OnDemand for AIX

Installation and Configuration Guide

Version 2.2

G544-5280-01

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The OnDemand for AIX Product Team

Second Edition (September 1997)

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About this publication

This book provides information about installing and configuring IBM OnDemand for AIX Version 2.2 (OnDemand). You can use the information in this book when you initially set up an OnDemand system, to configure devices and install and configure software. The information in this book can also be used as a reference for an operational OnDemand system, for example, to add devices, install and configure optional software, and configure the database manager and storage manager.

Topic 1.0, “Installation checklist” on page 3 contains the list of tasks an installer typically completes when setting up OnDemand servers and OnDemand client software for the first time.

Topic 3.0, “Hardware and software requirements” on page 11 lists the basic hardware and software requirements for OnDemand servers and client PCs.

Who should use this publication

This book is of primary interest to people responsible for installing and configuring products. This book can also be used by other people in an organization responsible for planning and maintaining hardware, software, and applications. This book provides the information an installer needs to install and configure OnDemand and related software programs on the RS/6000 and client PCs, building the OnDemand operating environment. This book also contains information that can be used after the initial installation of OnDemand, for example, to add devices to the system, maintain databases, and configure components of the system, such as ADSM and DB2.

How this publication is organized

“Related Documentation,” beginning on page xx contains a list of documents that you might find helpful when working with OnDemand, AIX/6000, and other components of the system.

“Preparing the server,” beginning on page 17 describes the tasks you may need to perform to prepare the RS/6000 before installing and configuring OnDemand AIX server software.

“Installing OnDemand AIX server software,” beginning on page 33 provides instructions for installing OnDemand, DB2 for AIX, and ADSM software on the server.

“Configuring the server,” beginning on page 45 describes how to configure OnDemand AIX server and related software programs to operate in your environment.

Installing and configuring OnDemand client software is described beginning on page 155 (for the OS/2 client) and beginning on page 187 (for the Windows client).

"Post installation," beginning on page 227 describes how to verify the installation of your OnDemand system and includes tasks we recommend you complete before you allow production use of the system.

Related IBM products

PSF/MVS: MVS Download feature

The MVS Download feature selects output data sets from the JES spool and transfers the data using associated JCL parameters to an OnDemand server.

If you download data from an MVS system to an OnDemand server, refer to the *PSF/MVS: MVS Download Guide* for important information about the MVS Download feature, including instructions about how to install, configure, and operate the MVS Download feature on an MVS system.

Product support

The IBM Support Center maintains current information about IBM OnDemand for AIX, including program temporary fixes (PTFs).

Before you install OnDemand, contact the IBM Support Center or your IBM software service representative to obtain the latest maintenance level of OnDemand.

If problems occur when you run any of the OnDemand programs, you can call the IBM Support Center to obtain software problem and defect support. The phone number for the IBM Support Center is 1-800-237-5511. Please complete the following information before you call the IBM Support Center.

Problem Summary Form

IBM OnDemand for AIX Version 2.2
Product Number 5622–662

Background Information

Current Date and Time:
Problem Date and Time:
AIX/6000 Level:
AIX/6000 PTFs:

Problem Description

Data Captured
Include core dumps, error message numbers and text, list active processes, and so forth.

Our use of typefaces

Throughout this book, words and phrases appear in **Bold**, *Italic*, and other fonts. The following explains our convention when using these fonts.

Bold	Used for paragraphs that call attention to especially relevant information about a topic or command.
Italic	Used to emphasize concepts and terms.
`Monospace`	Indicates output of commands and programs in examples. Also used for information you are instructed to type.
UPPERCASE	Indicates parameter or command names.
“Quoted phrase”	Used for references to other parts of the book or other books.

Platform-specific conventions

We use the following AIX conventions in this book:

$	The prompt for the Bourne and Korn shells. All of the examples in this book assume you use one of these two shells.
#	The prompt for the *root* (or *superuser*) user.
****	The AIX command continuation character. The \ (backslash) tells AIX to continue reading the command from the next input line.

You will encounter the words *command* (or *menu*) interface, *command line*, *interactive*, and *prompt* in this book. A command or menu interface is a capability provided by AIX (with *SMIT*, for example) and DB2 for AIX to simplify routine administrative tasks. Most menu interfaces are shells that run the same commands that you would type at the command line. Typing at the command line is the process of interacting with the shell prompt. The shell interprets and executes the commands you type at the prompt.

There may be occasions when you find it necessary to make changes to AIX/6000, OnDemand, ADSM, DB2 for AIX, and other configuration files and scripts. Whenever you modify a file, first make a backup copy of the current “production” file. Edit the file with a text editor that does not substitute characters (for example, the blank and tab characters) and does not truncate lines. When in doubt, use the *vi* editor.

Related documentation

ADSTAR Distributed Storage Manager for AIX Version 2.1

ADSTAR Distributed Storage Manager for AIX (ADSM) provides optical and tape storage management for the data that you archive in OnDemand. The following publications contain information about or related to ADSM concepts, procedures, and commands. Refer to the *General Information* book for a complete list of ADSM publications.

General Information, GH35-0131

Administrator's Guide, SH35-0134
Administrator's Reference, SH35-0135
Messages, SH35-0133
Device Configuration, SH35-0137

AIX Version 4

The following publications contain information about or related to AIX Version 4 concepts and procedures:

AIX Version 4 Getting Started, SC23-2527
System User's Guide: Operating System and Devices, SC23-2544
System User's Guide: Communications and Networks, SC23-2545
System Management Guide: Operating System and Devices, SC23-2525
System Management Guide: Communications and Networks, SC23-2526
Guide to Printers and Printing, SC23-2783
Common Desktop Environment 1.0: User's Guide, SC23-2793
Common Desktop Environment 1.0: Advanced User's and System Administrator's Guide, SC23-2795
Messages Guide and Reference, SC23-2641
Performance Monitoring and Tuning Guide, SC23-2365
Problem Solving Guide and Reference, SC23-2606

DATABASE 2 for AIX Version 2

OnDemand stores index data and control information in DATABASE 2 for AIX (DB2 for AIX) database tables. The following publications contain information about DB2 for AIX. Refer to the *Information and Concepts Guide* for a complete list of DB2 for AIX publications.

Information and Concepts Guide, S20H-4664
DB2 for AIX Installation and Operation Guide, S20H-4757
Administration Guide, S20H-4580
Command Reference, S20H-4645
Messages Reference, S20H-4808
Problem Determination Guide, S20H-4779
Database System Monitor Guide and Reference, S20H-4871
SQL Reference, S20H-4665

MVS TCP/IP

The following publications contain information about TCP/IP in the MVS environment:

Planning and Customization, SC31-7134
Programmer's Reference, SC31-7135
Messages and Codes, SC31-7132

OnDemand Version 2.2

The following publications contain information about OnDemand Version 2.2:

Introduction and Planning Guide, G544-5281
Installation and Configuration Guide, G544-5280

Administrator's Reference, S544-5293
Indexing Reference, S544-5489
OS/2 Client User's Guide, S544-5278
Windows Client User's Guide, S544-5275
Getting Started with the User Interface for Windows NT and Windows 95, S544-5469
Getting Started with the Administrator Interface for Windows NT and Windows 95, S544-5463

Print Services Facility for AIX

OnDemand uses Print Services Facility for AIX (PSF for AIX) to provide server-based print management. The following publications contain information about PSF for AIX. Refer to the *Print Administration* book for a complete list of PSF for AIX publications.

Facts About PSF for AIX, G544-5305
Print Administration, S544-3817
Print Submission, S544-3878

Print Services Facility for MVS

OnDemand uses the MVS Download feature of Print Services Facility for MVS (PSF/MVS) to support automatic transmission of datasets from the MVS/JES spool to a RS/6000. The following publications contain information about PSF/MVS:

MVS Download Guide, G544-5294
System Programming Guide, S544-3672
Application Programming Guide, S544-3673
Messages and Codes, S544-3675

RS/6000

The following publication contains information about the hardware of the RS/6000:

Getting Started: Using RS/6000, GC23-2377

Transmission Control Protocol/Internet Protocol

The following publications contain information about Transmission Control Protocol/Internet Protocol (TCP/IP). OnDemand requires and uses TCP/IP for communications between servers, clients, MVS systems, and remote devices.

IBM TCP/IP: Introduction, GC31-6080
IBM TCP/IP: Tutorial and Technical Reference, GG24-3376
Internetworking with TCP/IP Volume I: Principles, Protocols, and Architecture, Douglas E. Comer, Prentice Hall, Englewood Cliffs, New Jersey, 1991.
Internetworking with TCP/IP Volume II: Implementation and Internals, Douglas E. Comer, Prentice Hall, Englewood Cliffs, New Jersey, 1991.
Networking Personal Computers with TCP/IP, Craig Hunt, O'Reilly & Associates, Inc., 1995.

Things we changed for Release 2.2

Revisions to the technical content of this book have been made with the use of revision bars to mark the changes.

Revisions to the editorial content of this book have been made without the use of revision bars to mark the changes.

Changes to the technical content

Description	Page
Updated the OnDemand publication list.	xxi
Added a description of changes to this publication.	xxiii
Additions and updates to the installation checklist.	3
Miscellaneous updates to backup files.	7
Administrator interface now runs only under Windows NT and Windows 95.	13
Added register license information for OnDemand.	15
Added server license to list of ADSM software components to install.	37
Added 32-bit client install component to OnDemand server software installation.	39
Removed register license information for DB2; with DB2 for AIX Version 2.1.1 or later, this is done by the installation program.	47
Updated linking database user exit program with information about using ADSM to manage DB2 log files.	49
Deleted the loadpkx command. No longer required for ADSM.	65
Added command to save ADSM server activity log records.	66
Use element address not connection address when labeling optical storage volumes in ADSM.	70
Moved Implementing a Copy Storage Pool from the Administrator's Reference to this book.	75
Added chapter about configuring ADSM to manage DB2 archived log files and backup image files.	85
Added information about license management, table space migration, importing tables, and using ADSM to manage archived log files to the ars.cfg configuration file.	93
Added license information for OnDemand library server.	93
Added note about ars.cfg file and SP nodes.	95
Added database manager environment variables.	98
Moved Configuring the System Log User Exit from the Administrator's Reference to this book.	111

Description	Page
Added description of the System Log table.	112
Updated database table space filesystem information.	119
Changed AIX initialization to support using ADSM to manage DB2 log files and backup image files.	125
Removed information about backing up cache file systems. Refer to Backup and Recovery in the Administrator's Reference for details. Also added restrictions about scheduling maintenance processes.	133
Changed the database backup command information to include table space backups and managing backup images with ADSM.	135
Changed LAN printer to server printer and changed device from 4028 to 4019.	140
Updated instructions for adding a local print queue.	142
Updated instructions for adding a remote print queue.	142
Updated configuring PSF queue device with new SMIT command.	146
Removed references to the Makefile for the FAX user exit. We do not supply a Makefile.	153
Updated the OS/2 client installation overview.	157
Updated the OS/2 client installation.	159
Updated installing OS/2 client software on a network.	167
Updated how to create an OS/2 client setup diskette.	169
Added how to create and use a response file to install OS/2 clients.	171
Listed DBCS files supplied for mapping fonts for the OS/2 client.	174
Updated the Windows client installation overview.	189
Updated the Windows client installation.	193
Changed base software requirement for administrator interface.	201
Updated installing Windows client software on a network	203
Updated how to create a Windows client setup diskette.	205
Added how to create and use a response file to install Windows 16-bit client software.	207
Added how to create and use a response file to install Windows 32-bit client software.	209
Listed DBCS files supplied for mapping fonts for the Windows client.	214
Updated post installation section to include defining storage nodes to ADSM and configuring the system log and system migration application groups to support table spaces.	227

	Description	Page
	Moved Defining Storage Nodes to ADSM from the Administrator's Reference to this book.	231

Before you begin

This section of the book contains important information that we recommend you review and verify before installing and configuring your OnDemand system, reinstalling OnDemand software, upgrading to a new version of OnDemand, or applying maintenance to OnDemand software.

- Installation checklist
- Configuration files
- Hardware and software requirements
- License software information

1.0 Installation checklist

For a typical OnDemand installation, the following list of tasks must be performed.

- ☐ Contact the IBM Support Center for the latest maintenance levels of AIX/6000, DB2 for AIX, ADSM, and OnDemand.
- ☐ Obtain a copy of the OnDemand README file. Read the entire file before you begin.
- ☐ Check the OnDemand prerequisites (refer to page 11).
- ☐ Obtain license information for program products (beginning on page 15).
- ☐ Verify the RS/6000 hardware configuration (beginning on page 19).
- ☐ Verify the AIX/6000 software level (beginning on page 21).
- ☐ Configure magnetic storage devices, including defining database filesystems, cache filesystems, and a work space filesystem (beginning on page 25).
- ☐ Configure TCP/IP (beginning on page 31).
- ☐ Save copies of OnDemand configuration and shell script files, if you are reinstalling or upgrading to a new version of OnDemand (beginning on page 7).
- ☐ Install DB2 for AIX (beginning on page 35).
- ☐ Install ADSM to maintain reports on archive media or manage DB2 archived log files and backup image files (beginning on page 37). Before you install and configure ADSM, obtain a copy of the ADSM README file. Read the entire file before you begin.
- ☐ Install OnDemand server software (beginning on page 39).
- ☐ Install PSF for AIX to support server-based print or FAX. (beginning on page 41).
- ☐ Configure DB2 for AIX (beginning on page 47).
- ☐ If you installed ADSM to maintain reports on archive media or manage DB2 archived log files and backup image files, configure ADSM (beginning on page 51).
- ☐ If you installed ADSM to maintain reports on archive media or manage DB2 archived log files and backup image files, configure archive media (beginning on page 52).

- ☐ If you installed ADSM to maintain reports on archive media or manage DB2 archived log files and backup image files, label, check-in, and initialize storage volumes (beginning on page 69).
- ☐ If you installed ADSM and you want OnDemand to automatically create a backup copy of reports stored on archive media, configure ADSM to do so (beginning on page 75).
- ☐ If you plan to use ADSM to manage DB2 archived log files and backup image files, configure ADSM to do so (beginning on page 85).
- ☐ Verify the OnDemand server configuration file (beginning on page 93).
- ☐ Link the OnDemand server program (beginning on page 103).
- ☐ Create the OnDemand database (beginning on page 105).
- ☐ Create the system logging facility (beginning on page 109).
- ☐ If you plan to generate reports or statistics using log records generated by OnDemand, you must enable system and application group logging and create a system log user exit program (refer to page 111).
- ☐ Create the system migration facility (beginning on page 115).
- ☐ Backup the database (beginning on page 117).
- ☐ Add database filesystems, to increase the size of the base database filesystem or to define table space filesystems to OnDemand (beginning on page 119).
- ☐ Define cache filesystems to OnDemand (beginning on page 123).
- ☐ Define AIX *init* entries for server programs (beginning on page 125).
- ☐ Define AIX *init* entries for data downloading, indexing, and loading (beginning on page 129).
- ☐ Define AIX *crontab* entries for maintenance programs (beginning on page 133).
- ☐ If you installed PSF for AIX to provide server-based print, configure PSF for AIX and define printers for OnDemand (beginning on page 139).
- ☐ If you installed PSF for AIX to provide server-based FAX, configure the OnDemand FAX solution (beginning on page 143).

Complete the following list of tasks to install OnDemand OS/2 client software on a PC.

- ☐ Check the prerequisites and verify the PC hardware and software level (refer to page 12).
- ☐ Install the OS/2 client software (beginning on page 159).
- ☐ If you are using fonts that are not defined to OnDemand, if you have modified AFP fonts, or if you have created your own AFP fonts, you must define the fonts, code pages, and character set files to OnDemand (beginning on page 173).

Complete the following list of tasks to install OnDemand Windows client software on a PC.

- ☐ Check the prerequisites and verify the PC hardware and software level (refer to page 13).
- ☐ Install the Windows client software, including at least one copy of the administrator interface (beginning on page 187).
- ☐ If you are using fonts that are not defined to OnDemand, if you have modified AFP fonts, or if you have created your own AFP fonts, you must define the fonts, code pages, and character set files to OnDemand (beginning on page 213).

Complete the following list of tasks to support MVS Download.

- ☐ Check the prerequisites and verify the MVS, PSF/MVS, and TCP/IP software levels for the MVS Download feature (refer to page 11).
- ☐ Install and configure the MVS Download feature (refer to the *PSF/MVS: MVS Download Guide* on the MVS system.
- ☐ Set up the arsjesd command to receive datasets and store them in file systems on the RS/6000 (refer to page 129).

Verify the installation of OnDemand (refer to page 229).

- ☐ After installing and configuring OnDemand software on the RS/6000, **restart the system**. AIX reinitializes and starts the server daemon, DB2 for AIX, ADSM, and other processes that you defined when you configured OnDemand. Then log on to the library server with an OnDemand client program to verify the installation.

Define storage nodes to ADSM (refer to page 231).

- ☐ Before you can copy data or reports to archive media, you must define storage nodes to ADSM. This includes data, such as the system log data and system migration data and reports that you store in OnDemand.

Define storage sets (refer to page 235).

- ☐ Before you define reports or load data into an application group, you must define storage sets. You must define a storage set that writes data to archive media for the system-related application groups.

Configure the System Log application group (refer to page 237).

- ☐ Before you define OnDemand objects, load data, or let users access the system, update the System Log application group so that OnDemand maintains data written to the system logging facility for the life of your OnDemand system. Also, if you define table space file systems to OnDemand, update the System Log application group to store index data in table spaces.

Configure the System Migration application group (refer to page 241).

- ☐ If you plan to maintain index data on archive media, you must assign the System Migration application group to a storage set that writes data to archive media. Also, if you define table space file systems to OnDemand, update the System Migration application group to store index data in table spaces.

2.0 Configuration and shell script files

When you install the OnDemand server software, the installation program copies program, configuration, and script files from the distribution media to directories on the RS/6000. When you configure an OnDemand server to meet the specific requirements of your environment, you make changes to several OnDemand scripts and database configuration files and you may customize application and font initialization files.

Before you apply maintenance to, reinstall, or upgrade to a new version of OnDemand server software, save a copy of the files listed in the following tables in a temporary directory, such as */arstmp*.

Table 1 (Page 1 of 2). Configuration and Shell Script Files

File	Location	Purpose
ars_adsm	/usr/lpp/ars/bin	Script file that can be used to perform general purpose ADSM functions. Changes described in topic 14.6, "Verify and configure the ars_adsm shell script" on page 64.
ars_db	/usr/lpp/ars/bin	Script file that can be used to perform general purpose DB2 for AIX functions. Changes described in topic 19.1, "Verify and modify database environment variables" on page 105.
ars_load	/usr/lpp/ars/bin	Script file used to index and load data on a server. Changes described in topic "Verify ars_load shell script" on page 130.
ars.cache	/usr/lpp/ars/config	Cache file systems defined to OnDemand. Changes described in topic 25.0, "Defining cache file systems" on page 123.
ars.cfg	/usr/lpp/ars/config	OnDemand configuration file. Changes described in topic 17.0, "Verify the OnDemand server configuration file" on page 93.
ars.dbfs	/usr/lpp/ars/config	Database file systems defined to OnDemand. Changes described in topic 24.0, "Defining table space filesystems" on page 119.
arslog	/usr/lpp/ars/bin	System log user exit program. Described in topic 21.0, "Configuring the system log user exit" on page 111.
archive.mac	/usr/lpp/ars/config	Commands used to initialize ADSM, including definitions about storage libraries and drives, devices, and storage pools.
history.dev	/usr/lpp/adsmserv	Device history file.
history.vol	/usr/lpp/adsmserv	Storage volume history file.
dsmserv.opt	/usr/lpp/adsmserv/bin	System options file for the ADSM server.
dsm.sys	/usr/lpp/adsm/bin	System options file for the ADSM administrative client program.

Table 1 (Page 2 of 2). Configuration and Shell Script Files

File	Location	Purpose
dsm.opt	/usr/lpp/adsm/bin	Server options for the ADSM administrative client program.

If you added user-defined code pages for OS/2 clients, save copies of the files listed in Table 2. The location shows the default installation directory. Adding code page files for the OS/2 client is described in topic 38.0, “Mapping AFP fonts” on page 173.

Table 2. User-Defined Code Page Files

File	Location	Purpose
ICODED.FNT	\ARSOS2\FONT	Coded Font file. Contains the list of coded font files used by the OS/2 client program.
CSDEF2.FNT	\ARSOS2\FONT	Character Set Definition file. Contains the list of character sets used by the OS/2 client program.
CPDEF2.FNT	\ARSOS2\FONT	Code Page Definition file. Contains the list of code page files used by the OS/2 client program.
***.CP2	\ARSOS2\FONT\MAPS	Code Page Map file. Any user-defined OS/2 code page map file added to OnDemand.
ALIAS2.FNT	\ARSOS2\FONT	The Alias file. Used to map AFP fonts to Type 1 fonts.

If you added user-defined code pages for Windows clients, save copies of the files listed in Table 3. The location shows the default installation directory for the Windows 3.1. The default directory for the Windows NT and Windows 95 client is ARS32. Adding code page files for the Windows client is described in topic 48.0, “Mapping AFP fonts” on page 213.

Table 3. User-Defined Code Page Files

File	Location	Purpose
ICODED.FNT	\ARS\FONT	Coded Font file. Contains the list of coded font files used by the Windows client program.
CSDEF.FNT	\ARS\FONT	Character Set Definition file. Contains the list of character sets used by the OnDemand Windows client program.
CPDEF.FNT	\ARS\FONT	Code Page Definition file. Contains the list of code page files used by the Windows client program.
***.CP	\ARS\FONT\MAPS	Code Page Map file. Any user-defined Windows code page map file added to OnDemand.
ALIAS.FNT	\ARS\FONT	The Alias file. Used to map AFP fonts to Type 1 or Truetype fonts.

Restoring saved files

After you reinstall the OnDemand server software, you must configure the installed files for your environment. Restore the files that you saved or make changes to copies of

the installed files, using the configuration information in the files that you saved as a guide.

3.0 Hardware and software requirements

3.1 Server hardware requirements

The exact RS/6000 configuration that you need to support your OnDemand for AIX server depends on the volume of data being managed and the number of concurrent users. The RS/6000 processor family supports a wide range of configurations, with the high-end capable of supporting two gigabytes of memory, 800 gigabytes of DASD, and over two terabytes of optical storage from a single RS/6000 processor.

The minimum configuration for an OnDemand server requires the following:

- RISC System/6000 Model F40.
- A minimum of 128 megabytes of memory.
- Token Ring or Ethernet network adapter.
- Magnetic and optical storage for the OnDemand database and archived report files. A minimum of eight gigabytes of space and two separate disks are required.
- A CD-ROM drive for system installation.
- An 8mm tape drive, automated tape library, or optical library for data backup and recovery. A five gigabyte, 8mm tape drive is recommended for a small system configuration. An automated tape library or dedicated optical library is recommended for medium and large system configurations. The *Introduction and Planning Guide* provides details about system configurations.

Optical and tape storage

If you plan to use ADSM to maintain files on optical and tape storage volumes, consult the documentation provided with ADSM for a list of the devices supported by the ADSM server. Table 4 lists the optical libraries manufactured by IBM and supported by ADSM.

Table 4. Optical Libraries

Device	Drives	Storage Cells	Unformatted Capacity	SCSI IDs Required
IBM 3995-C60	1, 5.25 inch	20	52 GB	2
IBM 3995-C62	2, 5.25 inch	52	135 GB	3
IBM 3995-C64	2, 5.25 inch	104	270 GB	3
IBM 3995-C66	4, 5.25 inch	156	405 GB	5
IBM 3995-C68	4, 5.25 inch	258	671 GB	5

Since OnDemand compresses report files before placing them on storage volumes, you can obtain greater storage capacities than the values listed in the table. For example, if you use an IBM 3995-C68 to store files and OnDemand can achieve a compression ratio of 5:1, you can store two terabytes of data, online, in one library.

ADSM also supports optical libraries from Hewlett-Packard, ATG Cygnet, Kodak, DISC, and Phillips/LMS, tape libraries from IBM and StorageTek, and many other storage devices.

3.2 Server software requirements

An OnDemand server requires the following AIX software:

- AIX/6000 Version 4.1.4 or later.
- TCP/IP, which is standard with AIX.
- DATABASE 2 for AIX Version 2.1.1 or later. To use the Database Director tool, you must have AIXWindows and Motif installed on your system.
- ADSTAR Distributed Storage Manager for AIX Version 2.1 or later with the appropriate optical or tape device support modules and the AIX Administrative Client, to support optical and tape storage management. We recommend that you purchase an ADSM license for 10 concurrent users; you may require additional user licenses, depending on the number of storage nodes that you define to ADSM.
- PSF for AIX Version 2.1 or later, to provide support for server-based printing and FAX.

3.3 PSF/MVS: MVS Download feature software requirements

- IBM TCP/IP for MVS Version 3.1 or later.
- PSF/MVS Version 2.2 or later.
- PSF/MVS: MVS Download feature.

3.4 OS/2 client requirements

The OnDemand OS/2 client runs under IBM OS/2 Version 3.0 or later and IBM OS/2 Warp Connect and requires the following hardware and software:

- Physical connection to the network, such as a Token Ring or Ethernet network adapter.
- A minimum of 16 megabytes of memory.
- An 80386 or faster processor; an 80486 processor is recommended when viewing AFP or image documents.
- A super-VGA display and adapter with a minimum resolution of 800x600 is recommended.
- A minimum of 50 megabytes of free hard disk space.
- For OS/2 Version 3.0 or later, the IBM OS/2 TCP/IP Version 2.0 Base kit is required.
- For OS/2 Warp Connect, the standard Warp Connect TCP/IP support is required.

3.5 Windows client requirements

The OnDemand Windows client runs under Microsoft Windows 3.1 or later, Windows NT 4.0, and Windows 95 and requires the following hardware and software:

- Physical connection to the network, such as a Token Ring or Ethernet network adapter.
- A minimum of 12 megabytes of memory.
- An 80386 or faster processor; an 80486 processor is recommended when viewing AFP or image documents.
- A super-VGA display and adapter with a minimum resolution of 800x600 is recommended.
- A minimum of 50 megabytes of free hard disk space.
- For Windows 3.1 or later, a Windows-compatible TCP/IP socket program, such as the IBM TCP/IP for DOS Version 2.1.1 or later.

  Note: Other TCP/IP packages compatible with the Windows sockets API may also be supported. Contact your IBM representative for the latest information about other TCP/IP packages.
- For Windows NT 4.0 and Windows 95, the standard TCP/IP support is required.

OnDemand does not provide ATM for Windows NT Version 4.0 or later. If you require ATM to display Adobe Type 1 fonts in a document or use ATM for other purposes, you must purchase a license from Adobe.

3.6 Administrator interface requirements

The OnDemand administrator interface runs under Microsoft Windows NT 4.0 and Windows 95 and requires the following hardware and software:

- Physical connection to the network, such as a Token Ring or Ethernet network adapter.
- A minimum of 16 megabytes of memory.
- An 80386 or faster processor; an 80486 processor is recommended.
- VGA display and adapter.
- A minimum of 18 MB of free hard disk space.
- The standard Windows NT or Windows 95 TCP/IP support is required.

3.7 OS/2 client setup program requirements

The OnDemand OS/2 client setup program runs under IBM OS/2 Version 3.0 or later and IBM OS/2 Warp Connect and requires the same basic hardware and software as the OS/2 client (refer to 3.4, “OS/2 client requirements” on page 12), except as noted below:

- VGA display and adapter.
- Up to 50 MB of free hard disk space, depending on the setup options selected.

3.8 Windows client setup program requirements

The OnDemand Windows client setup program runs under Microsoft Windows 3.1 or later and requires the same basic hardware and software as the Windows client (refer to 3.5, “Windows client requirements” on page 13), except as noted below:

- VGA display and adapter.
- Up to 50 MB of free hard disk space, depending on the setup options selected.

3.9 Administrator interface setup program requirements

The OnDemand administrator interface setup program runs under Microsoft Windows NT 4.0 and Windows 95 and requires the same basic hardware and software as the administrator interface (refer to 3.6, “Administrator interface requirements” on page 13), except as noted below:

- Up to 50 MB of free hard disk space, depending on the setup options selected.

4.0 Obtaining software license information

Certain program products that you install on an RS/6000 require license passwords. For example, DB2 for AIX and ADSM require license passwords. During installation of each product, we explain how to register the license information. Before installing these products, you must obtain the license information from IBM.

If you ordered and received a version of OnDemand on CD-ROM and you plan to use iFOR/LS to manage the product licenses, IBM provided the license information in the CD-ROM container case and the license software on the CD-ROM. If you have questions about the license information or software, contact IBM at 1-800-446-8989.

If you ordered and received a version of DB2 on CD-ROM, IBM provided concurrent node lock license information in the CD-ROM container case. If you have questions about the license information, contact IBM at 1-800-446-8989.

If you ordered and received ADSM, IBM provided the license information with the product package. You must register a license password for one or more client nodes, the Unix environment, and one or more device support modules. If you have questions about the license information, contact IBM at 1-800-446-8989.

If you did not receive license information from IBM or have questions about the license keys or concurrent use information, you can call the IBM Key Generation at 1-800-446-8989. Representatives staff the center, Monday through Friday, between the hours of 6 a.m. and 6 p.m. MST. Before you call IBM, you must have a customer number, the program ID, and the system ID of the RS/6000 where you intend to install the products. The program ID for OnDemand Version 2.2 is 5622-662. The program ID for DB2 for AIX Version 2.1 is 5871-AAA. The program ID for ADSM Version 2.1 is 5765-564. You can use the *uname* command to obtain the system ID of the RS/6000. The following example shows how to obtain the system ID of the RS/6000 with the *uname* command. Login to AIX and type the following command at the prompt:

```
uname -m
```

After you type the command and press Enter, AIX displays the system ID, for example, `00202805200`.

Preparing the OnDemand server

This section of the book describes the steps needed to prepare the RS/6000 before you install the OnDemand server software:

- Verify the RS/6000 configuration, including optical and tape storage devices.
- Verify the AIX/6000 system software and environment.
- Configure the physical volumes and create the volume groups and file systems where you intend to install and configure OnDemand and related software programs and store databases and log files.
- Verify the TCP/IP network configuration.

5.0 Verifying RS/6000 hardware

5.1 Verify the hardware configuration

An IBM customer engineer probably installed the RS/6000 hardware that supports OnDemand, including internal adapters and devices, such as magnetic storage, network adapters, and external devices, such as 8mm tape drives, optical storage libraries, and CD-ROM drives.

Check the system configuration to ensure that it contains the minimum devices required by OnDemand. You can use the *lscfg* command to list the system configuration information. The following example shows a typical configuration reported by the *lscfg* command.

```
INSTALLED RESOURCE LIST
The following resources are installed on the machine.

+ fd0              00-00-0D-0,0      Diskette Drive
+ scsi0            00-00-0S          Standard SCSI I/O Controller
+ hdisk0           00-00-0S-0,0      2.5 GB SCSI Disk Drive
+ hdisk1           00-00-0S-1,0      2.5 GB SCSI Disk Drive
+ hdisk2           00-00-0S-2,0      2.5 GB SCSI Disk Drive
+ hdisk3           00-00-0S-3,0      2.5 GB SCSI Disk Drive
+ rmt0             00-00-0S-5,0      5.0 GB 8mm Tape Drive
+ tok0             00-02             Token-Ring High-Performance Adapter
+ mem0             00-0A             128 MB Memory Card
+ mem1             00-0B             32 MB Memory SIMM
+ sa0              00-00-S1          Standard I/O Serial Port 1
+ tty0             00-00-S1-0,0      Asynchronous Terminal
+ scsi2            00-05             SCSI I/O Controller
+ ibmjb0           00-05-00-6,0      Optical Jukebox
+ mo1              00-05-00-1,0      Optical Drive
+ mo2              00-05-00-3,0      Optical Drive
```

5.2 Verifying optical devices

If you plan to store report files and resources on optical storage devices, you must define and configure the optical libraries and optical drives attached to the system to ADSM.

Listing optical device information

You can use the *lsdev* command to the list the optical devices attached to the system For example:

```
lsdev -Cs scsi -H
```

The *lsdev* command lists the optical devices. For example:

```
Device Name         Location          Description

+ ibmjb0            00-05-00-6,0      Optical Jukebox
+ mo1               00-05-00-1,0      Optical Disk Drive
+ mo2               00-05-00-3,0      Optical Disk Drive
```

Figure 1. Listing Optical Devices

If the *lsdev* command does not list all of the optical devices attached to the system, do not be alarmed. This probably means that optical device drivers are not loaded on the system. And, depending on the device, the *lsdev* command may not list an optical library.

Recording optical device information

Complete Table 5 for each optical library that you want to define to ADSM. You will need this information when you configure optical devices for ADSM (see topic 14.1, “Define and configure storage devices” on page 52). Please see the *ADSM Device Configuration* publication for details about how to understand the use of SCSI library devices and how to configure SCSI devices.

Using the information listed by the *lsdev* command, record the SCSI adapter and connection address of each optical device. In Figure 1, the SCSI adapter of the optical library is `00-05` and the connection address for the optical library is `6,0`.

Table 5. Configure Optical Devices Worksheet

Component	SCSI Adapter	Connection Address	Element
Library			n/a
Drive 1			1
Drive 2			2
Drive 3			3
Drive 4			4

6.0 Verifying AIX/6000 base system software

6.1 Verify installed software

A typical RS/6000 that supports an OnDemand server includes the following AIX software:

- AIX Base Operating System. You can check the version of the operating system with the *oslevel* command.
- Transmission Control Protocol/Internet Protocol (TCP/IP)
- Unicode base converters for AIX code sets and fonts. While we recommend that you install the entire `iconv` subset, at a minimum, you must install the `bos.iconv.ucs.com` converter.
- Device drivers and diagnostic software
- Messages. One or more language filesets may be installed.
- System Management Interface Tool (SMIT)
- AIXwindows Environment/6000 and Motif. Required for the DB2 for AIX Database Director tool. Also eases the installation, configuration, and maintenance process.
- InfoExplorer Hypertext Information and Help Text

You can use SMIT to generate a list of the software installed on the system.

1. Login to AIX as the *root* user.
2. Type the following command at the prompt:

```
smitty lslpp_installed
```

3. SMIT displays the List the Installed Software panel. Press **Enter**.
4. SMIT generates a list of the software installed on the RS/6000. Review the list of installed software to verify that the minimum components exist on the system.

6.2 Verify base file systems

Check the base operating system file systems and mount points and to make sure there is enough free space on the appropriate file systems to support your OnDemand server environment. For example:

- You will install OnDemand and related software programs in the */usr* file system. Depending on the options you select, you will require a minimum of 250 MB of free space in the */usr* file system.
- During configuration of OnDemand, you will add files and directories to the */home* file system, that require approximately 1 MB of free space.

- OnDemand uses the */tmp* file system to store temporary files. You should make sure that at least 32 MB of free space is available.
- Other programs that may run in your OnDemand environment may use the */var* file system to store temporary files. You should make sure that at least 32 MB of free space is available.
- If you plan to use ADSM to provide optical storage management and you plan to create backup images of the ADSM database on disk, you must provide sufficient free space for one or more image files. Each file requires approximately 500 KB of free space.

You can use the *df* command to display file systems. The following example shows a list of file systems and directories reported by the *df* command.

```
Filesystem    Total KB    free %used   iused %iused Mounted on
/dev/hd4          8192    2408   70%     854    41% /
/dev/hd9var       4096    3336   18%      99     9% /var
/dev/hd2        389120    9292   97%   24136    24% /usr
/dev/hd3          6384     676   90%     103    21% /tmp
/dev/hd1          4096    3928    4%      19     1% /home
```

Figure 2. AIX File Systems

You can use SMIT to increase the size of a file system. Using Figure 2 as an example, we will increase the size of the */tmp* file system.

1. Login to AIX as the *root* user.
2. Verify that the *root* volume group contains enough free space to support the new allocation of the */tmp* file system. You can use the *smitty lsvg* command to list the contents of the *root* volume group. Make sure that the number of FREE PPs supports the space requirement.
3. Change the size of the */tmp* file system. Type the following command at the prompt:

```
smitty chjfs
```

4. SMIT displays the File System Name panel. Select **/tmp** and press **Enter**.
5. SMIT displays the Change/Show Characteristics of a Journaled File System panel. In the SIZE of file system (in 512-byte blocks) field, type the total number of 512 byte blocks that you want AIX to allocate to the */tmp* file system. In our example, we will increase the size to 64000 (sixty-four thousand) blocks, to provide free space for the temporary files required by OnDemand.
6. Press **Enter**. SMIT increases the size of the file system.
7. Press **F10** to exit SMIT.

6.3 Verify paging space

An OnDemand server can support hundreds of concurrent users and processes. Doing so requires adequate system resources, such as paging space. Allocating sufficient paging space, in multiple paging areas on different disk drives and controllers, can improve the overall performance of the system.

At a minimum, AIX requires paging space equal to two times the amount of memory (RAM) installed on the system. For example, on a RS/6000 with 128 MB of RAM, you should allocate a minimum of 256 MB of paging space.

You can use the *lsps* command to display the characteristics of the system paging spaces. For example, entering the following command:

```
lsps -a
```

Displays a system paging space report similar to the following:

```
Page Space  Physical Volume   Volume Group    Size   %Used  Active  Auto  Type
paging00    hdisk1            arsvg          128MB      19     yes   yes    lv
hd6         hdisk0            rootvg         128MB      24     yes   yes    lv
```

The example lists two paging spaces, each with 128 MB of space, for a total of 256 MB of paging space.

Increasing paging space

You can use SMIT to increase the system paging spaces.

1. Login to AIX as the *root* user.
2. Verify that the volume group where you plan to increase the paging space contains enough free space to support the new allocation. You can use the *smitty lsvg* command to list the contents of the volume group. Make sure that the number of FREE PPs supports the space requirement.

   Note: If the volume group does not contain enough free space, you must add a paging space.
3. Increase the system paging spaces. Type the following command at the prompt:

```
smitty pgsp
```

4. SMIT displays the Paging Space panel.
   - To increase the size of a paging space, select **Change/Show Characteristics of a Paging Space**.

In the NUMBER of additional logical partitions field, type the number of additional logical partitions that you want to allocate to the paging space. Press **Enter** to increase the size of the paging space.

- To add a paging space, select **Add Another Paging Space**.

  Note: The volume group where you plan to add the paging space must exist before you can add the paging space. Please refer to “Create volume groups” on page 27 for details about creating a volume group.

  Select the name of the volume group where you want to add the paging space. In the SIZE of paging space (in logical partitions) field, type the number of additional logical partitions that you want to allocate to the paging space. Set the Start using this paging space NOW? and Use this paging space each time the system is restarted? fields to **Yes**. Press **Enter** to add the paging space.

7.0 Defining and configuring storage volumes and file systems

7.1 Overview

Estimating storage requirements

Before you begin defining applications to OnDemand and storing data in application groups, it is important to estimate the data storage requirements of your applications. Estimating Application Storage Requirements, in the *Introduction and Planning Guide* contains information that can help you estimate storage requirements for the data that you plan to archive in OnDemand.

Configuring a storage subsystem

After you estimate the storage requirements for your applications, you can configure the magnetic storage devices installed on the RS/6000 to support the storage required by OnDemand programs, data download and indexing, databases, log files, and cache storage. Depending on the type of applications that you define to OnDemand and the number and size of the report files that you plan to archive in OnDemand, you may need to configure the magnetic storage devices into volume groups and logical volumes and assign logical volumes to specific physical volumes. Configuring storage devices in this way allows you to extend volume groups and logical volumes as your storage needs grow and configure volume groups for high availability and maximum performance. Planning a Storage Subsystem, in the *Introduction and Planning Guide* contains recommendations about how to configure physical devices to support OnDemand.

Logical Volumes and File Systems in the *AIX System Management Guide: Operating System and Devices* publication provides important concepts about logical volumes and file systems and describes how to manage devices and file systems. If you are not familiar with volume groups, logical volumes, and file systems, we recommend that you review the material in your AIX documentation before you continue.

7.2 Setting up storage devices

The following topics provide examples of the commands that you can use to set up a storage system that supports OnDemand. Please see System Management Interface Tool, in the *AIX System Management Guide: Operating System and Devices* for an overview of SMIT and information about the types of device management tasks you can perform with SMIT. Please see Online Information and Help in the *AIX System User's Guide* for an overview of InfoExplorer and instructions about how to display online information about device management tasks and commands. Table 6 on page 26 lists the limitations for AIX storage management.

Table 6. Limitations for AIX Storage Management

Component	AIX 4.1
Physical volume	32 per volume group
Volume group	255 per system
Physical partition	1016 per physical volume; up to 256MB each in size
Note: The maximum number of physical partitions that you can define for a physical volume depends on the capacity of the device and the physical partition size. For example, you can define 536, 8 MB physical partitions for a 4.5 GB disk, reserving one physical partition for the *jfslog*.	
Logical volume	256 per volume group; up to 64 GB each in size
Logical partition	35512 per volume group with no mirroring
Filesystem	Up to 64 GB in size
File	Up to 2 GB in size

Prepare storage devices

A storage device must be designated as a physical volume and be put into an available state before it can be assigned to a volume group.

Use the *smitty disk* command to designate a storage device as a physical volume. Please see Logical Volumes in the *AIX System Management Guide: Operating System and Devices* publication for details about how to set up storage devices and physical volumes.

Note: If the storage devices attached to the system have already been designated as physical volumes, skip this section and continue with “Create volume groups” on page 27.

Complete the following steps to designate a storage device as a physical volume:

1. Login to AIX as the *root* user.
2. Enter the following command at the prompt:

```
smitty disk
```

   SMIT displays the Fixed Disk panel.

3. Select **Add a Disk** and press **Enter**. SMIT displays the Disk Type panel.
4. Select the type of disk drive, for example, `2000mb SCSI 2.0 GB SCSI Disk Drive`.
5. Press **Enter**. SMIT displays the Parent Adapter panel.
6. Select the SCSI adapter where the disk is attached.
7. Press **Enter**. SMIT displays the Add a Disk panel.
8. Enter the CONNECTION address.

9. Press **Enter**. SMIT adds the disk.
10. Press **F10** to exit SMIT.

Create volume groups

We recommend that you create at least one volume group, the *ars* volume group. Depending on the number of storage volumes that you need to configure, you may want to create volume groups for each of the major OnDemand storage subsystems. For example, a volume group for cache storage, a volume group for the OnDemand database, and so forth. Please refer to Planning a Storage Subsystem in the *Introduction and Planning Guide* for information about OnDemand storage requirements and recommendations about volume groups.

Use the *smitty vg* command to add a volume group. Please see Logical Volumes in the *AIX System Management Guide: Operating System and Devices* publication for details about how to set up volume groups.

Complete the following steps to create a volume group:

1. Login to AIX as the *root* user.
2. Enter the following command at the prompt:

```
smitty mkvg
```

   SMIT displays the Add a Volume Group panel.

3. Type the VOLUME GROUP name. For example, **arsvg**.
4. Verify the Physical Partition SIZE in megabytes. When the volume group contains physical disks of 1 to 2.5 GB in size, set this value to 4. When the volume group contains physical disks of 4 GB in size, set this value to 8. When the volume group contains physical disks greater than 4 GB in size, set this value to 32.
5. Optionally assign one or more physical volumes to the volume group. A physical volume can belong to only one volume group.
6. Set Activate volume group AUTOMATICALLY at System Restart to **yes**.
7. Press **Enter**. SMIT adds the volume group.
8. Press **F10** to exit SMIT.

Create logical volumes

We recommend that you create logical volumes for each component of the OnDemand storage subsystems that you plan to implement on a server. For example:

- OnDemand database, on the library server
- DB2 for AIX active log files, on the library server
- DB2 for AIX archive log files, on the library server
- Data downloading and indexing

- Cache storage
- ADSM database
- ADSM recovery log.

Please refer to Planning a Storage Subsystem in the *Introduction and Planning Guide* for information about OnDemand storage requirements and recommendations about logical volumes.

We strongly recommend that you assign a different physical volume to each logical volume associated with the OnDemand database. That way, if one of the disks that contains database information becomes damaged, only one logical volume is affected, which can simplify recovery of the database. If you do not assign a specific physical volume to a logical volume, SMIT randomly allocates space for the logical volume on one or more of the physical volumes assigned to the volume group.

Use the *smitty mklv* command to add logical volumes to a volume group and optionally assign logical volumes to specific physical volumes. Please see Logical Volumes in the *AIX System Management Guide: Operating System and Devices* publication for details about how to set up logical volumes.

Complete the following steps to create a logical volume:

1. Login to AIX as the *root* user.
2. Enter the following command at the prompt:

```
smitty mklv
```

   SMIT displays the Add a Logical Volume panel.

3. Type the VOLUME GROUP name. For example, **arsvg**.
4. Press **Enter**. SMIT displays the Add a Logical Volume panel.
5. Type the Logical Volume NAME. For example, **primloglv**.
6. Type the Number of Logical PARTITIONS. This is the number of 4 (or 8 or 32) MB partitions that you want to allocate to the logical volume. For example, if you plan to allocate 40, 4 MB primary log files, you need to allocate a minimum of 160 MB for the primary log logical volume.
7. Optionally assign the logical volume to a specific physical volume.
8. Press **Enter**. SMIT adds the logical volume.
9. Press **F10** to exit SMIT.

Define file systems

The final step in preparing storage devices is to define journaled file systems for the logical volumes that you defined in “Create logical volumes” on page 27. Depending on the configuration of the OnDemand server, you may need to create file systems for

data loading and indexing, the document cache, and the OnDemand database and DB2 for AIX log files.

Note: Do not create file systems for the logical volumes that support the ADSM database and recovery log.

Please refer to Planning a Storage Subsystem in the *Introduction and Planning Guide* for information about OnDemand storage requirements and recommendations about file systems.

Use the *smitty crfs* command to add a journaled file system on a previously defined logical volume. Please see Logical Volumes in the *AIX System Management Guide: Operating System and Devices* publication for details about how to set up file systems.

Complete the following steps to create a file system:

1. Login to AIX as the *root* user.
2. Enter the following command at the prompt:

```
smitty crjfslv
```

   SMIT displays the Add a Journaled File System on a Previously Defined Logical Volume panel.

3. Type the LOGICAL VOLUME Name. For example, **primloglv**. You can create one file system per logical volume.
4. Type the MOUNT POINT. This is the name of the file system. For example, **/arsdb_primarylog**.
5. Set Mount AUTOMATICALLY at system restart to **yes**.
6. Press **Enter**. SMIT adds the file system.
7. Press **F10** to exit SMIT.

Add paging space to OnDemand volume groups

If the system requires additional paging space (please refer to topic 6.3, “Verify paging space” on page 23), you can add paging spaces to the volume groups that you created for OnDemand. Please refer to “Increasing paging space” on page 23 for details about how to increase the system paging spaces.

Activate volume groups, logical volumes, and file systems

At this point, we recommend that you activate the volume groups, logical volumes, and file systems that you created.

- Use the *varyonvg* command to activate a volume group.
- Use the *mount* command to activate a logical volume and file system.

8.0 Setting TCP/IP options

8.1 Verify TCP/IP hardware and software

OnDemand uses the TCP/IP network protocol to communicate with client PCs and MVS systems. You must configure TCP/IP and the OnDemand TCP/IP hosts (servers and clients) that use the network. The following sections provide information about how to configure TCP/IP on a RS/6000 that supports an OnDemand server.

Before configuring TCP/IP, complete the following tasks:

- Verify connection of the network adapter card to the network.
- Verify installation of TCP/IP software on the RS/6000.

8.2 Configure TCP/IP

1. Login to AIX as the *root* user.
2. Type the following command at the prompt.

```
smitty tcpip
```

   SMIT displays the TCP/IP panel.

3. Select Minimum Configuration and press **Enter**. SMIT displays the Available Network Interfaces panel.
4. Select the network interface (adapter) installed on the RS/6000. For example, Token Ring Interface. Press **F7** to select the adapter. Then press **Enter**. SMIT displays the Minimum Configuration and Startup menu.
5. Set the TCP/IP values for the RS/6000.

   Required fields:

Field	Example
HOSTNAME	potomac
Internet ADDRESS	192.9.9.1
Network INTERFACE	tr0
RING Speed	16

   Optional fields:

Field	Example
Network MASK	255.255.255.0
NAMESERVER Internet ADDRESS	192.9.9.19
NAMESERVER DOMAIN Name	rocky.company.com
Default GATEWAY Address	192.9.9.29

6. When you have finished setting the required and optional values, press **Enter** to configure TCP/IP.
7. Press **F10** to exit SMIT.

8.3 Register the TCP/IP port address of the RS/6000

Register the TCP/IP port address of the RS/6000. The port address is where OnDemand monitors for client programs connecting to the server.

1. Login to AIX as the *root* user.
2. Type the following command at the prompt.

```
smitty tcpip
```

   SMIT displays the TCP/IP panel.

3. Select Further Configuration and press **Enter**.
4. Select Client Network Services and press **Enter**.
5. Select Services (/etc/services) and press **Enter**. SMIT displays the Services (/etc/services) panel.
6. Select Add a Service and press **Enter**.
7. In the Official Internet SERVICE Name field, type **ondemand** (in lowercase letters).
8. In the Socket PORT Number field, type **1445**.
9. When you have finished setting the values, press **Enter** to add the service.
10. Press **F10** to exit SMIT.

Installing software on the OnDemand server

This section of the book contains instructions for installing the product software required by OnDemand. The required software includes the OnDemand product files and DB2 for AIX. This section also describes how to install certain optional software, such as ADSM, to maintain reports stored on archive media or manage DB2 archived log files and backup image files, and PSF for AIX, which is required, if you plan to use the OnDemand server-based print or FAX functions.

When you install IBM product files, the installation program copies files into default directories. We recommend that you do not change the names of the files or directories. Changing the names may cause difficulties at a later time when, for example, you may need to apply maintenance or upgrade to a new release of a product.

Note: The typical OnDemand system includes ADSM to manage archive media. If you plan to use another product to provide archive media management, you must obtain installation instructions from the product vendor and detail information about how to configure the product for use with OnDemand.

9.0 Installing DB2 for AIX

OnDemand stores report file index data and control information in DB2 tables on the library server. OnDemand requires approximately 46 MB of free space in the */usr* file system to install the required DB2 for AIX options.

Note: If you are already using DB2 for AIX, skip this section and continue installation and configuration of OnDemand with topic 10.0, "Installing ADSM" on page 37.

If you are installing software on an object server, skip this section. Install DB2 for AIX only on the library server.

Complete the following steps to install the DB2 for AIX product files on the RS/6000 that supports the OnDemand library server.

Note: This chapter explains how to install DB2 for AIX Version 2.1. If you plan to install a different DB2 product, use the installation guide provided with the product instead of the instructions in this chapter.

1. Insert the DB2 for AIX program CD-ROM into the drive.
2. Login to AIX as the *root* user.
3. Install the DB2 for AIX product files using SMIT. Type the following command at the prompt.

```
smitty install_latest
```

   SMIT displays the Install Software at Latest Available Level panel.

4. Press **F4** to list the install devices in the INPUT device/directory for software field. Select the CD-ROM drive, for example, **/dev/cd0**, and press **Enter**.
5. Press **F4** in the Software to Install field to list the software products on the CD-ROM. The minimum required options are:
   - DB2 Client Application Enabler (client)
   - DB2 Command Line Processor (clp)
   - DB2 Communication Support - Base with TCP/IP (cs.rte)
   - DB2 Database Director (dd)
   - DB2 Executables (db2.rte)
   - DB2 Utilities and Samples (db2.misc)
6. Select the options to install by placing the cursor on a option and pressing **F7**.
7. Press **Enter** after selecting the required options.
8. Move to the COMMIT software updates entry field. Press the Tab key to change the field to **no**.

Note: It is not necessary to commit the software; you can install and use the software without committing it. This simplifies maintenance and makes adding new options easier.

9. Move to the SAVE replaced files? field. Press the Tab key to change the field to **yes**.

   Note: You must choose yes for this field because you are not committing the software. Incompatible parameter selections may cause the installation program to fail.

10. Press **Enter**.
11. Press **Enter** to confirm your choice.

    The installation program displays status messages and copyright information. When the installation program completes, it displays an “installation successful” message.

12. Press **F10** to exit SMIT. Remove the program CD-ROM from the drive.

10.0 Installing ADSM

OnDemand can use ADSM to provide optical and tape storage management for reports, resources, and DB2 archived log files and backup image files. OnDemand requires 50 MB of free space in the */usr* file system to install the required ADSM options.

Note: If you do not plan to use ADSM to provide storage management for OnDemand, skip this section and continue with topic 11.0, “Installing OnDemand for AIX” on page 39.

If you are already using ADSM on the server, skip this section and continue with topic 11.0, “Installing OnDemand for AIX” on page 39.

Complete the following steps to install the ADSM product files on a RS/6000 that supports an OnDemand object server.

Note: This chapter explains how to install ADSM Version 2.1. If you plan to install a different ADSM product, use the installation guide provided with the product instead of the instructions in this chapter.

1. Insert the ADSM program CD-ROM into the drive.
2. Login to AIX as the *root* user.
3. Install the ADSM product files using SMIT. Type the following command at the prompt:

```
smitty install_latest
```

   SMIT displays the Install Software at Latest Available Level panel.

4. Press **F4** to list the install devices in the INPUT device/directory for software field. Select the CD-ROM drive, for example, **/dev/cd0**, and press **Enter**.
5. Press **F4** in the Software to Install field to display the software components on the CD-ROM. You must install the following options:

   - ADSM Administrator GUI client (adsm.admin)
   - ADSM API (adsm.api)
   - ADSM Backup/Archive client (adsm.base)
   - ADSM Common files (adsm.common)
   - ADSM Server (adsmserv.base)
   - ADSM Server License (adsm.license)

6. Select the options to install by placing the cursor on an option and pressing **F7**.
7. Press **Enter** after selecting the required options.

8. Move to the COMMIT software updates entry field. Press the Tab key to change the field to **no**.

   Note: It is not necessary to commit the software; you can install and use the software without committing it. This simplifies maintenance and makes adding new options easier.

9. Move to the SAVE replaced files? entry field. Press the Tab key to change the field to **yes**.

   Note: You must choose yes for this field because you are not committing the software. Incompatible parameter selections may cause the installation program to fail.

10. Press **Enter**.
11. Press **Enter** to confirm your choice.

    The installation program displays status messages and copyright information. When the installation program completes, it displays an “installation successful” message.

12. Press **F10** to exit SMIT. Remove the program CD-ROM from the drive.

11.0 Installing OnDemand for AIX

Complete the following steps to install the OnDemand product files on a RS/6000 that supports an OnDemand server. OnDemand requires approximately 200 MB of free space in the */usr* file system to install the software, depending on the options that you select.

1. Insert the OnDemand program CD-ROM into the drive.
2. Login to AIX as the *root* user.
3. Install the OnDemand product files using SMIT. Type the following command at the prompt.

```
smitty install_latest
```

   SMIT displays the Install Software at Latest Available Level panel.

4. Press **F4** to list the install devices in the INPUT device/directory for software field. Select the CD-ROM drive, for example, **/dev/cd0**, and press **Enter**.
5. Press **F4** in the Software to Install field to display the software components on the CD-ROM.

   You must install the OnDemand server option (ars.server) on each server. The server option includes the enhanced ACIF (ars.acif) option, to index files on the RS/6000.

   Optionally install one or more of the client options:

   - ars.client.os2
   - ars.client.win31
   - ars.client.win32

   You must install the client options on at least one server.

   SMIT places the OnDemand client program files in a file system on the RS/6000. You must install the files on a PC, before you can access OnDemand.
6. Select the options to install by placing the cursor on a package and pressing **F7**.
7. Press **Enter** after you have selected the required options.
8. Move to the COMMIT software updates entry field. Press the Tab key to change the field to **no**.

   Note: It is not necessary to commit the software; you can install and use the software without committing it. This simplifies maintenance and makes adding new options easier.
9. Move the cursor to the SAVE replaced files? entry field. Press the Tab key to change the field to **yes**.

Note: You must choose yes for this field because you are not committing the software. Incompatible parameter selections may cause the installation program to fail.

10. Press **Enter**.
11. Press **Enter** to confirm your choice.

    The installation program displays status messages and copyright information. When the installation program completes, it displays an “installation successful” message.
12. Press **F10** to exit SMIT. Remove the program CD-ROM from the drive.

12.0 Installing PSF for AIX

OnDemand uses PSF for AIX on the library server to provide server-based print and FAX support for client programs. PSF for AIX supports a variety of print and FAX devices, including channel, parallel, and serial attached printers and print and FAX devices attached to remote systems communicating via TCP/IP. OnDemand can require up to 80 MB of free space in the */usr* file system to install the required PSF for AIX options.

Note: If you are installing software on an object server, skip this section. Install PSF for AIX only on the library server.

If you do not plan to provide server-based print or FAX support on the library server, skip this section and continue with “Configuring the OnDemand server” on page 45.

If you are already using PSF for AIX on the library server, verify the packages required to support OnDemand server-based print and FAX, listed in Table 7 on page 42. If you installed the full PSF for AIX product, you can skip this section and continue with “Configuring the OnDemand server” on page 45.

This chapter provides general instructions about installing PSF for AIX. For detailed information about installing PSF for AIX, refer to *IBM AIX PSF for AIX Print Administration*

Complete the following steps to install the PSF for AIX software on the RS/6000 where you installed the OnDemand library server.

1. Insert the PSF for AIX program CD-ROM into the drive.
2. Login to AIX as the *root* user.
3. Install the PSF for AIX product files using SMIT. Type the following command at the prompt.

```
smitty install_latest
```

   SMIT displays the Install Software at Latest Available Level panel.

4. Press **F4** to list the install devices in the INPUT device/directory for software field. Select the CD-ROM drive, for example, **/dev/cd0**, and press **Enter**.
5. Press **F4** in the Software to Install field to display the software components on the CD-ROM.
   - You must install the **psf.base** component.
   - If you plan to print or FAX line data, you must install the **psf.acif** component.
   - If you plan to create your own user exit programs, you must install the **psf.exits** component.

- Table 7 on page 42 lists some of the additional PSF for AIX components that may be required, depending on your print and FAX requirements. You may or may not need to install the components listed in the table or you may need to install components not listed in the table, depending on the fonts required to reprint or FAX files that you store in OnDemand. Please refer to Installing PSF for AIX in the *IBM AIX PSF for AIX Print Administration* book for a complete list of the packages provided with PSF for AIX, including code pages and fonts.

Table 7. Optional PSF for AIX Packages

PSF for AIX Package	Purpose
psf.fnt.codepage	Printing AFP or line data that use IBM AFP fonts or AFP data that use IBM Compatibility fonts on 240-pel or 300-pel printers.
psf.fnt.compats.codefont	Printing AFP data that use IBM Compatibility fonts on 240-pel or 300-pel printers.
psf.fnt.compats.fonts240	Printing AFP data that use IBM Compatibility fonts on 240-pel printers.
psf.fnt.compats.fonts300	Printing AFP data that use IBM Compatibility fonts on 300-pel printers.
psf.fnt.latin1.codefont	Printing AFP or line data that use IBM fonts on 240-pel or 300-pel printers.
psf.fnt.latin1.fonts240	Printing AFP or line data that use IBM fonts on 240-pel printers.
psf.fnt.latin1.fonts300	Printing AFP or line data that use IBM fonts on 300-pel printers.

6. Select the packages to install by placing the cursor on a package and pressing **F7**.
7. Press **Enter** after selecting the required packages.
8. Move to the COMMIT software updates entry field. Press the Tab key to change the field to **no**.

   Note: It is not necessary to commit the software; you can install and use the software without committing it. This simplifies maintenance and makes adding new options easier.
9. Move to the SAVE replaced files? entry field. Press the Tab key to change the field to **yes**.

   Note: You must choose yes for this field because you are not committing the software. Incompatible parameter selections may cause the installation program to fail.
10. Press **Enter**.
11. Press **Enter** to confirm your choice.

The installation program displays status messages and copyright information. When the installation program completes, it displays an “installation successful” message.

12. Press **F10** to exit SMIT. Remove the program CD-ROM from the drive.

Configuring the OnDemand server

This section of the book provides a guide to configuring OnDemand programs and control files, setting up the OnDemand database, and modifying AIX control files to support OnDemand.

Configuration tasks include the following:

- Configure DB2 for AIX.
- Configure ADSM to maintain reports on archive media.
- Configure ADSM to automatically maintain a backup copy of reports stored on archive media.
- Configure ADSM to manage DB2 archived log files and backup image files.
- Verify the OnDemand server configuration file.
- Link the OnDemand server programs.
- Create and initialize the OnDemand database.
- Create the system logging facility.
- Configure the system log user exit.
- Create the system migration facility.
- Backup the OnDemand database.
- Add table space filesystems.
- Notify OnDemand about file systems available for cache storage.
- Modify AIX control files to automatically start OnDemand, DB2 for AIX, and ADSM during AIX system initialization.
- Automate the data download, index, and load programs.
- Set up OnDemand maintenance programs to run automatically, on a regular schedule.
- Optionally set up server-based printing using PSF for AIX.
- Optionally set up server-based FAX using PSF for AIX.

Note: The typical OnDemand system includes ADSM to provide storage management for archive media. If you plan to use another product to perform archive media management, you must obtain detail information from the product vendor about how to configure the product for use with OnDemand.

13.0 Configuring DB2 for AIX

Note: This chapter explains how to configure DB2 for AIX Version 2.1. If you plan to configure a different DB2 product, use the installation and configuration guide provided with the product instead of the instructions in this chapter.

Complete the following tasks to configure the DB2 for AIX software on the OnDemand library server:

1. Create an instance of the DB2 for AIX program.
2. Create links to */usr/lib* and */usr/include*.
3. Create a link to the OnDemand database user exit program.

13.1 Create an instance of DB2 for AIX

Overview

To create an instance of DB2 for AIX, first login to AIX as the *root* user. Then use SMIT to create the DB2 for AIX owner group and user. Set the password for the user. Finally, run the *db2icrt* command to create the instance owner. The following topics provide additional information:

- Create the sysadm1 group
- Create the archive user
- Set the password for the archive user
- Run the db2icrt command

Note: If you operate the Network Information Service (NIS, also known as Yellow Pages or YP) , you probably want to create the *sysadm1* group and the *archive* user on the NIS master server, not on the RS/6000 where you plan to install OnDemand. Check with your AIX system administrator before you begin. Refer to “Network Information Service” in the *AIX System Management Guide: Communications and Networks* publication for information about NIS, including how to maintain users and groups.

If you are installing OnDemand on an SP node, the node must have authority to update the global groups and users files. Otherwise, you must add the DB2 for AIX owner group and user from the SP control workstation (CWS).

Create the sysadm1 group

1. Enter **smitty mkgroup** at the prompt. SMIT displays the Add Group panel.
2. Type **sysadm1** in the Group Name field.
3. Add the *root* user to the USER list field.
4. Set the ADMINISTRATIVE group? field to **True**.

5. Press **Enter** to create the *sysadm1* group.
6. Press **F10** to exit SMIT.

Create the archive user

1. Enter **smitty mkuser** at the prompt. SMIT displays the Add a User panel.
2. Type the following values for the *archive* user:

Table 8. Defining the Archive User

Field	Value
User Name	archive
PRIMARY Group	sysadm1
HOME Directory	/u/archive
Group Set	sysadm1
Initial PROGRAM	/bin/ksh
Max FILE Size	4194302

3. Press **Enter** to create the *archive* user.
4. Press **F10** to exit SMIT.

The value of 4194302 for the Max FILE Size is the maximum size of a file that the *archive* user can create, in 512 byte blocks. This allows the *archive* user to create files up to 2 GB in size.

Set the password for the archive user

This is an optional step; OnDemand does not require a password for the *archive* user. However, if your operating procedures require that you assign a password to all AIX users, complete the following steps.

1. Enter **smitty passwd** at the prompt. SMIT displays the Change a User's Password panel.
2. Type **archive** in the User Name field.
3. The system prompts you to type the new password. Type the password at the prompt.
4. Press **Enter** to set the password.
5. Press **F10** to exit SMIT.

Run the db2icrt command

To set up the *archive* user as the DB2 for AIX instance owner, enter the following commands at the AIX prompt.

```
cd /usr/lpp/db2_02_01/instance
./db2icrt archive
```

The *db2icrt* command creates an *sqllib* directory in the instance owner's home directory and places several files in the directory.

13.2 Create file links

The *db2ln* command creates links for the database libraries and include files. Once you create these links, you don't have to specify the full path to the DB2 for AIX product libraries and include files.

To create the file links:

1. Login to AIX as the *root* user.
2. Enter the following command at the prompt:

```
/usr/lpp/db2_02_01/cfg/db2ln
```

13.3 Create a link to the database user exit program

The *db2uexit* program copies online archived log files from the primary log file directory to either the archive log file directory or ADSM-managed storage (depending on whether you use ADSM to manage log files). An archived log file becomes *offline* when it is no longer stored in the primary log file directory. After creating a backup image of the database, the ars_db command deletes the offline archived log files, if you maintain the files on disk (if ADSM maintains the log files, the policy domain determines when the offline archived log files are deleted). Refer to topic 16.0, “Using ADSM to manage DB2 files” on page 85 for information about configuring ADSM to manage DB2 log files.

The software installation program copies the *db2uexit* program to the */usr/lpp/ars/config* directory. You must identify how log files are managed and create a link to the appropriate program from the DB2 for AIX instance owner's program (executable) directory.

1. Login to AIX as the *root* user.
2. Change to the */home/archive/sqllib/bin* directory.
3. Create a link to the *db2uexit* program. Choose the appropriate link command:
   - If you maintain archived log files on disk, create a link to the db2uexit.disk program:

```
ln -s /usr/lpp/ars/config/db2uexit.disk db2uexit
```

- If you use ADSM to manage archived log files, create a link to the db2uexit.adsm program:

```
ln -s /usr/lpp/ars/config/db2uexit.adsm db2uexit
```

  You must configure ADSM to manage DB2 log files. Configuration includes defining a storage library to hold the log files, initializing storage volumes, and defining a policy domain to maintain the files. Refer to topic 16.0, “Using ADSM to manage DB2 files” on page 85 for details.

Note: If the *db2uexit* program encounters errors when copying log files, it creates the *db2uexit.err* file. If this file exists, it means that you did not set up the log file directories correctly or there is insufficient space available in the filesystem to hold the offline archived log files. Refer to topic 19.2, “Set access to database directories” on page 107 for details. The directory where the *db2uexit* program stores the error file is determined by the ARS_TMP variable in the *ars.cfg* file. The default setting is the */arstmp* directory. Refer to 17.5, “Verify and modify temporary data filesystem setting” on page 97 for details.

14.0 Configuring ADSM

This chapter provides information about how to configure ADSM Version 2.1 to maintain reports on archive media. If you installed a different ADSM product, use the administrator's guide provided with the product instead of the information in this chapter.

If you do not plan to store reports on archive media, skip this section and continue with topic 16.0, “Using ADSM to manage DB2 files” on page 85.

Complete the following tasks to configure ADSM on an OnDemand server:

1. Define storage devices.
2. Define logical volumes.
3. Verify and modify storage management file.
4. Verify and modify client and server files.
5. Define administrative users.
6. Verify and configure ars_adsm shell script.
7. Create a link to the ADSM API.
8. Initialize storage volumes.
9. Register administrative users and software license.
10. Start ADSM.
11. Verify installation of the ADSM database and recovery log.
12. Delete default storage pools.
13. Process storage manager configuration files.
14. Label storage volumes.
15. Check in storage volumes.
16. Define initial storage volumes.
17. Backup the database and save critical files.

Note: Before configuring ADSM, we recommend that you review “OnDemand and ADSM” in the *Introduction and Planning Guide* and have a copy of the *ADSM Administrator's Reference* available. If you have questions about configuring ADSM, including how to define devices to ADSM and storage management policies for OnDemand, we recommend that you ask your ADSM administrator or contact the IBM support center.

14.1 Define and configure storage devices

This topic explains how to define and configure storage devices for use by ADSM.

Before you define optical devices to ADSM, make sure that the devices are not configured for diagnostics (refer to topic 5.2, “Verifying optical devices” on page 19). Complete Table 5 on page 20 for each optical library that you want to define to ADSM.

ADSM Version 2.1.0.3 or later is required, if you are configuring an IBM 3995 optical library that contains half-height drives or an optical library that reads and writes WORM optical platters.

The *ADSM: Device Configuration* publication provides details about how to configure device drivers for use by ADSM, how to understand and consider the use of SCSI library devices, and how to configure SCSI devices.

Define an optical library

If you plan to use ADSM to manage files in an optical library, you must define and configure the library. When you define an optical library, SMIT automatically configures the library.

1. Type **smitty adsm_devices** and press **Enter**. SMIT displays the ADSM Devices panel.
2. Select **Library/MediumChanger** and press **Enter**. SMIT displays the Library/MediumChanger panel.
3. Select **Add a Library/MediumChanger** and press **Enter**. SMIT displays the Library/MediumChanger Type panel.
4. Select **ADSM-SCSI-LB** and press **Enter**. SMIT displays the Parent Adapter panel.
5. Select the SCSI adapter where the optical library is attached and press **Enter**. SMIT displays the Add a Library/MediumChanger Type panel.
6. Enter the CONNECTION Address. For example, the connection address for a 3995 optical library is usually `6,0`.

   Refer to the documentation provided by the optical library manufacturer for information about the connection address.
7. Press **Enter**. SMIT adds the optical jukebox.
8. Select and add all the optical libraries.
9. Press **F10** to exit SMIT.

Define optical drives with SMIT

If you plan to use ADSM to manage files in an optical library, you must define and configure the drives in the library. When you define an optical drive, SMIT automatically configures the drive.

1. Type **smitty adsm_devices** and press **Enter**. SMIT displays the ADSM Devices panel.

2. Select **Optical R/W Disk Drive** and press **Enter**. SMIT displays the Optical R/W Disk Drive panel.
3. Select **Add a Optical Disk Drive** and press **Enter**. SMIT displays the Optical Drive Drive Type panel.
4. Select **ADSM-SCSI-OP** and press **Enter**. SMIT displays the Parent Adapter panel.
5. Select the SCSI adapter where the optical drive is attached and press **Enter**. SMIT displays the Add a Optical Disk Drive panel.
6. Enter the CONNECTION Address. For example, the connection address for the first drive in a 3995 optical library is usually `1,0`. The connection address for the second drive in a 3995 optical library is usually `2,0`. The connection address for the third drive in a 3995 optical library is usually `3,0`. The connection address for the fourth drive in a 3995 optical library is usually `4,0`.

   Refer to the documentation provided by the optical library manufacturer for information about the connection address.
7. Press **Enter**. SMIT adds the optical drive.
8. Select and add all the optical drives.
9. Press **F10** to exit SMIT.

Define a tape backup device with SMIT

If you plan to create a backup copy of the ADSM database on tape, you must define a tape backup device. When you define a tape backup device, SMIT automatically configures the drive.

1. Type **smitty adsm_devices** and press **Enter**. SMIT displays the ADSM Devices panel.
2. Select **Tape Drive** and press **Enter**. SMIT displays the Tape Drive panel.
3. Select **Add a Tape Drive** and press **Enter**. SMIT displays a list of tape drive types.
4. Select the tape device type that you want to configure and press **Enter**. For example, **ADSM-SCSI-MT**. SMIT displays the Parent Adapter panel.
5. Select the SCSI adapter where the tape device is attached and press **Enter**. SMIT displays the Add a Tape Drive panel.
6. Enter the CONNECTION Address, for example `5,0`, and press **Enter**. SMIT adds the tape device.
7. Press **F10** to exit SMIT.

14.2 Define logical volumes

Note: Do not define logical volumes, if you are upgrading from an earlier version of ADSM and have already allocated logical volumes for the database and recovery log.

If you created logical volumes for the database and recovery log in “Create logical volumes” on page 27, skip this step and continue with topic 14.3, “Verify and modify ADSM storage management file” on page 54.

ADSM uses AIX logical volumes rather than files for the ADSM database and recovery log to provide enhanced performance. Logical volumes provide ADSM access to low level device operations when reading and writing data. You must create logical volumes for the recovery log and the ADSM database.

Complete the following steps to define logical volumes for ADSM:

1. Login to AIX as the *root* user.
2. Define logical volumes using SMIT. Enter the following command at the prompt:

```
smitty mklv
```

   SMIT displays the Add a Logical Volume panel.

3. Press **F4** in the Volume Group Name field to display the logical volumes available on the RS/6000.
4. Select the name of the volume group. This is the volume group where you want to assign the logical volume. For example, **arsvg** or **adsmvg**. Refer to “Create volume groups” on page 27 for details about creating OnDemand volume groups.
5. Press **Enter**. SMIT displays the Add a Logical Volume panel.
6. Type the Logical Volume NAME. We recommend that you name the logical volume for the database **dsmdblv**. We recommend that you name the logical volume for the recovery log **dsmloglv**.
7. Type the Number of LOGICAL PARTITIONS.

   We recommend that you allocate 400, 4 MB logical partitions for the database and 40, 4 MB logical partitions for the recovery log. These values result in an initial allocation of approximately 1.6 GB for the database and 160 MB for the recovery log. The *ADSM Administrator's Reference* provides details about allocating space for the database and recovery log.
8. Press **Enter**. SMIT adds the logical volume.
9. After you define both logical volumes, press **F10** to exit SMIT.

14.3 Verify and modify ADSM storage management file

OnDemand provides a set of sample definitions that you can use to define storage libraries, storage devices, storage pools, policy domains, and the database backup device to ADSM. The sample definitions are contained in the archive.mac file in the */usr/lpp/ars/config* directory. You must verify and, if necessary, change statements in or add statements to the file to support your ADSM storage environment. After starting

and initializing the ADSM, you will process the file to define the libraries, devices, and storage management policies for OnDemand to the ADSM server.

To change the file, login to AIX as the *root* user and edit a copy of the file using a standard text editor. You can copy the installed file to *archive.mac.orig* and then edit the archive.mac file.

Note: Whenever you modify a file, first make a backup copy of the current "production" file. Edit the file with a text editor that does not substitute characters (for example, the blank and tab characters) and does not truncate lines. When in doubt, use the *vi* editor.

Verify the ADSM server name

Before you process the archive.mac file, you must verify the name of the ADSM server that is set in the file. By default, the name of the server is `ARCHIVE`.

Locate the following statement in the file:

```
set servername ARCHIVE
```

If necessary, change the name of the server to match the name of your ADSM server. The name that you specify must be the same as the name of the server that you specify in the *dsm.sys* and *dsm.opt* files (refer to topic 14.4, "Verify and modify ADSM client and server files" on page 60).

Define a storage library to ADSM

If you configured an optical or tape library on the system, you must define the storage library to ADSM. When you define a storage library to ADSM, you define a device class for the library, define the library and the drives contained in the library, and define a storage pool for the library.

The steps in this section describe how to define a single library to ADSM. You can copy and change the statements in the file, if you need to define more than one library to ADSM.

For more information about commands used to define storage libraries to ADSM, please refer to the *ADSM: Administrator's Reference*

1. Change the DEFINE LIBRARY statement to support the optical or tape library that you configured on the system.

```
def library archlib0 libtype=scsi device=/dev/lb0
```

   The string `archlib0` is an arbitrary name that you assign to the library. Make sure that the name is not already defined to ADSM. Replace the string `lb0` with the

device name that SMIT created when you configured the library (refer to “Define an optical library” on page 52).

2. Change the DEFINE DRIVE statements to support the disk drives in the library that you configured on the system. The following example shows how to define the drives in a library that contains four drives, such as an IBM 3995-C68 optical storage library. The 3995-C68 uses elements numbers 1 through 4 for the optical drives.

```
def drive archlib0 optdrv0 device=/dev/rop0 element=1
def drive archlib0 optdrv1 device=/dev/rop1 element=2
def drive archlib0 optdrv2 device=/dev/rop2 element=3
def drive archlib0 optdrv3 device=/dev/rop3 element=4
```

   The string `archlib0` is the library that you created in step 1 on page 55. The strings `optdrv0`, `optdrv1`, `optdrv2`, and `optdrv3` are arbitrary names you assign to the optical disk drives. Make sure the names are not already defined to ADSM. Replace the strings `op0`, `op1`, `op2`, and `op3` with the device names that SMIT created when you configured the optical drives (refer to “Define optical drives with SMIT” on page 52).

3. Change the DEFINE DEVCLASS statement to define the characteristics of the storage library. The following example shows how to define a device class for an optical library that contains four, 5.25 inch optical drives with an estimated unformatted capacity of 2600 MB each. ADSM keeps idle optical platters in the drives for ten minutes before dismounting them.

```
def devclass odlib0 devtype=optical format=2600MB -
             mountlimit=4 library=archlib0 -
             estcapacity=2600M mountretention=10
```

   The string `odlib0` is an arbitrary name that you assign to the optical device class. Make sure the name is not already defined to ADSM. The string `archlib0` is the library that you defined in step 1 on page 55.

   If the optical library you are defining to ADSM uses 650 MB drives, change the value of the `format` and `estcapacity` parameters. If the optical library you are defining to ADSM supports two drives, change the value of the `mountlimit` parameter. If the optical library you are defining to ADSM uses WORM optical platters, change the value of the `devtype` parameter to `WORM`.

   You can set the `mountretention` parameter to a larger value, if you are configuring a storage subsystem where the most frequently accessed data resides on the same storage volumes or if you expect a low volume of retrieval activity to data stored in the library. The `mountretention` parameter governs how long ADSM retains idle storage volumes before dismounting them. For example, if you set the value to 360, ADSM retains idle storage volumes for six hours before dismounting them.

4. Change the DEFINE STGPOOL statement to define a storage pool for the library. A storage pool is a collection of storage volumes that belong to the same device class.

```
define stgpool ODAIX1 odlib0 -
               desc='Optical storage for OnDemand' -
               collocate=no reclaim=60 -
               maxscratch=1 reusedelay=30
```

The string `ODAIX1` is an arbitrary name that you assign to the storage pool. Make sure that the name is not already defined to ADSM. The string `odlib0` is the device class that you created in step 3 on page 56.

We recommend that you specify `collocate=no`. Refer to the ADSM documentation for more information.

The `reclaim` parameter specifies when to initiate reclamation of fragmented space on volumes in the storage pool, based on the percentage of reclaimable space on a volume. Reclamation makes the fragmented space usable again by moving any remaining active files from one volume to another volume, thus making the original volume available for reuse. Refer to the ADSM documentation for details.

The `maxscratch` parameter can be used to enable ADSM to automatically mount new scratch volumes when needed, without intervention from an ADSM administrator. Setting the value to `1` means that ADSM can mount a new scratch volume once. Use caution when setting this parameter to a larger value. Refer to the ADSM documentation for more information.

The `reusedelay` parameter determines when a storage volume can be rewritten or returned to the scratch pool. That is, the number of days that must elapse after all of the files on a storage volume have been deleted before ADSM can write over the volume or return the volume to the scratch pool. Refer to the ADSM documentation for details.

Define a policy domain for OnDemand

Another set of storage manager commands in the archive.mac file defines an ADSM policy domain to manage storage for OnDemand. A policy domain supports a single storage pool. You can copy and change the statements in the file, if you need to define more than one domain for OnDemand.

Note: When you create an application group, you specify the length of time that OnDemand maintains the data stored in the application group. When you assign the application group to a storage set that provides archive media support, you must make sure that the storage set identifies a domain that supports the retention period required by the report files stored in the application group. The retention period that you specify for the domain must be the same as the life of the data for the application group.

The following statements in the file define a policy domain to manage data for a period of seven years (2557 days). The policy domain contains a policy set, a single management class, and a copy group that writes to a primary storage pool.

1. Verify and, if necessary, change the DEFINE DOMAIN statement.

```
define domain OD7YRPD desc='OnDemand Policy Domain'
```

   Replace the string OD7YRPD with the name of an ADSM domain used to manage storage for OnDemand. Make sure that the name is not already defined to ADSM.

2. Verify and, if necessary, change the DEFINE POLICYSET statement for the domain.

```
define policyset OD7YRPD OD7YRPS desc='OnDemand Policy Set'
```

   Replace the string OD7YRPD with the name of the policy domain that you defined in step 1. Replace the string OD7YRPS with the name of the policy set. Make sure that the name is not already defined to ADSM.

3. Verify and, if necessary, change the DEFINE MGMTCLASS statement for the policy set.

```
define mgmtclass OD7YRPD OD7YRPS OD7YRMG -
       desc='OnDemand Management Class'
```

   Replace the string OD7YRPD with the name of the policy domain that you defined in step 1. Replace the string OD7YRPS with the name of the policy set that you defined in step 2. Replace the string OD7YRMG with the name of the management class. Make sure that the name is not already defined to ADSM.

4. Verify and, if necessary, change the DEFINE COPYGROUP statement for the management class. The copy group identifies the name of the storage pool where ADSM stores OnDemand data and the length of time that ADSM maintains the data.

```
define copygroup OD7YRPD OD7YRPS OD7YRMG standard -
              type=archive dest=ODAIX1 retver=2557
```

   Replace the string OD7YRPD with the name of the policy domain that you defined in step 1. Replace the string OD7YRPS with the name of the policy set that you defined in step 2. Replace the string OD7YRMG with the name of the management class that you defined in step 3. Replace the string ODAIX1 with the name of the storage pool that you defined in step 4 on page 57. Replace the string 2557 with the length of

time (in days) that you want ADSM to maintain OnDemand data in the storage pool.

5. After you define the policy set and management class, assign a default management class for the policy set.

```
assign defmgmtclass OD7YRPD OD7YRPS OD7YRMG
```

   Replace the string `OD7YRPD` with the name of the policy domain that you defined in step 1 on page 58. Replace the string `OD7YRPS` with the name of the policy set that you defined in step 2 on page 58. Replace the string `OD7YRMG` with the name of the management class that you defined in step 3 on page 58.

6. After you define a default management class for the policy set, validate and activate the policy set.

```
validate policyset OD7YRPD OD7YRPS
activate policyset OD7YRPD OD7YRPS
```

   Replace the string `OD7YRPD` with the name of the policy domain that you defined in step 1 on page 58. Replace the string `OD7YRPS` with the name of the policy set that you defined in step 2 on page 58.

For more information about commands used to define and initialize policy domains, please refer to the *ADSM: Administrator's Reference*

Define the ADSM database backup device class

The archive.mac file contains statements that define the device class used to create a backup image of the ADSM database. You can backup the database to tape or to a file on disk.

Tape device class

The following lines in the file define a device class to backup the database to tape. The statements in the file support an 8MM tape drive on the ADSM device */dev/mt0*, as configured in topic 14.1, “Define and configure storage devices” on page 52.

```
DEF LIBRARY DUMPLIB LIBTYPE=MANUAL
DEF DRIVE DUMPLIB DUMPDRIVE DEVICE=/dev/mt0
DEF DEVCLASS DUMPTAPEDEV DEVTYPE=8MM LIBRARY=DUMPLIB FORMAT=8200
COMMIT
```

Disk file device class

The following lines in the file define a device class to backup the database to a file on disk. The DIRECTORY is where you want ADSM to write the database backup file.

```
DEF DEVCLASS DUMPFILEDEV DEVTYPE=FILE DIRECTORY=/dsmdump
COMMIT
```

To define the database backup device class:

1. Remove the comment characters from the beginning and the end of the lines in the file that support the device class that you want to configure.
2. If you define a disk file device class, the DIRECTORY must exist before running the database backup command.

Refer to the *ADSM Administrator's Reference* for more information about the commands used to define a device class to support the database backup.

14.4 Verify and modify ADSM client and server files

You must create several files before you can initialize ADSM. These files contain information that ADSM uses to support the OnDemand environment.

1. Login to AIX as the *root* user.
2. Make a backup copy of the installed files.

   Before you modify a file, always make a backup copy of the installed or production file.
3. Create a production version of each file that contains the statements required for ADSM to support the OnDemand environment.

   Edit or create files with a text editor that does not substitute characters (for example, the blank and tab characters) and does not truncate lines. When in doubt, use the *vi* editor.

dsmserv.opt

The *dsmserv.opt* file contains system options for the ADSMserver.

1. Change to the */usr/lpp/adsmserv/bin* directory.
2. Backup the installed server options file, *dsmserv.opt*. Enter the following command at the AIX prompt:

```
mv dsmserv.opt dsmserv.opt.orig
```

3. Create the *dsmserv.opt* file. Enter the following command at the AIX prompt:

```
vi dsmserv.opt
```

4. The following example shows an ADSM server options file that enables TCP/IP as the communications protocol and sets the port address of the server, specifies a maximum of 255 simultaneous retrieves, establishes values for the database and recovery log buffer pools, expires report files twice a day, and defines where the volume and device configuration information is written.

```
   COMMmethod TCPIP
   TCPPort 1501
   TCPWindowsize 0
   MAXSessions 255
   COMMTimeout 30
   IDLETimeout 60
   BUFPoolsize 512
   LOGPoolsize 256
   EXPInterval 12
   VOLUMEHistory /usr/lpp/adsmserv/history.vol
   DEVCONFig /usr/lpp/adsmserv/history.dev
```

5. Add the lines to the file.
6. Save the file and exit the text editor.

dsm.sys

The *dsm.sys* file contains system options for the ADSM administrative client.

1. Change to the */usr/lpp/adsm/bin* directory.
2. Backup the installed server options file, *dsm.sys*. Enter the following command at the AIX prompt:

```
mv dsm.sys dsm.sys.orig
```

3. Create the *dsm.sys* file. Enter the following command at the AIX prompt:

```
vi dsm.sys
```

4. The following example shows a *dsm.sys* file that sets the server name and fully qualified TCP/IP host name of the server, enables TCP/IP as the communications protocol, sets the TCP/IP port address of the server, and turns off compression. OnDemand handles compression and decompression of files managed by ADSM.

```
SErvername         archive
COMMmethod         TCPip
TCPPort            1501
TCPServeraddress   peak.ibm.com
COMPRESSION OFF
```

5. Add the lines to the file.

   Replace the string `peak.ibm.com` (the `TCPServeraddress` parameter) with the fully qualified TCP/IP host name or IP address of the RS/6000 where you installed ADSM.

6. Save the file and exit the text editor.

dsm.opt

The *dsm.opt* file contains options for the ADSM administrative client.

1. Change to the */usr/lpp/adsm/bin* directory.
2. Backup the installed server options file, *dsm.opt*. Enter the following command at the AIX prompt:

```
mv dsm.opt dsm.opt.orig
```

3. Create the *dsm.opt* file. Enter the following command at the AIX prompt:

```
vi dsm.opt
```

4. The following example shows a *dsm.opt* file that sets the server name and the startup option.

```
SErvername         archive
QUIET
```

5. Add the lines to the file.
6. Save the file and exit the text editor.

14.5 Define ADSM administrative users

We recommend that you identify a user who can start the ADSM server and administrative client and perform general ADSM administrative functions. Besides the user you designate as the ADSM administrator, we recommend that you also define the environment for the *root* user.

Before the administrative user starts ADSM and does storage manager administration, you must define an environment for ADSM. The environment consists of path statements, so that ADSM knows where to find executable programs and other files, and values for several operational variables that ADSM requires.

1. Login to AIX as the user.
2. Create or edit the .profile file, which can be found in the user's login directory. If necessary, make a backup copy of the current .profile file.
3. Edit the .profile file with a text editor that does not substitute characters and does not truncate lines. When in doubt, use the *vi* editor.
4. Add the following lines to the end of the .profile file, to set environment variables used by the ADSM administrative client:

```
export DSMSERV_DIR=/usr/lpp/adsmserv/bin
export DSMSERV_CONFIG=/usr/lpp/adsmserv/bin/dsmserv.opt
export DSM_DIR=/usr/lpp/adsm/bin
export DSMI_DIR=/usr/lpp/adsm/bin
```

5. Update the PATH statement in the file to include the following ADSM directories:

```
/usr/lpp/adsm/bin
/usr/lpp/adsmserv/bin
```

   The PATH statement should look similar to the following, after you add the ADSM directories:

```
PATH=$PATH:/usr/lpp/ars/bin:/usr/lpp/adsm/bin:/usr/lpp/adsmserv/bin
```

6. Save the file and exit the text editor.
7. Edit the *.dtprofile* file.
8. Locate the following line in the file:

```
# DTSOURCEPROFILE=true
```

   Remove the comment character (#) from the beginning of the line. Doing so means that AIX will read the .profile file when the user logs on to AIX.

9. Save the file and exit the text editor.

14.6 Verify and configure the ars_adsm shell script

The ars_adsm command is a Korn shell script that can be used to perform general purpose ADSM functions, such as starting and stopping ADSM and creating a backup copy of the ADSM database.

Before you can use the ars_adsm command, you must verify and if necessary, change the ADSM administrative userid and password and the database backup device class set in the script. The script can be found in the */usr/lpp/ars/bin* directory.

1. Login to AIX as the *root* user
2. Change to the */usr/lpp/ars/bin* directory.
3. Copy the installed shell script file, *ars_adsm*, to *ars_adsm.orig*.
4. Make any required changes to the ars_adsm file with a standard text editor.

   Make sure that you set the execute file permissions for the ars_adsm file.

   Note: Whenever you modify a file, first make a backup copy of the current "production" file. Edit the file with a text editor that does not substitute characters (for example, the blank and tab characters) and does not truncate lines. When in doubt, use the *vi* editor.
5. A default user ID and password for an ADSM administrator are set to arbitrary strings in the script. If you specify different values for the userid and password when you register the ADSM administrator (refer to topic 14.9, "Register ADSM administrative users and software license" on page 65), you must either change the values in the script, or use the `-u` and `-p` command line options when you invoke the command.
   - Locate the string `USERID=archive` in the script. If required, change the string `archive` to the value you set for the ADSM administrative user ID.
   - Locate the string `PASSWORD=archive1` in the script. If required, change the string `archive1` to the value you set for the ADSM administrative password.
6. You must set the variable for the database backup device class. Locate the string `CUST_DUMPDEV=DUMPDEV` in the script.
   - Change the string to `CUST_DUMPDEV=DUMPFILEDEV`, if you plan to backup the database to a file on disk.
   - Change the string to `CUST_DUMPDEV=DUMPTAPEDEV`, if you plan to backup the database to tape.

14.7 Create the link to the ADSM API

The *libApiDS.a* file is a client API that OnDemand requires to work with ADSM. The software installation program copies the file to the */usr/lpp/adsm/api/bin* directory. You must create a link to the file from the */usr/lib* directory.

1. Login to AIX as the *root* user.
2. Change to the */usr/lib* directory.

3. Create a link to the *libApiDS.a* file. Enter the following command at the prompt:

```
ln -sf /usr/lpp/adsm/api/bin/libApiDS.a
```

14.8 Initialize the database and recovery log

Note: If you are upgrading from an earlier version of ADSM, do not initialize the database and recovery log.

As part of ADSM initialization, you must allocate space for the ADSM database and recovery log with the dsmserv command.

1. Login to AIX as the *root* user.
2. Enter the following commands to initialize the database and the recovery log. Replace the string `dsmloglv` with the name of the logical volume that you created for the recovery log (refer to topic 14.2, “Define logical volumes” on page 53). Replace the string `dsmdblv` with the name of the logical volume that you created for the database (refer to topic 14.2, “Define logical volumes” on page 53).

```
cd /usr/lpp/adsmserv/bin
dsmserv install 1 /dev/rdsmloglv 1 /dev/rdsmdblv
```

   The dsmserv command processes the server options file, formats the database and recovery log, and does other ADSM initialization.

14.9 Register ADSM administrative users and software license

This topic describes how to register a user to perform ADSM administrative duties and register ADSM licenses with the ADSM server.

1. Login to AIX as the *root* user.
2. Start the ADSM server. Enter the following commands at the prompt:

```
cd /usr/lpp/adsmserv/bin
dsmserv
```

3. Use the REGISTER LICENSE command to register administrative users. Enter the following commands at the ADSM prompt. Replace the string `archive` with the userid that you want to register as an ADSM administrator. Replace the string `archive1` with the password for the userid.

```
register admin archive archive1
grant authority archive classes=system
set passexp 9999
set actlogretention 365
```

The userid that you register and the password you specify must match the values that you specified in the *ars_adsm* shell script file. The default values in the shell script file are `archive` (userid) and `archive1` (password). Refer to topic 14.6, "Verify and configure the ars_adsm shell script" on page 64 for more information about the *ars_adsm* shell script file.

The SET PASSEXP command is used to set the password expiration period to the number of days that the password remains valid. We recommend that you set the password expiration period to **9999** days so that the administrator client password will not expire for a very long time.

The SET ACTLOGRETENTION command is used to specify the retention period, in days, of server activity log records. The activity log includes information about client sessions and migration and diagnostic error messages. We recommend that you retain server activity log records for one year.

4. Use the REGISTER LICENSE command to register licenses with the ADSM server. The licenses enable the server to support a specific number of nodes, client environments, and specific removable media libraries and drives. You must register the following licenses:
   - The maximum number of additional clients (nodes)
   - The Unix environment support
   - A device support module for the library or libraries that you defined to ADSM

   Please refer to topic 4.0, "Obtaining software license information" on page 15, if you have questions about obtaining ADSM licenses.
5. Enter a REGISTER LICENSE command at the ADSM prompt to register each of the licenses required for your system. For example:

```
register license kkkkkkkkkkkkkkkkkkkkkkkk
```

Replace the string `kkkkkkkkkkkkkkkkkkkkkkkk` with a license key supplied by IBM. Type the license key portion of the product license. Do not enter the vendor ID or product identification.

6. After you register all of the required licenses, ADSM must validate the license information. Use the AUDIT LICENSES command to validate the license information. Enter the following command at the ADSM prompt:

```
audit license
```

ADSM verifies that the new license terms are known to the server.

7. When complete, enter **halt** at the prompt to stop the ADSM server.

14.10 Start ADSM

The next step is to start ADSM and the administrative client so that you can perform several tasks to prepare ADSM to support OnDemand. We recommend that you start an administrative client in console mode and another administrative client in interactive mode. You can review messages generated by the maintenance tasks in the console window. You can enter ADSM commands in the interactive window.

Complete the following steps to start ADSM.

1. Login to AIX as the *root* user.
2. Start ADSM, if it is not already started. For example:

```
/usr/lpp/ars/bin/ars_adsm -sv
```

3. Start an ADSM administrative client in console mode. Enter the following command at the prompt of an aixterm window:

```
dsmadmc -consolemode
```

4. Enter an ADSM administrator userid and password when prompted.
5. Start an ADSM administrative client in interactive mode. Enter the following command at the prompt of an aixterm window:

```
dsmadmc -outfile=/tmp/adsm.output
```

   This form of the command causes ADSM to write a log containing the commands and command output to file. When you have completed configuring ADSM, store a copy of this file in a safe place.

6. Enter an ADSM administrator userid and password when prompted.

14.11 Verify installation of the database and the recovery log

After starting the ADSM administrative console and client, you can verify that ADSM correctly initialized the logical volumes you defined for the ADSM database and recovery log.

To verify installation of the database, run the following report:

- Database report.

This report shows you the volumes assigned to the database. Enter the following command at the *adsm>* prompt.

```
Query DB format=detailed
```

To verify installation of the recovery log, run the following two commands from the server.

- Space report. This report provides information about the status of the recovery log you defined, including capacity, space available, and utilization. Enter the following command at the *adsm>* prompt.

```
Query LOG format=detailed
```

- Volume report. This report shows you the volumes assigned to the recovery log. Enter the following command at the *adsm>* prompt.

```
Query LOGVol
```

ADSM displays messages in the administrative console and the output of the command in the administrative console window.

14.12 Delete default storage pools

This step is optional and should not be performed if you use ADSM to support applications other than OnDemand.

1. Start ADSM and the administrative console and client, if they are not already started. Refer to topic 14.10, “Start ADSM” on page 67 for instructions about how to start ADSM and the administrative console and client.
2. Enter the following commands at the *adsm>* prompt of the administrative client:

```
delete stgpool archivepool
delete stgpool backuppool
delete stgpool spacemgpool
```

ADSM displays the output of the command in the administrative console window.

14.13 Process the storage manager configuration file

After initializing and starting ADSM, you can process the archive.mac storage manager configuration file, to define storage libraries, devices, and policy management information to the ADSM server. The archive.mac file contains the storage manager

commands that you set up in topic 14.3, “Verify and modify ADSM storage management file” on page 54.

1. Start ADSM and the administrative console and client, if they are not already started. Refer to topic 14.10, “Start ADSM” on page 67 for instructions about how to start ADSM and the administrative console and client.
2. Enter the following command at the *adsm>* prompt of the administrative client:

```
macro /usr/lpp/ars/config/archive.mac
```

ADSM displays the output of the command in the administrative console window.

14.14 Label storage volumes

You must label storage volumes before ADSM can initialize and store report data on them. If you plan to backup the ADSM database to tape, you must label tape volumes before ADSM can initialize and use them to create a backup image of the ADSM database.

Label tape storage volumes

If you plan to backup the ADSM database to tape, complete the following steps to label tape volumes.

Note: ADSM must not be active when you label storage volumes. If necessary, enter **QUIT** at the *adsm>* prompt to stop the administrative client; press the **Ctrl** and **C** keys to close the administrative console. To stop ADSM, enter **/usr/lpp/ars/bin/ars_adsm -tv** at the AIX prompt.

1. Login to AIX as the *root* user.
2. Change to the */usr/lpp/adsmserv/bin* directory.
3. Run the *dsmlabel* program. For example:

```
dsmlabel -drive=/dev/mt0
```

   The example uses the default ADSM tape drive.

4. The *dsmlabel* program prompts you to place a blank tape in the drive.

   Any tape with a pre-existing label is rejected and the next unlabeled tape is requested.

5. The *dsmlabel* program prompts you to enter a label for the tape volume.

   Labels can be from 1 to 6 alphanumeric characters in length. You can use the characters A through Z and 0 through 9. The label cannot include embedded blanks. ADSM converts lowercase letters in a volume label to uppercase.

We recommend that you maintain a central log with information about storage volumes. The log should contain information such as the date the volume was labeled, the type of media, the capacity, the volume label, and the type of data to be written on the storage volume.

6. After labeling the tape, ADSM ejects the tape from the drive.
7. Repeat step 4 on page 69 to label additional tapes.
8. Press **Enter** to exit the *dsmlabel* program when you have completed labeling tape volumes.

Label storage volumes

If you defined an optical or tape library to store report files and resources, you must label the storage volumes before ADSM can write data on them. The number of storage volumes that you need to label depends on the volume of data that OnDemand processes for applications that you defined to OnDemand and the compression ratio achieved. The following example outlines how to label optical storage volumes.

Complete the following steps to label optical storage volumes:

Note: Dismount all mounted storage volumes before you proceed. Issue the QUERY MOUNT command from the ADSM administrative console to list the mounted storage volumes. Use the DISMOUNT VOLUME command from the administrative console to dismount all mounted storage volumes.

ADSM must not be active when you label storage volumes. If necessary, enter **QUIT** at the *adsm>* prompt to stop the administrative client; press the **Ctrl** and **C** keys to close the administrative console. To stop ADSM, enter **/usr/lpp/ars/bin/ars_adsm -tv** at the AIX prompt.

1. Login to AIX as the *root* user.
2. Change to the */usr/lpp/adsmserv/bin* directory.
3. Run the *dsmlabel* program to label storage volumes for each of the optical libraries that you configured on the system. The following example shows how to label storage volumes in an IBM 3995-C62 optical library:

```
dsmlabel -library=/dev/lb0
         -drive=/dev/rop0,1 -drive=/dev/rop1,2
         -keep
```

Replace the string `lb0` with the device name of the library. Replace the strings `op0,1` and `op1,2` with the device names and element addresses of the optical drives. The `-keep` option causes the program to keep volumes inside the library after they are labeled.

If you are labeling storage volumes in a library with one drive, omit the second `-drive` parameter.

If you are labeling storage volumes in a library with four drives, you can specify a third and fourth `-drive` parameter. Enter the device names and element addresses of the additional drives, for example, `/dev/rop2,3` and `/dev/rop3,4`.

4. The *dsmlabel* program prompts you to place a blank optical platter in the drive.

   Any platter with a pre-existing label is rejected and the next unlabeled platter is requested.

5. The *dsmlabel* program prompts you to place a label for the storage volume.

   All optical platters must have unique labels. Labels can be from 1 to 32 alphanumeric characters in length. You can use the characters A through Z and 0 through 9. The label cannot include embedded blanks. ADSM converts lowercase letters in a volume label to uppercase.

   We recommend that you maintain a central log with information about storage volumes. The log should contain information such as the date the volume was labeled, the type of media, the capacity, the library name, the volume label, and the type of data to be written on the storage volume.

6. Repeat step 4 to label additional storage volumes.

7. Press **Enter** to exit the *dsmlabel* program, when you have finished labeling storage volumes.

For more information about labeling storage volumes, refer to “Managing Storage Volumes” in the *ADSM for AIX: Administrator's Guide*.

14.15 Check storage volumes into the library

Use the CHECKIN LIBVOL command to make storage volumes available to ADSM. This command causes ADSM to check the storage volumes into the library and record volume identifiers and status in the ADSM database.

1. Restart ADSM and the administrative console and client, if they are not already started. Refer to topic 14.10, “Start ADSM” on page 67 for instructions about how to start ADSM and the administrative console and client.

2. Enter the *checkin* command. For example:

```
checkin libvol libraryname status=scratch search=yes
```

   Enter the command at the ADSM administrative client *adsm>* prompt. Replace the string `libraryname` with the name of a library that you defined in “Define a storage library to ADSM” on page 55.

3. ADSM processes all of the storage volumes in the library. ADSM displays status information in the console window, including the label of each volume checked into the library.

4. After ADSM completes scanning the library and registering all of the storage volumes in the database, you can issue the QUERY LIBVOL command to list the volumes in the library and status information about the storage volumes.

14.16 Define initial storage volumes

After labeling storage volumes, you must define an initial storage volume for each storage pool and library that you defined and configured for OnDemand.

Complete the following steps to define an initial storage volume.

1. Restart ADSM and the administrative console and client, if they are not already started. Refer to topic 14.10, “Start ADSM” on page 67 for instructions about how to start ADSM and the administrative console and client.
2. For each storage pool that you created for OnDemand, verify the label of the storage volume that you want to define as the initial storage volume.

   When ADSM writes data to the storage pool for the first time, it must use the volume that you define. Defining an invalid initial storage volume requires manual intervention when ADSM attempts to write to the storage pool for the first time.
3. Enter the *define volume* command. For example:

```
define vol poolname volume
```

   Enter the command at the ADSM administrative client *adsm>* prompt. Replace the string `poolname` with the name of a storage pool that you defined for OnDemand. Refer to “Define a storage library to ADSM” on page 55 for information about setting up storage pools. Replace the string `volume` with the name of the labeled storage volume that you want ADSM to use as the initial storage volume for the storage pool.
4. ADSM displays the output of the command in the administrative console window.
5. After ADSM finishes defining the initial storage volume, close the ADSM console and stop the ADSM administrative client. Enter **QUIT** at the *adsm>* prompt to stop the client. Press the **Ctrl** and **C** keys to close the console.

14.17 Backup the database and save critical files

To complete the configuration of ADSM with OnDemand, you should backup the database and save files that contain important information. The backup copy of the database can be used if you need to recover the database (and should be saved until the next time that you create a full backup of the database). The files contain important information that you must have, if you need to recover the database.

Backup the database

You will need at least one formatted tape storage volume. Please refer to “Label tape storage volumes” on page 69 for instructions about how to create a formatted tape storage volume.

You must define a device class to dump the database to tape. Please refer to “Tape device class” on page 59 for instructions about how to define a device class for tape backup.

Complete the following steps to create a backup copy of the ADSM database on tape.

1. Login to AIX as the *root* user.
2. Place a formatted tape storage volume in the tape drive.
3. Stop ADSM. Enter **QUIT** at the *adsm>* prompt to stop an administrative client. Press the **Ctrl** and **C** keys to close an administrative console. To stop ADSM, enter **/usr/lpp/ars/bin/ars_adsm -tv** at the AIX prompt.
4. Change to the */usr/lpp/adsmserv/bin* directory.
5. Run the *dsmserv dumpdb* command to backup the database. For example:

```
dsmserv dumpdb devclass=dumptapedev vol=xxxxxx
```

   Replace the string `dumptapedev` with the name of the device class that you defined for tape backup of the database. Replace the string `xxxxxx` with the name of a labeled tape storage volume.

6. The *dsmserv dumpdb* command issues several messages, concluding with “Database dump process completed,” after successfully creating the database backup.
7. Record information about the database backup, such as the date and volume label, and store the backup copy of the database in a safe location, preferably offsite (until you create another full backup of the database).

Save critical files

After you configure ADSM with OnDemand, we recommend that you save copies of the following files. These files contain important information that you must have, if you need to recover the database.

- The server options file (DSMSERV.OPT)
- The volume history file (HISTORY.VOL)
- The device configuration file (HISTORY.DEV)

Use a standard AIX command to copy the files to removable media.

Store the copies of the files in a safe location, preferably offsite. Save the files until you create another backup copy of the files.

15.0 Implementing a copy storage pool

Note: This chapter describes how to implement a copy storage pool with ADSM Version 2.1. If you installed a different ADSM product, use the administrator's guide provided with the product instead of the information in this chapter.

15.1 Overview

This chapter of the book describes how you can use ADSM to manage a backup copy of data stored on archive media. This capability means that OnDemand can automatically retrieve a backup copy of a report file from archive media, when needed, without administrator intervention. If you do not need to maintain a backup copy of reports stored on archive media, skip this section and continue with topic 16.0, “Using ADSM to manage DB2 files” on page 85.

Maintaining a backup copy of reports can increase the availability of your system. For example, assume you need to have backup copies of the files stored in the ODAIX1 primary storage pool. All of the files stored in the ODAIX1 storage pool are critical to the operation of the company. You can define a copy storage pool to contain the backup copies. The copy storage pool allows ADSM to maintain multiple copies of files on archive media, thus reducing the potential for data integrity loss because of media failure. If the primary file is not available or becomes corrupted, ADSM accesses and uses the duplicate file from the copy storage pool.

After you define the copy storage pool, you must copy all of the files that existed before you defined the copy storage pool. You can then schedule daily incremental backups of the files in the primary storage pool.

To use ADSM to independently manage more than one copy of a file on archive media, you must complete the following tasks:

- Identify the primary storage pool that contains the data that you need to back up.
- Identify a library and storage volumes for the copy storage pool.
- Define the library and drives to ADSM, including a device class for the library. Refer to topic 15.3, “Defining the storage library to ADSM” on page 76 for details.
- Define a copy storage pool. Topic 15.4, “Defining the copy storage pool” on page 78 provides details.
- Copy the files from the primary storage pool to the copy storage pool. Topic 15.6, “Copying existing files” on page 81 provides details.
- Define a schedule to incrementally backup the primary storage pool to the copy storage pool. Topic 15.7, “Scheduling the backup copy” on page 82 provides details.

Refer to the *ADSM Administrator's Guide* for more information about using copy storage pools to improve data availability.

15.2 Storage pools

OnDemand stores copies of report files in cache storage, for short-term, high-speed access, and on archive media, to support long-term storage. ADSM maintains the files stored on archive media. When you load reports into an application group that requires archive media support, ADSM stores the data in a primary storage pool. When OnDemand requests a file from archive media, ADSM usually retrieves the requested file from a primary storage pool.

A copy storage pool stores copies of data that resides in a primary storage pool. With this method, ADSM maintains a backup copy of files that are stored in a primary storage pool independently and transparently to OnDemand. The backup copy can be used to restore the original file if it become damaged, lost, or unusable.

When you implement a copy storage pool, remember the following points:

- Copy storage pools require additional space in the ADSM database.
- The copy storage pool can be assigned to the same library as the primary storage pool. However, you would typically assign the copy storage pool to a different library.
- You can copy data from one or more primary storage pools to the same copy storage pool.
- A copy storage pool must be defined on the object server where the primary storage pool resides.

  To backup files to a storage node that resides on a different object server, you must define a secondary storage node to OnDemand and ADSM. Use the administrator interface to define a secondary storage node.
- A primary storage pool file must always exist for a copy storage pool file to exist. When a primary storage pool file is deleted, so is the copy of the file in the copy storage pool.

Copies in a copy storage pool are produced by using the BACKUP STGPOOL command. The copies are made incrementally while the server is operational. Central scheduling allows for producing copies at convenient times for your installation. The *ADSM Administrator's Guide* provides details about defining and managing storage pools.

15.3 Defining the storage library to ADSM

When you add an optical or tape library to the system, you must define it to ADSM. When you define a library to ADSM, you define a device class for the library and define the library and the drives contained in the library. You also define a storage pool for the collection of storage volumes that belong to the library. Finally, you define a policy domain, with information that ADSM uses to maintain the data stored in the storage pool.

The following steps are an example of defining an optical library, device class, storage pool, and policy domain as the destination for files backed up from a primary storage pool.

For more information about commands used to define storage libraries, device classes, storage pools, and policy domains or if you have questions about the procedures referenced in this chapter, please refer to the *ADSM Administrator's Reference*.

Start ADSM administrative clients

When you perform ADSM administrative tasks, we recommend that you start an administrative client in console mode and another administrative client in interactive mode. You can review messages generated by the maintenance tasks in the console window. You can enter ADSM commands in the interactive window.

1. Login to AIX as the *root* user.
2. Start ADSM, if it is not already started. For example:

```
/usr/lpp/ars/bin/ars_adsm -sv
```

3. Start an ADSM administrative client in console mode. Enter the following command at the prompt of an aixterm window:

```
dsmadmc -consolemode
```

4. Enter an ADSM administrator userid and password when prompted.
5. Start an ADSM administrative client in interactive mode. Enter the following command at the prompt of an aixterm window:

```
dsmadmc
```

6. Enter an ADSM administrator userid and password when prompted.

Define the library

The following example shows how to define a SCSI-attached library to ADSM.

```
    def library archlib9 libtype=scsi device=/dev/lb9
```

The string `archlib9` is an arbitrary name that you assign to the library. Make sure that the name is not already defined to ADSM. Replace the string `lb9` with the device name that SMIT created when you defined the library to AIX.

Define the drives

The following example shows how to define the drives in a library that contains four drives, such as an IBM 3995-C68 optical storage library. The 3995-C68 uses elements numbers 1 through 4 for the optical drives.

```
def drive archlib9 optdrv0 device=/dev/rop0 element=1
def drive archlib9 optdrv1 device=/dev/rop1 element=2
def drive archlib9 optdrv2 device=/dev/rop2 element=3
def drive archlib9 optdrv3 device=/dev/rop3 element=4
```

The string `archlib9` is the library that you defined in "Define the library" on page 77. The strings `optdrv0`, `optdrv1`, `optdrv2`, and `optdrv3` are arbitrary names you assign to the optical disk drives. Make sure the names are not already defined to ADSM. Replace the strings `op0`, `op1`, `op2`, and `op3` with the device names that SMIT created when you defined the optical drives to AIX.

Define the device class

The following example shows how to define a device class for an optical library that contains four, 5.25 inch optical drives with an estimated unformatted capacity of 2600 MB each. ADSM keeps idle optical platters in the drives for ten minutes before dismounting them.

```
def devclass odlib9 devtype=optical format=2600MB   -
             mountlimit=4 library=archlib9          -
             estcapacity=2600M mountretention=10
```

The string `odlib9` is an arbitrary name that you assign to the optical device class. Make sure the name is not already defined to ADSM. The string `archlib9` is the library that you defined in "Define the library" on page 77.

15.4 Defining the copy storage pool

The following example shows how to define a copy storage pool to ADSM. All of the storage volumes in the copy storage pool are located on the same object server as the primary storage pool.

```
define stgpool ODAIX1-COPY odlib9                    -
               desc='Copy storage pool for ODAIX1'   -
               collocate=no reclaim=60               -
               maxscratch=1 reusedelay=30            -
               pooltype=copy
```

Figure 3. Defining a Copy Storage Pool

The string `ODAIX1-COPY` is an arbitrary name that you assign to the storage pool. Make sure that the name is not already defined to ADSM. The string `odlib9` is the device class that you defined in "Define the device class."

15.5 Assigning storage volumes to the copy storage pool

You must define the same number of volumes in the copy storage pool as were already defined in the primary storage pool. If you copy data from more than one primary storage pool to the same copy storage pool, you must define the total number of volumes in all of the primary storage pools.

The following topics describe how to label and check storage volumes into a library.

Stop OnDemand

ADSM must not be active when you label storage volumes. We recommend that you stop the OnDemand system, including ADSM, before you begin. The *Administrator's Reference* provides detailed instructions about stopping all of the processes related to OnDemand.

Label storage volumes

After stopping OnDemand and ADSM, complete the following steps to label new storage volumes for the copy storage pool.

1. Login to AIX as the *root* user.
2. Change to the */usr/lpp/adsmserv/bin* directory.
3. Run the *dsmlabel* program to label storage volumes. The following example shows how to label optical storage volumes in an IBM 3995-C68 optical library:

```
dsmlabel -library=/dev/lb9
         -drive=/dev/rop0,1 -drive=/dev/rop1,2
         -drive=/dev/rop2,3 -drive=/dev/rop3,4
         -keep
```

Figure 4. Labeling Optical Storage Volumes

   Replace the string `lb9` with the device name of the library. Replace the strings `op0,1`, `op1,2`, `op2,3`, and `op3,4` with the device names and element addresses of the optical drives. The `-keep` option causes the program to keep volumes inside the library after they are labeled.

4. The *dsmlabel* command prompts you to place a blank optical platter in each drive.

   Any platter with a pre-existing label is rejected and the next unlabeled platter is requested.

5. The *dsmlabel* command prompts you to type a label for the storage volume.

   All optical storage volumes must have unique labels. Labels can be from 1 to 32 characters in length. You can use the characters A through Z and 0 through 9. The

label name cannot include embedded blanks. ADSM converts lowercase letters in a volume label to uppercase.

We recommend that you maintain a central log with information about storage volumes. The log should contain information such as the date the volume was labeled, the type of media, the capacity, the library, the volume label, and the type of data to be written on the storage volume.

6. Repeat step 4 on page 79 to label additional storage volumes.
7. Press **Enter** to exit the *dsmlabel* program when you have finished labeling storage volumes.

For more information about the *dsmlabel* command, please refer to the *ADSM Administrator's Reference*.

Check storage volumes into the library

Use the CHECKIN LIBVOL command to make the storage volumes in the copy storage pool available to ADSM. This command causes ADSM to record the identifiers and status of the volumes in the ADSM database. The *ADSM Administrator's Reference* provides details about the CHECKIN LIBVOL command.

Before you check storage volumes into the library, you must start ADSM and the administrative client. We recommend that you start an administrative client in console mode and another administrative client in interactive mode. You can review messages generated by the maintenance tasks in the console window. You can enter ADSM commands in the interactive window.

1. Login to AIX as the *root* user.
2. Start ADSM with the following command:

```
/usr/lpp/ars/bin/ars_adsm -sv
```

3. Start an ADSM administrative client in console mode. Enter the following command at the prompt of an aixterm window:

```
dsmadmc -consolemode
```

4. Enter an ADSM administrator userid and password when prompted.
5. Start an ADSM administrative client in interactive mode. Enter the following command at the prompt of an aixterm window:

```
dsmadmc
```

6. Enter an ADSM administrator userid and password when prompted.

7. Issue the CHECKIN LIBVOL command to cause ADSM to scan a library for new storage volumes. For example:

```
checkin libvol archlib9 status=scratch search=yes
```

Figure 5. Checking Storage Volumes into a Library

   Enter the command at the ADSM administrative client *adsm>* prompt. Replace the string `archlib9` with the name of the library.

8. ADSM processes all of the storage volumes in the library. ADSM displays status information in the console window, including the label of each volume processed.
9. After ADSM completes scanning the library and registering all of the new storage volumes in the database, you can issue the QUERY LIBVOL command to list the volumes in the library and status information about the storage volumes.

Restart OnDemand

When you have completed labeling and checking the storage volumes into the library, you can restart OnDemand. The *Administrator's Reference* provides detailed instructions about restarting all of the processes related to OnDemand.

15.6 Copying existing files

Before ADSM schedules the first incremental backup of the files in the primary storage pool, you must copy the files that existed in the primary storage pool before you created the copy storage pool. For more information about managing storage pools, please refer to the *ADSM Administrator's Guide*.

The following example shows how to copy the files from the primary storage pool to the copy storage pool. We recommend that you start an administrative client in console mode and another administrative client in interactive mode. You can review messages generated by the maintenance tasks in the console window. You can enter ADSM commands in the interactive window.

1. Login to AIX as the *root* user.
2. Start ADSM, if it is not already started. For example:

```
/usr/lpp/ars/bin/ars_adsm -sv
```

3. Start an ADSM administrative client in console mode. Enter the following command at the prompt of an aixterm window:

```
dsmadmc -consolemode
```

4. Enter an ADSM administrator userid and password when prompted.

5. Start an ADSM administrative client in interactive mode. Enter the following command at the prompt of an aixterm window:

```
dsmadmc
```

6. Enter an ADSM administrator userid and password when prompted.
7. Issue the BACKUP STGPOOL command. For example:

```
backup stgpool ODAIX1 ODAIX1-COPY
```

Figure 6. Copying Existing Files to the Copy Storage Pool

Replace the string `ODAIX1` with the name of the primary storage pool. Replace the string `ODAIX1-COPY` with the name of the copy storage pool.

If you copy data from more than one primary storage pool to the same copy storage pool, issue the backup storage pool command for each primary storage pool.

15.7 Scheduling the backup copy

ADSM includes a central scheduling component that allows the automatic processing of administrative commands, such as copying data from a primary storage pool to a copy storage pool. Each administrative command is called an event. Each scheduled event is tracked by the server and recorded in the database. You set up an administrative command schedule by defining schedule parameters, such as the start day, date, and time, specifying the command to be executed, such as the BACKUP STGPOOL command, and activating the schedule. The *ADSM Administrator's Guide* provides details about scheduling operations.

The following example shows how to define a schedule for an incremental backup of the primary storage pool to the copy storage pool every day beginning at 11 p.m.

Enter the BACKUP STGPOOL command at the ADSM administrative client *adsm>* prompt. For example:

```
define schedule backup_ODAIX1 type=administrative
cmd='backup stgpool ODAIX1 ODAIX1-COPY'
active=yes startime=23:00 period=1
```

Figure 7. Defining a Copy Storage Pool Schedule

Replace the string `ODAIX1` with the name of the primary storage pool. Replace the string `ODAIX1-COPY` with the name of the copy storage pool.

If you copy data from more than one primary storage pool to the same copy storage pool, define a backup schedule for each primary storage pool.

After you define the backup copy schedule, you can close the ADSM console and administrative client. Enter **QUIT** at the *adsm>* prompt to stop the client. Press the **Ctrl** and **C** keys to close the console.

16.0 Using ADSM to manage DB2 files

Note: This chapter describes how to use ADSM Version 2.1 to manage DB2 for AIX Version 2.1 archived log files and backup image files. If you installed different ADSM and DB2 products, use the administration guides provided with the products instead of the information in this chapter.

You can use ADSM to manage DB2 archived log files and backup image files. This capability means that you do not have to maintain these files on disk. If you do not plan to maintain DB2 files in ADSM-managed storage, skip this section.

Before you can begin storing DB2 for AIX archived log files and backup images in ADSM-managed storage, you must properly configure ADSM. You need to configure several files used during ADSM initialization and operation and define the storage management options that ADSM uses to maintain the files. The remaining topics in this chapter provide details about configuring ADSM to support DB2.

Note: Configuring ADSM to manage DB2 files is separate from configuring ADSM to maintain reports stored on archive media. Topic 14.0, “Configuring ADSM” on page 51 provides details about configuring ADSM to maintain reports stored in OnDemand.

16.1 Configuring the dsm.sys file

The dsm.sys file contains system options for the ADSM servers. You define one server to manage OnDemand application group data. If you plan to manage the DB2 for AIX log files and backup images on a different server, you must define the server in the dsm.sys file. The dsm.sys file is stored in the /usr/lpp/adsm/bin directory.

- The server name must be the same as the name of the server in the dsm.opt.db2 file. Refer to topic 16.2, “Configuring the dsm.opt.db2 file” on page 86 for details.
- You must set the COMPRESS parameter to yes.
- You must set the PASSWORDACCESS parameter to generate.

The following example shows a typical system options file. Two ADSM servers are defined: one for managing OnDemand application group data and one for managing the DB2 for AIX log files and backup images.

```
* The following server manages OnDemand application group data
SERVERNAME archive
COMMETHOD tcpip
TCPPORT 1500
TCPSERVERADDRESS everest.penn.boulder.ibm.com
COMPRESS no

* The following server manages DB2 log files and backup images
SERVERNAME dbbackup
COMMETHOD tcpip
TCPPORT 1500
TCPSERVERADDRESS everest.penn.boulder.ibm.com
COMPRESS yes
PASSWORDACCESS generate
```

16.2 Configuring the dsm.opt.db2 file

The dsm.opt.db2 file contains user options that identify the ADSM server that manages the DB2 for AIX log files and backup images. When archiving log files and creating backup images, the ars_db command reads this user options file to determine the name of the ADSM server that manages the files. The user options file is stored in the /usr/lpp/adsm/bin directory.

- The server must be defined in the dsm.sys file used to initialize ADSM. Refer to topic 16.1, “Configuring the dsm.sys file” on page 85 for details.
- When required, the environment variable DSMI_CONFIG can be set to point to the DB2 user options file.

The following example shows a typical user options file.

```
servername dbbackup
quiet
```

16.3 Defining the storage hierarchy

You must define the storage hierarchy that ADSM uses to manage the DB2 for AIX log files and backup images. The storage hierarchy can consist of a storage library, device class, storage pool, and policy domain.

- If you plan to use an existing storage pool to manage DB2 for AIX files, you do not need to define a storage library or device class.
- If you plan to use an existing policy domain to manage DB2 for AIX files, the domain must include an archive copy group and a backup copy group. Refer to

"Defining the archive copy group" on page 88 and "Defining the backup copy group" on page 88 for details.

- If you plan to define a new storage hierarchy to manage DB2 for AIX files, you must define a storage library, device class, storage pool, and policy domain, including the archive and backup copy groups.
- The storage pool where ADSM manages the files must use rewriteable media (not WORM).

Note: We recommend that you use dedicated hardware and define a dedicated storage hierarchy to manage the DB2 for AIX log files and backup images.

The following topics provide information about defining a policy domain:

- Defining the domain
- Defining the policy set
- Defining the management class
- Defining the archive copy group
- Defining the backup copy group
- Assigning a default management class
- Validating the policy set
- Activating the policy set

Refer to topic 14.0, "Configuring ADSM" on page 51 for details about how to define a storage library, device class, and storage pool.

Defining the domain

The following example shows how to define a policy domain to ADSM. Provide a name that is unique to ADSM. The name we chose for the sample policy domain implies that ADSM will maintain the files for one year. The length of time that ADSM maintains the files depends on the definitions for the archive and backup copy groups.

```
define domain 1YRPD -
     desc='Domain for DB2 file storage'
```

Defining the policyset

The following example shows how to define a policy set to ADSM. Provide a name that is unique to ADSM. The policy set identifies the policy domain.

```
define policyset 1YRPD 1YRPS -
     desc='Policy set for DB2 file storage'
```

Defining the management class

The following example shows how to define a management class to ADSM. Provide a name that is unique to ADSM. The management class identifies the policy domain and the policy set.

```
define mgmtclass 1YRPD 1YRPS 1YRMG -
     desc='Management class for DB2 file storage'
```

Defining the archive copy group

The archive copy group determines ADSM options for the DB2 for AIX archived log files, including the number of days that ADSM maintains the files. DB2 for AIX log files must be maintained until they are no longed needed for database or table space recovery. Log files are valid between full, offline backup images of the database. When you create a full, offline backup image of the database, the log files created prior to the backup image can be deleted. For example, if you create a full, offline backup image of the database every thirty days, you must keep log files for at least thirty days. If you do not create full, online backup images of the database, we recommend that you maintain the files indefinitely.

The following example shows how to define an archive copy group. The archive copy group identifies the policy domain, policy set, and management class. The archive copy group also identifies the storage pool where ADSM manages the DB2 for AIX archived log files and the length of time that ADSM maintains the files. In the example, ADSM maintains each DB2 for AIX archived log file stored in the storage pool for 366 days.

```
define copygroup 1YRPD 1YRPS 1YRMG standard -
       type=archive dest=ODAIX1 retver=366
```

Defining the backup copy group

The backup copy group determines ADSM options for the DB2 for AIX backup images, including the number of versions of each backup image maintained and the length of time that ADSM maintains them. Plan to save one version of each backup image. By default, ADSM maintains files in a backup copy group until they are deleted by an administrator.

The following example shows how to define a backup copy group. The backup copy group identifies the policy domain, policy set, and management class. The backup copy group also identifies the storage pool where ADSM manages the DB2 for AIX backup images and the number of versions of each backup image that ADSM maintains. In the example, ADSM maintains one version of each DB2 for AIX backup image file indefinitely.

```
define copygroup 1YRPD 1YRPS 1YRMG standard -
       type=backup dest=ODAIX1 verexists=1
```

Assigning a default management class

You must assign a default management class for a policy domain. The following example shows how to assign a default management class.

```
assign defmgmtclass 1YRPD 1YRPS 1YRMG
```

Validating the policy set

Before you activate a policy set, it must be validated by ADSM. The following example shows how to validate the policy set.

```
validate policyset 1YRPD 1YRPS
```

Activating the policy set

You must activate the policy set to make the definitions available to ADSM. The following example shows how to activate the policy set.

```
activate policyset 1YRPD 1YRPS
```

16.4 Registering the DB2 storage node in ADSM

You must register a storage node in ADSM for DB2 for AIX to use when archiving log files or storing backup images. The storage node identifies the policy domain where ADSM obtains the definitions for managing the files stored in the domain. The node name must be the TCP/IP host name of the server where DB2 for AIX is running. The node name must unique to ADSM. You must supply a node password.

The following example shows how to register a node.

```
register node everest password domain=1YRPD -
       contact='OnDemand/DB2 <administrator names>'
```

16.5 Setting the ADSM node password in DB2

You must configure DB2 with the ADSM node and password the database manager uses to log on to ADSM. The database manager logs on to ADSM, when required, to store archived log files and backup image files in ADSM-managed storage. Part of the log on process includes verification of the ADSM node and node password. Configure DB2 with the same node name and password that you registered in ADSM (refer to topic 16.4, “Registering the DB2 storage node in ADSM” on page 89).

To set the ADSM node password in DB2:

- Login to AIX as the root user.
- Run the dsmapipw command, specifying the ADSM node and password that you registered in topic 16.4, “Registering the DB2 storage node in ADSM” on page 89.

Refer to Setting up an ADSTART Distributed Storage Manager Client in the *DB2 for AIX Administration Guide* for details about setting the node password in DB2 and the dsmapipw command.

If you change the ADSM node password, you must also change the password in DB2.

16.6 Space requirements

The storage pool where ADSM manages the DB2 for AIX log files and backup images must contain enough storage to hold the files needed to recover your database. Since we recommend that you maintain database files indefinitely, you must plan to allocate a sufficient number of storage volumes to meet these needs. For example, a single log file requires approximately 1.3 MB of storage space. Depending on the amount of data that you store in OnDemand and the frequency of full database backups, you may need to maintain hundreds of log files in ADSM-managed storage. Depending on the frequency and type of backup images you create, you may need to maintain several database and table space backup images. Depending on the size of your database and tables, each backup image may require several storage volumes. Finally, if you plan to migrate large tables of application group data to their own table spaces, DB2 for AIX requires storage for a backup image of each migrated table.

16.7 Backup considerations

Depending on the size of the database and the frequency of backups, you may need to regularly initialize and load scratch storage volumes into the storage library. If ADSM determines there is not enough space available in the storage pool, it can request a mount for a scratch storage volume. However, the backup command cannot complete until the mount request is satisfied. If you operate in an unattended environment, this could have an adverse affect on system availability, especially when running an offline backup.

By default, when creating a backup image, DB2 for AIX opens a single session to ADSM to store the backup image. A session requires its own drive and storage volume. Depending on your system configuration and operating environment, you may be able

to allocate additional sessions to the backup process. Allocating additional sessions improves the performance of the backup process. For example, if you allocate two sessions to the backup process, the backup image can be written to two storage volumes in parallel, considerably reducing the time required to complete the backup image. However, before changing the default set up, please remember:

- To support more than one session, the storage library where ADSM maintains the backup image must have two or more drives.
- If the storage library where ADSM maintains the backup image is also used to maintain OnDemand application group data, running the backup process at the same time that users are querying data or you are loading data into OnDemand results in contention for drives and storage volumes. Increasing the number of sessions for the backup process intensifies the contention.

To increase the number of ADSM sessions available to the backup process, locate the string OPEN 1 SESSION in the ars_db shell script file. Change the string to the number of sessions that you want to make available to the backup process. For example, to make two sessions available to the backup process, change the string to OPEN 2 SESSION.

In addition to storing the DB2 for AIX log files and backup images in ADSM, we strongly encourage you to regularly back up the ADSM database and control files. Doing so can help prevent prolonged system outages in the event that you need to recover the database. You can define a schedule to ADSM that automatically starts the backup process on a regular basis. The *ADSM Administrator's Guide* describes how to define ADSM schedules.

17.0 Verify the OnDemand server configuration file

When you start OnDemand, the server program reads the ars.cfg file to obtain information about license management, servers, processes, and the database, storage, and server print manager programs, such as the locale, location of program, configuration, and temporary work space directories, the name of the OnDemand database, where to store DB2 for AIX log files, and the method used to migrate tables to table spaces and import tables from archive media to the database.

Before you create the OnDemand database, start OnDemand, use archive media or server print functions, migrate tables to table spaces, or import tables from archive media to the database, review the settings in the ars.cfg file. If necessary, make changes to the file. If you make changes to the ars.cfg file after starting the server, you must stop and restart the server to use the modified file.

Note: Depending on the type of server you are configuring, the ars.cfg file may not contain all of the environment variables listed in the following topics. For example, when you configure an object server, you do not define the license management, log file, server print manager, and database manager variables.

To change the ars.cfg file, login to AIX as the *root* user. Change to the /usr/lpp/ars/config directory. Copy the installed configuration file, ars.cfg, to ars.cfg.orig. Make any required modifications to the ars.cfg file using a standard text editor. Edit the file with a text editor that does not substitute characters (for example, the blank and tab characters) and does not truncate lines. When in doubt, use the *vi* editor.

17.1 Verify license information

Verify, and if necessary, change the variable that determines the method used to manage license information and the variable that determines the maximum number of concurrent users allowed on the system. By default, OnDemand manages license information on the library server. You can optionally use iFOR/LS to manage license information. If you plan to use iFOR/LS to manage license information, contact the IBM support center before proceeding.

If you need to support more than one concurrent user, you must acquire Entitlements for Additional Users. Entitlements for additional users do not require additional or different license keys. The product license key provided with the base product unlocks the product for use and does not restrict the number of concurrent users. It is up to you, the purchaser of the product, to make sure that you have sufficient entitlements for the number of users.

If you acquire additional entitlements, you need to update the ARS_NUM_LICENSE variable in the ars.cfg file with the number of concurrent users allowed. You must stop and restart the system (library server) before the new value takes effect.

The ARS_NUM_LICENSE variable does not display the maximum number of concurrent users. The value is the number of licenses you entered. To see if your

system has exceeded the allowed number of users, search the system log for error messages issued when too many users have accessed the library server concurrently.

Table 9 lists the license management environment variables.

Table 9. License Management Environment Variables in ars.cfg

Variable	Meaning	Default
ARS_NUM_LICENSE	Determines the number of concurrent users allowed to access the library server. This variable is valid only when you use OnDemand to manage license information. This variable is ignored on an OnDemand object server.	1
ARS_USE_IFORLS	Determines the method used to manage license information. The default value is 0 (zero) which means that OnDemand manages license information. If you plan to use iFOR/LS to manage license information, contact the IBM support center before proceeding. This variable is ignored on an OnDemand object server.	0

17.2 Verify and modify language settings

Verify, and if necessary, change the variables that OnDemand uses to determine the national language environment you wish to use by setting the LANG environment variable to the desired locale and the ARS_CODEPAGE environment variable to the desired code page. The *DB2 for AIX Installation and Operation Guide* provides details about national language support, including a table that lists the supported locales and code pages.

Note: You must provide the correct locale and code page for your country's operating environment before you create the OnDemand database. When users access the database, the locale and code page determine date and time presentation format and determine whether character data conversion is required.

After you create the database, you must never change the locale or code page.

Table 10 lists the language and code page environment variables.

Table 10 (Page 1 of 2). Language Environment Variables in ars.cfg

Variable	Meaning	Default
LANG	The locale value, which is a combination of the language and territory. The territory is used to map to the country code.	en_US

Table 10 (Page 2 of 2). Language Environment Variables in ars.cfg

Variable	Meaning	Default
ARS_CODEPAGE	The code page, which is the IBM-defined code page as mapped from the operating system code set.	819

17.3 Verify and modify server settings

Verify and if necessary, make changes to the variables that OnDemand uses to determine the name of the library and object server, the number of processes to start to support database connections, and the server communication method. Table 11 lists the server environment variables.

Table 11 (Page 1 of 2). Server Environment Variables in ars.cfg

Variable	Meaning	Default
ARS_SRVR	The name of the OnDemand library server. If you are configuring an OnDemand object server, set this parameter to the TCP/IP host name alias, fully qualified host name, or IP address of the library server. If you are configuring an object server on an SP node and you want to use IP addresses, set this variable to the external IP address of the node where you installed the library server. If you are configuring an OnDemand library server, do not set this parameter.	Null
ARS_LOCAL_SRVR	The name of the object server. If you are configuring an OnDemand object server, set this parameter to the TCP/IP host name alias, fully qualified host name, or IP address of the object server. If you are configuring an object server on an SP node and you want to use IP addresses, set this variable to the external IP address of the node where you installed the library server. If you assign a storage node to an object server, you must use the value of the ARS_LOCAL_SRVR variable for the object server name in the storage node definition. If you are configuring an OnDemand library server, do not set this parameter.	Null

Table 11 (Page 2 of 2). Server Environment Variables in ars.cfg

Variable	Meaning	Default
ARS_NUM_DBSRVR	Determines the number of processes that OnDemand starts on the library server to support database requests. Refer to 17.9, “About the ARS_NUM_DBSRVR parameter” on page 100 for details about parameter values. Do not set this parameter on an OnDemand object server.	0
ARS_DBSRVR_COMM	OnDemand database connections require the Portable Streams Environment (PSE). You must verify that the correct PSE driver is loaded before you start OnDemand. Enter `strload -q -d spx` at the AIX prompt. If the driver is loaded, AIX responds with `spx: yes`. To load the driver, enter `strload -d spx` at the AIX prompt. For more information about the *strload* command and loading PSE drivers and modules, issue the `man strload` command. Do not set this parameter on an OnDemand object server.	STREAMS

17.4 Verify and modify log file setting

Verify and if necessary, make changes to the variable that OnDemand uses to determine the location of the DB2 for AIX offline archived log files. Table 12 lists the log file environment variable.

Table 12. Log File Environment Variable in ars.cfg

Variable	Meaning	Default
ARS_ARCHIVE_LOGPATH	Set to the directory that contains the offline archived log files. The *db2uexit.disk* program copies online archived log files from the primary log file directory to the archive log file directory. An archived log file becomes *offline* when it is no longer stored in the primary log file directory. After creating a backup image of the database, the ars_db command removes the offline archived log files. OnDemand ignores this parameter if you use ADSM to manage DB2 log files. Do not set this parameter on an OnDemand object server.	/arsdb_archivelog

17.5 Verify and modify temporary data filesystem setting

Verify and if necessary, change the variable that determines where various OnDemand programs store temporary data. Table 13 lists the work directory variable.

Table 13. Temporary Data Filesystem Variable in ars.cfg

Variable	Meaning	Default
ARS_TMP	The location where OnDemand stores work files. You must allocate sufficient free space in this directory or filesystem to support tasks such as migrating and importing index data. We strongly encourage you to define a dedicated filesystem where OnDemand can store temporary work files. We recommend that at least 500 MB of free space be available in this filesystem at all times. If your storage configuration permits, we recommend that you allocate 1 GB of free space to this filesystem. The permissions for the filesystem must be `drwxrwxrwt`. Use the chmod command to set the permissions. For example, `chmod 1777 /arstmp` sets the proper permissions for the /arstmp filesystem. Set this parameter on each OnDemand server.	/arstmp

17.6 Verify and modify server print manager setting

Verify and if necessary, make changes to the variable that OnDemand uses to support server-based printing. Table 14 on page 98 lists the server print environment variable.

Table 14. Server Print Environment Variable in ars.cfg

Variable	Meaning	Default
ARS_PRINT_PATH	The location where OnDemand temporarily stores print data used by the server print manager. Make sure that enough space is available in this location to hold print files for the maximum number of concurrent print requests that you anticipate the server must manage. We strongly encourage you to define a dedicated filesystem where OnDemand can store temporary print files. We recommend that at least 500 MB of free space be available in this filesystem at all times. If your storage configuration permits, we recommend that you allocate 1 GB of free space to this filesystem. The permissions for the filesystem must be `drwxrwxrwt`. Use the chmod command to set the permissions. For example, `chmod 1777 /arstmp` sets the proper permissions for the /arstmp filesystem. Do not set this parameter on an OnDemand object server.	/arstmp

17.7 Verify and modify database manager settings

If you are configuring the OnDemand library server, verify and if necessary, make changes to the variables that OnDemand uses to work with DB2 for AIX. Table 15 lists the database environment variables.

Table 15 (Page 1 of 2). Database Environment Variables in ars.cfg

Variable	Meaning	Default
DB2DBDFT	Set to the database alias name of the OnDemand database. OnDemand connects to the database when applications are started. Do not set this parameter on an OnDemand object server.	ARCHIVE
DB2INSTANCE	The name of the instance owner you created when you configured DB2 for AIX. Topic 13.1, “Create an instance of DB2 for AIX” on page 47 provides information about defining the instance owner. Do not set this parameter on an OnDemand object server.	archive

Table 15 (Page 2 of 2). Database Environment Variables in ars.cfg

Variable	Meaning	Default
ARS_DB_ADSM_CONFIG	The name of the ADSM user options file that identifies the ADSM server that manages the DB2 archived log files and backup image files. You must set this parameter if you use ADSM to manage DB2 archived log files and backup image files. Topic 16.0, "Using ADSM to manage DB2 files" on page 85 provides details about configuring ADSM to manage DB2 archived log files and backup image files. Do not set this parameter on an OnDemand object server.	/usr/lpp/adsm/bin/ dsm.opt.db2
ARS_DB_IMPORT	Determines the method OnDemand uses to process table space migration and import tables from archive media to the database. Refer to 17.10, "About the ARS_DB_IMPORT parameter" on page 102 for details about parameter values. Do not set this parameter on an OnDemand object server.	0
ARS_DB_TABLE_SHARE	Determines whether a database process can lock a table. By default, tables cannot be locked. We recommend that you use the default setting. Contact the IBM support center before you change the value of this variable.	Null
ARS_DB_RUNSTATS_SHARE	Determines whether a database process can make changes to a table while the RUNSTATS utility is active. By default, tables can be changed. We recommend that you use the default setting. Contact the IBM support center before you change the value of this variable.	Null
ARS_DB_RUNSTATS_OPTIONS	Determines the level of statistical information gathered by the RUNSTATS utility. We recommend that you use the default setting. Contact the IBM support center before you change the value of this variable.	Null
ARS_DB_PARTITION	Determines whether the database supports partitioning of data across nodes or systems. By default, the database does not support partitioning. If the database you install supports partitioning, change the value of this variable to 1 (one). Currently, partitioning is supported by IBM DB2 Universal Database Version 5: Extended Enterprise Edition. To store application group index data across partitions, an application group must identify a partition field.	Null

17.8 Verify and modify storage manager settings

Verify and if necessary, make changes to the variables that OnDemand uses to work with ADSM. Table 16 lists the storage manager environment variables.

Table 16. Storage Manager Environment Variables in ars.cfg

Variable	Meaning	Default
DSMSERV_DIR	The directory that contains the ADSM server files.	/usr/lpp/adsmserv/bin
DSMSERV_CONFIG	The full path name of the ADSM server options file.	/usr/lpp/adsmserv/bin/dsmserv.opt
DSM_DIR	The directory that contains the ADSM space management client files.	/usr/lpp/adsm/bin
DSM_CONFIG	The full path name of the ADSM space management client options file.	/usr/lpp/adsm/bin/dsm.opt
DSM_LOG	The directory where ADSM stores the space management client error log.	/tmp
DSMG_DIR	The directory that contains the ADSM administrative client files.	/usr/lpp/adsm/bin
DSMG_CONFIG	The full path name of the ADSM administrative client options file.	/usr/lpp/adsm/bin/dsm.opt
DSMG_LOG	The directory where ADSM stores the administrative client error log.	/tmp
DSMI_DIR	The directory that contains the ADSM API files.	/usr/lpp/adsm/bin
DSMI_CONFIG	The full path name of the ADSM API options file.	/usr/lpp/adsm/bin/dsm.opt
DSMI_LOG	The directory where ADSM stores the ADSM API error log.	/tmp

17.9 About the ARS_NUM_DBSRVR parameter

The ARS_NUM_DBSRVR parameter determines the number of processes that OnDemand starts on the library server to support database requests. This provides a performance advantage by distributing the server workload over several processes, while balancing the impact on system resources.

In addition to database connections by OnDemand end-user client programs, the value that you set must support:

- The DB2 command line processor.
- The number of active *ars_db* processes.
- The number of active *ars_load* processes (two for each).

Description

Each connection to the OnDemand database requires a database agent. OnDemand can start a database agent for each connection. However, each agent requires its own private memory and some portion of application shared memory. You can use the ARS_NUM_DBSRVR parameter to optimize the way that OnDemand handles the database load. For example, you can define ARS_NUM_DBSRVR so that OnDemand starts a fixed number of database agents, regardless of the number of concurrent database requests. While this may appear restrictive, database requests typically process very quickly. For example, ten database agents can handle a heavy database request load, while balancing the impact on system resources.

The ARS_NUM_DBSRVR parameter supports high performance database access for OnDemand servers with the following characteristics:

- Many concurrent database requests. For example, a system with 20 concurrent users.
- One or more load processes active.
- One or more database maintenance processes active.
- Database administration from the DB2 command line.

We recommend that you set the ARS_NUM_DBSRVR parameter to support the peak number of concurrent database connections that you expect the library server to handle. A low value limits access to the database during periods of high database activity. A high value requires more system resources during periods of high database activity. The value that you choose also depends on the characteristics of the queries. For example, general queries typically keep a connection open longer than a more specific query.

Examples

Use the *ps -ef | grep ars* and *ps -ef | grep db2* commands to display AIX processes:

1. The default setting of `ARS_NUM_DBSRVR=0` is recommended for servers that support a small number of concurrent users. OnDemand starts a process to handle the database connection for each client request.
   - One main *arssockd* process.
   - One additional *arssockd* process for each database connection.
   - One *db2agent* process for each database connection.
2. Set the number of database servers to ten, `ARS_NUM_DBSRVR=10`, for servers that support many concurrent users. OnDemand starts ten processes to handle all database connections.
   - One main *arssockd* process.
   - Ten additional *arssockd* processes.
   - A maximum of eleven *db2agent* processes, based on the number of database connections.

Notes

1. The size of the DB2 for AIX MAXAPPLS database parameter must exceed the size specified in the ARS_NUM_DBSRVR parameter.

   The MAXAPPLS parameter determines the maximum number of simultaneous database connections. The default value is 20 (twenty).

   We recommend that you set this parameter to three times the value specified in the ARS_NUM_DBSRVR parameter.

   If you set the ARS_NUM_DBSRVR parameter to zero and you expect the server to handle more than twenty concurrent database connections, you must increase the value of the MAXAPPLS parameter.

   Refer to the DB2 documentation for details about modifying the MAXAPPLS parameter.

2. The size of the AIX NUMBER of Processes per User parameter must exceed the size of the MAXAPPLS parameter plus the number of processes started by the DB2 for AIX instance owner. The AIX default value is 20 (twenty), and is increased to 500 during installation of DB2 for AIX.

17.10 About the ARS_DB_IMPORT parameter

The ARS_DB_IMPORT environment variable in the ars.cfg configuration file determines the method OnDemand uses to migrate tables to table spaces with the arstblsp command. OnDemand also uses the ARS_DB_IMPORT environment variable to determine the method to import tables from archive media to the database.

Choose the method by setting the ARS_DB_IMPORT environment variable in the ars.cfg file to one of the following values:

0 Use the EXPORT and IMPORT commands to migrate table data. This method requires disk space to hold log records generated when exporting existing table data and importing data to the new table space. This is the default migration method.

1 Use the EXPORT and LOAD commands to migrate table data. This method requires disk space to hold log records generated when exporting existing table data. The LOAD command generates a backup image of the new table space. The image file is stored in ADSM-managed storage. This is the recommended migration method.

Note: Before you can use ADSM to manage DB2 for AIX backup images, you must properly configure ADSM. Refer to topic 16.0, “Using ADSM to manage DB2 files” on page 85 for details.

2 Use the EXPORT and LOAD commands to migrate the table data. This method requires disk space to hold log records generated when exporting existing table data. The LOAD command generates a backup image of the new table space. The image file is stored in the filesystem identified by the ARS_TMP environment variable (set in the ars.cfg file).

18.0 Link OnDemand server programs

After installing OnDemand software on a RS/6000, you must create a link to the OnDemand server program that will run on the RS/6000. For example, if you plan to run a cache-only library server on the RS/6000, you must create a link to the OnDemand cache-only server program.

OnDemand provides the arslink command to create the link to the server program. Specify the appropriate options when you run the arslink command. The options are:

-a Link an ADSM library server.

-ao Link an ADSM object server.

-x Link a cache-only library server.

-xo Link a cache-only object server.

Run the arslink command one time on each server or node that is part of the OnDemand system. For example, if OnDemand runs on two RS/6000s, run the arslink command once on each RS/6000. If the OnDemand system runs on four nodes of an RS/6000 SP, run the arslink command once on each node.

18.1 Examples

To link the OnDemand programs to a library server with ADSM on the same RS/6000, enter the following command at the prompt:

```
/usr/lpp/ars/config/arslink -a
```

To link the OnDemand programs to a cache-only library server, enter the following command at the prompt:

```
/usr/lpp/ars/config/arslink -x
```

To link the OnDemand programs to an object server with ADSM on the same RS/6000, enter the following command at the prompt:

```
/usr/lpp/ars/config/arslink -ao
```

To link the OnDemand programs to a cache-only object server, enter the following command at the prompt:

```
/usr/lpp/ars/config/arslink -xo
```

18.2 Unlinking server programs

If you need to change the links that you created, you must unlink the programs from the server. You can use the `-u` flag of the arslink command to unlink the programs. To unlink the programs from a server, enter the following command at the prompt:

```
/usr/lpp/ars/config/arslink -u
```

After unlinking the programs, you must relink the programs to the proper server before you can continue configuring the server.

19.0 Creating the OnDemand database

OnDemand stores report file index data, application support information, and other data required for OnDemand operation in DB2 for AIX tables on the library server. Before you define OnDemand objects or archive data in OnDemand, you must create the OnDemand database structure and initialize the control information and application support tables. The database resides on the OnDemand library server.

Before you create the OnDemand database, you must verify and make changes to database variables set in the ars_db shell script. The file can be found in the */usr/lpp/ars/bin* directory. After modifying the file, you can invoke the *ars_db* command to create, initialize, and bind the database. The *Administrator's Reference* describes the ars_db command, options, and parameters.

19.1 Verify and modify database environment variables

1. Login to AIX as the *root* user.
2. Change to the */usr/lpp/ars/bin* directory.
3. Copy the installed shell script, ars_db to *ars_db.orig*.

   Note: Whenever you modify a file, first make a backup copy of the current "production" file. Edit the file with a text editor that does not substitute characters (for example, the blank and tab characters) and does not truncate lines. When in doubt, use the *vi* editor.
4. Make changes to the ars_db file with a standard text editor, such as *vi*. Table 17 lists the database environment variables set in the *ars_db* file.

Table 17 (Page 1 of 2). Variables in ars_db Shell Script File

Variable	Description	Default[Range]
ARS_CODESET	The code set associated with the locale for your country's operating environment. You must provide the correct locale, code set and code page before you create the database. Set the locale and code page in the ars.cfg file. Refer to 17.2, "Verify and modify language settings" on page 94 for details. The DB2 documentation provides details about national language support, including a table that lists the supported locales, codes sets, and code pages.	IS08859-1
ARS_DBPATH	Base database filesystem. The filesystem where the database manager stores system tables and allocates the USERSPACE1 table space. Verify the filesystem name. Topic 7.2, "Setting up storage devices" on page 25 provides information about configuring volume groups and filesystems.	/arsdb
ARS_LOGPATH	Directory for the active archived log files. Verify the file system and directory used to store the active archived log files. Topic 7.2, "Setting up storage devices" on page 25 provides information about configuring volume groups and file systems.	/arsdb_primarylog

Table 17 (Page 2 of 2). Variables in ars_db Shell Script File		
Variable	**Description**	**Default[Range]**
ARS_BUF_PAGE	Size of the database buffer pool in 4 KB blocks.	12500 [2-524288]
ARS_DBHEAP	Size of the database heap in 4 KB blocks.	640 [32-60000]
ARS_LOGFILSIZ	Size of the log file in 4 KB blocks.	1000 [4-16384]
ARS_LOGPRIMARY	Number of primary log files.	40 [2-128]
ARS_BUF_SIZE	Size of the buffer when backing up the database in 4 KB blocks. This value is set to 0 (zero) in the shell script, which means to use the DB2 for AIX default value (1024).	0 [16-524288]

OnDemand database considerations

ARS_BUF_PAGE

If you plan to operate OnDemand on a RS/6000 with less than 128 MB of RAM, change the ARS_BUF_PAGE value. This value should be set to approximately half the available memory in the machine. For example, if the RS/6000 has 32 MB of RAM, set ARS_BUF_PAGE to 4000 (16 MB). However, we recommend that you do not increase ARS_BUF_PAGE to a value greater than 12500 (50 MB), regardless of the amount of RAM on the RS/6000.

ARS_DBHEAP

The database heap primarily contains control block information and log file buffers. Its size is dependent on the number of simultaneous connections to the database and the number of log file buffers. The default value for the database heap provides enough storage to support more than fifty concurrent database connections. The DB2 documentation provides details about configuring this parameter.

ARS_LOGFILSIZ and ARS_LOGPRIMARY

If you plan to install OnDemand on a RS/6000 configured with less than 4 GB of magnetic storage space, you may need to adjust the ARS_LOGFILSIZ and ARS_LOGPRIMARY values. These values determine the total amount of space available to DB2 for AIX to log changes to the database. The values that you use must support the largest single report file load or unload that you anticipate. DB2 for AIX will fail, if there is not enough log file space to support a report file load (or unload).

The amount of data that you plan to store in OnDemand and the frequency and type of database backups affects the size and number of log files that you must allocate for DB2 for AIX. You must allocate enough storage space in the file system that contains the primary log files to satisfy the requirements for the primary log files. The default values (ARS_LOGFILSIZ * ARS_LOGPRIMARY) require 160 MB of free space in the file system.

Please review Estimating Database Storage and Estimating Transaction Log File Storage in the *Introduction and Planning Guide* for information about estimating the

amount of storage that you need to allocate for the OnDemand database and DB2 for AIX log files.

19.2 Set access to database directories

The *sysadm1* group must have write access to the directory names specified in the ARS_DBPATH, ARS_LOGPATH, and ARS_ARCHIVE_LOGPATH environment variables.

The *sysadm1* group is the group that you created when you configured DB2 for AIX. Topic 13.1, “Create an instance of DB2 for AIX” on page 47 describes how to create the *sysadm1* group. Topic 19.1, “Verify and modify database environment variables” on page 105 describes setting the ARS_DBPATH and ARS_LOGPATH variables. 17.4, “Verify and modify log file setting” on page 96 describes setting the ARS_ARCHIVE_LOGPATH variable.

If necessary, change the owner of the directories to *sysadm1*.

1. Login to AIX as the *root* user.
2. Use the *chown* command to change directory ownership.

   For example, to change the */arsdb* directory to the *archive* owner and the *sysadm1* group, type the following command at the prompt:

```
chown -R archive:sysadm1 /arsdb
```

3. Issue the *chown* command to change the ownership of the directories specified in the ARS_DBPATH, ARS_LOGPATH, and ARS_ARCHIVE_LOGPATH environment variables.

For more information about the *chown* command, type **man chown** at the prompt or refer to your AIX documentation.

19.3 Create the OnDemand database

After making any necessary changes to the database variables set in the ars_db shell script file (refer to topic 19.1, “Verify and modify database environment variables” on page 105), you can run the ars_db command to start DB2 for AIX and initialize the OnDemand database. The ars_db command does the following tasks to create the database:

- Reads database configuration specifications.
- Updates the database configuration.
- Verifies the directories for the primary and archived log files.
- Builds the OnDemand support tables and indexes.
- Builds application support tables and indexes.

- Binds the database to OnDemand.
- Creates a backup of the database.

To start DB2 for AIX and create the database:

1. Login to AIX as the *root* user.
2. Type the following command at the prompt:

```
/usr/lpp/ars/bin/ars_db -gcv
```

3. The ars_db command reads the value of the LANG environment variable in the ars.cfg file and prompts you to verify the locale.
   - If the ars_db command displays the correct locale, type `Y` and press the Enter key to continue.
   - If the ars_db command displays the incorrect locale, type `N` and press the Enter key. The ars_db command stops, and does not create the database.

     You must provide the correct locale, code set and code page before you re-run the ars_db command to create the database. Set the locale and code page in the ars.cfg file. Refer to 17.2, “Verify and modify language settings” on page 94 for details. Set the code set in the ars_db file. Refer to topic 19.1, “Verify and modify database environment variables” on page 105 for details.
4. OnDemand creates the database, makes a backup image of the database, and restores the OnDemand tables to the database. This process will take several minutes.

The ars_db command creates the database using SQL commands. Refer to the DB2 documentation for information about the SQL commands issued by the ars_db command and messages printed at the console.

20.0 Creating the system logging facility

This topic describes how to initialize the OnDemand system logging facility. OnDemand provides the system logging facility as an aid to the system administrator. OnDemand writes messages generated by the programs and commands that service end-user requests and support the data loading and maintenance processes to the system log. The system logging facility is critical to the operation of the system.

OnDemand maintains the system logging facility on the library server. The system logging facility includes an application group, application, and folder.

Before starting OnDemand for the first time, you must initialize the system log on the library server with the arssys.create command. The arssys.create command is a shell script file that does the following tasks:

- Builds the system logging facility tables and indexes.
- Creates a folder, application group, and application for the system log.

Complete the following steps to create the system logging facility:

1. Login to AIX as the *root* user.
2. Type the following command at the prompt:

```
/usr/lpp/ars/config/arssys.create -l
```

The `-l` flag causes the arssys.create command to initialize the system logging facility.

21.0 Configuring the system log user exit

You can configure OnDemand to record information, warning, and error messages in the system logging facility. OnDemand can record messages about system activity, such as logon and logoff, and application group activity, such as queries and data retrieval. In addition, you can configure OnDemand to pass these messages to the system log user exit program.

- You enable OnDemand to record system messages and determine the types of system messages recorded in the system log by selecting the appropriate options in the System Parameters dialog box.
- You enable OnDemand to record application group messages by selecting the appropriate option in the System Parameters dialog box.
- You can determine the types of application group messages OnDemand records in the system log by setting Message Logging options when you create or update an application group.
- You enable OnDemand to pass system and application group messages to the system log user exit by selecting the appropriate options in the System Parameters dialog box.

When you've completed these steps, OnDemand records messages in the system log and passes the messages to the system log user exit.

When OnDemand passes a message to the system log user exit, it calls the *arslog* script in the */usr/lpp/ars/bin* directory. By default, the script does not perform any function. However, you can replace the script with one that does specific functions, such as check the message number and issue alerts using, for example, NetView.

A message passed to the arslog shell script contains the fields listed in Table 18 on page 112.

Table 18. System Log User Exit Shell Script Variables

Variable	Purpose	Example
$1	Time stamp	08/13/95 14:24:31
$2	Log record identifier	57049
$3	OnDemand userid	ADMIN
$4	User's accounting information	Z76-001J/999999
$5	Severity: **1** Alert **2** Error **3** Warning **4** Information **5** Debug	3
$6	Message number	31
$7	Message text	Failed Login: odaixlib1 7.52.365.12

If you modify and run the arslog shell script, remember that:

- The script runs under the UID of the *root* user. The *root* user is a privileged account with unrestricted access to all files and commands.
- You should specify the full path name of all commands invoked from the script. For example, specify */bin/mail*, not *mail*.

OnDemand script files are Korn shell scripts and programs are coded in the C language. However, the user exit logging script can call any executable file. It is your responsibility to develop the user exit logging script and validate the quality and performance of the script. The actual mechanism for taking action based on the messages provided by OnDemand is dependent on the software that you are using on the RS/6000.

The administrator interface online help provides information about how to enable OnDemand to write messages to the system log and pass messages to the system log user exit program. The administrator interface online help also provides information about how to choose the application group messages that OnDemand writes to the system log and passes to the system log user exit program.

The System Log table contains one row for each record written to the system logging facility. Table 19 lists the fields, data types, and descriptions of the fields that make up a system log record.

Table 19 (Page 1 of 3). System Log Table

Column Name	Data Type	Size	Description
time_stamp	Date/Time(TZ)	4	The time stamp of the log record in the OnDemand internal date format. Refer to the arsdate command for details.

Table 19 (Page 2 of 3). System Log Table

Column Name	Data Type	Size	Description
userid	VARCHAR	20	The userid of the user that generated the log record.
severity	CHAR	1	The severity of the log record. **1** Alert **2** Error **3** Warning **4** Information **5** Debugging
msg_num	SMALLINT	2	The message number of the log record.
msg_text	VARCHAR	254	The message text of the log record.
appl_id	CHAR	1	Determines whether OnDemand overhead information is valid. **A** Not applicable. The overhead information does not contain useful information. **N** No. The overhead information does not apply to the log record. However, the overhead information may be useful for other purposes. For example, a log record created when a document is retrieved contains overhead information about the document. **Y** The overhead information contains information about the document belonging to this particular log record.
log_id	INTEGER	4	The identifier for the OnDemand client connection.
account	VARCHAR	60	The user's accounting information.
doc_name	VARCHAR	11	The name of the object.
doc_off	INTEGER	4	The offset of the document within the compressed object.
doc_len	INTEGER	4	The length of the document within the compressed object. A 0 (zero) means all of the data.
comp_off	INTEGER	4	The compressed offset of the document within the compressed object.
comp_len	INTEGER	4	The compressed length of the document within the compressed object. A 0 (zero) means all of the data.

Table 19 (Page 3 of 3). System Log Table

Column Name	Data Type	Size	Description
annot	CHAR	1	Determines whether annotations exist for the document. Applies only if the annotation flag is set (YES) for the application group.
comp_type	CHAR	1	The method used to compress document data.
resource	INTEGER	4	The resource identifier for the document.
pri_nid	SMALLINT	2	The primary storage node identifier.
sec_nid	SMALLINT	2	The secondary storage node identifier.

22.0 Creating the system migration facility

This topic describes how to initialize the system migration facility.

OnDemand provides the system migration facility to maintain index data on archive media. Migration of index data from the database to archive media is based on the data caching and migration values that you define for an application group. The system migration facility is critical to the operation of the system.

OnDemand maintains the system migration facility on the library server. The system migration facility includes an application group, application, and folder.

Before starting OnDemand for the first time, you must initialize the system migration facility on the library server with the arssys.create command. The arssys.create command is a shell script file that does the following tasks:

- Builds the system migration facility tables and indexes.
- Creates a folder, application group, and application for the system migration facility.

Complete the following steps to create the system migration facility:

1. Login to AIX as the *root* user.
2. Type the following command at the prompt:

```
/usr/lpp/ars/config/arssys.create -m
```

The `-m` flag causes the arssys.create command to initialize the system migration facility.

23.0 Creating a back up copy of the database

At this point in the installation and configuration process, we recommend that you create a full, offline backup image of the OnDemand database on removable media. A full backup image of the database is required to rebuild the database, in the event that you need to do so. Table space backups are not a replacement for a full database backup image. For example, if you have a site disaster or the database becomes corrupted, even though you took backups of all the table spaces, you cannot rebuild the database unless you have a full database backup (and log files generated since the last full database backup).

Complete the following steps to create a full, offline backup of the database.

1. Log on to AIX as the *root* user.
2. Place a formatted tape volume in the tape drive.
3. Use the ars_db command to create an offline backup of the database. For example:

```
/usr/lpp/ars/bin/ars_db -v -y /dev/rmt0
```

   Replace the string `/dev/rmt0` with the name of the tape drive where you want to write the backup of the database.

4. After completing the backup, the ars_db command issues the “Backup successful” message.
5. Record information about the database backup, such as the date and volume label, and store the backup copy of the database in a safe location, preferably offsite. Save the backup copy until you create another full backup image of the database.

24.0 Defining table space filesystems

24.1 Overview

When you create the OnDemand database, the database manager allocates space for the database using configuration information that you provide. For example, the ARS_DBPATH environment variable (set in the ars_db shell script) determines the base filesystem where the database manager stores system tables and allocates the USERSPACE1 table space.

Before you begin loading reports in OnDemand, you must decide whether to store index data in the base filesystem or table space filesystems. If you decide to store index data in table space filesystems, you must define the filesystems to OnDemand.

Regardless of where you decide to store index data, you must make sure that sufficient free space is available in the filesystems to hold the index data created during load processing. If you need to allocate additional free space, you can increase the size of a filesystem or add table space filesystems.

- You must use the Database Director tool to increase the size of a database filesystem. The Database Director tool is a DB2 for AIX graphical user interface to database objects. Detailed information is provided through the online help facility within the Database Director tool.
- Adding table space filesystems allows OnDemand to improve database performance and provides flexible backup and recovery options. Table spaces allow OnDemand to locate tables of application group index data on different filesystems. You can choose to backup table spaces, rather than the entire database. If a media failure occurs and you need to recover the database, you may be able to restore the affected table space, rather than the entire database.

Before you increase the size of a filesystem or add table space filesystems, you must define physical volumes to AIX, configure the database volume group and logical volumes, and define the filesystems and mount points to AIX. Topic 7.0, “Defining and configuring storage volumes and file systems” on page 25 provides details.

24.2 About table spaces

There are two types of table spaces:

- System Managed Space (SMS) Table Space, where the AIX filesystem manager controls the storage space.
- Database Managed Space (DMS) Table Space, where the database manager controls the storage space.

In general, a DMS table space provides better performance than a SMS table space. However, OnDemand allocates all of the disk space required for a DMS table space at the time that you define the application group. The size of a DMS table space is a

factor of the maximum number of rows permitted for the table and the size of a row. A database row is calculated using the lengths of the application group fields and adding overhead required by OnDemand. Space is allocated across all defined DMS table space filesystems.

Note: We do not recommend using DMS table space filesystems because all of the space for a DMS table space must be allocated when the table space is created. We estimate the amount of space required for a DMS table space, using the maximum number of rows and the lengths of the fields defined for the application group. Because we estimate the amount of space needed, we may allocate space that is never used. It is also possible that we may not allocate enough space for a table space, which could result in data loading errors.

Space is allocated for a SMS table space when it is required. The AIX filesystem manager increases the size of a SMS table space, as required, during a load process. The AIX filesystem manager allocates space in the SMS table space filesystem with the most free space.

When you create an application group, you choose the type of table space used to store application group data (SMS, DMS, or None):

- We recommend that you use SMS table spaces.
- If your organization defines few application groups, you can use DMS table spaces.
- If you choose None, application group data is stored in the USERSPACE1 table space.

When defining table space filesystems, consider the following:

- We recommend that table space filesystems contain only OnDemand application group data.
- Do not define SMS and DMS table spaces in the same filesystem. Refer to topic 24.3, “The ars.dbfs file” for details.
- We recommend that you allocate equal amounts of disk space to each SMS filesystem.
- Set the correct permissions for each table space filesystem. Refer to topic 24.4, “Table space filesystem permissions” on page 121 for details.

For more information about table spaces, please refer to the *DB2 for AIX Administration Guide.*

24.3 The ars.dbfs file

The ars.dbfs file in the /usr/lpp/ars/config directory on the library server is the OnDemand table space filesystem configuration file. Records in this file identify the names of the filesystems that OnDemand can use to store table spaces and determine the type of table spaces created in the filesystem. As installed, the file does not contain any records. If you plan to store application group index data in table spaces, you must add at least one record to the file before you load reports into the application group.

When naming table space filesystems, we recommend that you use the following convention:

```
/filesystem TSTYPE
```

Where `filesystem` is the name of the filesystem and `TSTYPE` is the type of table spaces created in the filesystem. We recommend that the filesystem name identify the type of table spaces allocated in the filesystem. For example, the following record identifies an SMS table space filesystem:

```
/arsdb/db1/SMS SMS
```

For each record that you add to the ars.dbfs file, indicate whether the filesystem will contain SMS table spaces or DMS table spaces. The following shows an example of an ars.dbfs file that defines two SMS table space filesystems and two DMS table space filesystems:

```
/arsdb/db1/SMS SMS
/arsdb/db2/SMS SMS
/arsdb/db3/DMS DMS
/arsdb/db4/DMS DMS
```

Using the table space filesystem definitions in the example ars.dbfs file:

- When you create an application group that uses SMS table spaces, the AIX filesystem manager allocates space for the table space as needed, across the SMS table space filesystem that contains the most space, either /arsdb/db1/SMS or /arsdb/db2/SMS.
- When you create an application group that uses DMS table spaces, the database manager allocates space for the entire table space at that time, across both DMS table space filesystems, /arsdb/db3/DMS and /arsdb/db4/DMS.
- If the application group does not use table spaces, OnDemand stores application group index data in the base database filesystem.

24.4 Table space filesystem permissions

An OnDemand table space filesystem must be owned by the database instance owner and group. By default, *archive* is the instance owner and *sysadm1* is the group. Make sure that the user and group file permissions are set correctly. For example:

```
drwxrws---  3 archive sysadm1  512 May 17 12:58 /arsdb/db1/SMS
```

Figure 8. Database Filesystem Permissions

Use the *chown* command to set the ownership permissions. For example, the following command changes the owner of the /arsdb/db1/SMS filesystem to the *archive* user and the *sysadm1* group.

```
chown -R archive:sysadm1 /arsdb/db1/SMS
```

Use the *chmod* command to set the file permissions. For example, the following command sets the correct permissions for the /arsdb/db1/SMS filesystem.

```
chmod 2770 /arsdb/db1/SMS
```

25.0 Defining cache file systems

OnDemand supports cache storage for high-speed retrieval of report files and resources that you store in application groups. Before you load data that requires cache storage into OnDemand, you must notify OnDemand about the file systems available for cache storage.

You must define at least one cache file system on each server.

The ars.cache file resides in the usr/lpp/ars/config directory and contains the list of file systems on that server used by OnDemand for cache storage. The following sample ars.cache file defines five cache file systems.

```
/arscache/cache1
/arscache/cache2
/arscache/cache3
/arscache/cache4
/arscache/cache5
```

Figure 9. Defining Cache File Systems

The first entry in the file is the name of the cache file system that OnDemand uses as the base file system. After defining this file system to OnDemand, you must not change this line in the file. OnDemand creates links from this file system to the other cache file systems that you specify.

Each server requires its own ars.cache file.

Complete the following steps to set up the *ars.cache* file:

1. Login to AIX as the *root* user.
2. Change to the usr/lpp/ars/config directory.
3. Create the file using a standard text editor, such as *vi*.
4. Insert one line in the file for each file system on the server that OnDemand can use for cache storage.

   Refer to topic 7.2, “Setting up storage devices” on page 25 for details about setting up a volume group and file systems for cache file systems.
5. Save the file and exit the text editor.
6. An OnDemand cache file system must be owned by the *root* user and the *system* group. Make sure that only the user file permissions are set, not the group or other file permissions. For example:

```
drwx------  3 root system  512 Sep 22 13:08 /arscache/cache1
```

Figure 10. Cache File System Permissions

7. Use the *chown* command to set the ownership permissions. For example, the following command changes the owner of the */arscache/cache1* file system to the *root* user and the *system* group.

```
chown -R root:system /arscache/cache1
```

8. Use the *chmod* command to set the file permissions. For example, the following commands set the correct permissions for the */arscache/cache1* file system.

```
chmod 700 /arscache/cache1
chmod g-s /arscache/cache1
```

26.0 Setting up AIX initialization files

This chapter describes how to set up AIX/6000 control files so that the OnDemand and related software programs start whenever AIX is initialized.

You can use the init facility to automatically start the OnDemand server daemon and related software programs each time the RS/6000 is restarted. The init facility reads the records in the /etc/inittab file. Each record in the file defines a specific process and contains runtime parameters.

Use the *mkitab* command to add records to the init facility for the following OnDemand processes, in the order specified:

- Start ADSM, if you installed ADSM to provide archive storage management for OnDemand.
- Start DB2 for AIX on the library server.
- Start the OnDemand server daemon.

For example:

```
mkitab "arssockd:2:once:/usr/lpp/ars/bin/arssockd"
```

For more information about the *init* facility, the *mkitab* command, the /etc/inittab file, and AIX system initialization, refer to your AIX documentation.

26.1 Start ADSM

OnDemand provides the ars_adsm command to start ADSM. The following example shows an *inittab* record that causes the *init* facility to automatically start ADSM whenever AIX is initialized.

```
arsadsm:2:wait:/usr/lpp/ars/bin/ars_adsm -sv
     >> /tmp/ars_adsm.log 2>&1;
```

The *init* command must wait until ADSM is completely initialized before processing the next record in the file. Any output or error messages generated by the ars_adsm command are written to the *ars_adsm.log* file in the */tmp* directory.

The *Administrator's Reference* provides information about the ars_adsm command, options, and parameters.

Remove ADSM installation entries

When you install ADSM, the installation program adds two entries to the *inittab* file. These entries load the kernel extension and start an ADSM server. Since we recommend that you use the ars_adsm command to perform these tasks, you must delete the entries with the *rmitab* command. Enter the following commands to remove the entries from the *inittab* file:

```
rmitab "adsm"
rmitab "autosrvr"
```

26.2 Start DB2 for AIX

OnDemand provides the ars_db command to start DB2 for AIX on the library server. The following example shows an *inittab* record that causes the *init* facility to automatically start DB2 for AIX whenever AIX is initialized on the library server.

```
arsdb2:2:wait:su - archive
     "-c /usr/lpp/ars/bin/ars_db -gkv"
     >> /tmp/ars_db.log 2>&1;
```

The *init* command must wait until DB2 for AIX is completely initialized before processing the next record in the file. Any output or error messages generated by the ars_db command are written to the *ars_db.log* file in the */tmp* directory.

The *Administrator's Reference* provides details about the ars_db command, options, and parameters.

26.3 Start the OnDemand server daemon

Starting the server daemon on the library server

The following example shows an *inittab* record that causes the *init* facility to automatically start the OnDemand server daemon whenever AIX is initialized on the library server:

```
arssockd:2:once:/usr/lpp/ars/bin/arssockd
```

Starting the server daemon on an object server

The following example shows an *inittab* record that causes the *init* facility to automatically start the OnDemand server daemon whenever AIX is initialized on an object server:

```
arssockd:2:once:/usr/lpp/ars/bin/arsobjd
```

27.0 Automating data downloading, indexing, and loading

This chapter describes how to set up the OnDemand programs that receive datasets from an MVS system, store the data in file systems on the RS/6000, create index information, and load the data into application groups as tasks that never terminate, periodically check for, index, and load data, and are automatically started whenever AIX is initialized.

You can use the init facility to automatically start these programs each time AIX is initialized. The init facility reads the records in the /etc/inittab file. Each record in the file defines a specific process and contains runtime parameters.

Use the *mkitab* command to add records to the init facility. For example:

```
mkitab "arssockd:2:once:/usr/lpp/ars/bin/arssockd"
```

For more information about the *init* facility, the *mkitab* command, the /etc/inittab file, and AIX system initialization, refer to your AIX documentation.

27.1 Automating data download

The arsjesd command is an OnDemand program that typically runs as an AIX daemon, monitoring a TCP/IP port for data transmitted by MVS Download. The arsjesd command receives the data transmitted by MVS Download and stores it in file systems on the RS/6000. The *PSF/MVS: MVS Download Guide* provides details about setting up and operating MVS Download on the MVS system.

The following example shows an *inittab* record that causes the *init* facility to automatically start the arsjesd command during AIX initialization.

```
arsjesd:2:once:/usr/lpp/ars/bin/arsjesd -p 6001
     -d /arsacif/acif1 -d /arsacif/acif2 -d /arsacif/acif3
     >> /tmp/arsjesd.log 2>&1;
```

In the example, the arsjesd command monitors TCP/IP port number 6001 and stores data transmitted from the MVS system in three download directories. The arsjesd command writes output messages to the arsjesd.log file in the */tmp* directory.

Verify the TCP/IP port number that the arsjesd command monitors. If necessary, replace the string `6001` with the port number on your system. You must specify the same port number for the arsjesd command and MVS Download on the MVS system. The port number that the arsjesd command monitors is different than the TCP/IP port number that OnDemand monitors for client program requests (by default, 1445).

Verify the names of the data download directories. If necessary, replace the strings `/arsacif/acif1`, `/arsacif/acif2`, and `/arsacif/acif3` with the names of the data download directories that you set up when you defined and configured storage volumes and file systems (refer to topic 7.2, “Setting up storage devices” on page 25).

Refer to the arsjesd command in the *Administrator's Reference* for more information about the options and parameters you can specify when you use the arsjesd command to support MVS Download.

27.2 Data indexing and loading

The ars_load command is an OnDemand Korn shell script that can run as an AIX daemon to monitor specific file systems for report data downloaded from an MVS system. If the data needs to be indexed, the ars_load command calls the data indexing program and stores the index files in the specified index directory. The ars_load command then calls the database and storage manager programs to store the report data, resources, and index data into an application group. You can use the *init* command to make sure that the data indexing and loading program automatically starts each time AIX is restarted.

Note: You should carefully plan when you load reports, to avoid problems, such as locking database tables. We recommend that you do not run the ars_load command at the same time that you run database statistics (for example, running the arsmaint command with the -r option or the ars_db command with the -s option) or perform maintenance on the database (for example, running ars_db with the -m option). There may be other processes that conflict with data indexing and loading. For example, you cannot load data while an offline backup of the database is in process.

Verify ars_load shell script

Before you index files and store data in OnDemand, you must verify certain environment variables contained in the ars_load shell script file. The ars_load command is a Korn shell script that can be used to perform data indexing and loading. If necessary, make changes to the script. The file can be found in the */usr/lpp/ars/bin* directory.

1. Login to AIX as the *root* user.
2. Change to the */usr/lpp/ars/bin* directory.
3. Copy the installed shell script file, *ars_load*, to *ars_load.orig*.
4. Make any required changes to the ars_load file with a standard text editor, such as *vi*.

   Whenever you modify a file, first make a backup copy of the current “production” file. Edit the file with a text editor that does not substitute characters (for example, the blank and tab characters) and does not truncate lines. When in doubt, use the *vi* editor.
5. Verify and if necessary, change the OnDemand administrative user ID and password. Table 20 on page 131 lists the default variables in the file.

Table 20. Environment Variables in ars_load		
Variable	**Meaning**	**Default**
USERID	OnDemand administrative user ID	admin
PASSWD	Password for the OnDemand administrative user	Null

6. Save the changes to the file and exit the text editor.
7. Set the execute file permissions for the ars_load script file.

Automating data indexing and loading

The following example shows an *inittab* record that causes the *init* facility to automatically start the ars_load command during AIX initialization.

```
arsload:2:once:/usr/lpp/ars/bin/ars_load -v
     -c /arsacif/acif4
     -d /arsacif/acif1 -d /arsacif/acif2 -d /arsacif/acif3
```

In the example, the program checks for data in three download directories every ten minutes (the default polling time). If data needs to be indexed, the ars_load command calls the arsacif command, which creates index and resource data, creating files with the types *ind* and *res*, and stores the output files in the index directory (`/arsacif/acif4` in the example).

Verify the names of the data download and index directories. If necessary, replace the strings `/arsacif/acif1`, `/arsacif/acif2`, `/arsacif/acif3`, and `/arsacif/acif4` with the names of the data download and index directories you set up when you defined and configured storage volumes and file systems (refer to topic 7.2, “Setting up storage devices” on page 25).

The data loading program stores reports and optionally, resources, in the application group identified in the downloaded file name. By default, the data loading program assumes there is only one application in the application group. If there is more than one application in the application group, you may need to process the downloaded file before it is loaded. Contact the IBM support center for more information about data download exits and processing.

The ars_load command requires the user ID and password of an OnDemand user with administrator authority for the application group. The example uses the values for the user ID and password contained in the script. Refer to topic “Verify ars_load shell script” on page 130 for information about changing the user ID and password to support your environment.

After indexing the data, the ars_load command deletes the files downloaded from the MVS system. Any output or error messages generated by the data indexing and loading program are written to *stdout* and *stderr* and recorded in the system log. You can open the System Log folder and review the messages generated by the ars_load command.

The *Administrator's Reference* provides details about the ars_load command, options, and parameters.

28.0 Setting up maintenance programs

This chapter describes how to configure OnDemand maintenance programs to run automatically on a regular schedule. Processes that may need to run on a regular schedule include programs that maintain the OnDemand database and cache storage, copy data to archive media, and create backup copies of the OnDemand and ADSM databases.

Note: The business and operational requirements of your organization and the configuration of your system determine when you can run and the time available to perform maintenance, such as reorganizing and backing up the database. Most database maintenance should take place when there is little or no other activity (especially loading data or administering the system). Some maintenance tasks must run when the system is idle. You should carefully schedule maintenance processes, to avoid problems, such as locking database tables. For example, we recommend that you do not run the ars_load command at the same time that you run database statistics (for example, running the arsmaint command with the -r option or the ars_db command with the -s option) or perform maintenance on the database (for example, running ars_db with the -m option). There may be other processes that conflict; for example, you cannot load data while an offline backup of the database is in process. The time of day and frequency with which you run the maintenance programs and the processing options you specify will vary, based on your environment. For example, if you do not load data every day or you add few rows to the database when you do load data, you can schedule database maintenance less often, perhaps once a month. Conversely, if you load a high volume of data every day, we recommend that you maintain the database after the load processing completes. In addition, if your system has plenty of space available to store index data and reports, you may be able to maintain the system less often. The examples that follow demonstrate how to set up the database maintenance processes using typical options: the use of cache storage, migrating data to archive media, and maintaining the database and cache storage every day. The example commands are scheduled to run early in the morning, after load processing completes and before users begin logging on the system. Use these examples as a guideline. The exact syntax of the commands and when you run them on your system will vary.

28.1 The cron facility

You can set up AIX processes to run according to a preset schedule using the cron facility. The cron facility consists of a never-ending program, one or more crontab files that contain the entries processed by cron, and a command to update the cron schedule (add an record to a crontab file). After updating crontab files, the cron program automatically processes new entries in the files, usually within a minute after the files have been updated. crontab files are stored in the */var/spool/cron/crontabs* directory tree. The cron program automatically starts during AIX system initialization.

To create the crontab entries for the OnDemand maintenance programs, you must login to AIX as the *root* user. To add records to *root's* crontab file, use the crontab *-e* command. The crontab command reads existing records for the *root* user into an edit window. Add the OnDemand maintenance program records to the end of the file.

For more information about the cron facility, the cron program, crontab files, and the crontab command, consult your AIX documentation.

28.2 OnDemand data and cache storage maintenance program

The arsmaint command maintains application group data in the database and on cache storage using application group storage management information. The arsmaint command can migrate application group index data from the database to archive media, expire the index data from the database, delete imported index data, reorganize and optimize database tables, copy files to archive media, expire files from cache storage, and verify cache file system links and permissions.

You typically set up the arsmaint command to do these tasks on a regular schedule. If you load a high volume of data every day, we recommend that you schedule the arsmaint command after the load processing completes. You should schedule the arsmaint command to run during a period of little or no other system activity.

Please refer to the *Administrator's Reference* for more information about the arsmaint command, parameters, and options.

Scheduling arsmaint on a library server

The following example shows a crontab record that automatically starts the arsmaint command every day at 4 a.m., with options to migrate and expire application group index data, copy reports to archive media, expire reports from cache storage, validate cache file systems, and list the status of cache file systems. This format of the command is typically used when the library server and an object server reside on the same RS/6000 and support archive media.

```
00 4 * * * /usr/lpp/ars/bin/arsmaint -cdeimsv
```

The following example shows a crontab record that automatically starts the arsmaint command every day at 5 a.m., to optimize application group index data. This format of the command is used only on the library server.

```
00 5 * * * /usr/lpp/ars/bin/arsmaint -r
```

Running arsmaint on an object server

The following example shows a crontab record that automatically starts the arsmaint command every day at 4 a.m., with options to maintain cache storage and copy files to archive media. This format of the command is typically used on an object server that supports archive media and resides on a different RS/6000 than the library server.

```
00 4 * * * /usr/lpp/ars/bin/arsmaint -cmsv
```

28.3 Database index maintenance

OnDemand provides the ars_db command to maintain the OnDemand system tables in the database on the library server. For example, the ars_db command can reorganize the indexes in the Application Group table to optimize access to application group data.

We recommend that you perform maintenance on the indexes of all system tables at least twice a month, when the system is idle. The ars_db command runs only on the library server.

The following example shows a crontab record that causes the cron program to automatically start the ars_db command twice a month, on the 7th and 14th of each month, beginning at 5 a.m., using the recommended command options.

```
00 5 7,14 * * /usr/lpp/ars/bin/ars_db -mv
     >> /tmp/ars_db.log 2>&1;
```

Refer to the *Administrator's Reference* for more information about the ars_db command, parameters, and options.

28.4 OnDemand database backup command

After you load data into OnDemand and finish maintaining the database, we recommend you create a backup image of the OnDemand database. A backup image can be used to recover the database, if a hardware failure occurs or application data becomes corrupted. If you process several loads each day, you can backup the database once a day, after the last load process completes.

OnDemand provides the ars_db command to create a backup image of the database. The ars_db command runs only on the library server.

The ars_db command supports table space and database backups:

- OnDemand supports incremental table space backups and complete database backups.

- An online backup can be taken when other applications or processes are connected to the database. That is, other applications and processes can read and modify data while the backup is in process. An online backup can be scheduled with the cron facility.
- When an offline backup of the database is in process, only the backup process can be connected to the database. No other applications or processes can be connected to the database. We recommend that you stop the OnDemand system before you start an offline backup process.
- When you back up the database with the ars_db command, OnDemand removes the log files from the archived log file directory, releasing the space taken by files that are no longer needed. However, if you use ADSM to manage DB2 log files, the policy domain determines when archived log files are removed. Topic 16.0, “Using ADSM to manage DB2 files” on page 85 provides details about how to configure ADSM to manage DB2 log files.
- We recommend that you use ADSM to manage the backup image files on archive media. Doing so means that you do not have to manage the backup files on disk. Topic 16.0, “Using ADSM to manage DB2 files” on page 85 provides details about how to configure ADSM to manage backup image files.

The following example shows a crontab record that causes the cron program to automatically start the ars_db command and create a complete, online backup image of the OnDemand database every day beginning at 5:30 a.m. The backup image is written to a tape in the device */dev/rmt0*. A tape must be mounted in the device before the ars_db command starts.

```
30 5 * * * /usr/lpp/ars/bin/ars_db -v -z /dev/rmt0
     >> /tmp/ars_db.log 2>&1;
```

Please refer to the *Administrator's Reference* for more information about the ars_db command, parameters, and options, including how to use the ars_db command to backup the database to ADSM-managed storage.

28.5 ADSM database backup command

After you load data into OnDemand and finish maintaining cache storage, we recommend that you create a backup image of the ADSM database. The backup image can be used to recover the database, if a hardware failure occurs or the database becomes corrupted. If you process several loads each day, you can backup the database once a day, after the last load process completes.

You can use the ars_adsm command to create a backup image of the database.

You must define a device class for the database backup, before you can create a backup image of the database. “Define the ADSM database backup device class” on page 59 provides details about how to define the device class. You must verify that the ars_adsm shell script file references the correct device class, before you can create a

backup image of the database. Topic 14.6, “Verify and configure the ars_adsm shell script” on page 64 provides details about setting the device class in the ars_adsm shell script.

Before you can backup the database to tape, you must initialize a tape storage volume with the *dsmlabel* command. Refer to topic 14.14, “Label storage volumes” on page 69 for details. Also, if you plan to backup the database to tape, make sure that an initialized tape storage volume is mounted in the tape drive that you defined in the device class for the database backup.

The following example shows a crontab record that causes the cron program to automatically start the ars_adsm command and create a backup copy of the ADSM database every day at 5:30 a.m.

```
30 5 * * * /usr/lpp/ars/bin/ars_adsm -dv
     >> /tmp/ars_adsm.log 2>&1;
```

The example uses values for the ADSM administrative user ID and password set in the ars_adsm shell script. Topic 14.6, “Verify and configure the ars_adsm shell script” on page 64 provides instructions for changing these values.

The *Administrator's Reference* provides details about the ars_adsm command, parameters, and options.

29.0 Configuring server printing

This chapter provides general instructions about configuring PSF for AIX to provide server-based print management for OnDemand. For information about configuring PSF for AIX to support different types of printers, printer attachments, and print data streams, including AFPDS, line-data, and PCL, refer to the *IBM PSF for AIX: Print Administration* publication.

Note: If you do not plan to use PSF for AIX to provide server-based print management for OnDemand, skip this section.

If you are configuring software on an object server, skip this section. Configure PSF for AIX only on the library server.

Before you begin using PSF for AIX, complete the one-time task of setting up PSF for AIX operating environment variables. Then install and configure the various types of printers that OnDemand needs to support and define the printer queues and queue devices that PSF for AIX uses to manage the printing environment.

29.1 Set PSF for AIX environment variables

Before you start PSF for AIX and perform print manager administrative tasks, you must set up an environment for PSF for AIX. The environment consists of path statements so that PSF for AIX knows where to find executable programs.

Besides any users that you designate as administrators, we recommend that you also set up the environment for the *root* user.

To add the PSF for AIX path to a user's .profile file:

1. Login to AIX as that user. For example, *root*.
2. Create or edit the .profile file. The .profile file is located in the user's login directory.

   Note: Whenever you modify a file, first make a backup copy of the current "production" file. Edit the file with a text editor that does not substitute characters (for example, the blank and tab characters) and does not truncate lines. When in doubt, use the *vi* editor.
3. Add the following path information to the *PATH=* statement in the .profile file:

```
:/usr/lpp/psf/bin
```

The PATH statement should look similar to the following, after you add the PSF for AIX executable directory:

```
PATH=$PATH:/usr/lpp/ars/bin:/usr/lpp/adsm/bin:
     /usr/lpp/adsmserv/bin:/usr/lpp/psf/bin
```

For more information about the PSF for AIX path statement and other PSF for AIX environment variables, refer to the *IBM PSF for AIX: Print Administration* publication.

29.2 Installing printers

This section provides general information about installing an AIX-defined printer for use with PSF for AIX. An AIX-defined printer is one of four categories of printers supported by PSF for AIX. The exact procedures that you use will depend on the printer that you install and how you attach the printer to the RS/6000.

Note: Refer to the *IBM PSF for AIX: Print Administration*publication for more information about installing other types of printers supported by PSF for AIX, including a S/370 channel-attached printer, LAN-attached IPDS printers, and a TCP/IP-attached IPDS printer.

1. Read the documentation for the printer. The setup and operator guide for the printer may contain printer-specific information that you may need during printer configuration.
2. Select a parallel, serial, network, or channel port to connect the printer.
3. Shut down the system with the *shutdown -F* command.
4. Turn off the system and any external devices.
5. Connect the printer to the appropriate port.
6. Set up the printer as described in the printer documentation.
7. Restart the system.

29.3 Configuring printers

This section provides general information about configuring an AIX-defined printer for use with PSF for AIX. The exact procedures that you use will depend on the printer that you configure and how you attach the printer to the RS/6000.

Note: Refer to the *IBM PSF for AIX: Print Administration* publication for more information about configuring other types of printers supported by PSF for AIX, including a System/370 channel-attached printer, LAN-attached IPDS printers, and a TCP/IP-attached IPDS printer.

1. Login to AIX as the *root* user.
2. Use SMIT to configure the printer. Type **smitty makprt** at the prompt. SMIT displays the Select Printer/Plotter Type panel.
3. Select the printer type.
4. Select the Printer/Plotter Interface.

5. Select the Printer/Plotter Parent Adapter.
6. Enter the port number. Review and change as necessary other device characteristics on the Add a Printer/Plotter panel. The following table shows an example of values that can be used to configure a printer to support the server print option from OnDemand client programs:

Table 21. Printer Device for a Server Printer

SMIT Entry Field	Example of Value
Printer	4019
Printer Type	IBM 4019 Laserprinter
Interface	rs232
Parent Adapter	sa0
Port Number	s1
State	Available

7. Press **Enter** to configure the printer.
8. Press **F10** to exit SMIT.

29.4 Adding printer queues and queue devices

This section provides general information about adding printer queues and queue devices to support an AIX-defined printer for use with PSF for AIX. The exact procedures that you use will depend on the printer that you configure and how you attach the printer to the RS/6000.

Note: Refer to the *IBM AIX PSF for AIX: Print Administration* publication for more information about adding printer queues and queue devices to support other types of printers supported by PSF for AIX, including a S/370 channel-attached printer, LAN-attached IPDS printers, and a TCP/IP-attached IPDS printer.

A printer queue is one of several types of queues supported by the AIX/6000 general queueing system. A printer queue is the spooling area where OnDemand places print data streams for the print manager. Queues are defined in the /etc/qconfig file.

A queue device is a reference to the physical device defined for a specific printer queue. A queue can have one or more queue devices. Queue devices are defined in the /etc/qconfig file.

Note: Queue devices controlled by PSF for AIX must identify PSF for AIX as the queueing system *backend process*. The default name of the PSF for AIX program that functions as the backend process is */usr/lpp/psf/bin/ainbe*.

Use SMIT to add a print queue and queue device for a printer that you attach to the RS/6000 or a LAN-attached printer.

For information about queues and queue devices, refer to the *AIX/6000 System Management Guide: Operating System and Devices* publication.

Adding a local print queue

1. Login to AIX as the *root* user.
2. Type **smitty mkpq** at the prompt to add a local queue.
3. Select and type local print queue values. Follow the instructions provided by SMIT.
4. Press **Enter** to add the print queue.
5. Press **F10** to exit SMIT.

Adding a remote print queue

You can optionally set up a remote print queue, to support printing to devices that reside on another RS/6000 attached to the network.

1. Login to AIX as the *root* user.
2. Type **smitty mkpq** at the prompt to add a remote queue.
3. Select and type remote print queue values. Follow the instructions provided by SMIT.
4. Press **Enter** to add the print queue.
5. Press **F10** to exit SMIT.

29.5 Define the printer to OnDemand

Use the administrator interface to define the printer to OnDemand.

1. Select Printers from the Areas list of the Administrative Tasks window and choose Add.
2. In the Add a Printer dialog box, enter a Name for the printer. This is the name that users select when they want to send items to the printer using the server print command.
3. Specify the Server Queue Name. This is the name of the PSF for AIX queue that you defined in topic 29.4, “Adding printer queues and queue devices” on page 141.
4. Select Printer from the Print Type list.
5. Choose OK to define the printer to OnDemand.

30.0 Configuring server FAX

Note: If you do not plan to use PSF for AIX to provide server-based FAX for OnDemand, skip this section.

If you are configuring software on an object server, skip this section. Configure PSF for AIX only on the library server.

30.1 Overview

OnDemand allows users to FAX directly from the item they are viewing or to FAX items from the document list. OnDemand supports two FAX methods:

- The Windows client can use any FAX package that supports printing from Windows applications. For example, the WinFax Lite program. Using this FAX method, OnDemand functions as if printing to a Windows printer. All of the information required to FAX the document, such as the FAX telephone number and cover page, must be specified outside OnDemand.
- Users can send a FAX through the OnDemand server print facility, PSF for AIX. This FAX method is the same as a server print, except that the user specifies a FAX device instead of a print device. Server-based FAX is supported from any OnDemand client program. When the user selects a FAX device, OnDemand allows the user to enter FAX information, such as the user name, company, and telephone number and the recipient's name and phone number. The user can choose to have OnDemand complete the user information, by selecting an option that invokes a server user exit program (defined by the customer). The FAX information is passed to the OnDemand server, along with the FAX request. After retrieving the documents, OnDemand submits the print job to PSF for AIX for processing.

  PSF for AIX generates PCL data that is compatible with several, third-party FAX devices. Any FAX device that supports the PCL 5 data stream and can be configured to extract the FAX phone number and other parameters from the beginning of the PCL data stream can be used to support OnDemand server-based FAX. Management and tracking of a FAX is not done by OnDemand or PSF for AIX; it is usually a function of the FAX hardware or software.

This section of the book provides information to assist you with installing and configuring the OnDemand server-based FAX solution.

About PSF for AIX

PSF for AIX provides server-based print management for OnDemand. When a user selects an item and chooses the server print command, OnDemand processes the print requests and submits a print job to PSF for AIX. PSF for AIX translates the data stream for the target printer and prints the job on printers attached to an OnDemand server or a LAN-attached printer.

When a user chooses the server print command and specifies a FAX device, OnDemand displays a dialog box to collect information about the FAX operation, such as the telephone number, recipient, and cover page. The client program sends the print request to the server. The server program retrieves the document and submits the print job to PSF for AIX. OnDemand provides an exit to PSF for AIX that formats the cover page, inserting telephone numbers, names, and other information specified by the user, converts the data to PCL, and places the job on the queue associated with the FAX device.

Topic 12.0, “Installing PSF for AIX” on page 41 lists the minimum software required when you use PSF for AIX to provide server-based FAX support for OnDemand. The *IBM Print Services Facility for AIX: Print Administration* book provides details about installing, configuring, and using PSF for AIX.

Note: PSF for AIX converts the input data to PCL format, using 300-pel codepage and font files. You must select the 300-pel codepage and font files appropriate for your system when you install PSF for AIX. Refer to topic 12.0, “Installing PSF for AIX” on page 41 for details.

Configuring OnDemand FAX support -- the basics

Complete the following steps for each FAX device that you want to use with OnDemand:

1. Install and configure the FAX device.
2. Define a PSF for AIX queue.
3. Configure the arspsf command for the PSF for AIX queue.
4. Configure the PSF for AIX queue device.
5. Configure the PSF for AIX queue.
6. Define the FAX device to OnDemand.
7. Optionally create a PSF for AIX header page user exit program.

Complete the following tasks to configure FAX support for OnDemand:

1. Set environment variables in OnDemand shell script files.
2. Optionally create a FAX user exit program.

The following topics provide details about each of the steps.

30.2 Installing and configuring the FAX device

You must obtain detailed installation and configuration instructions from the vendor of the FAX device that you plan to use with OnDemand. The information that you obtain must cover the following topics:

- How to attach the FAX device to the PC or workstation.
- How to define the FAX device to AIX.

- How to attach the FAX device to a local or remote AIX queue.

You must decide a name that OnDemand will use as the AIX queue name when submitting jobs to the FAX device.

30.3 Define a PSF for AIX queue

Define a PSF for AIX queue by using SMIT to add a PSF for AIX queue for an AIX-defined printer. You define a queue for PCL output so that PSF for AIX converts data from AFP to PCL before OnDemand places it on the AIX queue associated with the FAX device.

1. Login to AIX as the *root* user.
2. Use SMIT to add a PSF for AIX queue. The fast path is **smitty psf_add_parallel**.
3. SMIT displays the Data Stream Type panel.
4. Select **PCL5**.
5. Enter the name of the PSF for AIX queue in the Printer NAME field. For example, **faxdev1**.
6. Press **Enter** to define the queue.
7. Press **F10** to exit SMIT.

30.4 Configure the arspsf command for the PSF for AIX queue

The arspsf shell script file in the */usr/lpp/ars/fax* directory is the program that OnDemand invokes to process files and send them to the FAX machine.

Note: You must create an instance of the arspsf command for each PSF for AIX queue that you define.

Copy the arspsf command

1. Login to AIX as the *root* user.
2. Change to the */usr/lpp/ars/fax* directory.
3. Make a copy of the arspsf program for the PSF for AIX queue. For example:

```
cp arspsf arspsf_faxdev1
```

Replace the string `faxdev1` with the name of the PSF for AIX queue that you defined in topic 30.3, “Define a PSF for AIX queue.”

Set environment variables

After you create a copy of the arspsf file for the PSF for AIX queue, you must modify several variables set in the file for your FAX environment.

- The FAX product. The FAX_PRODUCT variable determines an alias name for the third-party vendor of the FAX device. The OnDemand server-based FAX solution currently supports several third-party vendors. If you have questions about the supported third-party FAX vendors or if you need to support a different third-party FAX device, please contact OnDemand technical support.
- The name of the FAX queue. The FAX_QUEUE variable determines the name of the AIX queue where OnDemand places the output data. You must set the value of the FAX_QUEUE variable to the name of the AIX queue that you defined for the FAX device in topic 30.2, “Installing and configuring the FAX device” on page 144.
- The prefix that OnDemand must add to dial the recipient's FAX phone number. The PHONE_PREFIX variable determines the characters that OnDemand adds to the beginning of the dial string used by the modem to dial the recipient's FAX machine. For example, in many locations, to connect to an outside number, a user must dial `9` before dialing the phone number.

To modify the file, complete the following steps:

1. Login to AIX as the *root* user.
2. Change to the */usr/lpp/ars/fax* directory.
3. Edit the copy of arspsf shell script file that you created in “Copy the arspsf command” on page 145. For example:

```
vi arspsf_faxdev1
```

4. To set the name of the fax product, locate the string `FAX_PRODUCT`.
5. To set the name of the fax queue, locate the string `FAX_QUEUE`.
6. To set the dialing prefix, locate the string `PHONE_PREFIX`.
7. Save the file and exit the editor.

30.5 Configure the PSF for AIX queue device

Configure the PSF for AIX queue device by using SMIT to change the name of the backend program. The backend program identifies the instance of the arspsf command that you created for the PSF for AIX queue.

1. Login to AIX as the *root* user.
2. Use SMIT to configure the PSF for AIX queue device. The fast path is **smitty chpq**.
3. SMIT displays the Print Queue to Change/Show panel.
4. Select the name of the PSF for AIX queue that you defined in topic 30.3, “Define a PSF for AIX queue” on page 145.
5. SMIT displays the Change/Show Characteristics of Queue Device panel. Select Queue Device Characteristics and press Enter.

6. The BACKEND PROGRAM Pathname field identifies the program that transforms the incoming FAX job. The field should appear as follows:

```
/usr/lpp/psf/bin/ainbe faxdev1
```

   You must replace the contents of the field with the following command. Replace the first instance of the string `faxdev1` with the name of the arspsf instance that you created for the PSF for AIX queue in topic 30.4, “Configure the arspsf command for the PSF for AIX queue” on page 145. Replace the second instance of the string `faxdev1` with the name of the PSF for AIX queue that you created in topic 30.3, “Define a PSF for AIX queue” on page 145.

```
/usr/lpp/ars/fax/arspsf_faxdev1 faxdev1
```

7. Press **Enter**.
8. Press **F10** to exit SMIT.

30.6 Configure the PSF for AIX queue

Change the command to execute

Configure the PSF for AIX queue by using SMIT to change the name of the command to execute. The command to execute identifies the instance of the arspsf command that you created for the PSF for AIX queue.

1. Login to AIX as the *root* user.
2. Use SMIT to configure the PSF for AIX queue. The fast path is **smitty psf_prt_sel_device_options**.
3. SMIT displays the Printer Name / Attachment panel.
4. Select the name of the PSF for AIX queue that you defined in topic 30.3, “Define a PSF for AIX queue” on page 145.
5. SMIT displays the PCL Printer Device Options panel.
6. In the COMMAND to Execute for Printer Output field, enter the following command. Replace the string `faxdev1` with the name of the arspsf instance that you created in topic 30.4, “Configure the arspsf command for the PSF for AIX queue” on page 145.

```
/usr/lpp/ars/fax/arspsf_faxdev1
```

7. Press **Enter**.
8. Press **F10** to exit SMIT.

Change the PSF for AIX header page user exit options

Configure the PSF for AIX queue by using SMIT to change the header page user exit options. The header page program name identifies the user exit program that PSF for AIX loads into memory to create a customized FAX cover page. OnDemand provides a sample user exit program that you can use. Please refer to topic 30.9, “PSF for AIX FAX header page user exit” on page 150 for details about the header page user exit program provided with OnDemand.

1. Login to AIX as the *root* user.
2. Use SMIT to configure the PSF for AIX queue. The fast path is **smitty psf_prt_sel_header_exit**.
3. SMIT displays the Printer Name panel.
4. Select the name of the PSF for AIX queue that you defined in topic 30.3, “Define a PSF for AIX queue” on page 145.
5. SMIT displays the Header Page User Exit Options panel.
6. Set the ACTIVATE Header Page Exit field to **YES**.
7. In the HEADER PAGE PROGRAM Name field, enter the following command:

```
/usr/lpp/ars/fax/arsfxhdr
```

8. Press **Enter**.
9. Press **F10** to exit SMIT.

Change the resources path

Configure the PSF for AIX queue by using SMIT to update the path to search for resources. The path to search for resources identifies the location of the O1FAXOLY overlay file, the */usr/lpp/ars/fax* directory. The overlay file is provided with the sample PSF for AIX header page user exit program, for use when printing the default OnDemand FAX cover page. If you create your own PSF for AIX header page user exit program and define a different overlay file, we recommend that you store the file in this directory.

1. Login to AIX as the *root* user.
2. Use SMIT to configure the PSF for AIX queue. The fast path is **smitty psf_prt_sel_processing_options**.
3. SMIT displays the Printer Name panel.
4. Select the name of the PSF for AIX queue that you defined in topic 30.3, “Define a PSF for AIX queue” on page 145.
5. SMIT displays the Processing Options panel.
6. In the PATH to Search for Resources field, enter the following path:

```
/usr/lpp/ars/fax
```

7. Press **Enter**.
8. Press **F10** to exit SMIT.

30.7 Set environment variables in OnDemand shell script files

The ars.cfg file

The ARS_PRINT_PATH variable in the ars.cfg configuration file points to the filesystem where the arspsf command stores FAX and temporary files. The default value is `/tmp`.

If you plan to set up a dedicated FAX filesystem or if you want to store these files in a different location, you must modify the ARS_PRINT_PATH variable to point to the filesystem.

Note: We strongly encourage you to set up a dedicated filesystem where the arspsf command can store FAX and temporary files.

The arsprt file

The EXTRA_OPTIONS variable in the arsprt shell script file determines whether PSF for AIX generates messages when processing files. The default setting turns off message generation. For example:

```
EXTRA_OPTIONS="-o MSGCOUNT=0"
```

If you need to display the messages generated by PSF for AIX, for example, while debugging a print or FAX problem, you can turn on message generation by setting the value to blank. For example:

```
EXTRA_OPTIONS=
```

30.8 Define the FAX device to OnDemand

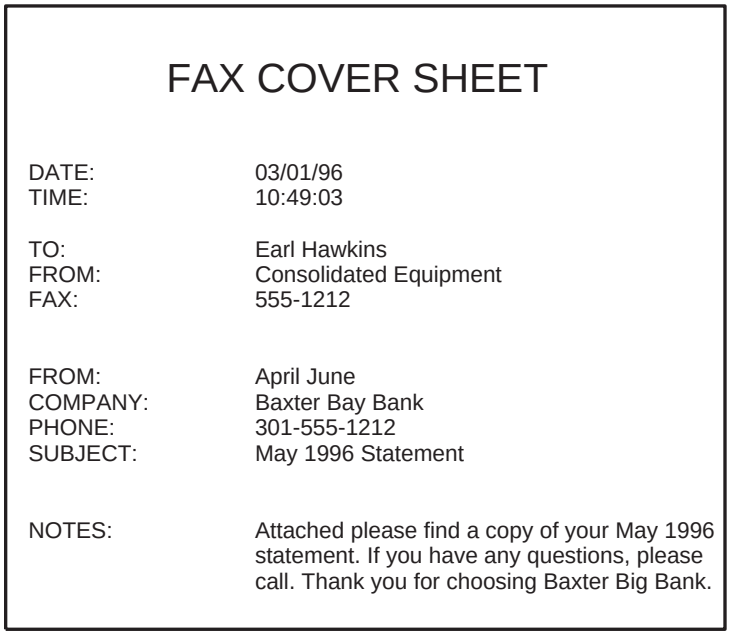
Use the administrator interface to define the FAX device to OnDemand.

1. Select Printers from the Areas list of the Administrative Tasks window and choose Add.
2. In the Add a Printer dialog box, enter a Name for the FAX device. This is the name that users select when they want to FAX items using the server print command.

3. Specify the Server Queue Name. This is the Printer Name of the PSF for AIX queue that you defined in topic 30.3, “Define a PSF for AIX queue” on page 145.
4. Select FAX from the Print Type list.
5. Choose OK to define the FAX device to OnDemand.

30.9 PSF for AIX FAX header page user exit

OnDemand provides a sample PSF for AIX header page user exit program that you can use to format the appearance of the FAX cover page. You can specify a different PSF for AIX header page user exit program for each FAX device that you define to OnDemand. After you activate a PSF for AIX header page user exit program for a particular FAX device, PSF for AIX loads the program into memory and runs the program before OnDemand submits a job to the FAX device. Figure 11 shows an example of the FAX cover page produced by OnDemand.


FAX COVER SHEET

DATE: 03/01/96
TIME: 10:49:03

TO: Earl Hawkins
FROM: Consolidated Equipment
FAX: 555-1212

FROM: April June
COMPANY: Baxter Bay Bank
PHONE: 301-555-1212
SUBJECT: May 1996 Statement

NOTES: Attached please find a copy of your May 1996 statement. If you have any questions, please call. Thank you for choosing Baxter Big Bank.

Figure 11. FAX Cover Page

In addition, you can use the source code of the sample user exit program to write you own FAX header page user exit program. OnDemand provides the source code when you install the base product. Please refer to topic 30.10, “Creating a PSF for AIX FAX header page user exit program” on page 151 for details about creating a FAX header page user exit program.

OnDemand provides the O1FAXOLY overlay file in the */usr/lpp/ars/fax* directory for use when printing the default FAX cover page.

30.10 Creating a PSF for AIX FAX header page user exit program

Overview

PSF for AIX provides a header page user exit that you can use to format the appearance of the FAX cover page. You can specify a different header page user exit program for each FAX device that you define. OnDemand ships a sample header page user exit program. Figure 11 on page 150 shows an example of the default FAX cover page generated by OnDemand.

The source code for the header page user exit program is located in the */usr/lpp/ars/fax* directory. The sample user exit program was written in the C programming language and complied using the AIX *make* command. The following files comprise the sample header page user exit program provided by OnDemand:

Table 22. FAX Header Page User Exit Files

File	Purpose
arsfxhdr.c	The source code for the FAX header page user exit program.
arsfxhdr	The complied FAX header page user exit program.
Makefile	The file that supplies the *make* command information about the target files and commands to update the target files.
O1FAXOLY	The overlay used to print the default FAX cover page.

To compile the header page user exit program, you must have the XL C Compiler and the *bosadt.bosadt.obj*, *bosadt.bosadt.data*, and *bosadt.lib.obj* components of the Base Application Development Toolkit of the AIX/6000 operating system installed.

Creating the user exit program

You can create your own header page user exit program in one of the following ways:

- Copy the source code for the sample header page user exit program, rename it, and modify it using an AIX editor.
- Write your own header page user exit program.

Compiling and installing the user exit program

After you create your own header page user exit program, you must compile the program code and then install it in the */usr/lpp/ars/fax* directory. You do this by using the *make* command.

When the *make* command is executed, it reads the *Makefile* file supplied by OnDemand. The *Makefile* file contains information about the target files and commands to update the target files. The *Makefile* is located in the */usr/lpp/ars/fax* directory.

Before you put a header page user exit program into general use at your location, we recommend that you test it first to make sure that it runs correctly. Because your user

exit program becomes part of the PSF for AIX executable code, a defective user exit program could cause problems with PSF for AIX.

To compile and install your header page user exit program, follow these steps:

1. Login to AIX as the *root* user.
2. If you already have an existing executable header page user exit program, perform the following task. Otherwise, skip to step 3.
   - Bring down all queue devices for the PSF for AIX queue and kill any instances of PSF for AIX associated with the queue devices by entering the following command for each FAX device that will use the header page user exit program you are installing:

```
psfctl -kd printername1 printername2...printernameN
```

   where `printername` are the names of the queue devices.
3. Change to the */usr/lpp/ars/fax* directory.
4. Make a backup copy of the executable header page user exit program. For example:

```
mv arsfxhdr arsfxhdr.backup
```

5. Run the *make* command. For example:

```
make arsfxhdr
```

   The *make* command reads the *Makefile* file supplied with OnDemand and compiles and generates the new header page user exit program.

Providing access to the overlay

OnDemand provides the O1FAXOLY overlay file for use when printing the default FAX cover page. This overlay file is called by the header page user exit program supplied with OnDemand.

To use a different overlay when printing a FAX cover page, you must make sure that the overlay file can be located by PSF for AIX. We recommend that you store overlay files for use when printing FAX cover pages in the */usr/lpp/ars/fax* directory. After storing overlay files in this directory, make sure that the *Path to Search for Resources* for the PSF for AIX queue that you defined for the FAX device includes this directory.

Activating the user exit program

Before you can use the new header page user exit program, you must restart the print queue associated with the FAX device so that the changes will be recognized by OnDemand.

To restart the queue, enter the following command at the AIX prompt. Replace `printername` with the name of the PSF for AIX queue that you defined for the FAX device.

```
psfctl -dtu printername
```

30.11 Creating an OnDemand FAX user exit program

Overview

OnDemand provides a user exit that you can use to complete user information for an item and place the data on the FAX cover page. This information can include the company name, the person sending the FAX, and the person's phone number. After you activate the FAX user exit program, OnDemand loads the program into memory and runs the program when it processes a FAX request. Please refer to the user's guide or online help for one of the OnDemand client programs for details about how the end-user selects this option. OnDemand ships a sample FAX user exit program. The program does not perform any function. You can replace the sample user exit program with your own.

The source code for the FAX user exit program is located in the */usr/lpp/ars/exits* directory. The sample user exit program was written in the C programming language and complied using the AIX *make* command. The following files comprise the sample FAX user program provided by OnDemand:

Table 23. FAX User Exit Program Files

File	Purpose
arsufax.c	The source code for the FAX user exit program.
arscsxit.h	The header file for the FAX user exit program.
arsufax	The compiled FAX user exit program. Install this file in the */usr/lpp/ars/bin/exits* directory.

To compile the FAX user exit program, you must have the XL C Compiler and the *bosadt.bosadt.obj*, *bosadt.bosadt.data*, and *bosadt.lib.obj* components of the Base Application Development Toolkit of the AIX/6000 operating system installed.

Creating the user exit program

You can create your own FAX user exit program in one of the following ways:

- Copy the source code for the sample FAX user exit program, rename it, and modify it using an AIX editor.
- Write your own FAX user exit program.

Compiling and installing the user exit program

After you create your own FAX user exit program, you must compile the program code and then install it in the */usr/lpp/ars/bin/exits* directory. Compile the program with the *make* command.

When the *make* command is executed, it reads a *Makefile*. The *Makefile* file contains information about the target files and commands to update the target files. You must create the *Makefile* and place it in the */usr/lpp/ars/exits* directory.

Before you put a FAX user exit program into general use at your location, we recommend that you test it first to make sure that it runs correctly. Because your user exit program becomes part of the OnDemand executable code, a defective user exit program could cause problems with OnDemand.

To compile and install your FAX user exit program, follow the instructions provided with PSF for AIX. Refer to the *PSF for AIX: Print Administration* publication for details.

Activating the user exit program

Before you can use the new FAX user exit program, you must restart the OnDemand system. Refer to Starting OnDemand in the *Administrator's Reference* for details.

Installing OS/2 client software

This section of the book provides information about installing, updating, and removing the OnDemand OS/2 client software on a PC and the network, including mapping AFP fonts to fonts that can be displayed on the PC.

31.0 Overview

31.1 Installation overview

You typically use the OnDemand setup program to initiate installation of the OS/2 client software on a PC. The setup program provides you with options that determine the type of installation performed, that is, local or network, and the software transferred to the PC.

After transferring files to the PC, the OnDemand setup program invokes the Software Installer installation program. The installation program allows you to select the components that you want to install on the PC:

- The OS/2 client software
- Outline fonts

Based on your installation selections, the installation program may create or modify program groups and icons, program shortcuts, folders, and initialization files.

31.2 Preparing for installation

Choosing the install type

There are several ways you can install and run OnDemand OS/2 client software on a PC:

- You can install a copy on a PC by selecting the *local* install type. The local install places a copy of OnDemand OS/2 client software and control files on the PC.
- You can install a copy on a LAN server so that the software can be copied onto the hard disks of individual PCs. First, select the *local* install type to install a copy of OnDemand OS/2 client software and control files on the server. Then, select the *local* install type to install a copy of the software on individual PCs.
- You can install a copy on a LAN server so that multiple PCs can run it from the server. First, select the *local* install type to install a copy of OnDemand OS/2 client software and control files on the server. Then, select the *network* install type to copy OnDemand Windows client control files to individual PCs.

The *network* install type stores OnDemand OS/2 client control files on the PC. No program files are copied to the PC. The PC runs a copy of the OnDemand OS/2 client programs from a LAN server. Before the OnDemand OS/2 client can be started on the PC, the OnDemand OS/2 client programs must be installed on the LAN server using the *local* install type. After a network install, when the end-user starts OnDemand, OS/2 loads the OnDemand programs from the LAN server into memory on the PC. OnDemand allocates temporary work space on the local PC for data and resources. When the end-user selects items for viewing, OnDemand saves any run-time options the user changes on the PC. Topic 35.0, “Installing software on a network” on

page 167 provides an example of a local install on a LAN server and a network install on a PC.

Choosing the installation program

There are two programs you can use to install OnDemand OS/2 client software on a PC:

- The ARSSETUP program can be used to transfer files from an OnDemand server to the PC. After transferring files to the PC, the ARSSETUP program automatically invokes the INSTALL program to install OnDemand software on the PC.
- The INSTALL program can be used to copy OnDemand OS/2 software to the PC. The INSTALL program can be used only after the ARSSETUP program has transferred files to a PC on the network.

Disk space requirements

The ARSSETUP program requires up to 36 MB of disk space to hold files transferred from the server to the PC, for a local install including outline fonts. Please verify there is at least that much space available on the work drive before starting the setup program.

The installation program requires an additional 18 MB of disk space, for a local install with all options, including outline fonts.

Installation drives and directories

The installation program lets you choose the target drive to install components. The default drive is C.

- The default installation directories for the OS/2 client are \ARSOS2 (for OS/2 client programs, temporary files, and AFP codepage maps) and \PSFONTS (for the outline font files).
- Language DLL and help files are installed in the \ARSOS2\LOCALE\&l directory. The **&l** part of the path name shows the locale, for example, **ENU** for the US English version of OnDemand.

32.0 Installing the OS/2 client

You must be running OS/2 Version 3.0 or later or OS/2 WARP Connect to install OnDemand.

32.1 Installing with the ARSSETUP program

Topic 36.0, “Creating the ARSSETUP diskette” on page 169 describes how to create an ARSSETUP program diskette.

1. Obtain the name of the OnDemand server where the OnDemand client installation files reside. Obtain an OnDemand userid and password to access the server.
2. Select a PC drive that the setup program can use for temporary work space.
3. Make sure that TCP/IP is started on the PC.
4. At the OS/2 prompt, type **d:\arssetup\arssetup**, where **d** is the letter assigned to the drive that contains the ARSSETUP program.
5. Press Enter. The setup program starts and displays the Logon to a Server dialog box.
6. Select the name of the OnDemand server in the Server list. Type the OnDemand User ID and Password in the entry fields. Choose Help for assistance with completing the fields in the Logon to a Server dialog box.
7. Choose OK. The setup program displays the File Transfer Information dialog box. The File Transfer Information dialog box is where you specify the work drive that the setup program uses, choose an installation type, and optionally, select to transfer additional software installation files to the PC. Choose Help for assistance with completing the fields in the File Transfer Information dialog box.
8. Choose OK. The setup program displays the File Transfer Progress window and transfers files from the OnDemand server to the PC. This will take several minutes.

   The setup program temporarily stores files in the \$ARSINST directory on the work drive. If this directory exists, the setup program issues a message. Choose Yes to continue the installation. The setup program replaces any files that exist in the directory. Choose No to cancel the file transfer and return to the File Transfer Information dialog box to specify a different work drive.
9. After transferring installation files to the PC, the software installation program starts. Follow the instructions on the screen. You may need to select check boxes and choose the Continue button on successive screens to specify the components to install.
10. The installation program displays the Installation Directories window. Verify the following installation options:
    - OnDemand components that you want to install. Select items from the list.
    - Disk space required.
    - Drives and directories where the installation program copies the software.

To change a single drive or directory name, type over the suggested default in the appropriate field.

Use the Disk Space command to change the drive letter for all of the directories. Choose the target drive and select **Change directories to selected drive**.

If you are installing OnDemand on a PC that will run the software from a LAN server, change the **Network Code Directory** to a network drive. The **Local (Misc) Directory** must reside on a physical drive on the PC. Verify the other drives and directories. Refer to topic 35.0, “Installing software on a network” on page 167 for an example.

11. Choose Install. The installation program displays progress of the installation. When complete, the installation program displays a message indicating successful installation.
12. Exit the installation program.
13. The ARSSETUP program asks you to confirm before deleting the temporary files and directories.
    - If you do not need to restart the installation program or save the files, delete the temporary files and directories.
    - If you are installing OnDemand OS/2 client software files on a LAN server, **do not erase the installation files**. You can copy OnDemand OS/2 client software from the LAN server to other PCs on the network using these files and the INSTALL program.

32.2 Installing with the INSTALL program

Before you can use the INSTALL program, you must place a copy of OnDemand OS/2 client software on a LAN server or other PC on the network using the OnDemand local installation method.

1. Make sure that TCP/IP is started on the PC and that you know the location of the INSTALL program.
2. At the OS/2 prompt, type **d:\$arsinst\install**, where **d** is the letter assigned to the drive that contains the INSTALL program.
3. Press Enter. The software installation program starts. Follow the instructions on the screen. You may need to select check boxes and choose the Continue button on successive screens to specify the components to install.
4. The installation program displays the Installation Directories window. Verify the following installation options:
    - OnDemand components that you want to install. Select items from the list.
    - Disk space required.
    - Drives and directories where the installation program copies the software.

To change a single drive or directory name, type over the suggested default in the appropriate field.

Use the Disk Space command to change the drive letter for all of the directories. Choose the target drive and select **Change directories to selected drive**.

If you are installing OnDemand on a PC that will run the software from a LAN server, change the **Network Code Directory** to a network drive. The **Local (Misc) Directory** must reside on a physical drive on the PC. Verify the other drives and directories. Refer to topic 35.0, “Installing software on a network” on page 167 for an example.

5. Choose Install. The installation program displays progress of the installation.
6. When complete, the installation program displays a message indicating successful installation.
7. Exit the installation program.

33.0 Updating OS/2 client software

You can use the OnDemand OS/2 setup program to update the OnDemand OS/2 client software on a PC. Complete the following steps to update the OS/2 client software on a PC.

1. Close any open OnDemand document windows and exit the OS/2 client program if it is active.
2. Complete steps 1 through 8 beginning on page 159
3. The installation program starts and, after checking for OnDemand OS/2 client software installed on the PC, displays the installation options dialog box.
4. Select **Update the currently installed product**, if it is not already selected.
5. Choose **Continue**. The installation program updates all currently installed OnDemand components.
6. Exit the installation program.
7. Choose Yes to delete the temporary installation files.

34.0 Removing OS/2 client software

You can use the OnDemand OS/2 setup program to remove OnDemand OS/2 client software from a PC. Complete the following steps to remove OS/2 client software from a PC.

1. Close any open OS/2 client document windows and exit the OS/2 client program if it is active.
2. Complete steps 1 through 8 beginning on page 159.
3. The installation program starts and, after checking for OS/2 client software components installed on the PC, displays the installation options dialog box.
4. Select **Delete the installed product and re-install**.
5. Choose **Continue**. The installation program displays the Components to Delete window with a list of OS/2 client software installed on the PC.
6. Select the component(s) you want to remove from the PC. Choose **Delete**. The installation program deletes the selected components.
7. Exit the installation program.
8. Choose Yes to delete the temporary installation files.

35.0 Installing software on a network

You can install OnDemand software and fonts on a LAN server, allowing other PCs on the network to run the software and access the fonts from the server. Setting up OnDemand in this way requires approximately 2 MB of disk space on the individual PCs.

Before you can run OnDemand from a LAN server, you must install OnDemand network software on the individual PCs.

The following topics provide an example of installing OnDemand OS/2 software on a LAN server and individual PCs:

- Install OnDemand on the LAN server.
- Install OnDemand network software on the PC.

35.1 Install OnDemand on a LAN server

1. Start the arssetup command. Select **Local** for the install type.
2. When the installation program starts, select the OnDemand clients that you want to install on the server. If you plan to use outline fonts with OnDemand, select the fonts.
3. Verify the drive assignment and directories. When installing OnDemand software on a server, the directories typically reside on a local hard drive. For example:

```
Local (Misc) Directory......C:\APPS\ARSOS2
Client Directory............C:\APPS\ARSOS2
IBM Fonts Directory.........C:\APPS\ARSOS2\FONTS
Outline Fonts Directory.....C:\PSFONTS
Data Directory..............C:\APPS\ARSOS2\DATA
Resource Directory..........C:\APPS\ARSOS2\RES
Print Directory.............C:\APPS\ARSOS2\PRINT
```

Figure 12. Drives and Directories on the LAN Server

35.2 Install OnDemand network software on the PC

1. Start the arssetup command. Select **Network** for the install type.
2. When the installation program starts, select the OnDemand client program.
3. Verify the drive assignments and directories. Make sure that the Network Code Directory identifies the drive and directory on the LAN server where you installed the OnDemand software in topic 35.1, “Install OnDemand on a LAN server.” The other directories typically reside on a local hard drive. For example:

```
Local (Misc) Directory.....C:\ARSOS2
Network Code Directory.....N:\APPS\ARSOS2
Data Directory.............C:\ARSOS2\DATA
Resource Directory.........C:\ARSOS2\RES
Print Directory............C:\ARSOS2\PRINT
```

Figure 13. Program Drives and Directories on the PC

36.0 Creating the ARSSETUP diskette

Complete the following steps to create an OS/2 client ARSSETUP diskette.

1. Change to a working directory on the PC.
2. FTP to the RS/6000 where you installed the OnDemand server software.
3. Issue the **binary** FTP subcommand.
4. Change to the /usr/lpp/ars/client/os2/install directory.
5. Issue the **get** FTP subcommand for the following file:

   arssetup.exe
6. Change to the /usr/lpp/ars/client/os2/local/common/ars directory.
7. Issue the **get** FTP subcommand for the following file:

   arssock2.dll
8. Change to the /usr/lpp/ars/client/os2/install/enu directory.
9. Issue the **get** FTP subcommand for the following files:

   arslangc.dll
   arslangi.hlp
10. Change to the /usr/lpp/ars/client/os2/local/common/locale/uconvtab directory.
11. Issue the **get** FTP subcommand for the following file:

    IBM-850
12. Close the FTP session.
13. Place a blank, formatted diskette in the A: drive.
14. Create the directory `\ARSSETUP` on the diskette.
15. Create the directory `\ARSSETUP\LOCALE` on the diskette.
16. Create the directory `\ARSSETUP\LOCALE\ENU` on the diskette.
17. Create the directory `\ARSSETUP\LOCALE\UCONVTAB` on the diskette.
18. Type the following commands at the OS/2 prompt:

```
xcopy  arss*.*     a:\arssetup
xcopy  arslang*.*  a:\arssetup\locale\enu
xcopy  IBM*.*      a:\arssetup\locale\uconvtab
```

19. Remove the diskette from the drive.
20. Label the diskette `OnDemand OS/2 Client ARSSETUP Diskette`.
21. Erase the files that you transferred from the RS/6000 to the working directory.

37.0 Creating and using response files

37.1 Introduction

This chapter provides an overview of using response files to install the OS/2 client software on PCs connected to the network. For detailed information about creating and using response files, refer to the *LAN Configuration, Installation, and Distribution Utility Guide*.

A response file is an ASCII file that supplies the client-specific configuration information required during redirected installation of a product on a PC. The response file contains predefined answers to the configuration questions that users are normally asked during a product installation, such as the installation drive and directory and the components to install. A system administrator can use a response file to automate the installation and configuration of the OS/2 client software over a network of PCs. The response file makes it unnecessary for the system administrator (or other user) to sit at each PC and manually enter an answer to each question that is displayed during installation.

37.2 Format of a response file

Response files are product-specific ASCII files that contain sequences of keyword=value pairs that are interpreted by the product installation program. The response file can also contain comment lines.

37.3 Creating a response file

Response files commonly have an extension of .CID and are found in the product installation directory.

OnDemand provides a model response file in the product installation directory. The name of the model response file is ARSOS2.CID. The arssetup program copies the file to the installation directory ($ARSINST by default). Use a standard text editor to view or make changes to the file. The file contains comment lines that explain the keywords and their values and installation options.

37.4 Installing software using a response file

A response file is not invoked directly. Instead, a response file is specified as a parameter value for the installation program. You can run the install program and specify an action and a response file. For example, the command:

```
d:\$arsinst\install /A:I /R:arsos2.cid
```

Causes the install program to install the software on the client PC using the instructions found in the ARSOS2.CID response file in the $ARSINST directory on the D drive. By

default, the install program expects to find the response file in the directory where the install program resides.

The response file directs the processing of the installation for the OS/2 client program. When you run the install program with a response file, no messages or dialog boxes are displayed. Instead, messages are written to a log file. You identify the directory where the install program places the log file and name the log file by specifying the **/L1** command line option. For example, the command:

```
d:\$arsinst\install /A:I /R:arsos2.cid /L1:c:\temp\arsos2.log
```

Causes the install program to write the log file ARSOS2.LOG in the TEMP directory on the C drive.

37.5 Verifying software installation

To verify the installation of a product that you installed using a response file, open the log file and examine the return code. The return code should indicate that the software was successfully installed on the client PC.

37.6 Using a response file to install OnDemand software

In general, complete the following steps to prepare the OnDemand OS/2 client software for installation using a response file and then install the software on other PCs connected to the network.

1. Install the software on the PC server. Use the ARSSETUP program to transfer the files from the OnDemand library server to the PC server and install the software on the PC. **Do not delete the installation directory**.
2. Modify the model response file provided with OnDemand to meet your specific installation requirements.
3. Test the installation process and the response file by installing the software on a client PC.
4. After testing and validating the response file, install the software on other PCs. Run the install program with the **/A:I** option to install the software, the **/R:** option to read the response file you created in step 2, and the **/L1:** option to identify the log file.
5. Examine the log files to verify the installation of the software.

38.0 Mapping AFP fonts

OnDemand needs to map the AFP fonts your document was created with to fonts that can be displayed on your workstation. For OnDemand to map the best matching outline fonts to display your AFP document, it needs to know certain characteristics about the fonts that were used to create your document. Mapping AFP fonts to outline fonts is done with the IBM-supplied font definition files installed as part of OnDemand. These files are stored in the \ARSOS2\FONT directory you specified when you installed OnDemand. You may edit them using any workstation editor. The shipped version of the font definition files maps the IBM Expanded Core (Latin only), compatibility, Sonoran, and Data1 fonts for you.

If your document uses an AFP font whose family isn't installed on your workstation, you can use the ALIAS2.FNT file to substitute that font family with a different one. The ALIAS2.FNT file remaps several of the AFP fonts to IBM Expanded Core fonts. If you have any outline fonts installed on your workstation, you may want to remove or comment out the font family name substitutions in the ALIAS2.FNT file. Topic 38.8, "Alias file" on page 183 provides details about using the ALIAS2.FNT file.

If you created your documents with only the unmodified IBM fonts, you won't need to remap fonts to view them in OnDemand.

38.1 When you need to map fonts

If you are using fonts that are not defined to OnDemand, if you have modified the IBM AFP fonts, or if you have created your own AFP fonts (for example, with PSF/2 Type Transformer), you need to define those fonts in the font definition files in order for documents using those fonts to display correctly with OnDemand.

- If you created a new coded font (or renamed one), you will need to define the coded font in the Coded Font file (ICODED.FNT or CODED.FNT) if your document contains coded fonts.
- If you created a new character set, you have to define it in the Character Set Definition file (CSDEF2.FNT).
- If you created a new code page, you have to define it in the Code Page Definition file (CPDEF2.FNT).
- If you have created a new code page or modified a code page by moving characters, you have to create a new Code Page Map file (cpgid.CP2).

If you only have modified an existing IBM font component, you may not need to perform any of the above steps. For example, if you have only deleted code points in the IBM code page, the font files supplied with OnDemand can be used without modification.

38.2 Files supplied for mapping fonts

The following types of files for font support are installed by default in the following subdirectories under the directory in which OnDemand was installed:

Table 24. OnDemand Font Files and Directories

File	File Name	Subdirectory	Description
Coded Font files	ICODED.FNT CODED.FNT[1] ICODED.CHS[2] ICODED.CHT[3] ICODED.JPN[4] ICODED.KOR[5]	\FONT	Specifies which AFP code page and AFP character set make up the coded font.
Character Set definition file	CSDEF2.FNT CSDEF2.CHS[2] CSDEF2.CHT[3] CSDEF2.JPN[4] CSDEF2.KOR[5]	\FONT	Defines AFP character set attributes, such as point size. It also maps the font character set to its font global identifier (FGID).
Code Page definition file	CPDEF2.FNT CPDEF2.CHS[2] CPDEF2.CHT[3] CPDEF2.JPN[4] CPDEF2.KOR[5]	\FONT	Maps each AFP code page to an OS/2 code page and indicates which Code Page Map file for OnDemand to use.
Code Page Map file	*cpgid*.CP	\FONT\MAPS	Defines character identifier mappings. It matches the IBM code page character identifiers and their hexadecimal code points with a corresponding character identifier and ASCII code point representing an OS/2 code page.
Alias File	ALIAS2.FNT	\FONT	Maps AFP font type families to Type 1 outline font family names.

Note:

1. CODED.FNT is an optional file. A sample can be found in the SAMPLES subdirectory of the \ARSOS2\FONT directory. The CODED.FNT file is meant to contain coded fonts you've created.
2. Code page and character set files for the Simplified Chinese client.
3. Code page and character set files for the Traditional Chinese client.
4. Code page and character set files for the Japanese client.
5. Code page and character set files for the Korean client.

38.3 Steps for mapping your fonts

After reading the rest of this chapter to determine which font files you need to modify, follow these steps:

1. Gather the information needed to define the fonts in the font definition files. This information is described in the following sections of this chapter.
2. Make backup copies of any of the following font definition files that you plan to modify:
   - CSDEF2.FNT
   - CPDEF2.FNT
   - ICODED.FNT
   - ALIAS2.FNT

   Note: Backup copies of these files should be made so that you have an unmodified copy in the event something happens to your modified copy that makes it inoperable.
3. Install any other outline fonts you are planning to use with OnDemand.
4. If you have created or modified a code page, use the BLDCPMAP REXX program to build the code page map file:
   a. Substitute any non-matching characters in the code page map file or ALIAS2.FNT file if you wish (topic 38.7, “Code page map files” on page 181 and “ REXX program for building a code page map file” on page 182 provide details about code page map files).
   b. Edit the CPDEF2.FNT file and add your code page name and the name of the code page map file to use.
5. If you have created a new character set or OnDemand tells you a character set name is undefined, edit the CSDEF2.FNT file and add your character set name in the [CHARSET] section and specify the correct attributes for your font. Add the appropriate information in the [FGID] section of the file if you are using a new font global identifier (FGID) for the character set.
6. If you have created a coded font, create or edit the CODED.FNT file and add your coded font.

Syntax rules for font definition files

Syntax rules for OnDemand font definition files are as follows:

- A semicolon (;) in the first column of any of these files will cause the line to be treated as a comment statement and ignored.
- Section headers within files are enclosed in brackets [ ] and must *not* be removed or changed.
- All values are case insensitive.
- If a parameter value is invalid and a default value exists, it will be substituted.
- All parameters are positional.
- Blanks are allowed between parameter values.

38.4 Coded font file

The IBM Coded Font file (ICODED.FNT) maps AFP coded fonts to their AFP character sets and AFP code pages. Two Coded Font files can be used with OnDemand:

ICODED.FNT This file contains definitions for approximately 2500 IBM-supplied coded fonts.

CODED.FNT You can create this optional file to define a list of any coded fonts you have created. If you create a CODED.FNT file, you must place it in the \ARSOS2\FONT directory. A sample of this file can be found in the SAMPLES subdirectory of the \ARSOS2\FONT directory.

If a CODED.FNT file exists in the \ARSOS2\FONT subdirectory, it is searched first for the coded fonts used in an AFP file. If the coded font name is not found in CODED.FNT or if CODED.FNT does not exist, only the OnDemand-supplied ICODED.FNT file will be searched. Performance can be improved by moving coded font file definitions you use most often from the ICODED.FNT file to the CODED.FNT file.

```
X?A155N2 = C?A155N1, T1DCDCFS
X?AE10   = C?S0AE10, T1S0AE10
X?GT10   = C?D0GT10, T1D0BASE
X?ST15   = C?D0ST15, T1D0BASE
X?A0770C = C?A07700, T1DCDCFS
X?A0770I = C?A07700, T1GI0361
X0T0550C = C0T05500, T1DCDCFS
```

Figure 14. Example of CODED.FNT File

Coded font file rules

- A question mark (?) can be used as the wild-card character only for the second character in the coded font name and the character set name. This allows all the character rotations of the coded fonts to be handled with one entry for searching.

  Note: A sequential search is performed for the coded font, and the first match is used (including the wild-card character).

- After the coded font name, the character set name must be listed first, followed by the code page name.
- The character set and code page *must* be separated by a comma.

38.5 Character set definition file

The Character Set Definition file specifies the character set attributes and font global identifier of the font. It is split into 2 sections, one for character sets [CHARSET] and one for font global identifiers [FGID].

```
[CHARSET]
;charset = fgid, height, width, strikeover, underline
C?H200A0=2304,110,73,0,0
C?H200D0=2304,140,93,0,0
C?N200B0=2308,120,80,0,0
C?4200B0=416,120,144,0,0
C?D0GT15=230,80,96,0,0
C?A155A0=33207,110,73,0,0
C?A175A0=33227,110,73,0,0
C?T055D0=4407,140,93,0,0
C?T17500=4555,100,67,0,0
C?T17560=4555,60,40,0,0
DEFAULT =2308,80,0
```

Figure 15. Example of [CHARSET] section in Character Set Definition File

The first section identified by the section header [CHARSET] lists each AFP font character set and its corresponding attributes:

- Font global identifier (fgid)
- Font height
- Font width
- Strikeover
- Underline

Table 25. Character Set Definition File Attribute Values for [CHARSET]

Attribute	Possible Values	Shipped Default	Description
Fgid	IBM-defined FGID or your own defined FGID within this range: 3840 to 4095 or 65260 to 65534	2308	A unique value that identifies the type family, typeface, and sometimes the point size of the character set.
Height	1 to 990	80	The vertical size of the character set (minimal baseline-to-baseline value) expressed in tenths of a point. For example, a 9-point font would have a height of 90.
Width	0 to 99 (currently ignored)	0	The average horizontal size of the characters in 1440th of an inch. Currently, 0 is always used because OS/2 determines an appropriate font width based on the font height.
Strikeover	1 (means yes), 0 (means no)	0	A font whose characters all have a line, parallel to the character baseline, placed over the middle of the character.
Underline	1 (means yes), 0 (means no)	0	A font whose characters all have a line, parallel to the character baseline, placed under the character.

The second section, identified by the section header [FGID], lists each font global identifier and its corresponding attributes:

- Font type families
- Codepage

```
[FGID]
;fgid = familyname, codepage
230=Gothic,850
416=Courier,850
2304=Helvetica,850
2308=Times New Roman,850
4407=Sonoran Serif,850
4555=Sonoran Serif,850
33207=Sonoran Sans Serif,850
33227=Sonoran Sans Serif,850
```

Figure 16. Example of [FGID] section in Character Set Definition File

Table 26. Character Set Definition File Attribute Values for [FGID]

Attribute	Description	Possible Values	Shipped Default
Familyname[1]	An outline font name or an AFP type family name. This name appears on the OS/2 Palette if you have the font installed on your workstation.	Any Adobe Type 1 font name or AFP type family name	Times New Roman
Codepage	The code page encoding with which the font was created.	850, 65400[2]	

Note:

1. "Familyname" is the same as "type family" in AFP fonts.
2. "65400" is the font-specific encoding.

Character set definition file rules

- Parameters must be separated by a comma. Table 25 on page 178 and Table 26 list the possible values and shipped default values for each parameter.
- In the [CHARSET] section of the file, only `fgid` and `height` (point size) are required.
- In the [FGID] section of the file, only the type `familyname` and `codepage` are required.
- A question mark (?) can be used as the wild-card character only for the second character in the character set name. This allows all the character rotations of the coded fonts to be handled with one entry while searching.

  Note: A sequential search is performed for the character set, and the first match is used (including the wild-card character).
- The [CHARSET] section must come before the [FGID] section.

- You can set a default character set. The default character set that is defined in the file must be the last entry in the [CHARSET] section.
- If you add your own AFP font character set to the [CHARSET] section, you must assign it a font global identifier. Font global identifiers you create must be in the ranges of 3840 to 4095 or 65260 to 65534. If the new character set has the same familyname and code page as an existing character set, you may use the same font global identifier; otherwise, you must add a unique font global identifier to the [FGID] section.

38.6 Code page definition file

The Code Page Definition file maps the IBM AFP code page name to its code page global identifier (CPGID). The section header [CODEPG] is followed by a list of AFP code pages and their AFP code page global identifier that maps to a Code Page Map file (topic 38.7, “Code page map files” on page 181 provides details about mapping code pages). The last line gives the default code page map file.

```
[CODEPG]
;codepage = cpgid
T1DCDCFS=1003
T1DEBASE=2058
T1D0BASE=2063
T1D0GP12=2085
T1GI0395=2079
T1GPI363=2066
T1V10037=37
T1V10273=273
T1000290=290
T1000310=310
T1000423=423
T1000905=905
DEFAULT =361
```

Figure 17. Example of Code Page Definition File

Table 27. Code Page Definition File Attribute Values

Attribute	Possible Values	Shipped Default
Code Page Global Identifier	IBM-defined CPGID or your own defined CPGID within this range: 65280 to 65534	361

Code page definition file rules

- If you create your own code page, you must assign it a unique code page global (CPGID) identifier. Leading zeros are not valid. (You may use an IBM code page global identifier but only if the character-to-hexadecimal code mapping is the same for your code page.)

- You can set a default code page. The default code page that is set within the file must be the last entry in the file.

38.7 Code page map files

OnDemand provides one Code Page Map file for each AFP code page supplied with PSF and the Data1 and Sonoran licensed programs. These files are installed in their own subdirectory (MAPS) under the \ARSOS2\FONT directory. The file is named for its code page global identifier (CPGID) and has a file extension of .cp2 (for example, 2063.cp2 is the file name for the T1D0BASE code page map; its CPGID is 2063). Each file contains the character identifiers (and associated EBCDIC hexadecimal code points) for an AFP host code page and maps them to character identifiers (and associated ASCII code points) for the OS/2 ASCII code page.

```
;T1000395   to    850
LA020000 C1    LA020000 41
LO120000 EE    LO120000 E0
LI510000 8E    NOMATCH 00
LO110000 CE    NOMATCH 00
LO610000 70    LO610000 9B
LY020000 E8    LY020000 59
ND030000 F3   ND030000 33
ND040000 F4   ND040000 34
SM900000 9A   SM900000 C4
SM190000 90    SM190000 B0
LJ010000 91    LJ010000 6A
LF510000 A0   NOMATCH 00
;;;;;;;; ;     SS010000 02
;;;;;;;; ;     SP030000 FF
/*
```

Figure 18. Example of Code Page Map File

Code page map file rules

- Parameters must be separated by blanks.
- "NOMATCH" means there is not a matching character in the OS/2 code page.
- The "NOMATCH" hexadecimal code of 00 is mapped to the undefined code point. When a document contains a character that does not exist in the OS/2 code page, that character cannot be displayed on the screen. If the character has not been remapped in the Code Page Map file or the Alias file [1], the undefined code point character will be displayed as a blank character.
- The string of semi-colons (;;;;;;;;) means this line is ignored as a comment. It also indicates the OS/2 code page contains a character that doesn't exist in the AFP

1 Topic 38.8, "Alias file" on page 183 provides information about remapping code points.

code page. The code point for a OS/2 character not found in the AFP host code page can be used for replacing NOMATCH characters.

REXX program for building a code page map file

OnDemand supplies a sample Restructured Extended Executor Language (REXX) program (BLDCPMAP.REX) you can use to create Code Page Map files. This program executes in MVS, VM, or OS/2 REXX environments. The REXX program is in the SAMPLES subdirectory of the \ARSOS2\FONT directory. [2]

The BLDCPMAP.REX program requires a host AFP code page and the OS/2 code page file: CP850.MAP. [3] The program's output is a Code Page Map file that maps the characters in the host code page to matching characters in the OS/2 code page so it can be used with OnDemand. It also identifies how many unmatched characters there are in the code page. Matching is done using graphic character identifiers, for example, LA010000.

If you are going to use the BLDCPMAP.REX EXEC on your MVS or VM system, ensure that you upload it as an ASCII file with carriage return and line feed (CR/LF) as specified in the BLDCMAP.REX file prologue.

On a VM system, the BLDCPMAP.REX EXEC must be run from the command line rather than from a file listing.

Setting up to build a code page map file

You can either transfer the BLDCPMAP REXX program and the OS/2 code page file to your host system and run the program there, or you can transfer your AFP code pages to your workstation and run the program under OS/2 (if you have REXX installed on your workstation). You can use any file transfer program that handles standard host record format files and ASCII CR/LF line endings, with or without ASCII to EBCDIC translation (we recommend using the Communications Manager or PC/3270 File Transfer programs).

If you transfer the REXX program and the OS/2 code page file (this file has an extension of .MAP) to your MVS or VM host system, they must be translated from ASCII to EBCDIC and CR/LF must indicate a new line. All of the files transferred to the host system must be human-readable. If you transfer your AFP code pages to your OS/2 workstation, you *must* specify a **binary** format. If the file transfer is not correct, a REXX error occurs when you run the BLDCPMAP program.

On your OS/2 workstation, rename the BLDCPMAP.REX file to BLDCPMAP.CMD and ensure that REXX is installed. On your VM host system, the filetype for the BLDCPMAP file must be EXEC. On your MVS system, the program may be run explicitly with the EXEC command or implicitly by member name, if the partitioned data set containing the

---

2 The \ARSOS2 directory is the directory in which you installed OnDemand.

3 The OS/2 code page files are shipped with OnDemand and can be found in the SAMPLES subdirectory of the \ARSOS2\FONT directory.

BLDCPMAP program was previously allocated to your system file that contains execs (usually SYSEXEC or SYSPROC). If the REXX program is named correctly, you can run the program without parameters to get the correct syntax of the command. You can also display the prologue for the EXEC for syntax.

When you run the BLDCPMAP program, and you have selected which Code Page Map file you want to use with OnDemand, place that Code Page Map file in the MAPS subdirectory of the \ARSOS2\FONT directory in the directory in which you installed OnDemand. Update the CPDEF2.FNT file in the \ARSOS2\FONT directory. In order for OnDemand to find the Code Page Map file, it must be named as follows:

```
code-page-global-identifier.CP2
```

For more information about using the Code Page Map file, refer to topic 38.7, “Code page map files” on page 181. For more information about the BLDCPMAP program (for example, the syntax for running the program), refer to the prologue in the BLDCPMAP.REX file.

38.8 Alias file

The Alias File contains 2 sections: one section for font family name aliases [FONT] and one section for character identifier aliases [CHARID].

The first section, identified by the section header [FONT], lists the font familyname aliases. Font familyname aliases allow you to change all of the requested instances of a font familyname (as defined in the Character Set Definition file) to another font familyname. For example, this file is used to change all requests for the Sonoran Serif font (which may not exist on the workstation) to requests for the Times New Roman font (which is one of the core fonts shipped with OS/2 and OnDemand) as shown in Figure 19.

```
[FONT]
; ***** Requested font = Type 1 font *****
Book=Times New Roman
CourierOverstrike=Courier
Sonoran Serif=Times New Roman,Times New Roman
Sonoran Sans Serif=Helvetica,Arial
Text=Courier,Courier New
```

Figure 19. Example of [FONT] section in Alias File

The second section, identified by the section header [CHARID], lists the character identifier aliases. Character identifier aliases (also known as glyph identifiers) allow you to change all of the requested instances of a character to another character. For example, since the OS/2 code page does not contain the ff ligature (LF510000), it’s not mapped to a character in the code page map files (refer to Figure 18 on page 181). Instead, it’s mapped to NOMATCH 00. If you want to map all occurrences of LF510000 — NOMATCH pair to a lower case f, you could do this in the [CHARID] section of the ALIAS2.FNT file with the following entry:

```
LF510000=LF010000
```

If you want to change one specific character for one specific code page, you may remap the character on that code page to another character as shown in Figure 18 on page 181.

The Alias file is checked only when a NOMATCH 00 is found in a character mapping.

Note: Using the Alias file for more than a few character substitutions is not recommended as program performance will be affected. If a lot of character substitutions are needed, it is better to make those changes directly to the mappings in the Code Page Map files you're using.

```
[CHARID]
LF510000=LF010000
SA000000=SP320000,SP100000
```

Figure 20. Example of [CHARID] Section in Alias File

Alias file rules

- For family name aliases, all requests for the first family name in the Character Set Definition file have the second family name substituted for them.
- Only 1 family name substitute per line is allowed (to the right of the equal sign), and they must be separated by a comma.
- If multiple mappings are listed in the file for the same family name, only the first match is used.
- The Alias file is processed sequentially and is *not* chained (for example, if "Century Schoolbook" is set equal to "Times," and "Times" is set equal to "Times New Roman," "Century Schoolbook" will *not* be set to "Times New Roman").
- Blanks in family names are treated as characters (for example, "Times New Roman" is not the same font as "TimesNewRoman").
- The [CHARID] section of the Alias file is only used if the second character identifier is NOMATCH 00.
- The character identifier that you want modified in the [CHARID] section must be followed by an equal sign and the character identifier to which it is to be changed. A character remap occurs when the modified character identifier (the character to the left of the equal sign in the [CHARID] section) matches the first character identifier of a non-matching pair in the Code Page Map file.
- Several character identifiers (substitute char id) may be listed to the right of the equal sign separated by commas. The first substitute character identifier is substituted for the modified character identifier unless it doesn't exist in the OS/2 font. If it doesn't exist, the next substitute character identifier is used.
- A maximum of 4 substitute character identifiers are allowed.

38.9 Support for substituting fonts

OnDemand supports Type 1 fonts installed under the OS/2 Font Palette. Type 1 outline fonts are supplied with OnDemand. These fonts are installed in the fonts directory you specified when you installed OnDemand (the default directory is \PSFONTS). The installed OnDemand Type 1 outline fonts and their PC file names are as follows:

```
FONT NAME      PC FILE NAME
BarCode        bar*.*
Boldface       bfc*.*
Courier APL2   cou*.*
Gothic Text    got*.*
Letter Gothic  lgo*.*
OCR A          ocr_a.*
OCR B          ocr_b.*
Prestige       prs*.*
PostNet        V500001.*
FinCodes       V500003.*
```

OnDemand uses the Core Fonts already installed with OS/2:

```
cour*.*
helv*.*
tnr*.*
```

Make sure that these outline fonts are installed on your workstation. You can use the Selective Install to install the fonts.

Installing Windows client software

This section of the book provides information about installing, updating, and removing the OnDemand Windows client software on a PC and the network, including mapping AFP fonts to fonts that can be displayed on the PC.

39.0 Overview

39.1 Installation overview

You typically use the OnDemand setup program to initiate installation of the Windows client software on a PC. The setup program provides you with options that determine the type of installation performed, that is, local or network, and the software transferred to the PC.

After transferring files to the PC, the OnDemand setup program invokes either Software Installer, to install 16-bit software, or InstallShield, to install 32-bit software. The installation program allows you to select the components that you want to install on the PC:

- The Windows client software
- The administrator interface software
- Adobe Type Manager (ATM) for Windows 3.1 or Windows 95
- Outline fonts (requires ATM)
- Adobe PDF viewing software

Based on your installation selections, the installation program may create or modify program groups, icons, shortcuts, folders, and initialization files.

39.2 Preparing for installation

Operating environments

OnDemand provides 16-bit and 32-bit Windows client software and 16-bit and 32-bit versions of ATM and Adobe PDF viewing software. Table 28 shows the typical installation choices:

Table 28. Client Software Components and Operating Environments

Component	Windows 3.1	Windows 95	Windows NT 4.0
OnDemand client	16-bit	32-bit	32-bit
Adobe PDF viewer	16-bit	32-bit	32-bit
ATM	16-bit	32-bit	Not available[4]

[4] OnDemand does not provide ATM for Windows NT version 4.0 or later. If you require ATM to display Adobe Type 1 fonts in a document or use ATM for other purposes, you must purchase a license from Adobe.

Choosing the install type

There are several ways you can install and run OnDemand Windows client software on a PC:

- You can install a copy on a PC by selecting the *local* install type. The local install places a copy of OnDemand Windows client software and control files on the PC.
- You can install a copy on a LAN server so that the software can be copied onto the hard disks of individual PCs. First, select the *local* install type to install a copy of OnDemand Windows client software and control files on the server. Then, select the *local* install type to install a copy of the software on individual PCs.
- You can install a copy on a LAN server so that multiple PCs can run it from the server. First, select the *local* install type to install a copy of OnDemand Windows client software and control files on the server. Then, select the *network* install type to copy OnDemand Windows client control files to individual PCs.

The *network* install type stores OnDemand Windows client control files on the PC. No program files are copied to the PC. The PC runs a copy of the OnDemand Windows client programs from a LAN server. Before the OnDemand Windows client can be started on the PC, the OnDemand Windows client programs must be installed on the LAN server using the *local* install type. After a network install, when the end-user starts OnDemand, Windows loads the OnDemand programs from the LAN server into memory on the PC. OnDemand allocates temporary work space on the local PC for data and resources, when the end-user selects items for viewing. OnDemand saves any run-time options an end-user changes in a copy of ARS.INI in the Windows directory on the PC. Topic 44.0, “Installing software on a network” on page 203 provides an example of a local install on a LAN server and a network install on a PC.

Choosing the installation program

There are several programs you can use to install OnDemand Windows client software on a PC:

- The ARSSETUP program can be used to transfer files from an OnDemand server to the PC. After transferring files to the PC, the ARSSETUP program automatically invokes the INSTALL or SETUP program to install OnDemand software on the PC.
- The INSTALL program can be used to copy OnDemand 16-bit software to the PC. The INSTALL program can be used only after the ARSSETUP program has transferred files to a PC on the network.
- The SETUP program can be used to copy OnDemand 32-bit software to the PC. The SETUP program can be used only after the ARSSETUP program has transferred files to a PC on the network.

Disk space requirements

The ARSSETUP program requires up to 62 MB of disk space to hold files transferred from the server to the PC, for a local install including Adobe software. Please verify there is at least that much space available on the work drive before starting the setup program.

The installation program requires an additional 45 MB of disk space, for a local install with all options, including outline fonts and Adobe software.

Installation drives and directories

The installation program lets you choose the target drive to install components. The default drive is C.

- The default installation directories for the 16-bit client are \ARS (for Windows client programs, temporary files, and AFP codepage maps), \PSFONTS (for the outline font files) and \ACROBAT3 (for Adobe PDF viewing software).
- The default installation directories for the 32-bit client are \ARS32 (for Windows client programs, temporary files, and AFP codepage maps), \PSFONTS (for the outline font files), and \ACROBAT3 (for Adobe PDF viewing software).
- Language DLL and help files are installed in the \ARS\LOCALE\&l (16-bit) or \ARS32\LOCALE\&l (32-bit) directory. The **&l** part of the path name shows the locale, for example, **ENU** for the US English version of OnDemand.

Adobe software provided by OnDemand

ATM and Windows 3.1

If you are using Windows 3.1 and ATM Version 2.02 or later, do not install the version of ATM provided with the Windows client.

If you do, however, need to upgrade to the version of ATM supplied with OnDemand, you must remove ATM as the system driver before installing the software. Remove ATM as the system driver by changing the SYSTEM.INI file in the Windows directory and then restarting Windows. First, make a back up copy of SYSTEM.INI. Then edit the SYSTEM.INI and change the lines as indicated in Table 29.

Table 29. Updating ATM Software

Locate this Statement	Change the Statement to
system.drv=atmsys.drv	system.drv=system.drv
atmsys.drv=system.drv	;atmsys.drv=system.drv

The installation program changes SYSTEM.INI back to its original state.

ATM and Windows NT

OnDemand does not provide ATM for Windows NT version 4.0 or later. If you require ATM to display Adobe Type 1 fonts in a document or use ATM for other purposes, you must purchase a license from Adobe.

Adobe PDF viewing software and Windows 95 or Windows NT

When you install the OnDemand Windows client software on a PC that runs Windows 95 or Windows NT, the installation program always installs the 32-bit version of Adobe PDF viewing software. If you install the 16-bit version of the Windows client program on

a PC that runs Windows 95 or Windows NT, you will not be able to use Adobe PDF viewing software with OnDemand.

40.0 Installing the Windows client

You must be running Windows 3.1, Windows 95, or Windows NT 4.0 or later to install OnDemand.

40.1 Installing with the ARSSETUP program

Topic 45.0, “Creating the ARSSETUP diskette” on page 205 describes how to create an ARSSETUP program diskette.

1. Obtain the name of the OnDemand server where the OnDemand client installation files reside. Obtain an OnDemand userid and password to access the server.
2. Select a PC drive that the setup program can use for temporary work space.
3. Make sure that TCP/IP is started on the PC.
4. If the PC runs Windows 3.1, select Run from the File menu of Program Manager. In the Command Line entry field, type **d:\arssetup\arssetup**, where **d** is the letter assigned to the drive that contains the ARSSETUP program.

   If the PC runs Windows 95 or Windows NT, choose Run from the Start menu. In the Open box, type **d:\arssetup\arssetup**, where **d** is the letter assigned to the drive that contains the ARSSETUP program.

   Note: We recommend that a user with administrator privileges install the client software on a Windows NT system.
5. Choose OK. The setup program starts and displays the Logon to a Server dialog box.
6. Select the name of the OnDemand server in the Server list. Type the OnDemand User ID and Password in the entry fields. Choose Help for assistance with completing the fields in the Logon to a Server dialog box.
7. Choose OK. The setup program displays the File Transfer Information dialog box. The File Transfer Information dialog box is where you specify the work drive that the setup program uses, choose an installation type, and optionally, select to transfer additional software installation files to the PC. Choose Help for assistance with completing the fields in the File Transfer Information dialog box.
8. Choose OK. The setup program displays the File Transfer Progress window and transfers files from the OnDemand server to the PC. This will take several minutes.

   The setup program temporarily stores files in the \$ARSINST (Windows 3.1) or \$ARS32IN (Windows 95 or Windows NT) directory on the work drive. If this directory exists, the setup program issues a message. Choose Yes to continue the installation. The setup program replaces any files that exist in the directory. Choose No to cancel the file transfer and return to the File Transfer Information dialog box to specify a different work drive.
9. After transferring installation files to the PC, if you selected to install the Adobe PDF viewing software, the setup program starts the Adobe Acrobat setup program. Follow the instructions to install Adobe PDF viewing software.

After installing the software, the Acrobat setup program displays an information message about restarting Windows. Do not restart Windows until after you exit the OnDemand setup program.

10. The software installation program starts. Follow the instructions on the screen. You may need to select check boxes and choose the Continue or Next button on successive screens to specify the components to install.
11. If you are installing the 16-bit client, verify the following installation options:
    - OnDemand components that you want to install. Select items from the list.
    - Disk space required.
    - Drives and directories where the installation program copies the software.

      To change a single drive or directory name, type over the suggested default in the appropriate field.

      Use the Disk Space command to change the drive letter for all of the directories. Choose the target drive and select **Change directories to selected drive**.

      If you are installing OnDemand on a PC that will run the software from a LAN server, change the **Network Code Directory** to a network drive. The **Local (Misc) Directory** must reside on a physical drive on the PC. Verify the other drives and directories. Refer to 44.0, “Installing software on a network” on page 203 for an example.

    Then choose Install. The installation program displays progress of the installation. When complete, the installation program displays a message indicating successful installation. Exit the installation program.
12. If you are installing the 32-bit client, verify the following installation options:
    - The drives and directories where the installation program copies the software.

      If you are installing the client on a PC that will run the software from a LAN server, first select the drive and directory on the PC where the software installation program copies control files and then select the drive and directory on the LAN server where the OnDemand Windows client software resides.
    - OnDemand components that you want to install.
    - Disk space required.

    Then choose Next. The installation program displays the progress of the installation. When complete, the installation program displays a message indicating successful installation. Click OK to continue.
13. After the software installation program completes, the ARSSETUP program asks you to confirm before deleting the temporary files and directories.
    - If you do not need to restart the installation program or save the files, delete the temporary files and directories.
    - If you are installing OnDemand Windows client software files on a LAN server, **do not erase the installation files**. You can copy OnDemand Windows client

software from the LAN server to other PCs on the network using these files, with the INSTALL or SETUP program.

14. If you installed Adobe software, restart Windows.

40.2 Installing with the INSTALL or SETUP program

Before you can use the INSTALL or SETUP program, you must place a copy of OnDemand Windows client software on a LAN server or other PC on the network using the local install type with the ARSSETUP program.

1. Make sure that TCP/IP is started on the PC and that you know the location of the INSTALL or SETUP program.
2. If the PC runs Windows 3.1, Select Run from the File menu of Program Manager. In the Command Line entry field, type **d:\$arsinst\install**, where **d** is the letter assigned to the drive that contains the INSTALL program.

   If the PC runs Windows 95 or Windows NT, choose Run from the Start menu. In the Open box, type **d:\$ars32in\setup**, where **d** is the letter assigned to the drive that contains the SETUP program.

   Note: We recommend that a user with administrator privileges install the client software on a Windows NT system.
3. Choose OK. The software installation program starts. Follow the instructions on the screen. You may need to select check boxes and choose the Continue or Next button on successive screens to specify the components to install.
4. If you are installing the 16-bit client, verify the following installation options:
   - OnDemand components that you want to install. Select items from the list.
   - Disk space required.
   - Drives and directories where the installation program copies the software.

     To change a single drive or directory name, type over the suggested default in the appropriate field.

     Use the Disk Space command to change the drive letter for all of the directories. Choose the target drive and select **Change directories to selected drive**.

     If you are installing OnDemand on a PC that will run the software from a LAN server, change the **Network Code Directory** to a network drive. The **Local (Misc) Directory** must reside on a physical drive on the PC. Verify the other drives and directories. Refer to topic 44.0, “Installing software on a network” on page 203 for an example.

   Then choose Install. The installation program displays the progress of the installation. When complete, the installation program displays a message indicating successful installation. Exit the installation program.
5. If you are installing the 32-bit client, verify the following installation options:
   - The drives and directories where the installation program copies the software.

If you are installing the client on a PC that will run the software from a LAN server, first select the drive and directory on the PC where the software installation program copies control files and then select the drive and directory on the LAN server where the OnDemand Windows client software resides.

- OnDemand components that you want to install.
- Disk space required.

Then choose Next. The installation program displays progress of the installation. When complete, the installation program displays a message indicating successful installation. Click OK to continue.

6. If you installed Adobe software, restart Windows.

41.0 Updating Windows client software

41.1 Updating Windows 16-bit client software

Complete the following steps to update the Windows 16-bit client software on a PC.

1. Close any open OnDemand document windows and exit the Windows client program if it is active.
2. If you are using the ARSSETUP program, complete steps 1 through 8 beginning on page 193. If you are using the INSTALL program, complete steps 1 and 2 on page 195.
3. The installation program starts and, after checking for Windows client software installed on the PC, displays the Installation options dialog box.
4. Select **Update the currently installed product**, if it is not already selected.
5. Choose **Continue**. The installation program updates all currently installed OnDemand Windows client components.
6. Exit the installation program.
7. If prompted, choose Yes to delete the temporary installation files.

41.2 Updating Windows 32-bit client software

We recommend that a user with administrator privileges update the client software on a Windows NT system.

Complete the following steps to update the Windows 32-bit client software on a PC.

1. Close any open OnDemand document windows and exit the Windows client program if it is active.
2. If you are using the ARSSETUP program, complete steps 1 through 8 beginning on page 193. If you are using the INSTALL program, complete steps 1 and 2 on page 195.
3. Verify the following installation options:
   - The drives and directories where the installation program updates the software.

     If you are updating the client on a PC that will run the software from a LAN server, first verify the drive and directory on the PC where the software installation program copies control files and then verify the drive and directory on the LAN server where the OnDemand Windows client software resides.
   - OnDemand components that you want to update.
   - Disk space required.
4. Click Next. The installation program displays the progress of the installation.

5. When complete, the installation program displays a message indicating successful installation. Click OK to continue.
6. If prompted, choose Yes to delete the temporary installation files.

42.0 Deleting Windows client software

42.1 Deleting Windows 16-bit client software

Complete the following steps to delete the Windows 16-bit client software on a PC.

1. Close any open OnDemand document windows and exit the Windows client program if it is active.
2. If you are using the ARSSETUP program, complete steps 1 through 8 beginning on page 193. If you are using the INSTALL program, complete steps 1 and 2 on page 195.
3. The installation program starts and, after checking for Windows client software installed on the PC, displays the Installation options dialog box.
4. Select **Delete the installed product and re-install**, if it is not already selected.
5. Choose **Continue**. The installation program displays the Components to Delete window with a list of Windows client software installed on the PC.
6. Select the component(s) you want to delete from the PC.
7. Choose **Delete**. The installation program deletes the selected components.
8. Exit the installation program.
9. If prompted, choose Yes to delete the temporary installation files.

42.2 Deleting Windows 32-bit client software

We recommend that a user with administrator privileges delete the client software on a Windows NT system.

Complete the following steps to delete the Windows 32-bit client software on a PC.

1. Close any open OnDemand document windows and exit the Windows client program if it is active.
2. Click Start.
3. Point to Programs.
4. Point to OnDemand32.
5. Click unInstallShield.
6. On the Confirm File Deletion dialog box, click Yes. The unInstallShield program removes OnDemand program files, folder items, and program folders, directories, and registry entries from the PC.
7. When the unInstallShield program completes, click OK to exit the program.

43.0 Installing the administrator interface

43.1 General installation notes

1. You must be running Windows 95 or Windows NT 4.0 or later to install the OnDemand administrator interface.

   We recommend that a user with administrator privileges install the administrator interface software on a Windows NT system.

2. Install the OnDemand administrator interface with the OnDemand Windows client setup program. You can select either the local or network installation option. Refer to topic 39.0, “Overview” on page 189 for important installation information and topic 40.0, “Installing the Windows client” on page 193 for complete installation instructions.

3. Depending on the installation options you select, the setup program installs the software on the target PC (local installation option), creates an initialization file for the administrator interface, creates the OnDemand program group (if necessary), and places the administrator interface program icon in the program group.

4. TCP/IP must be running on the PC before you install the administrator interface.

5. The installed administrator interface (local installation option) requires 5 MB of disk space.

6. The OnDemand Windows installation program lets you choose the target installation drive. The default installation drive is C. The default installation directory is \ARS32.

   If you choose the OnDemand administrator network install option, change the installation drive to a logical network drive.

43.2 Updating the administrator interface

Topic 41.0, “Updating Windows client software” on page 197 describes how to update OnDemand software on a PC, including the administrator interface.

43.3 Removing the administrator interface

Topic 42.0, “Deleting Windows client software” on page 199 describes how to remove OnDemand software from a PC, including the administrator interface.

44.0 Installing software on a network

You can install OnDemand software and fonts on a LAN server, allowing other PCs on the network to run the software and access the fonts from the server. Setting up OnDemand in this way requires approximately 2 MB of disk space on the individual PCs.

Before you can run OnDemand from a LAN server, you must install OnDemand network software on the individual PCs. If you plan to use outline fonts with OnDemand and ATM does not already exist on the individual PCs, you must install ATM on the PCs.

We recommend that a user with administrator privileges install the client software on a Windows NT system.

The following topics provide an example of installing OnDemand 16-bit Windows software on a LAN server and individual PCs:

- Install OnDemand on the LAN server.
- Install OnDemand network software on the PC.
- Install ATM on the PC.

44.1 Install OnDemand on a LAN server

1. Start the arssetup command. Select **Local** for the install type.
2. When the installation program starts, select the OnDemand clients that you want to install on the server. If you plan to use outline fonts with OnDemand, select ATM and the fonts.
3. Verify the drive assignment and directories. When installing OnDemand software on a server, the directories typically reside on a local hard drive. For example:

```
Local (Misc) Directory......C:\APPS\ARS
Client Directory............C:\APPS\ARS
IBM Fonts Directory.........C:\APPS\ARS\FONTS
Outline Fonts Directory.....C:\PSFONTS
Data Directory..............C:\APPS\ARS\DATA
Resource Directory..........C:\APPS\ARS\RES
Print Directory.............C:\APPS\ARS\PRINT
```

Figure 21. Drives and Directories on the LAN Server

44.2 Install OnDemand network software on the PC

1. Start the arssetup command. Select **Network** for the install type.
2. When the installation program starts, select the OnDemand clients that you want to access from the PC.
3. Verify the drive assignments and directories. Make sure that the Network Code Directory identifies the drive and directory on the LAN server where you installed the OnDemand software in topic 44.1, “Install OnDemand on a LAN server” on page 203. The other directories typically reside on a local hard drive. For example:

```
Local (Misc) Directory.....C:\ARS
Network Code Directory.....N:\APPS\ARS
Data Directory.............C:\ARS\DATA
Resource Directory.........C:\ARS\RES
Print Directory............C:\ARS\PRINT
```

Figure 22. Program Drives and Directories on the PC

44.3 Install ATM on the PC

1. Start the arssetup command. Select **Local** for the install type.
2. When the installation program starts, select ATM.

   ATM will be installed in the Windows directory on the local hard drive. However, ATM can access outline fonts that reside on a LAN server. In addition, OnDemand can access AFP codepage maps and other AFP font files that reside on a LAN server.
3. Verify the drive assignments and directories. Make sure that the Local (Misc) Directory, Data Directory, Resource Directory, and Print Directory identify the drive and directory on the PC where you installed the OnDemand network software in topic 44.2, “Install OnDemand network software on the PC.” Make sure that the Client Directory, IBM Fonts Directory and the Outline Fonts Directory identify the drive and directory on the LAN server where you installed the OnDemand software in topic 44.1, “Install OnDemand on a LAN server” on page 203. For example:

```
Local (Misc) Directory......C:\ARS
Client Directory............N:\APPS\ARS
IBM Fonts Directory.........N:\APPS\ARS\FONTS
Outline Fonts Directory.....N:\PSFONTS
Data Directory.............C:\ARS\DATA
Resource Directory..........C:\ARS\RES
Print Directory............C:\ARS\PRINT
```

Figure 23. Font Drives and Directories on the PC

45.0 Creating the ARSSETUP diskette

Complete the following steps to create a Windows ARSSETUP diskette.

1. Change to a working directory on the PC.
2. FTP to the RS/6000 where you installed the OnDemand server software.
3. Issue the **binary** FTP subcommand.
4. Change to the /usr/lpp/ars/client/win/install directory.
5. Issue the **get** FTP subcommand for the following file:

   arssetup.exe
6. Change to the /usr/lpp/ars/client/win/local/common/ars directory.
7. Issue the **get** FTP subcommand for the following file:

   arssockw.dll
8. Change to the /usr/lpp/ars/client/win/install/enu directory.
9. Issue the **get** FTP subcommand for the following files:

   arslangi.dll
   arslangi.hlp
10. Change to the /usr/lpp/ars/client/win/local/common/locale/uconvtab directory.
11. Issue the **get** FTP subcommand for the following file:

    IBM-1252
12. Close the FTP session.
13. Place a blank, formatted diskette in the A: drive.
14. Create the directory `\ARSSETUP` on the diskette.
15. Create the directory `\ARSSETUP\LOCALE` on the diskette.
16. Create the directory `\ARSSETUP\LOCALE\ENU` on the diskette.
17. Create the directory `\ARSSETUP\LOCALE\UCONVTAB` on the diskette.
18. Type the following commands at the DOS prompt:

```
xcopy  arss*.*     a:\arssetup
xcopy  arslangi.*  a:\arssetup\locale\enu
xcopy  IBM*.*      a:\arssetup\locale\uconvtab
```

19. Remove the diskette from the drive.
20. Label the diskette `OnDemand Windows Client ARSSETUP Diskette`.
21. Erase the files that you transferred from the RS/6000 to the working directory.

46.0 Response files for the Windows 16-bit client

46.1 Introduction

This chapter provides an overview of using response files to install the Windows 16-bit client software on PCs connected to the network. For detailed information about creating and using response files, refer to the *LAN Configuration, Installation, and Distribution Utility Guide*.

A response file is an ASCII file that supplies the client-specific configuration information required during redirected installation of a product on a PC. The response file contains predefined answers to the configuration questions that users are normally asked during a product installation, such as the installation drive and directory and the components to install. A system administrator can use a response file to automate the installation and configuration of the Windows 16-bit client software over a network of PCs. The response file makes it unnecessary for the system administrator (or other user) to sit at each PC and manually enter an answer to each question that is displayed during installation.

46.2 Format of a response file

Response files are product-specific ASCII files that contain sequences of keyword=value pairs that are interpreted by the product installation program. The response file can also contain comment lines.

46.3 Creating a response file

Response files commonly have an extension of .CID and are found in the product installation directory.

OnDemand provides a model response file in the product installation directory. The name of the model response file is ARSWIN.CID. The arssetup program copies the file to the installation directory ($ARSINST by default). Use a standard text editor to view or make changes to the file. The file contains comment lines that explain the keywords and their values and installation options.

46.4 Installing software using a response file

A response file is not invoked directly. Instead, a response file is specified as a parameter value for the installation program. You can run the install program and specify an action and a response file. For example, the command:

```
d:\$arsinst\install /A:I /R:arswin.cid
```

Causes the install program to install the software on the client PC using the instructions found in the ARSWIN.CID response file in the $ARSINST directory on the D drive. By

default, the install program expects to find the response file in the directory where the install program resides.

The response file directs the processing of the installation for the Windows 16-bit client software. When you run the install program with a response file, no messages or dialog boxes are displayed. Instead, messages are written to a log file. You identify the directory where the install program places the log file and name the log file by specifying the **/L1** command line option. For example, the command:

```
d:\$arsinst\install /A:I /R:arswin.cid /L1:c:\temp\arswin.log
```

Causes the install program to write the log file ARSWIN.LOG in the TEMP directory on the C drive.

46.5 Verifying software installation

To verify the installation of a product that you installed using a response file, open the log file and examine the return code. The return code should indicate that the software was successfully installed on the client PC.

46.6 Using a response file to install OnDemand software

In general, complete the following steps to prepare the OnDemand Windows 16-bit client software for installation using a response file and then install the software on other PCs connected to the network.

1. Install the software on the PC server. Use the ARSSETUP program to transfer the files from the OnDemand library server to the PC server and install the software on the PC. **Do not delete the installation directory**.
2. Modify the model response file provided with OnDemand to meet your specific installation requirements.
3. Test the installation process and the response file by installing the software on a client PC.
4. After testing and validating the response file, install the software on other PCs. Run the install program with the **/A:I** option to install the software, the **/R:** option to read the response file you created in step 2, and the **/L1:** option to identify the log file.
5. Examine the log files to verify the installation of the software.

47.0 Response files for the Windows 32-bit client

47.1 Introduction

This chapter provides information that can be used to create and use response files to install the Windows 32-bit client software on PCs connected to the network. You typically use the InstallShield setup program to create a response file. You then install the software on other PCs by running the InstallShield setup program and specifying the name of the response file.

A response file is an ASCII file that supplies the client-specific configuration information required during redirected installation of a product on a PC. The response file contains predefined answers to the configuration questions that users are normally asked during a product installation, such as the installation drive and directory and the components to install. A system administrator can use a response file to automate the installation and configuration of the Windows 32-bit client software over a network of PCs. The response file makes it unnecessary for the system administrator (or other user) to sit at each PC and manually enter an answer to each question that is displayed during installation.

47.2 Format of a response file

The format of a response file is similar to that of an .INI file. A response file contains pairs of keywords and values organized into sections. The keywords and values are interpreted during software installation.

47.3 Creating a response file

Response files commonly have an extension of .ISS and are found in the Windows directory.

You can create a response file by running the InstallShield setup program with the **-r** command line option. For example, the command:

```
d:\$ars32in\setup -r
```

Causes the setup program to record all of your answers to the product installation questions in the SETUP.ISS response file. You can direct the setup program to place the response file in a different directory and name a response file by specifying the **-f1** command line option. For example, the command:

```
d:\$ars32in\setup -r -f1 d:\$ars32in\ars32in.iss
```

Causes the setup program to create the ARS32IN.ISS file in the $ARS32IN directory on the D drive.

47.4 Installing software using a response file

A response file is not invoked directly. Instead, a response file is specified as a parameter value for the installation program. You can run the InstallShield setup program and specify a response file with the **-s** command line option. For example, the command:

```
d:\$ars32in\setup -s
```

Causes the setup program to install the software using the instructions found in the SETUP.ISS response file in the $ARS32IN directory on the D drive. By default, the setup program expects to find the response file in the directory where the setup program resides. Use the **-f1** option to identify the location and name of the response file. For example, the command:

```
d:\$ars32in\setup -s -f1 d:\$ars32in\ars32in.iss
```

Causes the setup program to install the software using the ARS32IN.ISS response file located in the $ARS32IN directory on the D drive.

The response file directs the processing of the installation for the Windows 32-bit client software. When you run the setup program with the **-s** option, no messages or dialog boxes are displayed. Instead, messages are written to a log file. By default, the log file (SETUP.LOG) is written to the directory where the setup program resides. You can direct InstallShield to place the log file in a different directory and name the log file by specifying the **-f2** command line option. For example, the command:

```
d:\$ars32in\setup -s -f2 c:\temp\ars32in.log
```

Causes the setup program to write the log file ARS32IN.LOG in the TEMP directory on the C drive.

47.5 Verifying software installation

To verify the installation of a product that you installed using a response file, open the log file and locate the ResponseResult section. Examine the value of the ResultCode parameter. The return code should be zero (0).

47.6 Using a response file to install OnDemand software

In general, complete the following steps to prepare the OnDemand Windows 32-bit client software for installation using a response file and then install the software on other PCs connected to the network.

1. Transfer the installation files from the OnDemand library server to a PC server. Use the ARSSETUP program to transfer the files. **Do not delete the installation directory**.
2. Install the software on the PC server. Run the InstallShield setup program with the **-r** option to create the response file and the **-f1** option to name the response file. We recommend that you place the response file in the installation directory ($ARS32IN by default).

3. Test the installation process and the response file by installing the software on a client PC.
4. After testing and validating the response file, install the software on other PCs. Run the InstallShield setup program with the **-s** option to read the response file you created in step 2 on page 210, the **-f1** option to identify the response file, and the **-f2** option to identify the directory where the setup program writes the log file.
5. Examine the log files to verify the installation of the software.

48.0 Mapping AFP fonts

OnDemand needs to map the AFP fonts your document was created with to fonts that can be displayed on your workstation. For OnDemand to map the best matching outline fonts to display your AFP document, it needs to know certain characteristics about the fonts that were used to create your document. Mapping AFP fonts to outline fonts is done with the IBM-supplied font definition files installed as part of OnDemand. These files are stored in the \ARS\FONT directory you specified when you installed OnDemand. You may edit them using any workstation editor. The shipped version of the font definition files maps the IBM Core Interchange (Latin only), compatibility, coordinated, Sonoran, and Data1 fonts for you.

If your document uses an AFP font whose family (familyname) isn't installed on your workstation, you can use the ALIAS.FNT file (one of the font definition files installed with OnDemand) to substitute that font familyname with a different one. The ALIAS.FNT file remaps several of the AFP fonts to IBM Core Interchange fonts. If you have any outline fonts installed on your workstation, you may want to remove or comment out the font familyname substitutions in the ALIAS.FNT file. Topic 48.8, "Alias File" on page 224 provides more information about using the ALIAS.FNT file.

The IBM Core Interchange fonts (shipped with OnDemand) are in Type 1 outline format. These fonts are delivered in three type families: Times New Roman, Helvetica, and Courier. Each type family is provided in these character set groups:

Latin The Latin group is available in 4 typefaces: roman medium, roman bold, italic medium, and italic bold.

Symbols The Symbols group is available in 2 typefaces: roman medium and roman bold.

Because the IBM Core Interchange fonts are also available for printing with PSF/2; Version 2 of PSF/MVS, PSF/VM and PSF/VSE; and PSF/6000, they help standardize fonts across applications and installations.

If you created your documents with only the unmodified IBM fonts, you won't need to remap fonts to use OnDemand.

48.1 When You Need to Map Fonts

If you are using fonts that are not defined to OnDemand, if you have modified the IBM AFP fonts, or if you have created your own AFP fonts (for example, with PSF/2 Type Transformer), you need to define those fonts in the font definition files in order for documents using those fonts to display correctly with OnDemand.

- If you created a new coded font (or renamed one), you will need to define the coded font in the Coded Font file (ICODED.FNT or CODED.FNT).
- If you created a new character set, you have to define it in the Character Set Definition file (CSDEF.FNT).

- If you created a new code page, you have to define it in the Code Page Definition file (CPDEF.FNT).
- If you have created a new code page or modified a code page by moving characters, you have to create a new Code Page Map file (cp_id.CP).

If you only have modified an existing IBM font component, you may not need to perform any of the above steps. For example, if you have only deleted code points in the IBM code page, the font files supplied with OnDemand can be used.

48.2 Files Supplied for Mapping Fonts

The following types of files for font support are installed by default in the following subdirectories under the directory in which OnDemand was installed:

Table 30 (Page 1 of 2). OnDemand Font Files and Directories

File	File Name	Subdirectory	Description
Coded Font files	ICODED.FNT CODED.FNT[1] ICODED.CHS[2] ICODED.CHT[3] ICODED.JPN[4] ICODED.KOR[5]	\FONT	Specifies which AFP code page and AFP font character set make up the coded font.
Character Set definition file	CSDEF.FNT CSDEF.CHS[2] CSDEF.CHT[3] CSDEF.JPN[4] CSDEF.KOR[5]	\FONT	Defines AFP character set attributes, such as point size. It also maps the font character set to its font global identifier.
Code Page definition file	CPDEF.FNT CPDEF.CHS[2] CPDEF.CHT[3] CPDEF.JPN[4] CPDEF.KOR[5]	\FONT	Maps each AFP code page to a Windows character set[6] . and indicates which Code Page Map file for OnDemand to use.
Code Page Map file	*cpgid*.CP	\FONT\MAPS	Defines character identifier mappings. It matches the IBM code page character identifiers and their hexadecimal code points with a corresponding character identifier and ASCII code point representing a Windows ANSI or SYMBOL character set.[6]
Alias File	ALIAS.FNT	\FONT	Maps AFP font type families to Type 1 or TrueType outline font family names.

Table 30 (Page 2 of 2). OnDemand Font Files and Directories

File	File Name	Subdirectory	Description

Note:

1. CODED.FNT is an optional file. A sample can be found in the SAMPLES subdirectory of the \ARS\FONT directory. The CODED.FNT file is meant to contain coded fonts you've created.
2. Code page and character set files for the Simplified Chinese client.
3. Code page and character set files for the Traditional Chinese client.
4. Code page and character set files for the Japanese client.
5. Code page and character set files for the Korean client.
6. The Windows term "character set" is roughly equivalent to the AFP term "code page."

48.3 Steps for Mapping Your Fonts

After reading the rest of this chapter to determine which font files you need to modify, follow these steps:

1. Gather the information needed to define the fonts in the font definition files. This information is described in the following sections of this chapter.
2. Make backup copies of any of the following font definition files that you plan to modify:
   - CSDEF.FNT
   - CPDEF.FNT
   - ICODED.FNT
   - ALIAS.FNT

   Note: Backup copies of these files should be made so that you have an unmodified copy in the event something happens to your modified copy that makes it inoperable.
3. Install any other outline fonts you are planning to use with OnDemand. (The *Adobe Type Manager User Guide* provides information about installing fonts with ATM.)
4. If you have created or modified a code page, use the BLDCPMAP REXX program to build the code page map file:
   a. Determine which Windows character set (ANSI or SYMBOL) is a suitable match for the AFP code page.
   b. Substitute any non-matching characters in the code page map file or ALIAS.FNT file if necessary. (Refer to topic 48.7, "Code Page Map Files" on page 221 and " Code Page Map File REXX Program for Building a Code Page Map File" on page 222 for information about code page map files and the code page map file program respectively.)

c. Edit the CPDEF.FNT file and add your code page name, code page identifier, and the best matching Windows character set name for the fonts you are using.

   Note: If you are specifying the SYMBOL Windows character set, the font familyname used with the code page must be a symbol font.

5. If you have created a new character set, edit the CSDEF.FNT file and add your character set name in the [CHARSET] section. Specify the correct attributes for your font in the CSDEF.FNT. Add the appropriate information in the [FGID] section of the file if you are naming a new font global identifier.
6. If you have created a coded font, create or edit the CODED.FNT file and add your coded font.

Syntax Rules for Font Definition Files

Syntax rules for OnDemand font definition files are as follows:

- A semicolon (;) in the first column of any of these files will cause the line to be treated as a comment statement and ignored.
- Section headers within files are enclosed in brackets [ ] and must *not* be removed or changed.
- All values are case insensitive.
- If a parameter value is invalid and a default value exists, it will be substituted.
- All parameters are positional.
- Blanks are allowed between parameter values.

48.4 Coded Font File

The IBM Coded Font file (ICODED.FNT) maps AFP coded fonts to their AFP character sets and AFP code pages. Two Coded Font files can be used with OnDemand:

ICODED.FNT This file contains definitions for approximately 2500 IBM-supplied coded fonts.

CODED.FNT You can create this optional file to define a list of any coded fonts you have created. If you create a CODED.FNT file, you must place it in the \ARS\FONT directory. A sample of this file can be found in the SAMPLES subdirectory of the \ARS\FONT directory.

If a CODED.FNT file exists in the \ARS\FONT subdirectory, it is searched first for the coded fonts used in an AFP file. If the coded font name is not found in CODED.FNT or if CODED.FNT does not exist, only the OnDemand-supplied ICODED.FNT file will be searched.

```
X?A155N2 = C?A155N1, T1DCDCFS
X?AE10   = C?S0AE10, T1S0AE10
X?GT10   = C?D0GT10, T1D0BASE
X?ST15   = C?D0ST15, T1D0BASE
X?A0770C = C?A07700, T1DCDCFS
X?A0770I = C?A07700, T1GI0361
X0T0550C = C0T05500, T1DCDCFS
```

Figure 24. Example of CODED.FNT File

Coded Font File Rules

- A question mark (?) can be used as the wild-card character only for the second character in the coded font name and the character set name. This allows all the character rotations of the coded fonts to be handled with one entry for searching.

  Note: A sequential search is performed for the coded font, and the first match is used (including the wild-card character).

- After the coded font name, the character set name must be listed first, followed by the code page name.
- The character set and code page *must* be separated by a comma.

48.5 Character Set Definition File

The Character Set Definition file specifies the character set attributes and font global identifier of the font. It is split into 2 sections, one for character sets [CHARSET] and one for font global identifiers [FGID].

```
[CHARSET]
;charset = fgid, height, width, strikeover, underline
C?H200A0=2304,110,73,0,0
C?H200D0=2304,140,93,0,0
C?N200B0=2308,120,80,0,0
C?4200B0=416,120,144,0,0
C?D0GT15=230,80,96,0,0
C?A155A0=33207,110,73,0,0
C?A175A0=33227,110,73,0,0
C?T055D0=4407,140,93,0,0
C?T17500=4555,100,67,0,0
C?T17560=4555,60,40,0,0
DEFAULT =2308,80,0
```

Figure 25. Example of [CHARSET] section in Character Set Definition File

The first section identified by the section header [CHARSET] lists each AFP font character set and its corresponding attributes:

- Font global identifier (fgid)

- Font height
- Font width
- Strikeover
- Underline

Table 31. Character Set Definition File Attribute Values for [CHARSET]

Attribute	Possible Values	Shipped Default	Description
Fgid	IBM-defined FGID or your own defined FGID within this range: 3840 to 4095 or 65260 to 65534	2308	A unique value that identifies the type family, typeface, and sometimes the point size of the character set.
Height	1 to 990	80	The vertical size of the character set (minimal baseline-to-baseline value) expressed in tenths of a point. For example, a 9-point font would have a height of 90.
Width	0 to 99 (currently ignored)	0	The average horizontal size of the characters in 1440th of an inch. Currently, 0 is always used because Windows determines an appropriate font width based on the font height.
Strikeover	1 (means yes), 0 (means no)	0	A font whose characters all have a line, parallel to the character baseline, placed over the middle of the character.
Underline	1 (means yes), 0 (means no)	0	A font whose characters all have a line, parallel to the character baseline, placed under the character.

The second section, identified by the section header [FGID], lists each font global identifier and its corresponding attributes:

- Font type families
- Style
- Weight
- Italic

```
[FGID]
;fgid = familyname, style, weight, italic
230=Gothic,MODERN,MED,0
416=Courier,MODERN,MED,0
2304=Helvetica,SWISS,MED,0
2308=TimesNewRoman,ROMAN,MED,0
4407=SonoranSerif,ROMAN,MED,0
4555=SonoranSerif,ROMAN,BOLD,1
33207=SonoranSansSerif,SWISS,MED,1
33227=SonoranSansSerif,SWISS,BOLD,1
```

Figure 26. Example of [FGID] section in Character Set Definition File

Table 32. Character Set Definition File Attribute Values for [FGID]

Attribute	Description	Possible Values	Shipped Default
Familyname[1]	An outline font name or an AFP type family name. This name appears on the ATM Control Panel if you have the font installed on your workstation.	Any Adobe Type 1 font name or AFP type family name	TimesNewRoman
Style[2]	The same as a Windows "family." It is approximately equivalent to type family plus typeface style in AFP fonts.	SWISS,[3] ROMAN,[4] SCRIPT,[5] MODERN,[6] DISPLAY[7]	ROMAN
Weight	The degree of boldness of a typeface caused by different thickness of the strokes that form a graphic character.	LIGHT, MED, BOLD	MED
Italic	A font whose characters slant to the right.	1 (means yes), 0 (means no)	0

Note:

1. "Familyname" is the same as "type family" in AFP fonts and "typeface name" in Windows.
2. "Style" is the same as Windows "family" and is roughly equivalent to "typeface style" and "type family" in AFP fonts.
3. SWISS is a proportionally spaced font, without serifs.
4. ROMAN is a proportionally spaced font, with serifs.
5. SCRIPT is a fixed-pitch font designed to look like handwriting.
6. MODERN is a fixed-pitch font, with or without serifs.
7. DISPLAY is a decorative font.

Character Set Definition File Rules

- Parameters must be separated by a comma. Table 31 on page 218 and Table 32 on page 219 list the possible values, and shipped default values for each parameter.
- In the [CHARSET] section of the file, only `fgid` and `height` (point size) are required.
- In the [FGID] section of the file, only the type `familyname` and `style` are required.
- A question mark (?) can be used as the wild-card character only for the second character in the character set name. This allows all the character rotations of the coded fonts to be handled with one entry while searching.

  Note: A sequential search is performed for the character set, and the first match is used (including the wild-card character).
- The [CHARSET] section must come before the [FGID] section.
- You can set a default character set. The default character set that is defined in the file must be the last entry in the [CHARSET] section.
- If you add your own AFP font character set to the [CHARSET] section, you must assign it a font global identifier. Font global identifiers you create must be in the ranges of 3840 to 4095 or 65260 to 65534. If the new character set has the same familyname, style, weight, and italic attributes as an existing character set, you may use the same font global identifier; otherwise, you must add a unique font global identifier to the [FGID] section.

48.6 Code Page Definition File

The Code Page Definition file maps the IBM AFP code page name to its code page global identifier (CPGID) and to a Windows character set. The section header [CODEPG] is followed by a list of AFP code pages and their parameters. The first parameter in each line is the AFP code page global identifier that maps to a Code Page Map file. (Topic 48.7, “Code Page Map Files” on page 221 provides information about mapping code pages.) The second parameter is the Windows character set that you decide is the best match for your AFP code page. The last line gives the default parameter values to be used when a default is required.

```
[CODEPG]
;codepage = cpgid,wincp
T1DCDCFS=1003,ANSI
T1DEBASE=2058,ANSI
T1D0BASE=2063,ANSI
T1D0GP12=2085,ANSI
T1GI0395=2079,ANSI
T1GPI363=2066,SYMBOL
T1V10037=37,ANSI
T1V10273=273,ANSI
T1000290=290,ANSI
T1000310=310,ANSI
T1000423=423,ANSI
T1000905=905,ANSI
DEFAULT =361,ANSI
```

Figure 27. Example of Code Page Definition File

Table 33. Code Page Definition File Attribute Values

Attribute	Possible Values	Shipped Default
Code Page Global Identifier	IBM-defined CPGID or your own defined CPGID within this range: 65280 to 65534	361
Windows Character Set	ANSI or SYMBOL	ANSI

Code Page Definition File Rules

- Parameters must be separated by a comma. Table 33 lists the possible values and shipped default values for each parameter.
- Only the first parameter (code page identifier) is required.
- If you create your own code page, you must assign it a unique code page identifier. Leading zeros are not valid. (You may use an IBM code page global identifier but only if the character-to-hexadecimal code mapping is the same for your code page.)
- You can set a default code page. The default code page that is set within the file must be the last entry in the file.

48.7 Code Page Map Files

OnDemand provides one Code Page Map file for each AFP code page supplied with PSF and the Data1 and Sonoran licensed programs. These files are installed in their own subdirectory (MAPS) under the \ARS\FONT directory. The file is named for its code page global identifier (CPGID) and has a file extension of .cp (for example, 2063.cp is the file name for the T1D0BASE code page map; its CPGID is 2063). Each file contains the character identifiers (and associated EBCDIC hexadecimal code points)

for an IBM code page and maps them to character identifiers (and associated ASCII code points) for a Windows ANSI or SYMBOL character set.

```
;T1000395   to    ANSI
SP010000 40    SP010000 20
LA150000 42    LA150000 E2
LA170000 43    LA170000 E4
LA130000 44    LA130000 E0
SP180000 8B    SP180000 BB
SM560000 8C    SM560000 89
SA000000 8D   SP100000 2D
LI510000 8E   NOMATCH 00
LF570000 8F   NOMATCH 00
SM190000 90    SM190000 B0
LJ010000 91    LJ010000 6A
LF510000 A0   NOMATCH 00
;;;;;;;; ;     SD150000 5E
;;;;;;;; ;     SD130000 60
;;;;;;;; ;     LT630000 FE
/*
```

Figure 28. Example of Code Page Map File

Code Page Map File Rules

- Parameters must be separated by blanks.
- "NOMATCH" means there is not a matching character in the Windows character set.
- The "NOMATCH" hexadecimal code of 00 is mapped to the undefined code point. When a document contains a character that does not exist in the Windows character set, that character cannot be displayed on the screen. If the character has not been remapped in the Code Page Map file or the Alias file [5], the undefined code point character will be displayed as a blank character.
- The string of semi-colons (;;;;;;;;) means this line is ignored as a comment. It also indicates the Windows code page contains a character that doesn't exist in the IBM code page. The code point for a Windows character not found in the IBM code page can be used for replacing NOMATCH characters.

Code Page Map File REXX Program for Building a Code Page Map File

OnDemand supplies a sample Restructured Extended Executor Language (REXX) program (BLDCPMAP.REX) you can use to create Code Page Map files. This program executes in MVS, VM, or OS/2 REXX environments. The REXX program is in the SAMPLES subdirectory of the \ARS\FONT directory.[6]

---

5 Topic 48.8, "Alias File" on page 224 provides information about remapping code points.

6 The \ARS directory is the directory in which you installed OnDemand.

The BLDCPMAP.REX program requires a host AFP code page and one of the Windows character set files: ANSI.WCP or SYMBOL.WCP.[7]The program's output is a Code Page Map file that maps the characters in the host code page to matching characters in the Windows character set so it can be used with OnDemand. It also identifies how many unmatched characters there are in the code page so that you can determine which Windows character set (ANSI or SYMBOL) contains the most matching characters. Matching is done using graphic character identifiers.

If you are going to use the BLDCPMAP.REX EXEC on your MVS or VM system, ensure that you upload it as an ASCII file with carriage return and line feed (CR/LF) as specified in the BLDCMAP.REX file prologue.

On a VM system, the BLDCPMAP.REX EXEC must be run from the command line rather than from a file listing.

Setting up to Build a Code Page Map File

You can either transfer the BLDCPMAP REXX program and the Windows character set file to your host system and run the program there, or you can transfer your AFP code pages to your workstation and run the program under OS/2 (if you have REXX installed on your workstation). You can use any file transfer program that handles standard host record format files and ASCII CR/LF line endings, with or without ASCII to EBCDIC translation. (We recommend using the Communications Manager File Transfer program.)

If you transfer the REXX program and the Windows character set files (these files have an extension of .WCP) to your MVS or VM host system, they must be translated from ASCII to EBCDIC and CR/LF must indicate a new line. All of the files transferred to the host system must be human-readable. If you transfer your AFP code pages to your OS/2 workstation, you *must* specify a **binary** format. If the file transfer is not correct, a REXX error occurs when you run the BLDCPMAP program.

On your OS/2 workstation, rename the BLDCPMAP.REX file to BLDCPMAP.CMD and ensure that REXX is installed. On your VM host system, the filetype for the BLDCPMAP file must be EXEC. On your MVS system, the program may be run explicitly with the EXEC command or implicitly by member name, if the partitioned data set containing the BLDCPMAP program was previously allocated to your system file that contains execs (usually SYSEXEC or SYSPROC). If the REXX program is named correctly, you can run the program without parameters to get the correct syntax of the command. You can also list the prologue for the EXEC for syntax.

When you run the BLDCPMAP program, and you have selected which Code Page Map file you want to use with OnDemand, place that Code Page Map file in the MAPS subdirectory of the \ARS\FONT directory in the directory in which you installed

7 The Windows character set files are shipped with OnDemand and can be found in the SAMPLES subdirectory of the \ARS\FONT directory.

OnDemand. Update the CPDEF.FNT file in the \ARS\FONT directory. In order for OnDemand to find the Code Page Map file, it must be named as follows:

```
code-page-global-identifier.CP
```

For more information about using the Code Page Map file, refer to topic 48.7, “Code Page Map Files” on page 221. For more information about the BLDCPMAP program (for example, the syntax for running the program), refer to the prologue in the BLDCPMAP.REX file.

48.8 Alias File

The Alias File contains 2 sections: one section for font family name aliases [FONT] and one section for character identifier aliases [CHARID].

The first section, identified by the section header [FONT], lists the font familyname aliases. Font familyname aliases allow you to change all of the requested instances of a font familyname (as defined in the Character Set Definition file) to another font familyname. For example, this file is used to change all requests for the SonoranSerif font (which may not exist on the workstation) to requests for the TimesNewRoman font (which is one of the core fonts shipped with OnDemand) as shown in Figure 29.

ATM is the supported font program, however, TrueType fonts can be used with OnDemand, but fidelity and character mapping will likely be incorrect. As a backup, a second font (TrueType) can be specified after the Type 1 font name. If the Type 1 font is not found, the TrueType font will be used to display your document.

Note: Be aware that font familyname remapping, especially to TrueType fonts, can cause some misalignment of text characters since the display font is not the same as the font used to create the AFP document. The font familyname can be found listed in the ATM Control Panel. Remapping of one font familyname to a different font familyname with very different characteristics (such as STYLE) may mean a matching font cannot be found. You will receive an error message if either font substitute cannot be found.

```
[FONT]
; ***** Requested font = Type 1 font, TrueType font  *****
Book=TimesNewRoman,Times New Roman
CourierOverstrike=Courier,Courier New
SonoranSerif=TimesNewRoman,Times New Roman
SonoranSansSerif=Helvetica,Arial
Text=Courier,Courier New
```

Figure 29. Example of [FONT] section in Alias File

The second section, identified by the section header [CHARID], lists the character identifier aliases. Character identifier aliases (also known as glyph identifiers) allow you to change all of the requested instances of a character to another character. For example, since the Windows ANSI character set does not contain the ff ligature (LF510000), it’s not mapped to a character in the code page map files (refer to

Figure 28 on page 222). Instead, it's mapped to NOMATCH 00. If you want to map all occurrences of LF510000 — NOMATCH pair to a lower case f, you could do this in the [CHARID] section of the ALIAS.FNT file with the following entry:

```
LF510000=LF010000
```

If you want to change one specific character for one specific code page, you may remap the character on that code page to another character as shown in Figure 28 on page 222.

The Alias file is checked only when a NOMATCH 00 is found in a character mapping.

Note: Using the Alias file for more than a few character substitutions is not recommended as program performance will be affected. If a lot of character substitutions are needed, it is better to make those changes directly to the mappings in the Code Page Map files you're using.

```
[CHARID]
LF510000=LF010000
SA000000=SP320000,SP100000
```

Figure 30. Example of [CHARID] section in Alias File

Alias File Rules

- For family name aliases, all requests for the first family name in the Character Set Definition file have the second family name substituted for them. If the second family name is not found, the TrueType font (the third family name) is requested.
- Only 2 family name substitutes per line are allowed (to the right of the equal sign), and they must be separated by a comma.
- If multiple mappings are listed in the file for the same family name, only the first match is used.
- The Alias file is processed sequentially and is *not* chained (for example, if "Century Schoolbook" is set equal to "Times," and "Times" is set equal to "TimesNewRoman," "Century Schoolbook" will *not* be set to "TimesNewRoman").
- Blanks in family names are treated as characters (for example, "Times New Roman" is not the same font as "TimesNewRoman").
- The [CHARID] section of the Alias file is only used if the second character identifier is NOMATCH 00.
- The character identifier that you want modified in the [CHARID] section must be followed by an equal sign and the character identifier to which it is to be changed. A character remap occurs when the modified character identifier (the character to the left of the equal sign in the [CHARID] section) matches the first character identifier of a non-matching pair in the Code Page Map file.
- Several character identifiers (substitute char id) may be listed to the right of the equal sign separated by commas. The first substitute character identifier is

substituted for the modified character identifier unless it doesn't exist in the Windows font. If it doesn't exist, the next substitute character identifier is used. If none of the substitute character identifiers exist, the undefined code point is used. If you want to examine the contents of the Windows character sets, list the .WCP files in the SAMPLES subdirectory of the \ARS\FONT directory.

- A maximum of 4 substitute character identifiers are allowed.

48.9 Support for TrueType Fonts

OnDemand supports Type 1 fonts installed under Adobe Type Manager (ATM). Type 1 outline fonts are supplied with OnDemand and provide better fidelity in general than mapping to TrueType fonts. These fonts are installed in the fonts directory you specified when you installed OnDemand (the default directory is \PSFONTS). The installed OnDemand Type 1 outline fonts and their PC file names are as follows:

```
FONT NAME      PC FILE NAME
TIMESNEWROMAN  tnr*.*
HELVETICA      helv*.*
COURIER        cou*.*
BOLDFACE       bfc*.*
COURIERAPL2    apl*.*
GOTHICTEXT     got*.*
LETTERGOTHIC   lgo*.*
OCR_A          ocr_a.*
OCR_B          ocr_b.*
PRESTIGE       prs*.*
```

TrueType Fonts

OnDemand queries ATM when the OnDemand viewer is started. If ATM is not available or the Type 1 font you requested cannot be found, OnDemand uses TrueType fonts. If you don't install and use ATM, you may use TrueType fonts to display your documents. To use TrueType fonts, you must do the following:

1. If ATM is installed, it must be disabled, removed, or the Type 1 fonts installed with OnDemand must be removed (if they are not used by other applications on your workstation). You can use ATM to remove these fonts.
2. To disable the check for ATM and the error message generated, you must edit the ARS.INI file in the Windows directory to add the following line in the [Misc] stanza:

   ```
   TTONLY=TRUE
   ```

   To request a specific TrueType font, use the second font substitution family name in the ALIAS.FNT file as described in topic 48.8, "Alias File" on page 224.

TrueType Font Substitution Problems

Make sure that the TrueType font you have requested is installed on your workstation. Font substitutions that occur when fonts are not available may cause unexpected results when displaying your files. For example, Courier New is requested in the ALIAS.FNT file and is available with Windows 3.1, but is not available on WIN-OS2 3.1, but can be installed.

Post installation

This section of the book describes how to verify the installation of your OnDemand system.

Other important tasks described in this section include:

- Defining ADSM storage nodes

  If you plan to copy data to archive media, you must define storage nodes to ADSM. Depending on the storage management requirements of the data you store in OnDemand, you may need to define more than one storage node.

- Defining storage sets

  You must define storage sets before you can define you own application groups or assign the system defined application groups to a storage set. Depending on the storage management characteristics of the application groups on your system, you may need to define more than one storage set.

- Configuring the system log application group

  We recommend that you define a storage set that writes files to archive media and then update the storage management settings in the System Log application group so that OnDemand copies data written to the system logging facility to archive media. We also recommend that you store system log index data in table spaces.

- Configuring the system migration application group

  If you need to migrate index data from the database to archive media, you must define a storage set that writes files to archive media and then update the storage management settings in the System Migration application group to identify the storage set where OnDemand migrates the data. We also recommend that you store system migration index data in table spaces.

49.0 Verifying the installation

1. Complete all of the steps in Preparing the OnDemand server beginning on page 17.
2. Complete all of the steps in Installing software on the OnDemand server beginning on page 33.
3. Complete all of the steps in Configuring the OnDemand server beginning on page 45.
4. Shutdown AIX.
5. Restart AIX. Reinitializing AIX starts the OnDemand server daemon, DB2 for AIX, ADSM, and other required programs.
6. Install at least one of the OnDemand client programs on a PC.
7. Start the OnDemand client program. OnDemand displays the Logon to a Server dialog box.
8. Click Update Servers. OnDemand displays the Update Servers dialog box.
9. Add the name of the OnDemand library server. Click Help for information about the fields and options.
10. Click Close to return to the Logon to a Server dialog box.
11. Select the name of the server that you added in the Update Servers dialog box, if it is not already selected.
12. Type an OnDemand userid and password in the fields provided.
13. Press Enter.
14. Open and search the System Log folder.

If you were able to view messages stored in the system log, you can consider the installation of OnDemand successful.

If the client program does not start, check the drive, path name, and program name values used to start the program. Then try the command again.

If the client program issues a message indicating a problem, follow the instructions in the message window. If the problem persists, contact the IBM support center for help with resolving the problem.

50.0 Defining storage nodes to ADSM

This chapter of the book describes how to define an OnDemand storage node to ADSM. A storage node identifies an OnDemand object server and ADSM node. The node name that you specify must belong to an ADSM policy domain that supports the media type and retention period required by the data that you plan to archive in the storage set.

50.1 Storage configuration concepts

Before you load data into application groups that require optical or tape storage management, you must plan for, install, and set up the physical devices and configuration files that support your data archiving requirements.

If you followed the instructions in topic 14.0, “Configuring ADSM” on page 51, you probably configured one or more storage libraries to support ADSM, defined devices and device classes to support the libraries, and defined policy domains that ADSM uses to maintain the data stored in the libraries.

The OnDemand administrator interface provides commands that you can use to define storage sets and storage nodes. You typically define one or two storage sets for an OnDemand system, depending on the retention requirements of the data that you plan to archive in OnDemand. For example, a seven year storage set and a ninety day storage set. A storage set can contain one or more primary and secondary storage nodes. A storage node identifies an ADSM node on an OnDemand object server. An ADSM node resides in a domain. A domain identifies a storage pool, which is where ADSM manages a collection of storage volumes. The storage volumes reside in an optical or tape library.

When you define an application group to OnDemand, you select the name of the storage set that supports the life of the data and other storage management characteristics of the data that you plan to store in the application group. The storage nodes in the storage set determine the type of media and where and how long data is maintained. That is, after you register a storage node as a node in ADSM, you link it to a specific domain, which governs how long the data is maintained by ADSM and the storage library where ADSM stores the data.

50.2 Verify storage node information

After you define an OnDemand primary or secondary storage node, you must register the storage node as a node in ADSM. When you register a node in ADSM, you assign the node to an ADSM policy domain. The policy domain contains information about where ADSM stores the data, for example, a specific optical library, and the length of time that ADSM maintains the data. A policy domain supports a single storage pool. A storage pool supports a single optical library. You can register one or more nodes in a policy domain.

Before you register a node in a domain:

- Verify that the domain contains a storage pool with sufficient capacity to maintain the data to be stored in the node.
- Verify that the domain contains a copy group that retains the data for the required number of days (or years).
- We recommend that you register a secondary node in a different domain than where ADSM manages data for the associated primary nodes.

The node registration information includes the name of the node, the node password, identifies the policy domain. When you use ADSM to provide storage management for OnDemand, the node name and password in ADSM must be the same as the storage node name, logon name, and password that you specify when you define a storage node to OnDemand. The administrator interface online help provides information about the storage node name, logon name, and password.

For more information about registering nodes in ADSM, please refer to the *ADSM Administrator's Reference*.

50.3 Register the storage node in ADSM

Complete the following steps to register a node in ADSM. We recommend that you start an administrative client in console mode and another administrative client in interactive mode. You can review messages generated by the maintenance tasks in the console window. You can enter ADSM commands in the interactive window.

1. Login to AIX as the *root* user.
2. Start ADSM, if it is not already started. Enter the following command at the AIX prompt:

```
/usr/lpp/ars/bin/ars_adsm -sv
```

3. Start an ADSM administrative client in console mode. Enter the following command at the prompt of an aixterm window:

```
dsmadmc -consolemode
```

4. Enter an ADSM administrator userid and password when prompted.
5. Start an ADSM administrative client in interactive mode. Enter the following command at the prompt of an aixterm window:

```
dsmadmc
```

6. Enter an ADSM administrator userid and password when prompted.
7. Register the node. The following example registers the node `PRI7YR` in the `OD7YRPD` domain.

```
register node PRI7YR password domain=OD7YRPD -
              contact='OnDemand <administrator name>'
```

Figure 31. Node Registration Information

   Enter the command at the *adsm>* prompt. Replace the string `PRI7YR` with the ADSM node name. Replace the string `password` with the ADSM node password. The ADSM node name and password and the OnDemand storage node name and password must be the same. Replace the string `OD7YRPD` with the name of the ADSM domain where you plan to assign the storage node.
8. ADSM displays status messages confirming successful completion of the register command.
9. If you are registering a primary storage node and you want ADSM to maintain a backup copy of the data in a copy storage pool, verify that the primary storage pool data is backed up to a copy storage pool. 15.0, “Implementing a copy storage pool” on page 75 provides detailed instructions.
10. If you are registering a primary storage node and you want OnDemand to maintain a backup copy of the data stored in the primary storage node, verify that the secondary storage node is registered as a node in ADSM.

    If it is not, you must register the secondary storage node as a node in ADSM. The following example registers the node `SEC7YR` in the `OD7YRPD` domain.

```
register node SEC7YR password domain=OD7YRPD -
              contact='OnDemand <administrator name>'
```

Figure 32. Node Registration Information

    Enter the command at the *adsm>* prompt. Replace the string `SEC7YR` with the ADSM node name. The ADSM node name and password and the OnDemand storage node name and password must be the same.

    Replace the string `OD7YRPD` with the ADSM policy domain. You typically register the secondary node in a different domain than the primary node.
11. When you have completed registering nodes, stop the ADSM administrative client and close the ADSM console. Enter **QUIT** at the *adsm>* prompt to stop the client. Press the **Ctrl** and **C** keys to close the administrative console.

For more information about using the ADSM administrative server and console and ADSM commands, please refer to the *ADSM Administrator's Reference*.

51.0 Defining storage sets

You must define storage sets before you define reports to OnDemand or load files into application groups. If you need to maintain index data on archive media, you must assign the System Migration application group to a storage set that writes data to archive media. Also, we recommend that you assign the System Log application group to a storage set that writes data to archive media. The storage sets that you define can write data to cache storage or archive media. The storage management requirements of the application groups that you add to the system determine the types of media you need and how you configure storage sets.

A storage set must contain at least one primary storage node. A primary storage node can write data to cache storage or, if you installed ADSM, archive media. If the primary storage node writes data to archive media and you need to maintain a backup copy of the data, you can define a secondary storage node or implement a copy storage pool in ADSM. The administrator interface online help provides details about defining storage sets and storage nodes. 15.0, “Implementing a copy storage pool” on page 75 describes how to implement a copy storage pool in ADSM.

You must assign each system-related application group to a storage set to ensure proper operation of the system. You should assign these application groups to storage sets that write data to archive media and maintain the data for the life of your OnDemand system. Refer to topics 52.0, “Configuring the System Log application group” on page 237 and 53.0, “Configuring the System Migration application group” on page 241 for details.

When you define an application group, you must assign it to a storage set. Use the administrator interface to define an application group and assign it to a storage set.

52.0 Configuring the System Log application group

Before you begin defining applications to OnDemand, loading data into application groups, or allowing end-users to access the system, we recommend that you configure the System Log application group to permanently store data written to the system logging facility on archive media. You can do this by first defining a storage set that writes data to archive media and then updating the System Log application group and assigning it to the storage set. If your system does not support archive media, you should assign the System Log application group to a cache-only storage set and change the length of time that OnDemand maintains system log data in cache storage to the maximum permitted value. In addition, if you define table space file systems to OnDemand, we recommend that you store system log index data in table spaces.

When you install and configure OnDemand, you initialize the system logging facility. The system logging facility contains the System Log application group, a set of system log applications, and the System Log folder. The System Log application group contains the storage management information that OnDemand uses to maintain the data written to the system logging facility. When you initialize the system, the application group is not assigned to a storage set, the life of the data is indefinite, and data is maintained in a cache storage file system for seven years. Because the application group is not assigned to a storage set, a permanent copy of the system log data is not maintained.

52.1 Maintaining system log data on archive media

We recommend that you create a storage set that writes system log data to archive media. You must add at least one primary storage to the storage set. The primary storage node must identify a storage node in ADSM that maintains data indefinitely. You may want to add a secondary storage node to the storage set or implement a copy storage pool in ADSM, so that OnDemand automatically creates a backup copy of the data written to the primary storage node. The administrator interface online help provides information about defining storage sets and storage nodes.

When you define the primary storage node, you must provide the name of an ADSM node. The node must be registered in an ADSM domain that maintains data on archive media. The domain must also maintain the data indefinitely. If you define a secondary storage node, make sure that the node is registered in a different domain than the primary node. The storage node name and password in OnDemand must be identical to the node and password in ADSM. When you register the node in ADSM, you must specify the name of the appropriate ADSM domain. Otherwise, ADSM assigns the node to the default domain. Topic 14.0, “Configuring ADSM” on page 51 provides details about defining storage devices to ADSM and configuring ADSM policy domains to support OnDemand. Topic 50.0, “Defining storage nodes to ADSM” on page 231 provides details about registering a node in ADSM.

After you define the storage set, you must update the System Log application group and assign it to the storage set. After assigning the application group to the storage set, OnDemand automatically copies data written to the system log to archive media.

Complete the following steps to assign the System Log application group to a storage set:

1. Start the administrator interface.
2. Log on to the server with the ADMIN user. The ADMIN user is a system administrator user created when you initialize the system.
3. Click Application Groups.
4. Point to the System Log application group and click the right mouse button.
5. From the pop-up menu, select Update. OnDemand displays the Update an Application Group window.
6. Click the Storage Management tab.
7. In the Storage Set Name list, select the name of the storage set. The storage set that you select should write data to archive media and maintain the data indefinitely.
8. Replace the contents of the Length of Time before copying Cache to Archive Media field with a `0` (zero). This causes OnDemand to migrate system log records to archive media when the arsmaint command runs.
9. Click OK. OnDemand updates the database.

The administrator interface online help provides information about assigning an application group to a storage set.

52.2 Maintaining system log data in cache storage

If your OnDemand system does not support archive media, you should assign the System Log application group to a cache-only storage set and change the length of time that OnDemand maintains system log data in cache storage to the maximum permitted value. Doing so ensures that OnDemand does not expire system log data from cache storage for a very long time. Complete the following steps to assign the System Log application group to a storage set and change the length of time that OnDemand maintains system log data in cache storage:

1. Start the administrator interface.
2. Log on to the server with the ADMIN user. The ADMIN user is a system administrator user created when you initialize the system.
3. Click Application Groups.
4. Point to the System Log application group and click the right mouse button.
5. From the pop-up menu, select Update. OnDemand displays the Update an Application Group window.
6. Click the Storage Management tab.
7. In the Storage Set Name list, select the name of the storage set. The storage set named `Cache Only - Library Server` is a cache-only storage set created on the library server when you initialized the system.

8. Replace the contents of the Length of Time to Cache Data on Magnetic field with `10000`. This value causes OnDemand to maintain system log data in cache storage for approximately 27 years.
9. Click OK. OnDemand updates the database.

The administrator interface online help provides information about the settings in the storage management category.

To further protect the system log data, you may want to periodically create a backup copy of the cache file systems where the system log data is stored. Please contact OnDemand technical support through the IBM support center for details about how to identify the cache file systems where OnDemand maintains system log data and recommendations about the utilities you can use to create a backup copy of the data.

52.3 Storing system log data in table spaces

If you define table space file systems to OnDemand, we recommend that you configure the system log application group to store index data in table spaces. Topic 24.0, "Defining table space filesystems" on page 119 provides details about defining table space file systems.

To update the system log application group:

1. Start the administrator interface.
2. Log on to the server with the ADMIN user. The ADMIN user is a system administrator user created when you initialize the system.
3. Click Application Groups.
4. Point to the System Log application group and click the right mouse button.
5. From the pop-up menu, select Update. OnDemand displays the Update an Application Group window.
6. On the General page, select the type of table space. We recommend that you store the system log index data in SMS table spaces.
7. Click OK. OnDemand updates the database.

53.0 Configuring the System Migration application group

If you need to migrate index data from the database to archive media, you must assign the System Migration application group to a storage set that supports archive media. Migration is the process by which OnDemand moves index data from the database to archive media. This process optimizes database storage space while allowing you to maintain index data for a very long time. You typically migrate index data after users no longer need to access the reports, but, for legal or other requirements, you still need to maintain the data for some number of years or months. OnDemand uses the storage management settings for application groups that you define to maintain migrated index data on archive media. When you define an application group, you determine if OnDemand migrates index data and how long OnDemand maintains data stored in the application group. In addition, if you define table space file systems to OnDemand, we recommend that you store system migration index data in table spaces.

When you install and configure OnDemand, you initialize the system migration facility. The system migration facility contains the System Migration application group, a set of system migration applications, and the System Migration folder. The System Migration application group contains the storage management information that OnDemand uses to maintain index data migrated to archive media. By default, the application group is not assigned to a storage set. Because the application group is not assigned to a storage set, OnDemand does not migrate index data from magnetic storage to archive media.

53.1 Assigning the system migration application group to a storage set

If you need to store index data on archive media, you must assign the System Migration application group to a storage set that writes data to archive media. You must add at least one primary storage node to the storage set. The primary storage node must identify a storage node in ADSM that maintains data indefinitely. If you need to maintain a backup copy of data written to the primary storage node, you must define a secondary storage node or implement a copy storage pool in ADSM, so that OnDemand automatically creates a backup copy of index data migrated to archive media. The administrator interface online help provides information about defining storage sets and storage nodes.

When you define the primary storage node, you must provide the name of an ADSM node. The node must be registered in an ADSM domain that maintains data on archive media. The domain must maintain the data indefinitely. If you define a secondary storage node, make sure that the node is registered in a different domain than the primary node. The storage node name and password in OnDemand must be identical to the node and password in ADSM. When you register the node in ADSM, you must specify the name of the appropriate ADSM domain. Otherwise, ADSM assigns the node to the default domain. Topic 14.0, “Configuring ADSM” on page 51 provides details about defining storage devices to ADSM and configuring ADSM policy domains to support OnDemand. Topic 50.0, “Defining storage nodes to ADSM” on page 231 provides details about registering a node in ADSM.

After you define the storage set, you must update the System Migration application group and assign it to the storage set. After assigning the application group to the storage set, OnDemand automatically migrates index data to archive media, whenever the arsmaint command runs. Complete the following steps to assign the System Migration application group to a storage set:

1. Start the administrator interface.
2. Log on to the server with the ADMIN user. The ADMIN user is a system administrator user created when you initialize the system.
3. Click Application Groups.
4. Point to the System Migration application group and click the right mouse button.
5. From the pop-up menu, select Update. OnDemand displays the Update an Application Group window.
6. Click the Storage Management tab.
7. In the Storage Set Name list, select the name of the storage set. The storage set that you select should write data to archive media and maintain the data indefinitely.
8. Click OK. OnDemand updates the database.

The administrator interface online help provides information about assigning an application group to a storage set.

53.2 Storing system migration data in table spaces

If you define table space file systems to OnDemand, we recommend that you configure the system migration application group to store index data in table spaces. Topic 24.0, "Defining table space filesystems" on page 119 provides details about defining table space file systems.

To update the system migration application group:

1. Start the administrator interface.
2. Log on to the server with the ADMIN user. The ADMIN user is a system administrator user created when you initialize the system.
3. Click Application Groups.
4. Point to the System Migration application group and click the right mouse button.
5. From the pop-up menu, select Update.
6. On the General page, select the type of table space. We recommend that you store the system log index data in SMS table spaces.
7. Click OK to update the application group and return to the administrator window.

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