



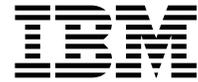
ADSTAR Distributed Storage Manager

# ADSMConnect Agent for Oracle Backup on AIX Installation and User's Guide

*Version 2*



ADSTAR Distributed Storage Manager



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*Version 2*

**Note**

Before using this information and the product it supports, read the general information under "Notices" on page v.

**Second Edition (June 1998)**

This edition applies to Version 2 of the ADSMConnect Agent for Oracle Backup on AIX, 5765-C05, and to any subsequent releases until otherwise indicated in new editions. Make sure you are using the correct edition for the level of the product.

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## Contents

<b>Notices</b> . . . . .	v
Trademarks . . . . .	v
<b>About This Book</b> . . . . .	vii
<b>Summary of Changes</b> . . . . .	ix
Second Edition, June 1998 . . . . .	ix
<b>Chapter 1. Introducing the ADSMConnect Agent for Oracle Backup</b> . . . . .	1
Understanding ADSM . . . . .	1
The ADSMConnect Agent for Oracle Backup . . . . .	3
<b>Chapter 2. Installing the Oracle Backup Agent on AIX 3.2</b> . . . . .	5
Preparing for Installation . . . . .	5
ADSMConnect Agent Environment . . . . .	5
Communication Methods . . . . .	5
Installation Considerations . . . . .	5
Installing the Oracle Backup Agent . . . . .	6
Contents of the CD-ROM . . . . .	6
Step 1: Installing the Oracle Backup Agent . . . . .	7
Step 2: Defining the Environment Variables . . . . .	8
Step 3: Editing the Client Options Files . . . . .	10
Step 4: Registering Your Workstation with the Server . . . . .	10
Step 5: Initializing the Password . . . . .	10
Post-Installation Tasks . . . . .	11
<b>Chapter 3. Installing the Oracle Backup Agent on AIX 4.1, 4.2, and 4.3</b> . . . . .	13
Oracle Backup Agent Environment . . . . .	13
Space and Hardware Requirements . . . . .	13
Operating System . . . . .	14
Software Support . . . . .	14
Communications Method . . . . .	14
Step 1: Installing the Oracle Backup Agent on AIX 4.1 . . . . .	14
Step 1: Installing the Oracle Backup Agent on AIX 4.2 and 4.3 . . . . .	15
ADSM API Files . . . . .	16
ADSMConnect Agent Files . . . . .	16
Step 2: Defining the Environment Variables . . . . .	17
Step 3: Editing the Client Options Files . . . . .	19
Editing the Client System Options File . . . . .	19
Specifying the ADSM Management Class . . . . .	19
Step 4: Registering Your Workstation with the Server . . . . .	20
Step 5: Initializing the Password . . . . .	21
<b>Chapter 4. Before Using the Oracle Backup Agent</b> . . . . .	23
Using Command Scripts in Oracle7 . . . . .	23

Using RMAN and the Oracle Backup Agent . . . . .	23
Removing Old Backups . . . . .	25
Removing Old Backups for Oracle7 . . . . .	25
Removing Old Backups for Oracle8 . . . . .	25
Using the Management Class . . . . .	25
Using Hierarchical Storage Management (HSM) with Archive Log Files . . . . .	26
Setting up Environment Variables . . . . .	26
Modifying the dsm.sys File . . . . .	26
Modifying the dsm.opt File . . . . .	27
Adding Space Management to the File Systems . . . . .	27
Reporting Problems . . . . .	28
If You Cannot Start ADSMConnect Agent for Oracle Backup . . . . .	28
If ADSMConnect Agent Starts and a Problem is Encountered . . . . .	28
ADSM Service . . . . .	29
<b>Chapter 5. Using the ADSM Central Scheduler Service to Automate Online Backups</b> . . . . .	31
Example of Central Scheduler Service to Automate Backups . . . . .	32
<b>Chapter 6. API Return Codes</b> . . . . .	35
<b>Index</b> . . . . .	37

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## About This Book

This book describes the installation and operation instructions for the system administrator and user. You should be familiar with your AIX workstation, your operating system, and your file backup systems.

The following publications provide additional information.

<b>Title</b>	<b>Order Number</b>
ADSTAR Distributed Storage Manager: Using the Application Programming Interface Version 2	SH26-4002
ADSTAR Distributed Storage Manager Using the Application Program Interface Version 3	SH26-4081
ADSTAR Distributed Storage Manager: Installing the Clients Version 2	SH26-4049
ADSTAR Distributed Storage Manager Installing the Clients Version 3	SH26-4080
ADSTAR Distributed Storage Manager: Using the UNIX Backup-Archive Clients Version 2	SH26-4053
ADSTAR Distributed Storage Manager Using the UNIX Backup-Archive Clients Version 3	SH26-4075
ADSTAR Distributed Storage Manager: Using the UNIX Hierarchical Storage Management Clients Version 2	SH26-4030
ADSTAR Distributed Storage Manager Using the UNIX Hierarchical Storage Management Clients Version 3	SH26-4083
Getting Started: Managing IBM RISC System/6000	GC23-2378
Using ADSM to Back Up Databases	SG24-4335
Enterprise Backup Utility Installation Guide for AIX, Release 2.0.10	A43148-1
Oracle7 Server Administrator's Guide	6694-70-1292
Oracle7 Enterprise Backup Utility Administrator's Guide, Release 2	A42580-2
Oracle SQL Net Administrator's Guide	—
Oracle8 Server Backup and Recovery Guide	A54640-01



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## Summary of Changes

This section summarizes changes made for this edition of the book.

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### Second Edition, June 1998

The updates include:

- The addition of a new chapter, Chapter 1, “Introducing the ADSTMConnect Agent for Oracle Backup” on page 1, to introduce ADSTM and the ADSTMConnect Agent.
- Changes made throughout the book to reflect the ADSTMConnect Agent support of both Oracle7 and Oracle8 databases.
- A separate chapter has been created to provide information on installing the ADSTMConnect Agent on AIX 3.2. See Chapter 2, “Installing the Oracle Backup Agent on AIX 3.2” on page 5.
- A separate chapter has been created to provide information on installing the ADSTMConnect Agent on AIX 4.1, 4.2, and 4.3. See Chapter 3, “Installing the Oracle Backup Agent on AIX 4.1, 4.2, and 4.3” on page 13.
- A chapter has been added to provide information on ADSTM central scheduling. See Chapter 5, “Using the ADSTM Central Scheduler Service to Automate Online Backups” on page 31.
- A chapter has been added for the API return codes. See Chapter 6, “API Return Codes” on page 35.



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## Chapter 1. Introducing the ADSMConnect Agent for Oracle Backup

This section provides a brief overview of ADSM and the ADSMConnect Agent.

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### Understanding ADSM

ADSTAR Distributed Storage Manager (ADSM) is a client/server program that provides storage management services in a multivendor, multiplatform computer environment.

ADSM:

- Reduces network complexity.

ADSM reduces network complexity with interfaces and functions that span the network providing a consistent approach to implementing ADSM across different operating systems and hardware.

- Increases administrator productivity.

ADSM can reduce the cost of network administration by allowing administrators to automate repetitive processes, schedule unmanned processes, and administer ADSM from anywhere in the network.

- Reduces the risk of data loss.

While many users do not back up their data at all, others use stand-alone backup techniques with diskettes and tapes as the only protection for business data. Even when backups are performed regularly, the success of these backup systems is often evaluated only at recovery time, often with disappointing results. ADSM lets administrators schedule routine backups and lets users recover from accidental data deletion without administrator involvement.

- Optimizes existing storage resources.

ADSM allows users to move infrequently used or large files from client file systems to ADSM storage. This saves space on client file systems and often eliminates the expense of upgrading client storage hardware.

ADSM also provides services to ensure that clients do not run out of storage space. ADSM monitors client storage and moves files from client file systems to ADSM storage if an "out-of-space" condition threatens. This can also eliminate the expense of client hardware upgrades.

ADSM provides these services:

- Backup and restore services.

Backup and restore services allow backup-archive clients to make backup copies of data at specified intervals and restore the data from those copies when required. These services provide protection from workstation or file server media failure, accidental file deletion, data corruption, data vandalism, and site-wide disasters.

- Archive and retrieve services.

Archive and retrieve services provide backup-archive clients with point-in-time copies of data for long-term storage.

- Server hierarchical storage management services.

Server storage is composed of storage pools. A storage pool is a named set of storage volumes that is used as the destination for client files. Server hierarchical storage management services optimize server storage by migrating client files from storage pools of more expensive media (disk, for example) to storage pools of less expensive media (tape, for example). Migration is started and stopped based on high and low thresholds that the administrator sets for each storage pool. Migration applies to all client files (backup and archive).

- Automation services.

ADSM administrators can increase productivity by automating many day-to-day storage administration tasks by defining policies and scheduling services for backup.

- Administration services.

Administration services provide ADSM administrators with support for day-to-day monitoring, administration, and accounting of ADSM. Administrators can manage the server from another system or the same system. The ADSM utilities allow the administrator set client and server options, define devices, format storage volumes, add additional clients, label tape volumes, and other tasks. ADSM monitors scheduled operations and maintains information about their status in the database. An administrator can export information to removable media. This data can be imported by another server, making the export and import features a handy utility for moving server information. The administrator can specify the accounting option, which is generated at the end of each client session.

- Security services.

Security services prevent unauthorized access to ADSM-managed data, storage, policy definitions, and administrative commands. These security options allow the security administrator to control the limit or extent of a person's access to these resources.

- Disaster recovery services.

Disaster recovery services assist the administrator with the implementation of a comprehensive backup and recovery procedure for important business applications, data, and records.

---

## The ADSCMConnect Agent for Oracle Backup

The ADSCMConnect Agent supports both Oracle7 databases with the Enterprise Backup Utility (**EBU**) and Oracle8 databases with the Recovery Manager (**RMAN**). The Oracle7 **EBU** and Oracle8 Recovery Manager performs backup (online and offline) and restore (online and offline) of Oracle databases. After the Oracle7 **EBU** or Oracle8 **RMAN** initiates a backup or restore, the ADSCMConnect Agent acts as the interface to ADSM. The ADSM server then applies its storage management functions to the data, which can be done while users are working, with minimal disruption.

The ADSCMConnect Agent (also called the Oracle Backup Agent) can work with any Version 2 or Version 3 ADSM server.

See Figure 1 for an understanding of how Oracle7 or Oracle8 works in conjunction with the ADSCMConnect Agent and the ADSM server.

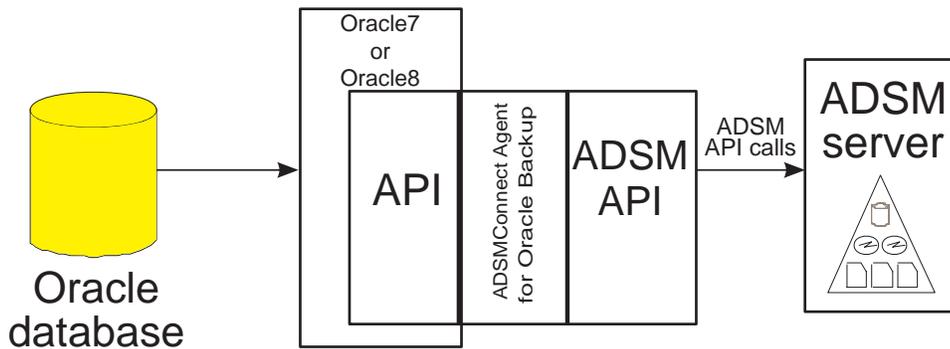


Figure 1. How Oracle7 or Oracle8 Interfaces with the ADSCMConnect Agent



---

## Chapter 2. Installing the Oracle Backup Agent on AIX 3.2

This chapter describes the installation procedures for the Oracle Backup Agent on AIX 3.2.

---

### Preparing for Installation

This section describes setup information to install the ADSMConnect Agent for Oracle Backup on an AIX workstation.

Before you install the ADSMConnect Agent for Oracle Backup, make sure the following are installed first:

- The ADSM server
- The Oracle database

A root user must install the ADSMConnect Agent on an AIX workstation.

**Note:** Do not install the Oracle7 Enterprise Backup Utility (EBU) until **after** you install the Oracle Backup Agent.

### ADSMConnect Agent Environment

The space and hardware requirements are:

- A RISC System/6000
- Disk space for AIX 3.2: 3 MB
- Memory: 16 MB

The operating system requirement is IBM AIX 3.2, or later.

### Communication Methods

<i>Table 2. Communication Software</i>		
To use this communication method:	Install this on the workstation	To connect to these ADSM servers:
TCP/IP	Standard with AIX/6000	AIX, HP-UX, MVS, OS/2, OS/400, Sun, VM, Windows NT
SNA LU6.2 (APPC)	AIX SNA Services/6000	AIX, MVS, OS/2, OS/400, VSE, VM

### Installation Considerations

The AIX 3.2 installation requires at least 3 MB of free disk space to install all available options.

When you install the ADSMConnect Agent on an AIX workstation, all of the ADSMConnect Agent files for the installed client components reside in **/usr/lpp/adsmagent/aob**.

---

## Installing the Oracle Backup Agent

To install the ADSMConnect Agent on an AIX workstation, use the System Management Interface Tool (SMIT). The AIX system supports two versions of SMIT: ASCII and Motif. With the ASCII version, select an item, and press **Enter**. With the Motif version, click on the item you want. The following procedures are written for the Motif version, but any significant differences for the ASCII version are noted.

For detailed information about using SMIT, see *Getting Started: Managing IBM RISC System/6000*, and read the SMIT windows during the installation process.

**Note:** Later versions of AIX incorporate slightly different SMIT screens than earlier versions. Where these differences exist, they are identified in the installation steps.

## Contents of the CD-ROM

The client program CD-ROM for AIX 3.2 contains the following:

Directory	Files
aix32	adsmaob.bff .toc aobkey.bff
doc	adsmaob.ps adsmaob.pdf adsmaob.htm

## Step 1: Installing the Oracle Backup Agent

Follow the steps below to install the ADSMConnect Agent for Oracle Backup program.

1. Insert the CD-ROM containing the client package into the CD-ROM drive.
2. Log in as the root user.  
**Note:** If you are using the Motif version of SMIT, you must be in the X Window system environment. Enter **xinit** if you are not.
3. Make a new directory **mnt**:  

```
mkdir /mnt
```
4. Enter this command to mount the CD-ROM:  

```
mount -o ro -v cdrfs /dev/cd0 /mnt
```
5. Enter **smit** on the command line. The System Management menu displays.  
Enter **smitty** if you are using the ASCII version of SMIT.
6. Select **Installation and Maintenance** on the System Management menu.
7. Select **Standard Installation & Maintenance** on the Installation and Maintenance menu.
8. Select **Software Installation & Maintenance** on the Standard Installation & Maintenance menu.
9. Select **Install / Update Software** on the Software Installation & Maintenance menu.
10. Select **Install Software Without Updates** on the Install / Update Software menu.
11. Enter **/mnt/aix32** to select the device on the Install Software Products at Latest Available Level screen.
12. Select **List** appearing next to the \*SOFTWARE to install selection. The Multi-select List screen displays.  
**Note:** With the ASCII version, press **F4** to select the software list.
13. Select **adsmagent.aob.obj** for the Oracle Backup Agent and/or select **adsmagent.aobord.obj** for the Verification File. Select **adsmagent.all** for both.  
**Note:** With the ASCII version, press **F7** to select the list.
14. Select **OK** on the Multi-select List screen. The Install Software Without Updates screen displays.
15. Select **DO** on the Install Software Without Updates screen to select the defaults. This message displays:  

```
ARE YOU SURE?
```
16. Select **OK**. Installation begins and the Install Software Without Updates screen displays.
17. Select **Done** when installation is successful. The Install Software Without Updates screen displays.

18. Select **Cancel**. The System Management Interface Tool menu displays.
19. Select **Exit** from the System Management Interface Toolbar screen.
20. Select **Exit SMIT F12** to exit SMIT.

### ADSM Files for the Oracle Backup Agent

The following files are included with the Oracle Backup Agent and are installed in the `/usr/lpp/adsmagent/aob` path.

File Name	Description
adismaob.ord	Verification file
dsm.opt.smp	Sample client user options file
dsm.sys.smp	Sample client system options file
en_US/dsmclient.cat	Messages
libobk.a	Shared library (for 3.2 and 4.1)
aobpswd	Password management program
options.doc	Documentation for client options
README.AOB	Recent updates and other special information

**Note:** A symbolic link is made to associate `libobk.a` with `/usr/lib/libobk.a`.

## Step 2: Defining the Environment Variables

The API uses unique environment variables to locate files. This allows you to use different files for API applications from those used by the interactive client, if necessary.

Specify the client system options file (**dsm.sys**), the client user options file (**dsm.opt**), and the API error log file (**dsierror.log**) that you want to use for the ADSMConnect Agent for Oracle Backup, using the `DSMI_DIR`, `DSMI_CONFIG`, and `DSMI_LOG` environment variables. See below for examples of how to specify these files.

The Oracle user must define the following environment variables.

### DSMI\_CONFIG

Points to the user options file (**dsm.opt**).

If the **dsm.opt** file is in your home directory, use:

```
export DSMI_CONFIG=/home/yourlogin/dsm.opt
```

**Note:** If using the ADSMConnect Agent with **RMAN**, it is recommended that you place **dsm.opt** in the `$DSMI_DIR` directory.

**DSMI\_DIR** Points to the directory that contains the client system options file (**dsm.sys**) and the verification file.

If these files are in the `/usr/lpp/adsmagent/aob` directory, use:

```
export DSMI_DIR=/usr/lpp/adsmagent/aob
```

## DSMI\_LOG

Points to the directory that contains the API error log file (**dsierror.log**).

For error log files, create a directory where you want the error logs to be created, and let the DSMI\_LOG environment variable point to that directory.

If the error log directory is **/home/yourlogin/logdir**, use:

```
export DSMI_LOG=/home/yourlogin/logdir
```

## DSMO\_AVG\_SIZE

The average size of objects in megabytes. This is passed to the ADSM server where it is used to determine storage pool and device usage. The default is 50 MB.

**Important:** Set this environment variable to a value in the approximate range of your database sizes so the ADSM server can determine device usage.

**DSMO\_FS** The file space name on the ADSM server with a string of one to 1024 characters. When setting up this option, do not use / in front of the file system name. For example, if the file system name is **oracle**, then enter this:

```
export DSMO_FS=oracle
```

The default is **/adsmorc**.

## DSMO\_NODE

The node name containing a string of one to 64 characters. This environment variable is used to specify a unique node name for the ADSMConnect Agent. This prevents any confusion with an existing ADSM backup-archive client.

The default is the value returned by the **gethostname** or **NODENAME** value in the options file.

**Note:** The ADSMConnect Agent does not use the NODENAME option from **dsm.sys** and **dsm.opt**.

## DSMO\_OWNER

A session and object owner name containing a string of from one to 64 characters. The default is a value returned by **getuid**.

**Note:** We recommend that you do not use this environment variable. If necessary, however, it can be used to override the login userid to restore an object backed up by another owner.

## DSMO\_PSWDPATH

This environment variable should point to the directory where your password file, **ADSMO.yourhostname** resides.

If you do not specify **DSMO\_PSWDPATH**, the default is to search the installation directory.

If the password file is in **/usr/lpp/adsmagent/aob**, use:

```
export DSMO_PSWDPATH=/usr/lpp/adsmagent/aob
```

**Note:** If using the ADSMConnect Agent with **RMAN**, it is recommended that you place the password file in the **\$DSMI\_DIR** directory.

### Step 3: Editing the Client Options Files

The root user should edit the **dsm.sys** file. It must refer to the correct ADSM server and communication option methods. Set the **PASSWORDACCESS PROMPT** option to **prompt** in the client system options (**dsm.sys**) file. **Prompt** is the default if a parameter is not specified.

The Oracle user should edit the **dsm.opt** file. The file should refer to the correct **SERVERNAME**.

#### Specifying the ADSM Management Class

When you back up a database, the default management class for your node will be used unless you override this with a different value specified in the include option. This option is placed in the include-exclude options file. The file name of the include-exclude options file is placed in the client systems option file. Refer to *ADSTAR Distributed Storage Manager Installing the Clients*.

For the management class you will use, define the backup copy group parameters **VERDELETED=0** and **REONLY=0**. This aids in the cleanup of files that the **ebutool** command deletes.

### Step 4: Registering Your Workstation with the Server

Instruct the ADSM administrator to register your node with the server and to inform you of the password. The administrator should specify **BACKDELETE=yes** so that you can delete old backups at a later time.

### Step 5: Initializing the Password

**Important:** The root user **must** run the **aobpswd** program before using the ADSMConnect Agent for Oracle Backup.

Follow the steps below to initialize the password.

- Set **DSMO\_PSWDPATH** to the path where the password file resides.
- Start the **aobpswd** program. This sets up a connection with the server that you specified in the **dsm.opt** file. The following screen displays:

```
ADSMConnect Agent for Oracle Backup
Password file authorization/update program
>> this must be run by the ROOT user if updating the value <<
```

- Enter your current ADSM node password to start the file.
- When the following prompt displays:  
Enter your new password

press **Enter** without entering a value. The following messages are displayed:

```
Your password has been written to the file.  
Verify that the DBA has read access to the ADSMO.pigeon file.
```

The **aobpswd** program creates a file called **ADSMO.yourhostname** in the directory specified by **DSMO\_PSWDPATH**. Make sure the user who will run the ADSMConnect Agent for Oracle Backup has read permission to **ADSMO.yourhostname**.

You can use the **aobpswd** program at a later time to update the password. Update the password before it expires on the ADSM server.

---

## Post-Installation Tasks

Once the ADSMConnect Agent for Oracle Backup is installed, you can install the Oracle Enterprise Backup Utility (**EBU**). See *Enterprise Backup Utility Installation Guide for AIX* for installation procedures.

To install the **EBU** executables so they work with ADSM, follow these steps:

1. Select the **EBU** executable option on the Oracle7 Enterprise Backup Utility Install Options screen. The **OBK\_HOME** for Oracle7 Enterprise Backup Utility menu displays.
2. Enter the path name for **OBK\_HOME**, the name of the directory where the **EBU** code will reside; for example, **/home/oracle/obackup**.  
**Note:** You can install it anywhere, but the directory name must be **OBACKUP**. The 3rd Party Media Management Software Vendor screen displays.
3. Select **Others** to specify ADSM. The Vendor Software Installation Directory displays.
4. Enter **/usr/lib**. This directory path links to this file:  
**/usr/1pp/adsmagent/aob**



---

## Chapter 3. Installing the Oracle Backup Agent on AIX 4.1, 4.2, and 4.3

The Oracle Backup Agent is ordered separately on a CD-ROM and has its own installation program. The CD-ROM also contains the ADISM API. The CD-ROM provides you with a permanent license to use the product.

The ADISM API Version 3, Release 1.3 is shipped with the Oracle Backup Agent. If you do not have this version of the ADISM API, it will be automatically installed for you.

Before you can install the Oracle Backup Agent, make sure that the ADISM Version 2 or Version 3 server is installed.

A root user must install the ADISM API and Oracle Backup Agent on an AIX workstation.

Check the current **README** file for any changes to the installation procedures.

The steps for installing are:

- Step 1: Install the Oracle Backup Agent on AIX. For AIX 4.1, see “Step 1: Installing the Oracle Backup Agent on AIX 4.1” on page 14. For AIX 4.2 or 4.3, see “Step 1: Installing the Oracle Backup Agent on AIX 4.2 and 4.3” on page 15.
- Step 2: Define the environment variables. See “Step 2: Defining the Environment Variables” on page 17.
- Step 3: Edit the client options file. See “Step 3: Editing the Client Options Files” on page 19.
- Step 4: Register your workstation with the server. See “Step 4: Registering Your Workstation with the Server” on page 20.
- Step 5: Initialize the password. See “Step 5: Initializing the Password” on page 21.

---

### Oracle Backup Agent Environment

This section contains client environment information and hardware and software requirements for installing the ADISMConnect Agent for Oracle Backup.

#### Space and Hardware Requirements

The space requirements are:

- An AIX workstation
- Disk space for AIX 4.1, 4.2, and 4.3: 3 MB
- Memory: 32 MB

## Operating System

The operating system requirement is AIX 4.1, 4.2, or 4.3.

## Software Support

The ADSMConnect Agent for Oracle Backup supports:

- Oracle7 Enterprise Backup Utility Version 2.1 or 2.2
- Oracle7 Version 7.3.2, 7.3.3, or 7.3.4
- Oracle8 Version 8.0.3 or 8.0.4

## Communications Method

To use this communication method:	Install this on the workstation	To connect to these ADSM servers:
TCP/IP	Standard with AIX/6000	AIX, HP-UX, MVS, OS/2, OS/400, Sun, VM, Windows NT
SNA LU6.2 (APPC)	AIX SNA Services/6000	AIX, MVS, OS/2, OS/400, VSE, VM

---

### Step 1: Installing the Oracle Backup Agent on AIX 4.1

Follow the steps below to install the ADSMConnect Agent for Oracle Backup. This example assumes that your CD-ROM drive is **/dev/cd0**.

1. Insert the CD-ROM containing the client package into the CD-ROM drive.
2. Log in as the root user.
3. Enter **smitty install**.
4. Select **Install and Update Software**.
5. Select **Install/Update Selectable Software (Custom Install)**.
6. Select **Install Software Products at Latest Level**.
7. Select **Install New Software Products at Latest Level**.
8. Enter **/dev/cd0** for **Input device / directory for software**.
9. Press **F4** to list **SOFTWARE to instal..**
10. Press **F7** to select the following:

```
adsm.client.aob
```

Press **Enter**.

**Note:** If your system does not have the ADSM API client Version 3.1.3 or later, it will be automatically installed for you.

11. Press **Enter** again.

12. A window will pop up prompting you:

ARE YOU SURE?

Press **Enter** again.

13. Once you are finished installing, press **F10** to get out of **smitty**.

To see a list of ADSM API files installed, see “ADSM API Files” on page 16.

To see a list of ADSMConnect Agent files installed, see “ADSMConnect Agent Files” on page 16.

---

### Step 1: Installing the Oracle Backup Agent on AIX 4.2 and 4.3

Follow the steps below to install the ADSMConnect Agent for Oracle Backup. This example assumes that your CD-ROM drive is **/dev/cd0**.

1. Insert the CD-ROM containing the client package into the CD-ROM drive.
2. Log in as the root user.
3. Enter **smitty install**.
4. Select **Install and Update Software**.
5. Select **Install and Update from LATEST Available Software**.
6. Enter **/dev/cd0** for **Input device / directory for software**.
7. Press **F4** to list **SOFTWARE to install**.
8. Press **F7** to select the following:

adsm.client.aob

Press **Enter**.

**Note:** If you have not installed the ADSM API client Version 3.1.3 or later, it will be automatically installed for you.

9. Press **Enter** again.
10. A window will pop up prompting you:

ARE YOU SURE?

Press **Enter** again.

11. Once you are finished installing, press **F10** to get out of **smitty**.

To see a list of ADSM API files installed, see “ADSM API Files” on page 16.

To see a list of ADSMConnect Agent files installed, see “ADSMConnect Agent Files” on page 16.

## ADSM API Files

The following files are included with the ADSM API and are installed in the **/usr/lpp/adsm/api/bin** path.

File Name	Description
dsm.sys.smp	Sample client system options file
dsm.opt.smp	Sample client user options file
en_US/dsmclientV3.cat	Messages file
README.API	Readme file
libApiDS.a	ADSM API library file
libXApi.a	ADSM X/Open library file
dsmtca	Trusted Communication Agent file
sample/xxxxxxx	ADSM API files for developers
xopen/xxxxxxx	ADSM X/Open API files for developers

**Note:** Symbolic links are made to associate **libApiDS.a** with **/usr/lib/libApiDS.a** and **libXApi.a** with **/usr/lib/libXApi.a**.

## ADSMConnect Agent Files

The following files are included with the ADSMConnect Agent for Oracle Backup and are installed in the **/usr/adsmagent/oba** path.

File Name	Description
README.AOB	Last-minute updates and other special information
libobk.a	ADSMConnect Agent library file
aobpswd	Password management program
agent.lic	Permanent license

**Note:** A symbolic link is made to associate **libobk.a** with **/usr/lib/libobk.a**.

---

## Step 2: Defining the Environment Variables

The API uses unique environment variables to locate files. This allows you to use different files for API applications from those that are used by the interactive client, if necessary.

Specify the following files that you want to use for the ADSMConnect Agent for Oracle Backup:

- Client system options file (**dsm.sys**). The ADSMConnect Agent uses the `DSMI_DIR` environment variable to locate **dsm.sys**.
- Client user options file (**dsm.opt**). The ADSMConnect Agent uses the `DSMI_CONFIG` or `DSMI_ORC_CONFIG` environment variable to specify this file.
- API error log file (**dsierror.log**). The ADSMConnect Agent uses the `DSMI_LOG` environment variable to specify this file.

See below for examples of how to specify these environment variables.

**DSMI\_DIR** Points to the ADSM API installed path.

If this is not set, the ADSMConnect Agent uses the API default installed path of `/usr/lpp/adsm/api`.

This environment variable needs to be defined only if the ADSM API is installed under a different path from the default path.

**DSMI\_CONFIG**

Points to the user options file (**dsm.opt**).

It is not required to set this environment variable. If `DSMI_ORC_CONFIG` is set, the ADSMConnect Agent uses the value from `DSMI_ORC_CONFIG`. If `DSMI_ORC_CONFIG` is not set, and `DSMI_CONFIG` is set, the ADSMConnect Agent uses the `DSMI_CONFIG` value.

If none is set, the ADSMConnect Agent uses the ADSM default installed path of `/usr/lpp/adsm/bin/dsm.opt`.

**DSMI\_LOG**

Points to the directory that contains the API error log file (**dsierror.log**).

For error log files, create a directory for the error logs to be created in, and let the `DSMI_LOG` environment variable point to that directory.

If the error log directory is `/home/yourlogin/logdir`, use:

```
export DSMI_LOG=/home/yourlogin/logdir
```

**DSMI\_ORC\_DIR**

Points to the ADSMConnect Agent installed path. If this is not set, the ADSMConnect Agent uses the default installed path

`/usr/lpp/adsmagent/aob`. This environment variable needs to be defined only if the ADSMConnect Agent is installed under a different path from the default path.

### **DSMI\_ORC\_CONFIG**

Points to the user options file (**dsm.opt**). If the **dsm.opt** file is in your home directory, use this command:

```
export DSMI_ORC_CONFIG=/home/yourlogin/dsm.opt
```

If this is not set and DSMI\_CONFIG is set, the ADSMConnect Agent uses the DSMI\_CONFIG value. If both environment variables are not set, the default is **/usr/lpp/adsm/bin**.

### **DSMO\_AVG\_SIZE**

The average size of objects in megabytes. This information is passed to the ADSM server where it is used to determine storage pool usage and device usage. The default is 50 MB.

**Important:** Set this environment variable to a value in the approximate range of your database sizes so the ADSM server can determine device usage.

**DSMO\_FS** The file space name on the ADSM server with a string of one to 1024 characters. When setting up this option, do not use / in front of the file system name. For example, if the file system name is **oracle**, then enter this:

```
export DSMO_FS=oracle
```

The default is **adsmorc**.

### **DSMO\_NODE**

The node name that contains a string of one to 64 characters. This environment variable is used to specify a unique node name for the ADSMConnect Agent. This prevents any confusion with an existing ADSM backup-archive client.

The default is the value that is returned by *gethostname*.

**Note:** The ADSMConnect Agent does not use the nodename value from **dsm.opt** and **dsm.sys**.

### **DSMO\_OWNER**

A session name and object owner name that contains a string of from one to 64 characters. The default is a value that is returned by **getuid**.

**Note:** We recommend that you do not use this environment variable. If necessary, however, it can be used to override the login user ID to restore an object that is backed up by another owner.

### **DSMO\_PSWDPATH**

This environment variable should point to the directory where your password file, **ADSMO.yourhostname** resides.

If you do not specify DSMO\_PSWDPATH, the default is to search the installation directory.

If the password file is in **/usr/lpp/adsmagent/aob**, use:

```
export DSMO_PSWDPATH=/usr/lpp/adsmagent/aob
```

---

### Step 3: Editing the Client Options Files

ADSM uses the following options in the client system options file (**dsm.sys**):

- SERVERNAME option (to identify the ADSM server)
- COMMETHOD option (to identify the communication method)
- TCPPORT option (to identify connection port)
- TCPSERVERADDRESS option (to identify the address of the machine that the ADSM server resides on)

ADSM uses a client options file that is called **dsm.opt** to specify the ADSM server.

These options are in effect for the entire ADSM session.

During the initial installation and set up of ADSM on your workstation, you are provided with a sample client system options file that is called **dsm.sys.smp**. The **dsm.sys.smp** file contains just the communication options and a sample **include-exclude** list. These basic options are the ones you need to get started quickly.

ADSM also provides a sample client user options file (**dsm.opt.smp**) to help you get started quickly.

The client options file resides in your ADSM API installation directory. The sample options files that are distributed with the ADSM API can be used for the ADSMConnect Agent.

### Editing the Client System Options File

The root user should edit the **dsm.sys** file. It must refer to the correct ADSM server method and communication option method. Set the PASSWORDACCESS option to **prompt** in the client system options (**dsm.sys**) file. **Prompt** is the default if a parameter is not specified.

### Specifying the ADSM Management Class

When you back up a database, the default management class for your node is used. You can override the default value with a different value that is specified in the Include option. This option is placed in the **Include-Exclude** options file. The file name of the **Include-Exclude** options file is placed in the client system's option file. See *ADSTAR Distributed Storage Manager Installing the Clients*.

To assign a management class name **orcbackup** to all of the Oracle backups with a default file space name of **adsmorc**:

1. Add the following entry under the server stanza that you will be using in the **dsm.sys** file where the ADSM API is installed:

```
incl excl /u01/oracle/include.def
```

2. Add the following entry in **/u01/oracle/include.def**:

```
include /adsmorc/.../* orcbackup
```

All the files backed up with a default file space name of **adsmorc** will be assigned to management class **orcbackup**.

If you do not want to use the **inclexcl** option, you can create a new domain just for Oracle backups. You must then register your node with the new domain.

For the management class you use, define the backup copy group parameters **VERDELETED=0** and **REONLY=0**. This aids in the clean up of files that the **ebutool** command deletes.

---

#### Step 4: Registering Your Workstation with the Server

Before you can begin requesting services from an ADSM server, the server must recognize your workstation. ADSM uses a node name and a password (if one is required) to identify each workstation. ADSM maintains a password for each node name. The process of setting up a node name and password is called *registration*.

Your ADSM administrator must register your workstation as a client with the server. You can then back up and restore documents from the server.

You need to provide the following information to your administrator:

- Your node name
- The initial password you want to use, if a password is required
- Contact information, such as your name, user ID, and phone number

Your administrator defines the following for you:

- The policy domain to which your client node belongs.  
A policy domain contains policy sets and management classes (that are defined by your ADSM administrator), that control how ADSM manages the objects you back up.
- Whether your application allows you to choose to compress objects before sending them to the server.
- Whether your application allows you to delete backup data from ADSM storage.

**Note:** If an ADSM client already exists on your workstation, it is recommended that you use a separate and unique node name for the ADSMConnect Agent on the same workstation.

Instruct the ADSM administrator to register your node with the server and to inform you of the password. The administrator should specify **BACKDELETE=yes** so that you can later delete old backups.

---

## Step 5: Initializing the Password

**Important:** The root user **must** run the **aobpswd** program before using the Oracle Backup Agent.

Follow the steps below to initialize the password.

1. Set **DSMO\_PSWDPATH** to the path where the password file resides. If this is not specified, the password file will be created in the current working directory.
2. Start the **aobpswd** program. This sets up a connection with the server that you specified in the **dsm.opt** file. The following screen displays:

```
ADSMConnect Agent for Oracle Backup
Password file authorization/update program
>> this must be run by the ROOT user if updating the value <<
```

3. Enter your current ADSM node password to start the file.
4. When the **Enter your new password** prompt displays, press **Enter** without entering a value. The following messages are displayed:

```
Your password has been written to the file.
Verify that the DBA has read access to the ADSMO.pigeon file.
```

The **aobpswd** program creates a file that is called **ADSMO.yourhostname** in the directory that is specified by **DSMO\_PSWDPATH**. Make sure that the user who runs the ADSMConnect Agent for Oracle Backup has read permission to **ADSMO.yourhostname**.

You can use the **aobpswd** program later to update the password. Update the password before it expires on the ADSM server.



---

## Chapter 4. Before Using the Oracle Backup Agent

Oracle7 and Oracle8 provides backup and restore functions for Oracle databases. You can perform full or partial, offline or online backups. Once you identify which database you want to back up, Oracle locates all of the necessary files and sends them to ADSM. The ADSMConnect Agent for Oracle Backup provides an interface between the Oracle API calls and the ADSM API routines. The ADSMConnect Agent translates the Oracle API calls into ADSM API calls.

---

### Using Command Scripts in Oracle7

Use Oracle command scripts to define and start backup and restore operations, or to register information in the Backup Catalog. To start the operations, enter the **OBACKUP** command that is followed by the appropriate script name. For example, to register databases in the Backup Catalog, use an **OBACKUP** register script.

To back up a database, use the **OBACKUP** scripts that are customized to execute the following tasks:

- Full online backups (backup online database)
- Full offline backups (backup offline database)
- Partial online backups (backup online)
- Backup of archived redo logs.

To restore a database, use **OBACKUP** scripts that are customized to execute the following tasks:

- Full consistent restore (restore database-consistent)
- Partial restore of tablespaces and control files (restore)
- Full restore to a specific point-in-time (restore database)
- Partial restore of tablespaces to another directory (restore remap).

If a backup is interrupted, the operation starts from the beginning.

---

### Using RMAN and the Oracle Backup Agent

To use **RMAN** with the Oracle Backup Agent:

1. Link **RMAN** with the Oracle Backup Agent. Before relinking, make sure that no other Oracle process is running. Shut down all the databases and listeners, and so forth. An example is shown below:

```
$ cd $ORACLE_HOME/rdbms/lib
$make -f ins_rdbms.mk ioracle LLIBMM=/usr/lib/libobk.a
```

This will relink the Oracle8 objects with the ADSMConnect Agent library. Make sure the relinking process finishes successfully.

2. Invoke **RMAN** for backup and restore of Oracle8 database. The following example assumes that the catalog database is set up and the target database is registered with the catalog database.

**Note:** **RMAN** does not pick up the environment variables you specify from the shell. In other words, environment variables like **DSMI\_DIR** and **DSMI\_CONFIG** will not take effect in the **RMAN** sessions. You will have to use the **parm** option while allocating the **RMAN** channels.

Invoke **RMAN** with the following command:

```
$> rman target xxx/yyy@target rcvcat rman/rman@catalog
    cmdfile bkdb.scr msglog bkdb.log
```

This will start **RMAN** in the following sequence:

```
target xxx/yyy@target: connect to target database
using user xxx and password yyy with connect string target
rcvcat rman/rman@catalog: connect to catalog database
using user rman and password rman with connect string catalog
cmdfile bkdb.scr: run bkdb.scr script
msglog bkdb.log: log the output messages in bkdb.log
bkdb.scr Script:
run
{
  #ENV is case sensitive
  allocate channel t1 type 'sbt_tape' parms
    'ENV=(DSMI_ORC_CONFIG=/home/oracle/dsm.opt,
          DSMO_AVG_SIZE=1000)';
  allocate channel t2 type 'sbt_tape' parms
    'ENV=(DSMI_ORC_CONFIG=/home/oracle/dsm.opt,
          DSMO_AVG_SIZE=1000)';
  backup
    filesperset 10
    format 'df_%t_%s_%p'
    (database);
}
```

This script allocates two parallel connections to the ADSM server with environment variables **DSMI\_ORC\_CONFIG** and **DSMO\_AVG\_SIZE**.

3. If you run the example above, **RMAN** creates a log file **bkdb.log** in the current working directory. If an error occurs, you will see the error stack in the log file.
4. To get an ADSM trace, add the following options to your **dsm.opt** file:

```
tracefile /home/oracle/adsmapi.trace
traceflag api pid
```

This will create the **/home/oracle/adsmapi.trace** file. Some other logs are available under **\$ORACLE\_HOME/rdbms/log**. Check **sbtiio.log** for some of the ADSMConnect Agent messages.

---

## Removing Old Backups

The ADSCMConnect Agent for Oracle Backup uses the ADSCM backup repository. Each database backup creates a new object with a new unique name. Since these have unique names, they always remain active and never expire. This happens so the Database Administrator (DBA) can control when copies are removed from the ADSCM server and can coordinate this with the Oracle7 **EBU** and Oracle8 **RMAN**.

### Removing Old Backups for Oracle7

Oracle7 ships a utility that is called **ebutool**. This utility should be used to delete old database backups that are no longer needed from the Backup Catalog. When backups are deleted from the Backup Catalog, **ebutool** sends *delete object* API calls to ADSCM. ADSCM then marks the objects inactive to ensure that they expire with the next ADSCM file expiration process. For example, to delete backups that are older than 30 days, enter this command:

```
ebutool -db_name=xxxx -purgejobs=30
```

You can define **ebutool** commands as part of a script that is started from the ADSCM central scheduler to automate the deletion process.

### Removing Old Backups for Oracle8

To remove an old backup on Oracle8, issue this command from the **RMAN** prompt:

```
RMAN> allocate channel for delete type 'sbt_tape';  
RMAN> change backuppiece 'name_of_backup_piece' delete;
```

See the Oracle **RMAN** manual for more information on the **change** command and its options.

### Using the Management Class

Use parameters in the Management Class definition to control when the inactive object expires on the ADSCM server.

For the backup copy group, use:

```
VERDELETED=0  
REONLY=0
```

This erases the inactive objects from the server after the next inventory expiration.

In order to delete backup objects, the ADSCM administrator must register your node by specifying **BACKDELETE=yes**.

---

## Using Hierarchical Storage Management (HSM) with Archive Log Files

Customers can take advantage of the HSM functions on the ADSM AIX client by ordering the optional Space Management feature. The use of the HSM functions on the ADSM AIX client can save space by archiving the redo log files to the ADSM server. This is a great benefit for an active database where the logs can get very large and become difficult to manage.

To use HSM with archive log files, the root user must perform the following tasks:

- Set up the environment variables
- Modify the **dsm.sys** file
- Modify the **dsm.opt** file
- Add space management to the file systems
- Edit the include-exclude file

## Setting up Environment Variables

Specify the client system options file (**dsm.sys**) and the client user options file (**dsm.opt**) that you want to use for backups, using the DSM\_CONFIG and DSM\_DIR environment variables. See below for examples of how to specify these files.

### DSM\_CONFIG

Points to the client user options file (**dsm.opt**). It can be the same file that the DSMI\_CONFIG variable points to. An example is:

```
export DSM_CONFIG=/usr/lpp/adsm/bin/dsm.opt
```

**DSM\_DIR** Points to the ADSM client directory that contains the client system options file (**dsm.sys**). An example is:

```
export DSM_DIR=/usr/lpp/adsm/bin
```

**Note:** Do not place a slash (/) at the end of the directory path.

## Modifying the dsm.sys File

The list below provides a brief description of some important space management options you can set in your **dsm.sys** file.

### DEFAULTSERVER

Specifies the ADSM server to which ADSM backs up and archives files from local file systems by default. If the MIGRATESERVER option is not specified, DEFAULTSERVER is the ADSM server to which ADSM migrates files from local file systems.

The default is the server specified in the first stanza of the **dsm.sys** file. An example is:

```
defaultserver cougar
```

### MIGRATESERVER

Specifies the ADSM server to which ADSM migrates files from your local file systems.

The default is the default server. An example is:

```
migrateserver pigeon
```

## Modifying the `dsm.opt` File

The `OPTIONFORMAT` option determines whether users must enter space management commands using the standard format for options (similar to the format used for backup-archive commands), or the short format (similar to the format used for UNIX commands). The default is `STANDARD`.

Modify the `dsm.opt` file to suit your needs.

## Adding Space Management to the File Systems

Because you only want to migrate archive log and control files, it is best to exclude space management services from all the files except the files you want to migrate. If you do not use include-exclude options, HSM might automatically migrate system files whenever the disk space is filled up to its high threshold mark (this will affect performance).

It is recommended that you should back up the files before migrating them. A management class is provided with the server that requires backing up the files before migration. If the default management class to the machine does not provide backups required before migration facility, use the include-exclude file to assign a management class to the files.

To add space management to a file system or to update space management settings for a file system, enter the `dsmmigfs` command:

```
dsmmigfs add /u01
```

This command adds space management to file system `/u01`.

To meet the above requirements, use the `inl excl` option, adding the following statement in a server stanza in your `dsm.sys` file:

```
inl excl /u01/oracle/include.def
```

Then, edit this file:

```
/u01/oracle/include.def
```

To edit the include-exclude file, enter these commands:

```
include /u01/oracle/dbs/arch  
exclude.spacemgmt /.../u01/.../  
include /u01/oracle/dbs/arch migsel
```

The following is an explanation of these commands:

### **include.def**

Is parsed from the bottom to the top.

**include /u01/oracle/dbs/arch\* migsel**

Assigns the management class **migsel** to the **/u01/oracle/dbs/arch\*** files.

**exclude.spacegmt /.../u01/.../\***

Means that all the files in the **/u01** directory are excluded for space management services.

**include /u01/oracle/dbs/arch\***

Means that the fileset **/u01/oracle/dbs/arch\*** is included for ADSM services.

If the migrated files are referenced while the database is in use, they are recalled automatically and will occupy the space again. In order to prevent being recalled every time they are referenced, use the **dsmattr** command to change the attribute of the files. for example:

```
dsmattr -recallmode=readwithoutrecall arch1_290.dbf
```

The **dsmattr** command changes the attribute of the **arch1\_290.dbf** file to **readwithoutrecall**. The **readwithoutrecall** attribute prevents the file from being restored to the disk if referencing to the file is for read only.

For more information on HSM, see *ADSTAR Distributed Storage Manager Using the UNIX Hierarchical Storage Management Clients*.

---

## Reporting Problems

### If You Cannot Start ADSMConnect Agent for Oracle Backup

If you encounter a problem while using ADSMConnect Agent for Oracle Backup or if you cannot start ADSMConnect Agent for Oracle Backup, collect this information:

- The **dsm.sys** file
- The **dsm.opt** file
- The **dsmo.env** file that demonstrates your use of environment variables.

To create this file, enter:

```
set | grep DSMI > dsmo.env  
set | grep DSMO >> dsmo.env
```

- The node information on the ADSM server. To obtain this information, enter:  
query node <nodename> format=detail

### If ADSMConnect Agent Starts and a Problem is Encountered

If you start ADSMConnect Agent for Oracle Backup successfully and then encounter a problem, collect this information:

- A problem description file that includes the command you used and the session output you received when the problem occurred.
- The **EBU** log file records text if it detects an error. A return code of 12 means it noticed some problems with the Media layer.

**Note:** Future releases of **EBU** might show the actual return code from the Media layer rather than the number 12.

- **RMAN** logs the ADSMConnect Agent messages in **\$ORACLE\_HOME/rdbms/log/sbtio.log**.
- The ADSM API error log file (**dsierror.log**). The **DSMI\_LOG** environment variable determines the location of this file.
- The **EBU** trace file. The trace option in the **OBACKUP** script file determines the creation and location of this file. If possible, recreate the backup problem with the trace flag turned on. To start tracing, declare an environment variable **OBK\_DEVDBG**:  

```
export OBK_DEVDBG=0x80000409
```
- The ADSM server activity log. To obtain this information, enter this ADSM administrator command:  

```
query actlog
```

See *ADSTAR Distributed Storage Manager Using the Application Program Interface* for application client return codes.

---

## ADSM Service

If you need ADSM customer assistance, call this number: 1–800–237–5511. Inform the customer service representative of the following information to determine the problem:

- You are using the ADSMConnect Agent for Oracle Backup
- Your ADSM server operating system platform, version, and release
- Your ADSM server version and release. To determine this, enter the following command:  

```
q status
```
- Your ADSMConnect Agent operating system platform, version, and release
- Your ADSMConnect Agent version and release. You can locate this in the README file, or you can enter the **what libobk.a** command. Two strings are displayed with the ADSMConnect Agent library version number: information regarding the ADSM API and the ADSMConnect Agent.



---

## Chapter 5. Using the ADSM Central Scheduler Service to Automate Online Backups

This section shows an example on how to use the ADSM Central Scheduler Service with the Oracle Backup Agent to automate online backups of Oracle server databases. This example illustrates the use of the ADSM Version 3 central scheduler client. You can also use the ADSM Version 2 scheduler client as well.

For more information on using the scheduler, see *Using the UNIX Backup-Archive Clients*.

Once the Oracle Backup Agent has been registered to an ADSM server and installed on the Oracle server, the procedure involves the following steps:

1. **On the ADSM server:**
  - a. Define a schedule to execute an AIX command file in the policy domain to which the Oracle Backup Agent is registered.
  - b. Associate the Oracle Backup Agent node to the defined schedule.
2. **On the Oracle Server where the Oracle Backup Agent is installed:**
  - a. Create the **bkdb** script.
  - b. Start the scheduler.

---

## Example of Central Scheduler Service to Automate Backups

The example below uses the following assumptions:

- The Oracle Backup Agent is registered to an ADSM server with a node name of **rangoon** and a password of **rangoon** in policy domain **oracle**.
- The event to be scheduled is a daily backup of the online database. The backups are to begin between 9:00 and 9:15 pm.

This method is flexible because you can define a command file with any set of commands you choose.

### On the ADSM server:

1. Enter the following command to define the schedule. You can enter this command on the server console or from an administrative client. The administrative client does not have to be running on the same system as the ADSM server.

```
def sched oracle daily_orcbkup desc="07Daily Online DB Backup"
  action=command objects="/home/oracle/sched/bkdb"
  starttime=21:00 duration=15 duru=minutes period=1 perunits=day
  dayofweek=any
```

ADSM displays this message:

```
ANR2500I Schedule daily_orcbkup defined in policy domain oracle.
```

2. To associate the Oracle Backup Agent to this schedule, issue the following command:

```
define association oracle daily_orcbkup rangoon
```

ADSM displays this message:

```
ANR2510I Node rangoon associated with schedule orc_dailybkup
in policy domain oracle.
```

At this point, a schedule has been defined on the ADSM server that runs a command file that is called **/home/oracle/sched/bkdb**. The schedule starts around 9:00 pm. The schedule is re-executed once a day and can start on any day of the week.

**Note:** If you want to confirm that the schedule and association have been set correctly, you can use the **Query Schedule** and **Query Association** ADSM administrative commands.

### On the Oracle Server:

This example assumes that you have installed the ADSM client on the Oracle Server.

1. Create the **bkdb** script. An example of the script is shown below:

```
#!/bin/ksh
export ORACLE_HOME=/orc7/app/oracle/product/734
export OBK_HOME=/orc7/app/oracle/product/734/obackup
export ORACLE_SID=t1
export DSMO_NODE=pigeon_orc7
export DSMI_ORC_CONFIG=/orc7db/dbs/t1/svtscripts/dsm.opt
ebu /orc7db/dbs/t1/svtscripts/bkoff.scr
```

An example of the **bkoff.scr** file is shown below:

```
backup offline database
  db_name = "t1"
  parallel = 3
  trace = "/orc7db/dbs/t1/svtscripts/bkoff.a06-00.trace"
  log = "/orc7db/dbs/t1/svtsciipts/bkoff.a06-00.log"
```

2. Start the scheduler. Follow the steps below.

**Note:** Only the root user can restore the backups done by the scheduler.

- a. Login as the root user.
- b. Define the following environment variable:  
\$ export DSM\_CONFIG=/orc7db/dbs/t1/svtscripts/dsm.opt
- c. Issue the following command:  
dsmc sched



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## Chapter 6. API Return Codes

This section describes what the return codes mean, and how you, as an application developer, should deal with them.

In this section, the return codes are listed in numerical order. For each return code, the following information is given:

### return code number

This number corresponds to the number in the header file **dsmrc.h**.

### severity code

This letter is an indication of the severity of the situation that caused the return code to be generated. The possible severity codes and their meanings are:

- |          |   |
|----------|---|
| <b>S</b> | Severe error. Processing could not continue.  |
| <b>E</b> | Error. Processing could not continue.   |
| <b>W</b> | Warning. Processing can continue, but problems might develop later. You should be cautious. |
| <b>I</b> | Information. Processing continues. No user response necessary.                              |

### symbolic name

This name corresponds to the definition in the header file, **dsmrc.h**.

**Note:** You should always use the symbolic name for a return code in your application rather than the return code number.

### explanation

This field explains the circumstances under which this return code might be generated.

### system action

This field describes what action the ADSMConnect Agent is going to take in response to the return code.

### user response

This field explains what you should do in response to the system action.

**Note:** Many of the return codes describe errors that cause processing to stop. You might want to send a message to the end user that describes the problem and suggest some course of action. To identify different messages, you can use these return code values or develop your own numbering system.

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<b>2410 E</b>	<b>DSM_RC_ORC_INVALID_MODE</b> <b>Explanation:</b> Invalid mode passed by Oracle. <b>System Action:</b> The system returns to the calling procedure. <b>User Response:</b> Contact your system administrator.
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## 2411 E • 2419 E

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2411 E	<b>DSM_RC_ORC_NULL_FILENAME</b> <b>Explanation:</b> Null file name passed by Oracle. <b>System Action:</b> The system returns to the calling procedure. <b>User Response:</b> Contact your system administrator.
2412 E	<b>DSM_RC_ORC_WRONG_BLKSIZE</b> <b>Explanation:</b> Wrong data block size. <b>System Action:</b> The system returns to the calling procedure. <b>User Response:</b> Contact your system administrator.
2413 E	<b>DSM_RC_ORC_OBJ_EXISTS</b> <b>Explanation:</b> Backup or restore object already exists. <b>System Action:</b> The system returns to the calling procedure. <b>User Response:</b> If backing up an object, make sure you generate a unique object name.
2414 E	<b>DSM_RC_ORC_NOTSAME_HANDLE</b> <b>Explanation:</b> The handle passed from Oracle is not the same handle that ADSM passed back. <b>System Action:</b> The system returns to the calling procedure. <b>User Response:</b> Contact your system administrator.
2415 E	<b>DSM_RC_ORC_END_OF_FILE</b> <b>Explanation:</b> End of file reached. <b>System Action:</b> The system returns to the calling procedure. <b>User Response:</b> No action required.
2416 E	<b>DSM_RC_ORC_WRONG_RDSTATE</b> <b>Explanation:</b> The operation must be in <b>read</b> state. <b>System Action:</b> The system returns to the calling procedure. <b>User Response:</b> Contact IBM ADSM support.
2417 E	<b>DSM_RC_ORC_LOWER_APIVER</b> <b>Explanation:</b> The run time API is lower than the compile time API. <b>System Action:</b> The system returns to the calling procedure. <b>User Response:</b> Use the <b>what</b> command to find out the compile time API level. Obtain the same or higher level of the API library.
2418 E	<b>DSM_RC_ORC_WRONG_WRTSTATE</b> <b>Explanation:</b> The operation must be in <b>write</b> state. <b>System Action:</b> The system returns to the calling procedure. <b>User Response:</b> Contact IBM ADSM support.
2419 E	<b>DSM_RC_ORC_INVALID_FLAG</b> <b>Explanation:</b> Invalid flag passed from Oracle. <b>System Action:</b> The system returns to the calling procedure. <b>User Response:</b> Contact your system administrator.

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## Index

### A

ADSM scheduler, using 31  
ADSMConnect Agent  
    ADSM scheduler 31  
    before using 23  
    installing on AIX 3.2 5  
    installing on AIX 4.x 13  
    overview 3  
    return codes 35  
API return codes 35  
archive log files, using 26

### B

backups  
    automating 31  
    example of using Central Scheduler Service 32  
    removing for Oracle7 25  
    removing for Oracle8 25

### C

Central Scheduler Service  
    example of to automate backups 32  
    using to automate backups 31  
command  
    OBACKUP 23  
    scripts 23  
communication method supported  
    for installing on AIX 3.2 5  
    for installing on AIX 4.x 14

### D

dsm.opt file  
    modifying for HSM 27  
dsm.sys file  
    modifying for HSM 26  
dsmmigfs command, using 27

### E

EBU (Enterprise Backup Utility)  
    installing 11  
    supported 3

EBU (Enterprise Backup Utility) *(continued)*  
    using to remove old backups 25

Enterprise Backup Utility (EBU)  
    installing 11  
    supported 3  
    using to remove old backups 25  
environment variables  
    defining when installing on AIX 3.2 8  
    defining when installing on AIX 4.x 17  
    using with HSM 26  
example of  
    Central Scheduler Service to automate backups 32

### F

file systems, adding space management to 27

### H

HSM, using 26

### I

installing on AIX 3.2  
    ADSM files installed 8  
    communication methods supported 5  
    communications method supported 5  
    contents of the CD-ROM 6  
    defining environment variables 8  
    editing the client options file 10  
    initializing the password 10  
    installation considerations 5  
    installing EBU 11  
    operating system requirement 5  
    preparing for installation 5  
    procedure for 6  
    registering the workstation 10  
    space requirements 5  
    specifying the ADSM management class 10  
installing on AIX 4.x  
    ADSM API files 16  
    ADSMConnect Agent files 16  
    communications method supported 14  
    defining environment variables 17  
    editing the client options files 19  
    editing the client system options file 19

- installing on AIX 4.x (*continued*)
  - initializing the password 21
  - operating system requirement 14
  - procedure for AIX 4.1 14
  - procedure for AIX 4.2 and 4.3 15
  - registering your workstation 20
  - software support 14
  - space requirements 13
  - specifying the ADSM management class 19

## L

- log files, using 26

## M

- management class, when used 25

## O

- OBACKUP command
  - use of 23
- obkcatutl utility 25
- Oracle Backup Agent
  - ADSM service 29
  - before using 23
  - installing on AIX 3.2 5
  - installing on AIX 4.x 13
  - overview 3
  - reporting problems 28
  - return codes 35
  - using the scheduler to automate backups 31
- Oracle7
  - removing backups 25
  - using command scripts 23
- Oracle8
  - removing backups 25

## P

- password
  - initializing when installing on AIX 3.2 10
  - initializing when installing on AIX 4.x 21
- problems, reporting 28

## Q

- q status command, using 29

## R

- Recovery Manager (RMAN)
  - supported 3
  - using to remove old backups 25
  - using with Oracle Backup Agent 23
- reporting problems 28
- return codes 35
- RMAN (Recovery Manager)
  - supported 3
  - using to remove old backups 25
  - using with Oracle Backup Agent 23

## S

- scheduler, ADSM 31
- scripts, using 23
- service, ADSM 29
- Space Management feature, using 26
- space management, adding to file systems 27

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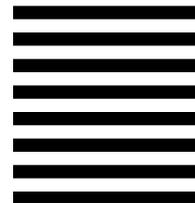
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