

ADSTAR Distributed Storage Manager  
for AS/400



# Quick Start

*Version 2*



ADSTAR Distributed Storage Manager  
for AS/400



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*Version 2*

**Note!**

Before using this information and the product it supports, be sure to read the general information under Appendix H, "Notices" on page 109.

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

**First Edition (June 1996)**

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## Before You Begin

ADSTAR Distributed Storage Manager for AS/400 (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 an AS/400 system
- Define the communication network for server and clients
- Customize ADSM for your environment

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## What You Should Know before Reading This Publication

Before using this publication, you should be familiar with:

- OS/400 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.

---

## 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, cautions, or information.

---



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:



AS/400 command line



ADSM Utilities



ADSM administrative client command line



ADSM administrative client graphical user interface



ADSM end user client command line (backup-archive or HSM client)



ADSM end user client graphical user interface (backup-archive or HSM client)

---

## How to Use This Book

This book will take you through the tasks you must perform to set up a basic, practical ADSM system. The approach is to take advantage of the defaults supplied with ADSM. Even in the customization section (Chapter 4, “Customizing Your ADSM System” on page 29), you will use most of the defaults supplied by commands or the graphical user interface.

## The Result

After you complete the tasks in Chapter 1, “Installing the Server” on page 3,

Chapter 2, “Installing the Clients” on page 13, and Chapter 3, “Setting Up the Server” on page 17, 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 backup-archive clients

#### **Standard Policy**

The default policy objects, which specify 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 29 describes tasks that allow you to add the following to your ADSM system:

#### **Tape Storage Pools**

Storage pools of tape volumes

#### **Server Storage Hierarchy**

Disk storage pools and tape storage pools arranged in a hierarchy so that client data migrates from disk to tape based on criteria that you specify

**Direct-to-Tape Policy**

Policies that specify that client files are stored directly to tape

**Include/Exclude Criteria**

Template that clients can use to exclude specified data from policy operations

**Automated Client Operations**

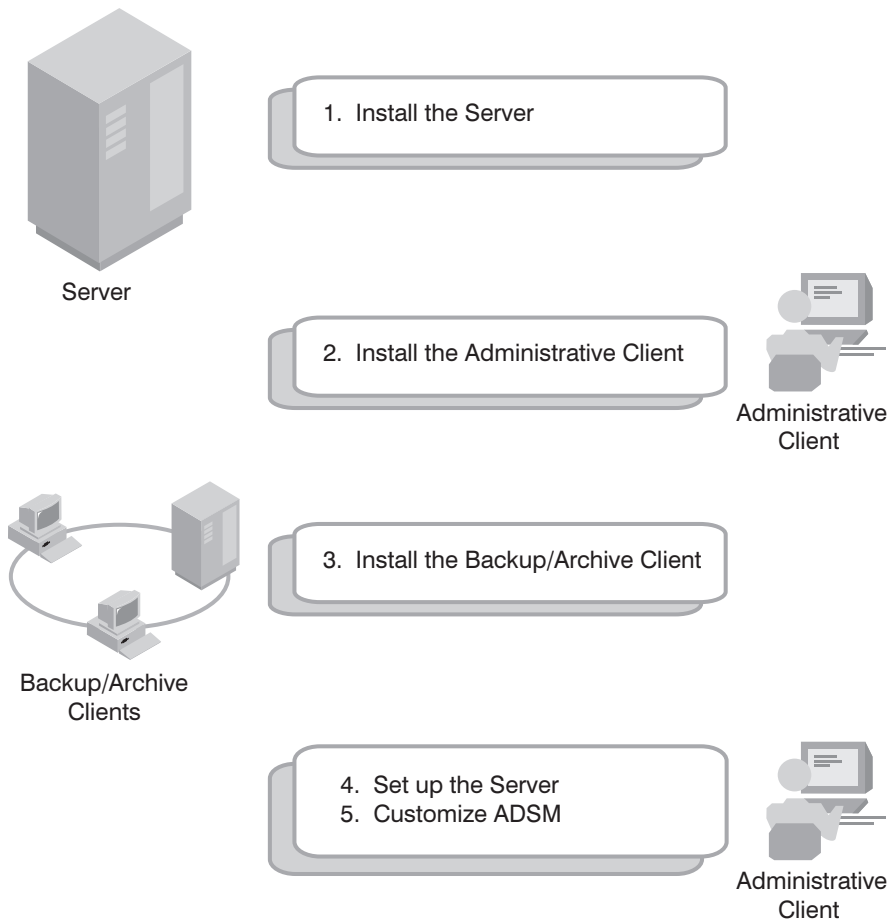
Schedules to automate client operations such as backup and archive.

**Automated Administrative Commands**

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 presents details of each task and provides page numbers where you can find the procedures.

- 1** Install the Server (page 3)
  - a** Install the server code (page 3)
  - b** Verify system values (page 5)
  - c** Enable server communications (page 6)
  - d** Specify your license terms (page 10)
- 2** Install the administrative client
  - a** Set up the AS/400 administrative client (page 13)
  - b** Set the client communications options (page 13)
  - c** Install all other administrative clients (page 13 and see *ADSM Installing the Clients*)
- 3** Install backup-archive clients (see page 13 and *ADSM Installing the Clients*)
- 4** Set up the Server (page 17)
  - a** Initialize and define database and recovery log volumes (page 17)
  - b** Start the server (page 19)
  - c** Start the administrative client (page 20)
  - d** Stop the server (page 22)
  - e** Stop the administrative client (page 23)
  - f** Create disk storage pool volumes (page 23)
  - g** Register client nodes (page 25)
  - h** Verify server installation (page 25)

## **5** Customize ADSM (page 29)

- a** Assign administrators (page 29)
- b** Add tape drives to ADSM (page 30)
  - Using ADSM Utilities (page 31)
  - Using commands and GUI (page 38)
- c** Verify storage management (page 49)
- d** Automate Client Operations (page 51)
- e** Automate Administrative Commands (page 54)
- f** Adjust database, recovery log, and storage pool space (page 55)

---

## **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:

- Permit clients to not use 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 cartridge capacities for tape devices?
  - Which devices are in automated libraries (for example, an IBM 3494) and which require operator intervention?
- What are the backup, archive, and space 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?

## Disk Space Recommendations

For preliminary planning purposes, the following disk space minimums are recommended:

<b>Server</b>	20MB
<b>Database</b>	25MB
<b>Recovery Log</b>	25MB
<b>Storage pool</b>	25MB
<b>Clients</b>	6MB per client (approximately)

Your disk space requirements will change as you expand the scope of your ADSM system:

- The database size is largely determined by the number of client files and versions of those files being stored on server storage. As you add clients, you will need to increase your database size.
- Storage pool space is largely determined by number and size of client files (including versions) and the backup destination (disk or sequential access media). You should reserve enough disk space to hold each day's changed data and allow migration to tape.



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## 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 the Server” on page 3.

## How ADSM Can Change the Way You Work

This book introduces you to a different way of managing storage for your installation. 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, the 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.

### 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 client

Provides space management services for workstations.

## 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. 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 shows an overview of the ADSM process for storing client data.

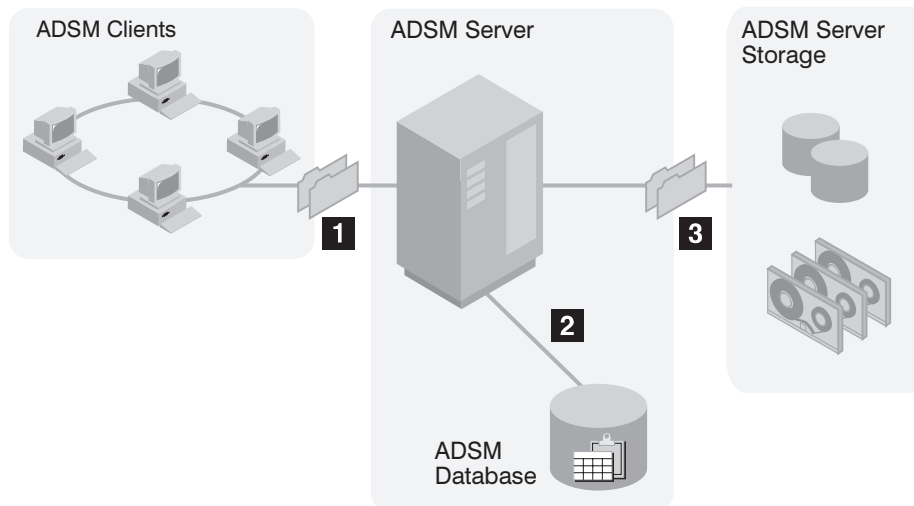


Figure 1. Overview of How ADSM Stores Client Data

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 shows the interaction between ADSM policy objects and ADSM backup, archive, and space management services.

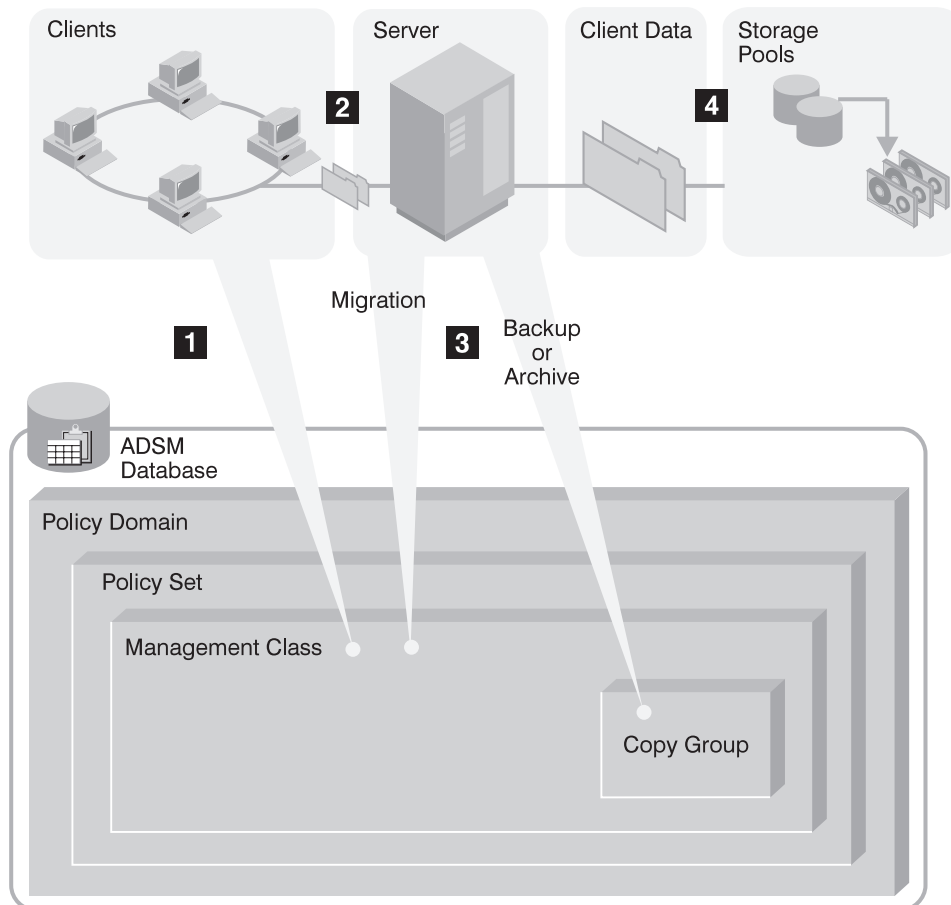


Figure 2. How ADSM Controls Backup, Archive, and Space Management

**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 storage pool and represents a unit of space available for ADSM client data.

Figure 3 on page xx 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 at least 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.

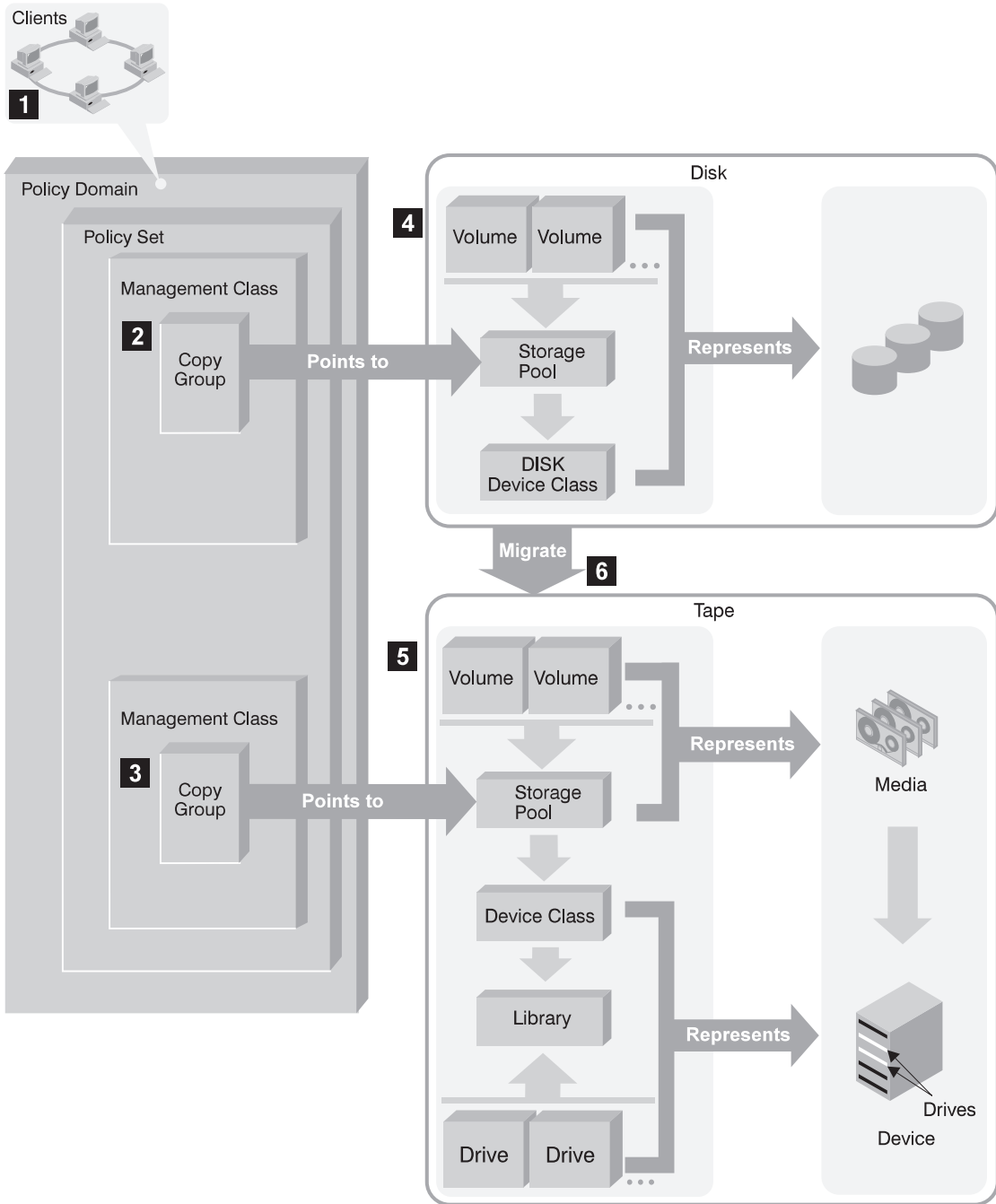


Figure 3. Putting it All Together

## **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

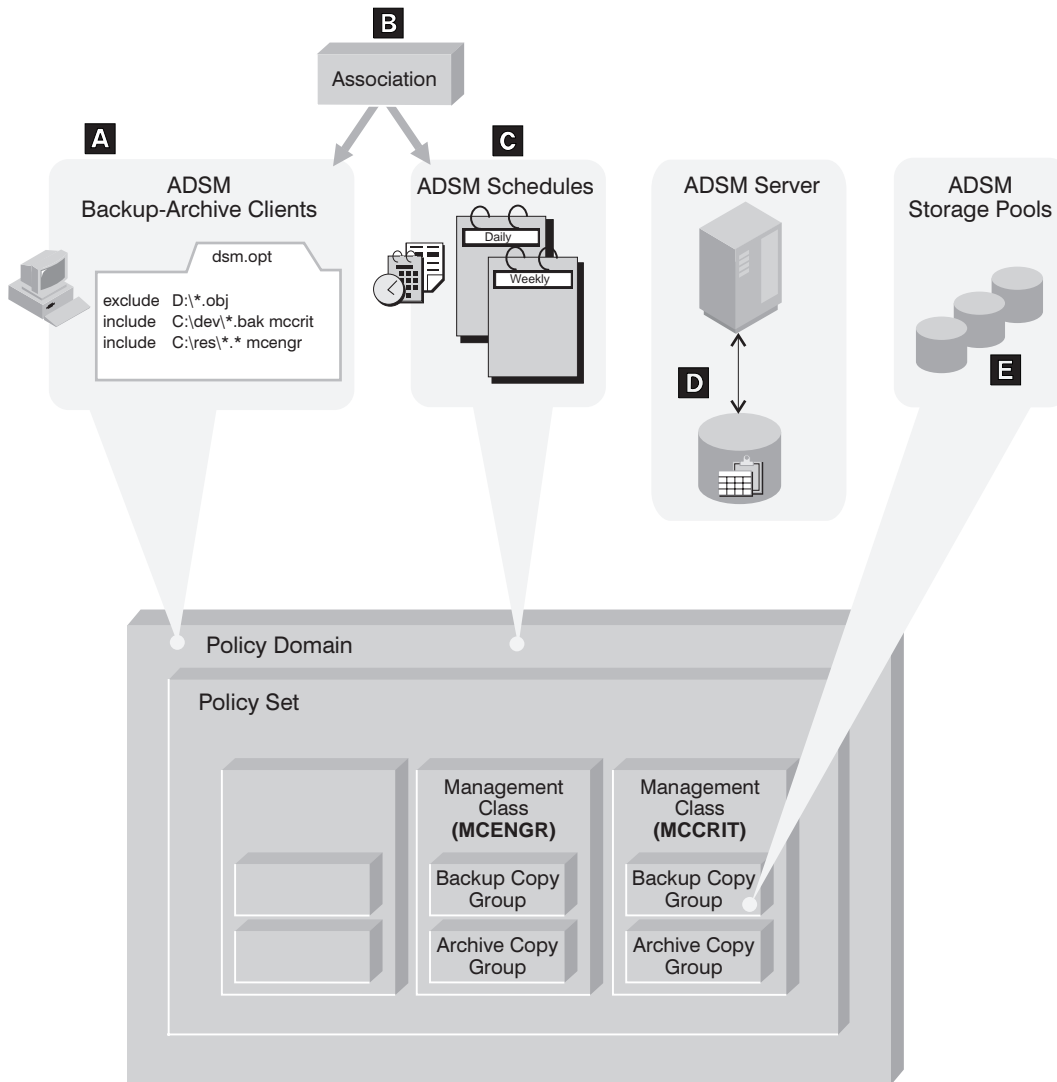


Figure 4. Automating Client Operations

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.)

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.)



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.) 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.



---

## Part 1. Installation



---

## Chapter 1. Installing the Server



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### To Install ADSM Version 2 over Version 1

- Before installing the Version 2 code, ensure that the ADSM server is halted.
- ADSM now runs in the QSYSWRK subsystem.
- Save recovery log, database, and storage pool files before installing the Version 2 code.
- When you first start the server after the installation, specify *\*YES (UPGRADEDDB)*, the upgrade database parameter, on the STRSVRADSM command. This parameter is specified *only* on the first start up.
- ADSM commands are now shipped with public authority set to *\*EXCLUDE*. To authorize other users to ADSM commands, refer to Appendix D, "Server Authority" on page 89.
- The AS/400 administrative client has been converted to use mode QADSM. You must stop and restart the QBASE or QCMN communication subsystem program for mode QADSM to take effect. For information on configuring your own communication subsystem, see "Enabling Server Communications" on page 6 and Appendix A, "Configuring Client Communications" on page 57.

---

#### Notes:

1. The server code is installed in the QADSM library.
2. User files are installed in the QUSRADSM user library.
3. A client options file on your client workstation must be modified to communicate with the server.

---

## Installing the Server Code



You need QSECOFR authority to install the server.

- 1** Ensure that the QSYSOPR delivery setting is in *\*BREAK* mode and the severity code filter is set to 95 by entering:

```
===> CHGMSGQ MSGQ(QSYSOPR) DLVRY(*BREAK) SEV(95)
```

**2** Insert the ADSM program tape into your AS/400 machine.

**3** Install the licensed program by entering:

```
===> go licpgm
```

The LICPGM menu appears.

**4** Select 11 (Install licensed programs).

**5** Select program *5763SV2 ADSM/400* from the menu. The Install Options panel appears:

```
                Install Options
                System: TUC400I

Type choices, press Enter.
Tape device . . . . . Name
Objects to install . . . . 1  1=Programs and language objects
                             2=Programs
                             3=Language objects
Automatic IPL . . . . . N    Y=Yes
                             N=No
```

Figure 5. Install Options

**6** On the Install Options panel, fill in the name of the tape device.

- If ADSM is on a single tape, select 1 (Programs and language objects) and press Enter. After ADSM is installed, continue to “Verifying System Values” on page 5.
- If you have a second tape with language objects, you will install program objects in this step and install language objects in the next step. Select 2 (Programs), and press ENTER. Go to step 7 or step 8 on page 5. (step 7 if the ADSM language tape matches the primary language on your system, or step 8 if it does not match)

**7** If you have a language tape for ADSM that matches the primary language of your system, insert the language tape, and select 11 (Install licensed programs). Select *5763SV2*, fill in the name of the tape device, select 3 (Language objects), and press ENTER. After the language objects have been installed, continue to “Verifying System Values” on page 5.

**8** If you have a language tape for ADSM that *does not* match the primary language of your system, do the following:

**a** Insert the language tape, enter the RSTLICPGM command, and prompt (PF4). Specify:

- Product: 5763SV2
- Device
- Type of object to be restored: \*LNG
- Language for Licensed program: \*SAVVOL

This causes a secondary language library to be created if it does not already exist on your system. For example, if you ordered language 2924, the ADSM panels and messages are stored in library QSYS2924.

**b** Add the secondary language library (for example, QSYS2924) to the appropriate library list by entering:

```
====> CHGSYSVAL SYSVAL(QSYSLIBL) +  
      VALUE('list of current libraries QSYS2924')
```

---

## Verifying System Values



Verify the QALWUSRDMN and QSYSLIBL system values.

**1** If the QALWUSRDMN system value is used, it must be updated to include QUSRADSM:

**a** Verify that QALWUSRDMN uses the *\*all* setting by entering:

```
====> WRKSYSVAL QALWUSRDMN
```

**b** Select 5 to display it.

**c** If the system value is not set to *\*all*, add the QUSRADSM library by selecting 2 to change it.

**2** Verify that QSYS2 is on your system library list by entering:

```
===> WRKSYSVAL QSYSLIBL
```

If it is not, add QSYS2 to the library by selecting 2 to change your library list.

---

## Enabling Server Communications

The ADSM server uses APPC, TCP/IP, IPX/SPX, or any combination as the communication method with the clients. The OS/400 administrative client uses only APPC as the communication method.

### APPC

During the installation, some communication entries were added to the communication subsystem, QBASE or QCMN. To activate these changes, you must stop and start QBASE or QCMN.

If you created your own communication subsystem, you must add the following communication entry to that subsystem, and then stop and restart the subsystem.

```
===> ADDCMNE SBSD(yoursubsystem) DEV(*APPC) JOBD(*USRPRF) +  
      DFTUSR(QADSM) MODE(QADSM)
```

### Verifying the AUTOCONFIG Facility

If all clients using APPC have controller and device descriptions defined, go to “TCP/IP” on page 7. If the controller and device descriptions are not defined, continue with this section.



AS/400

If the AUTOCONFIG facility is set on and the controller and device descriptions do not exist, they will be created the first time a client contacts the server.

**1** Verify that QAUTOCFG is on (set to 1) by entering:

```
===> DSPSYSVAL QAUTOCFG
```



- 2** Ensure that QCRTAUT is set to \*Change or \*All. If the system authority value is set to \*Use or \*Exclude, the AUTOCONFIG facility will not provide the proper authority to the device.

Check this by entering:

```
===> DSPSYSVAL QCRTAUT
```

If the automatic configuration facility cannot be used, you must manually configure the controller and device descriptions for each APPC attached workstation which will use ADSM and is not already configured. See Appendix B, "Defining the Controller and the Device Descriptions for APPC" on page 81.

**Notes:**

1. If the communication subsystem used with ADSM/400 is not active when an ADSM client node initially attempts to contact the server, it may be necessary to vary off the controller and device associated with that client node.
2. Vary on the controller description after you create the device and controller description. The status changes to VARY ON PENDING until the client node contacts the server. The status should then change to ACTIVE.

After the client node has been idle for a while, the status returns to VARY ON PENDING until the client issues an ADSM command.

For more information, refer to the *AS/400 Programming: Work Management Guide*.

## TCP/IP

Before using TCP/IP with ADSM, ensure that TCP/IP is installed and operational. See the *OS/400 Transmission Control Protocol/Internet Protocol Configuration and Reference Guide*, SC41-3420, for instructions and guidelines.

TCP/IP must be started before the ADSM server is started.

## IPX/SPX

Before using IPX/SPX with ADSM, ensure that IPX/SPX is installed and operational. See the *IPX/SPX Install Administrator's Guide*, SC23-2547, and the *AnyNet/2 Version 2.0.2 Guide to Sockets over IPX*, SV40-0112, for instructions and guidelines.

IPX must be started before the ADSM server is started.

## 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.

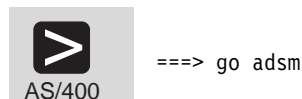
- APPC

No additional ADSM server configuration is required for APPC support of multiple adapters. However, you must ensure that the controller description for a client workstation contains the desired line description in the switched line list (SWTLINLST) parameter.

## Setting Server Communications Options

To enable server communications, use the ADSM Utilities menu.

- 1** To access ADSM Utilities, bring up the ADSM Main Menu by entering the following command:



The following menu is displayed:

```
ADSM          ADSTAR Distributed Storage Manager          System:TUC400I

Select one of the following:

    1. Utilities
    2. Recovery Tools
    3. Display console messages
    4. Verify server status
    5. Start administrative client

    10. Start server
    11. End server

Selection or command
====>
```

Figure 6. ADSM Main Menu

## 2 Select 1 (Utilities) to go to the ADSM Utilities menu.

```
ADSMUT      ADSTAR Distributed Storage Manager Utilities
                System: TUC400I

Select one of the following:

    1. Initialize server
    2. Work with devices
    3. Change server options
    4. Change administrative client options
    5. Create and format volume
    6. Initialize a tape

Selection or Command
====>
```

Figure 7. ADSM Utilities Menu

You can go directly to the ADSM Utilities menu from the OS/400 command line by entering:

```
====> go adsmut
```



The ADSM Utilities provides the Change Server Options (CHGSVRADSM) screen that lets you specify communication methods and license terms, which are described in this book. 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.



## 3 Select 3 (Change server options) and press enter to accept the default server work library, QUSRADSM.

The server displays the Change Server Options (CHGSVRADSM) screen (Figure 8 on page 10).

```

Change Server Options (CHGSVRADSM)

Type choices, press Enter.

Server working library . . . . . QUSRADSM      Name, *CURLIB
License terms:
Licensed clients . . . . . 1                  Number, *SAME
Desktop clients . . . . . *BASE              *SAME, *BASE
UNIX clients . . . . . *NO                  *SAME, *YES, *NO
MVS Open Ediiton clients . . . *NO          *SAME, *YES, *NO
Space management . . . . . *NO             *SAME, *YES, *NO
Device support module . . . . *BASE     *SAME, *BASE, *DEVICEMOD3...
Secondary server attachment . *NO         *SAME, *YES, *NO
TCP/IP communication method:
Enable TCP/IP . . . . . *NO                 *SAME, *YES, *NO
TCP/IP port . . . . . 1500                 1024-32767, *SAME
TCP/IP buffer size . . . . . 4              1-8 kilobytes, *SAME
APPC communication method:
Enable APPC . . . . . *YES                 *SAME, *YES, *NO
SNA buffer size . . . . . 15              1-31 kilobytes, *SAME
IPX communication method:
Enable IPX . . . . . *NO                   *SAME, *YES, *NO
IPX socket number . . . . . 8522           0001-FFFF, *SAME
IPX buffer size . . . . . 4                1-8 kilobytes, *SAME

```

Figure 8. Change Server Options (CHGSVRADSM) Screen

**4** If you are going to use TCP/IP or IPX communication, you must enable the method you will use. For example, to specify TCP/IP or IPX, change *Enable TCP/IP* or *Enable IPX* to *\*YES*.

- The TCP/IP server port address defaults to 1500; the size of the TCP/IP send and receive buffers defaults to 4KB.
- The IPX socket number defaults to 8522; the size of the TCP/IP send and receive buffers defaults to 4KB.

Do not press Enter yet. Your next task, specifying the terms of your license, is done from the CHGSVRADSM screen.

---

## Specifying the Terms of Your ADSM License

The base ADSM license provides the following:

- An unlimited number of administrative clients
- One DESKTOP backup-archive client
- Removable media devices not located in automated libraries (for example, IBM 3494)

**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.



To update your license terms server options, edit the Change Server Options (CHGSVRADSM) screen, and press Enter.

```
Change Server Options (CHGSVRADSM)

Type choices, press Enter.

Server working library . . . . . QUSRADSM      Name, *CURLIB
License terms:
Licensed clients . . . . . 1                Number, *SAME
Desktop clients . . . . . *BASE            *SAME, *BASE
UNIX clients . . . . . *NO                *SAME, *YES, *NO
MVS Open Edition clients . . . *NO        *SAME, *YES, *NO
Space management . . . . . *NO            *SAME, *YES, *NO
Device support module . . . . *BASE    *SAME, *BASE, *DEVICEMOD3...
Secondary server attachment . *NO        *SAME, *YES, *NO
TCP/IP communication method:
```

For example, to allow a total of 25 backup-archive clients on both OS/2 and AIX and attach devices in Device Support Module 3:

- 1 Change *Licensed clients* to 25.
- 2 Change *UNIX clients* to YES.
- 3 Change *Device Support Module* to DEVICEMOD3.



After the server has started, you can change the terms of your license without stopping the server, by issuing the REGISTER LICENSE command. See *ADSM Administrator's Guide* for details.



---

## Chapter 2. Installing the Clients

This chapter describes setting up the AS/400 administrative client (there is no AS/400 backup-archive client). It also provides some information on setting client communications options for all clients.

The AS/400 administrative client provides a command line interface only. The OS/2 administrative client, which is included in examples later in this book, provides both a command line interface and a graphical user interface (GUI). You may want to install the OS/2 client at this time so that you can use command line client (AS/400 or OS/2) and the OS/2 GUI for the tasks presented on the following pages.



To complete some of the tasks in Chapter 3, "Setting Up the Server" on page 17 and Chapter 4, "Customizing Your ADSM System" on page 29 you must install at least one backup-archive client.

For information about installing backup-archive clients, HSM clients, and administrative clients other than AS/400, see *ADSM Installing the Clients*. For information about client communications, see "Remote Client Communications Options" and Appendix A, "Configuring Client Communications" on page 57.

---

---

### Setting Up the AS/400 Administrative Client

The AS/400 administrative client is installed when you install the server code and uses the APPC communication method. You can use ADSM Utilities Menu (see Figure 7 on page 9) or the CHGADMADSM command to change the client options.

---

### Remote Client Communications Options

ADSM remote clients can use one of four communication methods to communicate with the server:

- SNA LU6.2
- TCP/IP
- Client Access/400
- IPX/SPX

The client user options file identifies the servers you can connect to and specifies the communication method and associated options. See *ADSM Installing the Clients* for details. Table 1 on page 14 specifies Communication Access Tools, the applicable communication method, and supported clients.

---

*Table 1. Communication Tools, Methods, and Supported Clients*

<b>Communication Access Tools</b>	<b>COMMMETHOD</b>	<b>Supported Clients</b>
Client Access/400	400COMM	DOS, Windows
NS Windows	SNALU6.2	Windows
CM2 for OS/2		OS/2
Client Access for OS/2		OS/2
Novell NetWare for SAA		Novell NetWare
AIX SNA Services/6000		AIX
TCP/IP	TCPIP	All ADSM clients support TCP/IP
NetWare IPX/SPX	IPXSPX	DOS, Novell, OS/2, Windows



- For more information about setting up your client communications, see Appendix A, “Configuring Client Communications” on page 57 for OS/2, DOS, Novell NetWare, and Windows clients.
- You should install at least one backup-archive client at this point and then continue on to Chapter 3, “Setting Up the Server” on page 17.



---

## Part 2. After Installation



---

## Chapter 3. Setting Up the Server

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

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

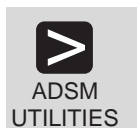
- archive** To copy a file to a storage pool for long-term storage.
- client node** A file server or workstation on which the backup-archive client program has been installed, which has been registered to the server.
- incremental backup** A backup of client files or directories that are new or have 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.

---

### Initializing the Server and Defining the Database and Recovery Log

The database size is largely determined by the number of client files being stored on server storage. For the tasks described in this book, you should have a database and recovery log of at least 25MB each. As you add backup-archive clients or HSM clients, you may need to increase your database size. See the *ADSM Administrator's Guide* for details about adding more space.

The size of the recovery log depends on a number of factors, including the number of concurrent client sessions. Begin with at least 25MB for the recovery log and monitor its utilization. If you need to change its size, see the *ADSM Administrator's Guide* for details.



To set up the database and recovery log volumes for the server, complete the following steps:

- 1** From the ADSM Utilities menu, select 1 (Initialize server).

```

Initialize Server (INZSVRADSM)

Type choices, press Enter.

Recovery log volume:
File . . . . . LOG01      Name
Library . . . . . *WRKLIB  Name, *LIBL, *CURLIB, *WRKLIB
Member . . . . . *FILE     Name, *FILE
Member size . . . . . 25      Megabytes
Replace member . . . . . *NO     *NO, *YES
+ for more values
Database volume:
File . . . . . DB01      Name
Library . . . . . *WRKLIB  Name, *LIBL, *CURLIB, *WRKLIB
Member . . . . . *FILE     Name, *FILE
Member size . . . . . 25      Megabytes
Replace member . . . . . *NO     *NO, *YES
+ for more values
Work library . . . . . QUSRADM  Name, *CURLIB

F3=Exit  F4=Prompt  F5=Refresh  F10=Additional parameters  F12=Cancel
F13=How to use this display  F24=More keys
Bottom

```

Figure 9. Initialize Server for ADSM Screen

**2** Specify the file names (for example, LOG01 and DB01) and the member sizes.

The following figure shows the type of information that the server displays after the files are created and formatted. This process may take several minutes to complete.

```

ADSTAR Distributed Storage Manager for OS400
Version 1, Release 2, Level 0.1/0.0

Licensed Materials - Property of IBM

5763-SV2 (C) Copyright IBM Corporation 1990, 1994. All rights reserved
U.S. Government Users Restricted Rights - Use, duplication or disclose
restricted by GSA ADP Schedule Contract with IBM Corporation.

ANR0300I Recovery log format started; assigned capacity 12 megabytes.
ANR0301I Recovery log format in progress; 4 megabytes of 12.
ANR0301I Recovery log format in progress; 8 megabytes of 12.
ANR0301I Recovery log format in progress; 12 megabytes of 12.
ANR0301I Recovery log format in progress; 16 megabytes of 16.
ANR0301I Recovery log format in progress; 20 megabytes of 20.
ANR0301I Recovery log format in progress; 24 megabytes of 24.
ANR0302I Recovery log formatting took 38243 milliseconds.
ANR0303I Format rate:      80.3 pages/second.
ANR0304I Page service time: 12.4 ms.
ANR0305I Recovery log format complete.
ANR0306I Recovery log volume mount in progress.
ANR0353I Recovery log analysis pass in progress.
ANR0354I Recovery log redo pass in progress.
ANR0355I Recovery log undo pass in progress.
ANR0352I Transaction recovery complete.
ANR0992I ADSM server installation complete.

```

---

## Starting the Server

You must start the server programs before any client can connect.

- 1** Before the server starts, the communication methods specified in the server options should already be active. If they are not active, start them. For example, issue the STRTCP command to start TCP/IP or the STRIXP command to start IPX.
- 2** To start the server, do either of the following:
  - From the ADSM main menu (see Figure 6 on page 8), select 10 (Start server). The screen in Figure 10 is displayed. Press Enter to accept the default work library and start the server.

```
Start Server for ADSM (STRSVRADSM)
Type choices, press Enter.
Work library . . . . . QUSRADSM      Name, *CURLIB
                   -----
```

Figure 10. Start Server Screen

- Enter the following command:

```
====> strsvradsm
```

The server takes a few minutes to start. When the startup is complete, this message is sent to the message queue of the user who initiated the server (issued the STRSVRADSM command):

```
Server is ready to communicate with clients
```

The server is now ready to communicate with clients. However, you must complete the remaining tasks in this chapter before the server is ready for backup and archive operations. These steps are performed from the administrative client.



You can use *option 4. Verify server (VFYSVRADSM)* from the main menu (see Figure 6 on page 8) to determine server status.

---

---

## Starting the Administrative Clients

To set up the server, you issue ADSM commands from an administrative client. This section describes how to start the AS/400 and OS/2 administrative clients.



The AS/400 administrative client provides a command line interface only. The OS/2 administrative client provides a graphical user interface and a command line interface.

The command line examples in this book are for the AS/400 administrative client. AS/400 does not accept continuation characters when a command is on more than one line; OS/2 requires 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 F, “Using ADSM Interfaces” on page 101.

---

For information on starting all other clients, see the *ADSM Installing the Clients*.

## Starting the AS/400 Administrative Client

**1** To start the administrative client do either of the following:

- Choose *option 5. Start Administrative Client for ADSM* from the ADSM main menu (Figure 6 on page 8). The following screen is displayed.

```
Start Administrative Client (STRADMADM)
Type choices, press Enter.
Administrator name . . . . . _____
Password . . . . . _____
Server working library . . . . . QUSRADM      Name, *CURLIB
```

- Enter the following command:

```
==> stradmadm
```

- 2 Specify ADSMADMIN as both the administrator name and password. If your startup is successful, ADSM displays the following screen, from which you can issue ADSM commands.

```
Previous administrative commands and messages:

ADSTAR Distributed Storage Manager
Command Line Administrative Interface - Version 1, Release 2, Level
(C) Copyright IBM Corporation, 1990, 1995, All Rights Reserved.

Enter your password:
ANS5100I Session established with server ADSM: 0S400

adsm>

Enter Administrative Command
====> _____
```

If the startup is not successful, the screen will not include message ANS5100I. There may have been a problem with setting up your APPC communications (see “APPC” on page 6).

- 3 If you wish, you can change the password of the ADSMADMIN client at this point. To change the password to TUCSON, for example, enter the following command:

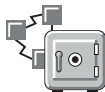


```
update admin adsmadmin tucson
```

## Starting the OS/2 Administrative Client

To start the OS/2 **administrative client GUI**, do either of the following:

- If your OS/2 desktop has the administrative GUI icon,



double click on the icon, or select the icon and press *Enter*.

- At the command prompt in an OS/2 window enter:

```
start dsmadm
```

To start the OS/2 **administrative client command line interface**, enter the following at the command prompt in an OS/2 window:

```
dsmdmc
```

---

## Stopping the Server

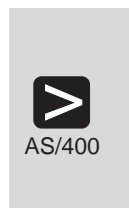
You can halt the server without warning if an unexpected problem requires you to return control to the operating system. To avoid severely affecting administrative and client node activity, stop the server only after current administrative and client node sessions have completed or been canceled.



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.

---

**1** To stop the server, do one of the following:



===> endsvradm

This command can also be issued by selecting 11 (End server) from the ADSM Main Menu.

The default for this command is stop the server after all current transactions are completed. You can issue this command only if you started the server or have all object authority.



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 the Administrative Client

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



quit



One of the following:

- Double click on the system menu symbol
- Click on the system menu symbol, and click on **Close** from the pull down menu
- Press F3

---

## Creating Disk Storage Pool Volumes

At server installation, three default disk storage pools are created: BACKUPPOOL, ARCHIVEPOOL, and SPACEMGPOOL. These default pools have no space (volumes) allocated to them. You must define volumes to any pool that you wish to use. You can add volumes to a storage pool at any time.

1



From the ADSM Utilities menu, Select 5 (Create and format volume). The following screen appears:

```
                                Create Volume for ADSM (CRTVOLADSM)
Type choices, press Enter.
Volume:
File . . . . . CLIENT01      Name
Library . . . . . QUSRADSM   Name, *CURLIB
Member . . . . . *FILE      Name, *FILE
Member size . . . . . 12     Megabytes
Replace member . . . . . *NO  *NO, *YES
+ for more values
```

You can create and format volumes for all your disk storage pools from this screen. For each volume, do the following:

- Specify a unique name for the volume file (for example, **backup01** for the BACKUPPOOL storage pool volume and **archive01** for the ARCHIVEPOOL storage pool volume)

- b** Specify a library name or leave as QUSRADSM to use the default library name.
- c** The default size for a disk storage pool volume allows only 12MB of client data to be backed up to server disk. For test purposes, you may want to format enough space to support one client. You can add more space later. If you are testing ADSM with client that has a 500MB hard drive, you may want to specify 500MB. for this file. Depending on the size of the space being allocated, this command can take a while to run.

**2** From an administrative client, define each of the volumes to the storage pools. For example, to define volumes **backup01 archive01**, use either the command line or the GUI:



```
define volume backuppool backup01
define volume archivepool archive01
```



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:
 

<b>Storage pool</b>	backuppool
<b>Volume name</b>	backup01
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:
 

<b>Storage pool</b>	archivepool
<b>Volume name</b>	archive01
10. Click on the **Add** push button

---

## Registering Client Nodes

You are now ready to register the backup-archive clients that you have previously 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
6. Click on the **Add** push button

---

## Verifying Your Server Installation

You can perform the following tasks to verify your server installation:

- 1** Query the database to determine the current utilization. You will repeat this step after the backup and archived operations to verify that the percent increased.



```
query db
```



Double click on **Database**

- 2** Start the backup-archive client command line or GUI.

- To start the **GUI** do one of the following:
  - If your OS/2 desktop has the backup-archive GUI icon,



double click on the icon, or select the icon and press *Enter*.

- At the command prompt in an OS/2 window enter:

```
start dsm
```

- To start the **command line interface**, enter the following at the command prompt in an OS/2 window:

```
dsmc loop
```

- 3** Run an incremental backup of the c: and d: drives. Because this is the first backup done from the workstation, an incremental backup will be a full backup and may take a while. The files from this and the next two operations are stored in the disk storage pools. If the disk storage pools do not have enough space to hold the files, ADSM issues and out of space error.



#### Backing Up a Drive

A drive must be labeled before it can be backed up.



END USER

```
dsmc incremental c: d:
```



END USER

1. From the **Drives for Backup/Archive** section of the **Drive Information**, select drives c: and d: by clicking on the drive (you can also deselect a drive by clicking on it)
2. Click on **ADSM** from the menu bar
3. Click on **Backup, Incremental** from the pull down menu

- 4** Run a selective backup (a selective backup backs up a file even if it has not changed). For example, to back up all the files in the **c:\devel** directory that begin with **proj**, do the following:



END USER

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



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

## 5 Archive a single file named **budget.jan** in the **c:\plan\proj1.\** directory



```
dsmc archive c:\plan\proj1.\budget.jan:
```



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** from the menu bar
3. Click on the **Archive, File specification** pull-down menu
4. In the **Archive by File Specification** window, enter **c:\plan\proj1.\budget.jan**
5. Click on the **List files** push button
6. Click on the **Archive** push button
7. From the **Archive Options** screen, click on the **Archive** push button

## 6 Query the database to verify that the percent utilized has increased (see step 1 on page 25).

## 7 Query the storage pools.

For each storage pool volume you defined, verify:

- Volume name
- Estimated capacity (specified earlier on the CRTVOLADSM command)
- Percent utilized (should be greater than zero after the backup and archive operations)



query volume \*



Double click on **Storage Pool Volumes**

---

## 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:

- Assigning additional administrators
- 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 you with a flexible, powerful ADSM system that can meet most customers' needs.



The ADSM server must be running to perform the tasks described here. From the ADSM main menu on the AS/400, select Verify server status (option 4). A message is displayed at the bottom of the menu. Start the server if it is not running (see "Starting the Server" on page 19 for the procedure).

---

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

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

---

### Assigning Administrators

You can assign additional administrators and give them different authority levels. For details about the other authority levels, see the *ADSM Administrator's Guide*.

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 **Administrator password** field, enter MISSOURI
7. Click on the **Add** push button

---

## Using Tape Drives with ADSM

This section shows you how to use tape drives with your ADSM system. After adding the tape drives to ADSM, you can migrate data in server storage from disk storage pools to tape storage pools. You can also back up and archive client data directly to tape. This section describes the following tasks on the pages indicated:

Task	Page
Add tape drives to your ADSM environment using the ADSM Work with Devices utility	31
Add tape drives to your ADSM environment using ADSM commands and graphical user interface	38
Prepare tape volumes for use	41
Use policy to back up and archive client data	42
Work with backup-archive clients	48
Verify that storage management works	49

If you want to use a tape management system with ADSM or include an automated tape library (for example, an IBM 3494), see the *ADSM Administrator's Guide* for details.

You can add tape to your ADSM environment by using *either* the ADSM Work with Devices utility (page 31) or the ADSM administrative commands and GUI (page 38). The utility is automated but, unlike the commands and GUI, you cannot specify all the possible parameters.



## Add Tape Drives to Your ADSM Environment: Using the ADSM Utility



Before you can use tape with ADSM, you need to identify the tape drive (or drives) to use and a pool of tape volumes to use with the drive. The following scenario shows the steps in performing this task for an installation that has two IBM 3490E tape drives that an operator manually loads with tapes (*stand-alone drives*).

The ADSM Work with Devices utility (WRKDEVADSM command) helps you to set up devices attached to your AS/400 so that ADSM can use them. The utility detects devices that are attached, helps you decide how to set them up, and sends commands to the server to create the necessary ADSM definitions.



To use the Work with Devices utility, the AS/400 administrative client for ADSM must be working (not necessarily running). You can use the utility if the server is up and you can successfully start the client using the procedure in “Starting the AS/400 Administrative Client” on page 20.

- 1** From the ADSM main menu on the AS/400, select Utilities (option 1).
- 2** From the Utilities menu, select Work with devices (option 2). (You can also use the WRKDEVADSM command on the AS/400 command line.)
- 3** A screen appears on which you must enter your administrator name and password and press enter.
- 4** The utility produces a list of storage pools and associated device classes, libraries, and drives, arranged so that you can see the associations among these objects. The objects in the list have a status of either DEFINED (known or defined to ADSM) or NEW (not known or defined to ADSM).

In this example, for an AS/400 system with two 3490E tape drives attached, you would see a screen as shown in Figure 11 on page 32.

```

                                Work with Devices for ADSM

Macro output file . . . MACROS____
Library . . . . . QUSRADSM____
Macro output member      DEVCFG____

Type options, press Enter.
  2=Change  5=Display

Opt   Storage Hierarchy      Type      Status
-     ARCHIVEPOOL            STGPOOL   DEFINED
-     BACKUPPOOL             STGPOOL   DEFINED
-     SPACEMGPOOL            STGPOOL   DEFINED
-     CART_TAPEPOOL1         STGPOOL   NEW
-     CART_TAPECLASS1        DEVCLASS  NEW
-     MANLIB                  LIBRARY   NEW
-     TAP01                   DRIVE     NEW
-     TAP02                   DRIVE     NEW

F3=Exit  F5=Refresh  F8=Submit to server  F9=Command
F10=Work with libraries  F11=Work with storage pools  F12=Cancel

Bottom

```

Figure 11. Work with Devices Screen

**5** In the **Opt** column next to the **CART\_TAPEPOOL1**, type **2**. A screen similar to Figure 12 on page 33 appears.

```

Change ADSM Storage Pool

Type choices, press Enter.

Storage pool name . . . . . CART_TAPEPOOL1__
Type of storage pool . . . . . PRIMARY_____
Device class name . . . . . CART_TAPECLASS1__
Next storage pool . . . . . *NONE_____
Maximum scratch volumes . . . . . 0_____

ADSM object name
PRIMARY, COPY
F4 for list
F4 for list
0-100000000

F3=Exit  F4=Prompt  F9=Command  F12=Cancel

```

Figure 12. Change Storage Pool Screen for CART\_TAPEPOOL1

**6** In the field labeled **Maximum scratch volumes**, type **100**. Press Enter.



### Scratch volumes

You can specify the number of scratch volumes that ADSM can request for this pool. 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. If you want to turn collocation on, you must update the storage pool by using the UPDATE STGPOOL command or the GUI. 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*.

**7** ADSM assumes tape volumes have the default estimated capacity for the volume type unless you change it. You may need to change the estimated capacity of tape volumes in the CART\_TAPEPOOL1 if, for example, you are

using IDRC on the drives, using enhanced capacity cartridge system (ECCST) tapes, or using tapes with nonstandard lengths.

To change the estimated capacity, return to the Work with Devices for ADSM menu (Figure 11 on page 32). In the **Opt** column next to **CART\_TAPECLASS1**, type **2**. A screen similar to Figure 13 appears.

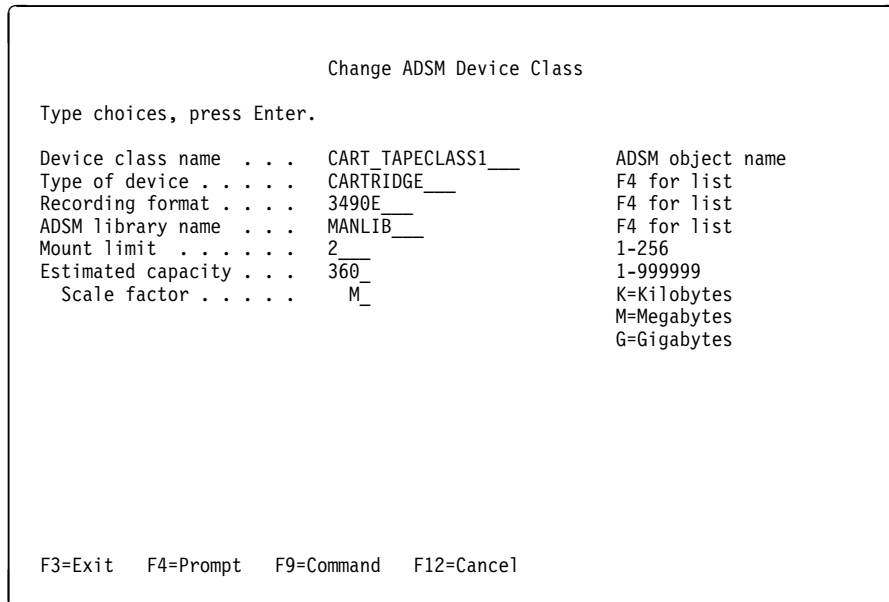


Figure 13. Change Device Class Screen

**8** For this example, assume that because you are using IDRC, you expect that the capacity of the tapes will be approximately double the ADSM default capacity of 360MB. In the field labeled **Estimated capacity**, type **720**. Press Enter.

**9** You can use your tape drives in two ways:

- Client data that has been stored in disk server storage can be migrated to tape. The next steps describe how to do that for the default disk storage pool, BACKUPPOOL.
- Client data can be backed up or archived directly to tape. See “Use Policy to Back up and Archive Client Data to Tape” on page 42 for details.

Your default disk storage pools (BACKUPPOOL, ARCHIVEPOOL, and SPACEMGPOOL) will probably become filled with client data over time. To prevent that, you can automatically migrate the data from those disk storage pools to the new CART\_TAPEPOOL1 storage pool that the utility will define. In this step and the next, you change the BACKUPPOOL storage pool so that data can migrate from BACKUPPOOL to CART\_TAPEPOOL1.

Return to the Work with Devices for ADSM menu (Figure 11 on page 32). In the **Opt** column next to **BACKUPPOOL**, type **2**. A screen similar to Figure 14 on page 35 appears.

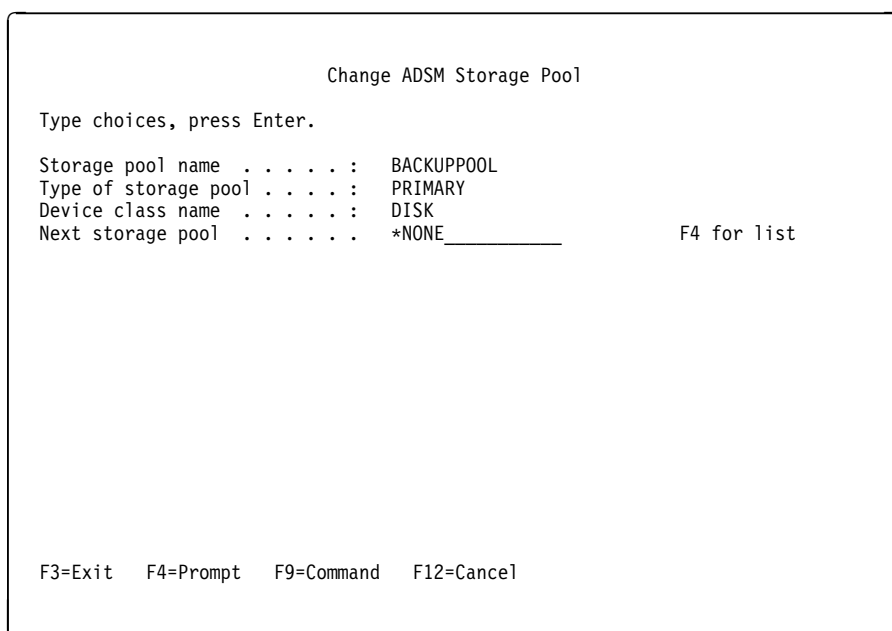


Figure 14. Change Storage Pool Screen for BACKUPPOOL

- 10** In the field labeled **Next storage pool**, type **CART\_TAPEPOOL1** or use F4 to select from a list of storage pools. Press Enter.



How full BACKUPPOOL becomes before data is migrated from it is determined by the *high migration threshold*, which has a default value of 90%. When data migration stops is determined by the *low migration threshold*, which has a default value of 70%. Thus with the defaults, data migration from the BACKUPPOOL to the CART\_TAPEPOOL1 begins when BACKUPPOOL is 90% full. Migration continues until BACKUPPOOL is down to 70% full.

Another default setting is to cache data (leave the data on the storage pool) even after the data has been migrated to the next storage pool. Performance is enhanced because the cached data remains available for quick access until the space is needed for new data.

Migration thresholds and caching which you can also change by updating the storage pool, are described in detail in *ADSM Administrator's Guide*.

- 11 Press F5 to refresh the list and check that the arrangement of the storage pools has changed. The Work with Devices screen should now look similar to Figure 15.

```
Work with Devices for ADSM

Macro output file . . . MACROS_____
Library . . . . . QUSRADSM__
Macro output member . . . . . DEVCFG___

Type options, press Enter.
  2=Change  5=Display

Opt  Storage Hierarchy      Type      Status
-    ARCHIVEPOOL           STGPOOL   DEFINED
-    BACKUPPOOL            STGPOOL   DEFINED
-    CART_TAPEPOOL1        STGPOOL   NEW
-    CART_TAPECLASS1       DEVCLASS  NEW
-    MANLIB                 LIBRARY   NEW
-    TAP01                  DRIVE     NEW
-    TAP02                  DRIVE     NEW
-    SPACEMGPOOL           STGPOOL   DEFINED

Bottom

F3=Exit  F5=Refresh  F8=Submit to server  F9=Command
F10=Work with libraries  F11=Work with storage pools  F12=Cancel
```

Figure 15. Work with Devices Screen after Changes

- 12** Press F8. The utility creates a file that contains commands to define to ADSM the objects labeled NEW in the list, and to make changes to objects that are already defined. This file, called a *macro*, is sent to the server to be run.



If you get an error when you submit the macro, display the job log for the interactive session to understand the error. You can use F9 (Command) to bring up an AS/400 command line while still in the utility, or you can exit the utility. Be aware that if you exit the utility, all modifications are lost. Enter the following AS/400 command:

```
====> dspjoblog
```

Press F10, then page up through the messages. Look for messages that have the prefix “ANR” or “ANS”.

- 13** When the utility has completed successfully, you can start the utility again to see what you have defined. The screen should look similar to Figure 16.

```

                                Work with Devices for ADSM
Macro output file . . . MACROS_____
Library . . . . . QUSRADSM_____
Macro output member      DEVCFG_____

Type options, press Enter.
  2=Change  5=Display

Opt   Storage Hierarchy      Type      Status
-     ARCHIVEPOOL            STGPOOL   DEFINED
-     BACKUPPOOL             STGPOOL   DEFINED
-     CART_TAPEPOOL1         STGPOOL   DEFINED
-     CART_TAPECLASS1       DEVCLASS  DEFINED
-     MANLIB                  LIBRARY   DEFINED
-     TAP01                   DRIVE     DEFINED
-     TAP02                   DRIVE     DEFINED
-     CART_TAPEPOOL1         STGPOOL   DEFINED
-     CART_TAPECLASS1       DEVCLASS  DEFINED
-     MANLIB                  LIBRARY   DEFINED

More...

F3=Exit  F5=Refresh  F8=Submit to server  F9=Command
F10=Work with libraries  F11=Work with storage pools  F12=Cancel

```

Figure 16. Work with Devices Screen after Running the Utility



CART\_TAPEPOOL1 is indented under BACKUPPOOL because it is the next storage pool in the hierarchy. CART\_TAPEPOOL1 also appears at same level as BACKUPPOOL to indicate that you can backup directly to tape if a policy allows it.

---

- 14** Go to “Displaying Information About Your Devices” on page 41 to view the results of your definitions.

## Add Tape Drives to Your ADSM Environment: Using Commands and GUI

Before you can use tape with ADSM, you need to identify the tape drive (or drives) to use and a pool of tape volumes to use with the drive. The following scenario shows the steps in performing this task for an installation that has two IBM 3490E tape drives that an operator manually loads with tapes (*stand-alone drives*).

### Identify the Drives to ADSM

To use a device with ADSM, you must define the library it is in, define the drive, and define a device class and its associated storage pool.

- 1** Define a library named **manlib**.



```
define library manlib libtype>manual
```

- 2** Define two drives named **tap01** and **tap02** to the **manlib** library.



```
define drive manlib tap01 device=tap01
```

```
define drive manlib tap02 device=tap02
```



#### Drive names

In this example, the names tap01 and tap02 match the AS/400 names for the drives. To use different names, see the *ADSM Administrator's Reference*.

---

- 3** Classify the devices in the library by device type. Because the only devices in our scenario are cartridge, we define a single device class named **CART\_TAPECLASS1**. It is helpful to choose device class names that identify the type of device for which it is intended (in this case, a cartridge device).





```
define devclass cart_tapeclass1 devtype=cartridge
format=3490e library=manlib mountlimit=2
```



#### Mount limit

Mount limit (number of drives available in this 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.

#### Estimated capacity

ADSM assumes tape volumes have the default estimated capacity for the volume type unless you change it. You may need to change the estimated capacity of tape volumes in the CART\_TAPEPOOL1 if, for example, you are using IDRC on the drives, using enhanced capacity cartridge system (ECCST) tapes, or using tapes with nonstandard lengths. For example, you are using IDRC and you expect that the capacity of the tapes will be approximately double the ADSM default capacity of 360MB. You can specify the estimated capacity when you define the device class, with the following command:

```
define devclass cart_tapeclass1 devtype=cartridge
format=3490e library=manlib mountlimit=2
estcapacity=720
```

## 4 Define a storage pool named **CART\_TAPEPOOL1** for the device class.



```
define stgpool cart_tapepool1 cart_tapeclass1
maxscratch=100 collocate=no
```



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 CART\_TAPEPOOL1
5. Click on the **Device class** tab, and enter the following:  
**Device class** cart\_tapeclass1 (from the drop-down list)  
**Maximum scratch volumes** 100
6. Click on the **Add** push button



### Scratch volumes

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*.

## Include Tape in Server Storage Migration: Commands and GUI

Now that you have identified your tape drives to ADSM, you can use them in two ways:

- Client data that has been stored in disk server storage can be migrated to tape. This section describes how to do that for the default disk storage pool, BACKUPPOOL.
- Client data can be backed up or archived directly to tape. See “Use Policy to Back up and Archive Client Data to Tape” on page 42 for details.

Your default disk storage pools (BACKUPPOOL, ARCHIVEPOOL, and SPACEMGPOOL) will probably become filled with client data over time. To prevent that, you can automatically migrate the data from those disk storage pools to the new CART\_TAPEPOOL1 storage pool that you have just created.

In this step, you change the BACKUPPOOL storage pool so that data can migrate from BACKUPPOOL to CART\_TAPEPOOL1.



ADMIN

```
update stgpool backuppool nextstgpool=cart_tapepool1
```



ADMIN

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 CART\_TAPEPOOL1 from the **Next pool** drop-down list
6. Click on the **Apply** push button



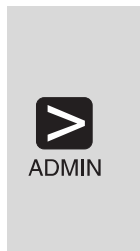
How full BACKUPPOOL becomes before data is migrated from it is determined by the *high migration threshold*, which has a default value of 90%. When data migration stops is determined by the *low migration threshold*, which has a default value of 70%. Thus with the defaults, data migration from the BACKUPPOOL to the CART\_TAPEPOOL1 begins when BACKUPPOOL is 90% full. Migration continues until BACKUPPOOL is down to 70% full.

Another default setting is to cache data (leave the data on the storage pool) even after the data has been migrated to the next storage pool. Performance is enhanced because the cached data remains available for quick access until the space is needed for new data.

Migration thresholds and caching are described in detail in *ADSM Administrator's Guide*.

## Displaying Information About Your Devices

At this point you have used either ADSM Utilities or the administrative commands to define your libraries, drives, and device classes. 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`

## Prepare Tape Volumes for Use

Tape volumes must be labeled before ADSM can use them.

- 1 If the tape volumes do not already have standard labels, initialize and label them for ADSM's use in the drives.



====> `inztap`



1. Select 1 (Utilities) from the ADSM main menu
2. Select 4 (Initialize a tape) from the Utilities menu
3. Repeat for all the volumes that you want to label

**2** The volumes you initialized can be used as scratch volumes, up to the number of scratch volumes you specified for the storage pool. Using scratch volumes allows ADSM to acquire volumes as needed. If you are using only scratch volumes, skip the rest of this step.

An alternative is to use private volumes in addition to or instead of scratch volumes in the CART\_TAPEPOOL1. To use private volumes, you must define specific volumes to the storage pool. If you use only defined volumes and the storage pool runs out of them, however, storage operations to that pool stop until you define more volumes.



```
define volume cart_tapepool1 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** cart\_tapepool1 (from the drop-down list)  
**Volume name** dsm001
6. Click on the **Add** push button

## Use Policy to Back up and Archive Client Data to Tape

The ADSM default policies specify the BACKUPPOOL as the location where backed up client files are stored, and ARCHIVEPOOL as the location where archived client files are stored. You have just seen how to migrate data from those disk storage pools to tape storage pools (“Add Tape Drives to Your ADSM Environment: Using the ADSM Utility” on page 31 or “Add Tape Drives to Your ADSM Environment: Using Commands and GUI” on page 38).

In addition to migrating data to tape storage pools from your disk storage pools, you can define policies that back up and archive client data directly to tape.



Although you can back up directly to tape, it is recommended instead that you back up to disk and let server migration move the data to tape.

When backing up directly to tape, the number of available tape drives limits the number of concurrent client sessions that can do meaningful work.

## Define the Policy Objects

In this section, you create a new policy that causes client files to be stored directly on tape when clients back up or archive their files. To do this, you create a new policy domain, policy set, management class, and backup and archive copy groups. You must also associate clients with the new domain. The result is a separate set of rules for managing the archived and backed-up files for a group of clients.

### 1 Define a policy domain **tapedom**.



```
define domain tapedom
```



1. Double click on **Policy Domains**
2. Click on **Edit** from the menu bar
3. Click on **Add** from the pull-down menu
4. Enter the following:  
**Domain name** tapedom
5. Click on the **Add** push button

### 2 Define a policy set named **tapepol** in the **tapedom** domain.



```
define policysset tapedom tapepol
```



1. Expand **Policy Domains**
2. Double click on **Policy Sets**
3. Click on **Edit** from the menu bar
4. Click on **Add** from the pull-down menu
5. Enter the following:  
**Policy domain** tapedom (from the drop-down list)  
**Policy set name** tapepol
6. Click on the **Add** push button

### 3 Define a management class named **tapemclass** in the **tapepol** policy set.



```
define mgmtclass tapedom tapepol tapemclass
```



1. Expand **Policy Domains**
2. Double click on **Management Classes**
3. Click on **Edit** from the menu bar
4. Click on **Add** from the pull-down menu
5. Enter the following:  
**Policy domain**                 tapedom (from the drop-down list)  
**Policy set**                     tapepol (from the drop-down list)  
**Management class name**   tapemclass
6. Click on the **Add** push button

**4** Define a backup copy group named **standard** in the **tapemclass** management class. Specify that client files are to be backed up to the **CART\_TAPEPOOL1** tape storage pool.



```
define copygroup tapedom tapepol tapemclass standard  
type=backup destination=cart_tapepool1 frequency=2  
verexists=1
```



1. Expand **Policy Domains**
2. Double click on **Backup Copy Groups**
3. Click on **Edit** from the menu bar
4. Click on **Add** from the pull-down menu
5. Enter the following from the drop-down lists:  
**Policy domain**                 tapedom  
**Policy set**                     tapepol  
**Management class**           tapemclass
6. Click on the **Copy control** tab, go to page 2, and enter the following:  
**Copy frequency**                     2  
**Number of backup versions  
to keep if client data exists**       1  
**Destination storage pool**           cart\_tapepool1
7. Click on the **Add** push button



In the preceding example, two parameters override the defaults:

- The minimum number of days between incremental backups is set to 2 (the default is 0).
- The server retains no more than 1 version of files that exist in the client file system (the default is 2).

- 5** Define an archive copy group named **standard** in the **tapemclass** management class. Specify that client files are to be archived to the **CART\_TAPEPOOL1** tape storage pool.



```
define copygroup tapedom tapepol tapemclass standard
type=archive destination=cart_tapepool1 retver=180
```



1. Expand **Policy Domains**
2. Double click on **Archive Copy Groups**
3. Click on **Edit** from the menu bar
4. Click on **Add** from the pull-down menu
5. Enter the following from the drop-down lists:  

<b>Policy domain</b>	tapedom
<b>Policy set</b>	tapepol
<b>Management class</b>	tapemclass
6. Click on the **Copy control** tab, go to page 2, and enter the following:  

<b>Length of time to retain</b>	
<b>archive version</b>	180
<b>Destination storage pool</b>	cart_tapepool1
7. Click on the **Add** push button



In the preceding example, one parameter overrides a default: The server retains an archive copy for 180 days (the default is 365).

## Implement Your Policy

Now that you have defined all the objects for your policy, take the following steps to put it into effect.

- 1** Assign **tapemclass** as the default management class for the **tapepol** policy set.



```
assign defmgmtclass tapedom tapepol tapemclass
```



1. Expand **Policy Domains**
2. Double click on **Management classes**
3. Click on the **tapemclass** management class
4. Click on **Selected** from the menu bar
5. Click on **Assign default**

## 2 Validate the **tapepol** policy set in the **tapedom** policy domain.



```
validate policysset tapedom tapepol
```



1. Expand **Policy Domains**
2. Double click on **Policy Sets**
3. Click on the **tapepol** policy set
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.

## 3 Activate the **tapepol** policy set for the **tapedom** policy domain.





```
activate policyset tapedom tapepol
```



1. Expand **Policy Domains**
2. Double click on **Policy Sets**
3. Click on the **tapepol** policy set
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
8. Click on **View** from the menu bar and **Refresh now** from the pull-down menu to verify that TAPEPOL has been activated

#### 4 Assign client nodes to the **tapedom** policy domain.

If you have already registered client nodes and either specified a policy domain or taken the default (**standard**), you must update the client node registration. For example, to update client node **chloe**, do either of the following:



```
update node chloe domain=tapedom
```



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. Specify TAPEDOM in the **Policy domain** field
6. Click on the **Apply** push button

Client node **chloe** now backs up to tape rather than to disk because it is assigned to the **tapdom** policy domain.

### Invoke 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 “Automate Administrative Commands” on page 54). If you schedule expiration processing, set the expiration interval server option to 0. See “Setting Server Communications Options” on page 8 for information on setting server options.



expire inventory

## Distribute a Sample Include-Exclude List for Clients

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. 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, you 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.

## Verify the Storage Management Environment

The following tasks can verify some of your customization. The backup and archive operations must be run from a client assigned to the **tapedom** policy domain.

### 1 Run an incremental backup of the c: and d: drives



```
dsmc incremental c: d:
```



1. From the **Drives for Backup/Archive** section of the **Drive Information** window, select drives c: and d: by clicking on the drive (you can also deselect a drive by clicking on it)
2. Click on **ADSM** from the menu bar
3. Click on **Backup, Incremental** from the pull down menu

### 2 Run a selective backup (a selective backup backs up a file even if it has not changed). 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*.*
```



1. From the **Drives for Backup/Archive** section of the **Drive Information** window, select drive c:
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 select the **Select All** push button

### 3 Archive a single file named **budget.jan** in the **c:\plan\proj1.\** directory



```
dsmc archive c:\plan\proj1.\budget.jan:
```



1. From the **Drives for Backup/Archive** section of the **Drive Information** window, select drive c:
2. Click on **ADSM** from the menu bar
3. Click on **Archive, File specification** pull-menu bar
4. In the **Archive by File Specification** window, enter **c:\plan\proj1.\budget.jan**
5. Click on the **List files** push button
6. Click on the **Archive** push button
7. From the **Archive Options** screen, click on the **Archive** push button

#### 4 Migrate data from a disk storage pool.

Migration from the disk storage pool will require 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 (**backuppoo1**, for example) by setting the high and low migration thresholds to 0. After migration occurs, reset the thresholds to their original settings.



```
update stgpoo1 backuppoo1 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:

<b>Migration Thresholds Low</b>	0
<b>Migration Thresholds High</b>	0
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, we lowered both migration thresholds to 0 to ensure that you could 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%.

---

---

## Automate Client Operations

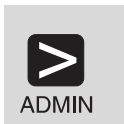
You can automate client operations such as backup to ensure that the clients' data is protected by ADSM. You can automate the following on most clients:

- 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 **bak**, 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 bak action=incremental  
starttime=23:00
```

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

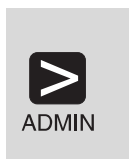


1. Expand **Central Scheduler**
2. Double click on **Backup/Archive Schedules**
3. Click on **Edit** from the menu bar
4. Click on **Add** from the pull-down menu
5. Enter the following:  

<b>Policy domain</b>	standard (from the drop-down list)
<b>Schedule name</b>	bak
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:

<b>Policy domain</b>	standard (from the drop-down list)
<b>Schedule name</b>	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:

<b>Start time</b>	23:00
<b>Period</b>	1
<b>Period units</b>	WEEKS (from the drop-down list)
<b>Day of week</b>	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.



END USER

```
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 BAK schedule runs.

- 4** Because the BAK 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 bak begindate=today-1
```



1. Expand the **Central Scheduler** object
2. Double click on **Backup/Archive Events**
3. Look for the BAK 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 BAK schedule the previous day:

```
query event standard bak 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 BAK 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`.

---

## Automate 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:  

<b>Schedule name</b>	expproc
<b>Administrative Command</b>	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

---

## Making the Most of Your Space

After you begin operations using ADSM, monitor the utilization of the database, recovery log, and storage pools (see “Verifying Your Server Installation” on page 25 for details). Based on this information, you may want to increase or decrease the amount of space assigned to each.

- To change the size of the database or recovery log, see the *ADSM Administrator's Guide*.
- To change the size of a disk storage pool, see “Creating Disk Storage Pool Volumes” on page 23.
- To change the size of a tape storage pool, see “Prepare Tape Volumes for Use” on page 41.

---

## Protecting Your ADSM Investment

Your ADSM system has been installed, customized, and verified. However, there is still one more crucial task: protecting your investment.

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. See the *ADSM Administrator's Guide* for a description of your options.

---

## Appendix A. Configuring Client Communications

This section helps you to configure the following communication methods:

- “Configuring Client Access/400 Optimized for OS/2 Clients” on page 58
- “Configuring Client Access/400 for DOS and Windows Clients” on page 58
- “Configuring NS/WIN for Windows Clients” on page 59
- “Configuring IPX/SPX for DOS, Windows, OS/2, and Novell Clients” on page 59
- “Configuring TCP/IP for All Clients” on page 60
- “Configuring with NetWare for SAA 3.11 and 3.12 for Novell Clients” on page 60
- “Configuring with NetWare for SAA 4.1 for Novell Clients” on page 63
- “Configuring APPC for OS/2 Clients with Communications Manager” on page 66

Sample client communications options files are included in each section.

Before you can configure your client communications, you must know the following parameters on your AS/400 system:

- Local network ID
- Local control point name
- Local adapter address
- TP name
- Mode name

Table 2 is useful in determining your AS/400 parameters. Use this table as an example when configuring your client communications.

Number	Parameter	Command	Example
<b>1</b>	Local Network ID	DSPNETA	USIBMSU
<b>2</b>	Local Control Point Name	DSPNETA	TUC400I
<b>3</b>	Local Adapter Address	DSPLIND	400043907001
<b>4</b>	TP Name	N/A	QANRTP.QADSM
<b>5</b>	Mode Name	N/A	QADSM

**Note:**

1. The first three parameters are dependent upon the OS/400 system. Parameters 4 and 5 (TP Name and Mode Name) are the actual names to use for these parameters.
2. If **2** local point is different than the default control point name, you will want to use the default control point name.

---

## Configuring Client Access/400 Optimized for OS/2 Clients

This section contains information needed to configure Client Access/400 Optimized for OS/2. In the client options file, see Table 2 on page 57, **1** and **2** for the AS/400\_PARTNER\_LUNAME. Ensure that the CPICNODENAME is displayed in uppercase.

Shown here is a sample minimum client option (dsm.opt) file:

```
commethod          sna1u6.2
tpname             QANRTP.QADSM
partnerluname      usibmsu.tuc400i
cpicnodename       QADSM
cpicbuffersize     31
```

---

## Configuring Client Access/400 for DOS and Windows Clients

This section contains required steps needed to configure Client Access/400 for DOS and Windows clients. Ensure your client COMMMETHOD is defined as 400COMM. To supply your AS/400 parameters, refer to Table 2 on page 57.

Edit your CONFIG.PCS file to include a TRLI statement to define your AS/400 local control point name **2** and local adapter address **3**. For example:

```
TRLI 2 TUC400I,3400043907001
```

This statement can be used if the network ID of the AS/400 is the same as the network ID of the client. If not, you must define an alias. Refer to the *AS/400 Client Access/400: DOS Installation and Administration Guide* for detailed information.

Shown here is a sample minimum client option (dsm.opt) file:

```
commethod          400comm
400partnerluname   tuc400i
400tpname          QANRTP.QADSM
```

---

## Configuring NS/WIN for Windows Clients

This section contains required steps needed to configure NS/WIN for Windows clients. Ensure your client COMMETHOD is defined as SNALU6.2 and your SYMBOLICDESTINATION is defined as ADSM400. To supply your AS/400 parameters, refer to Table 2 on page 57.

- 1 Edit your CONFIG.NSD file to include a TRLD statement to define your link name and the AS/400 local adapter address **3**. For example:

```
TRLD AS400SRV,3400943997001
```

- 2 Edit your SIDEINFO.NSD file to map the SYMBOLICDESTINATION name. This name corresponds to the SYMBOLICDESTINATION name of the server located in the client options file. Also include your AS/400 local network ID **1**, local control point name **2**, mode name **5**, and TP name **4**. For example:

```
ADSM400 1 USIBMSU.TUC400I 2 QADSM 5 QANRTP.QADSM 4
```

Refer to the *NS/WIN User's Guide and Reference* for detailed information.

Shown here is a sample minimum client option (dsm.opt) file:

```
commethod          snalu6.2
symbolicdestination adsm400
* tpname           QANRTP.QADSM
* partnerluname    usibmsu.tuc400i
cpicbuffersize     31
```

**Note:** You can use either the SYMBOLICDESTINATION or the combination of PARTNERLUNAME and TPNAME.

---

## Configuring IPX/SPX for DOS, Windows, OS/2, and Novell Clients

This section contains required steps needed to configure IPX/SPX. Ensure your client COMMETHOD is defined as IPXSPX. Use WRKIPXD on the AS/400 to display the IPX description. The IPX internal network number is the first 8 digits of the IPXSERVERADDRESS. The last 12 digits of IPXSERVERADDRESS should be 000000000001.

After you start IPX and start the ADSM server, a message is displayed in ADSMMSGQ (or the console message queue that is set in the server options) that indicates the server address and the socket number. This should match what you placed in the client options file.

The message in the message queue is ANR8223:

```
IPX available at address 3259BBD9000000000001 and port 8522.
```

Shown here is a sample minimum client option (dsm.opt) file:

```
commmethod          ipxspx
ipxserveraddress    3259bbd9000000000001
ipxsocket           8522
```

---

## Configuring TCP/IP for All Clients

This section contains required steps needed to configure TCP/IP. Ensure your client COMMMETHOD is defined as TCPIP. Use GO TCPADM to obtain the TCPSEVERADDRESS. Select WORK WITH TCP/IP INTERFACES. Obtain the IP address and place in the client options file.

Shown here is a sample minimum client option (dsm.opt) file:

```
commmethod          tcpip
tcpserveraddress    9.115.46.78
tcpport             1500
tcpbuffersize       32
tcpwindowsize       24
```

---

## Configuring with NetWare for SAA 3.11 and 3.12 for Novell Clients

This section contains required steps needed to configure NetWare for SAA 3.11 and 3.12 for Novell clients.

Although you may currently be using NetWare for SAA with your AS/400, you may not have needed the common programming interface for communications (CPI-C) utility, SIUTIL. This supports programs written using the the CPI-C interface. You use a side information file to contain the configuration information required for a CPI-C application to communicate with NetWare for SAA.

For additional information see *NetWare Installation and Upgrade Guide* or *NetWare for SAA Installation Guide*.

To use the NetWare client, you have to configure CPI-C on the NetWare server.  
Complete the following procedure:

- 1** Log in to your server and execute the SIUTIL utility with the following command:

```
F:\SYSTEM\NWSAA\CPIC\SIUTIL.EXE
```

- 2** If you are already using a side information file for an application, you can add another record to it:

- a** Select **Create a New Side Information File**.
- b** Enter the name of the file in capital letters with an extension of CPI. For example: **ADSM.CPI**.
- c** Press Enter.

- 3** Enter the name of the record in capital letters in the **Side Information Record Name** field. For example: **ADSM**.  
Press Enter.

- 4** The first panel of the CPI-C record is **Local LU Configuration Data**. Fill in the fields as described here:

- L1** The **LU Name** must match the server's Peripheral CP name from the NetWare service profile. For example, **ITSCPC**.
- L2** The **Security Type** must be **0** to indicate that there is no conversation-level security enabled.
- L3** The **User ID** field must be blank.
- L4** The **Password** field must be blank.
- L5** The **LU Session Limit** field must be greater than or equal to the LU Session Limit specified in P4 on the next screen. For example, **30**.
- L6** The **Network Name** must match the server's SNA Network ID from the NetWare for SAA Service Profile and the AS/400 attributes. See Table 2 on page 57, **1**, **USIBMSU**.

**5** The second panel of the CPI-C record asks for **Partner LU** data. You enter information about the AS/400 here.

**P1** The **LU Name** is the Local Control Point Name from the AS/400 Network attributes. See Table 2 on page 57, **2**, **TUC400I**.

**P2** In the **Data Link Control Name**, enter the Network topology you are using. For example, **ITRN**.

**P3** The AS/400 **Network Adapter Address** is the Local Adapter Address in Table 2 on page 57, **3**, 400043907001.

The Network Adapter Number must match the Adapter Type specified in the Service Profile (0 = Primary; 1 = Alternate).

**P4** The **LU Session Limit** field must be less than or equal to the **LU Session Limit** specified in **L5** in the previous panel as **30**.

**P5** Type the **Local Program Name** in uppercase as **DSMC**.

**P6** Type the **Remote Program Name** in uppercase as **QANRTP.QADSM**.

**6** The last panel of the CPI-C record asks for the mode data.

**MI** The **Mode Name** must be entered in uppercase and match the mode being used on the AS/400. Specify **QADSM**. All other mode data fields should match the values for the mode that you see if you use DSPMODD on the AS/400.

**M2** The **SAA Service Profile Name** must be in uppercase and must match the Service Profile Name you defined in CSCON when you set up NetWare for SAA. For example, **ITSC**.

**7** Add lines in the AUTOEXEC.NCF file to use this CPI-C profile and load some additional NLMs.

For a NetWare 3.11 server, you must add LOAD TSA311.NLM, and for a NetWare 3.12 server, you must add LOAD TSA312.NLM. These NLMs will also load SMDR.NLM.

One of TSA311.NLM or TSA312.NLM must also be loaded on each remote server if you want to back up files from it.

Use this command to load the CPI-C profile:

```
LOAD CPIC_SAA SYS:\SYSTEM\NWSAA\CPIC\ADSM.CPI
```



If you decide later to use Automatic Backup/Archive Services with the NetWare client, you also need to add the following to the AUTOEXEC.NCF file:

```
LOAD DSMC SCHED
```

**Note:** You may need to put in some delays to ensure that the communications software has started first.

**8** The CPI-C configuration is complete.

You can restart the server to test your AUTOEXEC.NCF entries or you can load the NLMs manually.

Shown here is a sample minimum client option (dsm.opt) file:

```
commethod          snalu6.2
symbolicdestination adsm
```

---

## Configuring with NetWare for SAA 4.1 for Novell Clients

This section contains required steps needed to configure NetWare for SAA 4.1 for Novell clients.

AS/400 customers may have configured the PLU (partner logical unit) through “Configure for AS/400 Connections”. If so, you must delete that definition and configure the “APPC Application Subsystem”.

Clear the PLU definition with the following steps:

1. Change directory (cd) to SYSTEM/CSCON directory and invoke CSCON service.
2. Select **Configure Communication Services**
3. Select **NetWare for SAA 2.0**
4. Select **Configure for AS/400 Connections**
5. Select **Configure System Information**
6. Select **DELETE reference to PLU** (see **2** in Table 2 on page 57)

To configure the NetWare server, you must configure the Communication Executive with CSCON and create a configuration file with APICFG. Follow the procedure listed here:

**1** Change directory (cd) to SYSTEM/CSCON directory and invoke CSCON service to configure the Communication Executive.

**a** Select **Configure Communication Services**

**b** Select **NetWare for SAA** and then select **Configure SNA Network ID**.  
The SNA network ID must match the controller description on the AS/400 for the NetWare for SAA workstation.

**c** Select **Configure for Peer Connections**, then select **Configure Peer PU Profiles**, and then select **(NWSAA) DEFAULT**

Default Peer PU profile name: NWSAA  
Peripheral node control point name: (already configured at step 1b)  
Node ID (block ID/PU ID): (already configured at step 1b)  
Default local/remote SAP for independent LUs: 04 hex

**d** Select **Configure APPC Application Subsystem**

**1** Select **Configure Modes**

**a)** <insert>

**b)** Enter new mode name: QADSM

Mode name:	QADSM
Number of sessions:	8
Minimum contention winners:	0
Number of autoactivated sessions:	0
Maximum RU size:	4096
Receive pacing count:	8

**2** Select **Configure Partner LUs**

**a)** <insert>

**b)** Enter new partner LU name:

Partner LU name:	(see <b>2</b> in Table 2 on page 57)
SNA network ID:	(see <b>1</b> in Table 2 on page 57)
Immediate link activation:	Yes
Conversation security support:	No

**2** Change directory (cd) to SYSTEM/CSCON directory and invoke APICFG to create the configuration file.

**a** Enter path/filename:

```
/SYSTEM/NWSAA/NWSAAAPLI.INI
```

**b** Select **Configure LU6.2**

**c** Select **Configure CPI-C Side Information Records**

```
<insert>
Symbolic Destination Name: ADSM
Partner TP:                QANRTP.QADSM
TP Type:                  Standard
Local LU:                 (see step 1b)
Mode:                     QADSM
Security Type:            None
Security User ID:
Security Password
```

## Starting NetWare for SAA and ADSM

This section shows how to start NetWare for SAA and the related modules to enable communication with the ADSM NetWare client. Ensure that you have the latest level of ADSM code, IP20572. Enter the following set of commands at the NetWare console:

```
LOAD TSA400.NLM
LOAD TSANDS.NLM
LOAD SMDR.NLM
LOAD COMMEEXEC
LOAD CPIC_SAA
LOAD NWSAA
LOAD SYS:/ADSM/DSMC
```

You are now ready to test the connection with the ADSM server. At the DSMC> prompt, type:

```
query schedule
```

A session should now be established with the server and information will be returned to the NetWare client.

Shown here is a sample minimum client option (dsm.opt) file:

```
commmethod          snalu6.2
symbolicdestination adsm
```

**Note:** You must use the SYMBOLICDESTINATION option in DSM.OPT. The ADSM NetWare client will not connect correctly if the TPNAME, PARTNERLUNAME, and CPICNODENAME are explicitly stated in DSM.OPT.

---

## Configuring APPC for OS/2 Clients with Communications Manager

This section contains required steps needed to configure APPC or SNALU6.2 for OS/2 3.x and later. 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.

At the minimum, you will need to create a mode and a side information file. You may already have a connection (link) configured, so you may be able to omit steps 6 through 10.

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

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



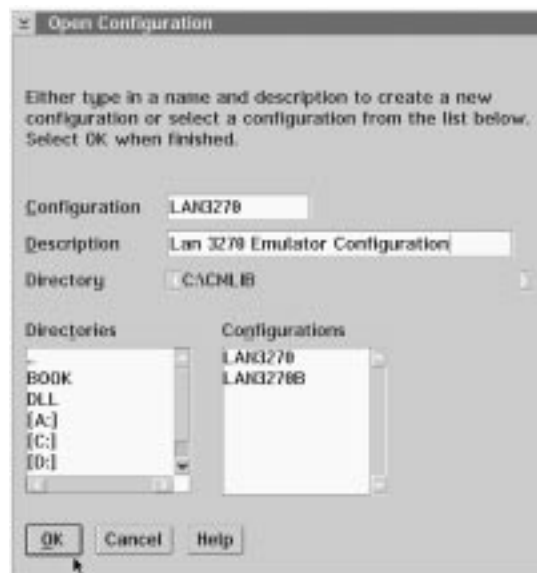
- 2** If the **CMSETUP** window appears, click on **OK**.



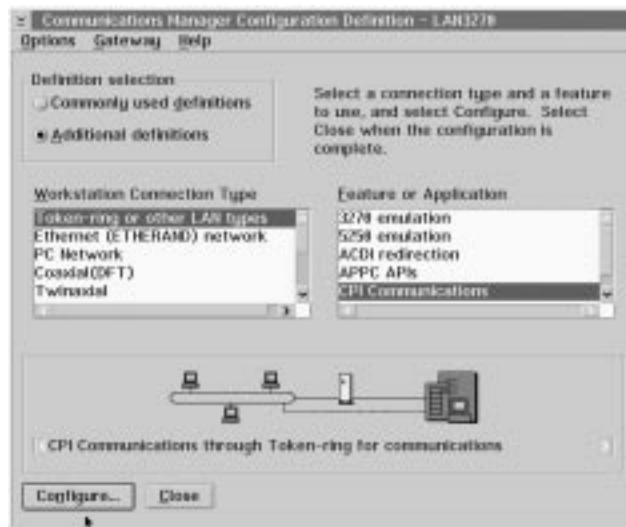
**3** In the **Communications Manager Setup** window, click on **Setup**.



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



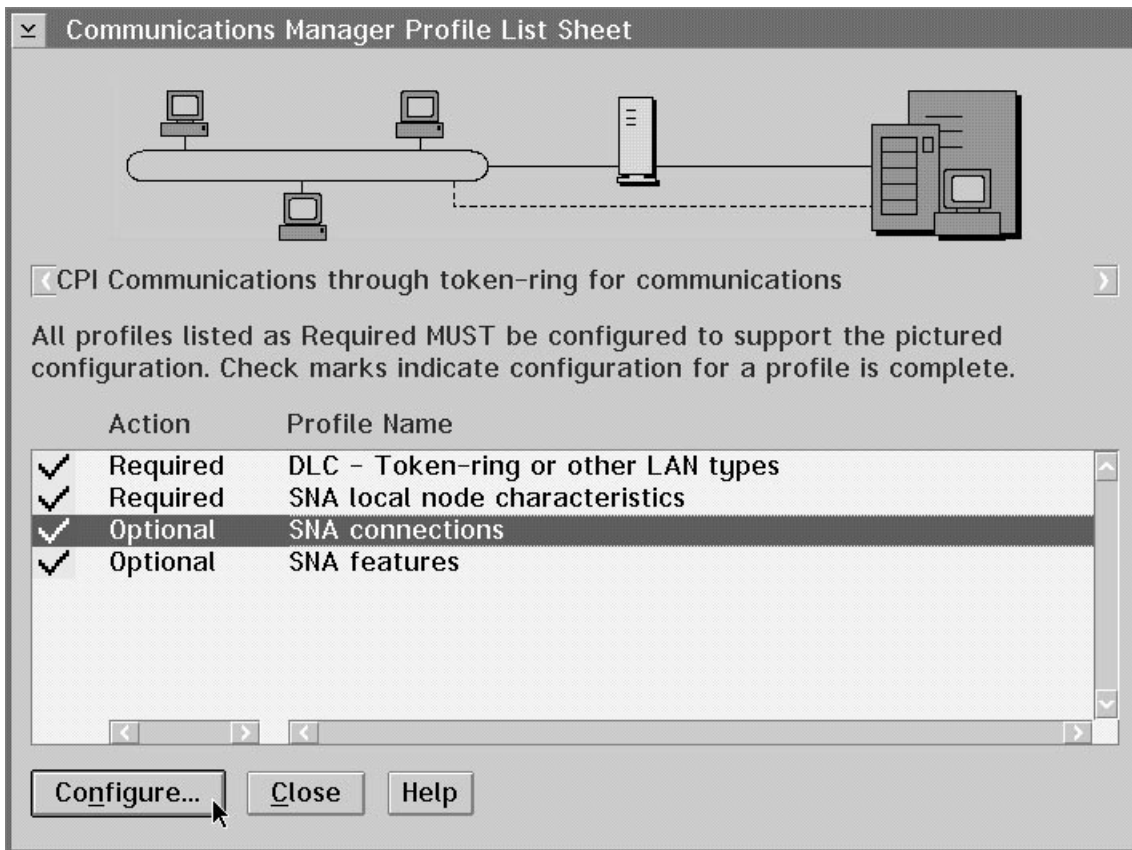
- 5** In the LAN3270 window, select **CPI Communications** in the **Feature or Application** entry field and click on **Configure...**





If you already have a connection (link), continue at step 11 on page 75. If you are able to run 5250 sessions, your link is already defined.

- 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** in the **Partner Type** entry field, and click on **Create...**



- 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:

**Note:** Refer to Table 2 on page 57 to supply your AS/400 parameters.

- a. Supply a name in the **Link name** field, or keep the current name.
- b. Type the AS/400 local adapter address **3** in the **LAN destination address (hex)** field.
- c. Type the AS/400 local network ID **1** in the **Partner network ID** field.
- d. Type the AS/400 local control point name **2** in the **Partner node name** field.
- e. Supply a comment if desired in the **Optional comment** entry field.

Click on **OK**.

Connection to a Peer Node

Link name: LINK0001  Activate at startup

LAN destination address (hex): 400043907001    Address format: Token Ring    Remote SAP (hex): 64

Adjacent node ID (hex):

Partner network ID: USIBMSU

Partner node name: TUC400 (Required for partner LU definition)

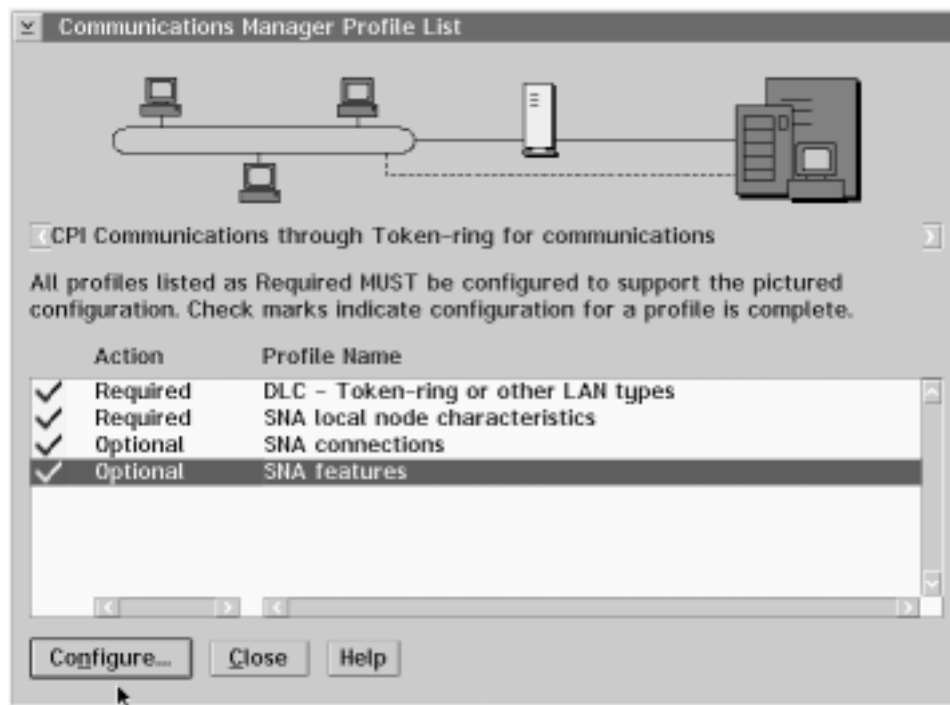
Optional comment: ADSM AS/400 Server

Buttons: OK, Define Partner LUs..., 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.



- 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

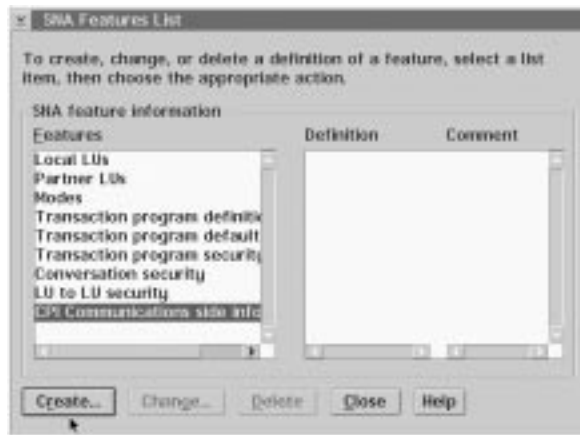
Default RU size

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:** Refer to Table 2 on page 57 to supply your AS/400 parameters.

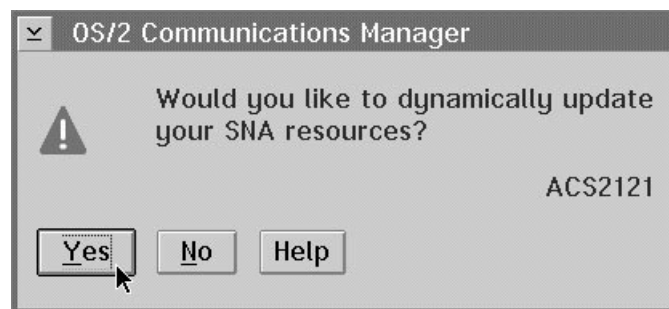
- a. Supply a name in the **Symbolic destination name** field. It is recommended that you use ADSM400. The name corresponds to the SYMBOLICDESTINATION name of the server located in the client options file.
- b. Select **Fully qualified name** in the **Partner LU** list box. Type your local network ID **1**, followed by the AS/400 local control point name **2**.
- c. Select **TP name** in the **Partner TP** list box. Type the AS/400 TP name **4**.
- d. Select **None** in the **Security type** entry field.
- e. Type **QADSM** **5** 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 with the following configuration:

- Symbolic destination name:** ADSM400
- Partner LU:**  Fully qualified name, USIBMSU, TUC400I
- Partner TP:**  Service TP, TP name: QANRTP.QADSM
- Security type:**  Same,  None,  Program
- Mode name:** QADSM
- Optional comment:** ADSM AS/400 Server

## 16 Close all configuration windows.

If your 3270 sessions are up, you are prompted to dynamically update your SNA resources. If not, the update is automatic. Select **Yes**.



Shown here is a sample minimum client option (dsm.opt) file:

```
* To use APPC communication method for OS/2
commethod          snalu6.2
symbolicdestination  adsm400
* tpname           QANRTP.QADSM
* partnerluname    usibmsu.tuc400i
cpicbuffersize     31
```

**Note:** You can use either the SYMBOLICDESTINATION or the combination of PARTNERLUNAME and TPNAM.

---

## Appendix B. Defining the Controller and the Device Descriptions for APPC

If the automatic configuration (AUTOCONFIG) facility is enabled, the controller and device descriptions are automatically created when the client first contacts the server.



It is recommended that you use the AUTOCONFIG facility to create the controller and device descriptions.

---

You may be able to logon from your workstation to force the automatic controller and device description. If you cannot use the AUTOCONFIG, you must manually configure the controller and device description for each workstation using ADSM that is not yet configured to the system.

---

### Defining the Controller Description

The following is an example of specifying the controller description:

```
===> CRTCTLAPPC CTLD(SUD00D8) LINKTYPE(*LAN) SWITCHED(*YES)
      SWTLINLST(TRLAN) RMTNETID(*NETATR) RMTCPNAME(SUD00D8)
      ADAPTADR(10005A25D2FE)
```

where:

- CRTCTLAPPC** Creates a controller description for an APPC controller. For more information about using this command, refer to the *AS/400 Communications User's Guide* or the *AS/400 CL Reference, Volume 3*.
- CTLD** Specifies the name of the controller description being created.
- Note:** It is recommended that the controller description name be the same as the client's LU name.
- LINKTYPE** Specifies the type of line to which this controller is attached. Possible values are:
- \*SDLC** Synchronous data link control (SDLC) line
  - \*TDLC** Twinaxial data link control (TDLC) line
  - \*LAN** Ethernet or token-ring local area network line
  - \*TRLAN** Token-ring local area network line
  - \*X25** X.25 line

<b>SWITCHED</b>	Specifies whether this controller is attached to a switched line, a token-ring network, Ethernet Lan or an X.25 switched virtual circuit. Possible values are:  <b>*NO</b> Must be specified for APPC controllers attached to a TDLC line.  <b>*YES</b> For this parameter.
<b>SWTLINLST</b>	Specifies the line on which the client will be communicating with the ADSM/400 server. A maximum of 64 switched line names can be specified.
<b>RMTNETID</b>	Specifies the name of the network ID of the client node. This value can be obtained from the APPC/SNA configuration information on the client. If you specify *NETATR, the local network name is taken from the network attributes.
<b>RMTCPNAME</b>	Specifies the LU name of the client workstation. This LUNAME must match the remote system's LUNAME. This value can be obtained from the APPC/SNA configuration information on the client.
<b>ADPTADR</b>	Specifies the adapter address of the remote controller. This is the address to which the system will send data when it communicates with the remote controller. This value can be obtained from the client workstation.

---

## Defining the Device Description

The following is an example of specifying the device description:

```
====> CRTDEVAPPC DEVD(TEST1) RMTLOCNAME(SUD00D8) RMTNETID(*NETATR)
      CTL(TEST1) MODE(#INTER)
```

where:

<b>CRTDEVAPPC</b>	Creates a device description for an APPC device. For more information about using this command, refer to the <i>AS/400 Communications User's Guide</i> or the <i>AS/400 CL Reference, Volume 3</i> .
<b>DEVD</b>	Specifies the name of the device description being created. This name must be the same name as the controller description and client's LU name.
<b>RMTLOCNAME</b>	Specifies the name of the remote location (LUNAME).
<b>RMTNETID</b>	Specifies the name of the remote network. If you specify *NETATR, the local network name is taken from the network attributes.

- CTL** Specifies the name of the controller description to which this device is attached.
- MODE** Specifies the name of the modes that define the sessions on this device. You can specify up to 14 mode names. However, it is recommended that you use a single mode name of #INTER.



---

## Appendix C. Server Setup for Multiple Servers

You can run multiple ADSM servers on your AS/400 system. Each server needs its own work library and cannot share that library with any other server. Therefore, you must create a library and specify it on all ADSM commands that require a work library parameter.

In addition, each server must specify a unique port (if TCP/IP) or socket (if IPX/SPX).

---

### Server Setup for TCP/IP and IPX/SPX

For each new server, do the following:

- 1** Create a new work library by entering:

```
===> CRTLIB NEWLIB
```

- 2** You must create a new console message queue. Depending on your use of the mount messages, you may also want a separate mount message queue. To create each new message queue, enter:

```
===> CRTMSGQ NEWLIB/ADSMMSGQ
```

- 3** The original server set a TCP/IP port address (the default is 1500) or IPX/SPX socket number (the default is 8522). Select a new port address or socket number to be included in the server options and in the client options files.
- 4** Use the CHGSVRADSM command or, from the ADSM Utilities screen, select 3 (Change server options) to do the following:
  - a** Specify your new work library and press Enter. The default parameters are displayed.
  - b** Enable the communication methods and specify the TCP/IP port and IPX/SPX socket number.
  - c** Specify the console message queue and mount message queue.

Whenever you start or end the server or work with this server, specify your new work library instead of the default (QUSRADSM) on all ADSM commands.

- 5 Initialize the new server by selecting option 1 (Initialize the server) from the ADSM utilities menu and specifying the new server work library. Continue with the procedures presented in Chapter 3, "Setting Up the Server" on page 17.

---

## APPC

For the APPC environment, you must create a unique QANRTP program for each server. The default server (QUSRADSM) uses QANRTP in QADSM. For each new server, do the following:

- 1 Retrieve the CL source code for QANRTP with RTVCLSRC.
- 2 Modify the work library parameter in the CL, recompile the program and store the program in the work library. In the following example, replace QUSRADSM with the name of your new work library, and then compile the program with CRTCLPGM and store it in the new work library.

```
PGM
DCL VAR(&PGMLIB) TYPE(CHAR*) LEN(10) VALUE(QADSM)
DCL VAR(&WKLIB) TYPE(CHAR*) LEN(10) VALUE(QUSRADSM)
MONMSG MSGID(CPF2103)
ADDLIBLE LIB(&PGMLIB) POSITION(*LAST)
CHGCURLIB CURLIB(&WKLIB)
CALL PGM(&PGMLIB/QANRSERV) PARM(PRESTARTTHREAD)
ENDPGM
```

**Note:** On the client workstation you must change the TPNAME in DSM.OPT from QANRTP.QADSM to QANRTP.*NEWLIB* (where *NEWLIB* is the library you will be running from).

---

## Using the Administrative Client with A Newly-Defined Server

To use the AS/400 administrative client with the new server, do the following:

- 1 Create a side information file (CSI) specifying the TPNAME, and store the CSI in NEWLIB.

**Note:** Ensure that the CSI and the transaction program are created in the server work library.



```
===> CRTCSI (NEWLIB/CSINAME) +  
      RMTLOC NAME (QANRDEVB) +  
      TNSPGM(QANRTP.NEWLIB) +  
      MODE(QADSM) +  
      TEXT(ADSM CSI)
```

- 2** Set the CSI by issuing the CHGADMADSM command and specifying your work library and pressing Enter.
- 3** Specify your new CSI name and press Enter.

---

## Setting a Unique Server Name

Use the SET SERVERNAME command to specify a unique server name for each server you set up. For example, to set a new server name for SERVER\_1, do the following:

- 1** Start the server if it is not already running (see “Starting the Server” on page 19).
- 2** Specify the name.



```
set servername server_1
```

When a client workstation attaches to the server, the server name is displayed. You can use this unique name to verify that the client is attached to the correct server.



## Appendix D. Server Authority

This appendix shows the authority required for objects referenced by ADSM commands.

### Commands Shipped with Public Authority \*EXCLUDE

Table 3 identifies which commands have restricted authority (public authority is \*EXCLUDE) when ADSM is installed. It shows IBM-supplied user profiles that are authorized to use these restricted commands.

Commands restricted to the security officer and to any user profile with \*ALLOBJ authority are indicated by **R** in the QSECOFR column. Commands authorized to the security officer and one or more IBM-supplied user profiles are indicated by **S** in the column of the authorized profiles.

Table 3 (Page 1 of 2). User Profiles Set Up for Commands Shipped with Public Authority \*EXCLUDE

Command	QSECOFR	QPGMR	QSYSOPR	QADSM
CHGADMADSM Change ADSM client options	R			S
CHGSVRADSM Change ADSM server options	R			S
CRTVOLADSM Create disk volume files	R			S
DMPADSM Dump ADSM database	R			S
DSPVOLADSM Display ADSM volumes	R			S
ENDSVRADSM End ADSM server	R	S	S	S
INZSVRADSM Initialize server	R			S
LODADSM Load ADSM database	R			S
STRADMADSM Start ADSM administrative client	R			S
STRAUDADSM Start ADSM database audit	R			S
STRRSTADSM Restore database for ADSM	R			S
STRSVRADSM Start ADSM server	R	S	S	S

Table 3 (Page 2 of 2). User Profiles Set Up for Commands Shipped with Public Authority  
\*EXCLUDE

Command	QSECOFR	QPGMR	QSYSOPR	QADSM
VFYSVRADSM Verify ADSM server	R	S	S	S
WRKDEVADSM Work with ADSM devices	R			S

### Authority Required for Objects Used by These Commands

Table 4 shows the objects and authorities required if the system administrator needs to authorize additional users to these commands. Library authority for these commands is READ.

If you must authorize a user to ADSM commands, ensure that the user has \*EXECUTE authority to the programs listed in this table and to the server work library.

Table 4 (Page 1 of 2). Authority Required to Authorize Additional Users to Commands Shipped with Public Authority \*EXCLUDE

Command	Referenced Object	Authority Required for Object
CHGADMADSM	Work Library QUSRADSM File QOPTADSM Program QANRCFGSVR Program QANRCFGCVD	EXECUTE OPERATIONAL and READ EXECUTE EXECUTE
CHGSVRADSM	Work Library QUSRADSM File QOPTADSM Program QANRCFGSVR Program QANRCFGSVD	EXECUTE OPERATIONAL and READ EXECUTE EXECUTE
CRTVOLADSM <sup>1</sup>	New File Work Library QUSRADSM Program QANRCRTVOL	OPERATIONAL and EXISTENCE EXECUTE EXECUTE
DMPADSM	Work Library QUSRADSM Program QANRCRTVOL Program QANRSERV	EXECUTE EXECUTE EXECUTE
DSPVOLADSM	Work Library QUSRADSM Program QANRDSPVOL Program QANRSERV	EXECUTE EXECUTE EXECUTE
ENDSVRADSM	Work Library QUSRADSM Program QANRENDSVR	EXECUTE EXECUTE
INZSVRADSM <sup>1</sup>	New File Work Library QUSRADSM Program QANRINZSVR Program QANRSERV	OPERATIONAL and EXISTENCE EXECUTE EXECUTE EXECUTE
LOADSM	Work Library QUSRADSM Program QANRLOD Program QANRSERV	EXECUTE EXECUTE EXECUTE
STRADMADSM	Work Library QUSRADSM CSI File QANRCSI Device File QANRDEVA Device File QANRDEVB Controller File QANRCTLD Program QANRSTRADM	EXECUTE EXECUTE EXECUTE EXECUTE EXECUTE EXECUTE

Table 4 (Page 2 of 2). Authority Required to Authorize Additional Users to Commands Shipped with Public Authority \*EXCLUDE

Command	Referenced Object	Authority Required for Object
STRAUDADSM	Work Library QUSRADSM Program QANRSTRAUD Program QANRSERV	EXECUTE EXECUTE EXECUTE
STRRSTADSM	Work Library QUSRADSM Program QANRSTRRST Program QANRSERV	EXECUTE EXECUTE EXECUTE
STRSVRADSM <sup>3 4 5</sup>	Work Library QUSRADSM Program QANRSTRSVR Program QANRSERV	EXECUTE EXECUTE EXECUTE
VFYSVRADSM	Work Library QUSRADSM Program QANVFYSVR QANR* USERSPACES	EXECUTE EXECUTE READ
WRKDEVADSM <sup>6</sup>	New File QANR* USERSPACE Work Library QUSRADSM Program QANRWRKDEV	OPERATIONAL and EXISTENCE OPERATIONAL and EXISTENCE EXECUTE EXECUTE

**Note:**

- <sup>1</sup> Commands ALCOBJ, DLCOBJ, CRTPF, RMVM, CHKOBJ, ADDPFM, GRTOBJAUT are also referenced.
- <sup>2</sup> Commands CRTPF, RMVM, CHKOBJ, ADDPFM, GRTOBJAUT are also referenced.
- <sup>3</sup> The server requires EXECUTE authority to issue these commands:  
ALCOBJ CHGMSGQ CHGOBJOWN CHKOBJ CHKTAP CLRMSGQ CRTDTAQ CRTMSGQ  
CRTPF DLCOBJ DLDTAQ DLMSGQ DLTOVR DSPHDWRSC DSPJOB ENDJOB  
GRTOBJAUT INZTAP OVRTAPF SBMJOB VRYCFG
- <sup>4</sup> The server requires EXECUTE authority to issue the following commands if the server is using an automated tape library:  
ADDTAPCTG CHGTAPCTG DSPTAPCTG RMVTAPCTG  
DSPTAPSTS CRTTAPCGY DLTTAPCGY DSPTAPCGY
- <sup>5</sup> The server requires EXECUTE authority to issue these API commands:  
QCLRDTAQ QCMDEXC QDCRCFGS QDCRDEVD QLZARTV QMHCHGEM QMHRCVPM  
QMHRVTM QMHSNDM QRCVDTAQ QSNDDTAQ QSYCUSRA QSYRUSRI QSZRTVPR  
QUSCRTUS QUSCRTUQ QUSDLTUQ QUSDLTUS QUSLJOB QUSPTRUS QUSRJOB  
QUSRJOBI QUSRMBRB QUSRMBRD QUSROBJD QWCCVTD T QWCRSVAL
- <sup>6</sup> Commands STRADMADMS, DSPTAPSTS, DSPHDWRSC are also used.



---

## Appendix E. Troubleshooting

This chapter presents tips for diagnosing and fixing problems with ADSM. It also gives symptoms and actions of problems that you may be experiencing. Before you begin diagnosing a problem, ensure that you have applied the latest:

- ADSM/400 PTFs  
See APAR I107777 for the latest listing of PTFs for all ADSM clients and servers.
- OS/400 service

---

### Tips

You can get information to help resolve problems by capturing additional messages in:

- Job Log
- Message Queue
- *qprint* File

Before trying to reproduce the problem and diagnose the error, see the following tips:

- For more information about an error message, see *ADSM Messages* or enter `HELP xxxxxx` (from the ADSM administrative client) where `xxxxx` is the message identifier.
- If you are using the `CSLMSGQ` option of the `CHGSVRADSM` command, delete the messages in the specified message queue.
- Delete old *qprint* files that the ADSM/400 server has created by doing a `WRKSPLF` for the user ID that started the server and deleting all unnecessary spool files.
- Delete old job logs that the ADSM/400 server created.
- Use either the `CSLMSGQ` or the `CSLOUT` option, or both:
  - The `CSLMSGQ` option sends all server messages to the specified message queue. Diagnostic messages sent to this message queue may help you resolve the problem.
  - Setting the `CSLOUT` option to `ON` causes all server messages to go to a single print file. This may help if you need to capture the file and send it to IBM for further help.  
**Note:** When you have resolved the problem, turn the `CSLOUT` option off because it takes additional system resources.
  - If you cannot fix a problem, call your IBM service representative. See *ADSM Messages* Chapter 1, and Appendix A, “Configuring Client Communications” on page 57 for a description of what you need to report. See “Getting the Job Logs” on page 94 for instructions on how to obtain job logs.

---

## Getting the Job Logs

An ADSM/400 server job usually displays a job log only for a job that ends abnormally. If your IBM service representative asks for the job logs to diagnose a problem, do the following:

1. Modify the QADSM job description in the QADSM library to indicate that you want a log level text of \*SECLEVEL.
2. Stop and restart the ADSM/400 server.
3. Obtain the job logs.
4. Reset the job description logging level to \*NOLIST.
5. Stop and start the server again.

---

## Console Message Queue and Second Level Help

The ADSM/400 CSLMSGQ is a console simulation. It is a single job on the AS/400 in the ADSM subsystem that receives messages from other ADSM jobs and sends those messages to a single queue. It uses message ANR7945 as a shell for other ADSM messages. Therefore, when you display second level help, you only see the first level message text. If you want additional information on a message, use the ADSM help facility or refer to *ADSM Messages*.

---

## Symptoms and Actions

This section addresses the following symptoms for the ADSM.

- Server does not initialize
- Server does not start
- Workstation does not communicate with the server using TCP/IP
- Workstation does not communicate with the server using APPC
- ADSM command fails (not communications related)

Find the symptom you are experiencing and perform the actions stated. Call for service if you are not able to correct the problem.

### Server Does Not Initialize

You tried option 1 on the ADSM Main Menu, but the server does not initialize.

1. If you have no indication why the problem is occurring in the output displayed during the INZSVRADSM command, display the job log from the ID that issued the INZSVRADSM command.
2. Select F10 to see additional detailed messages.
3. Scroll back looking for indications of problems in the job log.
4. Look for these possible problems:
  - Is the user initializing the server or the QADSM user authorized to all necessary commands? See Appendix D, "Server Authority" on page 89.



- Are the library lists correct? There should be no duplicate libraries between the system library list and the initial library list specified on the QADSM job description located in the QADSM library.
  - Does the system value QALWUSRDMN have the \*ALL setting? If not, have you added the QUSRADSM library to the list of libraries specified on this system value? If you are using a work library other than QUSRADSM, have you specified that library on the system value?
  - Do you have enough space on your AS/400 to contain the database and recovery log files you specified on the initialize command?
  - When certain problems occur during initialization, user spaces are kept for debug purposes. If you are getting the message ANR7900 with reason code 0002, sign off and sign back on before reinitializing the server or delete the QANR\* user spaces located in the server work library before attempting to reinitialize the server.
5. Before you reissue the command to initialize the server, make sure that all jobs from the previous invocation of the command have ended. If the server has stopped properly, there should be no QANRxxxx jobs in the QSYSWRK subsystem. If there are jobs in the subsystem, be sure to end them before attempting to reinitialize the server.

## Server Does Not Start

You tried option 10 on the ADSM Main Menu, but the server does not start.

1. Use the CSLMSGQ option or CSLOUT option to look for errors.
2. Look for these possible problems:
  - The problems listed in “Server Does Not Initialize” on page 94.
  - If you are using a new user ID to start the server, ensure that the user ID is authorized to objects listed in Appendix D, “Server Authority” on page 89. Check any messages on CSLMSGQ for an indication of a specific error. Also, if an error occurs while submitting the first job, issue the DSPJOBLOG command and press F10 to see additional messages and scroll back to look for problems.
  - Corrupted recovery log.

This may occur if the server is not being ended properly. You have two options:

- You can do a standalone dump, load, and audit (options 1, 2, and 3 on the Recovery Tools menu—see Figure 17 on page 96).



This operation can take a long time and can be avoided in some situations. Contact an IBM service representative before choosing this option.

---

```

ADSMRT      ADSTAR Distributed Storage Manager Recovery Tools
                                                    System: TUC400I

  Select one of the following:

    1. Dump database
    2. Load database
    3. Start audit database
    4. Display volumes
    5. Restore database

Selection or Command
===> _____

```

Figure 17. ADSM Recovery Tools Menu

- You can revert to a previous version of the ADSM log and database and then audit any tape volumes that have been changed since that version. To avoid this problem, ensure that you are stopping the ADSM server properly with the ENDSVRADSM command (see *ADSM Administrator's Guide* for details).
- 3. Before you reissue the command to start the server, ensure that all jobs from the previous invocation of the command have ended. Use the VFYSVRADSM (verify server) command. If the server has stopped properly, there should be no jobs in the QSYSWRK subsystem. If the server is running, and ENDSVRADSM will not end the server, end the QANRxxx jobs individually before attempting to restart the server.

## Workstation Does Not Communicate with the Server Using TCP/IP

You tried to communicate with the server using TCP/IP but cannot.

1. Verify that the server is up and operational by selecting option 4 from the ADSM main menu (Verify server status). Then check the CSLMSGQ to ensure that there are no error messages for TCP/IP. If TCP/IP is up and the ADSM server can access it, you should see a message ANR8200I indicating this.
2. Verify that the TCPIP server option is specified as a valid communication method. If it is not, specify it by using the CHGSVRADSM command and stop and restart the server.
3. Verify that TCP/IP is operational. Enter WRKTCPPSTS to check TCP/IP status. Select Work with TCP/IP connection status. You should see the port that ADSM is using in a listen state. If TCP/IP is not active, start it. You may also try stopping and restarting TCP/IP.

**Note:** The server must be started after TCP/IP. If you recycle or refresh TCP/IP, you must stop and restart the server.

4. Verify that the workstation attempting to use TCP/IP can PING the AS/400. If it cannot, resolve the TCP/IP problems.

5. Verify that the AS/400 can PING the workstation attempting to communicate with the ADSM/400 server. If it cannot, resolve the TCP/IP problems. Refer to your AS/400 TCP/IP documentation.
6. If the client is specifying a name (TCPSEVERADDRESS) rather than an IP address, try using the IP address instead to verify that the server name is being properly resolved. Verify that the IP address is correct.

### **Workstation Cannot Communicate with the Server Using IPX/SPX**

You tried to communicate with the server using IPX/SPX but cannot.

1. Verify that the server is up and operational by selecting option 4 from the ADSM main menu (Verify server status).
2. Verify that IPX/SPX is operational by using WRKIPXSTS. The circuit should be active if you check circuit status. You should see the socket in listen status if you check IPX connection status. You may need to stop and restart IPX if it is not active or is not working properly.

**Note:** The server must be started after IPX/SPX. If you recycle or refresh IPX/SPX, you must stop and restart the server.

3. Check the console message queue for message ANR8223I, indicating that the server is communicating using IPX/SPX. If the message is there, resolve the IPX/SPX error. If no message is there, ensure that IPX/SPX is specified in your server options.

### **Workstation Cannot Communicate with the Server Using APPC**

You tried to communicate with the server using APPC but cannot.

APPC errors are the hardest to diagnose. An error in an APPC parameter on either the AS/400 side or the client side can cause a communications failure. Errors can also occur if the device is varied on to the wrong subsystem or an incorrect routing entry is specified. Therefore, you must carefully check all APPC entries for typographical errors. Some APPC entries are case sensitive, and the installation instructions must be followed exactly.

Refer to Appendix A, "Configuring Client Communications" on page 57 for sample communication configurations.

1. Error message: CPIC PARM CHECK

Check your options file (dsm.opt). This message suggests that your communications manager setup and the options file do not match.

If you are using both APPC and TCP/IP, verify that both communication methods are specified in the server option file. The server defaults to APPC, so if only APPC is being used, you can either specify that for the communication method or allow it to default.

See Appendix A, "Configuring Client Communications" on page 57 for communication configuration information.

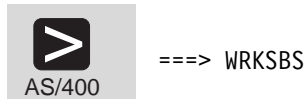
## 2. Error message: UNABLE TO ALLOCATE

Verify that the server is up and operational. Use Figure 6 on page 8 to determine server status.

Verify that the link is operational. Use the Subsystem Management Screens in the Communications Manager folder on your desktop.

3. If you have been using APPC and it has stopped working, verify that you have not lost the communication entry in your communication subsystem. This problem could be caused by reinstalling the operating system without reinstalling ADSM.

During installation, some communication entries are added to the communication subsystem, QBASE and QCMN. If you created your own communication subsystem, you added a communication entry to your subsystem. Verify that these still exist by using this procedure:



Select Communications subsystem

Select option 8 (Communications entries)

A screen similar to the one shown here appears.

Device	Mode	Job Description	Library	Default User	Max Active
*APPC	QADSM	*USRPRF		QADSM	*NOMAX
*APPC	#INTER	*USRPRF		QADSM	*NOMAX

If you were on ADSM Version 1 and upgraded to ADSM Version 2, you will have both entries. If you have only used ADSM Version 2, you will have just the first entry.

If you have lost these entries, reenter them with the following command and then stop and restart your communication subsystem.

```
====> ADDCMNE SBSD(subsystem) DEV(*APPC) JOBD(*USRPRF)
DFTUSR(QADSM) MODE(QADSM)
```

4. Verify that QSYS2 is on the system library list.
5. Verify all APPC parameters on the client side. If any error is occurring and you are NOT using a side information file, you should switch to the side information file at least until the problem is resolved.
6. Verify that all uppercase was specified for the transaction program.
7. Check the token ring address, the partner network id, and the partner node name. Ensure that these are all uppercase.

8. Recheck the side information file and ensure that this information is all in uppercase.

### Identify the Point of Failure

1. Specify CSLMSGQ on the server options file and specify \*NONE for CSLOUT. Messages are displayed in the message queue. Check there to determine if the server sees an available connection. Specifying \*NONE for the CSLOUT causes each unique server job to create a single qprint file should it need to put any messages out. You can quickly check the qprint files as they get created.

2. Ask yourself the following questions:

- a. Did the client successfully start a server process?

Determine whether the failure occurs after the client communicates with the server or before the client communicates with the server.

Look for messages in the CSLMSGQ that indicate a connection was attempted and any associated error messages. If an administrative session successfully attaches, message ANR0402 should appear. If a backup-archive session attaches, ANR0400 should appear. There may be error messages between the start and end session messages that indicate the problem. Also check spool files (usually in QADSM's spool files) for indications of problems.

- b. Was the transaction program called?

Look for spool files and job logs. It is possible that the wrong routing entry is being selected.

- c. Did the request get into the AS/400?

Look in the QSYSOPR message queue for communication related messages. Check the controller and devices to see if they are varied on (and if they exist at all).

If the devices do not exist, either auto configuration is not enabled or an error has occurred.

If the devices are varied off, you should vary them on.

Often the status of the devices is in an error state. In this case, you can try varying them off and varying them on again.

You can also try deleting the controller and devices and allow them to autcreate. If errors occur in creating, you will get a message in the QSYSOPR message queue.

You can also check messages in QHIST using DSPLOG.

- d. Did the request get out of the client machine?

At this point of failure, the connection attempt did not make it to the AS/400. You must first determine if the client is trying to send the request over the network.

Most errors are related to an improper setup. Therefore, recheck all of the APPC parameters before doing any further analysis.

Verify the communication subsystem is up and running.

Check the error log file on the client.

If necessary, turn client tracing on when you invoke the client:

```
dsmadm -id=xxxx -pass=xxx -tracefl=COMM -tracefile=myfile
```

If you still cannot isolate the problem, you may need to take a trace of the communication subsystem.

### **ADSM Command Fails (Not Communications Related)**

After you have started the server and communicated with it from attached workstations, other errors are usually straightforward. You may want to use either an administrative client in CONSOLE mode or specify CSLMSGQ on CHGSVRADSM to see if additional diagnostic messages are displayed. You can also display the activity log. Ensure that you are issuing commands properly.

If backups are failing, verify you have enough space in the storage pool to contain the backup. Also verify that you have not exceeded your licensing terms.

If you are unable to register additional nodes, verify that you have not exceeded your license terms.

---

## Appendix F. Using ADSM Interfaces

This chapter describes how to use two interfaces to ADSM:

- Graphical user interface (GUI) (see page 101)
- Command-line interface (see page 103)

For information about the ADSM Utilities interface, see “Setting Server Communications Options” on page 8

---

### Using the Graphical User Interface

You can manage the server from a graphical user interface.

**Note:** The GUI is not available on the AS/400 administrative client.

For instructions on starting the OS/2 GUI, see “Starting the OS/2 Administrative Client” on page 21.

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, or 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, or 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:

<b>Task help</b>	Step-by-step information on how to complete the task associated with a selected object.
<b>General help</b>	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.
<b>Contextual help</b>	Specific information for a selectable object, menu choice, notebook tab, field, and control or push button in a window.



<b>Help index</b>	An index of all the help topics. You can access help for entry directly from the index.
<b>Using help</b>	Information about the types of help.
<b>Hypertext links</b>	Links to more information about words that appear in a different color from the rest of the help text.
<b>Search</b>	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 AS/400, the administrative client invokes ADSM by using the STRADMADSM command. On other platforms, the administrative client invokes ADSM by using the DSMADMC command. This section shows AS/400 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:

```
===> stradmads
```

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

```
===> stradmads adminname(smith) password(secret)
```

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

```
quit
```



---

## Appendix G. Where to Look for More Information

This section shows you where to look for more information.

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### 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
ADSM Licensed Program Specifications	<i>ADSTAR Distributed Storage Manager for AS/400: Licensed Program Specifications</i>	GH35-0139
ADSM Administrator's Guide	<i>ADSTAR Distributed Storage Manager for AS/400: Administrator's Guide</i>	SC35-0196
ADSM Administrator's Reference	<i>ADSTAR Distributed Storage Manager for AS/400: Administrator's Reference</i>	SC35-0197
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
ADSM Using the Lotus Notes Backup Agent	<i>ADSTAR Distributed Storage Manager: Using the Lotus Notes Backup Agent</i>	SH26-4047

<b>Short Title</b>	<b>Publication Title</b>	<b>Order Number</b>
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
<b>CD-ROM</b>		
ADSM Online Library		SK2T-1878
AS/400 Softcopy Library		SK2T-2171

## 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 programming 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.

## Related AS/400 System Publications

The following table lists related AS/400 publications.

<b>Publication Title</b>	<b>Order Number</b>
<i>AS/400 Automated Tape Library Planning and Management</i>	SC41-3309
<i>AS/400 Local Device Configuration</i>	SC41-3121
<i>AS/400 Publications Reference</i>	SC41-3003
<i>Backup Recovery and Media Services for OS/400</i>	SC41-3345
<i>OS/400 CL Reference</i>	SC41-3722
<i>OS/400 Backup and Recovery – Basic</i>	SC41-3304
<i>OS/400 Backup and Recovery – Advanced</i>	SC41-3305
<i>OS/400 Communications Configuration</i>	SC41-3401
<i>OS/400 Remote Work Station Support</i>	SC41-3402
<i>OS/400 Work Management</i>	SC41-3306

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## 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.

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## 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.



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## Appendix H. Notices

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AIXwindows	Language Environment	SP2
Application System/400	Library Reader	System/370
APPN	MVS/DFP	System/390
AS/400	MVS/ESA	Systems Application Architecture
AT	MVS/SP	SystemView
BookManager	MVS/XA	Virtual Machine/Enterprise Systems Architecture
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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 programming 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 programming 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 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 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 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, 2<sup>20</sup> 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.

**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*.

**SPACEMGPOOL.** 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* 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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Easy to find	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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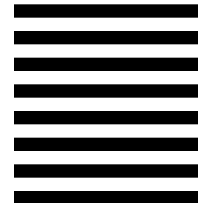
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