notes Backup Agent directory is C:\ADSM\DSMNOTES. See *ADSM Using the Lotus Notes Backup Agent* for more information.

Return Codes

The return codes in this section can occur when installing the server over an existing version of ADSM for OS/2. These return codes indicate errors that occurred while the installation program was attempting to dump the Version 1 database.

If any of the following return codes are displayed by the installation program, a file called **C:\DSMUPDT.ERR** will contain additional information regarding the error.

- Return code: X'64'

This return code indicates that the Version 1 server (DSMSERV.EXE) is no longer located in the directory that is specified in the INI file **EPFIS.INI** from the initial version one server installation.

- Return code: X'C8'

The install program was unable to obtain the path of the version one server from the installation INI (**EPFIS.INI**) file. This file exists but no longer contains the information from the initial Version 1 server installation.

- Return code: X'12C'

The install INI file was not found on the OS/2 boot drive. When the Version 1 server was installed, a file called EPFIS.INI was placed in the OS2\SYSTEM subdirectory and is now missing. If you have applied ADSM/2 program maintenance, a copy exists in the directory in which the Version 1 server was installed. Copy the EPFIS.INI file to the OS2\SYSTEM directory on your boot drive.

- Return code: X'190'

The execution of DSMSERV DUMPDB returned a return code 0 but the install program was unable to locate a success message in the output file that is created during the dump of the Version 1 database. See the file: **C:\\$DUMPDB\$.OUT** for details on the failed DUMPDB.

- Return code: X'1F4'

The execution of DSMSERV DUMPDB failed with a non-zero return code. See the file: **C:\\$DUMPDB\$.OUT** for details on the failed DUMPDB.

Appendix C. Installing ADSM Server Files Using CID

The Configuration, Installation, and Distribution (CID) installation is an OS/2-based set of components that allows you to automate the installation of the files necessary to run the server. An administrator who needs to install the ADSM server on multiple machines from a LAN instead of CD-ROM or diskettes can copy all of the installation files into a single directory on a remotely attached file server and make the necessary changes to the response and command files. The administrator then attaches to that disk or file server and performs the installation by processing the CIDINST command file.

Before using a CID installation, the administrator should be familiar with the general installation of ADSM.

Two files (CIDINST.CMD and ADSMRESP.DAT) are part of the installation package and they must be edited to fit your individual requirements. These files are located in the `\SERVERS\OS2` directory on the installation CDROM.

To prepare for the CID installation, the administrator of the file server must perform the following steps:

1 From an OS/2 window, create a directory on your file server where you want to keep the ADSM server installation files. The CIDINST.CMD file that is supplied on the installation CDROM uses the directory `D:\DSMINST`.

2 Copy **all** ADSM installation files to the file server directory created in Step 1. Use the COPY or XCOPY command, for example:

```
XCOPY H:\SERVERS\OS2\*.* D:\DSMINST
```

The example above copies all the files from the installation CDROM in drive H: to the `D:\DSMINST` directory on the file server.

3 Edit the CIDINST.CMD command file with an editor of your choice to:

- a. Change the contents of the **InstallFilesDirectory** variable to indicate the drive and directory where the ADSM installation files are located. These are the files that you copied in Step 2 and will most likely be on a file server.
- b. Change the contents of the **Action** variable to indicate the action you want performed. The valid actions are:
 - 'I' to install the selected components
 - 'D' to delete the selected components
 - 'U' to update the selected components
 - 'R' to restore a previously saved backup version of the server

- c. Change the **ResponseFileName** variable to another fully qualified file name if you chose not to use the supplied response file, which is ADSMRESP.DAT.
- d. Change the **ErrorLog** variable to the path and file name you want to use for the error log file. The error log contains information about the CIDINST processing. When CIDINST issues a nonzero return code, the error log will contain information about the error that occurred. When CIDINST returns with a return code of zero, the error log will contain a message indicating the requested action has been successful.
- e. Change the **HistLog** variable to the path and file name you want to use for the history log file. The history log has information that is useful to developers in determining the cause of many errors.

4 File and save your changes.

5 Edit the ADSMRESP.DAT response file (which is used in conjunction with the CIDINST.CMD file) to change the following:

- FILE—The directory in which to install the ADSM server
- WORK—The directory in which to install the ADSM client.
- COMP—The COMP entries are to define the actual ADSM components that you want installed.

Notes:

- a. The default is to install **all** the components (**except** “Install/Update ADSM Server from Version 1” component).
- b. Insert an asterisk (*) in column one (1) to comment out the components you *do not* want installed.
- CFGUPDATE—Specifies whether the CONFIG.SYS file is automatically updated. Valid values for this keyword are:
 - AUTO— Automatically updates CONFIG.SYS
The ADSM installation program makes the changes to your CONFIG.SYS file as described in Appendix B, “CONFIG.SYS Updates and Installation Return Codes” on page 69.
 - MANUAL— Does not update CONFIG.SYS
If you do not have ADSM update your CONFIG.SYS, you must update it by using “Server CONFIG.SYS Updates” on page 69.
- DELETEBACKUP—Specifies whether to delete only the backup versions of the product (if it has been previously installed) or to delete the entire product. Valid values for this keyword are YES and NO.
- OVERWRITE—Specifies whether to automatically overwrite ADSM Server files during installation. Valid values for this keyword are YES and NO.

- **SAVEBACKUP**—Specifies whether to save a backup version of the product (if it has been previously installed) when it is updated. Valid values for this keyword are YES and NO.

6 File and save your changes.

The OS/2 user can now attach to the remote disk or file server and start `CIDINST.CMD` to install ADSM.

Note: This procedure assumes that the CID environment is already set up with the previous steps.

7 To start `CIDINST.CMD`, change your working directory to the location of `CIDINST.CMD` on the file server and enter:

```
CIDINST
```

Note: When `CIDINST` is issued, processing time may vary depending on your machine type. The installation runs as a background task and therefore no status messages are issued.

8 Activate the server as documented in “Starting the Server” on page 13.

Appendix D. Using ADSM Administrative Interfaces

This chapter describes how to use the following ADSM administrative interfaces:

- Graphical user interface (GUI) (see page 78)
- Administrative command-line interface (see page 80)
- ADSM Server Utilities interface (see page 77)

Using the ADSM Server Utilities Interface

When you double-click on the ADSM Server Utilities icon, this screen appears:



Figure 26. ADSM Utilities

ADSM Server Utilities

- Server Options File Editor
Double-click on this option to reset or use the default for server options.
- Volume Formatter
Formats database, recovery log, and storage pools
- SCSI Device Detector
Detects and identifies attached SCSI devices
- Server Diagnostics

Provides extended information about an ADSM server. Your customer service representative may ask you to use this utility.

ADSM Online Information/Documentation

- **ADSM Common Questions and Answers**
Answers to frequently-asked questions
- **ADSM Tips and Techniques**
Tips about OS/2 base operating system, communications manager, local area network (LAN), database manager, compilers, languages, toolkit, and presentation manager.
- **ADSM Server Help**
Online help for the ADSM server.

Using the Graphical User Interface

You can manage the server from a graphical user interface. For instructions on starting the OS/2 GUI, see “Starting the OS/2 Administrative Client” on page 14.

You can use the GUI to do the following tasks:

- Define, change, or delete an ADSM object
- View ADSM server and database information
- Invoke other ADSM functions, for example, activating a policy set

Defining an Object

The following example shows how to define an ADSM client node:

- 1** Double click on the **Nodes** icon.
- 2** Click on **Edit** from the menu bar and then **Add** from the pull down menu.
The **Node - Add** notebook appears.
- 3** The **Node - Add** notebook contains notebook tabs and arrow buttons. Click on the tabs and arrow buttons to page through the notebook.
- 4** Define the node by entering data, clicking on radio buttons, selecting check boxes, and selecting from drop-down lists.
- 5** When you have completed your definition, click on the **Add** push button.

Changing an Object

The following example shows how to change information for an ADSM client node:

- 1** Double click on the **Nodes** icon.
The **Nodes - Details** screen appears.

- 2** Click on a node.
- 3** Click on **Selected** from the menu bar and then **Open as properties** from the pull down menu.
The **Properties** notebook appears.
- 4** The **Properties** notebook contains notebook tabs and arrow buttons. Click on the tabs and arrow buttons to page through the notebook.
- 5** Make your changes by entering data, clicking on radio buttons, selecting check boxes, and selecting from drop-down lists.
- 6** When you have made all your changes, click on the **Apply** push button.

Deleting an Object

The following example shows how to delete an ADSM client node:

- 1** Double click on the **Nodes** icon.
- 2** Click on the node or nodes that you want to delete.
- 3** Click on **Edit** from the menu bar and then **Delete** from the pull down menu.
The **Nodes - Delete** notebook appears.
- 4** Verify the node name or names and click on the **Delete** push button.

Using Online Help

The administrative client GUI provides the following types of online help:

Task help	Step-by-step information on how to complete the task associated with a selected object.
General help	An overview of the function of a window. For example, general help for the Nodes—Icons window explains how to use the window, lists the tasks you can complete with the Nodes object, and displays links where you can obtain more information.
Contextual help	Specific information for a selectable object, menu choice, notebook tab, field, and control or push button in a window.
Help index	An index of all the help topics. You can access help for an entry directly from the index.
Using help	Information about the types of help.
Hypertext links	Links to more information about words that appear in a different color from the rest of the help text.

Search

Under Services on a help window, you can search for occurrences of a text string in the online help.

Using the Administrative Command-Line Interface

The administrative command-line client lets administrators control and monitor the server through administrative commands. For more information on using the command-line interface, see *ADSM Administrator's Reference*.

On OS/2, the administrative client invokes ADSM by using the DSMADMC command. This section shows OS/2 examples. For more details and examples of other platform invocations, see *ADSM Administrator's Reference*.

Using Interactive Mode

To enter a series of administrative commands, start the administrative client in interactive mode by entering:

```
dsmadm
```

You are then prompted to enter your user ID and password. If you do not want to be prompted for that information, you can enter your user ID and password with the DSMADMC command by using the -ID and -PASSWORD options. For example, enter:

```
dsmadm -id=smith -password=secret
```

To end an administrative client session in interactive mode, use the QUIT command:

```
quit
```

Appendix E. Where to Look for More Information

This section shows you where to look for more information.

ADSM Publications

The following table lists the ADSM publications available in hardcopy and CD-ROM.

Short Title	Publication Title	Order Number
Hardcopy Publications		
ADSM General Information	<i>ADSTAR Distributed Storage Manager: General Information</i>	GH35-0131
ADSM Messages	<i>ADSTAR Distributed Storage Manager: Messages</i>	SH35-0133
ADSTAR Distributed Storage Manager for OS/2: Administrator's Guide	<i>ADSTAR Distributed Storage Manager for OS/2: Administrator's Guide</i>	GC35-0232
ADSTAR Distributed Storage Manager for OS/2: Administrator's Reference	<i>ADSTAR Distributed Storage Manager for OS/2: Administrator's Reference</i>	GC35-0233
ADSTAR Distributed Storage Manager for OS/2: License Information	<i>ADSTAR Distributed Storage Manager for OS/2: License Information</i>	GC35-0230
ADSM Using the UNIX HSM Clients	<i>ADSTAR Distributed Storage Manager: Using the UNIX Hierarchical Storage Management Clients</i>	SH26-4030
ADSM V2 Using the Apple Macintosh Backup-Archive Client	<i>ADSTAR Distributed Storage Manager Version 2: Using the Apple Macintosh Backup-Archive Client</i>	SH26-4051
ADSM Using the UNIX Backup-Archive Clients	<i>ADSTAR Distributed Storage Manager Version 2: Using the UNIX Backup-Archive Clients</i>	SH26-4052
ADSM V2 Using the OS/2 Backup-Archive Client	<i>ADSTAR Distributed Storage Manager Version 2: Using the OS/2 Backup-Archive Client</i>	SH26-4053
ADSM V2 Using the DOS Backup-Archive Client	<i>ADSTAR Distributed Storage Manager Version 2: Using the DOS Backup-Archive Client</i>	SH26-4054
ADSM V2 Using the Novell NetWare Backup-Archive Client	<i>ADSTAR Distributed Storage Manager Version 2: Using the Novell NetWare Backup-Archive Client</i>	SH26-4055
ADSM V2 Using the Microsoft Windows Backup-Archive Clients	<i>ADSTAR Distributed Storage Manager Version 2: Using the Microsoft Windows Backup-Archive Clients</i>	SH26-4056

Short Title	Publication Title	Order Number
ADSM Using the Lotus Notes Backup Agent	<i>ADSTAR Distributed Storage Manager: Using the Lotus Notes Backup Agent</i>	SH26-4047
ADSM Installing the Clients	<i>ADSTAR Distributed Storage Manager: Installing the Clients</i>	SH26-4049
ADSM Client Reference Cards	<i>ADSTAR Distributed Storage Manager: Client Reference Cards</i>	SX26-6013
ADSM Using the Application Programming Interface	<i>ADSTAR Distributed Storage Manager: Using the Application Programming Interface</i>	SH26-4002
CD-ROM		
ADSM Online Library		SK2T-1893

IBM Redbooks

The International Technical Support Center (ITSC) publishes redbooks, books on specialized topics such as using ADSM to back up databases. You can order publications through your IBM representative or the IBM branch office serving your locality. You can also search for and order books of interest to you by visiting the IBM Redbooks home page on the World Wide Web at this address:

<http://www.redbooks.ibm.com/redbooks>

Software Developer's Program

The IBM Storage Systems Division (SSD) Software Developer's Program provides a range of services to software developers who want to use the ADSM application program interface (API). Information about the SSD Software Developer's Program is available in:

- IBMSTORAGE forum on CompuServe
- SSD Software Developer's Program Information Package

To obtain the Software Developer's Program Information Package:

1. Call 800-4-IBMSSD (800-442-6773). Outside the U.S.A., call 408-256-0000.
2. Listen for the Storage Systems Division Software Developer's Program prompt.
3. Request the Software Developer's Program Information Package.

Do You Have Comments or Suggestions?

If you have difficulty using this publication or if you have comments and suggestions for improving it, please complete and mail the readers comment form found in the back of this publication. Your comments and suggestions can contribute to the quality and usability of this publication.

Translations

Selected ADSM publications have been translated into languages other than American English. For a complete list of the available translations and their order numbers, see *IBM ADSTAR Distributed Storage Manager General Information*. Contact your IBM representative for more information about the translated publications and whether these translations are available in your country.

Appendix F. Notices

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Glossary

The terms in this glossary are defined as they pertain to the ADSM library. If you do not find the term you are looking for, refer to the *IBM Dictionary of Computing*, New York: McGraw-Hill, 1994.

This glossary may include terms and definitions from:

- The *American National Standard Dictionary for Information Systems*, ANSI X3.172-1990, copyright (ANSI). Copies may be purchased from the American National Standards Institute, 11 West 42nd Street, New York 10036.
- The *Information Technology Vocabulary*, developed by Subcommittee 1, Joint Technical Committee 1, of the International Organization for Standardization and the International Electrotechnical Commission (ISO/IEC JTC2/SC1).

A

absolute. A backup copy group mode value indicating that a file is considered for incremental backup even if the file has not changed since the last backup. See also *mode*. Contrast with *modified*.

access mode. A storage pool and storage volume attribute that specifies whether data can be written to or read from storage pools or storage volumes. The access mode can be read/write, read-only, or unavailable. Volumes in primary storage pools can also have an access mode of destroyed. Volumes in copy storage pools can also have an access mode of offsite.

accounting facility. A facility that records statistics about client session activity.

accounting records. Files that record session resource usage at the end of each client session.

action choice. A choice in a pull-down menu that causes an action. See also *routing choice*.

activate. The process of validating the contents of a policy set and copying the policy set to the ACTIVE policy set.

active policy set. The policy set within a policy domain that contains the most recently activated policy currently in use by all client nodes assigned to that policy domain. See *policy set*.

active version. The most recent backup copy of a file stored by ADSM. Such a file is exempt from deletion until a backup detects that the user has either replaced the file with a newer version, or has explicitly deleted the file from the workstation. Contrast with *inactive version*.

activity log. A log that records normal activity messages generated by the server. These messages include information about server and client operations, such as the start time of sessions or device I/O errors. Each message includes a message ID, date and time stamp, and a text description. The number of days to retain messages in the activity log can be specified.

administrative client. A program that runs on a file server, workstation, or mainframe that allows administrators to control and monitor the server through administrator commands. Contrast with *backup-archive client*.

administrative command schedule. A database record that describes the planned processing of an administrative command during a specific time period. See also *client schedule*.

administrative privilege class. A permission granted to an administrator that controls the commands that the administrator can issue. See *system privilege class*, *analyst privilege class*, *operator privilege class*, *policy privilege class* or *storage privilege class*.

administrative session. A period of time in which an administrator user ID can communicate with a server to perform administrative tasks. Contrast with *client node session*.

administrator. A user who has been registered to the server. Administrators can be authorized to one or more of the following administrative privilege classes: system, policy, storage, operator, or analyst. Administrators can use the administrative client to enter server commands and queries in accordance with their privileges.

administrator definition. Server control information that includes the administrator's name, password, contact information, administrative privilege classes, policy domains and storage pools assigned to an administrator, and whether the administrative ID is locked from the server. An administrator definition can be exported from a source server and imported to a target server at a later date.

ADSM. ADSTAR Distributed Storage Manager.

ADSM application program interface (API). A set of functions that applications running on a client platform can call to store, query, and retrieve objects from ADSM storage.

ADSTAR Distributed Storage Manager (ADSM). A client/server program that provides storage management to customers in a multivendor computer environment.

Advanced Interactive Executive (AIX). An operating system used in the RISC System/6000 computers. The AIX operating system is IBM's implementation of the UNIX operating system.

Advanced Peer-to-Peer Networking (APPN). An extension to the LU6.2 peer orientation for end-user services. See *SNA LU6.2* and *Systems Network Architecture*.

Advanced Program-to-Program Communication (APPC). An implementation of the SNA/SDLC LU6.2 protocol that allows interconnected systems to communicate and share the processing of programs. See *SNA LU6.2*, *Systems Network Architecture*, and *Common Programming Interface Communications*.

AFS. Andrew file system.

AIX. Advanced Interactive Executive.

analyst privilege class. An administrative privilege class that allows an administrator to reset statistics.

Andrew file system (AFS). A distributed file system developed for UNIX operating systems.

API. Application program interface.

APPC. Advanced Program-to-Program Communication.

APPN. Advanced Peer-to-Peer Networking.

archive. A function that allows users to copy one or more files to a storage pool for long-term storage. Archive copies may be accompanied by descriptive information and may be retrieved by archive date, by file name, or by description. Contrast with *retrieve*.

archive copy. A user file that has been archived to an ADSM storage pool.

archive copy group. A policy object containing attributes that control the generation, destination, and expiration of archive files. An archive copy group belongs to a management class.

ARCHIVEPOOL. A disk storage pool defined by ADSM at installation. It can be the destination for client files that are archived to the server. See *storage pool*.

archive retention grace period. The number of days ADSM retains an archive copy when the server is unable to rebind the file to an appropriate management class.

AS/400. Application System/400.

assigned capacity. The portion of available space that can be used to store database or recovery log information. See also *available space*.

association. The relationship between a client node and a client schedule. An association identifies the name of a schedule, the name of the policy domain to which the schedule belongs, and the name of a client node that performs scheduled operations.

audit. The process of checking for logical inconsistencies between information that the server has and the actual condition of the system. ADSM has processes for auditing volumes, the database, libraries, and licenses. For example, in auditing a volume ADSM checks for inconsistencies between information about backed up or archived files stored in the database and actual data associated with each backup version or archive copy in server storage.

authentication. The process of checking a user's password before allowing that user access to the server. Authentication can be turned on or off by an administrator with system privilege.

autochanger. A small multislot tape device that has a mechanism that automatically puts tape cartridges into the tape drive or drives. Also called *medium* or *media changer*, or a *library*.

available space. The amount of space, in megabytes, that is available to the database and recovery log. This space can be used to extend the capacity of the database or recovery log, or to provide sufficient free space before a volume is deleted from the database or recovery log.

B

background process. A server process that runs in the background, allowing the administrative client to be used for other work.

backup. The process of copying information for safekeeping. ADSM has processes for backing up user files, the database, and storage pools. For example, users can back up one or more files to a storage pool to ensure against loss of data. Contrast with *restore*. See also *database backup series* and *incremental backup*.

backup-archive client. A program that runs on a workstation or file server and provides a means for users to back up, archive, restore, and retrieve files. Contrast with *administrative client*.

backup copy. A user file that has been backed up to an ADSM storage pool.

backup copy group. A policy object containing attributes that control the generation, destination, and expiration of backup files. A backup copy group belongs to a management class.

BACKUPPOOL. A disk storage pool defined by ADSM at installation. It can be the destination for client files that are backed up to the server. See *storage pool*.

backup retention grace period. The number of days ADSM retains a backup version after the server is unable to rebind the file to an appropriate management class.

backup series. See *database backup series*.

backup version. A file, directory, or file space that a user has backed up, which resides in ADSM server storage. There may be more than one backup version of a file in the storage pool, but at most only one is an active backup version. See *active version* and *inactive version*.

binding. The process of associating a file with a management class name. See *rebinding*.

buffer. Storage used to compensate for differences in the data rate flow, when transferring data from one device to another.

buffer pool. Temporary space used by the server to hold database or recovery log pages. See *database buffer pool* and *recovery log buffer pool*.

buffer pool size. The size of an area in memory used to store database or recovery log pages.

bus converter. A device that translates between different Hewlett-Packard internal I/O bus architectures.

C

cache. The process of leaving a duplicate copy on random access media when the server migrates a file to another storage pool in the hierarchy.

cartridge. A sequential storage media that contains magnetic tape in a protective housing. Contrast with *tape reel*.

CARTRIDGE. On ADSM servers that support it, a device class that is used to categorize tape devices that support tape cartridges, such as the 3495 Tape Library Dataserver.

cartridge system tape (CST). The base tape cartridge media used with 3480 or 3490 Magnetic Tape Subsystems. When specified as a media type in ADSM, CST identifies standard length tape. Contrast with *enhanced capacity cartridge system tape*.

central scheduler. A function that allows an administrator to schedule client operations and administrative commands. The operations can be scheduled to occur periodically or on an explicit date. See *client schedule* and *administrative command schedule*.

CID. Configuration Installation and Distribution.

client. A program running on a PC, workstation, file server, LAN server, or mainframe that requests services of another program, called the server. There are three types of ADSM clients: administrative, backup-archive, and space management. See *administrative client*, *backup-archive client*, and *space management client*.

Client Access/400. A software product that supports advanced program-to-program communications (APPC) in the DOS, OS/2, and Microsoft Windows environments and provides a set of end user services.

client domain. The set of drives, file systems, or volumes selected by a backup-archive client user during a backup or archive operation.

client migration. The process of copying a file from a client node to ADSM storage and replacing the file with

a stub file on the client node. The process is controlled by the user and by space management attributes in the management class. See also *space management*.

client node. A file server or workstation on which the backup-archive client program has been installed, which has been registered to the server.

client node definition. Server control information that includes the client's user ID, password, contact information, policy domain, file compression status, deletion authority, and whether the user ID is locked from the server. A client node definition can be exported from a source server so that it can be imported to a target server at a later date.

client node session. A period of time in which a user can communicate with a server to perform backup, archive, restore, or retrieval requests. Contrast with *administrative session*.

client options file. A file that a client can edit, containing a default set of processing options that identify the server, communication method, backup and archive options, space management options, and scheduling options. Also called the *dsm.opt* file.

client polling scheduling mode. A client/server communication technique where the client queries the server for work.

client schedule. A database record that describes the planned processing of a client operation during a specific time period. The client operation can be a backup, archive, restore, or retrieve operation, a client operating system command, or a macro. See also *administrative command schedule*.

client/server. A system architecture in which one or more programs (clients) request computing or data services from another program (server).

client system options file. A file, used on UNIX clients, containing a default set of processing options that identify the ADSM servers to be contacted for services. This file also specifies communication methods and options for backup, archive, space management, and scheduling. Also called the *dsm.sys* file. See also *client user options file*.

client user options file. A user-created file, used on UNIX clients, containing a default set of processing options that identify the server, communication method, backup and archive options, space management options,

and scheduling options. Also called the *dsm.opt* file. See also *client system options file*.

closed registration. A registration process in which an administrator must register workstations as client nodes with the server. Contrast with *open registration*.

collocation. A process that attempts to keep all data belonging to a single client node on a minimal number of sequential access media volumes within a storage pool. The purpose of collocation is to minimize the number of volumes that must be accessed when a large amount of data must be restored.

command line interface. A type of user interface where commands are specified on the command line when the backup-archive or administrative client is started. Contrast with *graphical user interface*.

commit. To make changes permanent in the database files. Changes made to the database files are not permanent until they are committed.

Common Programming Interface Communications (CPI-C). A programming interface that allows program-to-program communication using SNA LU6.2. See also *Systems Network Architecture*.

Common User Access (CUA). Guidelines for the dialog between a human and a workstation or terminal. One of the three SAA architectural areas.

communication manager. A component of OS/2 that allows a workstation to connect to a host computer and use the host resources as well as the resources of other personal computers to which the workstation is attached, either directly or through a host.

communication method. The method used by a client and server for exchanging information.

communication protocol. A set of defined interfaces that allow computers to communicate with each other.

compression. The process of saving storage space by eliminating empty fields or unnecessary data to shorten the length of the file. In ADSM, compression can occur at a workstation before files are backed up or archived to server storage. On some types of tape drives, hardware compression can be used.

Configuration Installation and Distribution (CID). IBM's term for capabilities to automate installation. CID-enabled products are capable of unattended, remote installation.

contextual help. A type of online help that provides specific information for each selectable object, menu choice, notebook tab, field, and control or push button in a window.

conversion. On VM servers, the process of changing from WDSF/VM to ADSM.

copy group. A policy object that contains attributes that control the generation, destination, and expiration of backup and archive files. There are two kinds of copy groups: backup and archive. Copy groups belong to management classes. See also *frequency*, *destination*, *mode*, *serialization*, *retention*, and *version*.

copy status. The status of volume copies defined to the database or recovery log. The copy status can be synchronized, stale, off-line, or undefined.

copy storage pool. A named set of volumes that contains copies of files that reside in primary storage pools. Copy storage pools are used to back up the data stored in primary storage pools. A copy storage pool cannot be a destination for a backup copy group, an archive copy group, or a management class (for space-managed files). See *primary storage pool* and *destination*.

CPI-C. Common Programming Interface Communications.

CST. Cartridge system tape.

CUA. Common User Access.

D

daemon. In the AIX operating system, a program that runs unattended to perform a standard service. Some daemons are triggered automatically to perform their tasks; others operate periodically.

daemon process. In the AIX operating system, a process begun by the root user or by the root shell that can be stopped only by the root user. Daemon processes generally provide services that must be available at all times, such as sending data to a printer.

damaged file. A file for which ADSM has detected data-integrity errors.

DASD. Direct access storage device.

database. A collection of information about all objects managed by the server, including policy management objects, users and administrators, and client nodes.

database audit. A utility that checks for and optionally corrects inconsistent database references.

database backup series. One full backup of the database, plus up to 32 incremental backups made since that full backup. Each full backup that is run starts a new database backup series. A backup series is identified with a number.

database backup trigger. A set of criteria that defines when and how database backups are run automatically. The criteria determine how often the backup is run, whether the backup is a full or incremental backup, and where the backup is stored.

database buffer pool. Storage that is used as a cache to allow database pages to remain in memory for long periods of time, so that the server can make continuous updates to pages without requiring input or output (I/O) operations from external storage.

database dump. A utility that copies database entries to media for later reload in case a catastrophic error should occur.

database load. A utility that copies database entries from media to a newly installed database.

database volume. A volume that has been assigned to the database.

dataserver. See *Tape Library Dataserver*.

data set. See *linear data set*.

data storage. The primary and copy storage pools used by the server to store users' files: backup versions, archive copies, and files migrated from client nodes (space-managed files). Synonymous with *server storage*. See *primary storage pool*, *copy storage pool*, *storage pool volume*, and *volume*.

DDM. Distributed Data Management.

default management class. A management class assigned to a policy set, which is used to govern backed up or archived files when a user does not explicitly bind a file to a specific management class.

definition. Server control information that includes administrator, client node, and policy definitions. A definition can be exported from a source server to

external media so that it can be imported to a target server at a later date.

deletion exit. An installation-wide exit that informs a tape management system or operator that the server has deleted a sequential access media volume from its database.

delimiter. (1) A character used to indicate the beginning and end of a character string. (2) A character that groups or separates words or values in a line of input.

density. On MVS and VM servers, a device class attribute that identifies the bits per inch that can be stored on tape reels. ADSM supports 1600 and 6250 bits per inch (bpi).

desktop. On-screen representation of a desk top.

desktop client. The group of clients supported by ADSM that are not UNIX-based and are not OpenEdition MVS. For example, a DOS client is a desktop client.

destination. A copy group or management class attribute that specifies the primary storage pool to which a client file will be backed up, archived, or migrated. At installation, ADSM provides storage destinations named BACKUPPOOL, ARCHIVEPOOL, and SPACEMGPOOL.

device class. A named group of storage devices. Each device class has a unique name and represents a device type of disk, file, optical disk, or tape.

device configuration file. A file that contains information about defined device classes, and, on AIX servers, defined libraries and drives. The file can be created by using an ADSM command or by using an option in the server options file. The information is a copy of the device configuration information in the ADSM database.

device driver. A collection of subroutines that control the interface between I/O device adapters and the processor.

device type. A category of storage device. Each device class must be categorized with one of the supported device types, for example, DISK or CARTRIDGE.

direct access storage device (DASD). A device in which access time is effectively independent of the location of the data.

DISK. A device class that is defined by ADSM at installation. It is used to categorize disk drives, such as 3390 DASD or 3380 DASD.

diskette. A small, magnetic disk enclosed in a jacket.

disk operating system (DOS). An operating system used in IBM PC, PS/2, and compatible computers.

Distributed Data Management (DDM). A feature of the System Support Program Product that allows an application program (client) to use server program functions to work on files that reside in a remote system.

DLL. Dynamic link library.

DLT. Digital linear tape.

domain. See *policy domain* or *client domain*.

DOS. Disk operating system.

drive. A device used to read and write data on a medium such as a disk, diskette, or tape.

dsm.opt file. See *client options file* and *client user options file*.

dsm.serv.opt. See *server options file*.

dsm.sys file. See *client system options file*.

dynamic. A copy group serialization value that specifies that ADSM accepts the first attempt to back up or archive a file regardless of whether the file is modified during the backup or archive process. See also *serialization*. Contrast with *shared dynamic*, *shared static*, and *static*.

dynamic link library. A file containing executable code and data bound to a program at load time or run time, rather than during linking. The code and data in a dynamic link library can be shared by several applications simultaneously.

E

ECCST. Enhanced capacity cartridge system tape.

enhanced capacity cartridge system tape (ECCST). Cartridge system tape with increased capacity that can only be used with 3490E tape subsystems. Contrast with *cartridge system tape*.

error log. A character file written on random access media that contains information about errors detected by the server or client.

estimated capacity. The available space, in megabytes, of a storage pool.

Ethernet. A data link protocol and LAN that interconnects personal computers and workstations via coaxial cable.

event. Administrative commands or client operations that are scheduled to be executed at a particular time.

event record. A database record that describes actual status and results for events.

exclude. The process of identifying files or directories in an include-exclude list to prevent these objects from being backed up whenever a user or schedule issues an incremental or selective backup operation, or to prevent these objects from being migrated off the client node via ADSM space management.

exclude-include list. See *include-exclude list*.

exit. To execute an instruction within a portion of a computer program in order to terminate the execution of that portion.

exit machine. On a VM server, a virtual machine that runs the mount and deletion installation-wide exits on VM systems.

expiration. The process by which files are identified for deletion because their expiration date or retention period has passed. Backed up or archived files are marked expired by ADSM based on the criteria defined in the backup or archive copy group.

expiration date. On MVS, VM, and VSE servers, a device class attribute used to notify tape management systems of the date when ADSM no longer needs a tape volume. The date is placed in the tape label so that the tape management system does not overwrite the information on the tape volume before the expiration date.

export. The process of copying administrator definitions, client node definitions, policy definitions, server control information or file data to external media.

export/import facility. See *import/export facility*.

extend. The process of increasing the portion of available space that can be used to store database or recovery log information. Contrast with *reduce*.

F

file data. File space definitions, authorization rules, backed up files, archive copies, and space-managed files. File data can be exported from a source server to external media so that it can be imported to a target server at a later date.

file record extent. The extent of the file enumerated in number of records.

file space. A logical space in a client's storage that can contain a group of files. For clients on systems such as OS/2, a file space is a logical partition and is identified by a volume label. For clients on systems such as AIX and UNIX, a file space can consist of any subset of directories and subdirectories stemming from a virtual mount point. Clients can restore, retrieve, or delete their file spaces from ADSM server storage. ADSM does not necessarily store all the files from a single file space together, but can identify all the files in server storage that came from a single file space.

File Transfer Protocol (FTP). In TCP/IP, the protocol that makes it possible to transfer data among hosts and to use foreign hosts indirectly.

format. A device class attribute that specifies the recording format used to read or write to sequential access media, for example to cartridge tape.

frequency. A copy group attribute that specifies the minimum interval, in days, between incremental backups.

FTP. File Transfer Protocol.

full backup. An ADSM function that copies the entire database. A full backup begins a new database backup series. Contrast with *incremental backup*. See *database backup series*.

fuzzy copy. A backup version or archive copy of a file that might not accurately reflect what is currently in the file because ADSM backed up or archived the file while the file was being modified.

G

general help. A type of online help that provides an overview of the function of the window.

graphical user interface (GUI). A type of user interface that takes advantage of a high-resolution monitor, including some combination of graphics, the object-action paradigm, the use of pointing devices, menu bars, overlapping windows, and icons. See *windowed interface*. Contrast with *command line interface*.

group of mirrored volumes. One, two, or three volume copies defined to the database or recovery log. Each volume copy in the group contains exactly the same portion of the database or recovery log. See *mirroring*.

GUI. Graphical user interface.

H

handle. A data structure that is a temporary local identifier for an object. A handle identifies an object at a specific location by binding it.

HDA. Head-disk assembly.

head-disk assembly (HDA). A field replaceable unit in a direct access storage device containing the disks and actuators.

help index. A type of online help that provides an alphabetic listing of all help topics.

hierarchical storage management (HSM) client. A program that runs on workstations to allow users to maintain free space on their workstations by migrating and recalling files to and from ADSM storage. The HSM client allows use of ADSM space management functions. Synonymous with *space management client*.

high migration threshold. A percentage of the storage pool capacity that identifies when ADSM can start migrating files to the next available storage pool in the hierarchy. Contrast with *low migration threshold*. See *server migration*.

HP-UX. Hewlett-Packard UNIX operating system. HP-UX is one of the operating systems that ADSM supports as a client environment and a server environment.

HSM client. Hierarchical storage management client.

I

import. The process of copying administrator definitions, client node definitions, policy definitions, server control information or file data from external media to a target server.

import/export facility. The facility that allows system administrators to copy definitions and file data from a source server to external media to move or copy information between servers. Any subset of information can be imported to a target server from the external media.

inactive version. A backup version of a file for which a more recently backed up version exists. Inactive backup versions are eligible for expiration processing according to the management class assigned to the file. Contrast with *active version*.

include-exclude file. On UNIX clients, a file containing statements that ADSM uses to determine whether to back up or migrate certain files, and to determine the associated management classes to use for backup, archive, and space management. See *include-exclude list*.

include-exclude list. A group of include and exclude option statements in a file. ADSM uses the statements to determine whether to back up or migrate certain files, and to determine the associated management classes to use for backup, archive, and space management. The exclude options identify files that should not be backed up or migrated off the client node. The include options identify files that are exempt from the exclusion rules, or assign a management class to a file or group of files for backup, archive, or space management services. The include-exclude list is defined either in the include-exclude file (for UNIX clients) or in the client options file (for other clients).

inconsistencies. Any discrepancy between the information recorded in the database about backed up or archived files and the actual data associated with backed up or archived files residing in server storage.

incremental backup. (1) A function that allows users to back up files or directories that are new or have changed since the last incremental backup. With this function, users can back up files or directories from a client domain that are not excluded in the include-exclude list and that meet the requirements for

frequency, mode, and serialization as defined in the backup copy group of the management class assigned to the files. Contrast with *selective backup*. (2) An ADSM function that copies only the pages in the database that are new or changed since the last full or incremental backup. Contrast with *full backup*. See *database backup series*.

internal mounting facility. On a VM server, a VM facility that allows the server to request tape mounts by sending a message to a mount operator. The message is repeated until the tape is mounted or until the mount wait time is exceeded.

inter-user communication vehicle (IUCV) facility. On a VM server, a VM communication method used to pass data between virtual machines and VM components.

IPX/SPX. Internetwork Packet Exchange/Sequenced Packet Exchange. IPX/SPX is Novell NetWare's communication protocol.

IUCV. Inter-user communication vehicle.

K

KB. Kilobyte.

kernel. The part of an operating system that performs basic functions such as allocating hardware resources.

kernel extension. A program that modifies parts of the kernel that can be customized to provide additional services and calls. See *kernel*.

kilobyte (KB). 1024 bytes.

L

LAN. Local area network.

length. A device class attribute that specifies the length of cartridge tape by specifying one of the following media types: CST for standard length tape or ECCST for double length tape.

library. (1) A repository for demountable recorded media, such as magnetic tapes. (2) In ADSM, a collection of one or more drives, and possibly robotic devices (depending on the library type), which can be used to access storage volumes. (3) In the AS/400 system, a system object that serves as a directory to

other objects. A library groups related objects, and allows the user to find objects by name.

linear data set. A type of MVS data set that ADSM uses for the database, the recovery log, and storage pools. The data set must be preallocated using VSAM IDCAMS and formatted by ADSM for its use. See *minidisk*.

load. See *mount*.

local area network (LAN). A network in which a set of devices are connected to one another for communication and that can be connected to a larger network.

log pool size. The size of an area in memory used to store recovery log pages.

logical volume. The combined space from all volumes defined to either the database or the recovery log. In ADSM, the database is one logical volume and the recovery log is one logical volume.

low migration threshold. A percentage of the storage pool capacity that specifies when ADSM can stop the migration of files to the next storage pool. Contrast with *high migration threshold*. See *server migration*.

M

macro file. An optional file that contains one or more administrative commands and is invoked from an administrative client.

management class. A policy object that users can bind to each file to specify how the server manages the file. The management class can contain a backup copy group, an archive copy group, and space management attributes. The copy groups determine how the ADSM server manages backup versions or archive copies of files. The space management attributes determine whether files are eligible for migration from client nodes to ADSM storage, and under what conditions. See also *copy group*, *binding* and *rebinding*.

mask. A pattern of characters that controls the keeping, deleting, or testing of positions of another pattern of characters or bits.

maximum extension. Specifies the maximum amount of storage space, in megabytes, that you can extend the database or recovery log.

maximum reduction. Specifies the maximum amount of storage space, in megabytes, that you can reduce the database or recovery log.

maximum utilization. The highest percentage of assigned capacity used by the database or recovery log.

MB. Megabyte.

megabyte (MB). (1) For processor storage and real and virtual memory, 2²⁰ or 1 048 576 bytes. (2) For disk storage capacity and transmission rates, 1 000 000 bytes.

migrate. (1) To move data from one storage pool to the storage pool specified as the next pool in the hierarchy. The process is controlled by the high and low migration thresholds for the first storage pool. See *high migration threshold* and *low migration threshold*. (2) To copy a file from a client node to ADSM storage. ADSM replaces the file with a stub file on the client node. The process is controlled by the include-exclude list and by space management attributes in management classes.

migration. The process of moving data from one storage location to another. See *client migration* and *server migration*.

minidisk. A logical subdivision of a VM physical disk that provides storage on contiguous cylinders of DASD. On a VM server, a minidisk can be defined as a disk volume that can be used by the database, recovery log, or a storage pool. See also *linear data set*.

mirroring. A feature that protects against data loss within the database or recovery log by writing the same data to multiple disks at the same time. Mirroring supports up to three exact copies of each database or recovery log volume. See *group of mirrored volumes*.

mm. Millimeter.

mode. A copy group attribute that specifies whether to back up a file that has not been modified since the last time the file was backed up. See *modified* and *absolute*.

modified. A backup copy group mode value indicating that a file is considered for incremental backup only if it has changed since the last backup. A file is considered changed if the date, size, owner, or permissions have changed. See *mode*. Contrast with *absolute*.

Motif. A graphical user interface that performs window management and contains a high level toolkit for application program development. It provides an icon view of the UNIX file system. Also known as X-Windows/Motif or Motif X—Toolkit.

mount. To place a data medium (such as a tape cartridge) on a drive in a position to operate.

mount exit. On a VM server, an installation-wide exit (DSMMOUNT EXEC) that requests tape mounts on behalf of the server on VM systems.

mount limit. A device class attribute specifying the maximum number of volumes that can be simultaneously accessed from the same device class, that is, the maximum number of mount points. See *mount point*.

mount operator. On a VM server, a VM user ID that can receive tape mount messages from the server.

mount point. A logical drive through which ADSM accesses volumes in a sequential access device class. For a device class with a removable media device type (for example, CARTRIDGE), a mount point is a logical drive associated with a physical drive. For a device class with the device type of FILE, a mount point is a logical drive associated with an I/O stream. The number of mount points for a device class is determined by the mount limit for that class. See *mount limit*.

mount request. A server request to mount a sequential access media volume so that data can be read from or written to the sequential access media.

mount retention period. A device class attribute that specifies the maximum amount of time, in minutes, that the server retains a mounted sequential access media volume that is not being used before it dismounts the sequential access media volume.

mount wait period. A device class attribute that specifies the maximum amount of time, in minutes, that the server waits for a sequential access volume mount request to be satisfied before canceling the request.

Multiple Virtual Storage (MVS). One of the family of IBM operating systems for the System/370 or System/390 processor, such as MVS/ESA. MVS is one of the supported server environments.

MVS. Multiple Virtual Storage.

N

Named Pipes. A communication protocol that is built into the OS/2 operating system. It can be used to establish communications between an ADSM/2 server and OS/2 clients. The client and ADSM/2 server must reside on the same system.

NetBIOS. Network Basic Input/Output System.

network adapter. A physical device, and its associated software, that enables a processor or controller to be connected to a network.

Network Basic Input/Output System (NetBIOS). An operating system interface for application programs used on IBM personal computers that are attached to the IBM Token-Ring Network.

Network File System (NFS). A protocol defined by Sun Microsystems that extends TCP/IP network file services. NFS permits remote node files to appear as though they are stored on a local workstation.

Networking Services/DOS (NS/DOS). A software product that supports advanced program-to-program communications (APPC) in the DOS and Microsoft Windows 3.1 environments. With NS/DOS, communications applications on your workstation "talk to" partner applications on other systems that support APPC.

NFS. Network File System.

node. A unique name used to identify a workstation to the server. See also *client node*.

notebook. A graphical representation that resembles a spiral-bound notebook that contains pages separated into sections by tabbed divider-pages. A user can "turn" the pages of a notebook to move from one section to another.

notify operator. A VM user ID that specifies an operator who receives messages about severe errors and abnormal conditions.

O

object. A collection of data managed as a single entity.

offsite volume. A removable media volume that is at a location where it cannot be mounted for use.

OpenEdition MVS. MVS/ESA services that support an environment within which operating systems, servers, distributed systems, and workstations share common interfaces. OpenEdition MVS supports standard application development across multivendor systems and is required to create and use applications that conform to the POSIX standard.

open registration. A registration process in which users can register their own workstations as client nodes with the server. Contrast with *closed registration*.

Operating System/2 (OS/2). An operating system used in IBM PC AT, PS/2, and compatible computers. OS/2 is one of the supported client environments and one of the supported server environments.

operator privilege class. An administrative privilege class that allows an administrator to issue commands that control the operation of the server. This privilege class allows disabling or halting the server to perform maintenance, enabling the server, canceling server processes, and managing tape.

optical disk. A disk that contains data readable by optical techniques.

optical drive. A drive mechanism that rotates an optical disc.

optical library. A disk storage device that houses optical disk drives and optical disks, and contains a mechanism for moving optical disks between a storage area and optical disk drives.

OS/2. Operating System/2.

OS/400. Operating System/400.

owner. The owner of backup-archive files sent from a multiuser client node, such as AIX.

P

page. (1) A block of instructions, data, or both. (2) In ADSM, a unit of space allocation within database volumes. (3) In a virtual storage system, a fixed block that has a virtual address and is transferred as a unit between real storage and auxiliary storage.

paging. (1) The action of transferring instructions, data, or both, between real storage and external page storage. (2) Moving data between memory and a mass storage device as the data is needed.

pattern-matching expression. A string expression that uses wildcard characters to specify one or more ADSM objects. See also *wildcard character*.

PC Support/400. A software product that supports advanced program-to-program communications (APPC) in the DOS, OS/2, and Microsoft Windows environments and provides a set of end user services.

platform. The operating system environment in which a program runs.

policy definition. Server control information that includes information about policy domains, policy sets (including the ACTIVE policy set), management classes (including the default management class), copy groups, schedules, and associations between client nodes and schedules. A policy definition can be exported from a source server so that it can be imported to a target server at a later date.

policy domain. A policy object that contains policy sets, management classes, and copy groups that is used by a group of client nodes. See *policy set*, *management class*, and *copy group*.

policy privilege class. An administrative privilege class that allows an administrator to manage policy objects, register client nodes, and schedule client operations (such as backup services) for client nodes. Administrators can be authorized with unrestricted or restricted policy privilege. See *unrestricted policy privilege* or *restricted policy privilege*.

policy set. A policy object that contains a group of management class definitions that exist for a policy domain. At any one time there can be many policy sets within a policy domain but only one policy set can be active. See *management class* and *active policy set*.

premigration. For an HSM client, the process of copying files that are eligible for migration to ADSM storage, but leaving the original file intact on the local system.

primary storage pool. A named set of volumes that ADSM uses to store backup versions of files, archive copies of files, and files migrated from client nodes via ADSM space management. A primary storage pool may be backed up to a copy storage pool either automatically or by command. See *destination* and *copy storage pool*.

privilege class. A level of authority granted to an ADSM administrator. ADSM has five privilege classes: system, policy, storage, operator, and analyst. The privilege class determines which ADSM administrative tasks the administrator can perform. For example, an administrator with system privilege class can perform any administrative task.

programmable workstation communication services (PWSCS). A product that provides transparent high performance communications between programs running on workstations or on host systems.

protection status. A device class attribute that specifies whether to update the RACF profile to identify which users have access to cartridge tapes associated with this device class on MVS servers.

PWSCS. Programmable workstation communication services.

Q

QIC. Quarter-inch cartridge (a type of magnetic tape media).

R

random access media. Any volume accessed in a nonsequential manner. In ADSM, volumes are accessed in a nonsequential manner if they reside in the DISK device class.

randomization. The percentage of the startup window that the server can use to randomize start times for different client nodes associated with a schedule.

rebinding. The process of associating a file with a new management class name. For example, rebinding occurs when the management class associated with a file is deleted. See *binding*.

recall. A function that allows users to access files that have been migrated from their workstations to ADSM storage via ADSM space management. Contrast with *migrate*.

reclamation. A process of consolidating the remaining data from many sequential access media onto a single new sequential access media.

reclamation threshold. A value that specifies a percentage of space on sequential access media volumes that can be occupied by reclaimable space. The remainder of the space is for active data. (Space becomes reclaimable when files are expired.)

recovery log. A log of updates that are about to be written to the database. The log can be used to recover from system and media failures.

recovery log buffer pool. Used to hold new transactions records until they can be written to the recovery log.

reduce. The process of freeing up enough space to allow you to delete a volume from the database or recovery log. Contrast with *extend*.

REEL. On ADSM servers that support it, a device class that is used to categorize tape devices that support tape reels, such as the 3420 9-track tape device.

register. Defines a client node or administrator who can access the server. See *registration*.

registration. The process of identifying a client node or administrator to the server.

reply operator. On a VM server, a VM user ID that specifies an operator who will reply to tape mount requests by the server.

restore. The process of returning a backup copy to an active storage location for use. ADSM has processes for restoring its database, storage pools, storage pool volumes, and users' backed-up files. For example, users can copy a backup version of a file from the storage pool to the workstation. The backup version in the storage pool is not affected. Contrast with *backup*.

restricted policy privilege. An administrative privilege class that enables an administrator to manage policy objects only for the policy domains for which the administrator has been authorized.

restricted storage privilege. An administrative privilege class that enables an administrator to control the allocation and use of storage resources only for the storage pools for which the administrator has been authorized.

retention. The amount of time, in days, that inactive backed up or archived files will be retained in the storage pool before they are deleted. The following copy group attributes define retention: retain extra versions, retain only version, retain version.

retention period. On an MVS server, a device class attribute that specifies how long files are retained on sequential access media. When used, ADSM passes this information to the MVS operating system to ensure that other tape management systems do not overwrite tape volumes that contain retained data.

retrieve. A function that allows users to copy an archive copy from the storage pool to the workstation. The archive copy in the storage pool is not affected. Contrast with *archive*.

RLIO. Record Level Input/Output.

rollback. To remove changes that were made to database files since the last commit point.

root. In the AIX and UNIX environments, the user name for the system user with the most authority.

root user. In the AIX and UNIX environments, an expert user who can log in and execute restricted commands, shut down the system, and edit or delete protected files. Also called the *superuser*.

routing choice. A choice in a pull-down menu that, when selected, brings up another window. See also *action choice*.

S

SAA. Systems Application Architecture.

schedule. A database record that describes scheduled client operations or administrative commands. See *administrative command schedule* and *client schedule*.

scheduling mode. The type of scheduling operation set for the server and client. ADSM supports two scheduling modes for client operations: client-polling and server-prompted.

scratch volume. A volume that is available for ADSM use. The volume is labeled, is either blank or contains no valid data, and is not defined to ADSM.

SCSI. Small computer system interface.

selective backup. A function that allows users to back up specific files or directories from a client domain. With this function, users can back up files or directories that are not excluded in the include-exclude list and that meet the requirement for serialization as defined in the backup copy group of the management class assigned to the files. Contrast with *incremental backup*.

sequential access media. Any volume that is accessed in a sequential manner, as opposed to a random manner. In ADSM, volumes are accessed sequentially if they reside in a device class other than DISK.

serialization. A copy group attribute that specifies what ADSM does if files are modified during back up or archive processing. The value of this attribute determines whether processing continues, is retried, or is stopped. See *static*, *dynamic*, *shared static*, and *shared dynamic*.

server. A program that provides services to other programs (clients).

server migration. The process of moving data from one storage pool to the next storage pool as controlled by the high and low migration thresholds. See *high migration threshold* and *low migration threshold*.

server options file. A file that specifies processing options for communication methods, tape handling, pool sizes, language, and date, time, and number formats.

server program. The program that provides backup, archive, space management, and administrative services to clients. The server program must be at the necessary level to provide all of these services.

server-prompted scheduling mode. A client/server communication technique where the server contacts the client when work needs to be done.

server storage. The primary and copy storage pools used by the server to store users' files: backup versions, archive copies, and files migrated from client nodes (space-managed files). Synonymous with *data storage*. See *primary storage pool*, *copy storage pool*, *storage pool volume*, and *volume*.

session resource usage. The amount of wait time, CPU time, and space used or retrieved during a client session.

shared dynamic. A copy group serialization value that specifies that a file must not be modified during a backup or archive operation. ADSM attempts to retry the backup or archive operation a number of times; if the file is in use during each attempt, ADSM will back up or archive the file on its last try even though the file is in use. See also *serialization*. Contrast with *dynamic*, *shared static*, and *static*.

shared static. A copy group serialization value that specifies that the file must not be modified during backup or archive. ADSM will retry the backup or archive operation a number of times; if the file is in use during each attempt, ADSM will not back up or archive the file. See also *serialization*. Contrast with *dynamic*, *shared dynamic*, and *static*.

shell. In the AIX and UNIX environments, a software interface between a user and the operating system of a computer. Shell programs interpret commands and user interactions on devices such as keyboards, pointing devices, and touch-sensitive screens and communicate them to the operating system.

signal. (1) A simple method of communication between two processes. One process can inform the other process when an event occurs. (2) In operating system operations, a method of inter-process communication that simulates software interrupts.

signal handler. A subroutine called when a signal occurs.

SMIT. System Management Interface Tool.

SNA LU6.2. Systems Network Architecture Logical Unit 6.2.

socket. (1) An endpoint for communication between processes or applications. (2) A pair consisting of TCP port and IP address, or UDP port and IP address.

space-managed file. A file that is migrated from and recalled to a client node via ADSM space management.

space management. The process of keeping sufficient free storage space available on a client node by migrating files to ADSM storage. The files are migrated based on criteria defined in management classes to which files are bound, and the include-exclude list.

Synonymous with *hierarchical storage management*. See also *migration*.

space management client. A program that runs on workstations to allow users to maintain free space on their workstations by migrating and recalling files to and from ADSM storage. Synonymous with *hierarchical storage management client*.

SPACEMGPPOOL. A disk storage pool defined by ADSM at installation. It can be the destination for files that are migrated from client nodes via ADSM space management. See *storage pool*.

stale copy status. Specifies that a volume copy is not available to the database or recovery log.

STANDARD copy group. A backup or archive copy group that is defined by ADSM at installation. See *copy group*.

STANDARD management class. A management class that is defined by ADSM at installation. See *management class*.

STANDARD policy domain. A policy domain that is defined by ADSM at installation. See *policy domain*.

STANDARD policy set. A policy set that is defined by ADSM at installation. See *policy set*.

stanza. A group of lines in a file that together have a common function or define a part of the system. Stanzas are usually separated by blank lines or colons, and each stanza has a name.

startup window. A time period during which a schedule must be initiated.

static. A copy group serialization value that specifies that the file must not be modified during backup or archive. If the file is modified during the attempt, ADSM will not back up or archive the file. See also *serialization*. Contrast with *dynamic*, *shared dynamic*, and *shared static*.

storage hierarchy. A logical ordering of primary storage pools, as defined by an administrator with system privilege. Generally, the ordering is based on the speed and capacity of the devices that the storage pools use. In ADSM, the storage hierarchy is defined by

identifying the *next* storage pool in a storage pool definition. See *storage pool*.

storage management services. A component that allows a central system to act as a file backup and archive server for local area network file servers and workstations.

storage pool. A named set of storage volumes that ADSM uses to store client data. A storage pool is either a primary storage pool or a copy storage pool. See *primary storage pool* and *copy storage pool*.

storage pool volume. A volume that has been assigned to an ADSM storage pool. See *volume*, *copy storage pool*, and *primary storage pool*.

storage privilege class. An administrative privilege class that allows an administrator to control the allocation and use of storage resources for the server, such as monitoring the database, recovery log, and server storage. Administrators can be authorized with unrestricted or restricted storage privilege. See *restricted storage privilege* or *unrestricted storage privilege*.

stub file. A file that replaces the original file on a client node when the file is migrated from the client node to ADSM storage.

superuser. See *root user*.

synchronized copy status. Specifies that the volume is the only volume copy or is synchronized with other volume copies in the database or recovery log. When synchronized, mirroring has started.

system privilege class. An administrative privilege class that allows an administrator to issue all server commands.

Systems Application Architecture (SAA). Software interfaces, conventions, and protocols that provide a framework for designing and developing applications that are consistent across systems.

Systems Network Architecture (SNA). A set of rules for data to be transmitted in a network. Application programs communicate with each other using a layer of SNA called advanced program-to-program communications (APPC).

T

tape. A recording medium consisting of a long, narrow, flexible strip with a magnetic coating wound onto a reel or into a cartridge. See *cartridge* and *tape reel*.

tape library. (1) A term used to refer to a collection of tape cartridges. (2) An automated device that performs tape cartridge mounts and demounts without operator intervention.

Tape Library Dataserver. An automated tape library consisting of mechanical components, cartridge storage frames, IBM tape subsystems, and controlling hardware and software. The tape library dataserver performs tape cartridge mounts and demounts without operator intervention.

tape reel. A cylinder with flanges on which magnetic tape is wound. Devices such as the 3420 9-track tape device support tape reels. Contrast with *cartridge*.

tape volume prefix. A device class attribute that is the high-level-qualifier of the file name or the data set name in the standard tape label.

task help. A type of online help that provides a list of tasks that can be completed with a selected object. When you select a task, the help provides step-by-step information on how to complete the task.

TCP/IP. Transmission Control Protocol/Internet Protocol.

Telnet. In TCP/IP, the protocol that opens the connection to the system.

Transmission Control Protocol/Internet Protocol (TCP/IP). A set of communication protocols that support peer-to-peer connectivity functions for both local and wide area networks.

trusted communication agent. A program that performs communication tasks on behalf of the client or server, and ensures the security of the communications.

U

unit name. On an MVS server, a device class attribute that specifies a group of tape devices used with the MVS server. A unit name can be a generic device type, an esoteric unit name, or a physical device.

unrestricted policy privilege. An administrative

privilege class that enables an administrator to manage policy objects for any policy domain.

unrestricted storage privilege. An administrative privilege class that enables an administrator to control the database, recovery log, and all storage pools.

utilization. The percent of assigned capacity used by the database or recovery log at a specific point of time.

V

validate. The process of ensuring that the active policy set contains a default management class and reporting on copy group definition errors.

version. The maximum number of backup copies retained for files and directories. The following copy group attributes define version criteria: *versions data exists* and *versions data deleted*.

Virtual Machine (VM). One of the family of IBM operating systems for the System/370 or System/390 processor, including VM/ESA, VM/XA, VM/SP, and VM/HPO. VM is one of the supported server environments.

Virtual Storage Extended (VSE). One of the family of IBM operating systems for the System/370 or System/390 processor, including VSE/ESA. VSE is one of the supported server environments.

VM. Virtual Machine.

volume. The basic unit of storage for the database, recovery log, or a storage pool. A volume can be an LVM logical volume, a standard file system file, a tape cartridge, or an optical cartridge. Each volume is identified by a unique volume identifier. See *database volume*, *scratch volume*, and *storage pool volume*.

volume history file. A file that contains information about: volumes used for database backups and database dumps; volumes used for export of administrator, node, policy, or server data; and sequential access storage pool volumes that have been added, reused, or deleted. The information is a copy of the same types of volume information in the ADSM database.

volume set. An entire image of the database or recovery log, as displayed on the administrative graphical user interface.

VSE. Virtual Storage Extended.

W

WDSF/VM. Workstation Data Save Facility/Virtual Machine.

wildcard character. A character or set of characters used to specify an unknown number or set of characters in a search string. Also called *pattern-matching character*.

window. A part of a display screen with visible boundaries in which information is displayed.

windowed interface. A type of user interface that is either a graphical user interface or a text based interface. The text based interface maintains a close affinity to the graphical user interface, including action

bars and their associated pull-downs and windows. See *graphical user interface*.

workstation. A personal computer system capable of maintaining data files.

Workstation Data Save Facility/Virtual Machine (WDSF/VM). The predecessor product to ADSTAR Distributed Storage Manager.

WORM. A type of optical media that can only be written to and cannot be erased.

X

X Windows. A network transparent windowing system developed by MIT. It is the basis for other products, such as Enhanced X Windows which runs on the AIX operating system.

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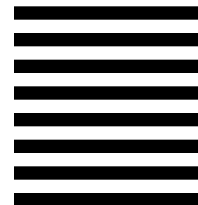
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