

IBM Infoprint Manager for AIX



Administrator's Guide

Version 3 Release 2

IBM Infoprint Manager for AIX



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Version 3 Release 2

Note

Before using this information and the product it supports, be sure to read the general information in "Notices" on page 217.

Sixth Edition (January 2002)

This edition applies to IBM Infoprint Manager for AIX, Version 3 Release 2 Modification 0, and to all subsequent releases and modifications until otherwise indicated in new editions or technical newsletters. Be sure to use the correct edition for the level of the product.

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About This Publication

This publication describes how to configure and maintain the different objects of IBM Infoprint Manager for AIX (Infoprint), such as queues and actual destinations. It also describes how to manage the AIX environment in which IBM Infoprint Control, the server portion of Infoprint, runs.

Who Should Use This Publication

This publication contains information for the administrators who create and configure the basic Infoprint environment. It also contains some information for the operators who monitor the Infoprint server. (Operator information also appears in *IBM Infoprint Manager for AIX: User's and Operator's Guide*.)

About the Documentation for Infoprint

Infoprint provides the following types of documentation:

- Infoprint library in portable document format (PDF) or hard copy
- Infoprint documentation on the World Wide Web
- Online help for Infoprint Submit, Infoprint Scan, the Infoprint Manager Operations GUI, the Infoprint Manager Administration GUI, the Infoprint VSM administrator's GUI, the Infoprint SMIT administrator's interface, and the Infoprint SMIT operator's GUI
- Manual (man) pages
- Infoprint online message catalog
- **readme** files

The Infoprint Publication Library

Infoprint provides the following publications in PDF format on a CD-ROM supplied with the product. Unless otherwise specified, you can order printed copies of these publications from IBM by requesting the form number for the publication:

- *IBM Infoprint Manager for AIX: Administrator's Guide*, S544-5595. This publication describes the primary administrator tasks necessary for setting up an Infoprint environment.
- *IBM Infoprint Manager for AIX: Getting Started*, G544-5817. This publication describes installing and configuring on both the Infoprint AIX server and all relevant client software. Additionally, this publication provides information on submitting jobs from Infoprint Submit, Infoprint Scan, Infoprint Select, and the Infoprint AIX client, scheduling jobs, and managing the print environment.
- *Infoprint Manager: Reference*, S544-5475. For administrators, operators, and application programmers with the need to perform command-line functions, this publication describes the commands, utilities, transforms, attributes, and attribute values associated with Infoprint.

Note: This publication is available only in PDF format.

- *PSF Direct Network Configuration Guide for System/370*, S544-5486. For system administrators or network specialists responsible for configuring a system for Print Services Facility (PSF) Direct. PSF Direct is a function of IBM Infoprint Manager for AIX that allows another PSF program (PSF/VM, PSF/MVS, or

PSF/VSE) to print remotely, using the SNA LU 6.2 protocol, on printers supported by Infoprint. The PSF program sends the print data stream directly to the Infoprint printer.

- *IBM PSF for AIX: AFP Upload Configuration Guide Using SNA Server/6000*, S544-5422. For system administrators, this publication describes how to configure AFP Upload on both AIX (client) and MVS (server) to send files to the JES spool on the MVS server using a SNA Server/6000 protocol.
- *IBM PSF for AIX: AFP Upload Configuration Guide Using TCP/IP*, S544-5423. For system administrators, this publication describes how to configure AFP Upload on both AIX (client) and MVS (server) to send files to the JES spool on the MVS server using a TCP/IP protocol.

Other Publications Related to Infoprint

The following publications contain information you might find useful while installing, administrating, and using Infoprint:

- *AIX Version 4 Release 1 Commands Reference*, SBOF-1851, or *AIX Version 4 Release 3 Commands Reference*, SBOF-1877. For administrators, operators, and end users, these publications provide complete information about AIX commands.

Note: Infoprint requires AIX Version 4.2.1 or 4.3. Users of AIX Version 4.2.1 should refer to *AIX Version 4 Release 1 Commands Reference*.

- *PSF/MVS MVS Download Guide*, G544-5294. For administrators and job submitters, this publication provides instructions for setting up the MVS Download support on PSF/MVS so that data can be transmitted from the Job Entry Subsystem (JES) spool on MVS for printing on an Infoprint system.
- *Printing for Fun and Profit under AIX*, GG24-3570. For administrators and systems engineers, this publication provides instructions for installing printer devices and configuring AIX print queues.
- *IBM Page Printer Formatting Aid: User's Guide*, S544-5284. For administrators and job submitters, this publication provides instructions for creating form definitions and page definitions with Page Printer Formatting Aid for AIX (PPFA).

Note: This is an optional feature of Infoprint.

- *Font Summary for AFP Font Collection*, G544-5633. For administrators and job submitters, this publication provides information on IBM fonts.
- *Advanced Function Presentation: Printer Information*, G544-3290. For administrators and job submitters, this publication provides information on IBM printer devices.
- *IBM Data Stream and Object Architectures: Bar Code Object Content Architecture Reference*, S544-3766. For administrators and job submitters, this publication provides information on bar codes.
- *IBM Data Stream and Object Architectures: Font Object Content Architecture Reference*, S544-3285. For administrators, this publication provides information on coded fonts.
- *IBM Data Stream and Object Architectures: Graphics Object Content Architecture Reference*, S544-5498. For administrators and job submitters, this publication provides information on printing graphics.
- *IBM Data Stream and Object Architectures: Image Object Content Architecture Reference*, SC31-6805. For administrators and job submitters, this publication provides information on the IOCA data stream.

- *IBM Data Stream and Object Architectures: Mixed Object Document Content Architecture Reference*, SC31-6802. For administrators and job submitters, this publication provides information on the MOD:CA data stream.
- *TCP/IP Tutorial and Technical Overview*, GG24-3376. For networking specialists, this publication provides an overview of the Transmission Control Protocol/Internet Protocol (TCP/IP) and its uses in heterogeneous networks.

Manual (man) Pages for Infoprint Commands, Utilities, and Transforms

Online information, in manual (man) page format, is available for all Infoprint commands and utilities. You can use the AIX **man** command to view man pages for the following Infoprint commands:

lprfp	pdpr
mkfntmap	pdpromote
pdaccount	pdq
pdclean	pdreorder
pdcreate	pdresubmit
pddelete	pdresume
pddisable	pdrm
pdenable	pdset
pdl	pdshutdown
pdmod	pdspace
pdpause	psfstat

For example, to view online information for the **pdpr** command, enter:

```
man pdpr
```

You can use the AIX **man** command to view the following man page for the **-o** flag, which is used to pass information to Infoprint on AIX print commands:

oflag

You can use the AIX **man** command to view man pages for the following Infoprint utilities:

admingui
afpsplit
ainupod1
ainupod2
ainupod3
ainurpt1
ainurpt2
ainurpt3
ainurpt4
ainurpt5
ainurpt6
cfu
ipguiadv
ipguibasic
ipguidist
jsmigr
opergui
pdadmin
pdcr cds
pdcr dflt
pdcr med

pdinitports
pdmigpp
pdmincfg
pdmsg
pdnetifspri
rc.iprsap
rc.pd
sense
setup
startcbd
startnotd
startppo
start_server
startsrv
stopcbd
stopnotd
stop_server
tdump
tlist
t2file

You can use the AIX **man** command to view man pages for the following Infoprint daemon utilities:

mvsprsd
pcl2afpd

ps2afpd

You can use the AIX **man** command to view man pages for the following Infoprint transform commands:

db2afp
d2afp
gif2afp
jpeg2afp
line2afp

pcl2afp
pdf2afp
ps2afp
sap2afp
tiff2afp

For information about the flags that you can use with the **man** command, refer to the **man** man page or to the AIX Version 4.2 *Commands Reference*.

Manual (man) Pages for Infoprint Attributes

The Manual Pages for Infoprint Attributes are no longer being revised. For the most current information on Infoprint Attributes, consult Chapter 7 in the *Infoprint Manager: Reference*.

Infoprint Online Message Catalog

Infoprint supplies a message catalog for the messages that are issued during its operation. For each message, the message catalog includes the text of the message, an explanation, a system action, and a response. You can view all information for a specific Infoprint error message by issuing the Infoprint **pdmsg** utility followed by the message number.

For example, from the command line enter:

```
pdmsg 5010-096
```


Messages issued by Infoprint have the following prefixes:

0420	0424
0421	0425
0422	5010
0423	

See the Infoprint **pdmsg** man page for a complete description of the **pdmsg** utility.

To view information about an AIX message, issue the AIX **info** command with the **-h** flag, followed by the message number. For example, from the command line enter:

```
info -h MessageNumber
```

where *MessageNumber* is the number of the AIX message.

readme Files

The **readme** files on the Infoprint product CD-ROM contain last-minute information about Infoprint that the hardcopy publications or the online information do not contain. You can use the AIX **more** command or a text editor, such as **dtpad** or **vi** on AIX, **EPM** on OS/2, or **Notepad** on Windows, to view the contents of the **readme** files.

Viewing PDF Publications

Infoprint provides software publications in PDF files on the publications CD-ROM. To view or print these publications:

1. Log in to AIX as **root** or as a member of the **system** group.
2. Insert the Infoprint publications CD-ROM into the drive.
3. To determine the identifier of your CD-ROM drive, enter on the AIX command line:

```
lsdev -C -c cdrom
```

4. Then enter:

```
mount -v cdrfs -r /dev/cdn /cdrom
```

where *cdn* is the identifier of your CD-ROM drive, and */cdrom* is the file system that was created to install Infoprint.

5. Read the **readme.txt** file in the **/cdrom** directory.
6. If your AIX server or Windows system has an internet browser, such as Netscape or Internet Explorer, select the **aixindex.html** file in the appropriate language directory and click on the descriptions to view the appropriate PDF file.

For example, if you use English, access the **/cdrom/english/aixindex.html** file.

If your AIX server or Windows system does not have an internet browser, move to the appropriate language directory and select the appropriate PDF file from the following choices:

Installing Infoprint Manager

Title	PDF file name
Getting up and running in no time with IBM installation services	inscf798.pdf
Installing and Configuring Infoprint Library	library.pdf

Installing Infoprint Manager Control on your AIX Server	aixinsr32.pdf
Installing Optional Features	insoptf32.pdf

Using Infoprint Manager

Title	PDF file name
IPDS Printer Operator Commands	refip798232.pdf
IPDS Error Recovery	ipdserrrecov32.pdf
Performing Optional Configuration	optcfg32.pdf
Printing Variable Data	VariData.pdf
Submitting a Job to a DocuTech 135 Printer	prdocu39932.pdf
Using Enhanced Grab and Move to Shift Page Images	prnpgoff39932.pdf
Using Infoprint Scan	g5445722.pdf

Infoprint Publications

Title	PDF file name
Administrator's Guide	iprf1mst.pdf
User's and Operator's Guide	ipro1mst.pdf
Infoprint Manager Reference	iprr2mst.pdf
IBM PSF for AIX: AFP Upload Configuration Guide Using SNA Server/6000	S5445422.pdf
IBM PSF for AIX: AFP Upload Configuration Guide Using TCP/IP	S5445423.pdf
SAP R/3 Support: Configuration and Printing Tasks	sapr332.pdf

7. To use the Adobe Acrobat Viewer, enter:

```
cd /usr/lpp/Acrobat3/bin
./acroexch
```

Click on the **Help** button to learn how to view or print a publication.

8. If you have installed Infoprint Submit or the Adobe Acrobat Viewer on Windows, you can print or view the Infoprint PDF publications from your Windows system. On Windows, the publications directory is called *d:\cdrom\books\language*, where *d*: is the identifier of your CD-ROM drive and *language* is the appropriate language for the books.

The Organization of This Publication

This publication describes Infoprint configuration and administration, and contains the following parts:

Part 1, "Getting Started with Infoprint"

This part provides an overview of the different Infoprint objects and describes using the Infoprint AIX client and the Infoprint interfaces that run on AIX: Infoprint SMIT administrator's interface, the Infoprint Manager Administration GUI, and the Infoprint VSM administrator's GUI.

Part 2, “Expanding Your Infoprint System”

This part contains specific information and procedures for adding and configuring:

- Servers
- Output devices
- Actual destinations
- Queues
- Logical destinations
- Default document and job objects
- Media
- User-Exit Programs
- Compiling customized user-exit programs
- Auxiliary sheets and user-exit programs
- Viewing accounting and Audit data
- Resource-context objects, which define directories that contain Advanced Function Presentation (AFP) resources
- Notification profiles

Part 3, “Maintaining Your Infoprint System”

This part contains information on:

- Controlling access to Infoprint
- Setting environment variables
- Monitoring disk usage on your AIX system

Part 4, “Customizing Infoprint for Special Jobs”

This part contains information on:

- Setting up the transform programs that are provided with Infoprint. The transform programs transform the incoming data stream into the Advanced Function Presentation (AFP) format.
- Setting up fonts for printing different data types
- Modifying global resource identifier files
- Using MVS Download to print from an MVS Client

The appendix contains instructions for customizing and using the Infoprint SMIT operator’s GUI on AIX.

This publication also includes a glossary and an index.

Conventions Used in This Publication

This publication uses conventions for the following:

- Highlighting
- Infoprint keyword notation
- Special characters in commands

Highlighting

This publication uses four different types of highlighting:

Bold In this publication, bold highlighting identifies commands, attributes, files, directories, and other items whose names the system predefines, such as **pdpr** and **/usr/lpp/psf**.

Italic When used in running text, italic highlighting identifies a variable item whose actual name or value you supply, such as *locale* or *FileName*. Italics also identify publication titles.

Bold Italic

Combined bold and italic highlighting identifies a specific keyword name that you enter exactly as shown and a variable value that you supply with the attribute. For example: "**copy-count=number**"

Monospace

When used in command examples, information in a monospaced font identifies the exact wording of the command. Titles of windows in graphical user interfaces also appear in a monospaced font.

Infoprint Keyword Notation

Keyword syntax notation uses symbols to show specific conditions. Do not enter the following symbols, unless specifically instructed to do so, when actually entering an Infoprint keyword:

Bar |
Braces { }

Note: There are some situations in which you will actually type the brace characters. See "Special Characters That Are Included in Commands" on page xix.

Brackets

[]

Underlining

—

Ellipsis

...

These symbols have the following meanings when used in the publications and in the online information:

- A vertical bar, | , between values means that you can enter only one of the values with the keyword or flag. For example:

job-hold={true | false}

means that when you set the **job-hold** attribute, you can specify either **true** or **false**, but not both.

- Braces, { } , around values identify required items that you must supply with the command. For example:

job-hold={true | false}

means that you must enter either **true** or **false**.

- Brackets, [] , around values indicate that they are optional. For example:

resource-context=directory[:directory...]

means that you do not have to enter more than one directory, but that you can have two or more directories, each separated by a colon, : .

- An ellipsis, ... , means that you can supply more than one occurrence of a keyword or value with the command. For example:

resource-context=directory[:directory...]

means that you can enter more than one directory name.

- Underlined text identifies the default fixed value that Infoprint uses if you do not specify a value. For example:

default-printer-resolution={240 | 300 | 480 | 600}

means that **240** is the default value.

Special Characters That Are Included in Commands

When colons, dashes, the equal sign, double quotation marks, single quotation marks, and braces are shown in command syntax notation, you must include them when you issue the command in most cases. These special characters have the following meanings:

- A colon, :, separates related values. For example:

```
pdpr -f file1 -x "page-select=3:6" file2
```

means that only pages 3 through 6 of file2 are to print.

- A dash, -, always precedes a flag, for example, **-x**.
- The equals sign, =, separates attribute and value pairs. For example:

```
pdmod -x "sides=2" DivSpool12:1011230045
```

means that **2** is the value assigned to the **sides** attribute.

- Double quotation marks, " ", surround multiple attribute and value pairs, such as:

```
-x "sides=2 print-quality=draft"
```

For consistency, this publication also shows double quotation marks around single attribute and value pairs in all command examples, although they are not required. For example:

```
-x "document-format=ascii"
```

- Double quotation marks, " ", surround text strings that contain spaces, such as:
- ```
-m "Down for maintenance"
```
- Single quotation marks, ' ', surround a text string that contains spaces inside another string that is enclosed in double quotation marks. An example is:
- ```
-x "sides=2 job-print-after='08:00:00 10/09/98'"
```
- Braces, { }, surround a value in a notification profile. An example is:
- ```
-x "notification-profile={delivery-method=electronic-mail}"
```

### Global Character Used in Examples and Shell Information

Examples using the asterisk (\*) as a global character, and other examples that are shown within this Infoprint publication relate to the Korn shell. Depending on the shell you are using, the examples shown may or may not work. The examples may also show control characters that other shells do not require. Adjust the examples as necessary for the shell you are using.

### **Examples of Commands and Attributes**

This publication shows examples of commands in a format designed for ease of reading. When entering the command, allow the command to wrap characters from one line to the next.

Many examples in this publication use spacing of attributes and values for ease of reading and formatting considerations. When entering the attributes and their values on the command line or in attributes files, use the correct syntax.

---

# Part 1. Getting Started with Infoprint

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## Chapter 1. Infoprint Configuration and Management Overview

IBM Infoprint Control (Infoprint), which is a part of IBM Infoprint Manager for AIX, is a highly flexible print management system providing you with many choices on how to expand and manage your print environment. Whether your print environment is simple with a few high-speed printer devices located together or whether you support thousands of jobs printing on a wide array of printing hardware running at different locations, Infoprint lets you make the most of your system.

This chapter briefly introduces Infoprint and provides you with information on design considerations that you can use to set up and manage the Infoprint configuration that best suits your needs. Use this information after you have completed the installation of your Infoprint system, as described on the IBM Infoprint Manager for AIX web site that you can access from <http://www.ibm.com/printers>.

This chapter contains the following topics:

- “Optimizing Your Print Resources”
- “What Is the Infoprint Server?” on page 4
- “Infoprint Server Configurations” on page 5
- “About Configuring and Managing the Objects Infoprint Servers Contain” on page 5
- “Infoprint Destination Configuration Models” on page 7
- “The Configuration and Management Interfaces Provided with Infoprint” on page 10

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### Optimizing Your Print Resources

Your print resources are the applications that generate your jobs, your printer devices, and the Infoprint objects that control the jobs as they process and print. Your Infoprint configuration, generated during installation, includes one Infoprint server, a default logical destination, a queue, and an actual destination (physical printer). Before adding more Infoprint objects, consider how Infoprint can help you:

- Manage your printer devices and distribute your printing workload:  
Many print environments have a significant investment in printer devices and a significant printing workload. Infoprint gives you the ability to centrally manage all of your printer hardware devices and set up a configuration that lets you route jobs with common requirements to a particular printer or set of printers supporting those types of jobs. This allows you to prevent situations where some printers are idle while other printers have a backlog of jobs waiting to print at certain times of the day. By optimizing the use of each printer, you can distribute your print demands among all of your available printers.
- Output jobs to fax or electronic mail:  
Instead of printing a hard copy of a job, you may want to transmit it to a fax machine or an electronic mailbox. Infoprint allows you to route jobs to fax and electronic mail in the same way that you would submit them to print. To install

and configure these options, see to *Configuring and Using Infoprint Fax and Email with Lightning Fax 6.5 (32faxemail2.pdf)* from the Infoprint Manager for AIX Administrator Tasks page on the Web.

- Balance the use of AIX systems:

By balancing the printing workload, you can also optimize the use of your AIX systems that support printing. These systems can use a significant amount of their resources to accept, schedule, and process jobs, and to manage the printers they control. System usage includes processing time, memory, and fixed disk capacity. If you distribute your jobs to several Infoprint servers running on several AIX systems, you will distribute the printing demands of your organization more evenly among those systems.
- Control jobs and documents:

Infoprint provides you with flexibility in specifying defaults for jobs and documents. You may want to use different job or document defaults for specific output devices or for specific types of jobs. When you configure your system, you should consider when and how you plan to use defaults and how to use them most effectively. Effective use of defaults can influence the other configuration decisions you make.
- See significant events when they happen:

Infoprint provides asynchronous event notification that informs job submitters, operators, and administrators of conditions requiring specific actions. For example, Infoprint can issue notification when queues have a backlog of jobs and can notify operators when the printers they are responsible for are out of paper. Your job submitters can receive notification if Infoprint cannot schedule their jobs at the requested actual destination. The types of events for which Infoprint can provide notification are highly configurable; you can ensure that Infoprint notifies the appropriate people when significant events occur. Event messages also provide you with valuable information that can alert you to a problem with the printing system and help you isolate the cause of the problem.

Continue with the following section that describes the different Infoprint objects and basic configuration considerations for each.

---

## What Is the Infoprint Server?

The Infoprint server contains all of the other Infoprint objects that you can create, customize, and monitor. This includes logical destinations, queues, actual destinations, media, and any defaults for job and document characteristics.

The Infoprint server can also contain auxiliary sheets and resource-context objects. You can use auxiliary sheets to separate jobs and to print job identification information. Resource-context objects point to the storage locations of the Advanced Function Presentation (AFP) resources, such as fonts and overlays, used with certain jobs.

The number of Infoprint AIX host systems you need depends on several factors, such as the speed of the AIX system, the amount of memory and fixed disk space on the system, and the speed of the printer devices it supports. Based on job throughput, add more Infoprint AIX servers as necessary.

The number of Infoprint AIX server instances (the **pdserver** process) on a particular server depends upon the amount of memory that is available for each process. Note that if you specify more than 10 Infoprint AIX server instances on the same host system in a non-DCE environment, you need to initialize the ports for

the eleventh process and all that follow. If you are running other Infoprint processes (such as **notifyd** or **sapcbd**), each one counts towards this total of 10. For more information about this process, see “Preparing to Create Additional Servers in a Distributed Environment” on page 11.

Server configuration and management tasks are minimal. Most of your tasks will involve creating, configuring, and managing objects within the server.

**Notes:**

1. When you install Infoprint, the first AIX system is configured with a minimum Infoprint configuration consisting of a server, logical destination, queue, and actual destination (in this case, a physical printer).
2. If you migrated an existing printing system to Infoprint, your initial configuration depends on the results of the migration.

---

## Infoprint Server Configurations

When you first install Infoprint, you select either a basic or advanced configuration for your server.

- A *basic* Infoprint server is configured to support:
  - Print on Demand (commercial) printing
  - Assignment of jobs to actual destinations when they are submitted (*early binding*). Early binding is like getting in a checkout line at the supermarket. From the moment that you get in line, you are “bound” to a single cash register. Your line may move slowly, or stop while the cashier changes the cash register tape, but you cannot pay at a different cash register unless you get out of line and into another line.
  - PostScript, TIFF, and variable data jobs
  - Jobs submitted from Infoprint Submit, Infoprint Scan, or Infoprint Library

On a basic Infoprint server, the Common Desktop Environment (CDE) is configured especially for Infoprint.

- An *advanced* Infoprint server is configured to support:
  - Data center (production) or distributed mission printing.
  - Printer pooling for workload balancing (*late binding*). Late binding is like getting a table at a crowded restaurant. You don’t know which table you will sit at until one becomes available, although you may have requirements that narrow the selection. For example, if there are six people in your party, you know that you will not sit at a table for two.
  - Jobs submitted from the command line, from workstation applications through Infoprint Select, or from other application programs.

---

## About Configuring and Managing the Objects Infoprint Servers Contain

Read the following to learn more about server objects and their configuration and management.

### What Are Infoprint Logical Destinations?

The Infoprint logical destination is the object in your Infoprint system to which job submitters and applications submit jobs. You may want to add more logical destinations to support specific types of jobs and specific groups of job submitters. Different groups of job submitters can have different default logical destinations. When you create an additional logical destination, you specify a name for the

logical destination and associate it with a specific queue. The logical destination and the queue must reside in the Infoprint server.

The most common type of logical destination is a *logical printer*. Users submit print jobs to logical printers.

## What Are Infoprint Queues?

An Infoprint queue receives jobs from a logical destination. The queue holds each job until an Infoprint actual destination associated with the queue that supports all of the job requirements is available to process the job. Queues also contain jobs that specify retention periods; retained jobs have either printed or were cancelled and remain in the system for a specified period. One or more logical destinations send jobs to the queue and the queue, in turn, sends jobs to one or more actual destinations. The actual destination to which a queue sends jobs does not have to be in the server that contains the queue. The actual destination can be running in an Infoprint server on a different AIX system.

## What Are Infoprint Actual Destinations?

An Infoprint actual destination represents an output device such as a printer, fax machine, or electronic mailing system. You create one actual destination for each output device that you use with Infoprint. You configure an actual destination so that its attributes represent the features and capabilities of the output device, such as two-sided printing for a printer. You also configure the actual destination to control how and the order in which it processes jobs, such as by job size or by when the queue received the job.

If you do not specify values for all of the attributes when you create an actual destination, Infoprint either provides default values for many of them, or obtains those values by using Simple Network Management Protocol (SNMP) requests. For more information about SNMP, see to *Setting Up and Tuning SNMP Communication (32snmp.pdf)* from the Infoprint Manager for AIX Administrator Tasks page on the Web. You can make modifications, as required, at a later time.

The most common type of actual destination is a *physical printer*. Physical printers represent printer devices. *Fax destinations* and *e-mail destinations* represent fax devices and electronic mailing systems.

## What Are Infoprint Media?

A medium represents the physical material, for example, paper, envelopes, transparencies, or multi-part forms, on which a job is printed. You can configure a medium to describe its dimensions, color, purpose, or any other useful information.

## What Are Infoprint Auxiliary-Sheet and Resource-Context Objects?

An auxiliary sheet is a sheet of paper that prints at the beginning, prints at the end of a job, or separates different parts of a job. The auxiliary sheet may have information printed on it or it may be blank. Infoprint provides five default types of auxiliary sheets; you can create more as required. You can also link user-exit programs, either those supplied with Infoprint or customized programs that you create, to control the information printed on the auxiliary sheet.

Infoprint provides you with the ability to manage AFP resources (fonts, overlays, form definitions, page definitions, and page segments) at the printer device. You

can store the resources in a centrally-available location and then use Infoprint resource-context objects to identify the location. After you have configured the resource-context objects, Infoprint searches for the AFP resources required by a job and then sends the resource with the job for processing.

## **What Are Infoprint Default Documents and Default Jobs?**

A job is a unit of work you send to Infoprint for processing and printing or transmission by fax or electronic mail. A job can consist of a single file, or many files. In Infoprint terminology, each file within a job is called a document. Both a job and the document or documents it contains have attributes that define job and document requirements.

Job validation is the process of ensuring that there is an actual destination capable of processing the requirements of the job. The values of job and document attributes determine the requirements, such as whether two-sided printing is required and the type of media on which the job must print. Job submitters and applications can specify the attributes with the job, or you can streamline the process. You may want to create default job and document objects and associate them with Infoprint logical destinations so that jobs automatically have certain default values applied. This saves time for the job submitter and ensures that physical printers are available or are made available to process jobs correctly.

---

## **Infoprint Destination Configuration Models**

Destination configuration models show the relationships among logical destinations, job- and document-attribute defaults, queues, and actual destinations. Your basic Infoprint destination configuration, the one created during installation, has a one-to-one relationship between a logical destination and an actual destination, and provides minimal job- and document-attribute default setting. As you customize your Infoprint environment to support your printing needs, you may want to consider a more advanced destination configuration model.

For any of the configuration models, while the logical destination and the queue to which it sends jobs must reside in the same Infoprint server, the actual destination can be running in a different Infoprint server running on a different AIX system.

### **About the Desktop Destination Configuration Model**

The desktop destination configuration model, as shown in Figure 1 on page 8, has a one-to-one relationship between a logical destination and an actual destination. The desktop model represents the way you typically manage and use a workstation printer. This model should be familiar to you if you have an existing printing system to which you are adding Infoprint. The capabilities of the actual destination directly control the types of jobs that your users can print, fax, or transmit by electronic mail with this destination configuration.

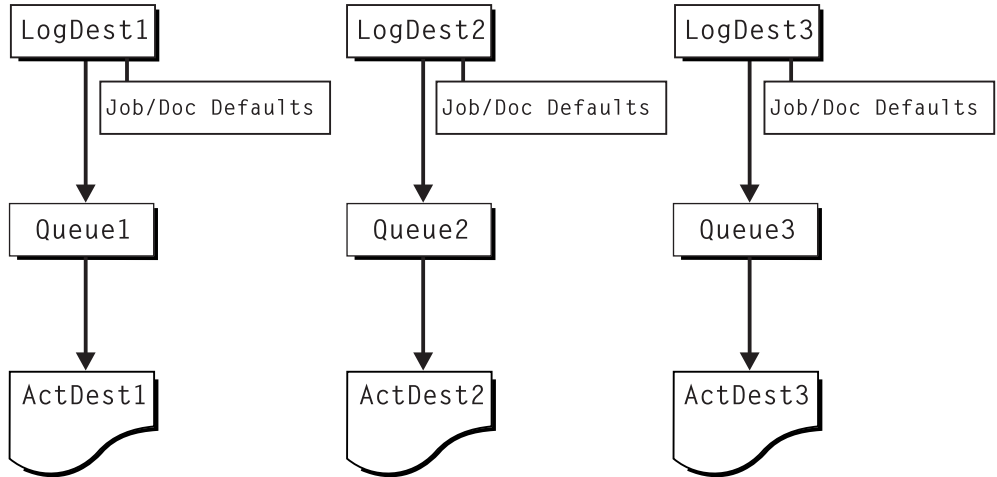


Figure 1. Desktop Destination Configuration Model

## About the Pool Destination Configuration Model

The pool destination configuration model, as shown in Figure 2, has a one-to-many relationship between a logical destination and two or more actual destinations.

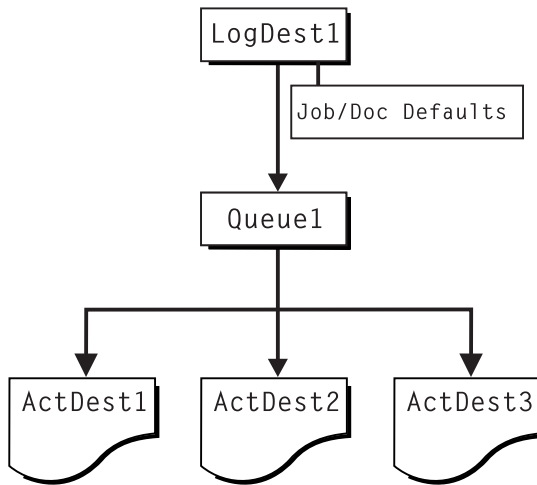


Figure 2. Pool Destination Configuration Model

This model is very effective when you have output devices that you want to group together based on things such as location, capability, speed, and capacity. You may also want to group them based on who uses them or who manages the output they generate. For example, all jobs sent to a specific group of printers come from the department that generates monthly statements for your customers. The jobs use the same set of job- and document-attribute defaults, including the form on which they print and the overlay they require. The printer operators responsible for the printers direct all of the output to a mail room for distribution. The pool model is also very beneficial in workload balancing.

## About the Funnel Destination Configuration Model

The funnel destination configuration model has a many-to-one relationship between two or more logical destinations and one actual destination. Figure 3 shows the funnel configuration.

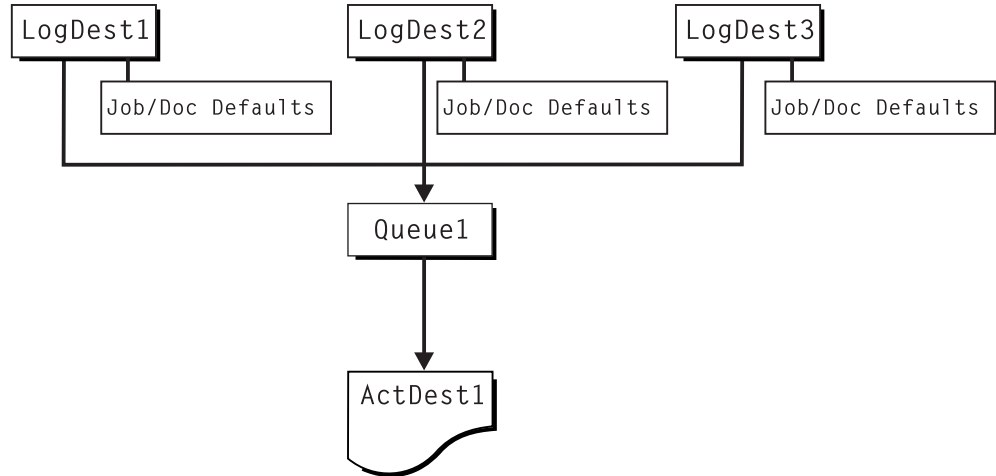


Figure 3. Funnel Destination Configuration Model

This is a flexible configuration model that provides you with the ability to more closely control setting job and document defaults for jobs. For example, you may configure one logical destination to provide job and document defaults for PostScript jobs and another logical destination to support jobs using AFP resources.

## About the Hourglass Destination Configuration Model

The hourglass destination configuration model, shown in Figure 4, has a many-to-many relationship between logical destinations and actual destinations. The hourglass model provides both the workload balancing benefit of the pool model and the flexible job- and document-defaulting benefits provided by the funnel model. The hourglass model is the most flexible of the destination configuration models.

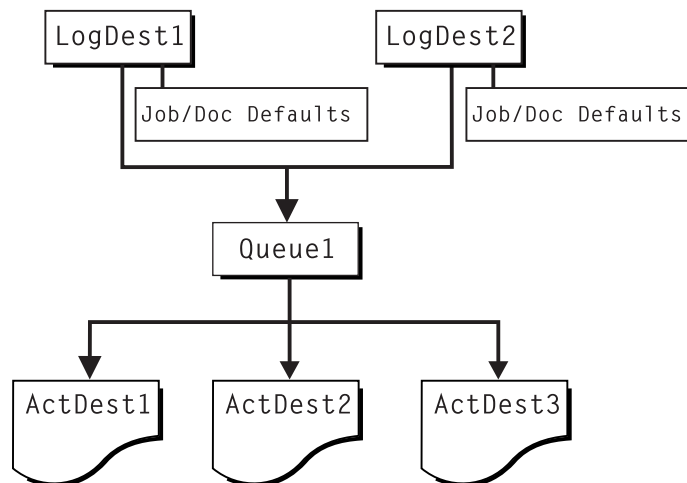
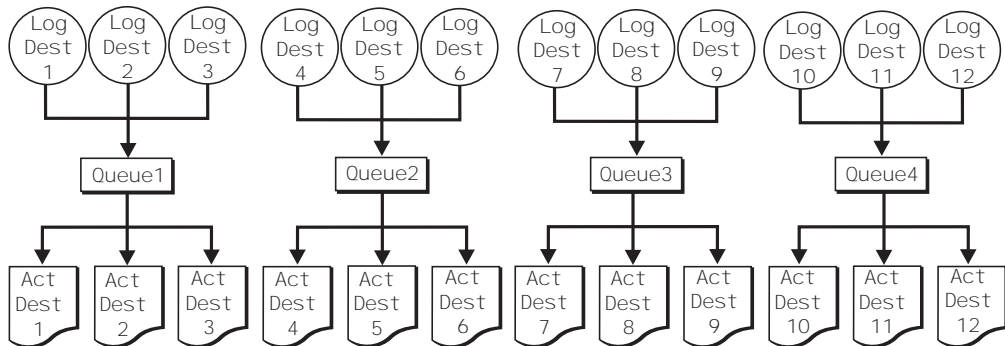


Figure 4. Hourglass Destination Configuration Model

## Recommended Distributed Configuration Model

To manage your print environment efficiently in a distributed environment (as shown in Figure 5), we recommend organizing your destinations using the hourglass configuration model and using multiple queues and default jobs to control the work flow through your Infoprint Manager AIX servers. Define queues based upon operators, rather than based upon the number of devices defined in your installation. Whether your installation has one operator for every ten printers at your site, or an operator managing all the printers on a particular floor, grouping printers by queue makes management of all printers and print jobs much easier because one person can monitor a single queue.

Having one person monitor a single queue is highly efficient. An operator can use the **Infoprint Manager Administration GUI** to view a particular queue. Because Infoprint Manager uses queue authorization to manage the security settings on print jobs, an operator has a much easier job overseeing this support without having to switch from one queue to another. You can create default jobs and associate them with different logical destinations to ensure that the queue schedules these jobs on the correct actual destinations. For example, the initial-value-job associated with LogDest1 can default **actual-destination-requested** to ActDest1, so that jobs submitted to LogDest1 are scheduled to ActDest1. Since **actual-destination-requested** is a multiple-valued attribute, you can also specify more than one actual destination on the initial value job's **actual-destination-requested** attribute and let other job and document attributes (such as **document-format**) determine which actual destination is selected.



*Figure 5. Distributed Configuration Model.* With this model, you can have different actual destinations associated with different logical destinations through the job and document defaults you specify.

---

## The Configuration and Management Interfaces Provided with Infoprint

You perform most of your Infoprint configuration and management tasks through one of the Infoprint administrators interfaces: the Infoprint Manager Administration GUI, the Infoprint Visual Systems Management (VSM) graphical user interface (GUI) or the Infoprint System Management Interface Tool (SMIT) administrator's interface. You perform very few tasks from the command line, so that you do not have to learn complex syntax or enter lengthy command strings.

All the interfaces provide online help, so that you do not have to search hardcopy publications to access procedural information. You can quickly access the help and information you need at the time that you need it. If you are not familiar with the interfaces, this publication contains information on their use.



---

## Chapter 2. Creating and Managing Servers

The Infoprint server manages and controls all other Infoprint objects in your Infoprint system. During Infoprint installation, one server was created that contains a logical destination, a queue, and an actual destination (a physical printer). Use the information in this chapter to add additional servers and to perform server configuration and maintenance tasks.

This chapter contains the following topics:

- “Preparing to Create Additional Servers in a Distributed Environment”
- “Creating Additional Servers or Starting Existing Servers” on page 12
- “Configuring Servers with a Mixed Language Environment” on page 12
- “Shutting Down a Server” on page 13

---

### Preparing to Create Additional Servers in a Distributed Environment

If you are configuring for a distributed, non-DCE environment and need to define many instances of the Infoprint server process, you should use the **fstshow** command to see what intercommunication ports are available on your server.

For example, entering `fstshow -o` on an AIX command line produces a display similar to the contents of the following table:

*Table 1. Output from Sample `fstshow -o` Command*

| IN-USE? | PORT# | PID   | DIR-ID | NAME    |
|---------|-------|-------|--------|---------|
| Y       | 2050  | 23266 | 2      | server1 |
| Y       | 2051  | 24272 | 0      | notifyd |
| N       | 2052  |       | 99     |         |
| N       | 2053  |       | 99     |         |
| N       | 2054  |       | 99     |         |
| N       | 2055  |       | 99     |         |
| N       | 2056  |       | 99     |         |
| N       | 2057  |       | 99     |         |
| N       | 2058  |       | 99     |         |
| N       | 2059  |       | 99     |         |

Once you have a list of the server intercommunication ports that are either in use or available (in the display above 2050 through 2059), you can see if you have enough ports to start more Infoprint Manager server processes. If not, you can use the **pdinitports** utility to initialize a larger range of port numbers for interprocess communication. Note that Infoprint Manager processes, such as **notifyd** and the SAP callback daemons also use server intercommunication ports.

Because Infoprint defaults to reserving only 10 ports, if you want to define more than 10 server processes, you must use the **pdinitports** utility to initialize more than 10 ports. For example, if you want to initialize Infoprint to use the server interprocess communication ports 2050 through 2069 for twenty server processes, enter the following at the AIX command line:

```
pdinitports 2050 2069
```

For a complete description of the **pdinitports** utility, see Infoprint Manager: Reference. Once you have completed this process, you can begin “Creating Additional Servers or Starting Existing Servers”.

---

## Creating Additional Servers or Starting Existing Servers

You can create a new server or start an existing server through the Infoprint SMIT administrator’s interface. If you are not familiar with how to start the Infoprint SMIT administrator’s interface, see “Using the Infoprint Interfaces” in the *AIX: Getting Started* manual (G544-5817).

To create a new server or start an existing server:

1. From the Infoprint Printing System panel, select **Start/Stop Servers**. A new menu displays.
2. Select **Start a Server**. The Start a Server dialog window opens.
3. Enter the name of the Infoprint server in the \* **SERVER name** field. By default, Infoprint fills in this field with the name of the AIX system on which you are running the SMIT session.
4. If you want to use a port number other than the default of **6874** as the communications port for Infoprint, enter the port number in the **PORT number** field.

**Note:** When selecting your own port number, always increment the choice by two because the Infoprint server uses two numbers: the one you specify and the next one, for example, 6874 and 6875.

5. If you want the Infoprint server to run in a locale other than your current locale, enter the locale name in the **LOCALE** field.
6. Press **Enter**. The result of this step depends on whether the server exists:
  - If the server does not exist, Infoprint displays a confirmation message asking if you want to create a new server. Respond to the prompt to continue.
  - If the server exists but is not currently running, Infoprint displays status information and issues a message when it successfully starts the server.
  - If the server exists and is running, Infoprint issues a message to indicate that the server is already operational.

**Notes:**

1. Normally you will only run one Infoprint server on an AIX system.
2. You also use this procedure to start a server that you have shut down.

---

## Configuring Servers with a Mixed Language Environment

If your Infoprint environment is a mixed language environment with separate locales, you must use “Creating Additional Servers or Starting Existing Servers” to create separate servers running in each language of your environment. Each of these servers can be named for the locale they support (such as english, french, or german).

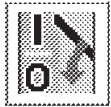
These Infoprint Manager servers do not need to contain any Infoprint Manager objects, such as queues or destinations. Instead, these servers handle the locale-specific processing of the commands and forward those commands to the Infoprint Manager server that contains the objects.

For each Infoprint client that is not running on the same AIX server as the Infoprint AIX servers, such as the Infoprint Manager Operations GUI, Infoprint

Submit, or Infoprint Select, you must ensure that it connects to the correct Infoprint server by setting the **PD\_SOCKET** environment variable to contain the port number of the Infoprint AIX server supporting the locale of your client. If your client is running in a locale not supported by the Infoprint server then connect it to an Infoprint server running in English. To perform this task, see Chapter 11, “Setting Infoprint and AIX Environment Variables” on page 139.

---

## Shutting Down a Server



You can shut down a server either immediately or after it finishes processing some or all of its current jobs.

Infoprint prevents the server from accepting new jobs while the server is shutting down and after it has shut down. Logical destinations and actual destinations in the server that were enabled at shutdown time are enabled when the server is restarted. Logical destinations and actual destinations in the server that were disabled at shutdown time are disabled when the server is restarted.

**Note:** See “Creating Additional Servers or Starting Existing Servers” on page 12 for the restart procedure.

To shut down a server:

1. Drag the **Shut Down** icon from the Actions area and drop it on the icon of the server you want to shut down.

The Shut Down Servers dialog window appears.

2. Select when you want the server to shut down. You can use the **Help** or the ? button to view information on the selections.
3. Select the **OK** button.
4. Infoprint starts the shutdown process based on the method you selected.

The server icon turns black indicating that it is shutting down. When the process is complete, the server icon disappears from the window.



---

## Chapter 3. Installing and Configuring Printer Devices and Related Hardware

This chapter contains the following topics:

- “Installing Channel-Attached Printer Devices”
- “Installing the i-data 7913 IPDS Printer LAN Attachment” on page 17
- “Configuring the IBM InfoColor 70 and the IBM Infoprint Color 100” on page 28
- “Using Infoprint Manager with the Infoprint Color 130 Plus” on page 37
- “Configuring the IBM Infoprint 2000” on page 42
- “Configuring the IBM Infoprint 4000” on page 47
- “Configuring the Halftone Management System” on page 47

For information on printers not included in this chapter, please go to the Infoprint Manager for AIX sitelet on the Web. You can access the sitelet from the Printing Systems homepage at <http://www.ibm.com/printers>.

To create and configure the Infoprint physical printers that represent printer devices, see “Creating and Managing Actual Destinations” in Infoprint Manager for AIX: Getting Started.

---

### Installing Channel-Attached Printer Devices

When you install a channel-attached printer device, you must:

1. Perform the prerequisite tasks.
2. Install the S/370 Channel Emulator/A adapter.
3. Load the device driver onto the S/370 Channel Emulator/A adapter.

You must also create and configure a PSF channel-attached physical printer to represent the printer device. For instructions, see “Creating and Managing Actual Destinations” in Infoprint Manager for AIX: Getting Started.

#### Prerequisite Tasks

Before installing a channel-attached printer, complete the following prerequisite tasks:

- \_\_\_ 1. Schedule an appointment with your IBM representative. This person will:
  - a. Install the S/370 Channel Emulator/A Adapter in the RS/6000 if it has not been installed already
  - b. Connect the channel cable to the printer
  - c. Install the bus and tag terminators in the last printer connected to the channel
  - d. Provide the control unit address for the printer
- \_\_\_ 2. Determine how many channel-attached printers and S/370 Channel Emulator/A Adapters to install.

While each S/370 Channel Emulator/A Adapter can physically attach four printers; for optimum performance, you should generally attach no more than two channel-attached printers to each RS/6000 with no more than one channel-attached printer per adapter. If you print relatively little data and require relatively few resources, you may be able to attach two printers to a single adapter.

If you install more than one adapter, you must decide which printer you will attach to each adapter.

- \_\_\_ 3. Check that you satisfy the electrical grounding requirements described in the documentation for the printer devices.
- \_\_\_ 4. Place the printer devices no more than 200 feet from the RS/6000 to which they will be attached.
- \_\_\_ 5. At the printer operator panel or console, set the printer to **High Speed Data Streaming** mode or to a similar mode, if applicable.
- \_\_\_ 6. Read *POWERstation and POWERserver Channel Emulator/A: User's Guide and Service Installation*.

## Installing the S/370 Channel Emulator/A Adapter

To find out if the S/370 Channel Emulator/A adapter has already been installed in your RS/6000, enter the following command on the AIX command line:

```
lsdev -C | grep chna
```

For each installed adapter, AIX returns a line similar to this:

```
chna0 Available 00-02 IBM S/370 Channel Emulator/A Adapter
```

If the adapter has not been installed, the IBM representative can install it; or you can install it yourself. To install the adapter:

1. Shut down the RS/6000. For example, to shut down the RS/6000 at 6:30 PM, first sending a warning to all users, enter:  

```
shutdown 18:30
```
2. After shutdown is complete, turn off the RS/6000 and all attached devices.
3. Follow the installation instructions in *POWERstation and POWERserver Channel Emulator/A: User's Guide and Service Installation*.
4. Record the number of the slot in which you installed the S/370 Channel Emulator/A adapter and some identifying information for the printer or printers that you intend to attach to the adapter. You will need this information when you configure the Infoprint physical printer that represents each printer device.
5. Attach the channel cable to the S/370 Channel Emulator/A adapter at the RS/6000.

### CAUTION:

- a. **Do not attach the channel cable to the printer. The cable and printer connection are easily damaged. The IBM representative will attach the channel cable to the printer.**
- b. **If a bus cable and tag cable are provided with the S/370 Channel Emulator/A adapter, do not attach these cables to the channel cable or to the printer. The IBM representative will attach them.**
6. When the IBM representative comes to attach the cables, ask him or her to tell you the control unit address for each printer. Record this address. You will need it when you configure the Infoprint physical printer that represents the printer device.
7. Turn on the RS/6000 and all attached devices.

## Loading the Device Driver onto the S/370 Channel Emulator/A Adapter

When you install Infoprint, you install a device driver for the S/370 Channel Emulator/A Adapter on the RS/6000. You must download this driver to each installed adapter. To do this:

1. Log on as **root**.
2. At the AIX command line, enter:

```
smit pd_psf_main
```

The Miscellaneous Configuration menu displays.

3. Select Load Driver onto S/370 Channel Emulator/A Adapter. The Adapter Selection panel (Figure 6) displays.

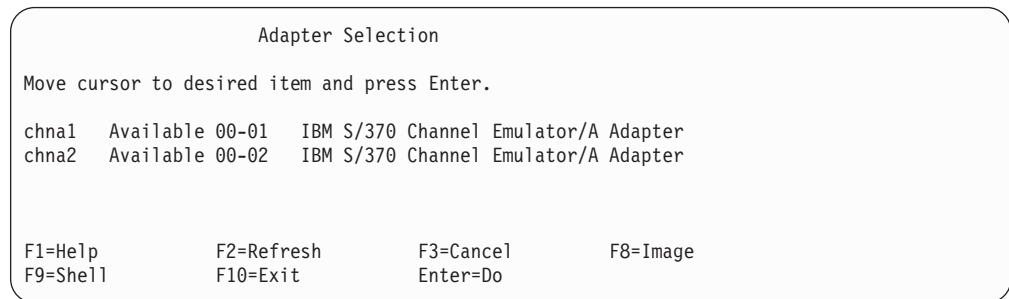


Figure 6. SMIT Adapter Selection Panel

4. Select an adapter.
5. Press **Enter** (ASCII interface) or select Do (AIXwindows interface).
6. To confirm that the device driver is loaded, enter the following command on the AIX command line:

```
lsdev -C | grep afp
```

For each adapter where the device driver was successfully loaded, AIX returns a line similar to this:

```
afp0 Available 00-02-00 IBM S/370 Channel Emulator/A Printer Driver
```

If the driver was not successfully loaded, the status is Defined instead of Available.

---

## Installing the i-data 7913 IPDS Printer LAN Attachment

Infoprint requires the i-data 7913 Intelligent Printer Data Stream (IPDS) Printer Local Area Network (LAN) Attachment in order to print on IBM coaxial and twinaxial printers. You must install and configure one i-data 7913 IPDS Printer LAN Attachment for each coaxial or twinaxial printer that you plan to install.

### How the i-data 7913 IPDS Printer LAN Attachment Works with Infoprint

The i-data 7913 IPDS Printer LAN Attachment is a hardware protocol converter that communicates between Infoprint and a coaxial or twinaxial IPDS printer device. You can use the i-data 7913 IPDS Printer LAN Attachment to connect this type of printer to any LAN-attached workstation.

The i-data 7913 IPDS Printer LAN Attachment requires TCP/IP communications protocols. It runs on either an IBM token-ring network or an Ethernet LAN. You must install one i-data 7913 IPDS Printer LAN Attachment for each coaxial or twinaxial IPDS printer device that you plan to install. You must install and configure each i-data 7913 IPDS Printer LAN Attachment separately.

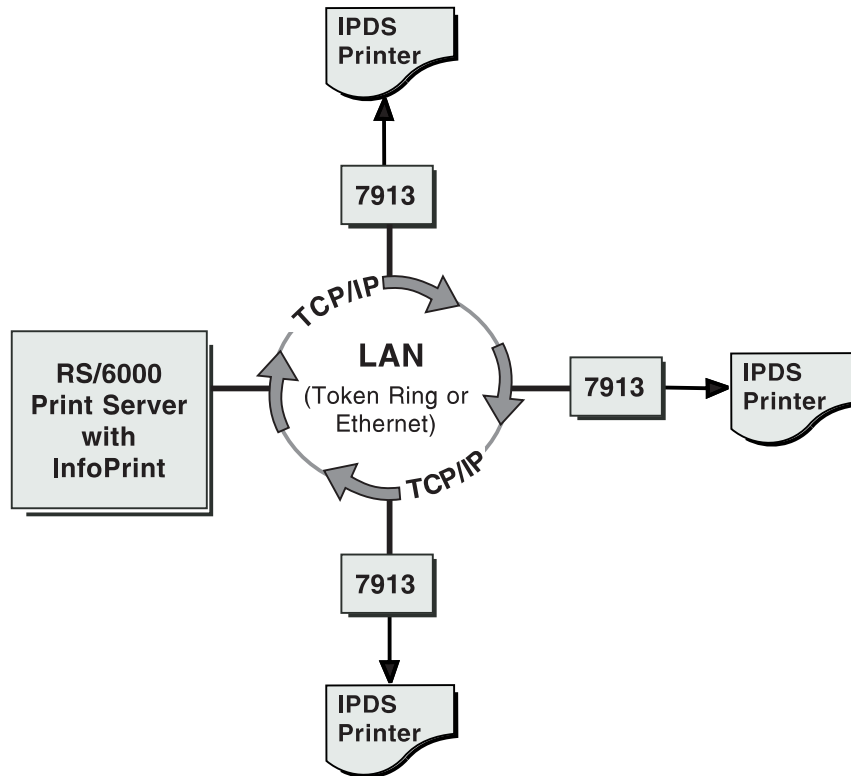


Figure 7. i-data 7913 IPDS Printer LAN Attachment in a TCP/IP LAN Environment

## How the i-data 7913 IPDS Printer LAN Attachment Fits into Network Configurations

There are two possible network configurations for the i-data 7913 IPDS Printer LAN Attachment.

Use the configuration in Figure 8 on page 19 for new TCP/IP installations with one RS/6000 print server. This server contains all the software that Infoprint requires to drive printers. This server also runs TCP/IP and contains the TCP/IP **bootp** daemon, which initializes the i-data 7913 IPDS Printer LAN Attachment.



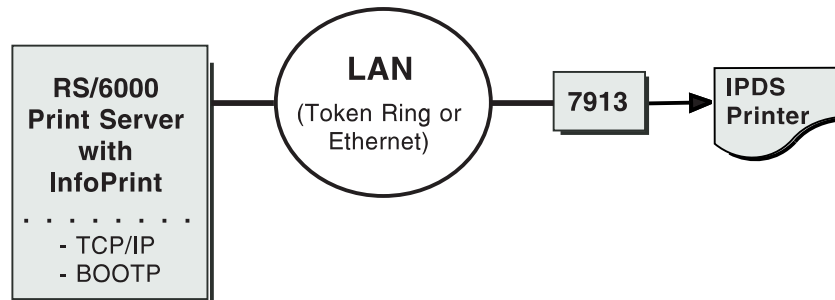


Figure 8. Network Configuration for New TCP/IP Installations

Use the configuration in Figure 9 for an TCP/IP network with the **bootp** daemon installed on another server. Normally, the server must belong to the same subnetwork as the i-data 7913 IPDS Printer LAN Attachment. An existing AIX server may be running Infoprint.

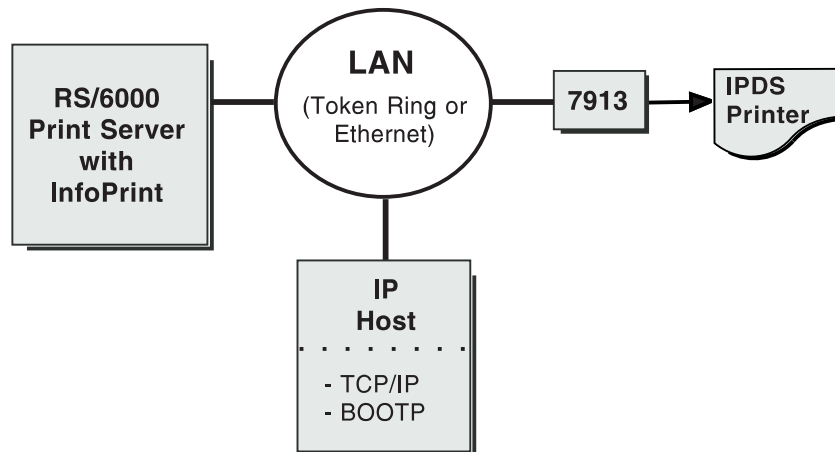


Figure 9. Network Configuration for Separate Internet Protocol Hosts

## Prerequisite Tasks

Before you begin to install the i-data 7913 IPDS Printer LAN Attachment, you must satisfy the following conditions:

- \_\_\_ 1. You have one i-data 7913 IPDS Printer LAN Attachment for each IBM coaxial or twinaxial printer that you plan to install. You can order the i-data 7913 IPDS Printer LAN Attachment as a printer feature.

The following printers require the i-data 7913 IPDS Printer LAN Attachment:

- IBM 3112 Page Printer Model 001
- IBM 3116 Page Printer Models 001, 002, and 003
- IBM 3812 Page Printer Model 2 with feature 3190 or 3192
- IBM 3816 Page Printer Models 01D and 01S with feature 7653 or 7654
- IBM 3912 Page Printer Models AS1 and NS1
- IBM 3916 Page Printer Models AS1 and NS1
- IBM 3930 Page Printer Models 02D and 02S
- IBM Laser Printer 4028 Models AS1 and NS1, including support for the 4028 with magnetic ink character recognition (MICR), Request for Price Quotation (RPQ) S02177
- IBM 6400 Line Matrix Printer (all models)
- IBM 6408 Line Matrix Printer Model CTA

**Note:** Infoprint does not support twinaxial connections for this printer device.

- IBM 6412 Line Matrix Printer Model CTA

**Note:** Infoprint does not support twinaxial connections for this printer device.

- 2. You have installed the following software:
  - IBM AIX Version 3.2.5 or higher for the RS/6000. For Infoprint Version 3.1, you must install IBM AIX Version 4.2.1 or higher.
  - The TCP/IP option (**bosnet.tcpip.obj**) of the AIX operating system
  - Infoprint Version 2.1 or higher
- 3. You have either an IBM token-ring network or an Ethernet LAN installed and operating.
- 4. Your AIX LAN coexists with TCP/IP. If it does not, refer to *TCP/IP Tutorial and Technical Overview*.
- 5. For each i-data 7913 IPDS Printer LAN Attachment that you plan to install, you have obtained the following information from your network administrator:
  - Internet Protocol (IP) address
  - Subnet mask
  - Gateway address

## The bootp Daemon

You must configure and start the **bootp** daemon on an AIX system in the TCP/IP network. The **bootp** daemon initializes the i-data 7913 IPDS Printer LAN Attachment.

### How the bootp Daemon Works

The TCP/IP **bootp** daemon supports one or more i-data 7913 IPDS Printer LAN Attachments. When you start an i-data 7913 IPDS Printer LAN Attachment, it broadcasts an initialization request to all systems on the LAN. The **bootp** daemon searches the **/etc/bootptab** file and returns information that defines the i-data 7913 IPDS Printer LAN Attachment within the network.

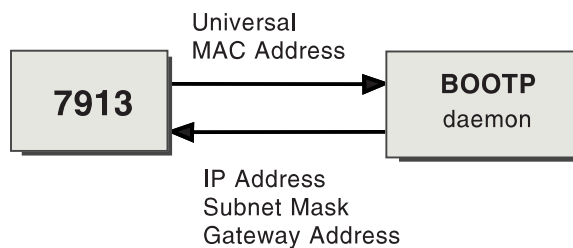


Figure 10. Data Flow between the i-data 7913 IPDS Printer LAN Attachment and the bootp Daemon

Figure 10 shows the exchange of the following data:

#### Universal medium access control (MAC) address

The universal MAC address is unique for each i-data 7913 IPDS Printer LAN Attachment. It is printed on the side panel of the i-data 7913 IPDS Printer LAN Attachment and defined in the hardware. The i-data 7913 IPDS Printer LAN Attachment broadcasts its universal MAC address when it starts. The **bootp** daemon uses the universal MAC address to find the i-data 7913 IPDS Printer LAN Attachment in the **bootptab** file.

### IP address

The IP address is the full address of the i-data 7913 IPDS Printer LAN Attachment as defined to the network. This address must be unique for each i-data 7913 IPDS Printer LAN Attachment.

### Subnet mask

The subnet mask is a bit template that indicates which part of the IP address represents the network. A 1 in the subnet mask indicates that the corresponding bit in the IP address is part of the network address; a 0 indicates that it is not. For example, if the IP address is 9.99.12.137 and the subnet mask is 255.255.255.0, the network address is 9.99.12.0.

### Gateway address

The gateway address is the address of the system that routes data to other networks.

## Filling out the bootp Configuration Worksheet

Before you begin to modify the `/etc/bootptab` file, fill out a **bootp** configuration worksheet for each i-data 7913 IPDS Printer LAN Attachment.

Table 2. *bootp Configuration Worksheet*

| Parameter                             | Where to Find the Value                                              | Value |
|---------------------------------------|----------------------------------------------------------------------|-------|
| Name                                  | Any name that identifies the i-data 7913 IPDS Printer LAN Attachment |       |
| Network type (token ring or Ethernet) | System administrator                                                 |       |
| Ring speed (token-ring only)          | System administrator                                                 |       |
| Universal MAC address                 | Side panel of the i-data 7913 IPDS Printer LAN Attachment            |       |
| IP address                            | System administrator                                                 |       |
| Subnet mask                           | System administrator                                                 |       |
| Gateway address                       | System administrator                                                 |       |
| Printer type (twinaxial or coaxial)   | Printer documentation                                                |       |

## Editing the /etc/bootptab File

The `/etc/bootptab` file contains a separate entry with configuration information for each i-data 7913 IPDS Printer LAN Attachment. To configure this file, edit it and add the values from Table 2. On most AIX systems, you must have **root** authority to edit the `/etc/bootptab` file.

Figure 11 shows an example of a simple `/etc/bootptab` file. There are entries for two i-data 7913 IPDS Printer LAN Attachments with the same subnet mask and gateway address.

```
P4028: ht=6: ha=00036EFFFFFF: ip=9.9.12.137:-
 sm=255.255.255.0: gw=9.99.12.254:
P3812: ht=6: ha=00036E00049F: ip=9.9.12.138:-
 sm=255.255.255.0: gw=9.99.12.254:
```

Figure 11. A Simple `bootptab` File

The keywords and fields in Figure 11 are as follows:

*EntryName*

A name of your choice that identifies the entry. This name has no meaning to the system.

**ht=HostHardwareType**

Enter **6** for a token ring network or **ethernet** for an Ethernet LAN. This keyword must precede the **ha** keyword.

**ha=HostHardwareAddress**

The universal MAC address of the i-data 7913 IPDS Printer LAN Attachment.

**ip=IPAddress**

The IP address of the i-data 7913 IPDS Printer LAN Attachment.

**sm=SubnetMask**

The subnet mask for the IP address.

**gw=GatewayAddress**

The gateway address for the network.

: Delimiter indicating the end of a value.

- Continuation character indicating that the entry continues on the next line.

Figure 12 shows a more complex way to describe the same **bootp** configuration as in Figure 11 on page 21. The file begins with a global entry for the subnet mask used by all i-data 7913 IPDS Printer LAN Attachments. An entry for the gateway address points to the subnet mask entry. In turn, each entry for an i-data 7913 IPDS Printer LAN Attachment points to the gateway address entry. This style is convenient to use when many i-data 7913 IPDS Printer LAN Attachments share the same subnet mask and gateway address. If the gateway address changes, you need to update only one entry.

```
Global entry with information that every host uses
global.lan:-
 sm=255.255.255.0:

Subnet entry with gateway address
subnetida.trlan:-
 tc=global.lan: gw=9.99.12.254:

Entries for 7913 units
P4028: tc=subnetida.trlan: ht=6: ha=00036EFFFFFF:-
 ip=9.9.12.137:

P3812: tc=subnetida.trlan: ht=6: ha=00036E00049F:-
 ip=9.9.12.138:
```

*Figure 12. A More Complex bootptab File*

In addition to the keywords you saw in Figure 11 on page 21, Figure 12 contains the following keywords:

**tc=template**

A pointer to another entry that contains addressing information.

# Comment character.

## Setting Up the bootp Daemon on AIX

After you have configured the **/etc/bootptab** file, you must set up and start the **bootp** daemon on AIX. Follow these steps:

1. Log on as **root**.
2. Add the following lines to the `/etc/services` file if they are not already present:
 

```
bootps 67/udp # bootp server port
bootpc 68/udp # bootp client port
```
3. Use *one* of the following methods to start the **bootp** daemon:
  - To have the **inetd** super-daemon start the **bootp** daemon, follow these steps:
    - a. Add the following line to the `/etc/inetd.conf` file if it is not already present:
 

```
bootps dgram udp wait root /etc/bootpd bootpd
```
    - b. On the AIX command line, enter the following commands so that the **inetd** super-daemon can recognize the update:
 

```
inetimp
refresh -s inetd
```
  - To start the **bootpd** daemon manually, follow these steps:
    - a. Verify that the `/etc/inetd.conf` file does not include a line that controls the **bootpd** daemon. If necessary, comment out or delete the line and refresh the `/etc/inetd.conf` file.
    - b. On the AIX command line, enter one of the following commands:
 

```
bootpd -s
```

or

```
bootpd -s -d -d -d -d -d
```

The **-s flag** indicates that the **inetd** super-daemon does not control the **bootpd** daemon. Each **-d** flag displays an additional amount of debugging information. You can specify the **-d** flag up to five times.

## Configuring a Twinaxial Printer

If you are using the i-data 7913 IPDS Printer LAN Attachment to connect a twinaxial printer, set the **Station address** to **0** at the printer device.

**Note:** You cannot use the CANCEL button on a twinaxial printer to cancel print jobs.

## Setting the Controls for the i-data 7913 IPDS Printer LAN Attachment

There are two models of the i-data 7913 IPDS Printer LAN Attachment, each with different controls:

- Model 03 for IBM token-ring networks
- Model 04 for Ethernet LANs

You must set the controls before you attach the i-data 7913 IPDS Printer LAN Attachment to the printer or to the network.

## DANGER

Disconnect the i-data 7913 IPDS Printer LAN Attachment from the electrical outlet before setting the controls.

### Model 03 for IBM Token-Ring Networks

Figure 13 shows the i-data 7913 IPDS Printer LAN Attachment Model 03 for IBM token-ring networks.

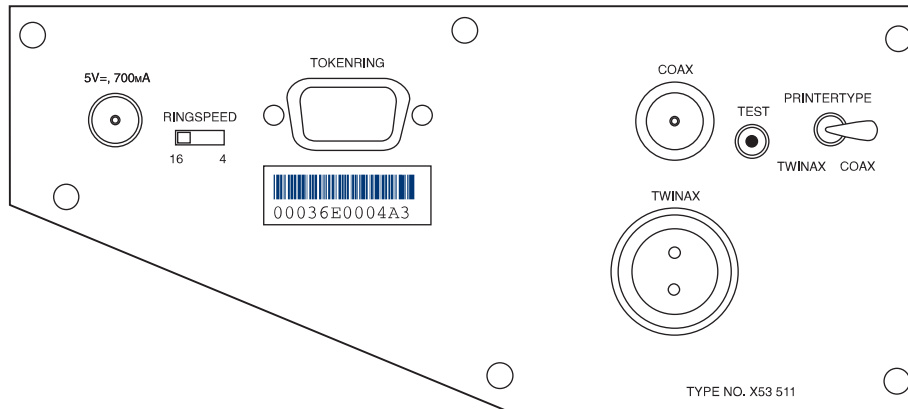


Figure 13. i-data 7913 IPDS Printer LAN Attachment Model 03 for IBM Token-Ring Networks

To set the controls on this model, follow these steps:

1. Disconnect the i-data 7913 IPDS Printer LAN Attachment from the electrical outlet.
2. Set the **RINGSPEED** switch to the speed of the token ring: **4** or **16** megabits per second. You can find out the speed from your system administrator.  
**Attention:** If the **RINGSPEED** switch is not set correctly, the LAN may malfunction.
3. Set the **PRINTERTYPE** switch to **COAX** for an IBM coaxial printer or **TWINAX** for an IBM twinaxial printer.

### Model 04 for Ethernet LANs

Figure 14 on page 25 shows the i-data 7913 IPDS Printer LAN Attachment Model 04 for Ethernet LANs.

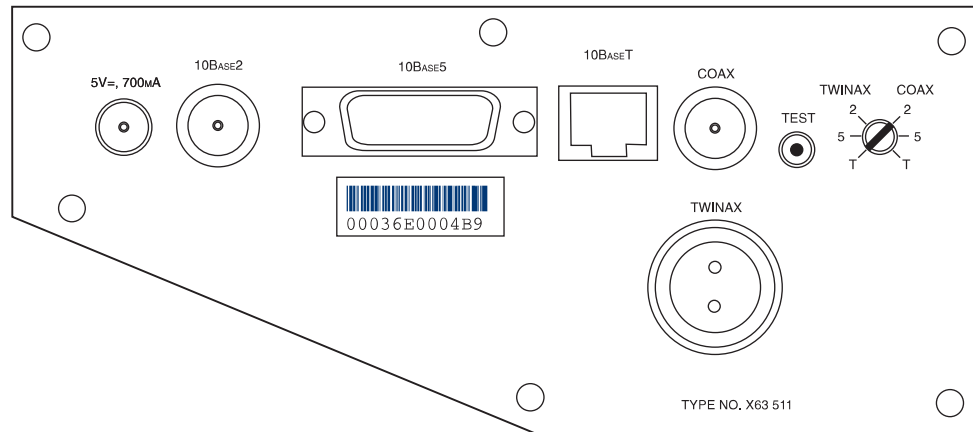


Figure 14. i-data 7913 IPDS Printer LAN Attachment Model 04 for Ethernet LANs

To set the controls on this model, follow these steps:

1. Disconnect the i-data 7913 IPDS Printer LAN Attachment from the electrical outlet.
2. Set the **TWINAX/COAX** rotary switch to one of the following positions:
  - COAX 2**  
10base2 to coax
  - COAX 5**  
10base5 to coax
  - COAX T**  
10baseT to coax
  - TWINAX 2**  
10base2 to twinax
  - TWINAX 5**  
10base5 to twinax
  - TWINAX T**  
10baseT to twinax

## Attaching the i-data 7913 IPDS Printer LAN Attachment

Attach the i-data 7913 IPDS Printer LAN Attachment by cabling it to the token ring or LAN and to the printer. For coaxial printers, you must also install the ferrite cable block shipped with the i-data 7913 IPDS Printer LAN Attachment. The ferrite cable block reduces electrical interference.

**Note:** Cables are not provided with the i-data 7913 IPDS Printer LAN Attachment or with Infoprint.

1. Disconnect the i-data 7913 IPDS Printer LAN Attachment from the electrical outlet.
2. Use a LAN connection cable to attach the i-data 7913 IPDS Printer LAN Attachment to the token ring or LAN.
3. Use a coaxial or twinaxial connection cable to attach the i-data 7913 IPDS Printer LAN Attachment to the printer.
4. For coaxial printers, clamp the ferrite cable block to the coaxial cable. Position the ferrite cable block about 10 centimeters (4 inches) from the i-data 7913 IPDS Printer LAN Attachment.

## Starting the i-data 7913 IPDS Printer LAN Attachment

To start the i-data 7913 IPDS Printer LAN Attachment, follow these steps:

1. Turn on the printer device.
2. Plug the i-data 7913 IPDS Printer LAN Attachment power cable into an electrical outlet.

The **POWER** light goes on. Several seconds later, the **LAN** light blinks. When the **bootp** daemon initializes the i-data 7913 IPDS Printer LAN Attachment, the **LAN** light changes from blinking to steady.

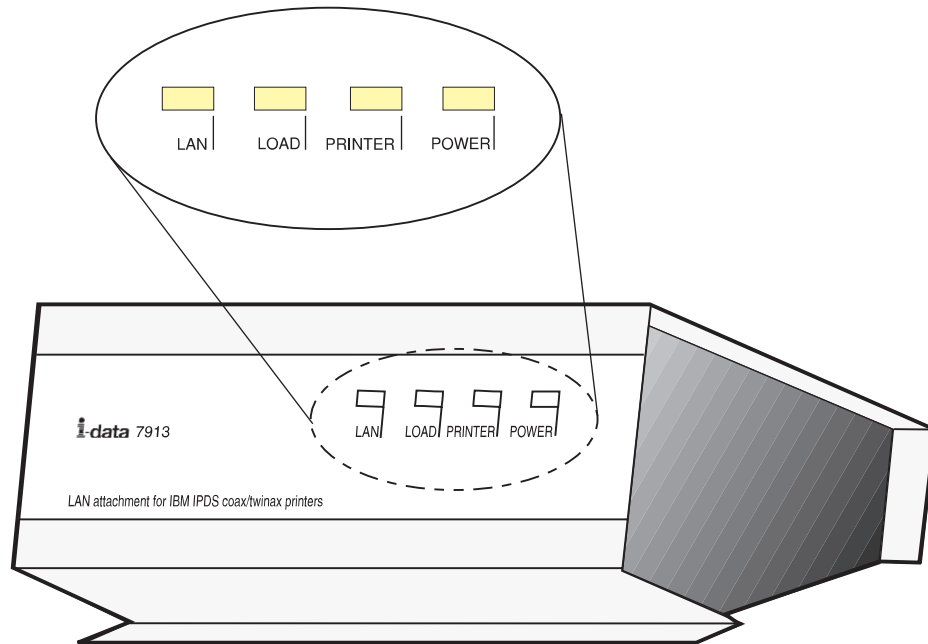


Figure 15. Status Indicators on the i-data 7913 IPDS Printer LAN Attachment

## Testing the i-data 7913 IPDS Printer LAN Attachment

After you have started the i-data 7913 IPDS Printer LAN Attachment, follow these steps to test it:

1. Press the **TEST** button on the side panel of the i-data 7913 IPDS Printer LAN Attachment. This breaks the connection between Infoprint and the i-data 7913 IPDS Printer LAN Attachment and causes the printer to print a test page.
2. From the RS/6000, ping the i-data 7913 IPDS Printer LAN Attachment to test both the physical LAN connection and the IP network connection.
  - a. Enter the **ping** command and the IP address or host name of the i-data 7913 IPDS Printer LAN Attachment, for example:

```
ping 9.99.12.73
```

If the **ping** command is successful, the response looks like this:

```
ping 9.99.12.73: 56 data bytes
64 bytes from 9.99.12.73: icmp_seq=0 ttl=255 time=1 ms
64 bytes from 9.99.12.73: icmp_seq=1 ttl=255 time=1 ms
64 bytes from 9.99.12.73: icmp_seq=2 ttl=255 time=1 ms
64 bytes from 9.99.12.73: icmp_seq=3 ttl=255 time=1 ms
⋮
```

- b. Press **Ctrl-C** to end the **ping** command.



## Shutting Down the i-data 7913 IPDS Printer LAN Attachment

To end the connection between Infoprint and the i-data 7913 IPDS Printer LAN Attachment, use the Infoprint Manager Administration GUI to shut down the actual destination that represents the printer device.

## Configuring the TCP KEEPALIVE Frequencies

Infoprint Manager uses TCP protocol and relies on TCP to detect when a connection with an i-data 7913 or a PSF DSS printer with a TCP/IP attachment type is no longer usable.

Infoprint Manager directs TCP to poll its connection partner periodically when no other data is exchanged between Infoprint Manager and its connection partner. These periodic polls, called KEEPALIVE transmissions, enable TCP to discover when a connection is no longer accessible through the network.

Although Infoprint Manager directs TCP to send KEEPALIVE transmissions, the frequency of these transmissions is controlled by system-wide TCP/IP configuration parameters. On AIX, the default frequency is after roughly two hours of inactivity. However, AIX allows the frequency of KEEPALIVE transmissions to be adjusted. The frequency applies to all TCP applications that direct TCP to send KEEPALIVE transmissions.

The **no** (network options) command can be used by the root user to configure KEEPALIVE frequencies:

```
no -o tcp_keepidle=nnn
no -o tcp_keepintvl=nnn
```

where *nnn* is in half-seconds.

The **tcp\_keepidle** parameter specifies the interval of inactivity that causes TCP to generate a KEEPALIVE transmission for an application that requests them. **tcp\_keepidle** defaults to 14400 (two hours).

The **tcp\_keepintvl** parameter specifies the interval between the nine retries that are attempted if a KEEPALIVE transmission is not acknowledged. **tcp\_keepidle** defaults to 150 (75 seconds).

You must run the **no** commands each time you start the AIX system. Adding **no** commands to the **/etc/rc.net** file is a convenient way to automate this step.

For example, adding:

```
no -o tcp_keepidle=480
no -o tcp_keepintvl=80
```

to **/etc/rc.net** causes TCP to send a KEEPALIVE transmission if a TCP connection has been inactive for four minutes and the application requested KEEPALIVE transmission, as Infoprint Manager does. Infoprint Manager recommends these TCP configuration settings for customers who use PSF DSS printers with a TCP/IP attachment type and i-data 7913s.

---

## Configuring the IBM InfoColor 70 and the IBM Infoprint Color 100

The IBM InfoColor 70 and Infoprint Color 100 printers require special configuration for optimal performance in an Infoprint Manager environment. The IBM InfoColor 70 ships with its own AIX (RS/6000) system, and the Infoprint Color 100 ships with its own Windows NT system. These systems, referred to below as printer CPUs, are dedicated to performing raster image processing (RIP) and other management functions for the printers. In addition, you may have purchased one or more Windows NT or AIX systems to function as additional “offline RIP” systems. These offline RIP systems are designed to accelerate the printing process. If your Infoprint Manager installation uses an InfoColor 70 or Infoprint Color 100 printer, the printer CPU must be configured as directed in the hardware documentation.

The IBM Infoprint Color 100 gives an application programmer the ability to add color to black and white documents to be printed on the Infoprint Color 100 AFP printer and an Infoprint 4000 printer with an InfoPrint Hi-Lite Color Model HC2 Post-Processor (HCPP).

This section contains the following topics:

- Configuring AIX Offline RIP Systems
- Mounting the CD-ROM File System on AIX
- Configuring Windows NT Offline RIP Systems
- Modifying Your colorRipd Configuration
- Configuring RIP Options
- Creating and Configuring the Actual Destination

### Creating the CD-ROM File System on AIX

Perform the following steps to create a CD-ROM file system only if you have not done so previously:

1. On the AIX command-line, type `smit cdrfs`
2. Select **Add a CDRom File System** from the list of choices presented.
3. Click the **List** button and select your CD-ROM device name (`cd0`, for example).
4. In the **Mount Point** field, type `/cdrom`
5. Click **OK**. The running person will raise his arms to indicate success. If he instead falls down and you see

```
crfs: 0506-909 /cdrom file system already exists
```

do not interpret this as a failure. (The existing `/cdrom` file system should be usable.)

6. Press the **F12** key to exit SMIT.

### Configuring AIX Offline RIP Systems

The AIX printer CPU that shipped with the InfoColor 70 printer must be configured as an offline RIP system. At any time, you may add AIX systems to accelerate RIPs for your InfoColor 70 or Infoprint Color 100 printer. These systems must also be configured as offline RIP systems.

To configure an AIX system to function as an offline RIP system, install and configure the FastRip Postscript interpreter program as directed in its documentation. Then install and configure the colorRipd program by following these steps:

1. Log into the AIX system as **root**.

2. Insert the gold Infoprint Manager for AIX Server 1 CD-ROM into the CD-ROM reader.
3. Open a terminal window. (If you are using the Common Desktop Environment (CDE), you may open a terminal window by clicking on the terminal icon contained in the front panel. The front panel is the task bar that appears at the bottom of the screen.) By default, the terminal icon is contained in a popup menu above the text editor icon that appears on the front panel.
4. If you have not done so previously, create a CD-ROM file system as described below.
5. At the AIX command line type `mount /cdrom`
6. Type `/cdrom/cfgColorRipd`
7. Provide the information as prompted.

Now, start the **colorRipd** process. The **colorRipd** process cannot be run as a daemon. (Do not attempt to automatically start **colorRipd** at boot time by making an entry into `/etc/inittab`.) The **colorRipd** process must be started manually. To start **colorRipd**, simply invoke the **runColorRipd** script that resides in the working directory specified during the configuration process. For example, if you specified `/rip1` as the working directory, the following command would start **colorRipd**:

```
/rip1/runColorRipd
```

If your AIX system has multiple processors, you may wish to run more than one instance of **colorRipd** simultaneously on the same AIX system. To do this, repeat the procedure described above, but specify a different working directory. Each running instance of **colorRipd** must have its own independent working space.

## Configuring Windows NT Offline RIP Systems

The NT printer CPU that shipped with the Infoprint Color 100 printer must be configured as an offline RIP system. To configure an NT system to function as an offline RIP system, install and configure the Barco Rip v4 PostScript Interpreter program as directed in its documentation.

If you already have a **colorRipd** program running on your Infoprint Manager for AIX Server, use the following procedure to stop and remove any previously installed **colorRipd** program:

1. From a Windows **Command Prompt**, change to the target directory where the **colorRipd** program is installed. If you have used the default directory, type: `cd /colorRipd`.
2. Stop the **colorRipd** service by typing: `deleteservice "Color Rip1"`, where **Color Rip1** is the name of the **colorRipd** service.

**Note:** If the named service has a space in the name, you must specify double quotes around the value.

You should see this response:

```
DeleteService [Color Rip1] SUCCESS
```

3. Go to **My Computer**→**Control Panel**→**Add/Remove Program** and select the **colorRipd** program from the list of programs.
4. Click the **Remove** button.

Then reinstall and configure the **colorRipd** program by following these steps:

1. Insert the Infoprint Manager Clients: Windows 95, Windows NT, &Macintosh CD-ROM into the drive.

2. Navigate to the `\colorRipd` directory on your CD-ROM drive.
3. Double-click on the **setup** icon and provide the information as prompted by InstallShield.

**Note:** You will need to do the following:

- Specify the `colorRipd` service name for the program (for example, `Color Rip1`).
- Select an Offline Rip System instead of a Print Server installation.
- Provide the name of the actual destination running on your Infoprint Manager for AIX Server through which the jobs will be submitted.
- Specify the hotfolder instead of the printer name if you are doing an online rip.

To enhance RIP performance, you can repeat steps 1 through 3 and add additional `colorRipd` programs (for example, `Color Rip1` through `Color Rip3`) to your Windows system.

At any time, you may add a Windows NT system to accelerate RIPs for your Infoprint Color 100 or InfoColor 70 printer. Each NT offline RIP system must be configured by following the procedure described above.

## Modifying Your `colorRipd` Configuration

To make changes to your `colorRipd` configuration, you must modify the property settings in the `colorRipd.cfg` file that resides in your working directory. A description of each configurable attribute follows:

### `crd_port`

The TCP/IP port that this instance of `colorRipd` will monitor. Each instance of `colorRipd` running on a system must monitor a different port. The default is 11126.

### `crd_work_directory`

A temporary working directory used for small files. By default, the `ini` subdirectory under the working directory is used.

### `crd_log_file`

The file used to log output from `colorRipd`. A backup log is periodically created by appending `.BAK` to this file name. By default, `colorRipd.log` in the working directory is specified.

### `crd_log_file_size`

The size of the log file before it wraps. Value is in bytes. The default value is 1024000 (almost 1 MB). The log file will have `WWWWW` placed at the wrap point. This marker appears at the end of file if the file has not yet wrapped.

### `rip_program`

The name of the executable or script which performs the RIP.

### `rip_work_directory`

The main temporary work directory. The files stored here are the original Postscript file, the `.ini` file with the RIP options (typically only a few Kbytes), and the output of the RIP. This output is 9 files—8 bitmap files and an index. All files are removed before the next RIP starts. Typically, the `rip` subdirectory in the working directory is used.

### `rip_hot_folder`

The location the hot folder daemon monitors for RIP files. This should be

set only for the **colorRipd** running on the printer CPU. **colorRipd** places RIP files and book ticket files in this directory.

**printer\_name**

The hostname or IP address of the printer CPU. If this attribute is set, **colorRipd** sends RIP files to the specified printer CPU. On the printer CPU, an instance of **colorRipd** must be listening on port 11126.

## Configuring RIP Options

For jobs printing on an InfoColor 70 or Infoprint Color 100 printer, Infoprint Manager interprets RIP options in the following order:

1. Options specified at job submission.
2. Attribute values in the default document associated with the logical destination.
3. Options in the **.ini** file associated with the actual destination.
4. For image width and image length, actual destination attribute values. For actual destination attributes, refer to *Infoprint Manager: Reference* or to the **pd\_att\_act\_dest** man page.

The default **.ini** file shipped with Infoprint is called **/usr/lpp/pd/bin/default.ini**. All 3170 actual destinations use this **.ini** file unless you specify another file using the **rip-ini-file** actual destination attribute.

**Note:** If you want to change the RIP options, do not edit the **/usr/lpp/pd/bin/default.ini** file. Copy it, make the changes in your copy, and specify your copy as the value of the **rip-ini-file** actual destination attribute. If there is a problem with your copy, you can restore the original values by resetting the **rip-ini-file** actual destination attribute to its default value.

The following displays an example of an **.ini** file.

|                 |              |
|-----------------|--------------|
| [setup          |              |
| bps:            | 4            |
| res:            | 600          |
| output:         | JobName      |
| ocompress:      | align72      |
| offormat:       | B/custdisk1/ |
|                 |              |
| duplex:         | 1            |
| tumble:         | 0            |
| orientation:    | 0            |
| copies:         | 1            |
| enablesettrap:  | 0            |
| blackoverprint: | 0            |
| overprint:      | P            |
|                 |              |
| stat:           | 2            |
| profile:        | 0            |
| machdebug       | 0            |

|               |                                              |
|---------------|----------------------------------------------|
| centery:      | 0                                            |
| pageclip:     | C                                            |
| outputfaceup: | 0                                            |
| jobtype:      | M                                            |
| cms_product:  |                                              |
| cms_proclink: |                                              |
| monochrome:   | 0                                            |
| resident:     | 0                                            |
|               |                                              |
| outputbin:    | 1s                                           |
| cutmedia:     | 1                                            |
| controlstrip: |                                              |
| ssy:          | 1                                            |
| centerx:      | 0                                            |
| autotrap:     | 0                                            |
| psx:          |                                              |
| psy:          |                                              |
| [job1:        |                                              |
| name:         | %stdin%                                      |
| type:         | ps                                           |
| dot:          | /c=r,170,15/m=r,170,75/y=r,170,90/k=r,170,45 |
| scale:        | 1                                            |
| hpos:         | 0                                            |
| vpos:         | 0                                            |

The keywords in the **[setup]** section of the **.ini** file are as follows:

**bps** Indicates the number of bits used to describe the gray value for each pixel. You can enter one of the following values:

- 2** Each pixel can have one of four levels of gray, from 0 to maximum density.
- 4** Each pixel can have one of sixteen levels of gray, from 0 to maximum density.

This keyword is equivalent to the document attribute **bits-per-spot**.

**res** Indicates the resolution, in pels, at which the printer device should print the image data in documents. For InfoColor 70 printers, the only valid value is **600**.

This keyword is equivalent to the document attribute **default-printer-resolution**.

**output**

The name of the RIPPed file. The value **JobName** indicates that this name should be the same as the job name.

**ocompress**

Indicates whether and how to compress the RIPped file. **align72** is the only valid compression algorithm. You should not change this value because in most cases it is desirable to compress the RIPped file. When you do not want to compress it, set the document attribute **compressed-output** to false.

This keyword is similar to the document attribute **compressed-output**.

**offormat**

The directory where backup RIPped files are stored. Do not change this value.

**duplex**

Indicates whether to print on both sides of the paper. Enter **1** for true or **0** for false. This keyword is similar to the document attribute **sides**.

**tumble**

Indicates whether to print successive pages so that the top of one page is at the same edge of the bottom of the next page. Enter **1** for true or **0** for false. If duplex is 0, you must enter 0.

**orientation**

Indicates the placement of the image on the page. You can enter one of the following values:

- 0** Portrait
- 1** Landscape
- 2** Reverse Portrait
- 3** Reverse Landscape

This keyword is equivalent to the document attribute **content-orientation**.

**copies** Indicates the number of document copies to print. Enter an integer from **1** to **2147483647**.

This keyword is equivalent to the document attribute **copy-count**.

**enablesettrap**

Indicates whether to turn on trapping for Quark XPress jobs. Enter **1** for true or **0** for false.

This keyword is equivalent to the document attribute **enable-settrap**.

**blackoverprint**

Indicates whether to print black over colors. You can enter one of the following values:

- 0** Omit colors from areas where black will be printed.
- 1** Print a colored background with black over it.

This keyword is equivalent to the document attribute **black-overprint**.

**overprint**

Indicates how to handle overprinting. You can enter one of the following values:

- 0** Ignore overprinting.
- 1** Render objects as if they would truly overprint each other.

**P** Handle overprinting according to PostScript specifications, knocking out in separations where the object applies ink.

This keyword is equivalent to the document attribute **overprint**.

**stat** Indicates the level of statistical information to report. You can enter an integer from **0** (none) to **4** (detailed).

**profile**  
You can leave this value blank.

**machdebug**  
Indicates the level of machine debugging information to report. You can enter an integer from **0** (none) to **4** (detailed).

**centery**  
Indicates whether to center the image vertically. Enter **1** for true or **0** for false.

This keyword overrides the **vpos** keyword.

This keyword is equivalent to the document attribute **image-center-y**.

**pageclip**  
Indicates how to clip images that are too wide for the page. You can enter one of the following values:

**C** Center the image horizontally and clip both sides.

**R** Clip the right side of the image.

**E** Issue an error message and end the job.

This keyword is equivalent to the document attribute **page-clip**.

**outputfaceup**  
Indicates whether to start the document on the side of the sheet that faces up in the output bin. Enter **0** for true or **1** for false. Note that these values are the opposite of what you would expect.

This keyword is similar to the document attribute **output-face-up**. Note that a value of true for the document attribute corresponds to a value of **0** for this keyword and results in face-up output. A value of false for the document attribute corresponds to a value of **1** for this keyword and results in face-down output.

**jobtype**  
Indicates the type of data. You can enter one of the following values:

**M** Master file

**V1** Variable data that completely replaces the master file

**V2** Variable data that replaces the master file where the variable data applies toner

**V3** Variable data that replaces the master file where the variable data does not apply toner. This value is used to print variable data in white.

**T** Test data

**cms\_product**  
Identifies the color correction program. You can enter a value of **xeikon** or



leave the value blank. If you enable Xeikon color correction, you must specify a value for the **cms\_proclink** keyword or for the document attribute **cms-proclink**.

This keyword is equivalent to the document attribute **cms-product**.

**cms\_proclink**

Identifies the translation table used by the color correction program. You can enter one of these fixed values:

**matchp\_ndtg2xkn\_2**

Match print, normal dot gain, 2 bits per spot

**matchp\_ndtg2xkn\_4**

Match print, normal dot gain, 4 bits per spot

**swop\_crom2xkn\_2**

SWOP Cromalin, 2 bits per spot

**swop\_crom2xkn\_4**

SWOP Cromalin, 4 bits per spot

This keyword is equivalent to the document attribute **cms-proclink**.

**monochrome**

Indicates whether to print in black and white. Enter **1** for true or **0** for false.

**resident**

Indicates whether to retain the RIPped file on the collator after printing. Enter **1** for true or **0** for false.

**output-bin**

Indicates the output bin. Enter the name of an output bin.

This keyword is equivalent to the document attribute **output-bin**.

**cutmedia**

Indicates whether to cut the paper. Enter **1** for true or **0** for false.

**controlstrip**

Indicates the file name of the pre-RIPped control strip to print with all documents. The control strip must be on the collator.

This keyword is equivalent to the document attribute **control-strip**.

**ssy**

The length of the medium sheet. Enter the length in millimeters or one of these fixed values:

**0** The sheet length equals the signature length. Because the InfoColor 70 requires some white space between signatures, a number of scan lines at the top, bottom, or both of the signature will not be included in the image.

**1** The sheet length equals the signature length plus the minimum amount of white space that the InfoColor 70 requires between signatures.

**centerx**

Indicates whether to center the image horizontally. Enter **1** for true or **0** for false.

This keyword overrides the **hpos** keyword.

This keyword is equivalent to the document attribute **image-center-x**.

**autotrap**

Indicates whether to enable trapping. Enter **1** for true or **0** for false.

**Note:** Trapping is a licensed feature of the InfoColor 70. **1** is valid only if this feature is installed.

**psx**

Indicates the width in millimeters of an image after it has been transformed for printing.

This keyword is similar to the document attribute **image-width**.

**psy**

Indicates the length in millimeters of an image after it has been transformed for printing.

This keyword is similar to the document attribute **image-length**.

The keywords in the **[job1]** section of the **.ini** file are as follows:

**name** Indicates the name of the job to which the keywords in this section apply. The value `%stdin%` indicates that they apply to any job submitted.

**type** Indicates the data type. This value is always **ps**.

**dot** Indicates the shape of pixels. Enter a value in this format:  
*/color=shape, lpi, angle...* where:

**color** Indicates the dot color:

**c** Cyan  
**m** Magenta  
**y** Yellow  
**k** Black

**shape** Indicates the dot shape:

**r** Round  
**c** Combined  
**l** Line  
**ln** Line not calibrated

**lpi** Is the screen frequency in lines per inch.

**angle** Is the screen angle.

Some other possible values:

**Classic**

*/c=r,170,15/m=r,170,75/y=r,170,90/k=r,170,45*

**Combined**

*/c=c,170,15/m=c,170,75/y=c,170,90/k=c,170,45*

**Sofocles**

*/c=l,158,15/m=l,158,75/y=l,158,90/k=l,158,45*

**Sofocles not calibrated**

*/c=ln,158,15/m=ln,158,75/y=ln,158,90/k=ln,158,45*

**No screen**

*/c=r,600,15/m=r,600,75/y=r,600,90/k=r,600,45*

This keyword is equivalent to the document attribute **dot-shape**.

**scale** Indicates the image scaling factor. You can enter a numeric value from 0 to 2147483647, which may optionally contain a decimal point. For example, to scale 120%, enter 1.2.

This keyword is equivalent to the document attribute **image-scale**.

**hpos** Indicates the horizontal offset of the logical page in millimeters to the right of the physical page origin.

The **centerx** keyword overrides this keyword.

This keyword is equivalent to the document attribute **x-image-shift**.

**vpos** Indicates the vertical offset of the logical page in millimeters below the physical page origin.

The **centery** keyword overrides this keyword.

This keyword is equivalent to the document attribute **y-image-shift**.

## Creating and Configuring the Actual Destination

Use the "Creating Actual Destinations with the Infoprint VSM Administrator's GUI" in Infoprint Manager for AIX: Getting Started to create a 3170 physical printer to represent the InfoColor 70 or Infoprint Color 100 printer device. Then issue the following command to define the hot folder, the .ini file, the RIP servers, and the directory where the RIP servers store files:

```
pdset -c destination -x
"printer-hot-folder=/custdisk1/HotFolder
rip-ini-file=/iniFilePath transform-output-location=/custdisk1"
-x color-rip-servers="IPAddress1:Port1...IPAddressN:PortN
PrinterName
```

For example, if the physical printer is called `colorprint`, the `.ini` file is called `/usr/lpp/pd/bin/colorprint.ini`, the directory for copying jobs for automatic print submission is called `/custdisk1/HotFolder`, and you have provided both an `address1` (9.99.1.11) and an `address2` (9.99.1.12) on the InfoColor70 system for storing RIPped files, enter the following command:

```
pdset -c destination -x
"printer-hot-folder=/custdisk1/HotFolder
rip-ini-file=/usr/lpp/pd/bin/colorprint.ini"
-x color-rip-servers="9.99.1.11:8433 9.99.1.12:5558" colorprint
```

Note that the system where the Infoprint Color 100 is attached is included among the RIP servers.

---

## Using Infoprint Manager with the Infoprint Color 130 Plus

The Infoprint Color 130 Plus is a high-speed, high quality, full-color digital printer that you can submit jobs to through Infoprint Manager. Significant processing demands are placed on the Infoprint Manager system when it is preparing and sending print jobs to an Infoprint Color 130 Plus. Therefore, you should dedicate one AIX server entirely to your Infoprint Color 130 Plus; this system should only contain one Infoprint Manager server, and it should only send print jobs to one Infoprint Color 130 Plus.

### System requirements

To submit jobs to an Infoprint Color 130 Plus through Infoprint Manager (without using the color PostScript transform), your system must meet the following requirements.

- Dedicated Gigabit Ethernet connection
- F80 AIX system with:
  - Two CPUs (450 Mhz)
  - Two GB RAM
  - Four 18 GB Serial Storage Architecture (SSA)
  - Two 18 GB SCSI hard drives

If you plan to use the PostScript color transform, your system must meet the following requirements.

- Dedicated Gigabit Ethernet connection
- F80 AIX system with:
  - Two 450 Mhz CPUs and four 500 Mhz CPUs
  - Six GB RAM
  - Six 18 GB Serial Storage Architecture (SSA)
  - Two 18 GB SCSI hard drives

## Defining the Infoprint Color 130 Plus to Infoprint Manager

**Important:** Because you are dedicating an Infoprint Manager server to your Infoprint Color 130 Plus, this procedure assumes that you have either just installed Infoprint Manager on this system or that you have created a new server on this machine. In either case, your Infoprint Manager server would not contain any objects (logical destinations, queues, or actual destinations) yet. If you are planning to use an existing Infoprint Manager server to send jobs to your Infoprint Color 130 Plus, you should delete all of the objects that currently exist in it before you start this procedure.

When you define your Infoprint Color 130 Plus to Infoprint Manager, you must define it as a **PSF TCP/IP-attached** printer. You can create the printer either from the AIX command line using the **pdcreate** command or from the Infoprint Manager Administration GUI using the **Create Printer Wizard**. Follow this procedure to define the printer using the GUI.

1. Start the Infoprint Manager Administration GUI.
2. Select **Printer -> Create -> PSF -> TCP/IP**.
3. In the first panel of the Create Printer Wizard, do the following.
  - a. Type a name for the printer in the **Name** field.
  - b. Verify that the server is correct in the **Server** field.
  - c. Select **InfoprintColor130Plus** from the **Model** drop-down list.

**Note:** If that model is not shown, you must update Infoprint Manager to the current service level.

- d. Type the TCP/IP address and port number for the printer in the correct fields.
- e. Click **Next**.
4. In the second panel, type a name for the logical destination that will send jobs to this printer and click **Next**.
5. In the third panel, type a name for the queue that will submit jobs to the this destination and click **Next**.
6. On the rest of the panels, accept the default values that Infoprint Manager sets for AFP color printing by clicking **Next** and finally **Finish**.

## Configuring the PSF TCP/IP printer in Infoprint Manager

Once you have created the printer in Infoprint Manager, you must do several other things before you can print. Complete the following procedures in any order. Instructions appear below.

- “Verifying the size and location of the Input Manager workspace”
- “Setting the **delete-segment-list** attribute on the default job”
- “Identifying where to store AFP resources” on page 40
- “Starting the color rasterized image processor (RIP) on this server” on page 41
- “Changing the color rendering value” on page 41

Once you have completed these steps, refer to *Printing Scenarios for Infoprint Manager with the Infoprint Color 130 Plus* (available from the IBM Printing Systems website at <http://www.ibm.com/printers>) for additional information on sending print jobs to the Infoprint Color 130 Plus. To find the publication, from the Printing Systems home page under **Resources for**, click **Infoprint Manager**, then click **Infoprint Manager for AIX** and select **3.2 Product Library**.

### Verifying the size and location of the Input Manager workspace

The Input Manager is the part of Infoprint Manager that breaks print jobs into segments to allow greater flexibility during processing. The Input Manager stores job segments in its workspace. Segments remain in the workspace either until they are manually deleted or the workspace fills up, depending on how you choose to manage the workspace. By default, the Input Manager workspace is located at `/var/psf/segments`.

Because of the size and complexity of the color print jobs you send to your Infoprint Color 130 Plus, the Input Manager workspace must have at least 18 GB of disk space available and it should be a separate filesystem. If the existing `/var/psf/segments` does not have that much disk space available, the easiest thing to do is to create a new filesystem and mount it over `/var/psf/segments`. None of the Infoprint Manager settings need to be changed.

**Note:** Make sure that the new filesystem is set to mount automatically at system reboot so that it will still be available if you have to reboot your system.

If you do not want to overmount the filesystem, you can create a new filesystem and mount it on a different mount point. In this case, you must change the Input Manager settings to point to the correct location. To change the Input Manager settings, do the following.

1. At an AIX command prompt, type:  
`smitty pd_psf_com_adm_inp`
2. Change the **PATH used for work area & percent usage threshold** to point to the new filesystem you created.
3. Confirm the changes and exit SMIT.

### Setting the delete-segment-list attribute on the default job

When the Input Manager breaks a print job into segments, it creates a file called a *segment list*. The segment list is used to make sure the job is reassembled in the correct order, to track job progress, and to perform other job management functions. Segment lists are stored in `/var/psf/seglist`, and can either be saved or deleted when a job is finished printing. To help your Infoprint Manager system use processing space effectively, set the **delete-segment-list** attribute on the default job

for your Infoprint Color 130 Plus system to **Yes**. By setting this attribute on the default job, it will be applied to all of the jobs that are printed through this logical destination.

You can set this attribute either from the AIX command line using the **pdset** command or in the Infoprint Manager Administration GUI. Follow this procedure to set the attribute using the GUI.

1. Start the Infoprint Manager Administration GUI.
2. Right-click the printer you created for your Infoprint Color 130 Plus and select **Job and Document Defaults** -> **Modify** from the pop-up menu.
3. In the **Job and Document Defaults** properties notebook, click the **Job Other** tab.

**Note:** If you do not see the **Job Other** tab, click **Show More**.

4. Find the **Delete segment list** field and select **Yes**.
5. Click **OK**.

### Identifying where to store AFP resources

There are various kinds of AFP resources, such as form definitions, page definitions, overlays, and fonts. The newest kind of AFP resource is the *data object*. Like other resources, data object resources are files that you can include in AFP documents. Data object resources can be EPS, PDF, and IOCA files. In addition, if you use the transforms that come with Infoprint Manager to convert TIF, GIF, and JPEG images into AFP first, they can be used as data object resources as well.

In Infoprint Manager, data object resources are grouped with BCOCA and GOCA objects, and all of those types of files are called *presentation object containers*. As with other kinds of AFP resources, you must tell Infoprint Manager where your presentation object containers are located.

You can define where your image resources are stored either from the AIX command line using the **pdset** command with the **resource-context-presentation-object-container** attribute or using the Infoprint Manager Administration GUI.

Follow this procedure to set the attribute using the GUI.

1. Start the Infoprint Manager Administration GUI.
2. Select **Options** -> **Customize**.
3. In the **Customize** dialog, click the **Printer** tab.
4. In the **Action** column, find **Change AFP Resources** and select the check box in the **Menu** column next to it.

This step adds this task to the **Printer** menu. If you want to add other tasks to the Printer menu or to any other menu, you can do it now or you can wait until later.

5. Click **OK** to apply the settings and close the dialog.
6. Select the printer that you created in “Defining the Infoprint Color 130 Plus to Infoprint Manager” on page 38.
7. Select **Printer** -> **AFP Resources** to open the **Change AFP Resources** dialog.
8. In the **Location of presentation object containers** field, type the path where your presentation object containers are stored. If they are stored in more than one location, list all of the paths separated with colons (:), for example:

```
/resources/containers:/dept123/pres-obj-containers:/dept456/pres-obj-containers
```

9. Fill in any other fields that are appropriate. For example, if you use form definitions, fill in the **Location of form definitions** field.
10. Click **OK** to apply the settings and close the dialog.

## Starting the color rasterized image processor (RIP) on this server

**Important:** You only need to perform this step if you will be submitting color PostScript print jobs to your Infoprint Color 130 Plus.

The RIP generates the data stream that Infoprint Manager sends to the printer. By default, Infoprint Manager uses a RIP that produces monochrome (black and white) documents. Therefore, you must install and start the color RIP before you send color documents to your Infoprint Color 130 Plus. You only have to start the RIP once.

To start the color RIP, type the following at a command prompt:

```
install.color
```

and press **Enter**. When the `install.color` script is finished, you will see the message:

```
The color Postscript config files have been activated.
```

If you ever want to send monochrome print jobs to your Infoprint Color 130 Plus, you can stop the color RIP and start the monochrome RIP by typing the following at a command prompt:

```
install.mono
```

and press **Enter**. When the `install.mono` script is finished, you will see the message:

```
The monochrome Postscript config files have been activated.
```

Be sure to start the color RIP again before you resume printing color jobs.

### Changing the color rendering value

While the Infoprint Color 130 Plus produces vibrant full-color images, including images that contain gradients and shading, it is not able to reproduce every shade of every color. The *color rendering intent* value (**color-rendering-intent** attribute) determines what Infoprint Manager does when it encounters a shade in a PostScript image that the Infoprint Color 130 Plus cannot reproduce exactly.

There are two possible values for color rendering intent:

#### **Relative**

When Infoprint Manager encounters a color that Infoprint Color 130 Plus cannot reproduce, it substitutes the closest color value that it *can* reproduce.

#### **Perceptual**

When Infoprint Manager encounters a color that Infoprint Color 130 Plus cannot reproduce, it adjusts all of the colors in the image so that they maintain their color relationships to each other. The result is an image that is pleasing to the eye, but that may not look exactly like the original image.

The default value is **Relative**.

You can set the *color rendering intent* value on a print job, a default document, or on an actual destination using either the command line or the Infoprint Manager Administration GUI. Follow this procedure to set the attribute using the GUI.

1. Start the Infoprint Manager Administration GUI.
2. If you have not already customized the GUI to add the **Change AFP Color** task to the **Printer, Printer -> Job and Document Defaults, Job, and Logical -> Job and Document Defaults** menus, do the following:
  - a. Select **Options -> Customize**.
  - b. In the **Customize** dialog, click the **Printer** tab.
  - c. In the **Action** column, find **Change AFP Color** and **Job and Document Defaults Change AFP Color** and select the check box in the **Menu** column next to it.
  - d. Repeat on the **Job** and **Logical** tabs.
  - e. Click **OK** to apply the settings and close the dialog.
3. Select the object that you want to set the *color rendering intent* value for by clicking it once.
4. Use the menu items you added in 2 to open the appropriate **Change AFP Color** dialog:
  - For an actual destination, select **Printer -> Change AFP Color**.
  - For a default job on an actual destination, select **Printer -> Job and Document Defaults -> Change AFP Color**.
  - For a default job on a logical destination, select **Logical -> Job and Document Defaults -> Change AFP Color**.
  - for a job that has already been submitted, select **Job -> Change AFP Color**.
5. In the **Change AFP Color** dialog, find the **Color rendering intent** field, select a value from the drop-down list, and click **OK**.

**Specifying the color rendering intent value on the other-transform-options attribute:** The attribute **other-transform-options** can now have a value which includes an equals sign, so **pragma** statements are supported. For example, to submit a color print job called PS.doc to a printer called color\_printer using perceptual color rendering, you could type the following on the command line:

```
pdpr -d color_printer -x "other-transform-options = -pragma
color-rendering-intent=perceptual" PS.doc
```

This pragma can also be used on a command line invocation of a transform or it can be specified in the transform configuration file.

---

## Configuring the IBM Infoprint 2000

The IBM Infoprint 2000 printer is a multi-purpose solution designed for a multiplicity of users. Whether you require the speed and precision of an Advanced Function Presentation (AFP) printer, or the print quality of a PostScript or PCL commercial printer with finishing capabilities, the Infoprint 2000 can meet your needs. In addition, the Infoprint 2000 printer can be configured as a Xerox printer replacement that supports both Xerox LCDS and Xerox Metacode as input data streams.

Before you can use an Infoprint 2000 printer, it is important to ensure that your IBM Printing Systems Customer Engineer (CE) has both created a local account



and added a local user. If these basic configuration tasks have not been performed on the Infoprint 2000 printer, you will not be able to use it with Infoprint Manager.

In order to submit print jobs to the Infoprint 2000, you must use a new destination support system (DSS) called Infoprint 2000 (specified as **IP2000** on the command line):

```
pdcreate -c destination \
-x destination-model=Infoprint2000 \
-x device-support-system=ip2000 \
-x attachment-type=tcpip \
-x destination-realization=actual \
-x destination-tcpip-internet-address=9.99.43.3 \
-x associated-queue=servername-default-queue \
servername:printername
```

Review the following three topics before attempting to use the IBM Infoprint 2000 printer.

## Matching Media on the Printer

Before you can send jobs to the IBM Infoprint 2000 printer, you must ensure that the media supported by the printer corresponds to the media specified by Infoprint Manager. You must:

1. Make sure media objects are defined for each media you will be using on the printer.
2. Tell Infoprint Manager what media is ready at the printer.

The **Infoprint Administration GUI** window shows a highlighted Infoprint 2000 printer defined in the **Queues** pane under **Printers**. By selecting the **Printers** drop-down menu and selecting the **Properties...** option, you can open the **Printer Properties** window. Then select the **Media/Bins/Trays** tab to see the media attributes signified by **letter**.

If you are using a non-AFCCU Infoprint 2000 printer, the **medium-type**, **medium-weight**, **medium-size**, and **medium-color** values specified in the **Printer Properties** window must exactly match the values for type, size, and color that are specified on the IBM Infoprint 2000 printer: To perform this task, you must check the Infoprint 2000 Paper Catalog and ensure it is mapped to the Infoprint Manager media. If you need to add a media object that is not yet defined, see Chapter 4, “Configuring Media” on page 61.

### Telling Infoprint Manager what media is ready at the printer

To see the current values for PSF tray characteristics for each item displayed in the Media ready field, specify the following from the AIX command line:

```
pdls -cp -r psf-tray-characteristics ip2000
```

where ip2000 is the name of the actual destination used in this example.

For this example, Infoprint Manager displays the following values:

**ip2000:**

**psf-tray-characteristics =**

```
1:letter:1:1:true
2:legal:2:2:true
3:ledger:3:3:true
```

```
4:A4:4:4:true
5:A3:5:5:true
6:B6:6:6:true
```

The first three values in each line, e.g. 1:letter:1, represent the tray name, medium, and input bin number. Tray name can be anything, but each one has to be unique. For simplicity, this example uses numbers 1 through 6. The medium and bin number should match the actual setup on the printer. That is, if tabloid paper is loaded in bin 2, one line should be "2:tabloid:2:2:true".

To set or change these values, you must use the **pdset** command at the AIX command line. To set the **psf-tray-characteristics** attribute for all six bins on the printer to define which of the supported paper sizes are loaded on the Infoprint 2000 printer.

For example, if you map "letter" paper to bin "1" through the **psf-tray-characteristics** attribute, the form definition provided with the print job should call out bin "1". When you update the **psf-tray-characteristics** attribute to change a paper size on the Infoprint 2000, the Infoprint AIX server will update the printer profile to reflect the change.

To complete this task from the command line of your Infoprint AIX server, use the following procedure:

1. To change the media ready, you must first disable the printer.
2. To initially define complete set of media ready invoke the **pdset** command. The following example sets the values shown above:

```
pdset -cp -x "psf-tray-characteristics=1:letter:1:1: 2:letter:2:2:
3:legal:3:z 4:tabloid:4:4: 5:A3:5:5: 6:A4:6:6:" ip2000
```

where ip2000 is the name of the actual destination used in this example.

You can change an individual media ready. If you have these values for **psf-tray-characteristics**:

**ip2000:**

**psf-tray-characteristics =**

```
1:letter:1:1:true
2:legal:2:2:true
3:ledger:3:3:true
4:A4:4:4:true
5:A3:5:5:true
6:B6:6:6:true
```

To change the paper in bin 3 from ledger to tabloid, invoke the following **pdset** command:

```
pdset -cp -x "psf-tray-characteristics+=3:tabloid" ip2000
```

where ip2000 is the name of the actual destination used in this example.

Note that in the above command, we used "+=" instead of just "=". This means you are adding a value to the list rather than replacing the whole list.

In this case, we specified tray name "3", so the previous setting for that tray is replaced. If you specified a tray name that was not in the list, it would be added.

## Submitting Jobs to the IBM Infoprint 2000 Printer

The Infoprint 2000 DSS allows you to submit jobs in two ways: Passthru Mode or Infoprint Mode.

If you will be submitting AFP jobs to the Infoprint 2000, IBM recommends that you set the **dss-job-message-disposition** actual device attribute to `log` so that all job error messages are sent to the `/var/psf/DestinationName/jobmessage.log` file, instead of printing out at the end of the job. When you use the **jobmessage.log** file, remember to look in the file when a job fails to print.

You can modify this attribute from the AIX command line as follows:

```
pdset -cp -x "dss-job-message-disposition=log" ip2000
```

where `ip2000` is the name of your actual destination for the Infoprint 2000 printer.

### Infoprint Mode

Infoprint mode implies that the job is ripped by Infoprint Manager. In this mode, you can specify a range of different calibration screens by using the Halftone Management System, which is described in the topic “Configuring the Halftone Management System” on page 47.

### Passthru Mode

Passthru sends the job to the Infoprint 2000 through a special socket connection that passes the job to Infoprint Manager spooler without ripping the job. To submit a job as passthru, you must ensure that one of the following attributes has been specified:

```
job-ripped-by-server=false
doc-formats-ripped-at-dest=postscript
doc-formats-ripped-at-dest=pcl
```

The **jobs-ripped-by-server** attribute is a job attribute that takes precedence over the **doc-formats-ripped-at-dest** printer attribute.

When sending a job to the printer in passthru mode, you must not specify any of the following attributes:

- **account-text**
- **base-printer**
- **carriage-control-type**
- **chars**
- **convert-to-ebcdic**
- **default-character-mapping**
- **default-medium**
- **default-font-fidelity-action**
- **font-fidelity-action**
- **form-definition**
- **halftone**
- **image-fit**
- **image-length**
- **image-width**
- **input-exit**
- **new-line-option**
- **number-up**

- **other-transform-options**
- **output-bin**
- **output-format**
- **overlay**
- **page-definition**
- **page-select**
- **plex**
- **printer-pass-through**
- **resource-context**
- **resource-context-font**
- **resource-context-form-definition**
- **resource-context-page-defintion**
- **resource-context-page-segment**
- **resource-context-overlay**
- **resource-context-user**
- **shift-out-shift-in**
- **sides**
- **start-on-new-sheet**
- **subject-text**
- **table-reference-characters**
- **transform-message-file-name**
- **transform-output-file-name**
- **x-image-shift**
- **x-image-shift-back**
- **y-image-shift-back**
- **y-image-shift**

Note that the following job attribute conditions are not supported for Passthru Mode support:

1. Any use of the **job-finishing** attribute.
2. If the job is a variable data job or contains:
  - More than one printable document
  - An insert sheet
  - A file-reference document
  - A document with `document-format=modca`
  - A document with `job-rip-action=rip-and-hold` or `job-rip-action=rip-only`
  - A **copy-count** attribute set higher than 1

## Limitations that Apply to the IBM Infoprint 2000 Printer

Because the Infoprint 2000 printer allows you to print AFP files on IPDS printers, there are some limitations to the printer and job commands that you can use. The Infoprint 2000 DSS does not support the following:

1. Duplex printing of tab paper.
 

While the Infoprint Manager GUIs allow you to request this support, printing duplex with tabbed paper causes output to be printed on the wrong side of the page and can cause a printer jam.

2. Forward space the job printing.
  3. Back space the job printing.
  4. Pausing a currently printing job.
  5. Resuming a job that had been paused while printing.
  6. Synchronous shut down of a printer.
- This option is supported for jobs paused while ripping.

---

## Configuring the IBM Infoprint 4000

Perform the following procedure with the help of your IBM service engineer (SE) to ensure that the actual destination, the Infoprint 4000 printer device, and the cutter-trimmer-stacker (CTS) (a post-processing device used for paper handling) all support the same media types.

1. Use the procedure in “Associating a Medium with a Physical Printer” on page 64 to specify the media that the actual destination representing the Infoprint 4000 supports.
2. On the printer, define forms that correspond to the media you specified in step 1, for example:

| <i>Medium Object Name</i> | <i>Printer_Form Name</i> | <i>Printing_Form Description</i> |
|---------------------------|--------------------------|----------------------------------|
| <b>letter</b>             | <b>na letter</b>         | 2-Up letter (8.5 by 11)          |
| <b>legal</b>              | <b>na legal</b>          | 2-Up legal (8.5 by 14)           |
| <b>ledger</b>             | <b>ledger</b>            | 1-Up (11 by 17)                  |

3. Set up the CTS for the dimensions required by the supported media. For example, to support ledger-size paper, set up the CTS for an 11-inch cut width and a 14-inch cut length. Note that the CTS may support a limited set of cut lengths and only one center slitting option.

---

## Configuring the Halftone Management System

### Halftone Management System Overview

To support printer calibration on devices such as the IBM Infoprint 20 and the IBM Infoprint 4000, use the Halftone Management System. The Halftone Management System gives you the ability to calibrate halftones for each screen frequency on all your Intelligent Printer Data Stream (IPDS) printers. The result is consistent grayscale for each appearance selection.

With the Halftone Management System, you can run multiple IBM Infoprint 4000 printers and calibrate each system. For two-engine duplex print systems, the Halftone Management System also allows you to calibrate each print engine separately, so that whatever document you print, the various levels of gray (grayscale) used to print the document will look the same on both engines. Note that this applies to input file types of TIFF, GIF, or JPEG; for both PostScript and Portable Document Format (PDF) files, a single calibration applies to both engines.

From the smallest network printer to the largest production printer, you can either use the halftone provided with Infoprint Manager or create your own. You can calibrate for different paper types to account for differences between supplies. Infoprint Manager will save and manage these calibrations, allowing you to select them on a job-by-job basis.

The Halftone Management System consists of two parts:

1. A daemon process (**runcalibd**) that runs on all Infoprint AIX servers.
2. A client process (**runcalib**) that can be run from any Infoprint AIX server.

You can calibrate printers on any Infoprint AIX server by using the client from another Infoprint AIX server. For example, if you have installed Infoprint servers A, B and C, you can calibrate printers on A using the client on either A, B or C. The daemon must be running on server A.

You invoke the Halftone Management System through the **Printer Calibration** icon (the page embossed with a lower-case "i" that is the fourth icon from the right) on the toolbar of the Infoprint Manager desktop (note that the **Printer Calibration** icon is available through the Infoprint Basic Configuration only; to use the Halftone Management System in an Infoprint Advanced configuration, you must use the command described in "Starting the Halftone Management System"):



Figure 16. Printer Calibration icon

This topic describes the following two procedures that you should ensure have been completed before attempting to use the Halftone Management System:

1. "Starting the Halftone Management System"
2. "Calibrating a Densitometer" on page 49

### Starting the Halftone Management System

If you find the Halftone Management System icon in the tool bar on your Infoprint Manager desktop and it starts, you do not need to perform this procedure and should go to "Calibrating a Densitometer" on page 49. If you do not see the Halftone Management System icon on your Infoprint Manager desktop or it does not start, you can use the following procedure to start the Halftone Management System:

1. From your Infoprint AIX server's command line, ensure that your Infoprint AIX server is running by specifying:  
`ps -ef | grep server` where *server* is the name of your Infoprint AIX server. You should see a response that shows the server running. Note that the following response example has been split across two lines for clarity:

| ID   | Process # |     |     | Time                   |
|------|-----------|-----|-----|------------------------|
| root | 26078     | "1" | "0" | "Mar 20 -<br>11:24:36" |

#### Process and Server Name

```
ksh /usr/lpp/pd/ipcal/bin/runcalibd
```

**Note:** The server must be running before you start the Halftone Management System client.

2. If the Calibration daemon (**runcalibd**) is not running, start it by specifying:

```
/usr/lpp/pd/ipcal/bin/runcalibd&
```

3. From the toolbar that displays at the bottom of the Basic Infoprint Administrator's GUI (displayed below), double-click on the **Printer Calibration** icon (fourth icon from the right).



Figure 17. Printer Calibration icon

This icon starts the Halftone Management System client.

If your system uses the Infoprint Advanced Configuration, you must do the following from the command line:

- a. Select a directory to start it from and always start from that directory. This is because a file will be created in that directory that contains information about the servers defined: `cd /calibration-client`

**Note:** If you start from a different directory you have to redefine the servers to which you want to connect. Multiple Halftone Management System clients can be started on the same AIX server, but they must be started from different directories. Because the clients would try to share the **calibgui.db** file, you cannot start two clients from the same directory.

- b. Invoke the client: `/usr/lpp/pd/ipcal/bin/runcalibd&`

From the client screen, a pop-up **Halftone Management System** window announces Starting the Halftone Management System Client.

To open this window, the client has created a **calibgui.db** file in the directory from which you entered the command.

If you either press the **Printer Calibration** icon or invoke the client from the command line before starting the Halftone Management System daemon, but after defining your Infoprint AIX server, Infoprint Manager provides an Error pop-up dialog with the following message:

```
Error in connecting to host fully_qualified_server_name -- A remote host refused an attempted
```

To resolve this problem, you must close the Halftone Management System client window and restart the daemon. Once you have completed these steps, go to “Defining Infoprint Servers to the Halftone Management System Client” on page 51.

### Calibrating a Densitometer

The reflection densitometer must be calibrated to provide accurate density readings. Prior to using, you must follow the instructions that are provided by the manufacturer to calibrate the densitometer. The densitometer used must comply to the spectral responses defined by ANSI PH2.18 - 1985 and ISO 5/3 - 1984. The densitometer should not have a polarizing filter. The Greytag Macbeth model D19C has a polarizing filter and should not be used. Densitometers which are appropriate to use include the X-Rite Model 504, 508, or 400B.

The densitometer should be used in Absolute Density mode for measurements. The following procedure describes how to calibrate the X-RITE 400B (1060) densitometer, using the Reflection Reference Card (part number 400-62). Since the X-RITE 400B is now obsolete, the following information is provided as reference.

The Reflection Reference is the card that is used to calibrate the densitometer. You will use only the circular patches labeled 1 (white reference) and 3 (black reference). The densitometer should be calibrated periodically, or whenever the instrument displays RECAL. You should store the Reflection Reference Card in its envelope.

1. Press the **FUNCTION** and **ENTER** keys in sequence, then release.  
After the version and copyright notices appear, the display will show N cal O Y.
2. Press the **ZERO** key and release.  
After the version and copyright notices appear, the display will show N qcal Y.
3. Press the **FUNCTION** key and release.  
SET L0 is displayed momentarily, followed by X.XX, where X.XX should be the white patch ORTHO value from the Reflection Reference card.
4. If X.XX matches the white patch ORTHO value for your reflection reference, press the **ENTER** key. If X.XX does not match, hold down the **ZERO** key and press either the **FUNCTION** or the **ENTER** key. Decrease (**FUNCTION**) or increase (**ENTER**) the value until the correct number is displayed. When finished, release the keys and press **Enter**.  
SET HI is displayed momentarily, followed by Y.YYH, where the Y.YY part of the value should be the black patch ORTHO value from the Reflection Reference card.
5. If Y.YY matches the black patch ORTHO value for your reflection reference, press the **ENTER** key. If Y.YY does not match, hold down the **ZERO** key and press either the **FUNCTION** or the **ENTER** key. Decrease (**FUNCTION**) or increase (**ENTER**) the value until the correct number is displayed. When finished, release the keys and press **Enter**.
6. When you see READ WHT displayed, center the circle on the base of the densitometer over the white patch (the one labeled "1") on the Reflection Reference. Push the head down and then release it to establish the white patch Optical Density.  
If INVALID displays, repeat the measurement.
7. When you see READ BLK displayed, center the circle on the base of the densitometer over the white patch (the one labeled "3") on the Reflection Reference. Push the head down and then release it to establish the black patch Optical Density.  
If INVALID displays, repeat the measurement.

Verify the calibration by measuring the black, gray, and white patches. If they agree within 0.02 OD to the reflection reference values on the card, density is accurately calibrated. If not, repeat this process until the measurements are accurate.

To find out how you can calibrate and set output appearances, see "Calibrating a Printer Using the Halftone Management System" on page 51.



## Calibrating a Printer Using the Halftone Management System

The Halftone Management System allows you to calibrate each of your printers to achieve a consistent tone curve for a set of generic halftone screens. The system also allows you to define additional calibrations for specific paper types. When calibrated the dot gain for a fifty percent dot will be nominally zero percent for **Standard** appearance, fourteen percent for **Highlight Midtown** appearance, and thirty-four percent for **Dark** appearance.

To use this tool to calibrate your printers, perform the following procedures in sequence:

1. Defining Infoprint Servers to the Halftone Management System Client
2. Defining Custom Patch Sets
3. Calibrating a Halftone
4. Measuring Optical Density with a Densitometer

### Defining Infoprint Servers to the Halftone Management System Client

The first time you start the Halftone Management System client, you will see an empty window. You must connect to the Infoprint AIX server to see a list of the printers that are available for calibration:

1. From the **Halftone Management System** (or **Main**) window, select the **Edit → Servers** option.
2. From the **Servers** window, select the **File → Add Server** option.
3. In the **Server Properties** window, fill in the **Server Name** field with the symbolic server name, and the **Hostname** field with either the explicit name of the server or the server's dotted decimal notation IP address.

For example, the **Server Name** field value could be `sage.penn.boulder.ibm.com`, while the **Hostname** field value could be either `sage` or `9.99.43.73`.

4. Return to the **Main** window and either use left mouse button to double-click on each printer or highlight the printer and press enter to display its output screens (as displayed below). The Main window displays all printers defined to the Infoprint server to which you are connected, but only the IPDS printers contain screens that can be calibrated.

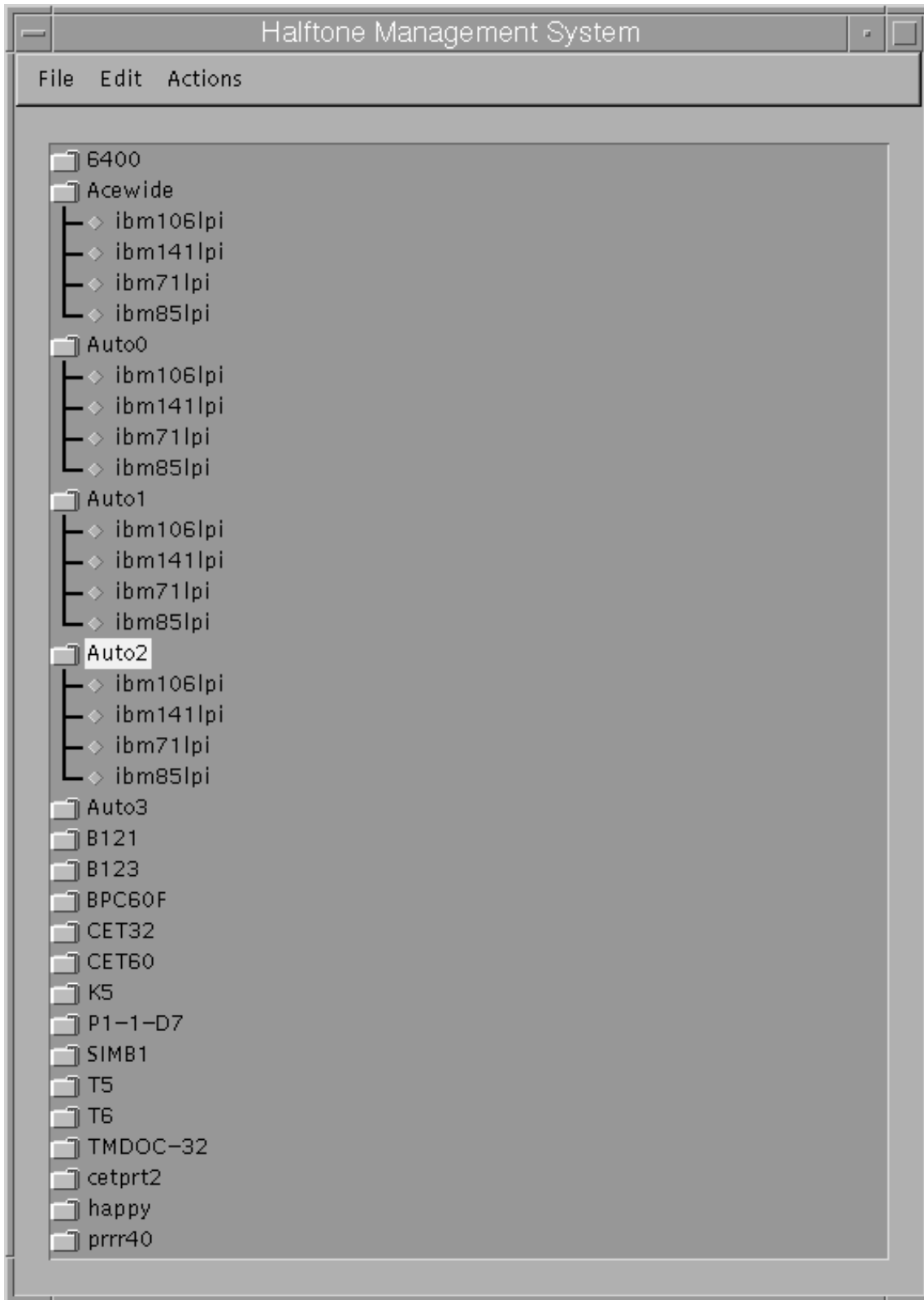


Figure 18. Main window

### Defining Custom Patch Sets

A patch set is a step wedge file that has patches with different shades of gray. One patch set has been defined (patches11 ). It has eleven uniformly-stepped grays.

To define additional patch sets, use the following procedure:

1. From the **Halftone Management System** window, select the **Edit → Patch Sets** option.
2. From the **Patch Sets** window, click on a patch set (such as patches11) and select the **Edit → Properties** option.
3. From the **Patch Set *name*** window (where *name* indicates the patch set highlighted in the previous step), use the left mouse button to select the patches that you would like to modify.

The screen shows 99 squares representing from 1-to-99 percent dot at one percent increments. Squares which are dark will be printed. To change a patch selection, point to the patch desired and click the left mouse button. Each click selects or deselects a patch. 0 percent and 100 percent dot patches are always included in each patch set. The example displayed below will print 0, 10, 20, 30, 40, 50, 60, 70, 80, 90, and 100 percent dot patches.

4. Once you have defined the patch set, select the **File → Save as** option and save your patch set with a unique name.

Note that the shipped patch set patches11 cannot be modified. However, a user-created patch set can be modified through the **Save** option. In the example below, the **Save** option is grayed-out because no changes have been made to the file.

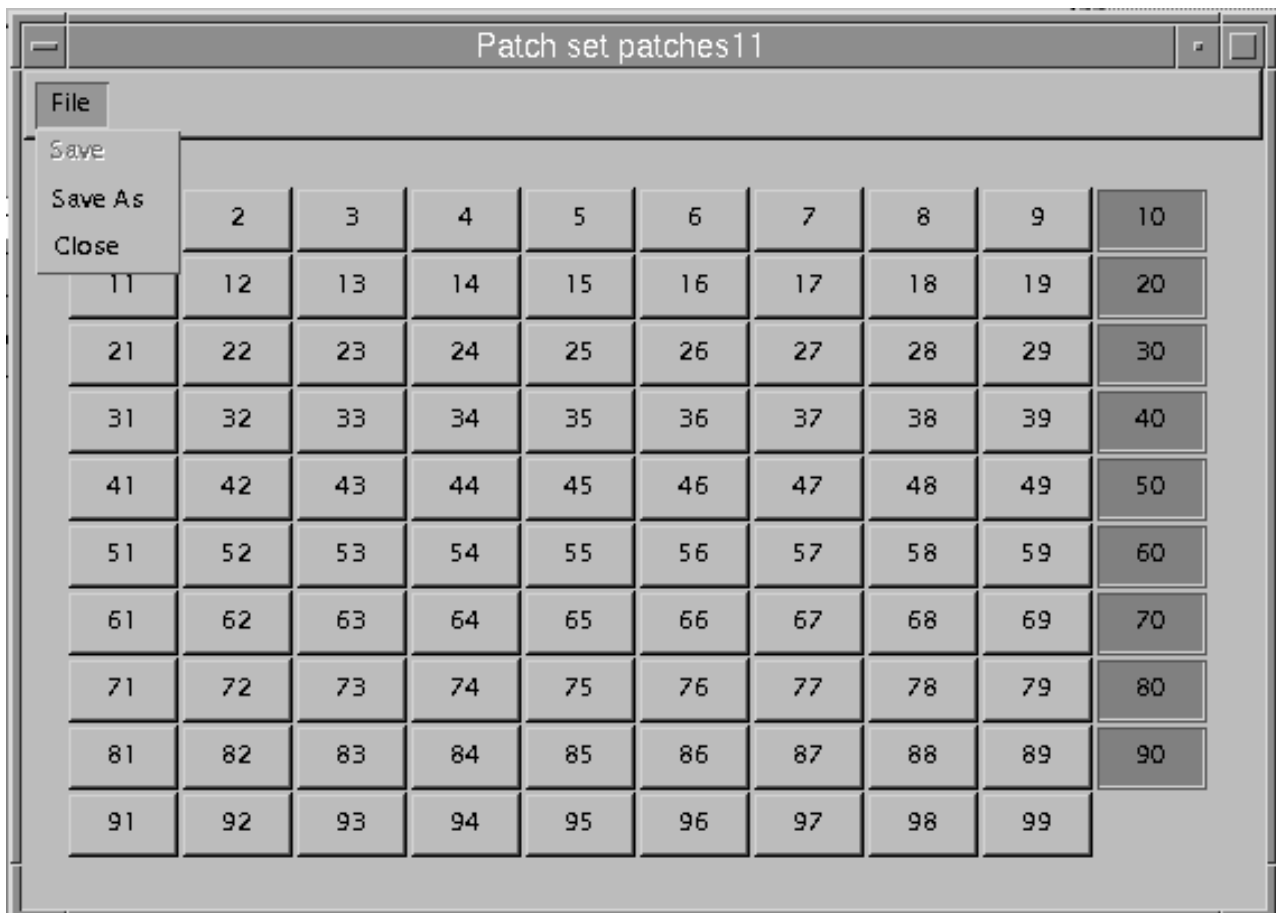


Figure 19. Patch set name window

## Calibrating a Halftone

Once you have either selected an existing patch set or created your own customized patch set, you must print it out, use a densitometer to measure the density of each gray patch. Then you must enter the calibration values in the Halftone Calibration Management System to create a calibration curve for the printer.

**Note:** Ensure that you use the Halftone Management System to both add and delete patch files and Calibration files.

Use the following procedure to accomplish these tasks:

1. If desired, define a custom patch set to print from the Halftone Management System window from the menu bar by selecting **EDIT** → **PATCH SETS**, then selecting the patch from the list and **ACTIONS** → **SELECT AS CURRENT**, **FILE** → **CLOSE**.
2. From the **Halftone Management System** window, select a printer and a halftone screen supported by that printer.
3. From the **Halftone Management System** window, select the **Actions** → **Print Patches** option.
4. If the actual destination you chose has a **logical-destination-assigned** attribute, the patch set will be sent to that logical printer. Otherwise, you will be prompted for a logical printer.
5. From the pop-up window, select **OK**.
6. Once you retrieve your output from the printer, use the densitometer to measure the patches. Because the Halftone Management System is designed to take multiple measurements of each patch and use the average, you could take three measurements of each patch.
7. Select the same actual destination (printer) and screen that you selected before you printed the patch set (in 2).  
Note that the printed patch set identifies the screen, patch set, and printer, along with a date/time stamp.
8. From the **Halftone Management System** window, select the **Actions** → **Calibrate** option.
9. From the **Enter calibration values** window (shown below), set **The number of entries to average** field (it defaults to 3) to the number of measurements you took for each patch.
10. If this is a custom calibration and you want it to replace the default calibration provided by Infoprint Manager, allow it to retain the default value in the **Calibration name** field. If you want to retain the original default, but have this custom calibration as a second option, type a name for the calibration in the **Calibration name** field.
11. To enter your densitometer readings, begin with the **0%** field. Enter your first 0% value and press **Enter**. The statistics of your values will be displayed under the columns **Average**, **Min**, and **Max**.

Enter calibration values

Printer: sage60  
 Screen: generic106lpi  
 Patch set : patches11  
 The number of entries to average:   
 Calibration name:

| % gray | Entry                | Average | Min | Max | # entries                            |
|--------|----------------------|---------|-----|-----|--------------------------------------|
| 0%     | <input type="text"/> |         |     | 0   | <input type="button" value="Clear"/> |
| 10%    | <input type="text"/> |         |     | 0   | <input type="button" value="Clear"/> |
| 20%    | <input type="text"/> |         |     | 0   | <input type="button" value="Clear"/> |
| 30%    | <input type="text"/> |         |     | 0   | <input type="button" value="Clear"/> |
| 40%    | <input type="text"/> |         |     | 0   | <input type="button" value="Clear"/> |
| 50%    | <input type="text"/> |         |     | 0   | <input type="button" value="Clear"/> |
| 60%    | <input type="text"/> |         |     | 0   | <input type="button" value="Clear"/> |
| 70%    | <input type="text"/> |         |     | 0   | <input type="button" value="Clear"/> |
| 80%    | <input type="text"/> |         |     | 0   | <input type="button" value="Clear"/> |
| 90%    | <input type="text"/> |         |     | 0   | <input type="button" value="Clear"/> |
| 100%   | <input type="text"/> |         |     | 0   | <input type="button" value="Clear"/> |

Figure 20. Enter calibration values window

If you specified more than 1 in the number of entries to average field, the cursor will remain in the field for your next reading. Otherwise, it will move

on to the next patch field. Continue until all your readings have been entered. The display below shows a sample customized Calibration named first\_run.

Printer: ip2000  
 Screen: ibm85lpi  
 Patch set : patches11  
 The number of readings per patch: 3  
 Calibration name: first\_run

| % gray | Entry | Average | Min  | Max  | # entries |       |
|--------|-------|---------|------|------|-----------|-------|
| 0%     |       | 0.0700  | 0.07 | 0.07 | 3         | Clear |
| 10%    |       | 0.1967  | 0.19 | 0.2  | 3         | Clear |
| 20%    |       | 0.3100  | 0.31 | 0.31 | 3         | Clear |
| 30%    |       | 0.4233  | 0.42 | 0.43 | 3         | Clear |
| 40%    |       | 0.5367  | 0.53 | 0.54 | 3         | Clear |
| 50%    |       | 0.6867  | 0.67 | 0.7  | 3         | Clear |
| 60%    |       | 0.8000  | 0.79 | 0.81 | 3         | Clear |
| 70%    |       | 0.9600  | 0.95 | 0.97 | 3         | Clear |
| 80%    |       | 1.0800  | 1.06 | 1.09 | 3         | Clear |
| 90%    |       | 1.3067  | 1.3  | 1.31 | 3         | Clear |
| 100%   |       | 1.4400  | 1.43 | 1.45 | 3         | Clear |

Do Cancel

Figure 21. First\_run calibration

- Once you have filled in your calibration values, press the **Do** button. Your calibration is saved in the `/usr/local/Infoprint/config` directory and ready for use.

### Measuring Optical Density with a Densitometer

The following procedure describes how you can measure optical density using the XRITE 400B Densitometer. While you can use other densitometers, this procedure has been verified with this particular make and model. Ensure that the density readings are absolute, not paper reference.

- Press the **FUNCTION** key until DEN appears. If DEN-R appears, press the **ZERO** key and try again.
- Center the circle on the base of the densitometer over the area to be measured.
- Push the head down and release it to measure the Optical Density (OD).

The density reading will appear as X.XXD.

- Record the X.XX value as it is displayed.

Several measurements should be taken at different representative locations on each gray patch and averaged to obtain an accurate OD value. Alternately, you can enter individual measurements into the calibration value screen and have the averaging performed automatically.

## Specifying a Halftone for Printing on the Infoprint AIX Server

You can use a particular halftone for printing a grayscale file through either Infoprint Submit interface or the AIX command line.

**Note:** The Halftone Management System does not need to be running when you print the job.

### Printing from Infoprint Submit

You can print using a particular halftone for printing a grayscale file from a job ticket (`name.jtk` file) in Infoprint Submit. Through this interface, you can specify a specific screen and output appearance. Begin by selecting a value in the **Screen Name** field of the **Look** tab. Note that all screen frequencies shipped with the product have the term 'ibm' prepended to their identifier. If you are accessing this interface for the first time, all your previous default calibrations will have 'ibm' attached to the name.

Infoprint Manager allows you to determine output appearance on a job-by-job basis by setting a default screen and output appearance in a default document or job object.

### Printing from the AIX Command Line

You can submit a halftone calibration from the AIX command line by using some variation of the following **pdpr** Command.

Note that this command is spread across three lines to illustrate each component more clearly:

| Command | Printer       |
|---------|---------------|
| pdpr    | -p sip20-sage |

| Customized Calibration file                        |
|----------------------------------------------------|
| -x halftone=generic106lpi:highlight-midtones.mycal |

|                           |
|---------------------------|
| <b>File to Be Printed</b> |
| grayscale.ps              |

**Note:** When submitting a **pdpr** command from the AIX command line, you specify the **halftone** attribute, rather than setting both frequency and output appearance as you do when using the Infoprint Submit interface. The actual halftone name for this example (generic1061pi:highlight-midtones.mycal) can be found either by using the **Infoprint Manager Administration GUI** to look up the halftone for the actual destination, or enter the following at the command line: `pdls -cp -r halftones-supported ActualDestination name`.



## Part 2. Expanding Your Infoprint System

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## Chapter 4. Configuring Media

This section describes how to create, configure, and manage media. Because the basic Infoprint VSM administrator's GUI displays medium icons and the advanced Infoprint VSM administrator's GUI does not, some of these tasks cannot be done in the advanced Infoprint VSM administrator's GUI. If you have the advanced Infoprint VSM administrator's GUI, you must use the AIX command line instead. Other tasks can be done in the advanced Infoprint VSM administrator's GUI using a different method from the basic Infoprint VSM administrator's GUI.

This chapter consists of the following topics:

- “Determining the Media That Are in the Servers”
- “Creating a Medium Object” on page 62
- “Viewing or Changing Attributes of a Medium” on page 63
- “Associating a Medium with a Physical Printer” on page 64

---

### Determining the Media That Are in the Servers

You can use the basic Infoprint VSM administrator's GUI to show the media in the servers monitored by the Infoprint Administration window. Because the advanced Infoprint VSM administrator's GUI does not display medium icons, if you have the advanced Infoprint VSM administrator's GUI, you must use the AIX command line.

**Note:** You can also perform this task using the Infoprint Manager Administration GUI. See the *Printer tasks* topic in the online help provided with the GUI for detailed instructions.

### Using the Basic Infoprint VSM Administrator's GUI

Open the Infoprint Administration window to see the media in the servers. They are in the Media folder in the Other Objects pane. Double-click on the Media folder to open a well that contains all of the available media.

### Using the AIX Command Line

To display all the media in specified servers, use the **pdls** command. For example, to display the media in **Server1**, enter:

```
pdls -c medium -r medium-identifier,associated-server,medium-type Server1:
```

Infoprint returns information similar to the following:

```
A4: medium-identifier=A4
A4: associated-server=Server1
A4: medium-type=

letter: medium-identifier=letter
letter: associated-server=Server1
letter: medium-type=

legal: medium-identifier=letter
legal: associated-server=Server1
legal: medium-type=
```

```
A4-colored: medium-identifier=A4-colored
A4-colored: associated-server=Server1
A4-colored: medium-type=stationery
```

For more information, refer to *Infoprint Manager: Reference* or the **pdls** man page.

---

## Creating a Medium Object

You can use the basic Infoprint VSM administrator's GUI to create a medium object. Because the advanced Infoprint VSM administrator's GUI does not display medium icons, if you have the advanced Infoprint VSM administrator's GUI, you must use the AIX command line.

### Using the Basic Infoprint VSM Administrator's GUI

Drag and drop a medium template onto the **Media Folder** icon. A dialog window displays requesting you to select the server where you want to create the medium; then another dialog window requesting you to enter the identifier and dimensions for the medium. Be sure to enter the dimensions accurately so that printed output will be aligned correctly on both sides of the medium. The new medium displays in the Media well.

**Note:** To specify whether medium dimensions are displayed in inches or millimeters, click the Preferences button to open the User Preferences dialog.

### Using the AIX Command Line

To create a medium, use the **pdcreate** command and the medium attributes. Specify:

- The name of the server where you want to create the medium
- The medium identifier
- The size of the medium, using one of these attributes:
  - **medium-dimensions** specifies the width and length of the medium in millimeters. Be sure to enter the dimensions accurately so that printed output will be aligned correctly on both sides of the medium. You must use this attribute if AIX physical printers are to use the medium.
  - **medium-size** specifies a predefined size by name.

For example, to create a letter-size (8.5 by 11 inches) medium called na-letter-colored in Server1, enter the following command:

```
pdcreate -c medium -x "medium-size=letter" Server1:na-letter-colored
```

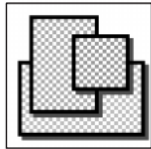
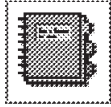
For more information, refer to *Infoprint Manager: Reference* or the **pdcreate** and **pd\_att\_medium** man pages.

---

## Viewing or Changing Attributes of a Medium

You can use the basic Infoprint VSM administrator's GUI to view or change attributes of a medium. Because the advanced Infoprint VSM administrator's GUI does not display medium icons, if you have the advanced Infoprint VSM administrator's GUI, you must use the AIX command line.

### Using the Basic Infoprint VSM Administrator's GUI



Drag and drop the **Notebook** action onto the medium object to view or change the values of the medium attributes.

### Using the AIX Command Line

To view the attributes of a medium, use the **pdls** command. For example, to view all the attributes of `na-letter-colored` in `Server1`, enter the following command:

```
pdls -c medium -r all Server1:na-letter-colored
```

To change the attributes of a medium, use the **pdset** command. For example, to change the description of `na-letter-colored` in `Server1`, enter the following command:

```
pdset -c medium -x "descriptor='Any color but white'"
Server1:na-letter-colored
```

For more information, refer to *Infoprint Manager: Reference* or the **pdls**, **pdset**, and **pd\_att\_medium** man pages.

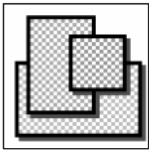
---

## Associating a Medium with a Physical Printer

You can use either the basic or the advanced Infoprint VSM administrator's GUI to associate a medium with a physical printer. Because the advanced Infoprint VSM administrator's GUI does not display medium icons, the method is different from the basic Infoprint VSM administrator's GUI.

**Note:** You can also perform this task using the Infoprint Manager Administration GUI. See the *Printer tasks* topic in the online help provided with the GUI for detailed instructions.

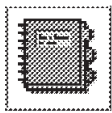
### Using the Basic Infoprint VSM Administrator's GUI



Drag and drop a **Medium** icon onto a physical printer icon to add it to the list of media that the physical printer supports.



### Using the Advanced Infoprint VSM Administrator's GUI



Depending on the input trays and paper feed mechanisms, a printer device may be capable of having a wide variety of paper sources loaded. You can use the attributes notebook for a physical printer to define the different paper types that operators can load in the printer.

To specify the media supported by the physical printer:

1. Open the attributes notebook for the physical printer.
2. Select the **Summary** attribute group button. A list displays.
3. Select **Forms**.
4. Use one or more of the buttons next to the **Media supported** list box to set up the media supported by the physical printer. You can use the **Help** button or the ? button to view information on using the buttons.
5. Select the **OK** button. Infoprint updates the physical printer attribute to the values you specified.



---

## Chapter 5. User-Exit Programs (PSF, Fax, and Email DSS Only)

This section describes the sample user-exit programs supplied with Infoprint and how you can create your own user-exit programs. While Chapter 6, “Creating and Managing Auxiliary Sheets and User Exit Programs” on page 89 contains information and procedures for creating and configuring auxiliary sheets and their associated user exits. The next section, Chapter 7, “Gathering Accounting and Auditing Data about Print Jobs” on page 99, describes how you can gather accounting information about print jobs from the Infoprint Manager AIX server and from the PSF auditing and accounting user-exit programs.

This chapter consists of the following topics:

- “What Type of User Exits Does Infoprint Support?”
- “Creating and Using Your Own User-Exit Programs” on page 67
- “Compiling and Installing the User-Exit Program” on page 67
- “Header Page and Trailer Page User-Exit Program Inputs and Outputs” on page 69
- “Separator Page User-Exit Program Inputs and Outputs” on page 72
- “Accounting and Audit User-Exit Program Inputs and Outputs” on page 74
- “Input Data User-Exit Program Inputs and Outputs” on page 77
- “Output Data User-Exit Program Inputs and Outputs” on page 78
- “User-Exit Program Structures” on page 80
- “User-Exits Programs for Line-Data Transform” on page 80
- “Attributes of the Line-Data Input File” on page 87

---

### What Type of User Exits Does Infoprint Support?

Infoprint supports dynamically loaded user-exit programs. These programs are loaded with the Infoprint executable program during initialization and are called at various points during job processing.

Infoprint allows seven different types of user exits, and they are called in the following order by Infoprint:

- Header (Start) page user exit
- Separator page user exit
- Accounting user exit
- Audit user exit
- Input data user exit
- Output data user exit
- Trailer (End) page user exit

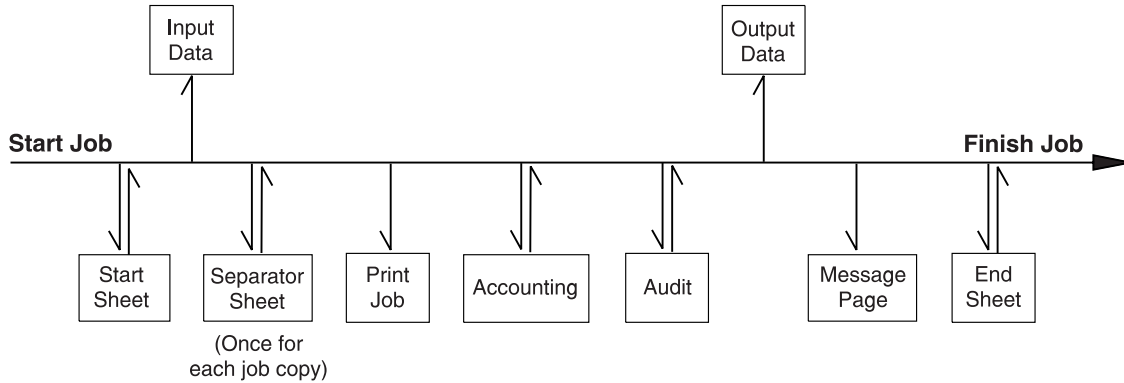


Figure 22. User Exits for Infoprint

## What Sample User-Exit Programs are Available?

Infoprint supplies sample user-exit programs for the header, separator, and trailer pages, and for accounting and auditing data. The sample header, separator, and trailer page user-exit programs generate Advanced Function Presentation (AFP) data stream pages. The sample accounting and auditing user-exit programs generate ASCII data in a report file format. Infoprint also supplies sample user-exit programs for input data and output data; however, these user-exit programs do not perform any function. You can use all of these sample programs as they are or you can modify them.

If you choose to modify the existing user-exit programs, the source code for each one is located in the `/usr/lpp/psf/exits` directory. Infoprint supplies the following sample programs:

### Program

#### File Name

#### Header Page

`ainuxhdr.c`  
`ainuxhdr2.c`  
`ainuxhdrp.c`  
`ainuxhdrx.c`  
`pduxblkh.c`

#### Separator Page

`ainuxsep.c`  
`ainuxsep2.c`  
`ainuxsepp.c`  
`ainuxsepx.c`  
`pduxblks.c`

#### Trailer Page

`ainuxtlr.c`  
`ainuxtlr2.c`  
`ainuxtlrp.c`  
`ainuxtlrx.c`  
`pduxblkt.c`

#### Accounting

`ainuxacc.c`  
`ainuxacc2.c`  
`ainuxaccp.c`



**Auditing**  
    **ainuxaud.c**  
    **ainuxaud2.c**  
    **ainuxaudp.c**  
**Accounting Log**  
    **ainacclog.c**  
**Auditing Log**  
    **ainaudlog.c**  
**Input Data**  
    **ainuxind.c**  
**Output Data**  
    **ainuxout.c**

See “User-Exits Programs for Line-Data Transform” on page 80 for sample user-exit programs used with the line-data transform.

---

## Creating and Using Your Own User-Exit Programs

You can create your own user-exit program at any time; however, you must perform additional tasks to activate your program. You must have the XL C Compiler and the **bos.adt** components of the Base Application Development Toolkit of the AIX operating system installed.

### Creating Your Own User-Exit Programs

You can create your own user-exit program in one of the following ways:

- Copy one of the sample user-exit programs, rename it, and modify it using an AIX editor.
- Write your own user-exit program. You can include the variable data shown in the following sections, for example, `USERID`; but Infoprint cannot process variable data that is not shown in this chapter.

---

## Compiling and Installing the User-Exit Program

When you finish creating your own user-exit program, you must compile the program code and then install it in the correct directory. You do this by using the AIX **make** command.

When the **make** command executes, it reads the **Makefile** file, supplied with Infoprint, that is located in the same directory as the sample programs. The **Makefile** file contains information about the specified target files and the commands necessary to update the target files.

Before you put your user-exit program into general use at your site, you should test it first to ensure that it runs correctly. Because your user-exit program becomes part of the Infoprint executable code, a defective user-exit program could cause problems with Infoprint.

### Compile and Install Your User-Exit Program

To compile and install your user-exit program, follow these steps:

**Note:** You must have **root** authority to use the **make** command in this directory.

1. If you already have an existing executable user-exit program in the **/usr/lpp/psf/bin** directory for the user-exit program you are adding, perform the following steps first; otherwise, go to step 2.

- a. Disable all the logical destinations associated with the queues that are to receive jobs that will use the new user-exit program.
  - b. Delete the executable user-exit program from the **/usr/lpp/psf/bin** directory.
2. To make the directory in which the user-programs are stored the current directory, enter:
 

```
cd /usr/lpp/psf/exits
```
  3. On the AIX command line, enter:
 

```
make
```

The **make** command reads the **Makefile** file supplied with Infoprint, compiles and generates the user-exit program.

4. On the AIX command line, enter:
 

```
make install
```

The **make install** command copies the executable user-exit program from the **/usr/lpp/psf/exits** directory into the **/usr/lpp/psf/bin** directory so that the code executes with Infoprint.

5. Enable all of the logical destinations that you disabled.

#### Notes:

1. If you do not want to copy the executable user-exit program into the **/usr/lpp/psf/bin** directory, you can copy them into another directory. However, if you do this, you need to add the path to the **PATH** statement in the **/etc/environment** file so that Infoprint can locate the module.
2. You can only specify one user-exit program for each function name provided by Infoprint per queue.
3. Ensure the function name of the user exit is one of the following where the name is in uppercase letters, because that is the entry point in the module:
  - ACCOUNTING
  - AUDIT
  - HEADER
  - SEPARATOR
  - TRAILER
  - INDATA
  - OUTDATA
4. If you do not want to use the same name for the user-exit program, you must edit the **Makefile** file and change the name of the user-exit program supplied with Infoprint to the new name. For example, if you want to call your new header user-exit program **header**, you must edit the **Makefile** file and change the name of the existing header user-exit program, **ainuxhdr** to **header**. In addition, you must change the source code file name from **ainuxhdr.c** to **header.c**. You may also add new exit targets in the **Makefile** file.
5. You must mark the function as an exported symbol during the link-editing step. Refer to the Infoprint supplied **/usr/lpp/psf/exits/Makefile** for more information.

## Activating the User-Exit Program

Before you can use the new user-exit program, you must activate the program. See Chapter 6, “Creating and Managing Auxiliary Sheets and User Exit Programs” on page 89 for the procedures to activate the various user-exit programs.

---

## Header Page and Trailer Page User-Exit Program Inputs and Outputs

Because the Infoprint start page and trailer page user-exit programs require the same inputs and produce the same outputs, the program descriptions are similar.

The source code (in the C programming language) for the sample header page user-exit programs and trailer page user-exit programs listed on page 66 are located in the `/usr/lpp/psf/exits` directory. These sample programs generate an AFP data stream page.

The data structures for the header and trailer page user-exit programs are included with the source code in the `/usr/lpp/psf/exits/ainuexit.h` file. The code for these structures is shown in “User-Exit Program Structures” on page 80.

The declaration of these exits is:

```
void HEADER (HEADER_EXITDATA *exitdata)
void TRAILER (TRAILER_EXITDATA *exitdata)
```

The `HEADER_EXITDATA` and the `TRAILER_EXITDATA` input/output parameters contain all the input and output data needed to communicate between Infoprint and the user-exit programs.

The `HEADER_EXITDATA` and the `TRAILER_EXITDATA` structures include these fields.

The following fields provide input information:

### **UserID**

Identifies the AIX user ID of the person who submitted the job. If you log in as yourself and then switch to `root`, the AIX user ID is `root`.

### **NodeID**

Identifies the name of the AIX system (host). The backend program sets the NodeID.

### **Jobname**

Identifies the name of the job. This is the same as the file name in the job.

Job submitters can also specify the job name with the Infoprint job attribute `job-name=name` when they submit a job.

If the job name is not specified for files defined as OTF, PCL, PostScript, ditroff, line data, unformatted ASCII, double-byte character set (DBCS) ASCII, EUC, PDF, JPEG, GIF, or TIFF files when the job is submitted, Infoprint creates a temporary file for the transform output. Infoprint uses the temporary file name for the job name.

### **SpoolID**

Identifies the job ID, which is an integer. Infoprint sets the SpoolID.

### **Printer Name**

Identifies the name of the Infoprint destination.

**hab** This function is not used in AIX.

**Date** Identifies the date printed.

**Time** Identifies the time printed.

### **Distribution**

Identifies the distribution information provided when the job is submitted.

## Other Input Values

The following fields are used by some of the sample programs to provide additional input information. This information can be specified from:

- Migrated jobs
- MVS Download jobs
- Fields set in the Infoprint VSM administrator's GUI default-document notebook **PSF Information** tab
- Fields in the Infoprint SMIT administrator's interface Submit an InfoPrint Job panel

### **Account**

Identifies the account information provided when the job is submitted.

The **Account** field value can be any null-terminated (X'00') character string. You should limit the string to 20 or less characters.

### **Address1**

Identifies the first line of address information provided when the job is submitted.

The **Address1** field value can be any null-terminated (X'00') character string. You should limit the string to 57 or less characters.

### **Address2**

Identifies the second line of address information provided when the job is submitted.

The **Address2** field value can be any null-terminated (X'00') character string. You should limit the string to 57 or less characters.

### **Address3**

Identifies the third line of address information provided when the job is submitted.

The **Address3** field value can be any null-terminated (X'00') character string. You should limit the string to 57 or less characters.

### **Address4**

Identifies the fourth line of address information provided when the job is submitted.

The **Address4** field value can be any null-terminated (X'00') character string. You should limit the string to 57 or less characters.

### **Building**

Identifies the building information provided when the job is submitted.

The **Building** field value can be any null-terminated (X'00') character string. You should limit the string to 24 or less characters.

### **Department**

Identifies the department information provided when the job is submitted.

The **Department** field value can be any null-terminated (X'00') character string. You should limit the string to 24 or less characters.

**Name** Identifies the name information provided when the job is submitted.

The **Name** field value can be any null-terminated (X'00') character string. You should limit the string to 24 or less characters.

### **Nodeid**

Identifies the nodeid information provided when the job is submitted.

The **Nodeid** field value can be any null-terminated (X'00') character string. You should limit the string to 10 or less characters.

### **Passthru**

Identifies any other information provided when the job is submitted that will be passed through the user exit to the backend program.

The following **Passthru** flags are supported:

**class** Identifies the one-character class attribute.

#### **destination**

Identifies the one-to eight-character destination attribute.

**forms** Identifies the one-to eight-character forms attribute.

#### **segmentid**

Identifies the one-to ten-character segmentation identifier.

The **Passthru** field value can be any null-terminated (X'00') character string no greater than 1,024 characters in length.

### **Programmer**

Identifies the programmer information provided when the job is submitted.

The **Programmer** field value can be any null-terminated (X'00') character string. You should limit the string to 24 or less characters.

**Room** Identifies the room information provided when the job is submitted.

The **Room** field value can be any null-terminated (X'00') character string. You should limit the string to 24 or less characters.

**Title** Identifies the title information provided when the job is submitted.

The **Title** field value can be any null-terminated (X'00') character string. You should limit the string to 24 or less characters.

### **Userid**

Identifies the userid information provided when the job is submitted.

The **Userid** field value can be any null-terminated (X'00') character string. You should limit the string to 10 or less characters.

The following fields provide output information:

### **PagePointer**

Points to a buffer containing the header page or trailer page data produced by the exit.

### **PageSize**

Indicates the size of the header page or trailer page data returned by the exit. This field is initially set to 0 before the exit is called. If no data is generated by the exit, this field remains set at 0.

### **PageType**

Indicates the type of header or trailer page data (if any) that the exit generates. The field is initially set to 0 (AFP data stream) before the exit is called. Valid values are:

**0** AFP data stream

**1** ASCII data

### Job Completion

Indicates the status returned by the exit. This field is initially set to 0 before the exit is called. Valid return codes are:

- 0** Good completion, all done, accept resultant page.
- 1** Bad completion, non-fatal error, no page generated.
- 5** Bad completion, fatal error. The exit is disabled until you shut down the actual destination.
- 8** Bad completion, terminate the current job.
- 12** Bad completion: terminate the job and put it in pending state. In addition, Infoprint disables the actual destination.

After you create your header or trailer page user-exit program, you must use the AIX **make** command to compile the code (see “Compiling and Installing the User-Exit Program” on page 67).

---

## Separator Page User-Exit Program Inputs and Outputs

The Infoprint separator page user-exit program is called before copies of a job (including the very first copy) print. This exit is also called before the error messages and the trailer page ( Figure 22 on page 66).

The source code (in the C programming language) for the sample separator page user-exit programs listed on page 66 are located in the **/usr/lpp/psf/exits** directory. These sample programs generate an AFP data stream page.

The data structures for the separator page user-exit program are included with the source code in the **/usr/lpp/psf/exits/ainuexit.h** file. The code for these structures is shown in “User-Exit Program Structures” on page 80.

The declaration of this exit is:

```
void SEPARATOR (SEPARATOR_EXITDATA *exitdata)
```

The **SEPARATOR\_EXITDATA** input/output parameter contains all the input and output data needed to communicate between Infoprint and the user-exit program.

The **SEPARATOR\_EXITDATA** structure includes the following fields.

The following fields provide input information:

#### UserID

Identifies the AIX user ID of the person who submitted the job. If you log in as yourself and then switch to **root**, the AIX user ID is **root**.

#### NodeID

Identifies the name of the AIX system (host). The backend program sets the NodeID.

#### Jobname

Identifies the name of the job. This is the same as the file name in the job.

Job submitters can also specify the job name with the Infoprint job attribute **job-name=name** when they submit the job.

If the job name is not specified for files defined as OTF, PCL, PostScript, ditroff, line data, unformatted ASCII, DBCS ASCII, EUC, PDF, JPEG, GIF,

or TIFF files when the job is submitted, Infoprint creates a temporary file for the transform output. The temporary file name is used for the job name.

**SpoolID**

Identifies the job ID, which is an integer. Infoprint sets the SpoolID.

**Printer Name**

Identifies the name of the Infoprint destination.

**hab** This function is not used in AIX.

**Date** Identifies the date printed.

**Time** Identifies the time printed.

**Distribution**

Identifies the distribution information provided when the job is submitted.

Additional input information fields are used by some of the sample programs; see “Other Input Values” on page 70.

The following fields provide output information:

**Copy** Indicates which copy is associated with this call to the exit. Initially set to 1, it increments by one each time the exit is called. The sample separator page user-exit program generates one separator page for the first copy and all subsequent copies of the job.

**PagePointer**

Points to a buffer containing the separator page data produced by the exit.

**PageSize**

Indicates the size of the separator page data returned by the exit. This field is initially set to 0 before the exit is called. If no data is generated by the exit, this field remains set at 0.

**PageType**

Indicates the type of separator page data (if any) that the exit generates. The field is initially set to 0 (AFP data stream) before the exit is called. Valid values are:

- 0** AFP data stream
- 1** ASCII data

**Job Completion**

Indicates the status returned by the exit. This field is initially set to 0 before the exit is called. Valid return codes are:

- 0** Good completion, all done, accept resultant page.
- 1** Bad completion, non-fatal error, no page generated.
- 5** Bad completion, fatal error. The exit is disabled until you shut down the actual destination.
- 8** Bad completion, terminate the current job.
- 12** Bad completion: terminate the job and put it in pending state. In addition, Infoprint disables the actual destination.

After you create your separator page user-exit program, you must use the AIX **make** command to compile the code (see “Compiling and Installing the User-Exit Program” on page 67).

---

## Accounting and Audit User-Exit Program Inputs and Outputs

The Infoprint accounting and audit user-exit programs require the same inputs and produce the same outputs so the program descriptions are similar.

The source code (in the C programming language) for the sample accounting and audit user-exit programs listed on page 66 are in the `/usr/lpp/psf/exits` directory.

These sample programs generate an ASCII data stream page. The sample programs store the data into a file you can access with the following executable reporting utilities:

### **ainurpt1**

Provides accounting data for the actual destinations defined, based upon the destination ID.

### **ainurpt2**

Provides accounting data for the actual destinations defined, based upon the userid.

### **ainurpt3**

Provides detailed accounting data for the destinations defined, based upon the particular userid supplied.

### **ainurpt4**

Provides audit data for the actual destinations defined, based upon the destination ID.

### **ainurpt5**

Provides audit data for the actual destinations defined, based upon the userid.

### **ainurpt6**

Provides detailed audit data for the actual destinations defined, based upon the particular userid supplied.

These executable reporting utilities are located in the `/usr/lpp/psf/exits` directory. By specifying these executable reporting utilities at the AIX command line, you can display data by either destination ID or userid. For example, to report on print requests submitted by a specific user to a actual destination for which the accounting user exit has been activated, you can specify **ainurpt3** and then provide the userid to the program.

**Note:** You must activate the audit and accounting exits to generate these reports. You can use the Infoprint Manager Administration GUI to activate auxiliary sheets for accounting and auditing information.

The data structures for the accounting and audit user-exit programs are included with the source code in the `/usr/lpp/psf/exits/ainuexit.h` and `/usr/lpp/psf/exits/ainurpt.h` files. The code for these structures is shown in “User-Exit Program Structures” on page 80.

The declarations of these exits are:

```
void ACCOUNTING (ACCOUNTING_EXITDATA *exitdata)
void AUDIT (AUDIT_EXITDATA *exitdata)
```

The `ACCOUNTING_EXITDATA` and the `AUDIT_EXITDATA` input/output parameters contain all the input and output data needed to communicate between Infoprint and the user-exit programs.



The ACCOUNTING\_EXITDATA and the AUDIT\_EXITDATA structures include the following fields.

The following fields provide input information:

**UserID**

Identifies the AIX user ID of the person who submitted the job. If you log in as yourself and then switch to **root**, the AIX user ID is **root**.

**NodeID**

Identifies the name of the AIX system (host). The backend program sets the NodeID.

**Jobname**

Identifies the name of the job. This is the same as the file name in the job.

Job submitters can also specify the job name with the Infoprint job attribute **job-name=name** when they submit the job.

If the job name is not specified for files defined as OTF, PCL, PostScript, ditroff, line-data, unformatted ASCII, DBCS ASCII, EUC, DPF, GIF, JPEG, or TIFF files when the job is submitted, Infoprint creates a temporary file for the transform output. The temporary file name is used for the job name.

**SpoolID**

Identifies the job ID, which is an integer. Infoprint sets the SpoolID.

**Printer Name**

Identifies the name of the Infoprint destination.

**hab** This function is not used in AIX.

**Pages Printed**

Shows the total number of impressions produced for this job.

**Bin 1 Sheets Printed**

Shows the total number of sheets selected from the primary bin.

**Bin 2 Sheets Printed**

Shows the total number of sheets selected from the secondary bin.

**Data Object Resources**

Shows the total number of Data Object Resources, which can consist of PDF pages, IOCA images, and Encapsulated PostScript (EPS) files, used in this job. Data Object Resources are also known as presentation-object containers (for more information, see the **presentation-object-container** attributes in the *Infoprint Manager: Reference*).

**Note:** The counters do not include resources contained in the input file. The counters only include resources used before the accounting or audit user exit is called. Therefore, the resources required for printing error messages and the trailer page do not appear in the resource totals.

**Number of Fonts used**

Shows the total number of fonts used in this job.

**Note:** The counters do not include resources contained in the input file. The counters only include resources used before the accounting or

audit user exit is called. Therefore, the resources required for printing error messages and the trailer page do not appear in the resource totals.

**Number of Overlays used**

Shows the total number of overlays used in this job.

**Note:** The counters do not include resources contained in the input file. The counters only include resources used before the accounting or audit user exit is called. Therefore, the resources required for printing error messages and the trailer page are not included in the resource totals.

**Number of Segments used**

Shows the total number of page segments used in this job.

**Note:** The counters do not include resources contained in the input file. The counters only include resources used before the accounting or audit user exit is called. Therefore, the resources required for printing error messages and the trailer page are not included in the resource totals.

**Start Date**

Identifies the date the job started printing.

**Start Time**

Identifies the time the job started printing.

**Stop Date**

Identifies the date the job finished printing.

**Stop Time**

Identifies the time the job finished printing.

Additional input information fields are used by some of the sample programs; see “Other Input Values” on page 70

The following fields provide output information:

**PagePointer**

Points to a buffer containing the accounting or audit page data produced by the exit.

**PageSize**

Indicates the size of the accounting or audit page data returned by the exit. This field is initially set to 0 before the exit is called. If no data is generated by the exit, this field remains set at 0.

**PageType**

Indicates the type of accounting or audit page data (if any) that the exit generates. The field is initially set to 0 (AFP data stream) before the exit is called. Valid values are:

- 0** AFP data stream
- 1** ASCII data

**Job Completion**

Indicates the status returned by the exit. This field is initially set to 0 before the exit is called. Valid return codes are:

- 0** Good completion, all done, accept resultant page.
- 1** Bad completion, non-fatal error, no page generated.

- 5 Bad completion, fatal error. The exit is disabled until you shut down the actual destination.
- 8 Bad completion, terminate the current job.
- 12 Bad completion: terminate the job and put it in pending state. In addition, Infoprint disables the actual destination.

After you create your accounting or audit user-exit program, you must use the AIX **make** command to compile the code. See “Compiling and Installing the User-Exit Program” on page 67.

---

## Input Data User-Exit Program Inputs and Outputs

The Infoprint input data user-exit program is used to monitor the incoming print data stream to Infoprint. This exit is called at the beginning of the job after the header (start) page (Figure 22 on page 66).

The source code (in the C programming language) for the sample input data user-exit program listed on page 66 is in the `/usr/lpp/psf/exits/ainuxind.c` file. This sample program consists of a return code and performs no function.

The data structures for the input data user-exit program are included with the source code in the `/usr/lpp/psf/exits/ainuexit.h` file. The code for these structures is shown in “User-Exit Program Structures” on page 80.

The declaration of this exit is:

```
void INDATA (INDATA_EXITDATA *exitdata)
```

The `INDATA_EXITDATA` input/output parameter contains all the input and output data needed to communicate between Infoprint and the user-exit program.

The `INDATA_EXITDATA` structure includes the following fields.

The following fields provide input information:

### UserID

Identifies the AIX user ID of the person who submitted the job. If you log in as yourself and then switch to **root**, the AIX user ID is **root**.

### NodeID

Identifies the name of the AIX system (host). The backend program sets the NodeID.

### Jobname

Identifies the name of the job. This is the same as the file name in the job.

Job submitters can also specify the job name with the Infoprint job attribute **job-name=name** when they submit the job.

If the job name is not specified for files defined as OTF, PCL, PostScript, ditroff, line-data, unformatted ASCII, DBCS ASCII, EUC, DPF, JPEG, GIF, or TIFF files when the job is submitted, Infoprint creates a temporary file for the transform output. The temporary file name is used for the job name.

### SpoolID

Identifies the job ID, which is an integer. Infoprint sets the SpoolID.

**Printer Name**

Identifies the name of the Infoprint actual destination.

**hab** This function is not used in AIX.

**Copy** Indicates which copy is associated with this call to the exit. Initially set to 1, it increments by one each time the exit is called.

**DataOffset**

Indicates the offset into the source file.

**DataSize**

Indicates the number of bytes in the buffer.

**DataPointer**

Points to a buffer containing the incoming print data stream.

**DataType**

Indicates the type of source data the exit receives. Valid values are:

- 0** AFP data stream
- 1** ASCII data

**Job Completion**

Indicates the status returned by the exit. This field is initially set to 0 before the exit is called. Valid return codes are:

- 0** Good completion, all done, accept resultant page.
- 1** Bad completion, non-fatal error, no page generated.
- 5** Bad completion, fatal error.
- 8** Bad completion, terminate the current job.
- 12** Bad completion: terminate the job and put it in pending state. In addition, Infoprint disables the actual destination.

After you create your input data user-exit program, you must use the AIX **make** command to compile the code (see “Compiling and Installing the User-Exit Program” on page 67).

**Note:** The input information fields used by some of the sample programs (see “Other Input Values” on page 70) are available through the alternate sample user exits. Infoprint does not provide an alternate Input Data User Exit.

## Output Data User-Exit Program Inputs and Outputs

The Infoprint output data user-exit program is used to monitor the outgoing print data stream from Infoprint. This exit is called at the end of the job before the error messages and the trailer page.

The source code (in the C programming language) for the sample output data user-exit program listed on page 66 is in the `/usr/lpp/psf/exits/ainuxout.c` file. This sample program consists of a return and performs no function.

The data structures for the output data user-exit program are included with the source code in the `/usr/lpp/psf/exits/ainuexit.h` file. The code for these structures is shown in “User-Exit Program Structures” on page 80.

The declaration of this exit is:

```
void OUTDATA (OUTDATA_EXITDATA *exitdata)
```

The `OUTDATA_EXITDATA` input/output parameter contains all the input and output data needed to communicate between Infoprint and the user-exit program.

The `OUTDATA_EXITDATA` structure includes the following fields.

The following fields provide input information:

**UserID**

Identifies the AIX user ID of the person who submitted the job. If you log in as yourself and then switch to `root`, the AIX user ID is `root`.

**NodeID**

Identifies the name of the AIX system (host). The backend program sets the NodeID.

**Jobname**

Identifies the name of the job. This is the same as the file name in the job.

Job submitters can also specify the job name with the Infoprint job attribute `job-name=name` when they submit the job.

If the job name is not specified for files defined as OTF, PCL, PostScript, ditroff, line-data, unformatted ASCII, DBCS ASCII, EUC, DPF, JPEF, GIF, or TIFF files when the job is submitted, Infoprint creates a temporary file for the transform output. The temporary file name is used for the job name.

**SpoolID**

Identifies the job ID, which is an integer. Infoprint sets the SpoolID.

**Printer Name**

Identifies the name of Infoprint destination.

**hab** This function is not used in AIX.

**Copy** Indicates which copy is associated with this call to the exit. Initially set to 1, it increments by one each time the exit is called.

**DataSize**

Indicates the number of bytes in the buffer.

**DataPointer**

Points to a buffer containing the outgoing print data stream.

**Job Completion**

Indicates the status returned by the exit. This field is initially set to 0 before the exit is called. Valid return codes are:

- 0** Good completion, all done, accept resultant page.
- 1** Bad completion, non-fatal error, no page generated.
- 5** Bad completion, fatal error. The exit is disabled until you shut down the actual destination.
- 8** Bad completion, terminate the current job.
- 12** Bad completion: terminate the job and put it in pending state. In addition, Infoprint disables the actual destination.

After you create your output data user-exit program, you must use the AIX `make` command to compile the code (see “Compiling and Installing the User-Exit Program” on page 67).

**Note:** The output information fields used by some of the sample programs (see “Other Input Values” on page 70) are available through the alternate sample user exits. Infoprint does not provide an alternate Output Data User Exit.

---

## User-Exit Program Structures

All input and output variables used in Infoprint user exits are defined through either of the following two files:

- The `/usr/lpp/psf/exits/ainuexit.h` file
- The `/usr/lpp/psf/exits/ainurpt.h` file

The `ainuexit.h` file contains definitions for the header, trailer, separator, accounting and audit exits, while the `ainurpt.h` file formats data for the following executable reporting utilities that apply to both the accounting and audit exits:

- Accounting Log
  - `ainurpt1`
  - `ainurpt2`
  - `ainurpt3`
- Audit Log
  - `ainurpt4`
  - `ainurpt5`
  - `ainurpt6`

These user-exit program structure files are written in the C programming language. The declarations and statements in these files show the structure of the Infoprint user-exit programs, which are imbedded as part of the user-exit program.

---

## User-Exits Programs for Line-Data Transform

Infoprint provides several sample user-exit programs for the line-data transform. Use of the user exits is optional. You specify the names of the exit programs with the `inpexit`, `indxexit`, `outexit`, and `resexit` keywords. Each of these keywords is described in Working with the Transform for Line Data.

Infoprint provides the following sample programs:

`/usr/lpp/psf/acif/apkinp.c`

Input-record user exit

`/usr/lpp/psf/acif/apkout.c`

Output-record user exit

`/usr/lpp/psf/acif/apkres.c`

Resource exit

In addition, Infoprint provides the following input-record user exits programs to translate input data streams:

`/usr/lpp/psf/acif/apka2e.c`

Converts ASCII stream data to EBCDIC stream data.

`/usr/lpp/psf/acif/asciinp.c`

Converts unformatted ASCII data that contains carriage returns and form feeds into a record format that contains an American National Standards Institute (ANSI) carriage control character. This exit encodes the ANSI carriage control character in byte 0 of every record.

`/usr/lpp/psf/acif/asciinpe.c`

Converts unformatted ASCII data into a record format as does `asciinp.c`, and then converts the ASCII stream data to EBCDIC stream data.

The C language header file for all ACIF exit programs is provided in `/usr/lpp/psf/acif/apkexits.h` along with the build rules for the ACIF user exits in `/usr/lpp/psf/acif/Makefile`

For more information about compiling user-exit programs, refer to “Compiling and Installing the User-Exit Program” on page 67.

## Input Record Exit

The line-data transform provides an exit that enables you to add, delete, or modify records in the line-data input file. The program invoked at this exit is defined by the value of the `inpxit` keyword of the `line2afp` command.

This exit is called after each record is read from the input file. The exit can request that the record be discarded, processed, or processed with control returned to the exit for the next input record. The largest record that Infoprint can process is 32756 bytes. This exit is not called when the line-data transform is processing resources from directories.

Figure 23 contains a sample C language header that describes the control block that is passed to the exit program.

```
typedef struct _INPXIT_PARMS /* Parameters for the input record exit */
{
 char *work; /* Address of 16-byte static work area */
 PFATTR *pfattr; /* Address of print file attribute information */
 char *record; /* Address of the input record */
 void *reserved1; /* Reserved for future use */
 unsigned short recordln; /* Length of the input record */
 unsigned short reserved2; /* Reserved for future use */
 char request; /* Add, delete, or process the record */
 char eof; /* EOF indicator */
} INPXIT_PARMS;
```

Figure 23. Sample Input Record Exit C Language Header

The address of the control block containing the following parameters is passed to the input record exit:

### **work (Bytes 1–4)**

A pointer to a static, 16-byte memory block. The exit program can use this parameter to save information across calls (for example, pointers to work areas). The 16-byte work area is aligned on a full word boundary and is initialized to binary zeros prior to the first call. The user-written exit program must provide the code required to manage this work area.

### **pfattr (Bytes 5–8)**

A pointer to the print file attribute data structure. See “Attributes of the Line-Data Input File” on page 87 for more information on the format of this data structure and the information it contains.

### **record (Bytes 9–12)**

A pointer to the first byte of the input record including the carriage control character. The record resides in a buffer that resides in storage allocated by the line-data transform but the exit program is allowed to modify the input record.

### **reserved1 (Bytes 13–16)**

These bytes are reserved for future use.

**recordln (Bytes 17–18)**

Specifies the number of bytes (length) of the input record. If the input record is modified, this parameter must also be updated to reflect the actual length of the record.

**reserved2 (Bytes 19–20)**

These bytes are reserved for future use.

**request (Byte 21)**

Specifies how the line-data transform processes the record. On entry to the exit program, this parameter is X'00'. When the exit program returns control to line-data transform, this parameter must have the value X'00', X'01', or X'02', where:

**X'00'** Specifies that the line-data transform should process the record.

**X'01'** Specifies that the line-data transform should not process the record.

**X'02'** Specifies that the line-data transform should process the record and then return control to the exit program to allow it to insert the next record. The exit program can set this value to save the current record, insert a record, and then supply the saved record at the next call. After the exit inserts the last record, the exit program must reset the **request** byte to X'00'.

A value of X'00' on entry to the exit program specifies that the record be processed. If you want to ignore the record, change the **request** byte value to X'01'. If you want the record to be processed and you want to insert an additional record, change the **request** byte value to X'02'. Any value greater than X'02' is interpreted as X'00', and the exit processes the record.

**Note:** Only one record can reside in the buffer at any time.

**eof (Byte 22)**

An end-of-file (**eof**) indicator. This indicator is a one-byte character code that specifies whether an **eof** condition has been encountered.

When **eof** is signaled (**eof** value='Y'), the last record has already been presented to the input exit, and the input file has been closed. The pointer **record** is no longer valid. Records may not be inserted when **eof** is signaled. The following are the only valid values for this parameter:

**Y** Specifies that **eof** has been encountered.

**N** Specifies that **eof** has not been encountered.

This end-of-file indicator allows the exit program to perform some additional processing at the end of the file. The exit program cannot change this parameter.

**Using the Line-Data Transform User Input Record Exits****apka2e**

The **apka2e** input-record exit program translates data that is encoded in ASCII (code set IBM-850) into EBCDIC (code set IBM-037) encoded data. You should use this exit when your job requires fonts such as GT12, which has only EBCDIC code points defined.

To execute the **apka2e** input record exit program, set the following keywords and values in your line-data transform keyword file. The **line2afp parmdd** keyword identifies the keyword file.



```
inpexit=/usr/lpp/psf/bin/apka2e
cc=yes
cctype=z
```

### **asciinp**

The **asciinp** input-record exit program transforms an ASCII data stream into a record format that contains a carriage control character in byte 0 of every record. If byte 0 of the input record is an ASCII carriage return (X'0D'), byte 0 is transformed into an ASCII space (X'20') that causes a data stream to return and advance one line; no character is inserted. If byte 0 of the input record is an ASCII form feed character (X'0C'), byte 0 is transformed into an ANSI skip to channel 1 command (X'31') that serves as a form feed in the carriage-control byte.

To execute the **asciinp** input record exit program, set the following keywords in your line-data transform keyword file. The **line2afp parmdd** keyword identifies the keyword file:

```
inpexit=/usr/lpp/psf/bin/asciinp
cc=yes
cctype=z
```

### **asciinpe**

The **asciinpe** input-record exit program combines both user input-record exits described above. To execute, specify `inpexit=/usr/lpp/psf/bin/asciinpe` as the exit program in the keyword file and follow the directions specified for both **apka2e** and **asciinp**.

While the **asciinp** and **asciinpe** input-record exits do not recognize other ASCII printer commands, you can modify these exits to account for the following:

- backspacing (X'08')
- horizontal tabs (X'09')
- vertical tabs (X'0B')

For more information on using and modifying these programs, refer to the prolog of the **asciinp.c** source file that is provided with Infoprint in the `/usr/lpp/psf/acif` directory.

## **Output Record Exit**

Using the output-record exit, you can modify or ignore the records the line-data transform writes into the output file. The program invoked at this exit is defined by the **outexit** keyword of the **line2afp** command.

The exit receives control before a record (structured field) is written to the output document file. The exit can request that the record be ignored or processed. The largest record that the exit can process is 32752 bytes, not including the record descriptor word. The exit is not called when the line-data transform is processing resources.

Figure 24 contains a sample C language header that describes the control block passed to the exit program.

```

typedef struct _OUTEXIT_PARMS /* Parameters for the output record exit */
{
 char *work; /* Address of 16-byte static work area */
 PFATTR *pfattr; /* Address of print file attribute information */
 char *record; /* Address of the record to be written */
 unsigned short recordln; /* Length of the output record */
 char request; /* Delete or process the record */
 char eof; /* Last call indicator */
} OUTEXIT_PARMS;

```

Figure 24. Sample Output Record Exit C Language Header

The address of the control block containing the following parameters is passed to the output record exit:

**work (Bytes 1–4)**

A pointer to a static, 16-byte memory block. The exit program can use this parameter to save information across calls (for example, pointers to work areas). The 16-byte work area is aligned on a full word boundary and is initialized to binary zeros prior to the first call. A user-written exit program must provide the code required to manage this work area.

**pfattr (Bytes 5–8)**

A pointer to the print file attribute data structure. See “Attributes of the Line-Data Input File” on page 87 for more information on the format of this data structure and the information it contains.

**record (Bytes 9–12)**

A pointer to the first byte of the output record. The record resides in a 32KB (where KB equals 1024 bytes) buffer. The buffer resides in storage allocated by the line-data transform, but the exit program is allowed to modify the output record.

**recordln (Bytes 13–14)**

Specifies the length, in bytes, of the output record. If the output record is modified, this parameter must also be updated to reflect the actual length of the record.

**request (Byte 15)**

Specifies how the line-data transform processes the record. On entry to the exit program, this parameter is X'00'. When the exit program returns control to the line-data transform, this parameter must have the value X'00' or X'01', where:  
**X'00'** Specifies that the line-data transform should process the record.  
**X'01'** Specifies that the line-data transform should ignore the record.

A value of X'00' on entry to the exit program specifies that the record be processed. If you want to ignore the record, change the **request** byte value to X'01'. Any value greater than X'01' is interpreted as X'00'; the exit processes the record.

**Note:** Only one record can reside in the buffer at any time.

**eof (Byte 16)**

An end-of-file (**eof**) indicator. This indicator is a one-byte character code that signals when the line-data transform has finished writing the output file.

When **eof** is signaled (**eof** value='Y'), the last record has already been presented to the output exit. The pointer **record** is no longer valid. Records may not be inserted after **eof** is signaled. The following are the only valid values for this parameter:

- Y Specifies that the last record has been written.
- N Specifies that the last record has not been written.

This end-of-file flag, used as a last-call indicator, allows the exit program to return control to the line-data transform. The exit program cannot change this parameter.

## Resource Exit

The line-data transform provides an exit that enables you to “filter” (exclude) resources. This exit is useful in controlling resources at the file-name level. For example, assume you only wanted to use those fonts that are not shipped with Infoprint. You could code this exit program to contain a table of all fonts shipped with Infoprint and filter those from the resource file. Security is another consideration for using this exit because you could prevent certain named resources from being included. The program invoked at this exit is defined by the **resexit** keyword of the **line2afp** command.

This exit receives control before a resource is read from a directory. The exit program can request that the resource be processed or ignored (skipped), but it cannot substitute another resource name in place of the requested one. If the exit requests that any overlay be ignored, the line-data transform automatically ignores any resources the overlay may have referenced (that is, fonts and page segments).

Figure 25 contains a sample C language header that describes the control block that is passed to the exit program.

```
typedef struct _RESEXIT_PARMS /* Parameters for the resource record exit */
{
 char *work; /* Address of 16-byte static work area */
 PFATTR *pfattr; /* Address of print file attribute information */
 char resname[8]; /* Name of requested resource */
 char restype; /* Type of resource */
 char request; /* Ignore or process the resource */
 char eof; /* Last call indicator */
} RESEXIT_PARMS;
```

Figure 25. Sample Resource Exit C Language Header

The address of the control block containing the following parameters is passed to the resource-record exit:

### **work (Bytes 1–4)**

A pointer to a static, 16-byte memory block. The exit program can use this parameter to save information across calls (for example, pointers to work areas). The 16-byte work area is aligned on a full word boundary and is initialized to binary zeros prior to the first call. A user-written exit program must provide the code required to manage this work area.

### **pfattr (Bytes 5–8)**

A pointer to the print file attribute data structure. See “Attributes of the Line-Data Input File” on page 87 for more information on the format of this data structure and the information presented.

### **resname (Bytes 9–16)**

Specifies the name of the requested resource. The exit program cannot modify or change this value.

### restype (Byte 17)

Specifies the type of resource the name refers to. This is a one-byte hexadecimal value where:

- X'03' Specifies a GOCA (graphics) object
- X'05' Specifies a BCOCA (barcode) object
- X'06' Specifies an IOCA (IO image) object
- X'40' Specifies a font character set
- X'41' Specifies a code page
- X'FB' Specifies a page segment
- X'FC' Specifies an overlay

The line-data transform does **not** call this exit for the following resource types:

- Page definition  
The page definition (**pagedef** keyword) is a required resource for transforming a line-data file.
- Form definition  
The form definition (**formdef** keyword) is a required resource for printing a transformed line-data file.
- Coded fonts  
The line-data transform must process coded fonts to determine the names of the code pages and font character sets they reference. This is necessary in creating Map Coded Font-2 (MCF-2) structured fields.

### request (Byte 18)

Specifies how the line-data transform processes the resource. On entry to the exit program, this parameter is X'00'. When the exit program returns control to the line-data transform, this parameter must have the value X'00' or X'01' where:

- X'00' Specifies that the line-data transform should process the resource.
- X'01' Specifies that the line-data transform should ignore the resource.

A value of X'00' on entry to the exit program specifies that the resource be processed. If you want to ignore the resource, change the **request** byte value to X'01'. Any value greater than X'01' is interpreted as X'00' and the resource is processed.

### eof (Byte 19)

An end-of-file (**eof**) indicator. This indicator is a one-byte character code that signals when the line-data transform has written the last record.

When **eof** is signaled (**eof** value = 'Y'), the last record has already been presented to the resource exit. The pointer **record** is no longer valid. Records may not be inserted after **eof** is signaled. The following are the only valid values for this parameter:

- Y Specifies that the last record has been written.
- N Specifies that the last record has not been written.

This end-of-file flag, used as a last-call indicator, returns control to the line-data transform. The exit program cannot change this parameter.

## Non-Zero Return Codes

If the line-data transform receives a non-zero return code from any exit program, the line-data transform issues message 0425-412 and terminates processing.

---

## Attributes of the Line-Data Input File

**Note:** This data structure is provided for informational purposes only.

The line-data transform provides information about the attributes of the line-data input file in a data structure available to the line-data transform user exits. Figure 26 shows the format of this data structure.

```
typedef struct _PFATTR /* Print File Attributes */
{
 char cc[3]; /* Carriage controls? - "YES" or "NO " */
 char cctype[1]; /* Carriage control type - A(ANSI), M(Machine), Z(ASCII) */
 char chars[20]; /* CHARS values, including commas (eg. GT12,GT15) */
 char formdef[8]; /* Form Definition (FORMDEF) */
 char pagedef[8]; /* Page Definition (PAGEDEF) */
 char prmode[8]; /* Processing mode */
 char trc[3]; /* Table Reference Characters - "YES" or "NO " */
} PFATTR;
```

Figure 26. Sample Print File Attributes C Language Header

The address of the control block containing the following parameters is passed to the user exits:

### **cc (Bytes 1–3)**

The value of the **cc** keyword as specified with the **line2afp** command. The line-data transform uses the default value, **yes**, if this keyword is not explicitly specified.

### **cctype (Byte 4)**

The value of the **cctype** keyword as specified with the **line2afp** command. The line-data transform uses the default value, **z** for ANSI carriage-control characters that is encoded in ASCII, if this keyword is not explicitly specified.

### **chars (Bytes 5–24)**

The value of the **chars** keyword as specified with the **line2afp** command, including any commas that separate multiple font specifications. Because the **chars** keyword has no default value, this field contains blanks if no values are specified.

### **formdef (Bytes 25–32)**

The value of the **formdef** keyword as specified with the **line2afp** command. Because the **formdef** keyword has no default value, this field contains blanks if no value is specified.

### **pagedef (Bytes 33–40)**

The value of the **pagedef** keyword as specified with the **line2afp** command. Because the **pagedef** keyword has no default value, this field contains blanks if no value is specified.

### **prmode (Bytes 41–48)**

The value of the **prmode** keyword as specified with the **line2afp** command. Because the **prmode** keyword has no default value, this field contains blanks if no value is specified.

### **trc (Bytes 49–51)**

The value of the **trc** keyword as specified with the **line2afp** command. The line-data transform uses the default value, **no**, if this keyword is not explicitly specified.



---

## Chapter 6. Creating and Managing Auxiliary Sheets and User Exit Programs

Besides logical destinations, queues, and actual destinations, the Infoprint server also controls auxiliary-sheet objects. This section contains information and procedures for creating and configuring these objects.

This chapter consists of the following topics:

- “Preparing to Work with Auxiliary Sheets”
- “Creating New Auxiliary-Sheet Objects Using the `pdcreate` Command” on page 98
- “Modifying Start Sheets for 3170 Physical Printers” on page 98

---

### Preparing to Work with Auxiliary Sheets

The following topics describe auxiliary-sheet terms, default auxiliary sheets, and user-exit programs supplied by Infoprint and provide examples of printed auxiliary sheets.

#### Terms Relating to Auxiliary Sheets

To understand auxiliary sheets and how Infoprint generates the information that appears on them, you need to understand the following terms:

##### **Auxiliary sheet**

Represents a particular sheet of paper, blank or otherwise, that can precede a job, separate documents within a job, or follow the job. PSF, AIX, and 3170 physical printers print auxiliary sheets.

##### **Auxiliary-sheet object**

Represents a set of user-exit programs that you can specify for Infoprint PSF, fax, and email actual destinations. User-exit programs process information that can be printed on an auxiliary sheet or recorded in an accounting or audit log. Both the actual destination and the auxiliary-sheet objects must reside in the same Infoprint server.

**Note:** AIX and 3170 physical printers print auxiliary sheets, but they do not support auxiliary-sheet objects. Fax and email destinations support the input-data and output-data auxiliary-sheet objects, but they do not transmit auxiliary sheets.

Two auxiliary-sheet styles supplied with Infoprint generate a file that you can use with an executable reporting utility to view job statistics. See Chapter 7, “Gathering Accounting and Auditing Data about Print Jobs” on page 99 for more information on viewing statistics.

##### **Auxiliary-sheet object name**

Identifies the auxiliary sheet. The names of some of the default auxiliary sheets indicate the style of the auxiliary sheet: **brief**, **full**, or **blank**.

##### **User exit**

A point during Infoprint processing that allows you to run a user-exit program and return control of processing to Infoprint after the user-exit program ends. Infoprint provides data at each exit point that can serve as

input to the user-exit program. Infoprint can use the output from the user-exit program for Infoprint processing; for example, a user-exit program can pass instructions about how to format a start sheet to Infoprint. Infoprint provides user exits for the following Infoprint auxiliary-sheet objects:

- Start sheet
- End sheet
- Separator sheet
- Accounting log
- Accounting sheet
- Audit log
- Audit sheet
- Input data stream
- Output data stream

**Note:** Fax and email destinations support only the input data stream and output data stream user exits.

See “Sequence of User-Exit Programs” on page 95 for more information about user exits and user-exit programs.

#### **User-exit program**

Defines the data that prints and creates the format of the auxiliary sheet style. Infoprint extends its function by providing user-exit programs that you can use to format start, end, or separator sheets for the job, track accounting and auditing information, or extract information about the incoming and outgoing job data streams.

#### **Form definition**

Defines the characteristics of the form or printed media, which includes: overlays used, the paper source (for cut-sheet printers), duplex printing, text suppression, fonts, and the position of composed-text data on the form.

See *Infoprint Manager: Reference* for more information about form and page definitions.

#### **Edge marks**

Marks that print at the edges of auxiliary sheets and help to identify job boundaries in printed output.

## **Infoprint Default Auxiliary-Sheet Objects**

Infoprint provides six default auxiliary-sheet objects, which it creates when you first create a server. Infoprint automatically identifies these as supported values for PSF actual destinations. The default auxiliary-sheet objects and their associated user-exit programs and form definitions are:

**none** Infoprint generates no auxiliary-sheet information.

**brief** Infoprint generates a brief style of auxiliary-sheet information, using form definition **F1A10110** and the following user-exit programs:

#### **ainuxhdr**

Start sheet

#### **ainuxsep**

Separator sheet

#### **ainuxtlr**

End sheet



**ainuxacc**  
Accounting exit

**ainuxaud**  
Audit exit

**full** Infoprint generates a full style of auxiliary-sheet information, using form definition **F1A10110** and the following user-exit programs:

**ainuxhdr2**  
Start sheet

**ainuxsep2**  
Separator sheet

**ainuxtlr2**  
End sheet

**ainuxacc2**  
Accounting exit

**ainuxaud2**  
Audit exit

**blank** Infoprint generates a blank style of auxiliary-sheet information, using form definition **F1A10110** and the following user-exit programs:

**pduxblkh**  
Start sheet

**pduxblks**  
Separator sheet

**pduxblkt**  
End sheet

**accounting-log**  
Infoprint generates accounting or audit information, using the following user-exit programs:

**ainacclog**  
Accounting exit. This program writes accounting information to the **/var/psf/accounting.log** file. It does not produce a printed sheet, but does allow the information to be displayed using the report generator programs. See Chapter 7, “Gathering Accounting and Auditing Data about Print Jobs” on page 99.

**ainaudlog**  
Audit exit. This program writes audit information to the **/var/psf/audit.log** file. It does not produce a printed sheet, but does allow the information to be displayed using the report generator programs. See Chapter 7, “Gathering Accounting and Auditing Data about Print Jobs” on page 99.

**job-ticket**  
Infoprint generates a printed start, separator, end, or audit sheet showing information from the job ticket in ASCII format or logs accounting information from the job ticket, using the following user-exit programs:

**ainuxhdrp**  
Start sheet

**ainuxsepp**  
Separator sheet

**ainxtrlp**  
End sheet

**ainuxaccp**  
Accounting exit. This program writes accounting information to the `/var/psf/podaccount.log` file. It does not produce a printed sheet, but does allow the information to be displayed using the report generator programs. See Chapter 7, “Gathering Accounting and Auditing Data about Print Jobs” on page 99.

**ainuxaudp**  
Audit exit

You can create your own auxiliary-sheet styles using the Infoprint **pdcreate** command on the AIX command line. See “Creating New Auxiliary-Sheet Objects Using the **pdcreate** Command” on page 98 for the procedure.

## Examples of Brief-Style and Full-Style Auxiliary Sheets

The examples of auxiliary-sheet printouts were produced using the Infoprint **brief** and **full** default auxiliary-sheet objects.

### Start Sheet Examples

In Figure 27, the user-exit program **ainuxhdr** generated the brief style of the start sheet and user-exit program **ainuxhdr2** generated the full style of the start sheet.

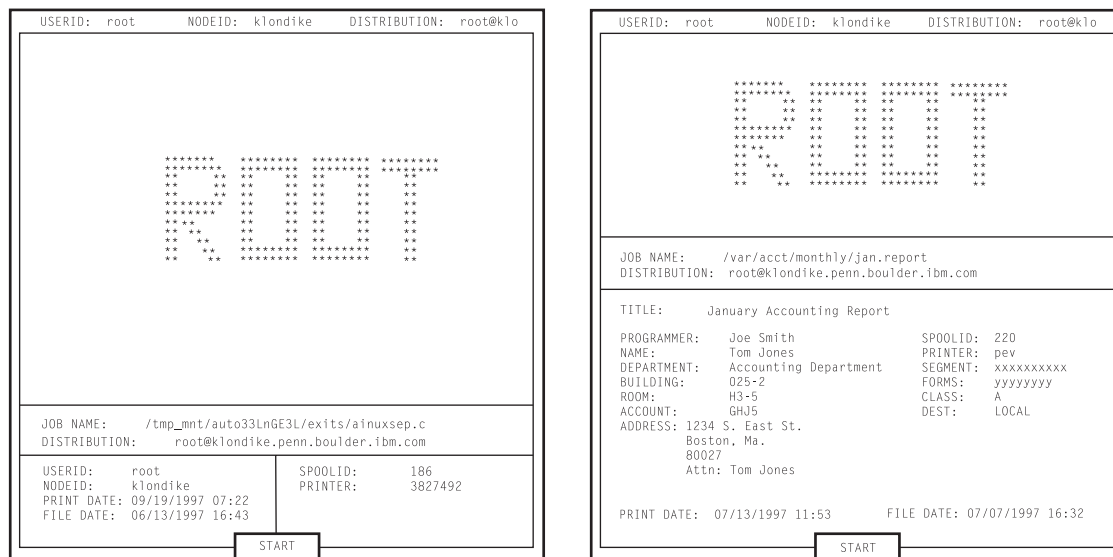


Figure 27. Brief and Full Styles of Start Sheets

### Separator Sheet Examples

In Figure 28 on page 93, the user-exit program **ainuxsep** generated the brief style of the separator sheet and user-exit program **ainuxsep2** generated the full style of the separator sheet.

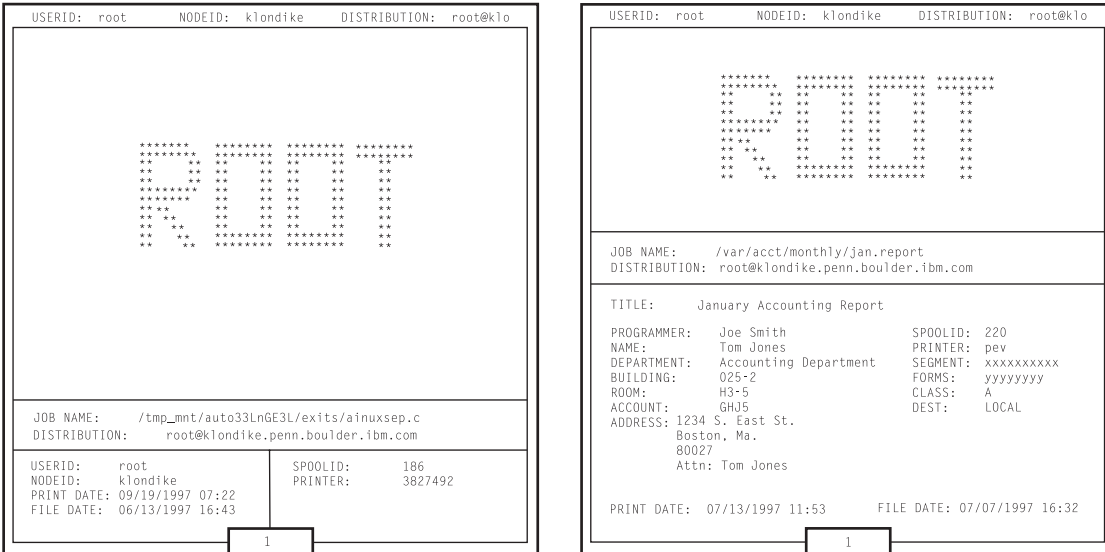


Figure 28. Brief and Full Styles of Separator Sheets

## End Sheet Examples

In Figure 29, the user-exit program **ainuxltr** generated the brief style of the end sheet and user-exit program **ainuxltr2** generated the full style of the end sheet.

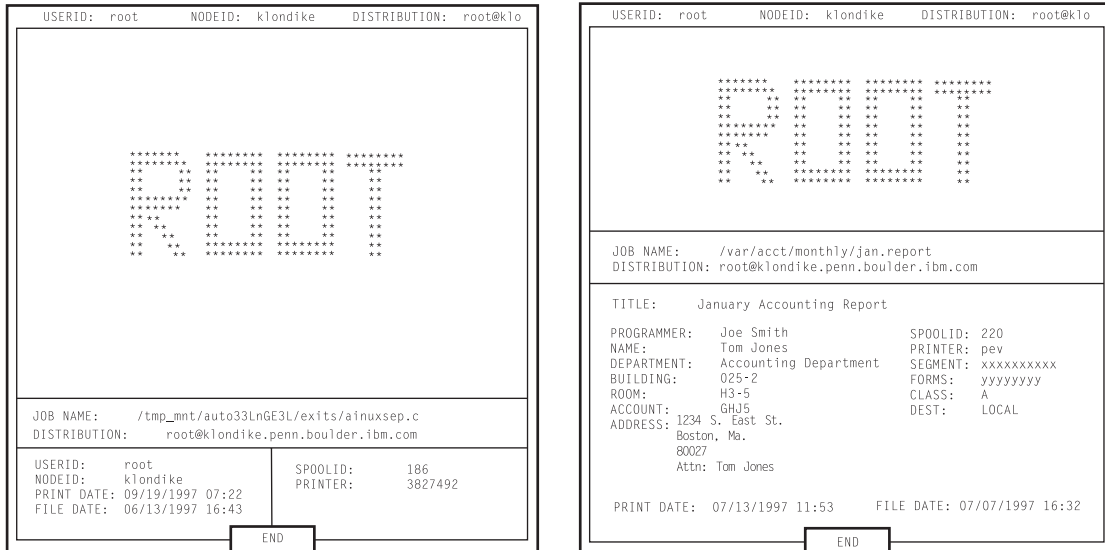


Figure 29. Brief and Full Styles of End Sheets

## Accounting Sheet Examples

In Figure 30 on page 94, the user-exit program **ainuxacc** generated the brief style of the accounting-log sheet and user-exit program **ainuxacc2** generated the full style of the accounting-log sheet.

|                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <pre> ACCOUNTING: UserID=root NodeID=starwars JobName=/info/afp/twopage.afp SpoolID=1366 PrinterName=psf4317 PagesPrinted=3 BinOneSheets=3 BinTwoSheets=0 FontsUsed=2 ResidentFontsUsed=0 OverlaysUsed=0 HardSegmentsUsed=0 SoftSegmentsUsed=0 DataObjectResources=0 StartDate=11/01/2000 StartTime=14:50:14 EndDate=11/01/2000 EndTime=14:50:15 FileDate=05/05/2000 FileTime=07:59:13 ExtendedSpoolID= </pre> | <pre> ACCOUNTING: System UserID=root System NodeID=starwars JobName=/info/afp/twopage.afp SpoolID=1367 PrinterName=psf4317 PagesPrinted=3 BinOneSheets=3 BinTwoSheets=0 FontsUsed=2 ResidentFontsUsed=0 OverlaysUsed=0 HardSegmentsUsed=0 SoftSegmentsUsed=0 DataObjectResourcesUsed=0 StartDate=11/01/2000 StartTime=14:51:46 EndDate=11/01/2000 EndTime=14:51:48 FileDate=05/05/2000 FileTime=07:59:13  Name= Supplied Userid= Supplied Nodeid= Address1= Address2= Address3= Address4= Account= Building= Department= Programmer= Room= Title= Segmentid= Class= Forms= Destination= Passthru= ExtendedSpoolID= </pre> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Figure 30. Brief and Full Styles of Accounting-Log Sheets

### Audit Sheet Examples

In Figure 31 on page 95, the user-exit program **ainuxaud** generated the brief style of the audit sheet and the user-exit program **ainuxaud2** generated the full style of the audit sheet.

```

AUDIT:
UserID=root
NodeID=starwars
JobName=/info/afp/twopage.afp
SpoolID=1366
PrinterName=psf4317
PagesPrinted=3
BinOneSheets=3
BinTwoSheets=0
FontsUsed=2
ResidentFontsUsed=0
OverlaysUsed=0
HardSegmentsUsed=0
SoftSegmentsUsed=0
DataObjectResources=0
StartDate=11/01/2000
StartTime=14:50:14
EndDate=11/01/2000
EndTime=14:50:15
FileDate=05/05/2000
FileTime=07:59:13
ExtendedSpoolID=

AUDIT:
System UserID=root
System NodeID=starwars
JobName=/info/afp/twopage.afp
SpoolID=1367
PrinterName=psf4317
PagesPrinted=3
BinOneSheets=3
BinTwoSheets=0
FontsUsed=2
ResidentFontsUsed=0
OverlaysUsed=0
HardSegmentsUsed=0
SoftSegmentsUsed=0
DataObjectResourcesUsed=0
StartDate=11/01/2000
StartTime=14:51:46
EndDate=11/01/2000
EndTime=14:51:48
FileDate=05/05/2000
FileTime=07:59:13

Name=
Supplied Userid=
Supplied Nodeid=
Address1=
Address2=
Address3=
Address4=
Account=
Building=
Department=
Programmer=
Room=
Title=
Segmentid=
Class=
Forms=
Destination=
Passthru=
ExtendedSpoolID=

```

Figure 31. Brief and Full Styles of Audit Sheets

## Sequence of User-Exit Programs

Figure 32 shows the order in which Infoprint calls the user-exit programs during job processing. You cannot change this order.

**Note:** Separator sheets are printed only between copies of a job, not between documents within a job.

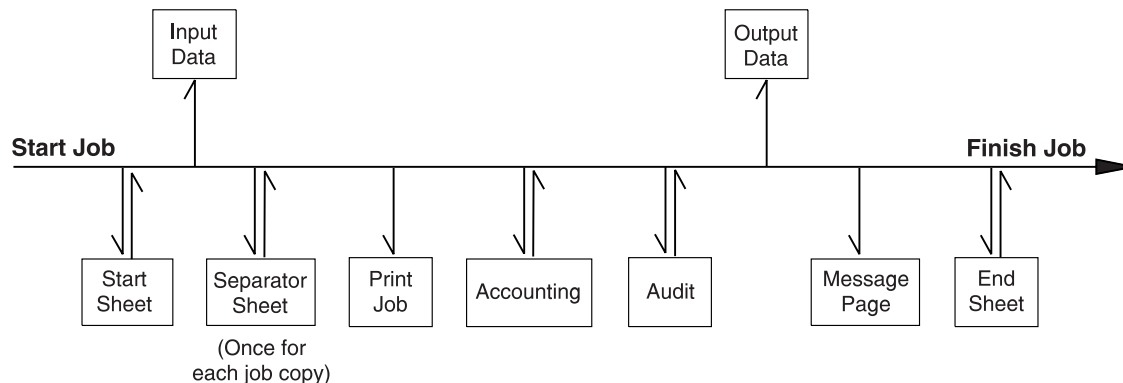


Figure 32. User Exits for Infoprint

## Directory Locations of User-Exit Programs Supplied with Infoprint

When you create the auxiliary-sheet object, you specify the name of the user-exit program and other options, such as the form definition, if the program produces printed output. You identify which auxiliary-sheet objects you want associated with each actual destination using the GUI attributes notebook for each actual destination. Infoprint loads the user-exit programs that are called out into memory and runs the programs when you submit a job to that printer.

Table 3 on page 97 shows the sample executable user-exit programs that Infoprint supplies.

Table 3. User-Exit Programs

| <b>Program</b>                           | <b>Description</b>                                                          |
|------------------------------------------|-----------------------------------------------------------------------------|
| Start Sheets                             |                                                                             |
| <code>/usr/lpp/psf/bin/pduxblkh</code>   | Prints a blank start sheet                                                  |
| <code>/usr/lpp/psf/bin/ainuxhdr</code>   | Prints a brief-style start sheet                                            |
| <code>/usr/lpp/psf/bin/ainuxhdr2</code>  | Prints a full-style start sheet                                             |
| <code>/usr/lpp/psf/bin/ainuxhdrp</code>  | Prints job ticket information on the start sheet                            |
| <code>/usr/lpp/psf/bin/ainuxhdrx</code>  | Prints a start sheet without vertical lines for IBM 64xx printers           |
| Separator Sheets                         |                                                                             |
| <code>/usr/lpp/psf/bin/pduxblks</code>   | Prints a blank separator sheet                                              |
| <code>/usr/lpp/psf/bin/ainuxsep</code>   | Prints a brief-style separator sheet                                        |
| <code>/usr/lpp/psf/bin/ainuxsep2</code>  | Prints a full-style separator sheet                                         |
| <code>/usr/lpp/psf/bin/ainuxsepp</code>  | Prints job ticket information on the separator sheet                        |
| <code>/usr/lpp/psf/bin/ainuxsepx</code>  | Prints a separator sheet without vertical lines for IBM 64xx printers       |
| End Sheets                               |                                                                             |
| <code>/usr/lpp/psf/bin/pduxblkt</code>   | Prints a blank end sheet                                                    |
| <code>/usr/lpp/psf/bin/ainuxtlr</code>   | Prints a brief-style end sheet                                              |
| <code>/usr/lpp/psf/bin/ainuxtlr2</code>  | Prints a full-style end sheet                                               |
| <code>/usr/lpp/psf/bin/ainuxtlrp</code>  | Prints job ticket information on the end sheet                              |
| <code>/usr/lpp/psf/bin/ainuxtlrx</code>  | Prints an end sheet without vertical lines for IBM 64xx printers            |
| Accounting                               |                                                                             |
| <code>/usr/lpp/psf/bin/ainuxacc</code>   | Prints a brief-style accounting sheet                                       |
| <code>/usr/lpp/psf/bin/ainuxacc2</code>  | Prints a full-style accounting sheet                                        |
| <code>/usr/lpp/psf/bin/ainuxaccp</code>  | Writes accounting information to <code>/var/psf/podaccount.log</code>       |
| <code>/usr/lpp/psf/bin/ainuacclog</code> | Writes accounting information to <code>/var/psf/accounting.log</code>       |
| Auditing                                 |                                                                             |
| <code>/usr/lpp/psf/bin/ainuxaud</code>   | Prints a brief-style audit sheet                                            |
| <code>/usr/lpp/psf/bin/ainuxaud2</code>  | Prints a full-style audit sheet                                             |
| <code>/usr/lpp/psf/bin/ainuxaudp</code>  | Prints job ticket information on the audit sheet                            |
| <code>/usr/lpp/psf/bin/ainaudlog</code>  | Writes accounting information to <code>/var/psf/audit.log</code>            |
| Input Data                               |                                                                             |
| <code>/usr/lpp/psf/bin/ainuxind</code>   | Performs no tasks; use it as a model for writing your own user exit program |
| Output Data                              |                                                                             |
| <code>/usr/lpp/psf/bin/ainuxout</code>   | Performs no tasks; use it as a model for writing your own user exit program |

In addition, you can use the source code of the sample user-exit programs to write your own user-exit programs. Infoprint provides the source code in the `/usr/lpp/psf/exits` directory.

---

## Creating and Configuring Auxiliary-Sheet Objects (PSF, Fax, and Email DSS Only)

When you first create a server, Infoprint creates the default auxiliary-sheet objects described in “Infoprint Default Auxiliary-Sheet Objects” on page 90. The following topics describe how you can create and configure auxiliary-sheet objects.

### Creating New Auxiliary-Sheet Objects Using the `pdcreate` Command

You create auxiliary-sheet objects from the AIX command line; you cannot create them through the Infoprint VSM administrator’s GUI. Use `-c auxiliary-sheet` with the `pdcreate` command and specify the server name and an auxiliary-sheet object name to create a new auxiliary-sheet object. Specify a name that uniquely identifies the auxiliary-sheet object within the server. Two servers can each contain an auxiliary-sheet object with the same name, but possibly with different values for their attributes.

You also specify the `psf-exit-form-definition`, `psf-exit-page-mark`, and `psf-exit-program-name` attributes with the command to specify the form definition, whether edge marks print, and the user-exit program used.

For example, to create an auxiliary-sheet object named `custom-start` contained in `Server1` that specifies the `ainuxhdr` user-exit program, the `F1A10110` form definition, and includes edge marks, enter the command:

```
pdcreate -c auxiliary-sheet -x "psf-exit-program-name=ainuxhdr
psf-exit-form-definition=F1A10110 psf-exit-page-mark=true"
Server1:custom-start
```

To read more about auxiliary-sheet attributes, enter the following at the AIX command prompt to view the associated man pages:

```
pd_att_aux_sheet
```

---

## Modifying Start Sheets for 3170 Physical Printers

Although 3170 physical printers do not support auxiliary-sheet objects, they do print start sheets when the value of the `printer-start-sheet` actual destination attribute is `full`.

The shell script that generates these start sheets is called `/usr/lpp/pd/bin/ic70hdr.ksh`. It reads from the `/usr/lpp/pd/bin/ic70hdr.ps` file. You can modify either of these programs to produce a customized start sheet. The output must be a valid PostScript file.



---

## Chapter 7. Gathering Accounting and Auditing Data about Print Jobs

Infoprint allows you to gather accounting information about print jobs from two sources:

- The Infoprint Manager AIX server that applies to all device support systems (DSS). For more information, see “Working with Infoprint AIX Server Accounting Information”.

You should use accounting information from the Infoprint Manager if you:

- need to track accounting information for all types of Infoprint DSSs.
- want to take advantage of the **pdaccount** command to summarize data in a spread sheet program.

- The PSF auditing and accounting user-exit programs (applies only to PSF, FAX, and Email DSSs). For more information, see “Working with PSF Auditing and Accounting User-Exit Programs” on page 105.

You should use accounting information from the PSF auditing and accounting user-exit programs if you:

- use only PSF attached printers.
- need more detailed information than that provided by the **pdaccount** command.

---

### Working with Infoprint AIX Server Accounting Information

While all DSSs can store information about jobs processed, some DSSs are more accurate than others. All actual destination accounting logs are enabled through the server and actual destination **log-accounting-data** attribute. When the **log-accounting-data** attribute. When you specify `log-accounting-data=true`, Infoprint stores data into server accounting logs (one for each destination), which you can either view directly from the command-line or through the **pdaccount** command. The **pdaccount** command allows you to create views of summary information in a comma-delimited format (`Printer1,12997,1989787763`). This information can be saved in a file, which can be imported into a spread sheet to calculate the cost of consumables, the usage rate of printers, or the cost of printing by individual user. The summary information includes both the total pages and total octets (the number of bytes) printed, either by destination or by user as requested for a specified time period. You can also obtain the complete accounting records for a specified time period, instead of the summary data.

## How Does the pdaccount Command Collect Infoprint AIX Server Accounting Information?

To activate Infoprint AIX server account log support, you must change the **log-accounting-data** value. By default, the Infoprint Manager value is `log-accounting-data=false`, and the actual destination default is to use the server setting. As a result, you must set the **log-accounting-data** attribute as follows:

- To activate accounting for all destinations on a server:  
Set the server's **log-accounting-data** attribute to **True** (if an actual destination hasn't specified this attribute, the server's **log-accounting-data** attribute is used).
- To activate accounting for a specific actual destination,  
Set the **log-accounting-data** attribute to **True** for that specific actual destination. Otherwise, the value of the **log-accounting-data** attribute for the server is used.
- To deactivate accounting for all destinations on a server,  
Set the **log-accounting-data** attribute to **False** (if an actual destination hasn't specified this attribute, the server's **log-accounting-data** attribute is used).
- To deactivate accounting for a specific actual destination,  
Set the **log-accounting-data** attribute to **False** for that specific actual destination. Otherwise, the value of the **log-accounting-data** attribute for the server is used.

You may change the **log-accounting-data** attribute with a **pdset** command or the Infoprint Manager Administration GUI. For more information on the Infoprint Manager Administration GUI, see *Infoprint Manager for AIX: Getting Started*.

The **pdaccount** command obtains the following accounting information from one or more Infoprint Manager AIX servers:

- **actual destination name**
- **job owner**
- **global job-id**
- **submission time**
- **completion time**
- **pages-completed**
- **octets-completed**
- **data stream**
- **job name**

**Note:** You only get all these accounting options if you specify `pdaccount -t all` on the command line.

If you wanted to request summary information group by destinations on an Infoprint Manager server named `Server1` from 8 a.m. on 9/20/99 to 8 a.m. on 9/27/99, specify the following from an AIX command line:

```
pdaccount -t destination -s '08:00:00 09/20/99' -e '08:00:00 09/27/99'
Server1
```

Infoprint displays the information in a format similar to the following:

```
Destination Name,Pages Completed,Octets Completed
Printer1,12997,1989787763
Printer2,2455,17676836
Printer3,86673,189808083
```

where `Printer1` specifies the actual destination, 12997 indicates the pages completed, and 1989787763 indicates the octets completed within the specified week.

For more information about using the `pdaccount` command, see *Infoprint Manager: Reference*.

The various DSSs for actual destinations report **pages-completed** differently. For example, actual destinations created using the PSF DSS report the number of Intelligent Printer Data Stream (IPDS) pages printed, based upon the number of **begin-page** and **end-page** structured field pairs in the data. As a result, if you print a 2-up document as duplex, you could get a page count of 4 for a single sheet of paper. However, if you created an actual destination through the AIX DSS (which does not support *number-up* printing), it counts each side-sheet printed as a single page. As a result, if you print duplex, you will get a page count of 2 for each sheet printed out.

## How Do You Manage the Contents of the Infoprint AIX Server Accounting Logs?

Once you specify `log-accounting-data=true` on either an Infoprint AIX server or an actual destination, these accounting logs start growing without bound. The accounting logs must be managed carefully to avoid potential performance problems. Periodically, the log files must be either purged or moved to a different directory. If you do not perform either of these tasks, your installation will run out of space on the file system, preventing you from printing any more jobs. To avoid this problem, you should purge or move the accounting and audit logs as part of your system maintenance.

The accounting logs reside in a subdirectory of the server's directory. The following describes the names and location of the files, as well as their default permissions:

```
$PDBASE/ servername/accounting.logs
```

where *servername* indicates the name of your Infoprint AIX server. Infoprint provides one accounting log for each destination, named *actual\_destination\_name.accounting.log.v1*, where *actual\_destination\_name* specifies the actual destination where the job is processed. Locating them in a separate directory makes them easier for you to manage.

Infoprint restricts direct access to the logs by setting the permissions on the **accounting.log** directory to `rxw` (read,write,execute) for **root** and the system group. The logs themselves will be created with **root** having read and write access and the system group having read access.

To retain a record of Infoprint AIX server accounting data, you need to move the existing log files to a new directory. Use the following procedure:

1. Go to the directory where the log file, for example, `prt1.accounting.log.v1` on `server1`, resides by specifying:  

```
cd $PDBASE/server1/accounting.logs
```
2. Move the `prt1.accounting.log.v1` file to a directory named `1qrt2000` by specifying:  

```
mv prt1.accounting.log.v1 /1qrt2000
```

This command moves the existing file to the new directory and removes it from the `$PDBASE/server1/accounting.logs` directory. When the next job is processed on `prt1`, Infoprint creates a new `prt1.accounting.log.v1` file.

IBM recommends you move the data to another file system rather than deleting it from the system. This allows you to store accounting data and delete it from the system when you no longer need to refer to it. If you want to delete the `podaccount.log` file without storing the data in another directory,

1. Specify

```
cd $PDBASE/server1/accounting.logs
```

This command moves you into the correct path.

2. Enter

```
rm prt1.accounting.log.v1
```

When the AIX command-line prompt returns, you know that the `prt1.accounting.log.v1` file has been deleted from the system.

3. Enter

```
ls
```

This command displays the contents of your directory for you to verify that the file has been deleted. When the next job is submitted for printing, Infoprint creates a new `prt1.accounting.log.v1` file and writes the data into that file.

The `pdaccount` command only finds and processes the information in the original files. Once you move or rename the files, you cannot use the `pdaccount` command to summarize the data. You may want to use the `pdaccount` command to find and process the information and summarize it, store the summaries in a different location, and then delete the logs.

**Attention:** Requesting information for **all** accounting records can consume a lot of the server's memory since all the data is read into memory to be sent to you. If you have a lot of data to retrieve, you should consider requesting it for smaller time periods and concatenating the returned data.

For example, if you want to retrieve all the accounting records for a one month period, you could issue four `pdaccount` commands like this:

```
pdaccount -t all -s '00:00:00 03/01/00' -e '00:00:00 03/08/00' Server A
>March1.accting.data
pdaccount -t all -s '00:00:00 03/08/00' -e '00:00:00 03/15/00' Server A
>March2.accting.data
pdaccount -t all -s '00:00:00 03/15/00' -e '00:00:00 03/22/00' Server A
>March3.accting.data
pdaccount -t all -s '00:00:00 03/22/00' -e '00:00:00 03/31/00' Server A
>March4.accting.data
```

## Usage Considerations by DSS for Accounting Information

This section contains more information about server accounting information by DSS. It also gives suggestions for working with the various DSSs when using the accounting information in Infoprint Manager.

In general, Infoprint Manager logs jobs that complete or are paused, cancelled, or are cleaned while being processed by the actual destination. While Infoprint

Manager **does not** log jobs that are not completed but are put back into the queue because the printer is shutdown when a printer problem is encountered.

#### AIX DSS

- If **wait-for-job-completion** is set to **True** and the job completes successfully or is paused or cancelled, then the page count shown in the accounting log is the number of pages stacked at the printer. For example, a three-page document printed simplex records three pages in the accounting log and three pages are stacked; a four-page document printed duplex records four pages in the accounting log even though only two sheets are stacked.
- If **wait-for-job-completion** is set to **False**, the page count is not based on the number of pages stacked on the printer. In this case, Infoprint Manager uses the following methods to calculate a page count:
  1. The printer backend may return a non-zero page count that is based on the number of pages it is sending to the printer. If this number is returned, Infoprint Manager uses it for the page count that is reported in the accounting log.
  2. If the printer backend returns a zero for the page count and if the user has specified a **job-page-count** with the job, Infoprint Manager reports that page count in the accounting log.
  3. If the printer backend returns a zero for the page count and the user has not specified a **job-page-count** and the job is PCL or PostScript, then Infoprint Manager attempts to calculate a page count and records that calculated page count in the accounting log.
- **Limitation:** The octet count reported for cancelled or paused jobs may not be accurate.
- The octet count reported for cancelled jobs may not be accurate.

#### PSF DSS with TCP/IP attachment type

- On jobs that complete successfully, the page count shown in the accounting log is the number of AFP pages stacked on the printer, including start pages and end pages.

**Note:** For n-up documents, up to *n* pages are counted for each sheet-side that prints.

- **Limitations:**
  - When printing a multiple-document job in which all the documents are ASCII, the accounting log only shows pages for the last document printed.
  - If a job is paused or cancelled, the page count shown in the accounting log may not be accurate.
  - On paused jobs, the octet count is always zero (0).

#### PSF DSS with Other-Driver attachment type

- If **wait-for-job-completion** is set to **True** and the job completes successfully, then the page count shown in the accounting log is the number pages stacked at the printer. For example, a three-page document printed simplex records three pages in the accounting log and three pages stacked; a four-page document printed duplex reports four pages in the accounting log even through only 2 sheets are stacked.

- If **wait-for-job-completion** is set to **False**, the page count is not based on the number of pages stacked on the printer. Instead, the page count recorded in the accounting log is the number of pages PSF reports it has sent to the printer driver.
- **Limitations:** The page count and octet count reported in the accounting log for cancelled and paused jobs is not accurate.

#### **PSF DSS Command and Upload attachment types**

The page count recorded in the accounting log for destinations using the command or upload attachment types is the number of pages PSF generates and sends to the printer or host system. It is not based on the number of pages received or printed by the printer or host system.

#### **Email DSS**

The page count recorded in the accounting log for destinations using the Email DSS reflects the number of pages generated and sent to the email recipient by Infoprint Manager. It is not based on the number of pages received by the email recipient.

#### **FAX DSS**

The page count recorded in the accounting log for destinations using the FAX DSS reflects the number of pages generated and sent to the fax recipient by Infoprint Manager. It is not based on the number of pages received or printed by the fax recipient.

#### **Infoprint 2000 DSS**

The page count recorded in the accounting log for destinations using the Infoprint 2000 DSS reflects the number of pages generated and sent to the destination by Infoprint Manager. It is not based on the number of pages stacked on the printer.

#### **BSD DSS**

The page count recorded in the accounting log for destinations using the BSD DSS is based on the following criteria:

- If the user specifies a **job-page-count** job attribute or a **page-count** document attribute with the print job, Infoprint Manager records that number in the accounting log.
- If the user has not specified **job-page-count** or **page-count**, and the data being printed is PCL or PostScript, Infoprint Manager attempts to calculate the page count and records the calculated page count in the accounting log.

#### **3170 DSS**

The page count recorded in the accounting log for destinations using the 3170 DSS is not based on the number of pages stacked on the printer. Instead, it is based on the following criteria:

- If the user specifies a **job-page-count** job attribute or a **page-count** document attribute with the print job, Infoprint Manager records that number in the accounting log.
- If the user has not specified **job-page-count** or **page-count**, and the data being printed is PCL or PostScript, Infoprint Manager attempts to calculate the page count and records the calculated page count in the accounting log.

## Working with PSF Auditing and Accounting User-Exit Programs

The accounting and auditing PSF DSS user-exit programs also record data about jobs. For each job printed, Infoprint activates the user-exit programs specified by the actual destination's **accounting-log** and **audit-log** attributes *before* processing the print job's trailer page. More than one Infoprint actual destination can use the same user-exit program to write into the same log file.

### What Do the PSF DSS Accounting and Auditing User-Exits Provide?

The accounting and audit user-exit programs record statistical data on jobs processed by Infoprint actual destinations. Table 4 shows the most common accounting and audit user-exit programs, the files where they record data, and the types of data that they record.

Table 4. PSF DSS Accounting and Audit User-Exit Programs

| <b>Program</b>                                                                                                         | <b>Log File</b>         | <b>Records</b>                                                                                                                                                                                |
|------------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| /usr/lpp/psf/bin/ainuxaccp                                                                                             | /var/psf/podaccount.log | Job submitter, job ID, actual destination, pages per job, pages per actual destination, pages per output bin, data object resources, start date, start time, copies per job                   |
| /usr/lpp/psf/bin/ainacclog                                                                                             | /var/psf/accounting.log | Job submitter, job name, actual destination, pages per job, pages per actual destination, jobs per output bin, data object resources, start date, start time, fonts, resident fonts, overlays |
| /usr/lpp/psf/bin/ainaudlog                                                                                             | /var/psf/audit.log      | Job submitter, job name, actual destination, pages per job, pages per actual destination, jobs per output bin, data object resources, start date, start time, fonts, resident fonts, overlays |
| <b>Note:</b> /usr/lpp/psf/bin/ainacclog and /usr/lpp/psf/bin/ainaudlog record the same information in different files. |                         |                                                                                                                                                                                               |

This information is specified in flat ASCII format, with a single line for each job that is processed. You can use this information to determine billing procedures, to assess the workload of different output devices, or to determine how resources are used at your installation.

### How Do You Format PSF DSS Accounting and Audit Data for Viewing?

To view PSF DSS accounting and audit data, you can use one of the following executable reporting utilities that are provided with Infoprint:

- ainupod1** Reports accounting data stored in **podaccount.log**, sorted by job submitter.
- ainupod2** Reports accounting data stored in **podaccount.log**, sorted by job ID.

|                 |                                                                                         |
|-----------------|-----------------------------------------------------------------------------------------|
| <b>ainupod3</b> | Reports times and pages printed by the job submitter from <b>podaccount.log</b> .       |
| <b>ainurpt1</b> | Reports accounting data stored in <b>accounting.log</b> , sorted by actual destination. |
| <b>ainurpt2</b> | Reports accounting data stored in <b>accounting.log</b> , sorted by job submitter.      |
| <b>ainurpt3</b> | Reports times and pages printed by the job submitter from <b>accounting.log</b> .       |
| <b>ainurpt4</b> | Reports audit data stored in <b>audit.log</b> , sorted by actual destination.           |
| <b>ainurpt5</b> | Reports audit data stored in <b>audit.log</b> , sorted by job submitter.                |
| <b>ainurpt6</b> | Reports times and pages printed by the job submitter from <b>audit.log</b> .            |

For examples using these utilities, see *Infoprint Manager: Reference* or the man pages for the utilities.

---

## How Do You Manage the Contents of the PSF DSS Accounting Data File?

An installation with a regular schedule of printing jobs will accumulate accounting and audit data that must be managed carefully to avoid potential performance problems. Periodically, the log files must be either purged or moved to a different directory. If you do not perform either of these tasks, your installation will run out of space on the file system, preventing you from printing any more jobs. To avoid this problem, you should purge or move the accounting and audit logs as part of your system maintenance.

To retain a record of PSF DSS accounting and audit data, you need to move the existing log files to a new directory. Use the following procedure:

1. Go to the directory where the log file, for example, **podaccount.log**, resides by specifying:  

```
cd /var/psf
```
2. Move the **podaccount.log** file to a directory named **1quarter96** by specifying:  

```
mv podaccount.log /1quarter96
```

This command moves the existing file to the new directory and removes it from the **/var/psf** directory. The next time a job is submitted for printing from Infoprint Submit, Infoprint will create a new **podaccount.log** file in the **/var/psf** directory and write a single line of data for each job.

IBM recommends you move the data to another file system rather than deleting it from the system. This allows you to store accounting data and delete it from the system when you no longer need to refer to it. If you want to delete the **podaccount.log** file without storing the data in another directory,

1. Specify  

```
cd /var/psf
```

This command moves you into the correct path.

2. Enter  

```
rm podaccount.log
```



When the AIX command-line prompt returns, you know that the **podaccount.log** file has been deleted from the system.

3. Enter

```
ls
```

This command displays the contents of your directory for you to verify that the file has been deleted. When the next job is submitted for printing, Infoprint creates a new **podaccount.log** file and writes the data into that file.



---

## Chapter 8. Creating and Managing Resource-Context Objects (PSF, Fax, Email, and Infoprint 2000 DSS Only)

Resource-context objects identify the locations of different types of Advanced Function Presentation (AFP) resources that jobs sent to PSF physical printers, fax destinations, and e-mail destinations can reference. Resource-context objects let you encapsulate the directory path name in one place. Then you specify the resource-context object name rather than directory names with documents and actual destinations when specifying where to find resources. Later, if the location of a resource subsequently changes, you only need to modify the path name specified in the corresponding resource-context object.

The different types of AFP resources are:

### Form definitions

Form definitions provide instructions on how output devices position data on the page. Form definitions can specify overlays, a paper source for cut-sheet printer devices, duplexed printing, text suppression, data position, and the number and modifications of pages.

### Page definitions

Page definitions contain the formatting controls for line data. Page definitions can include controls for the number of lines per logical page, font selection, print direction, and the mapping of individual fields to positions on the logical page.

### Page segments

Page segments contain text and images that you can include at any addressable point on a page or an electronic overlay.

### Overlays

Overlays are collections of predefined data such as lines, shading, text boxes, or logos, that can merge with variable data on a page or a form during printing or transmission.

**Fonts** A font is a single size and typeface in a particular type family, including letters, numerals, punctuation marks, special characters, and ligatures.

You use the **pdcreate** command to identify the directory or directories where the AFP resources reside and provide a name for the resource-context object. You use the **PSF Resources** tab of the actual destination and default document attributes notebooks in the advanced Infoprint VSM administrator's GUI, or the AIX command line, to identify the resource-context object name or which paths you want to associate with that object. Jobs can also reference resource-context objects through their contained documents. See "The Search Order for AFP Resources" for the search order Infoprint uses to locate resource-context objects for a job. Both the actual destination and the resource-context objects that are referenced must reside in the same Infoprint server.

---

## The Search Order for AFP Resources

The following describes the order and the conditions on which Infoprint searches for AFP resources.

1. For fonts, paths specified by the **-osrchfontlib** keyword on the **enq**, **lp**, **qprt**, or **lprafp** command

2. Paths specified by the **-oreslib** keyword on the **enq**, **lp**, **qpri**, or **lprafp** command
3. The path specified by the **resource-context-user** document attribute.
4. The paths specified by one of the following document attributes, depending on the type of resource:
  - **resource-context-font**
  - **resource-context-form-definition**
  - **resource-context-overlay**
  - **resource-context-page-definition**
  - **resource-context-page-segment**

**Note:** When one of these document attributes contains a value, Infoprint ignores any location specified by the same attribute of a default document object, if one is used with the job.

5. The path specified by the **resource-context** document attribute.
6. The path specified by the **PSFPATH** environment variable.
7. The paths specified by the resource-context attributes of the actual destination. These attributes have the same names as the document attributes identified in step 4.
8. The **/usr/lpp/psf/reslib** directory.
9. For fonts, the **/usr/lpp/afpfonts** directory.
10. For fonts, the **/usr/lpp/psf/fontlib** directory.

If Infoprint cannot find the resource in any of the paths, it still processes the job and prints an error message at the end of the job.

---

## Creating a New Resource-Context Object

You create resource-context objects from the AIX command line; you cannot create them through the Infoprint VSM administrator's GUI. Use **-c resource-context** with the **pdcreate** command and specify the **context-address**, the server name, and resource-context object name to create a new resource-context object. Specify a name that uniquely describes the resource-context object within the server. All resource-context objects within a server appear in the selection lists for the fields in the **PSF Resource** tab of the actual destination attributes notebook. Two servers can each contain a resource-context object with the same name, but possibly with different values for their attributes.

Infoprint uses resource-context object names as values for the lists associated with the fields in the actual destination attributes notebook or as valid values you can enter in the fields of the default document attributes notebook. Job submitters can also use them as values for attributes of a document within a job.

For example, to create a resource-context object named **Resfont1** contained in server **Server1** that identifies **/resource/fonts/group1** as the directory containing AFP font resources, enter the command:

```
pdcreate -c resource-context -x "context-address=/resource/fonts/group1"
Server1:Resfont1
```

---

## Changing a Directory Path for a Resource-Context Object

If you need to change the path to a resource-context object, you use the **pdset** command.

For example, to change the path for the resource-context object named Resfont1 contained in server Server1 to /resource/fonts/group2 as the directory containing AFP font resources, enter the command:

```
pdset -c resource-context -x "context-address=/resource/fonts/group2"
 Server1:Resfont1
```

To read more about resource-context attributes, enter the following at the AIX command prompt to view the associated man pages:

```
man pd_att_res_context
```

---

## Assigning Resource-Context Objects to an Actual Destination

If you have the advanced Infoprint Manager Administration GUI, you can use it to assign resource-context objects to a PSF physical printer, fax destination, or e-mail destination. You can also use the AIX command line to do this.

### Using the AIX Command Line

To assign resource-context objects to a PSF physical printer, fax destination, or e-mail destination from the AIX command line, use the **pdset** command and the **resource-context-font**, **resource-context-overlay**, **resource-context-form-definition**, **resource-context-page-definition**, or **resource-context-page-segment** attribute. For example, to associate the font resource context object Resfont1 with the PSF physical printer Serv1-pp residing in server Server1, enter the following command:

```
pdset -c destination -x "resource-context-font=Resfont1"
 Server1:Serv1-pp
```

If you have not created a resource-context object, you can assign the path name of a directory containing resources to the actual destination in the same way. For example, to associate the directories /resource/overlays/julia and /resource/overlays/henry, which contain overlays, with the fax destination Serv1-fax residing in server Server1, enter the following command:

```
pdset -c destination -x
 "resource-context-overlay=/resource/overlays/julia:/resource/overlays/henry"
 Server1:Serv1-fax
```

Infoprint searches the directories specified by the resource-context objects or the directories you specified for resources required by jobs.

---

## Assigning a Resource-Context Object to a Default-Document Object

If you have the advanced Infoprint Manager Administration GUI, you can use it to assign resource-context objects to a default-document object. You can also use the AIX command line to do this.

### Using the AIX Command Line

To assign resource-context objects to a default-document object from the AIX command line, use the **pdset** command and the **resource-context-font**, **resource-context-overlay**, **resource-context-form-definition**, **resource-context-page-definition**, **resource-context-page-segment**, or **resource-context** attribute. For example, to associate the font resource context object Resfont1 with the default document report residing in server Server1, enter the following command:

```
pdset -c initial-value-document -x "resource-context-font=Resfont1"
 Server1:report
```

If you have not created a resource-context object, you can assign the path name of a directory containing resources to the default document in the same way. For example, you want Infoprint to search for resources of any type that it cannot find in the other resource contexts associated with a default document in the directory /resource/any. To associate this directory with the default document report residing in server Server1, enter the following command:

```
pdset -c initial-value-document -x "resource-context=/resource/any"
Server1:report
```

You can now assign the default-document object to an actual destination (use the Infoprint Manager Administration GUI) or inform the job submitters of the resource objects assigned to this default-document object.

---

## Chapter 9. Using Infoprint Manager Notifications-administrators

Infoprint Manager can detect events (such as **job completed** or **destination needs attention**) as they occur, generate messages about those events, and deliver the messages to users who need the information. For example, users can receive messages about jobs they submit, operators can be notified about Infoprint objects that require their attention, and administrators can be notified if someone makes a configuration change. With notifications, you don't have to query for status of the objects in your system— you just receive messages when specific events occur so you can take care of them.

You can tailor who receives these messages and how they are delivered based on the **notification profile** that is set for a particular Infoprint object.

---

### Understanding notification profiles

Most Infoprint objects (the server, actual destinations, logical destinations, queues, jobs, and default jobs) have **notification profiles** associated with them. A notification profile is composed of one or more *notification profile entries*. Each notification profile entry has three main components:

#### **Event Identifiers**

Which events cause messages to be sent. See “Event identifiers” on page 114 for more information.

#### **Delivery method**

How the messages are delivered. See “Delivery method and delivery address” on page 114 for more information.

#### **Delivery address**

Where the messages are sent. See “Delivery method and delivery address” on page 114 for more information.

In addition, a notification profile entry can include a comment (text that Infoprint will add to the general message text) and a locale (to set the language that the message will be sent in). Comments are optional. If you don't specify a locale, Infoprint delivers messages using the locale (language) that the user is running in.

Some objects only need one entry in their notification profiles. For example, when a person submits a job, he is probably the only one who needs to receive information about it, and he will probably be content to have all of the messages about that job delivered the same way.

For other objects, there are very good reasons to have multiple entries. For example:

- If operators manage printers from more than one workstation, you can create an entry for each workstation. That way, all of the messages go to all of the machines.
- If operators can address some messages (like **destination-needs-attention**), but an administrator needs to address others (like **object-deleted**), you can create an entry for each operator and one for the administrator. Messages are delivered to the person who can handle them.

- If an administrator likes to use Infoprint Manager Notifications while he's at work, and wants to keep a more permanent record of how often some events occur, he can set up two entries. One delivers messages to the Infoprint Manager Notifications client and one writes certain messages into a file that he can check periodically.

## Event identifiers

The **event identifiers** component lists the Infoprint events that trigger notifications. You can find a full list of Infoprint notification events and their descriptions in Chapter 9 of the *Infoprint Manager: Reference*. In the descriptions, you will see what objects each event supports. If you add an event to an object that it does not support, no messages will ever be generated for that event. For example, you can add the **queue-backlogged** event to a notification profile entry for an actual destination, but **queue-backlogged** only supports the queue, job, and server objects. As a result, the actual destination notification profile will not generate any messages about that event.

That chapter also lists the Infoprint Manager *event classes*, or groups of related notification events. When you add event identifiers to a notification profile, you can add individual events, event classes, or a combination of the two.

Each type of Infoprint object has a default set of event identifiers. Refer to “Default notification profiles” on page 117 for a list of defaults for each object.

## Delivery method and delivery address

The **delivery method** component shows how you want notification messages to be delivered. The **delivery method** and **delivery address** components are strongly related; the delivery method you choose determines the type of value you use for the delivery address.

In addition, delivery method and delivery address are the *keyed components* in notification profile entries; they are the two values that Infoprint Manager checks when you modify a notification profile. If the delivery method and delivery address that you specify match the delivery method and delivery address of an existing entry, Infoprint Manager updates that entry. If both values don't match any of the existing entries, Infoprint Manager adds a new entry to the profile.

There are various delivery methods defined for Infoprint objects. All methods are valid for all objects **except** for **job-log**; **job-log** is only valid for jobs. Table 5 on page 115 lists the delivery methods, along with descriptions and how to set the delivery address for each type. <sup>1</sup>

---

1. Two other delivery methods, **sapcb** and **sapconnect** exist, but they are only used internally in conjunction with the Infoprint Manager SAP Print Feature. You should never use either of those values in a notification profile entry.



Table 5. Infoprint Notification Delivery Method Characteristics

| Delivery Method                                                                      | Description                                                                                                                                                                                                                                                                                    | Delivery address                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>message</b></p> <p>Message is the default delivery method for all objects.</p> | <p>Sends a message to the Infoprint Manager notification server, where it waits for an Infoprint Manager Notifications client to pick it up. Once a message is picked up, it is deleted from the notification server; there are no further records of those messages.</p>                      | <p>The delivery address listed in the notification profile can be whatever you want it to be– a user id, office number, IP address, driver’s license number– as long as it is unique. In order to receive messages sent to that address, you must set the delivery address listed in the <b>Settings</b> dialog in the Infoprint Manager Notification client to the same value. The Infoprint Manager Notifications client will only pick up messages that specify an identical delivery address.</p> |
| <p><b>electronic-mail</b><br/>(synonyms: <b>e-mail</b>, <b>email</b>)</p>            | <p>Sends an E-mail to the address listed in the delivery address, OR, for jobs submitted using Infoprint Select, to the Select message window. Refer to “Infoprint Select and notifications” on page 116 for more information.</p>                                                             | <p>The E-mail address that you want notification messages to be sent to. For example, <b>kjones@printerco.com</b>. If you submit jobs using Infoprint Select, this value is set for you.</p>                                                                                                                                                                                                                                                                                                          |
| <p><b>exit</b></p>                                                                   | <p>Doesn’t actually send a message. Instead, when the event specified in the event identifier occurs, Infoprint Manager runs an exit program or script. Refer to “Using the ‘exit’ delivery method” on page 116 for more information.</p>                                                      | <p>The full path to the notification exit program or script (with hard-coded arguments, if any).</p>                                                                                                                                                                                                                                                                                                                                                                                                  |
| <p><b>file</b></p>                                                                   | <p>Writes the message in the file you specify in the delivery address. If the file doesn’t exist, Infoprint Manager will create it. If the file does exist, Infoprint Manager will overwrite it the first time it writes a message. After that, messages are added to the end of the file.</p> | <p>The directory path and name of the file that you want to write your notification messages in. This file must reside on the same system as your Infoprint Manager server.</p>                                                                                                                                                                                                                                                                                                                       |
| <p><b>file-add-to</b></p>                                                            | <p>Adds the message to the end of the file you specify in the delivery address. If the file doesn’t exist, Infoprint Manager will create it.</p>                                                                                                                                               | <p>The directory path and name of the file that you want to write your notification messages in. This file must reside on the same system as your Infoprint Manager server.</p>                                                                                                                                                                                                                                                                                                                       |
| <p><b>job-log</b></p> <p>Only valid for jobs.</p>                                    | <p>Writes messages into the <b>job-log</b> attribute of the job. To see the messages, issue the <b>pdls</b> command for the job-log attribute on the job you want to know about.</p>                                                                                                           | <p>No value needed.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <p><b>none</b></p>                                                                   | <p>Does not send any notifications; turns notification off.</p>                                                                                                                                                                                                                                | <p>No value needed.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

## Infoprint Select and notifications

When you submit a print job using Infoprint Select, a default notification profile is sent with the job. That notification profile sets the event-identifiers to a default set of events and the delivery method to either **e-mail** (if you have the Select message window running) or to **none** (if you don't have it running). The Infoprint Select default notification profile overrides any notification settings you configure in a default job.

If you don't want to use the Select default notification profile, use the appropriate procedure below.

### Windows NT

1. On the Windows system that Infoprint Select is installed on, right click on **My Computer** and select **Properties**.
2. In the System Properties window, click the **Environment** tab.
3. Click one of the variables listed under **System Variables** to signal that you want to create a system variable. The variable and its value will appear in the fields at the bottom of the dialog.
4. Clear the **Variable** and **Value** fields.
5. In the **Variable** field, type: `pdnotify` and in the **Value** field type: `override_select`.
6. Click **Set**.
7. Verify that `pdnotify` appears in the list of **System Variables** and not in the **User Variables**. If it appears in the list of User variables, delete it and start again from step 3.
8. Click **OK**.
9. Restart your system to make the changes take effect.

### Windows 2000

1. On the Windows system that Infoprint Select is installed on, right click on **My Computer** and select **Properties**.
2. In the System Properties window, click the **Advanced** tab.
3. On the Advanced tab, click **Environment Variables**.
4. In the **System variables** box on the **Environment Variables** dialog, click **New**.
5. In the **Variable Name** field, type `pdnotify` and in the **Variable Value** field, type `override_select`.
6. Click **OK**.
7. Verify that `pdnotify` appears in the list of **System variables** and not in the **User variables**. If it appears in the list of User variables, delete it and start again from step 4.
8. Click **OK** in the **Environment Variables** dialog.
9. Click **OK** in the System Properties window.
10. Restart your system to make the changes take effect.

### Using the 'exit' delivery method

The **exit** delivery method allows you to set up automatic responses to system events beyond just sending a message. When you set the delivery method for a given event to **exit**, you use the delivery address to specify the explicit path to a script or program on your system. Whenever that event occurs, Infoprint Manager runs the script or program you specify.

For example, if the Infoprint Manager server runs low on disk space, the **disk-space-low** event generates a message for the system administrator. The administrator then has to do something to clean up the disk so Infoprint Manager can continue to run effectively. However, using the **exit** delivery method can automate that process by launching a "disk clean up" script. The administrator can still receive the message, but will know that the script is already working on the problem.

If you are using the Print Optimizer DSS, Infoprint Manager provides a sample script called **poexitcleanup** that you can use with the **exit** delivery method. The script demonstrates one way that you can automate cleaning up disk space in the Print Optimizer resource filesystem after the **disk-space-low** event occurs.

By default, when you use the exit delivery method, Infoprint Manager only passes two values along to the script or program: the message number of the event that occurred and the text of the message. As a result, the command line that the exit delivery method executes is composed of the path that you specified in the delivery address, the last three digits of the message number, and the text of the message.

Therefore, if you create a notification profile entry for the **job-completed** event, setting the delivery method to **exit** and the delivery address to `/infoprint/exits/myscript`, when a job finishes printing, Infoprint Manager will generate and execute a command line similar to this one:

```
/infoprint/exits/myscript 280 "5010-280 Finished processing job ofc,
Job 20 (3520800004)."
```

The scripts or programs you write may require other information, such as the destination name or the printer model. To pass those values, you can include them in the delivery address of the notification profile entry; they will be added to the end of the command line when Infoprint Manager creates it.

---

## Default notification profiles

By default, the person who creates an object (server, destination, queue, job) receives the notification messages about that object. The default notification profile settings provide information such as object status, error conditions, or configuration changes. Some of these events require the person managing the object to intervene; for example, someone may need to clear a paper jam.

By default, the events listed in the following table generate messages for the corresponding objects. These messages are delivered to the user who created the object: job submitters receive messages about their print jobs; the administrator receives messages about destinations and servers that he or she created. The default delivery method is **message**, so the notifications are sent to the Infoprint Manager Notification client on the system that the person used to create the object.

*Table 6. Default notification profile settings*

| Object             | Events                                                                                                                                                    |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Actual destination | destination-needs-administrator<br>destination-needs-attention<br>destination-needs-operator<br>destination-timed-out<br>object-cleaned<br>object-deleted |

Table 6. Default notification profile settings (continued)

|                     |                                                                                                                                                                                                                                                                                                                          |
|---------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Default Job         | No defaults set. Refer to “Using notification profiles with default jobs” for more information.                                                                                                                                                                                                                          |
| Job                 | destination-needs-attention<br>destination-needs-operator<br>destinations-not-ready-for-job<br>document-aborted-by-destination<br>document-aborted-by-server<br>document-cancelled-at-destination<br>job-aborted-by-server<br>job-cancelled-by-operator<br>job-cannot-be-scheduled<br>job-completed<br>past-discard-time |
| Logical destination | object-cleaned<br>object-deleted                                                                                                                                                                                                                                                                                         |
| Queue               | object-cleaned<br>object-deleted<br>queue-backlogged                                                                                                                                                                                                                                                                     |
| Server              | internal-server-error<br>low-on-memory<br>memory-exhausted<br>object-cleaned<br>object-deleted<br>out-of-disk-space<br>out-of-dpf-haids<br>out-of-dpf-job-numbers<br>out-of-dpf-raids<br>sapcbd-down<br>sapconnect-down<br>server-shutdown-complete                                                                      |

Determining how much notification administrators, operators, and job submitters require takes some planning and, as you familiarize yourself with Infoprint, you should discover when you require more or less notification. You can start by using the defaults and see how many and what kind of messages you receive. If you find that you need more or less notification, or if you want to modify which users receive notifications, or if you want messages to be sent using a different delivery method, you can change the notification profiles.

## Using notification profiles with default jobs

When someone submits a print job, Infoprint Manager sends messages about that job based on a default notification profile. As a result, the delivery method is **message**, the delivery address is “the user ID of the person who submitted the job @ the address of the system the job was submitted from,” and the event identifiers are those listed in Table 6 on page 117. (If you submit jobs using Infoprint Select, the default notification profile is different. Refer to “Infoprint Select and notifications” on page 116 for additional information.)

If you want to change the settings in the default notification profile, you can create a notification profile on a default job. There are several things to keep in mind when you set up a notification profile on a default job:

- You can only set one default job on each logical destination. As a result, all of the jobs will use the same notification profile.

- If you set a delivery address in the notification profile for the default job, all messages will go to that address. However, if you leave the delivery address blank, Infoprint Manager will fill it in with the address that the job was submitted from (you can't specify this address; it is sent with the job). This option only works with the **message** and **e-mail** delivery methods and is the only time that the notification profiles are merged.
- If you submit a job with an explicit notification profile (for example, by including the **notification-profile** attribute when you submit a job using **pdpr**), that profile overrides the one set in the default job.

**Note:** If you submit jobs using Infoprint Select, an explicit notification profile is sent with every job. If you want to use a notification profile on a default job with Infoprint Select, refer to "Infoprint Select and notifications" on page 116 for information about overriding Select notifications.

---

## Changing notification profiles

### For jobs, default jobs, server, and actual destinations

You can use the properties notebooks in the Infoprint Manager Administration GUI to change notification profiles for jobs, default jobs, servers, and actual destinations. Open the properties notebook and click the **Notification** tab for an actual destination, a job, or a default job. For a server, click the **Other** tab. On the page that opens, you can see the notification profile entries that already exist, including:

- How messages about that object are delivered
- Who they are sent to
- What events generate messages
- Any comments that are included with the messages

Use the **Add**, **Modify**, and **Delete** buttons to make changes to the notification profile. Refer to the online help for the Infoprint Manager Administration GUI for additional information. You can also change notification for jobs in the Infoprint Manager Operations GUI.

**Note:** If you change the delivery method, make sure you change the delivery address appropriately.

---

## Getting help for notification messages

If you receive a notification message that you don't understand, Infoprint Manager provides a way to get more information about the situation. In some cases, the explanation even suggests some things you can do to resolve the problem.

To see the full text of an error message, use the **pdmsg** utility and specify the message number to display help for notification messages you received.

For example, you receive the following notification message about the PrintQueue1 contained in server MainServer.

```
To:nrharvey@hope.bpc.boulder.ibm.com
Subject: 5010-192 Message from Infoprint server: MainServer

[05/30/97 07:26:38] 5010-304 The queue MainServer:PrintQueue1 is backlogged.
```

To receive help for message 5010-304, enter the command:

pdmsg 5010-304

Infoprint displays information similar to the following:

```
5010-304 The queue _____:_____ is backlogged.
```

```
5010-304
```

```
EXPLANATION: Infoprint calculates that there are too many jobs in
this queue for all the jobs to print within the time specified by the
queue-backlog-upper-bound value.
```

```
A notification-profile value requested that you be notified of the event
queue-backlogged.
```

```
SYSTEM ACTION: The queue continues to accept jobs, but there will
be a delay before they print.
```

```
RESPONSE: Alleviate the backlog by moving some of the
jobs to a different queue or by adding actual destinations to this queue.
```

**Note:** The **LANG** environment variable and the message catalogs installed control the language in which the **pdmsg** utility displays message help information.

---

## Other notification methods

### Notify-operator attribute

The **notify-operator** attribute is a scaled-down version of a notification profile. It can only be set on Infoprint Manager queues and actual destinations and can only use the **e-mail** and **message** delivery methods. In addition, it only sends messages when one of the following events occur:

1. A job is added to a queue.
2. An actual destination starts processing a job.
3. An actual destination finishes processing a job.

The syntax of the **notify-operator** attribute is:

```
delivery-method:delivery-address
```

Refer to Table 5 on page 115 for descriptions of the e-mail and message delivery methods and their corresponding delivery addresses. By default, the notify-operator attribute is set to **message:your user ID@your node** when you create an actual destination or a queue. To change the value for an actual destination, you can use the **Notification** tab of the properties notebook. To change the value for a queue, use the **pdset** command.

The messages that the notify-operator attribute delivers are not standard error messages like the ones you receive when you use a full notification profile. Instead, you write the messages that you want to send and specify them as attributes of jobs when you submit them.

**Note:** You must either specify those attributes in the command when you submit the job or set the text in the job and document defaults for the appropriate logical destination.

The job attributes that you use to specify these messages are the following.

- **job-message-to-operator**  
The message that Infoprint Manager sends when it adds a job to the queue.
- **job-start-message**  
The message that Infoprint Manager sends when the job starts processing.
- **job-end-message**  
The message that Infoprint Manager sends when the job finishes processing.

You can type the text for all three of these messages in the appropriate field on the **Job Notification** tab of the properties notebook for a job or a default job.

In addition, you can use the **job-start-message** attribute in conjunction with the **job-start-wait** attribute. If you set the **job-start-wait** attribute on a job (or in a default job) to **true**, the actual destination receives the job and sends the job-start message. Then, it pauses the actual destination until the operator intervenes. This function is useful when different jobs need to be printed on different types of paper. Operators don't need to manually pause the actual destination to change paper between jobs; Infoprint Manager does it automatically. Once the printer is ready, the operator resumes the actual destination and the job prints.

To use the **job-start-wait** attribute, you must set it to **yes** on the job or default job. You can specify the attribute in the command when you submit a print job or set it on the **Job Notification** tab of the properties notebook for default jobs.





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## Part 3. Maintaining Your Infoprint System

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## Chapter 10. Controlling Access to Infoprint

This chapter describes:

- “Managing Infoprint Security with DCE”
- “Managing Infoprint Non DCE Security” on page 134

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### Managing Infoprint Security with DCE

Distributed Computing Environment (DCE) is an application that allows the secure use and administration of distributed applications, such as Infoprint. Managing DCE security is similar to managing AIX security. As a DCE administrator, you create *groups* that have certain permissions related to Infoprint objects. When logged into DCE, each user who has an account with a group has the permissions for the group. A DCE group that has **read**, **write**, and **delete** permission for an Infoprint object, such as a server or a queue, is similar to an AIX group that has **read**, **write**, and **execute** permission for an AIX directory or file. Unlike AIX **write** permission, DCE **write** permission allows you to modify, but not to delete, an object.

### Determining Appropriate DCE Permissions for Infoprint User Groups

This section describes four categories of users who need different permissions for Infoprint objects.

#### Administrators

This group needs to create, delete, and modify the objects for which they are responsible in the printing system. They must have **read**, **write**, and **delete** permission for these objects.

#### Printing system operators

This group needs to manage jobs and assist users. To manage jobs sent to an actual destination, the printing system operators must have **read** and **write** permission for the actual destination. To manage jobs that have been retained in a server, the printing system operators must have **read** and **write** permission for the server.

#### Printer operators

This group loads media and other supplies into printer devices. In order to make an actual destination accurately reflect the state of its printer device, printer operators must be able to set actual destination attributes. They must have **read** and **write** permission for the actual destination.

#### End users

This group needs to print, fax, and email jobs, modify their own jobs, cancel their own jobs, and query Infoprint objects. They do not need to log into DCE to submit jobs to unrestricted logical destinations or to modify, query, or cancel those jobs. They must have **read** permission for restricted logical destinations in order to submit jobs to those logical destinations.

When you installed Infoprint with DCE on your system, the installation created two DCE groups: **pd\_admin** and **pd\_operator**. By default, these groups have

permissions for every Infoprint object that you create. The **pd\_admin** group has **read**, **write**, and **delete** permission. The **pd\_operator** group has **read** and **write** permission.

The **pd\_admin** and **pd\_operator** groups may be sufficient for your needs. Members of these two groups can do all the administrator and operator tasks for your system.

On the other hand, you may need to create groups with different permissions. For example, if the printer operators are not the same people as the printing system operators, you may wish to create another group with **read** and **write** permissions only for actual destinations. You may also want to create a group of users who can submit jobs to a restricted output device.

## Adding Infoprint Administrators and Operators to the AIX **printq** Group

You must add all Infoprint administrators and operators to the AIX **printq** group. To do this, use the AIX System Management Interface Tool (SMIT).

To use SMIT:

1. On the AIX command line, enter:

```
smit chgroup
```

The SMIT Change Group Attributes panel is displayed.

2. Type **printq** in the Group name field and press Enter.
3. Type the user IDs of the administrators and operators, separated by commas, in the User List field and press Enter.
4. Exit from SMIT.

## Creating a DCE Group

To create a DCE group:

1. Log into DCE as the cell administrator:

```
dce_login cell_admin
```

2. To start the AIX System Management Interface Tool and go directly to the panel for creating a DCE group, enter:

```
smit mkdcegroup
```

The Add a Group Name panel is displayed.

3. In the **Group NAME** field, enter the name of the DCE group you want to add, for example, 203\_Operators.
4. In the **FULL name** field, enter a description of the group, for example, Printer operators for Room 203.
5. Select **Do**. SMIT displays a panel showing the progress of your command. When the command is successful, the running man icon at the top right corner of the panel stands with his arms up.
6. Select **Done**.

## Creating DCE Identities for Users

Before you can give a person an account with a DCE group, you must first create a DCE identity, or *principal*, for the person. Like an AIX user ID, a DCE principal has a login name and a user identification number (UID). Use the same login name and UID for DCE as for AIX.

To create a DCE principal for a user whose login name is `lkbyrd` and whose UID is 975:

1. Log into DCE as the cell administrator.
2. Enter:  

```
smit mkdceprinc
```

The Add a Principal panel is displayed.

3. In the **Principal NAME** field, enter the login name of the user you want to add, for example, `lkbyrd`.
4. In the **Principal ID** field, enter the UID number, for example, 975.
5. In the **Full NAME** field, enter the user's name and any other appropriate information, such as the user's telephone number.
6. Select **Do**. SMIT displays a panel showing the progress of your command. When the command is successful, the running man icon at the top right corner of the panel stands with his arms up.
7. Select **Done**.

## Giving a User a Primary Account with a DCE Group

After you have created a DCE principal for a user, you must give the principal a primary account with a DCE group. To do this:

1. Log into DCE as the cell administrator.
2. Enter:  

```
smit mkdceacct
```

A panel listing types of DCE accounts is displayed.

3. Select **user**. The Add an Account panel is displayed. You may have to use the scroll bar on the right side of the window to display all the fields.
4. In the **Principal to create account for** field, enter the DCE login name of the user you want to add, for example, `lkbyrd`.
5. In the **LOGIN user?** field, leave the default value of **yes**.
6. In the **GROUP to associate with this account** field, enter the name of the primary group to which you want to add this user, for example, `pd_operator`.
7. In the **ORGANIZATION to associate with this account** field, enter the name of your organization as you specified it when you installed DCE.
8. In the **HOME directory** field, you can enter the user's AIX home directory for your own information. DCE does not use this field.
9. In the **HOME directory** field, you can enter the user's AIX home directory for your own information. DCE does not use this field.
10. In the **ACCOUNT information** field, you can enter miscellaneous information about the account. DCE does not use this field.
11. In the **Require user to CHANGE PASSWORD on first login** field, leave the default value of **yes** if you want DCE to prompt the user to select a new password when he or she first logs into DCE. If you select **no**, the user can continue to use the password you assign or change it at any time.

12. In the **Maximum ticket LIFETIME** field, enter a value at least as large as the longest time that this user will leave the Infoprint VSM administrator's GUI running. If the ticket expires while the Infoprint VSM administrator's GUI is running, the user must log into DCE again to perform administrative tasks.

**Note:** The maximum ticket lifetime for a user cannot be longer than the maximum lifetime specified in the DCE authenticated policies. To change this maximum, go to the SMIT DCE Security and Administration panel and select **Registry Policies and Properties**, then **Authenticated Policies and Properties**, or enter `smit lsdcesecert` from the AIX command line.

13. Accept or modify the default values for the other fields in the window.
14. Select **Do**. DCE prompts you to enter a password for the new account.
15. Enter an appropriate password and press ENTER. DCE prompts you to enter your own password.
16. Enter the cell administrator's password and press ENTER.
17. When the command is complete, press ENTER.

## Making a User a Member of Additional DCE Groups

After you have created a DCE principal for a user and given the principal a primary account with a DCE group, you can add the principal to as many other DCE groups as you wish. For example, to add user `lkbyrd` to the `203_Operators` group:

1. Log into DCE as the cell administrator.

2. Enter:

```
smit mkdcegroupmem
```

The Add Members to a Group panel is displayed.

3. In the **Group NAME** field, enter the name of the group to which you want to add the user, for example, `203_Operators`.
4. In the **PRINCIPALS to add** field, enter the login name of the user you want to make a member of the group, for example, `lkbyrd`.
5. Select **Do**. SMIT displays a panel showing the progress of your command. When the command is successful, the running man icon at the top right corner of the panel stands with his arms up.
6. Select **Done**.

## Changing DCE Permissions for Infoprint Objects

When you have created DCE groups to fit your requirements, you must give the groups appropriate permissions to work with DCE objects. You can use the Infoprint SMIT administrator's interface to change object permissions.

To change the permissions for an Infoprint server, follow these steps:

1. Log into DCE as the cell administrator:

```
dce_login cell_admin
```

2. On the AIX command line, enter one of the following commands:

```
smit iprudce_security
```

or

```
smitty iprudce_security
```

The SMIT Security panel is displayed.

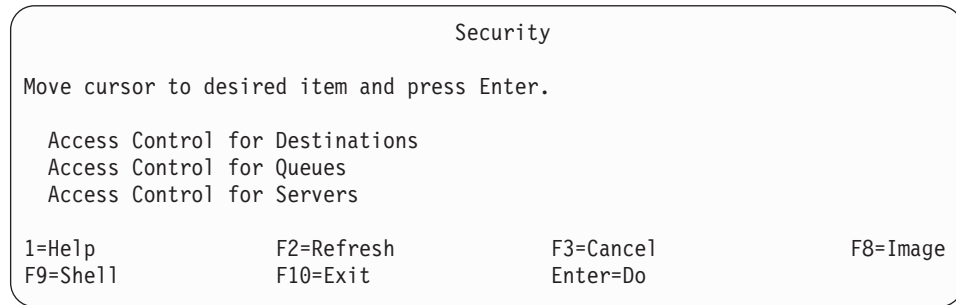


Figure 33. SMIT Security Panel

3. Select **Access Control for Servers**. The Access Control for Servers panel is displayed.

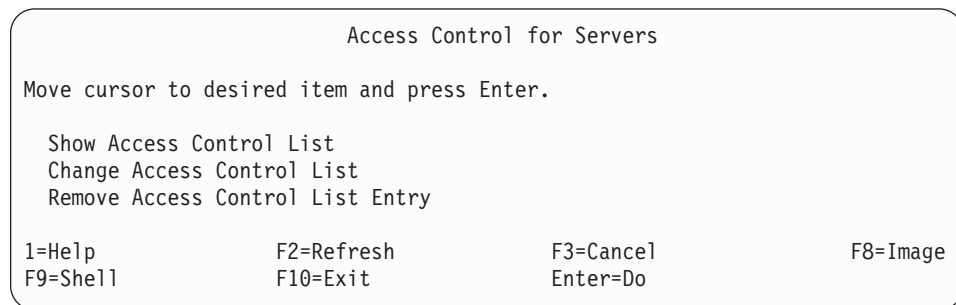


Figure 34. SMIT Access Control for Servers Panel

4. Select **Change Access Control List**. A list of servers is displayed.
5. Select a server name and press **Enter**. The ACL Type list is displayed.
6. Select one of the following values and press **Enter**:
  - user\_obj** Permissions for the owner of the object.
  - user** Permissions for a specific DCE user defined in this namespace.
  - group** Permissions for a specific DCE group defined in this namespace.
  - other\_obj** Permissions for the group to which the owner of the object belongs.
  - any\_other** Default permissions for DCE users and groups defined in this namespace.
  - foreign\_user** Permissions for a specific user defined in another DCE namespace.
  - foreign\_group** Permissions for a specific group defined in another DCE namespace.
  - foreign\_other** Default permissions for DCE users and groups defined in other DCE namespaces.
  - unauthenticated** Permissions for users who are not logged into DCE.

The Change Access Control List panel is displayed. Figure 35 shows the panel that is displayed when you select **group**.

```

Change Access Control List

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

 ^Entry Fields|
* Server Name Server1
* ACL Entry Type group
* Group Name ^| +
* Grant Read Permission yes +
* Grant Write Permission yes +
* Grant Delete Permission yes +
* Apply Settings to All Servers yes +
* Apply Settings to All Objects in Server yes +

1=Help F2=Refresh F3=Cancel F4=List
F5=Reset F6=Command F7=Edit F8=Image
F9=Shell F10=Exit Enter=Do

```

Figure 35. SMIT Change Access Control List Panel

#### 7. Fill in the panel and press **Enter**.

Notice that the last lines of the Change Access Control List panel allow you to propagate the permissions you set here to other objects. If you give the 203\_Operators group **read** and **write** permission for this server, the 203\_Operators group will have **read** and **write** permission for any logical destinations, actual destinations, or queues that you later create in the server.

Propagation only works for entries that have not yet been created. If you create a logical destination, then change the permissions for the server and apply your changes to all objects in the server, the existing logical destination will not inherit the changes.

## Adding Other DCE Namespaces to Your Infoprint Environment

Part of DCE is a directory tree called the DCE *namespace*. Installing Infoprint creates a branch of this directory tree where Infoprint stores its security information. This is your Infoprint cell directory structure.

When you start an Infoprint AIX server, it gets a list of servers from the namespace. Infoprint Manager uses the list to contact each of those servers. If a server that belongs to the DCE namespace has been shut down (`stop_server servername`) when you start the current Infoprint AIX server, Infoprint returns a message in the server error log, telling you that the server is not in the endpoint map:

```

5010-589 The DCE message text is:
Not registered in endpoint map (dce/rpc)
Object caine (server name)
was not found at location f5159c44-bdb1-aad5-8b80-004ace4a889@ (object UUID)
ncacn_ip_tcp:9.99.225.27 (ip_address)

```

When you see this message after starting your DCE configuration, it is informational and does not require you to take any action.



When problems arise in your DCE configuration, this message can be a valuable tool for diagnosing problems. It can indicate which old servers can be removed from your DCE namespace in order to improve performance. If you enter `pdls -c serv \*` from an AIX command line to list your available Infoprint AIX servers, but instead see the message about the endpoint map in the server error log for a server that you expect to be running, it indicates that there may be a problem with this server.

You can set up your Infoprint environment so that clients in another DCE namespace can communicate with the Infoprint server. Clients in other namespaces can issue only the **pdpr**, **pdls**, and **pdq** commands.

To add a DCE namespace to the Infoprint environment, follow these steps:

1. Log into DCE as the cell administrator:  
`dce_login cell_admin`
2. On the AIX command line, enter one of the following commands:  
`smit iprudce_ns`  
  
or  
`smitty iprudce_ns`

The SMIT Name Spaces panel is displayed.

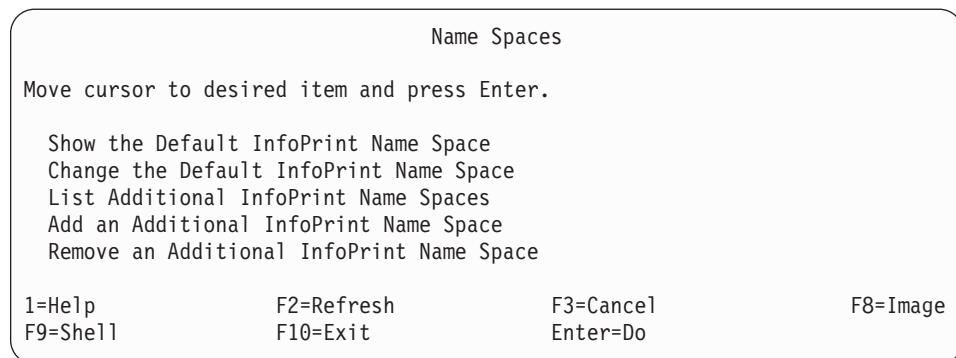


Figure 36. SMIT Name Spaces Panel

3. Select **Add an Additional InfoPrint Name Space**. The Add an Additional InfoPrint Name Space panel is displayed.

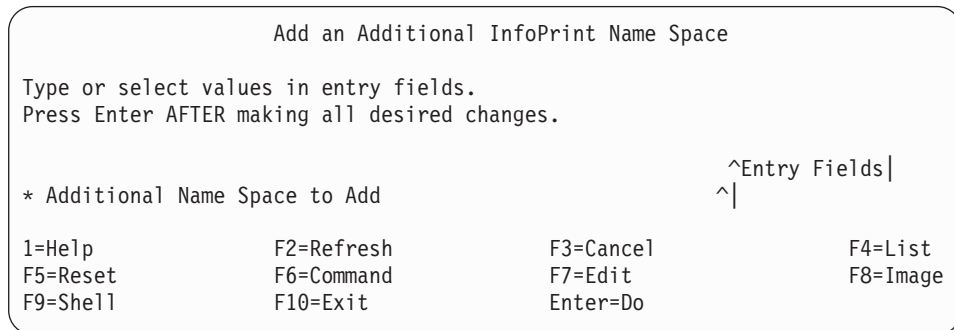


Figure 37. SMIT Add an Additional InfoPrint Name Space Panel

4. Enter the name of the namespace and press **Enter**.

## Ignoring Network Interfaces

You can also use DCE to configure Infoprint so that it ignores selected network interfaces. Follow these steps:

1. Log into DCE as the cell administrator:  

```
dce_login cell_admin
```
2. On the AIX command line, enter one of the following commands:  

```
smit iprudce_interfaces
```

or

```
smitty iprudce_interfaces
```

The SMIT Network Interfaces panel is displayed.

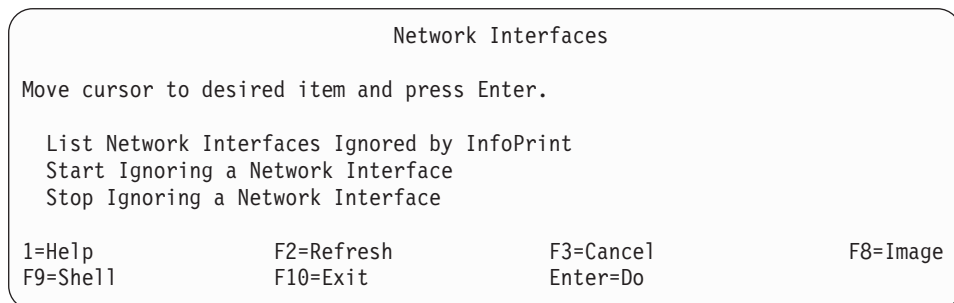


Figure 38. SMIT Network Interfaces Panel

3. Select **Start Ignoring a Network Interface**. The Start Ignoring a Network Interface panel is displayed.

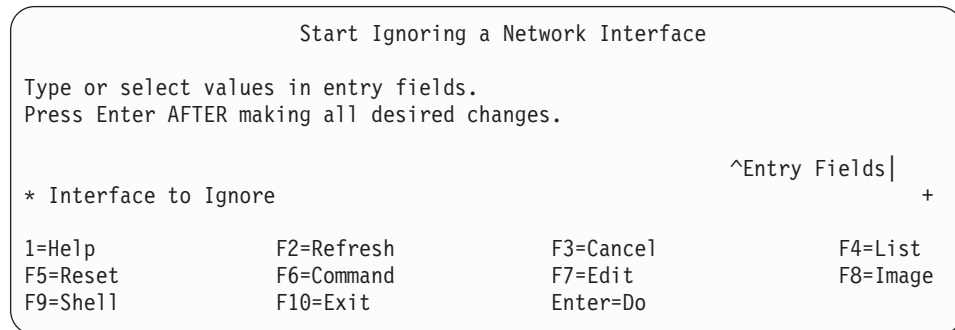


Figure 39. SMIT Start Ignoring a Network Interface Panel

4. Press **F4** to display a list of network interfaces.
5. Select an interface and press **Enter**.

## Examples

The examples in this section show you how to manage Infoprint security by creating DCE groups and granting permissions for specific objects to these groups.

### Creating Two Printer Operator Groups

Printer operators are responsible for supporting and maintaining printer devices. This includes such tasks as replacing toner, loading media, and making the printers available for large and small jobs at different times of the day.

Printer operators do not need all the permissions of the default **pd\_operator** group. The **pd\_operator** group has **read** and **write** permission for all Infoprint objects. Printer operators need **read** and **write** permission only for the actual destinations that represent printer devices in their care.

When you plan printer operator groups, first decide for which actual destinations each group needs **read** and **write** permission. This is easiest to do before you create the actual destinations. If the same printer operator group needs permission for all the actual destinations in a server, you can give the printer operator group **read** and **write** permission for the server's DCE **printers** directory. The group will automatically have **read** and **write** permission for all the actual destinations that you later create in the server. If you create the actual destinations before you give the printer operator group **read** and **write** permission for the server; or if different printer operator groups need **read** and **write** permission for different actual destinations in the same server, you must assign permissions for each actual destination individually.

Suppose that you are configuring Infoprint to manage two printer rooms. Each printer room contains several printer devices. One group of printer operators cares for all the printer devices in one room and another group of printer operators cares for all the printer devices in the other room.

1. Create dedicated servers to contain the actual destinations representing printer devices in each room. One server can support up to five actual destinations. See Chapter 2, "Creating and Managing Servers" on page 11 for instructions.
2. Create a printer operator group for each room. See "Creating a DCE Group" on page 126 for instructions.

3. Give each printer operator group **read** and **write** permission for the DCE **printers** directory of each server for the group's printer room. See "Changing DCE Permissions for Infoprint Objects" on page 128 for instructions.
4. For each printer device, create an actual destination in a server dedicated to the printer room where the printer device is located. See "Creating and Managing Actual Destinations" in Infoprint Manager for AIX: Getting Started. for instructions.
5. Give each printer operator membership in the appropriate printer operator group. See "Creating DCE Identities for Users" on page 127 for instructions.

### Restricting All Access to an Output Device

You may need to restrict all use of an output device to certain users. For example, you can restrict all use of a fax machine to salespeople who need to fax information to customers. To do this:

1. In the advanced Infoprint VSM administrator's GUI, open the attributes notebook for the logical destination that sends jobs to the actual destination representing the output device. Set the **Authorize Jobs** field on the **Jobs/Documents** tab to **yes**. Now only users who are logged into DCE can submit jobs to this logical destination.
2. Delete the permissions for the **any\_other** and **unauthenticated** groups from the access control list (ACL) for the logical destination. Now only users who have explicit **read** permission for this logical destination can submit jobs to it.
3. Create a DCE group with **read** permission for the logical destination.
4. Give each authorized user membership in the new DCE group.

### Restricting Functions of an Output Device

You may need to restrict certain functions of an actual destination to certain users. For example, you can restrict one-sided printing to editors, while allowing everyone else to print two-sided jobs on the same printers. To do this:

1. Create two logical destinations that send jobs to the actual destination representing the output device. Configure one logical destination to support all the functions of the output device and the other to support only the functions that everyone is permitted to use. For example, to restrict one-sided printing, create one logical destination with values of **1** and **2** for the **Sides Supported** field and another with a value of **2**.
2. Use the process in "Restricting All Access to an Output Device" to restrict all access to the logical destination that supports all the functions of the output device.

---

## Managing Infoprint Non DCE Security

Infoprint Manager Security, a feature that you administer through SMIT, allows you to protect your printing system by associating an Access Control List (ACL) with an Infoprint object or operation. An ACL is the list of users and groups who have permission to do something to or with an object and what type of permission that is.

**Note:** Infoprint Manager Security only uses the login ID permissions. Therefore, if a user logs in, then performs an SU to root or to another user, the permissions associated with the original login ID remain in effect.

## Types of permission

In Infoprint Manager, users can have three levels of permission:

### Read

- For operations, the user can perform the operation.
- For servers and queues, the user can view the attributes.
- For destinations, the user can view attributes and submit jobs to that destination.

**Write** For all objects, the user can view and modify attributes.

**Delete** For all objects, the user can view and modify attributes and can delete the object.

If you place UserA on the ACL for the logical destination **print2ld** and give UserA **read** permission, UserA can send print jobs to **print2ld** and can open the **print2ld** object to see its properties. However, UserA cannot make changes to the **print2ld** properties. If UserA tries to change any of the properties or tries to delete the destination, UserA receives an error message. If you decide that UserA needs to be able to do more, give UserA **write** permission as well. Then UserA can change the properties for **print2ld**, but UserA is not able to delete **print2ld**.

**Important:** If you protect a destination (logical or actual) so that only certain users can modify or delete its properties, you may inadvertently prevent other users from submitting print jobs to it. To be sure that all of your users can still print to the destination, add the **wildcard character (\*)** to the ACL as a user with **read** permission.

You can also attach ACLs to the operations that you can perform on Infoprint objects. Allowing you to protect both operations and objects means that Infoprint Manager Security provides different levels of security: you can protect all objects by using ACLs at the operation level or you can protect individual objects with ACLs applied only to them. Or you can do both—protect all objects by using operation-level ACLs for some operations and limit access to subsets of objects by using object-level ACLs.

For operations, there is only one level of permission: **read**. If a user has **read** permission, the user can perform that action; if the user does not have **read** permission, the user cannot perform the action. For example, UserB is a printer operator and must be able to move jobs to different positions in the print queue because some jobs need to be printed before others. You can give UserB **read** permission for the **pdpromote** command to allow him to move jobs to different positions in the print queue. On the other hand, UserC submits print jobs from his office workstation and doesn't like to wait for the jobs ahead of his jobs in the print queue. If you want to prevent him from moving jobs, don't put UserC on the ACL for the **pdpromote** command. When UserC tries to move his job to the top of the queue, the action is denied.

When you install Infoprint Manager, many operations are already protected so that only members of the **admin** and **oper** groups can perform them. You can see the ACLs for operations in SMIT. If you want users to be able to perform those operations, you must either add those users to the individual ACLs or to a group that has permissions (either the existing **admin** and **oper** groups or a new group that you create).

**Note:** If an object is protected, a user can only perform an operation on the object if the user has both **read** permission for the operation and the appropriate level of permissions for the object. If the object is not protected, any user with **read** permission on a operation can perform that operation.

If the object has an ACL, the permission needed depends on the operation (for example, List requires **read** permission, Set requires **write** permission, and Delete requires **delete** permission).

## Security Groups

No matter what size organization you work in, manually adding every user to every ACL can be a time-consuming process. To reduce some of the work, you can create *security groups*, which are groups of users who need to have the same levels of permission for the same objects. You use the name of the security group like a user ID; instead of adding each user id to an ACL, you add the security group name. For example, if you want all ten of your print operators to be able to perform the same operations, create a group and name it **operators**. Then add **operators** to the appropriate ACLs.

When you install Infoprint Manager, three security groups are created by default:

- |                  |                                                                                                                                                                               |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>acl_admin</b> | Users who have authority to manage security by changing ACLs and groups. The default members are <b>root</b> and the user who logged on when Infoprint Manager was installed. |
| <b>admin</b>     | Users who have administrator authority. The default members are <b>root</b> and the user who logged on when Infoprint Manager was installed.                                  |
| <b>oper</b>      | Users who have operator authority. The default member is <b>root</b> .                                                                                                        |

**Note:** You can modify these groups as needed. In the previous example, you could have simply added your operators to the default **oper** group and modified any permissions that weren't set to the level that you wanted them.

You can add users to multiple groups, but you cannot make one group a member of another group. For example, if you hire five new print operators, you might create a group for them called **trainees** since you only want them to have limited permissions until they are finished with their training. When they finish their training, you cannot add **trainees** to a member of the **operators** group. You will have to add their user IDs to the **operators** group one at a time. In addition, you will have to either delete the **trainees** group or delete the members from it; otherwise, those users will have conflicting levels of permission.

When users are members of more than one group and each group has a different level of permission for a particular object, the most restrictive permission applies. In the previous example, if you forgot to remove the new employees from the **trainees** group at the end of their training, they wouldn't be able to perform the tasks their job required (they would still be restricted).

**Note:** When you create a new group, the colon (:) cannot be a character in the name.

## Identifying users and groups: wildcarding

When you add users to ACLs or Security groups, you identify them by their user ID and the computer that they work on in this format: *username@computername*. The permissions you assign will only apply when that user accesses Infoprint Manager from that workstation.

If however, you or any of your users want to be able to work with Infoprint Manager objects from various workstations, you may not want to add multiple user ID/computer name combinations for the same person. Instead, you can use wildcarding. When you use wildcarding, you replace the *username* or *computername* with the wildcard character (\*) when you add a member to an ACL or Security Group. The wildcard character stands for *any username* or *any computername*. So, if you create an ACL member called **administrator@\***, no matter what computer you log on to as **administrator**, you have the same permissions. If you use the wildcard character before the computer name, for example **\*computer1**, any user who logs on to computer1 can perform the actions that the ACL member has permission for.

## Working with ACLs and Groups

Use the AIX SMIT utility to manage the security of your print system. Open an AIXterm window and enter `smit` on the command line. The line Infoprint Printing Systems appears as an option. By following the menu item to the right with your cursor, you can navigate the following directory structure of menu choices:

```
Infoprint Printing Systems
 Security
 Groups
 Add Group
 Show Group
 Add Users to Group
 Remove User from Group
 Access Control
 Access Control for Operations
 Show Access Control List
 Change Access Control List
 Remove Access Control List
 Access Control for Servers
 Show Access Control List
 Change Access Control List
 Remove Access Control List
 Access Control for Destinations
 Show Access Control List
 Change Access Control List
 Remove Access Control List
 Access Control for Queues
 Show Access Control List
 Change Access Control List
 Remove Access Control List
```

**Note:** For specific information about a menu choice, press the **F1** key for help.

Three groups are created for you by default and display when you choose the **Show Group** option on **Groups: acl\_admin, admin, and oper**. The root user is placed in the **acl\_admin** group. To have access to modify security characteristics, the user must be a member of the **acl\_admin** group.



---

## Chapter 11. Setting Infoprint and AIX Environment Variables

Infoprint uses environment variables:

- To define its environment within the AIX system
- To define the objects managed by and options available in the Infoprint SMIT operator's GUI

Environment variables are strings that have a name and a value in the form of **NAME=value**. Refer to *Infoprint Manager: Reference* for a complete list of Infoprint environment variables and AIX environment variables that affect Infoprint.

This chapter contains the following topics:

- “Preparing to Work with Infoprint and AIX Environment Variables”
- “Querying Environment Variables” on page 140
- “Editing the /etc/environment File” on page 141
- “Editing a .profile File” on page 141
- “Setting an Environment Variable from the Command Line” on page 142
- “Verifying the Setting of Environment Variables” on page 142

---

### Preparing to Work with Infoprint and AIX Environment Variables

Read through the following topics to become familiar with environment-variable structure and terms.

#### Where Are Environment Variables Found?

Infoprint and AIX environment variables can be found in the following files:

##### **Infoprint SMIT operator's GUI environment file**

The name of this file is the value of the **PPO\_DEFAULT\_ENV** environment variable, by default, **/usr/lpp/pd/bin/ppo.env**. It contains environment variables that define values used by the Infoprint SMIT operator's GUI.

##### **/etc/environment**

This file contains environment variables that apply to all sessions for all users on a given AIX system.

##### **.profile**

The **.profile** file in a user's home directory contains environment variables that apply to all the user's AIX sessions. Values in this file override values in **/etc/environment**.

#### How Are Environment Variables Set?

You can use the following methods to set or change values for environment variables:

- If you are an administrator, you can set AIX environment variables and Infoprint environment variables in the **/etc/environment** file or in the Infoprint SMIT operator's GUI environment file by using an AIX editor.

Settings in these files apply to all sessions for all users, unless users override them through their **.profile** files or from the command line.

- You can modify your **.profile** file in your home directory by using an AIX editor. Settings in the **.profile** file override settings in the **/etc/environment** file. These

settings apply only to you and are in effect for all AIX sessions, unless you override the settings from the command line.

- You can enter one of the following commands on the command line to set environment variables for a single AIX session:
  - In the Korn shell or the Bourne shell, use the **export** command.
  - In the C shell, use the **setenv** command.

Command line settings override settings in the **/etc/environment** file and **.profile** file. These settings apply only to you and are in effect only until you exit the AIX session from which you issued the command.

You cannot change the environment of a running process. If you change the value of an environment variable, you must restart any process that was started before the change if the change is to take effect for that process. For example, an Infoprint server is a process. If you change the **/etc/environment** file, you must stop and start the server again for the change to take effect.

## What Restrictions Apply?

The following restrictions apply when you create or define values for environment variables:

- Ensure that newly created environment variables do not conflict with standard variables, such as **MAIL**, **PS1**, **PS2**, and **IFS**. Refer to AIX documentation for further information.
- Ensure that the information in the **/etc/environment** file is in the **NAME=value** format. The **/etc/environment** file is not a shell script and does not accept data in any format other than the **NAME=value** format.

- Do not use variables to represent values in the **/etc/environment** file. For example:

```
PATH=$PATH:/path1:/path2
```

is not a valid entry in the **/etc/environment** file. Instead of **\$PATH**, enter a full path name.

- The format in which you specify the value for any variable that defines directory paths determines whether your value is appended to the current value or overrides it.

- The following format overrides the current value:

```
export PATH=/path1:/path2
```

If you do not include the Infoprint directories in the value you specify, you will not have automatic access to Infoprint.

- The following format appends your value to the current value:

```
export PATH=$PATH:/path1:/path2
```

---

## Querying Environment Variables

You can use one of the following AIX commands to query the value of an environment variable:

- In any shell, use the **echo** command.
- In the Korn shell, use the **print** command.

For example, to determine the default logical printer, enter:

```
echo $PDPRINTER
```

**Note:** Infoprint uses default values for some Infoprint environment variables without setting the environment variable. When you query those environment variables and you have not set a value, the response is a blank line.

To query all environment variables that have values set, enter:

```
env
```

---

## Editing the `/etc/environment` File

To set an environment variable in the `/etc/environment` file, you need to edit the file with an AIX editor. See “How Are Environment Variables Set?” on page 139 and “What Restrictions Apply?” on page 140 for additional information.

The following example shows how to set the **PDPRINTER** environment variable in the `/etc/environment` file using the **vi** editor:

1. Enter the following command to change to the `/etc` directory:

```
cd /etc
```

2. Enter the following command:

```
vi environment
```

A typical `/etc/environment` file contains lines similar to the following:

```
NLSPATH=/usr/lib/nls/msg/%L/%N:/usr/lib/nls/msg/%L/%N.cat
LANG=en_US
```

3. Insert or modify the following line in the `/etc/environment` file:

```
PDPRINTER=LogicalDestinationName
```

where *LogicalDestinationName* is the name of the logical printer you want to set as the default logical printer for all users.

4. Save the change in plain text format and exit from the editor.
5. Make the change effective by entering the command:

```
./etc/environment
```

6. Verify the change by entering the command:

```
echo $PDPRINTER
```

The logical destination name you entered displays.

---

## Editing a `.profile` File

To set an environment variable in the `.profile` file, you need to edit the file with an AIX editor. See “What Restrictions Apply?” on page 140 for information on restrictions.

The following example shows how to set the **PDPRINTER** environment variable in your `.profile` file, using the **vi** editor.

1. Enter the following command to change to your home directory:

```
cd
```

2. Enter the following command:

```
vi .profile
```

3. A typical `.profile` file contains lines similar to the following:

```
PATH=.:$HOME/bin:/bin:/usr/bin:/etc:/usr/ucb:/usr/bin/X11:tools/
usr/bin:/usr/lpp/cmvc/bin:/usr/OV/bin:/usr/local/tools/rs6/bin:/usr
/local/tools/rs6:/usr/dt/bin
export PATH
export EDITOR=vi
```

4. Insert or modify the following line in the **.profile** file:

```
export PDPRINTER=LogicalDestinationName
```

where *LogicalDestinationName* is the name of the logical printer you want to set as your default.

5. Save the change in plain text format and exit from the editor.
6. Make the change effective by entering the following command:

```
. .profile
```

7. Verify the change by entering the command:

```
echo $PDPRINTER
```

The logical printer name you entered displays.

---

## Setting an Environment Variable from the Command Line

To set the value of the environment variable **PDPRINTER** to Printer3 for a single AIX session, enter one of the following commands:

- In the Korn shell or the Bourne shell, enter:

```
export PDPRINTER=Printer3
```

- In the C shell, enter:

```
setenv PDPRINTER Printer3
```

---

## Verifying the Setting of Environment Variables

You can verify the setting of environment variables that Infoprint set or appended during Infoprint installation by doing the following procedures.

### Verifying the Setting of the PATH Environment Variable

During the installation process, Infoprint updates the AIX **PATH** environment variable to include the directory location of the Infoprint executable files; Infoprint appends **/usr/lpp/pd/bin** and **/usr/lpp/psf/bin** to the paths already specified.

To verify that the **PATH** environment variable is set and contains **/usr/lpp/pd/bin** and **/usr/lpp/psf/bin**, enter the command:

```
echo $PATH
```

### Verifying the Setting of the PDBASE Environment Variable

During the installation process, Infoprint adds the Infoprint **PDBASE** environment variable to the **/etc/environment** file and specifies **/var/pd** as the working directory where Infoprint stores its object code.

To verify that the **PDBASE** environment variable is set and contains **/var/pd**, enter the command:

```
echo $PDBASE
```

## Verifying the Setting of the XBMLANGPATH Environment Variable

During the installation process, Infoprint appends `/usr/lpp/pd/bitmaps/%B` to the value of this variable. The `/usr/lpp/pd/bitmaps/%B` directory contains icons for the Infoprint VSM administrator's GUI.

To verify that the `XBMLANGPATH` environment variable is set and contains `/usr/lpp/pd/bitmaps/%B`, enter the command:

```
echo $XBMLANGPATH
```

## Verifying the Setting of the MANPATH Environment Variable

During the installation process of an Infoprint Manager server or an Infoprint Manager client, Infoprint appends `:/usr/share/man/$LANG` to the value of this variable. The `:/usr/share/man/$LANG` directory is the location of the `cat7` subdirectory, which contains the Infoprint man pages. `$LANG` is the locale.

To verify that the `MANPATH` environment variable is set and contains `:/usr/share/man/$LANG`, enter the command:

```
echo $MANPATH
```



---

## Chapter 12. Monitoring Space on Your AIX System

AIX allocates space for the printing and monitoring tasks required in an Infoprint environment through different file systems. A *file system* is a structure of parent directories, subdirectories, and files. A *directory* is a unique type of file that contains only the information need to access files or other directories. Directories contain files, subdirectories, or a combination of both. The directory containing a subdirectory is the parent directory.

On occasion, you might have to ensure that work files used in printing jobs do not consume too much space on your file systems. For example, PostScript or TIFF job tickets that are ripped for printing might leave work files in the `/var/psf` file system. Over time, these files can reduce system performance and eventually stop the system. Develop a maintenance strategy with your IBM Printing Systems Company service representative.

This chapter consists of the following topics:

- “Monitoring Memory Use on your Infoprint AIX Server”
- “Using the Disk Usage Tool” on page 147
- “Using the `df` Command” on page 148
- “File Systems and Directories to Clean Up” on page 148

---

### Monitoring Memory Use on your Infoprint AIX Server

With service release PTF U474310, Infoprint Manager provides a method for monitoring memory use on your Infoprint AIX server. This support also provides you the opportunity to define and establish recovery options through exit programs or shell scripts that you can customize and add to the system. By default, the **Memory Usage** tab of the server property notebook is left blank; you must set these values and create the customized shell scripts or programs to activate this support.

You can access this support from the Infoprint Manager Administration GUI:

1. Select **Server**—>**Properties**.
2. Click the **Show more** button.
3. Select the **Memory Usage** tab.

From the **Memory Usage** page, you can specify a low memory threshold percentage and a high memory threshold percentage that cause Infoprint to invoke a customized exit program or shell script that you can write for your print installation. For example, in Figure 40 on page 147, you can see that if the server’s system memory usage goes above 60% (the value for the **upper memory usage threshold** field), Infoprint invokes a user-customized shell script (the `/localtools/uplimit` value for the **Upper memory usage exit** field) that contains specific recovery actions for your print installation. If the server’s system memory usage drops below 59% (the value for the **lower memory usage threshold** field), Infoprint calls a user-customized shell script (the `/localtools/lowlimit` value for the **Lower memory usage exit** field) that contains specific recovery actions for your print installation. This exit usually restores the previous state of the server, undoing temporary changes made by the upper threshold exit.

The customized exit programs or shell scripts can do as little or as much as you specify. For example, you might write a script to disable a certain set of printers. The script could also move jobs to other servers. Both the **lower-memory-usage-exit** and **upper-memory-usage-exit** server attributes allow you to substitute values in the commands that are generated to run the exit program. For example, %s is equivalent to *server name* and %t is equivalent to *threshold value*. If a particular exit attribute contains a value of memprob %s in the server **server1**, then when Infoprint invokes the memory usage shell script it passes server1 as the first argument.

For example, a shell script named `uplimit` might:

1. Prevent new jobs from arriving at a logical destination by disabling that Infoprint object.
2. Prevent the listing of jobs so that queries of the current backlog do not add to the memory constraints.
3. Ensure that any actual destinations (in this case, the three pooled actual destinations named *adn*) are re-enabled, so that they can reduce any backlog of jobs that could be causing the problem.

The `uplimit` script might look like the following:

```
#!/bin/ksh
pddisable prt1-ld
pdset -cserv -xdisallow-list-obj-class=job server1
pdenable ad1 ad2 ad3
```

The `lowlimit` script might look like the following:

1. Re-enable the logical destination so that new jobs are being accepted.
2. Reset the server to allow the listing of job queries.

The `lowlimit` script might look like the following:

```
#!/bin/ksh
pdeable prt1-ld
pdset -cserv -xdisallow-list-obj-class== server1
```

**Note:** You can use the **Queries to Prevent** section on the **Memory Usage** page to both add and remove the listing of any queries against a specified Infoprint object, such as **Jobs**. The **Jobs** object is the most useful to restrict, but this should be done cautiously, because once it has been set, you cannot query any jobs from either the Infoprint Manager Administration GUI or the Infoprint Manager Operations GUI.



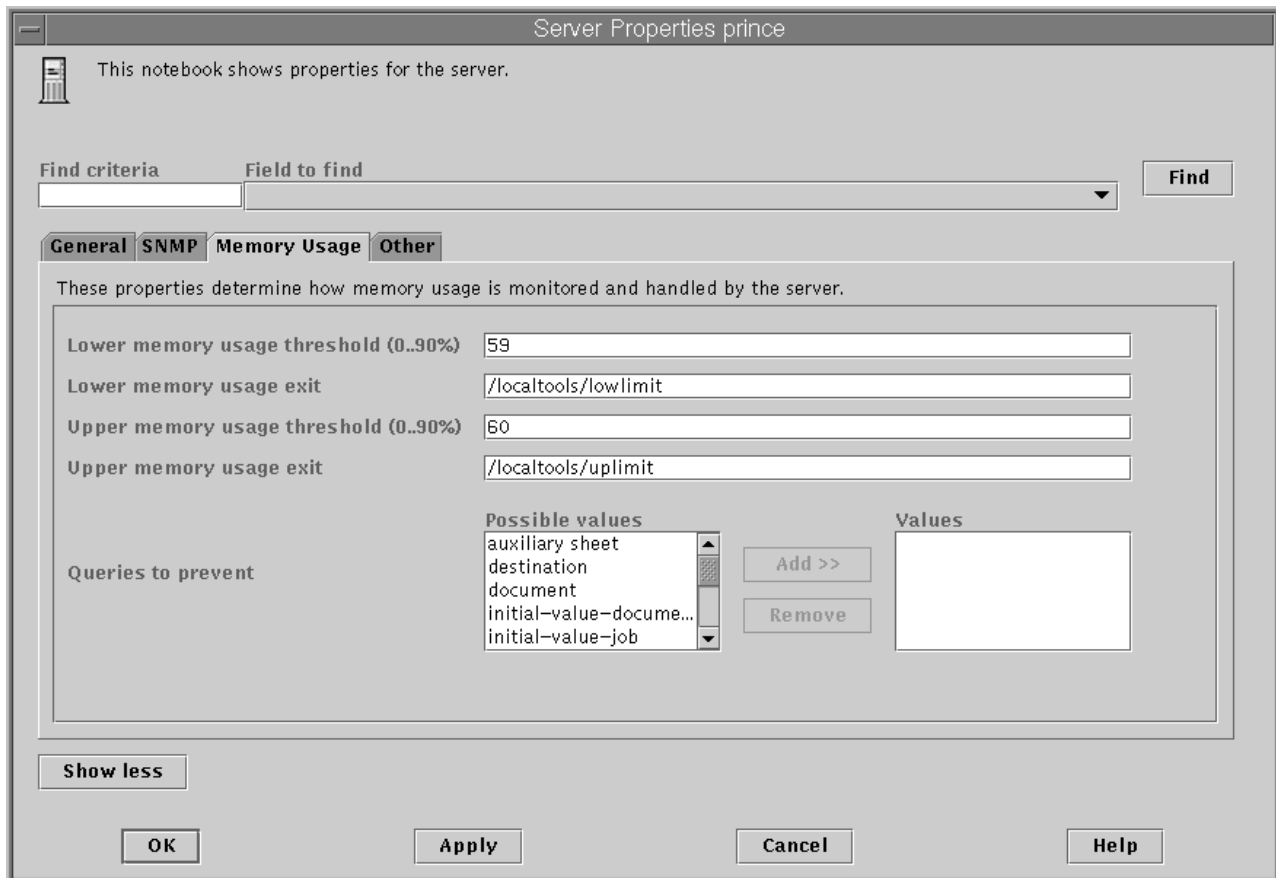


Figure 40. Memory Usage Page from the Server Properties Notebook

Note that if the shell scripts or programs are not in the system path, you must specify the fully-qualified path for the shell scripts that you have customized. If you misspell a shell script name or refer to a file that does not exist, Infoprint allows you to change the setting. For more information about the **lower-memory-usage-threshold**, **lower-memory-usage-exit**, **upper-memory-usage-threshold**, and **upper-memory-usage-exit** server attributes that support this feature, see *Infoprint Manager: Reference*.

Once you have selected the appropriate values, click **OK** to apply this change and close the **Server Properties** dialog.

## Using the Disk Usage Tool

The **Disk Usage** icon on the front panel of the CDE allows you to display information about total space and available space on a file system. To find this icon:

- In a basic Infoprint installation, click on the **User Tools** icon (the paper and pencil) to open a subpanel.
- In an advanced or distributed Infoprint installation, click on the **Application Manager** icon (the file drawer containing a ruler, calculator, and pencil) to open a window. In this window, click on the **Desktop\_Tools** icon.

When you select the **Disk Usage** icon, AIX displays information for all currently mounted file systems as shown in the following:

| Filesystem  | 512-blocks | Free    | %Used | Iused | %Iused | Mounted on        |
|-------------|------------|---------|-------|-------|--------|-------------------|
| /dev/hd4    | 16384      | 7024    | 58%   | 1069  | 27%    | /                 |
| /dev/hd2    | 1359872    | 493128  | 64%   | 17071 | 11%    | /usr              |
| /dev/hd9var | 16384      | 13528   | 18%   | 305   | 15%    | /var              |
| /dev/hd3    | 32768      | 30984   | 6%    | 87    | 3%     | /tmp              |
| /dev/hd1    | 16384      | 15368   | 7%    | 136   | 7%     | /home             |
| /dev/lv00   | 1015808    | 983440  | 4%    | 66    | 1%     | /var/psf          |
| /dev/lv01   | 2015232    | 1951888 | 4%    | 16    | 1%     | /var/psf/segments |
| /dev/lv02   | 3014656    | 2919936 | 4%    | 17    | 1%     | /var/pd           |

The first column displays AIX file systems that are also directories. These directories are all subdirectories of the /dev parent directory, which means that they contain special files for I/O devices. The most important column is the fourth from the left that displays the percentage of each file system used.

---

## Using the df Command

You can see how your AIX system uses space in a single file system by using the **df** command. To display the space on the file system where your current directory resides, enter the following command on the AIX command line:

```
df .
```

AIX displays the following:

| Filesystem | 512-blocks | Free  | %Used | Iused | %Iused | Mounted on |
|------------|------------|-------|-------|-------|--------|------------|
| /dev/hd1   | 16384      | 15368 | 7%    | 136   | 7%     | /home      |

---

## File Systems and Directories to Clean Up

Certain file systems and directories tend to fill up. You should check, and if necessary, clean up these file systems and directories regularly.

### File Systems Used by All Infoprint Installations

If either the /var/psf or the /var/pd file system is more than 85% full, you should contact your IBM service representative to determine whether you need to clean out files or modify any configuration changes. You might consider removing files, such as large accounting logs and old error logs. You can find these files as follows:

```
/var/pd/servername/accounting.logs
```

For more information on accounting logs, see “How Do You Manage the Contents of the Infoprint AIX Server Accounting Logs?” on page 101 in Chapter 7, “Gathering Accounting and Auditing Data about Print Jobs” on page 99.

```
/var/pd/server.BAK/error.log.BAK.timestamp
```

Each time the Infoprint server is started, it backs up the last **error.log**. You need to delete these old logs as determined by your maintenance strategy.

When Infoprint processes large jobs, it is not uncommon for the /var/psf/segments file system to grow to over 90% full.

**Note:** When deciding whether or not to delete files, create a new file system, or change your configuration, do not modify the logical volume (/dev/lv01) that is mounted on the /var/psf/segments file system. This file system is used by Infoprint when printing jobs and monitors its own system use.

## Directories Used by InfoColor 70 Printers

If you have any InfoColor 70 printers, you will occasionally have to clean out files from the following directories:

| <b>Directory</b>            | <b>On AIX System</b>                                                     |
|-----------------------------|--------------------------------------------------------------------------|
| <i>/var/pd/HostName</i>     | System where the Infoprint server is installed                           |
| <i>/custdisk1/Pool</i>      | System where the InfoColor 70 is attached                                |
| <i>/custdisk1/HotFolder</i> | System where the InfoColor 70 is attached                                |
| <i>/custdisk1/IPAddress</i> | All RIP servers, including the system where the InfoColor 70 is attached |



## Part 4. Customizing Infoprint for Special Jobs

### Chapter 13. Working with Infoprint Transform

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## Chapter 13. Working with Infoprint Transform Programs

Infoprint provides transform programs for the following data streams:

- Printer control language (PCL) data stream
- PostScript data stream
- Portable document format (PDF) data stream
- Tag image file form (TIFF) data stream
- Joint photographic experts group (JPEG) data stream
- Graphic interchange format (GIF) data stream
- ditroff data stream
- Double-byte ASCII and EUC data streams
- line-data data stream
- SAP data

The transforms convert the incoming data stream into the Advanced Function Presentation (AFP) format.

When a job in any of these formats is submitted to print on a PSF physical printer, Infoprint automatically invokes the appropriate transform. You can also run the transforms from the AIX command line without printing the generated output. You may find this useful if you intend to print the job later. Jobs print more quickly if they have already been transformed.

Most transforms have flags or option keywords that you can use to specify processing information. For a list of the flags or options and values for each transform, refer to *Infoprint Manager: Reference*. Configuration files, environment variables, and user-exit programs allow you to specify processing information for Infoprint to use when it invokes the transform automatically. You can also use configuration files and environment variables instead of typing flags on the command line whenever you run a transform.

This chapter consists of the following topics:

- “Customizing the PCL, PostScript, and PDF Transforms”
- “Customizing the TIFF, JPEG, and GIF Transforms” on page 155
- “Working with the Transform for Line Data” on page 157
- “Using the Parallel PDF RIP” on page 161

---

### Customizing the PCL, PostScript, and PDF Transforms

You can customize the transforms for PCL, PostScript, and PDF data by specifying values in the transform configuration files. Table 7 shows the default configuration files that Infoprint provides. You can either modify these files or create your own.

Table 7. Default PCL, Postscript, and PDF Transform Configuration Files

| <b>Data Stream</b> | <b>Transform</b> | <b>Configuration File</b> | <b>Daemon Configuration File</b> |
|--------------------|------------------|---------------------------|----------------------------------|
| PCL                | <b>pcl2afp</b>   | /psf/pcl2afp/pcl2afp.cfg  | /psf/pcl2afp/pcl2afpd.cfg        |
| PostScript         | <b>ps2afp</b>    | /psf/ps2afp/ps2afp.cfg    | /psf/ps2afp/ps2afpd.cfg          |
| PDF                | <b>pdf2afp</b>   | /psf/ps2afp/ps2afp.cfg    | /psf/ps2afp/ps2afpd.cfg          |

Notice that the PostScript and PDF transforms use the same default configuration files.

## Sample Configuration File

Figure 41 shows an example of a configuration file for the PostScript and PDF transforms. The configuration file for the PCL transform is similar.

```
ps2afp configuration file

KEYWORD EQUIVALENT ps2afp FLAG PURPOSE
#####

port = 8251 # -P which TCP/IP port to use
server = 127.0.0.1 # -S which server to connect with

ps_max_memory = 14000K # -M maximum amount of memory that
PostScript uses; the 'K' is ignored

ps_job_timeout = 20 # -j maximum number of minutes
to process PostScript job

ps_server_timeout = 20 # -s maximum number of minutes
server waits between jobs

ps_width = 8.5i # -w width of generated image
ps_length = 11i # -l length of generated image
ps_x_offset = 0i # -x left and right margins
ps_y_offset = 0i # -y top and bottom margins
ps_resolution = 600 # -r resolution of printer
ps_output_type = I01_G4 # -a type of AFP image to generate
```

Figure 41. Sample PostScript or PDF Configuration File

The configuration file uses keyword equivalents of the transform flags. Refer to *Infoprint Manager: Reference* for the keywords and values that you can specify in the configuration file.

## Daemon Configuration Files

The PCL, PostScript, and PDF transforms all require a daemon to be running before you can use them. The **pcl2afpd** daemon manages the PCL interpreter portion of the **pcl2afp** transform. The **ps2afpd** daemon manages the PostScript interpreter portion of the **ps2afp** and **pdf2afp** transforms. For more information about these daemons, refer to *Infoprint Manager: Reference*.

Each daemon, like the corresponding transform, uses a configuration file. The daemon configuration file can contain the same keywords as the transform configuration file, except **server**, plus some keywords that control the operation of the daemon. Refer to *Infoprint Manager: Reference* for the daemon keywords.

## Hierarchy of Transform Options

Infoprint assigns a hierarchy to its use of flags and configuration-file information when it runs the PCL, PostScript, or PDF transform program. The following lists the order in which Infoprint uses flags and information specified in configuration files:

1. Any values you specify on the command line, including values in the configuration file you specify with the **-C** flag.



Infoprint commands process flags from left to right. If you enter the same flag more than once, Infoprint uses the last occurrence of the flag to determine the value to use. For example, if you specify the following command:

```
ps2afp -Cconfig.file -r240 -r300 myfile.ps
```

The **ps2afp** command transforms the file using 300-pel resolution. Infoprint ignores the resolution value specified in the configuration file `config.file` and the first **-r240** flag and value.

2. Values specified in the **pcl2afp.cfg** or **orps2afp.cfg** configuration file in the current directory, if one exists and if you issue the transform command directly. Infoprint ignores values in the current directory if you invoke the transform command indirectly by submitting a job to print.
3. Values specified in the **pcl2afp.cfg** or **ps2afp.cfg** configuration file in your home directory, if one exists.
4. Values specified in the default transform command configuration file named in Table 7 on page 153.
5. Values specified in a customized configuration file identified with the **-C** flag of the **pcl2afpd** or **orps2afpd** command when the transform daemon started.
6. Values specified in the default transform daemon configuration file named in Table 7 on page 153.
7. Default values that are built into Infoprint. These are the same as the transform defaults except that the default PostScript or PDF output type is an IM1 uncompressed image.

---

## Customizing the TIFF, JPEG, and GIF Transforms

You can customize the transforms for TIFF, JPEG, and GIF data by:

- Specifying values in the transform configuration files
- Setting the transform environment variables

Table 8 shows the default configuration files that Infoprint provides. You can either modify these files or create your own.

*Table 8. Default TIFF, JPEG, and GIF Transform Configuration Files*

| <i>Data Stream</i> | <i>Transform</i> | <i>Configuration Files</i>                                                                                                                                    |
|--------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TIFF               | <b>tiff2afp</b>  | <code>/usr/lpp/psf/tiff2afp/tiff2afp.cfg</code><br><code>/usr/lpp/psf/tiff2afp/tiff2afp.3160cfg</code><br><code>/usr/lpp/psf/tiff2afp/tiff2afp.3900cfg</code> |
| JPEG               | <b>jpeg2afp</b>  | <code>/usr/lpp/psf/jpeg2afp/jpeg2afp.cfg</code><br><code>/usr/lpp/psf/jpeg2afp/jpeg2afp.3160cfg</code><br><code>/usr/lpp/psf/jpeg2afp/jpeg2afp.3900cfg</code> |
| GIF                | <b>gif2afp</b>   | <code>/usr/lpp/psf/gif2afp/gif2afp.cfg</code><br><code>/usr/lpp/psf/gif2afp/gif2afp.3160cfg</code><br><code>/usr/lpp/psf/gif2afp/gif2afp.3900cfg</code>       |

Infoprint uses the **.3160cfg** and **.3900cfg** configuration files to transform documents that have been submitted to print on an IBM Infoprint 60 printer or IBM Infoprint 4000 laser printer respectively.

## Sample Configuration File

Figure 42 shows an example of a configuration file for the TIFF transform. The configuration files for the JPEG and GIF transforms are similar.

```
a=iocal0
choice=full
cmp=g4
ms=5120
msf=0.01
nosniff=yes
noterm=yes
v=yes
pagetype=page
r=600
x=0
y=0
```

Figure 42. Sample TIFF Configuration File

The configuration file uses options in the same format as the transform options that you specify on the command line, except that command line options begin with a dash (-). Refer to *Infoprint Manager: Reference* for the options and values that you can specify in the configuration file.

## Transform Environment Variables

Many of the TIFF, JPEG, and GIF transform options have equivalent environment variables. Environment variables have the following format:

*transform\_option*

where *transform* is the name of the transform command in upper case and *option* is the command line option without the initial dash (-). For example, the environment variable that corresponds to the `—scale` option of the **jpeg2afp** transform is **JPEG2AFP\_scale**. Refer to *Infoprint Manager: Reference* for the options and values that you can specify as environment variables.

## Hierarchy of Transform Options

Infoprint assigns a hierarchy to its use of options and configuration-file information when it runs the TIFF, JPEG, or GIF transform program. The following lists the order in which Infoprint uses command-line options and information specified in configuration files:

1. Any values you specify on the command line, including values in the configuration files you specify with the `-C` option.

Infoprint commands process options from left to right. If you enter the same option more than once, Infoprint uses the last occurrence of the flag to determine the value to use. For example, if you specify the following command:

```
tiff2afp -Cconfig.file -r240 -r300 myfile.tif
```

the **tiff2afp** command transforms the file using 300-pel resolution. Infoprint ignores the resolution value specified in the configuration file `config.file` and the first `-r240` flag and value.

2. Values specified in the default transform command configuration file named in Table 8 on page 155.

3. Transform environment variables that you set with the **export** command, if you issue the transform command directly. Infoprint ignores these environment variables if you invoke the transform command indirectly by submitting a job to print.
4. Transform environment variables in the **.profile** file in your home directory.
5. Transform environment variables in the **/etc/environment** file.
6. Default values that are built into Infoprint. These are the same as the transform defaults.

---

## Working with the Transform for Line Data

Infoprint Manager includes a line-data transform program that transforms line data into the Advanced Function Presentation (AFP) data stream. Converting the line data allows you to print it on high-speed AFP printer devices.

### About Line Data

Read through the following topics to become familiar with line-data terms.

**Note:** The **line2afp** command and its keywords are a subset of the AFP Conversion and Indexing Facility (ACIF) **acif** command. Throughout this chapter references are made to ACIF because the **line2afp** command is linked to the **acif** command. When you use this transform and if errors occur, you may receive some error messages that make reference to ACIF.

### What Is Line Data?

Line data is simply unformatted data — that is, data with few or no embedded control characters to create font changes, page breaks, and so on. The line data is typically created by an application program. For example, an application might produce a bank statement that has line data indicating an account's daily balance.

The Infoprint line-data transform lets you format the following kinds of data with a page definition and form definition for printing on Infoprint-managed printer devices:

- S/370 line-mode data. This type of line data was originally designed for a 1403 printer, is typically generated on a S/370 host processor, and is usually EBCDIC characters with embedded control characters (carriage control, table reference characters, and so on). This type of line data can have double-byte code points and Shift In/Shift Out controls.
- Mixed-mode data is S/370 line-mode data embedded with certain AFP structured fields (for example, Include Page Segment).
- Single-byte ASCII data with no embedded control characters except for newlines.
- Single-byte ASCII data that contains ANSI carriage-control characters, table-reference characters, or both.
- Single-byte ASCII data that contains carriage returns and form feed controls if you specify the **asciinp** or **asciinpe** user-exit program.

When you transform the line-data job, you must specify a page definition and a form definition.

#### Notes:

1. You cannot use the line-data transform when printing files containing Proprinter ASCII.

2. When the **line2afp** command processes any unrecognized or unsupported keyword, **line2afp** issues a message, ignores the keyword, and continues processing any remaining keywords. The **line2afp** command then stops processing.
3. Infoprint also lets you transform and print DBCS ASCII data without a page definition. See *Infoprint Manager: Reference* or the **db2afp** man page.

## ANSI and Machine Carriage Controls

In many environments (including IBM mainframes and most minicomputers), printable data normally contains a carriage control character. The carriage control character acts as a vertical tab command to position the paper at the start of a new page, at a specified line on the page, or to control skipping to the next line. The characters can be one of two types: ANSI carriage control or machine carriage control.

**ANSI Carriage Control Characters:** The most universal carriage control is ANSI, which consists of a single character that is a prefix for the print line. The standard ANSI characters are:

| ANSI  | Action                                                         |
|-------|----------------------------------------------------------------|
| space | Single space the line and print                                |
| 0     | Double space the line and print                                |
| -     | Triple space the line and print                                |
| +     | Do not space the line and print                                |
| 1     | Skip to channel 1 (the top of the form, by convention)         |
| 2-9   | Skip to a hardware-defined position on the page                |
| A,B,C | Defined by a vertical tab record or forms control buffer (FCB) |

Note that all ANSI control characters perform the required spacing before the line prints. Using **line2afp** command keywords and values, ANSI controls may be encoded in EBCDIC (**cctype=a**) or in ASCII (**cctype=z**).

**Machine Carriage Control Characters:** Machine carriage controls were originally the actual hardware control commands for IBM printers and are often used on non-IBM systems. Machine controls are literal values, not symbols. They are not represented as characters in any encoding, and therefore, machine controls cannot be translated. Typical machine controls are:

| Machine | Action                                                              |
|---------|---------------------------------------------------------------------|
| X'09'   | Print the line and single space                                     |
| X'11'   | Print the line and double space                                     |
| X'19'   | Print the line and triple space                                     |
| X'01'   | Print the line (do not space)                                       |
| X'0B'   | Space one line immediately (do not print)                           |
| X'89'   | Print the line, then skip to channel 1 (top of form, by convention) |
| X'8B'   | Skip to channel 1 immediately (do not print)                        |

Note that machine controls print before performing any required spacing. There are many more machine control commands than ANSI. Carriage controls may be present in a file or not, but every record in the file must contain a carriage control if the controls are to be used. If the file contains carriage controls, but the **line2afp** command keyword and value **cc=no** is specified, the carriage controls are treated as printing characters. If no carriage controls are specified, the file prints as though it were single spaced.

## Variable-Length and Fixed-Length Files

The line-data transform program needs to know two things about a file in order to transform it:

- The length of each print record
- The kind of carriage control used

Some files contain information in each record that describes the record length; these are called variable-length files. Other files require an external definition of length; these are called fixed-length files.

For variable- and fixed-length files using length prefixes, MO:DCA-P structured fields are treated as a special case. All such structured fields are self-identifying and contain their own length. They need not contain a length prefix to be correctly interpreted and are processed correctly if there is a length prefix.

**Variable-Length Files:** Variable-length files may use a length prefix, which means they contain a prefix that identifies the length of the record in the file. Each record contains a field that gives the length of the record. If the record contains a length, that length must be a prefix for each record and it must be a 16-bit binary number that includes the length of the 2-byte length prefix. Use the **fileformat=record** keyword and value to identify files with length prefixes.

Variable-length files may use a separator or delimiter to indicate the end of a record, instead of using a length prefix. All of the bytes up to, but not including, the delimiter are considered part of the record. For AIX, the delimiter is X'0A'. If the file uses EBCDIC encoding, the newline character is X'25'. Use the **fileformat=stream** keyword and value to designate files that use newlines to indicate record boundaries.

Infoprint reads the first six bytes and tests for all ASCII characters (code points from X'00' to X'7F') to determine if a file is encoded in ASCII or EBCDIC. If no non-ASCII characters are found, line-data transform program assumes the file uses the ASCII newline character, X'0A'. Otherwise, the transform assumes the file uses the EBCDIC newline character, X'25'. Because an input file can misguide the line-data transform, a set of rules has been established to determine how the transform processes the file. The following combinations are possible:

| Data Type  | Newline Character   |
|------------|---------------------|
| All EBCDIC | EBCDIC X'25'        |
| All EBCDIC | ASCII X'0A' (Note)  |
| All ASCII  | EBCDIC X'25' (Note) |
| All ASCII  | ASCII X'0A'         |

**Note:** These combinations are possible only if a file contains a prefix with a string that indicates a different code set than actually exists.

- For EBCDIC data with ASCII newlines, use X'0320202020200A'.
- For ASCII data with EBCDIC newlines, use X'03404040404025'.

**Fixed-Length Files:** Fixed-length files contain records that are all the same length. No other separators, prefixes, or self-identifying information exists that indicates the record length. You must know the record length and use the **fileformat=record,nnn** keyword and value, where *nnn* represents the length of each record.

## How the imageout Keyword Affects Processing

The line-data transform converts image formats (IM1) in the input file, in overlays, and in page segments to uncompressed IOCA format, if **line2afp imageout=ioca** keyword and value is specified (the default). An uncompressed IOCA image may use a significantly higher number of bytes than an IM1 image and may take more processing time to convert, especially for shaded or patterned areas. Although IOCA is the MO:DCA-P standard for image data, and some data stream receivers may require it, all products may not accept IOCA data. All software products from the IBM Printing Systems Company do, however, accept IOCA data as well as IM1 image data.

IBM recommends that you specify **imageout=asis**, unless you have a specific requirement for IOCA images.

## Customizing the Line Data Transform

Infoprint provides several sample programming exits to assist you in customizing the line-data transform. Use of the programming exits is optional. You specify the names of the exit programs with the **inpxit**, **outexit**, and **resexit** keywords. Each of these keywords is described in *Infoprint Manager: Reference* or the **line2afp** man page.

Infoprint provides the following sample exits:

**/usr/lpp/psf/acif/apkinp.c**

Input record exit

**/usr/lpp/psf/acif/apkout.c**

Output record exit

**/usr/lpp/psf/acif/apkres.c**

Resource exit

In addition, Infoprint provides the following user input record exits to translate line-data data streams:

**/usr/lpp/psf/acif/apka2e.c**

Converts the ASCII stream data into the EBCDIC stream data.

**/usr/lpp/psf/acif/asciinp.c**

Converts unformatted ASCII data that contains carriage returns and form feeds into a record format that contains ANSI carriage control characters. This exit encodes the ANSI carriage control character in byte 0 of every record.

**/usr/lpp/psf/acif/asciinpe.c**

Converts unformatted ASCII data into a record format as does **asciinp.c** and then converts the ASCII stream data into EBCDIC stream data.

The C language header file for all line-data transform exit programs is also provided:

**/usr/lpp/psf/acif/apkexits.h**

along with the build rules for the line-data transform user exits:

**/usr/lpp/psf/acif/Makefile**

For more information about compiling user exit programs, refer to “Compiling and Installing the User-Exit Program” on page 67.

## Using the Parallel PDF RIP

With service release PTF U474310, Infoprint Manager for AIX Version 3 Release 2 provides the PDF Parallel RIP to improve the speed of PDF transforms for mostcolor jobs. It divides a PDF input file into separate pages and distributes these pages to several RIPs running in parallel. Then, it combines the resulting AFP data stream into a printable document. If you define two RIPs on the same Infoprint AIX server for a PDF input file with pages of a uniform complexity, the Parallel PDF RIP client can render this file into AFP in half the time of the standard PDF transform. While the greatest performance improvements occur for jobs printing on the Infoprint Color 130 Plus printer, you can use the Parallel PDF RIP client on any printers that produce AFP data.

The following describes:

1. “Installing the PDF Parallel RIP Client”.  
Specific instructions for setting up a PDF Parallel RIP Client (**pdfprs**).
2. “Customizing the PDF Parallel Transform” on page 163  
General information about the PDF transform files and how they can be used.
3. “Troubleshooting the Parallel PDF RIP Client” on page 167.  
Guidelines to avoid performance problems when using a PDF Parallel RIP Client (**pdfprs**).

### Installing the PDF Parallel RIP Client

The Parallel PDF RIP client (**pdfprs**) is installed with service release PTF U474310 and replaces the standard **pdf2afp** client on your system.

The **pdfprs** component consists of the following:

- the **pdfprs** executable in the **/usr/lpp/psf/bin** directory
- the **pdf2afp** configuration file in the **/usr/lpp/psf/ps2afp** directory.

The Parallel PDF RIP client is best used on an AIX server or servers, which may have from four to 16 processors. IBM recommends you set up a configuration to allow for system memory use like that displayed in Table 9.

Table 9. Processors Required to Use the Parallel PDF RIP client

| Processors Allocated | Function Performed                                                                                                                                                                                                                                                         |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                    | network traffic, I/O processes, and general system overhead.                                                                                                                                                                                                               |
| 1                    | <b>pdfprs</b> client as defined in “Sample Configuration File for the <b>pdfprs</b> Client” on page 163.                                                                                                                                                                   |
| 1                    | This first RIP transforms PDF into PostScript data.<br><br>Note that this must be a color RIP, even if you are using the client to transform black-and-white jobs on an Infoprint 4000 printer.<br><br>Each RIP is likely to use an entire processor to RIP the PDF files. |
| 1 to <i>n</i>        | For each additional daemon RIP as defined in “RIP Daemon Configuration Files” on page 164.                                                                                                                                                                                 |

Note that the most basic configuration (the **pdfprs** client and two additional RIPs) requires a minimum of four processors. Please ensure that your configuration can support this feature before installing it and submitting jobs through the Infoprint Manager **pdpr** print command.

You must create the first RIP to transform PDF input data to PostScript data, then use at least a two-RIP configuration on your Infoprint AIX server to transform the PDF into AFP data. To demonstrate how this support can be expanded by adding RIPs, this example creates a three-RIP configuration, with the first RIP transforming PDF input data into PostScript data. Note that these RIPs still use the PostScript daemon (**ps2afpd**), just like the standard PDF transform.

From an AIX window, complete the following procedure:

1. Create a directory for the PDF Parallel RIP client to distinguish it from the standard PDF data stream transform:

```
mkdir /var/psf/pdf2afp;chmod 777 /var/psf/pdf2afp
```

2. Create working directories for each of the new PDF RIPs:

```
mkdir /var/psf/pdf2afp/1;chmod 777 /var/psf/pdf2afp/1
```

```
mkdir /var/psf/pdf2afp/2;chmod 777 /var/psf/pdf2afp/2
```

```
mkdir /var/psf/pdf2afp/3;chmod 777 /var/psf/pdf2afp/3
```

```
mkdir /var/psf/pdf2afp/4;chmod 777 /var/psf/pdf2afp/4
```

3. Install new configuration files for each of these RIPs:

- **/var/psf/pdf2afp/8261.cfg**
- **/var/psf/pdf2afp/8262.cfg**
- **/var/psf/pdf2afp/8263.cfg**
- **/var/psf/pdf2afp/8264.cfg**

Note that for each new configuration file, you must change the **port**, **work\_directory**, and **log\_file** values. These three parameters are highlighted in Figure 44 on page 165 so you can see the directory structure recommended for this configuration.

4. From either the command line or the **ps2afpd.cfg** file, start daemons for each configuration file:

```
ps2afpd -C /var/psf/pdf2afp/8261.cfg
```

```
ps2afpd -C /var/psf/pdf2afp/8262.cfg
```

```
ps2afpd -C /var/psf/pdf2afp/8263.cfg
```

```
ps2afpd -C /var/psf/pdf2afp/8264.cfg
```

**Note:**

In the path where the working directories reside, you can create a **startcfg** script similar to the following to perform this task:

```
#!/bin/sh
cd /var/psf/ps2afp
if [$# -gt 0]
then
for i in $*
do
/usr/lpp/psf/bin/ps2afpd -C 826$i.cfg
done
else
for i in 1 2 3 4
```



```
do
/usr/lpp/psf/bin/ps2afpd -C 826$i.cfg
done
fi
```

5. To ensure that the pdfprs command is linked to the pdf2afp command, you must enter the following commands:
  - a. Access the correct directory by specifying: `cd /usr/lpp/psf/bin`
  - b. Create the necessary logical link to submit jobs to the PDF parallel RIP by specifying: `ln -sf pdfprs pdf2afp`

**Note:** If you need to restore the old **pdf2afp** client, you can specify the following from an AIX command line: `ln -sf ps2afp pdf2afp`.

This configuration will automatically invoke four RIPs and generally run faster than the standard PDF transform.

## Customizing the PDF Parallel Transform

You can customize the transforms for PDF data by specifying values in the transform configuration files. Table 10 shows the default configuration files that Infoprint provides. You can either modify these files or create your own.

Table 10. Default Parallel PDF Transform Configuration Files

| <b>Data Stream</b> | <b>Transform</b> | <b>Configuration File</b>                                         | <b>Daemon Configuration Files</b>                                                                                                                                                                                                                     |
|--------------------|------------------|-------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PDF                | pdf2afp          | /usr/lpp/psf/ps2afp/pdf2afp.cfg<br>The pdfprs configuration file. | /var/psf/pdf2afp/8261.cfg<br>/var/psf/pdf2afp/8262.cfg<br>/var/psf/pdf2afp/8263.cfg<br>/var/psf/pdf2afp/8264.cfg<br><br><b>Note:</b> This represents the 3-RIP configuration of our example, with the first RIP serving as the PDF to PostScript RIP. |

### Sample Configuration File for the pdfprs Client

Figure 43 on page 164 shows an example of a configuration file for the PDF parallel transform client. Note the three parameters that have been highlighted to show values you want to specify exactly as shown to enhance the performance of the parallel PDF RIP.

```

pdf2afp.cfg configuration file

KEYWORD EQUIVALENT ps2afp FLAG PURPOSE
#####

width = 8.5i # -w width of generated image
length = 11i # -l length of generated image
x_offset = 0i # -x left and right margins
y_offset = 0i # -y top and bottom margins
resolution = 600 # -r resolution of printer
output_type = FS45 # type of AFP image to generate
job_timeout = 120 # # maximum number of minutes to process a job

numInputBuffers=48 # set input buffers to improve performance
numOutputBuffers=66 # set output buffers to improve performance
pragma=outputThread=yes # specify for FS45 (color) RIP

number_of_rips = 3 # number of rips to use for processing

[pdf] # location of PDF -> PS conversion rip
port = 8261
server = server1

[rip1] # location of this rip
port = 8262
server = server1

[rip2] # location of this rip
port = 8263
server = server1

[rip3] # location of this rip
port = 8264
server = server1

```

Figure 43. Sample PDF Parallel Transform (pdf2afp.cfg) Configuration File

This sample configuration file uses keyword equivalents of the transform flags. Refer to *Infoprint Manager: Reference* for the keywords and values that you can specify in the configuration file.

**Note:** For this sample **pdf2afp.cfg** configuration to work correctly, you must have a configuration with a minimum of four processors dedicated to this task.

### RIP Daemon Configuration Files

The PDF parallel transform requires that at least three daemons be running to manage the PostScript interpreter portion of the **pdf2afp** transform. . To simplify your configuration, IBM recommends naming these daemons after the ports that they are running on. For this document, the configuration example begun in Figure 43 will use the names **8261.cfg**, **8262.cfg**, **8263.cfg**, and **8264.cfg**. For more information about this daemon, refer to *Infoprint Manager: Reference*.

The daemon, like the corresponding transform, uses configuration files. The daemon configuration files reside in the **/var/psf/** directory. It is recommended that you create a **/pdf2afp** subdirectory where all support related to the Parallel PDF RIP client (**pdfprs**) can reside.

Figure 44 shows an example of a configuration file for the PDF parallel transform client that RIPs a color (FS45) file.

```
8264.cfg configuration file

KEYWORD EQUIVALENT ps2afp FLAG PURPOSE
#####

port = 8264 # which TCP/IP port to use
work_directory = /var/psf/pdf2afp/4 directory to put work files in
log_files = /var/psf/pdf2afp/4/ps2afpd.log where to write log messages
notify = root # notify if problems are encountered
mail_command = /usr/bin/mail program used to send notifications
ps_program = /usr/lpp/psf/bin/ps2afpic # name of the PostScript interpreter program
ps_init_file = /usr/lpp/psf/bin/ps2afpec.ps # name of the PostScript interpreter
 # initialization file
ps_files_path = /usr/lpp/psf/ps2afp :\
 /usr/lpp/psf/config :
 /usr/lpp/psf
ps_max_memory = 32000K # path to search for jobInit files
 # maximum amount of memory that
ps_job_timeout = 9999 # PostScript uses; the 'K' is ignored
 # maximum number of minutes
ps_server_timeout = 180 # to process PostScript job
 # maximum number of minutes
ps_font_map_files = /usr/lpp/psf/ps/psfonts.map :\
 /var/psf/psfonts/user.map
ps_width = 8.5i # list of font mapping files
ps_length = 11i # width of generated image
ps_x_offset = 0i # length of generated image
ps_y_offset = 0i # left and right margins
ps_resolution = 600 # top and bottom margins
ps_output_type = FS45 # resolution of target printer
 # type of output to generate

pragma = colorRip=yes ;\
resources=none ;\
printerSpeed=130 ;\
linkBandWidth=6000000 ;\
resourceNameFilename=../.resNames;
```

Figure 44. Sample PDF Parallel Transform (8264.cfg) Configuration File for Color.

If you are defining and configuring daemon RIPs across several AIX servers, you must define the resources in the daemon RIP configuration file as shown in the highlighted section of Figure 44. This step ensures that NFS can find all the resources and concatenate the result into a single file. You only need to specify the **resourceNameFilename=** value on the **pragma** parameter this way if you are using inline resources and the FS45 IOCA color format.

These daemon configuration files can contain many of the same keywords as the transform configuration file, except **server**, plus some keywords that control the operation of the daemon. Refer to *Infoprint Manager: Reference* for the daemon keywords.

```

8264.cfg configuration file

KEYWORD EQUIVALENT ps2afp FLAG PURPOSE
#####

port = 8264 # which TCP/IP port to use
work_directory = /var/psf/pdf2afp/4 directory to put work files in
log_files = /var/psf/pdf2afp/4/ps2afpd.log where to write log messages
notify = root # notify if problems are encountered
mail_command = /usr/bin/mail program used to send notifications
ps_program = /usr/lpp/psf/bin/ps2afpi # name of the PostScript interpreter program
ps_init_file = /usr/lpp/psf/bin/ps2afpe.ps # name of the PostScript interpreter
 # initialization file
ps_files_path = /usr/lpp/psf/ps2afp :\
 /usr/lpp/psf/config :
 /usr/lpp/psf
 # path to search for jobInit files
ps_max_memory = 32000K # maximum amount of memory that
 # PostScript uses; the 'K' is ignored
ps_job_timeout = 9999 # maximum number of minutes
 # to process PostScript job
ps_server_timeout = 180 # maximum number of minutes
 # server waits between jobs
ps_font_map_files = /usr/lpp/psf/ps/psfonts.map :\
 /var/psf/psfonts/user.map
 # list of font mapping files
ps_width = 8.5i # width of generated image
ps_length = 11i # length of generated image
ps_x_offset = 0i # left and right margins
ps_y_offset = 0i # top and bottom margins
ps_resolution = 600 # resolution of target printer
ps_output_type = I01_G4 # type of output to generate

```

Figure 45. Sample PDF Parallel Transform (8264.cfg) Configuration File for Black and White.

### Configuring for a Dual Engine Halftone Printer

If you have either an Infoprint 4000 Advanced Function Duplex Printing System – Models ID5/ID6 or an Infoprint 4000 High Resolution Duplex Printing System, you can use the **pdfprs** client to drive a dual-engine configuration with customized halftone support for each engine. Note that while the **pdfprs** client can RIP both the color and the black-and-white (monochrome) PDF files, these printers only print black-and-white output. In addition, these printers do not provide as extensive a performance benefit as that you will see when printing color PDF files. Note that if you do print color PDF files and then would want to switch to black-and-white PDF files, you must stop the RIPs and change the configuration files.

For this support, you must configure and start an even number of RIPs. The first RIP must be customized to use the first print engine's halftone configuration, and the second RIP must be customized to use the second print engine's halftone configuration. This pattern must be repeated for each RIP that is configured.

In addition, each RIP must be configured to use the desired halftone configuration at the daemon configuration level. For example, if you are using two Infoprint 4000 printers, all the even-numbered RIPs should match the halftone configuration specified on printer1, while all the odd-numbered pages should match the halftone configuration specified on printer2. Figure 45 on page 166 provides an example of a monochrome RIP daemon configuration file, with the variables changed from the Color daemon configuration file in **bold-face** type.

### Hierarchy of Transform Options

Infoprint assigns a hierarchy to its use of flags and configuration-file information when it runs the PDF transform program. The following lists the order in which Infoprint uses flags and information specified in configuration files:

1. Any values you specify on the command line, including values in the configuration file you specify with the **-C** flag.

Infoprint commands process flags from left to right. If you enter the same flag more than once, Infoprint uses the last occurrence of the flag to determine the value to use. For example, if you specify the following command:

```
pdfprs -C8263.cfg -r240 -r300 myfile.ps
```

The **pdfprs** command transforms the file using 300-pel resolution. Infoprint ignores the resolution value specified in the configuration file `8263.cfg` and the first **-r240** flag and value.

2. Values specified in the default transform command configuration file named in Table 10 on page 163.
3. Values specified in a customized configuration file identified with the **-C** flag of the **ps2afpd** command when the transform daemon started.
4. Values specified in the default transform daemon configuration file named in the `/usr/lpp/psf/ps2afpd.cfg` file.
5. Default values that are built into Infoprint. These are the same as the transform defaults, except that the default PDF output type is an IM1 uncompressed image.

## Troubleshooting the Parallel PDF RIP Client

There are certain factors that can enhance the performance of your **pdfprs** client. The following section provides some recommendations.

### Defining RIPs on an Infoprint AIX server

The more RIPs you define, the greater the performance improvement. However, because a single RIP uses an entire CPU, you should never start more RIPs than your Infoprint Server can support. The **pdfprs** client generally uses one processor, so be sure that your configuration can support the number of RIPs that you define and start. For guidelines see Table 9 on page 161. For more information about defining RIPs across AIX servers, see 165.

### Specifying an uneven number of RIPs

If you have PDF files that have simple text data on the front page and more complex image data on the back page consistently throughout the job, a two-RIP configuration will not result in enhanced performance. Since the second RIP always gets the more complex pages, the job will take the same time to RIP as if a single RIP were used, while the first RIP remains idle. Use an uneven number of RIPs to distribute the pages in the job more evenly.

### Using **-p** or **-g** options from the command line

While you can specify a page subset for a particular job by using the **-p** or

| the **-g** flags on the **pdfprs** command, IBM recommends that you avoid  
| these flags. If Infoprint has to determine a subset of the pages in the job, it  
| slows down processing and reduces the benefit of having parallel RIPs.

---

## Chapter 14. Working with Fonts

This chapter describes the fonts required for printing different data formats. It also describes what you must do so that Infoprint can use them. This chapter consists of the following topics:

- “Font Substitution on the InfoColor 70”
- “Fonts for Printing Transformed PostScript and PDF Data”
- “Fonts for Printing ditroff Data” on page 174
- “Fonts for Printing DBCS ASCII and EUC Data” on page 182
- “Fonts for Printing Line Data” on page 184

---

### Font Substitution on the InfoColor 70

If any fonts are missing from a PostScript job submitted to the InfoColor 70, the printer automatically substitutes Helvetica.

---

### Fonts for Printing Transformed PostScript and PDF Data

The Infoprint PostScript transform program uses Type 1 outline fonts when transforming PostScript and PDF files. Infoprint includes the IBM Type 1 outline fonts and these fonts are installed in subdirectories of the `/usr/lpp/psf/ps/fonts` directory during installation. If you have other Type 1 outline fonts, you can also use them with the transform program.

**Note:** When Infoprint runs the PostScript transform program during job submission, it can search other directories for fonts.

### Font-Mapping Files

A font-mapping file identifies the file names of the Type 1 outline fonts on the AIX system. The Infoprint PostScript transform program requires at least one font-mapping file. Infoprint installs the default font-mapping file, `psfonts.map` in the `/usr/lpp/psf/ps` directory during installation. If you have other Type 1 outline fonts installed on your system, you can create additional font-mapping files to define their names.

#### PostScript Font-Mapping File Considerations

When you create your own font-mapping files, consider that:

- You can create more than one font-mapping file.
- At least one font-mapping file must contain the Courier font. The PostScript transform program substitutes Courier for any missing fonts.

#### Creating a PostScript Font-Mapping File

Use the Infoprint `mkfntmap` command to create a font-mapping file for use with the Infoprint PostScript transform program. You specify one or more input files containing Type 1 outline fonts and a name for the font-mapping file.

For example, to use the input file `FontFile` and create a font-mapping file named `font.map`, enter:

```
mkfntmap FontFile > font.map
```

## Using Font-Mapping Files with the `ps2afp` or the `pdf2afp` Command

By default, Infoprint uses the `psfonts.map` font-mapping file when you issue the `ps2afp` or the `pdf2afp` command; you do not have to specify the name of the default font-mapping file with the command.

To use font-mapping files that you have created when you issue the `ps2afp` or the `pdf2afp` command, you must do one of the following:

- Enter the path and name of the font-mapping file as the value of the `ps_font_map_files` keyword in the transform daemon configuration file. For performance reasons, this is the recommended method. You can specify more than one font-mapping file, if necessary. Separate the font-mapping files with colons.

For example, to specify the font-mapping files `font1.map` and `font2.map`, enter the following:

```
ps_font_map_files=/path/font1.map:/path/font2.map
```

- Enter the path and name of the font-mapping file as the value of the `ps_font_map_files` transform command configuration file. Use the same syntax as described for entering the value in the transform daemon configuration file. Using this method can result in significant performance degradation.
- Specify the font-mapping file, including its path name, from the command line using the `-F` flag of the `ps2afp` or the `pdf2afp` command. You can specify multiple files using multiple `-F` flags; Infoprint concatenates them from left-to-right (first entered to last entered) in that order.

For example:

```
ps2afp -F/path/font.map
```

This method can also result in degraded performance.

**Note:** If you use the `ps2afp -F` or the `pdf2afp -F` command flag or the `ps_font_map_files` keyword in the transform command configuration file to specify a font-mapping file, and the value is different than that specified in the transform daemon configuration file, the transform daemon restarts the PostScript interpreter so that the new value for the font-mapping file takes effect. However, restarting the PostScript interpreter decreases performance.

## Specifying Font Substitution through Initialization Files

You can issue specific PostScript commands to specify whether printers substitute fonts for those defined in job tickets that are neither inline with the job nor resident on the printer. To perform this task, modify the `UserInit` file that is located in the `/var/psf/ps2afp`

To ensure that fonts not inline with the job or resident on your printer substitute Courier fonts to allow the job to print, specify the following in the `UserInit` file:

```
%!
turnFontSubstitutionOn
```

To ensure that fonts not inline with the job or resident on your printer do not print, specify the following in the `UserInit` file:

```
%!
turnFontSubstitutionOff
```

**Note:** For your convenience, IBM has provided a sample `UserInit` file in the `/var/psf/ps2afp` directory (used by the IBM Infoprint 4000 PostScript



transform) and in the `/var/psf/ps2afp2` directory (used by the IBM Infoprint 60 PostScript transform): **UserInit.turnFontSubstitutionOn.sample**.

You can use the desktop **Text Editor** to rename and use this **UserInit** file at your installation.

## Adding Non-IBM Fonts to AIX for a PostScript Job

If your Infoprint system receives a PostScript job from a personal computer system, the fonts required for that job might not reside on the AIX system. An Infoprint Submit operator might find that either:

- Fonts are not available on AIX
- Fonts are not in the **.pfa** or **.pfb** format required for PostScript fonts

If either of these conditions occur, the AIX administrator must make these fonts available before printing the PostScript job.

To simplify the process of moving fonts from a personal computer system to AIX, fonts can be sent inline in a PostScript job and captured on AIX by using the **FontSave** utility.

**Note:** Before activating the **FontSave** utility, ensure that you have the correct licensing to add inline fonts from customer jobs onto the MPC. IBM provides this utility, but is not responsible for verifying that you are authorized to use the fonts a customer may provide inline through a print job.

### Activating the FontSave Utility

You can perform this task by using the following procedure. These directions presume that you have not modified the default file names used by the PostScript transform. If your AIX system controls both the IBM Infoprint 4000 and the IBM Infoprint 60, two separate PostScript transforms are controlled by two separate configuration files: **ps2afpd.cfg** for the Infoprint 4000 and **3160d.cfg** for the Infoprint 60.

If you have already edited either of these configuration files, these commands might differ. If your installation contains both transforms, ensure that you make the changes for both configuration files.

1. Ensure that the PostScript transform daemons are running prior to starting the Infoprint software.

If these daemons are not running, open an AIX window and enter:

```
ps2afpd -C /usr/lpp/psf/ps2afp/daemon
```

where *daemon* refers to either the **ps2afpd.cfg** or the **3160d.cfg** file.

2. Edit the `/usr/lpp/psf/ps2afp/daemon` configuration file by adding the following line at the end of the file:

```
input_exit = /usr/lpp/psf/bin/fontsave
```

3. Change the line that describes where the font maps reside from

```
ps_font_map_files = /usr/lpp/psf/ps/psfonts.map :\n /var/psf/psfonts/user.map
```

to

```
#ps_font_map_files = /usr/lpp/psf/ps/psfonts.map :\
/var/psf/psfonts/user.map
ps_font_map_files = /usr/lpp/psf/ps/psfonts.map :\
 /var/psf/psfonts/user.map :\
 /var/psf/workd/FontSave.map
```

where *workd* represents the PostScript transform's work directory. If you are printing to an Infoprint 4000, the directory defaults to **ps2afp**, and if you are printing to an Infoprint 60, the directory defaults to **ps2afp2**.

**Note:** By commenting out the original lines (#), you retain the ability to turn off the FontSave utility as described in "Deactivating the FontSave Utility" on page 173.

4. From the AIX-command line, verify these changes by using the **cd** command to access the changed files and using the **view** command to verify the changes.

The PostScript transform program detects these changes automatically after they have been saved.

5. Access the working directory that the PostScript transform uses by entering:  
`cd /var/psf/workd`

From the AIX command line, create the initial font save font mapping file by entering the following commands in sequence:

```
touch FontSave.map
chown daemon.printq FontSave.map
```

6. Test this function by preflighting a PostScript job from the Infoprint Submit Advanced options window using the command:  
`-a NONE`
7. Access the work directory for the PostScript transform, where the saved fonts should exist:

```
cd /var/psf/workd
```

8. Enter an **ls** command to ensure that the FontSave directory and the following files exist:
  - **FontSave.wrk**
  - **FontSave.map**
  - **FontSave.bak**

Note that the **FontSave.bak** might not be present if only one PostScript job has been preflighted through the transform when you view this display.

9. If this directory and these files are present, view the **FontSave.map** file, which displays the fonts that have been saved as Adobe Type I fonts that can be used by the PostScript transform.

For example, to map the Macintosh font Garamond-Light, the **FontSave.map** file would display the following line:

```
font Garamond-Light /var/psf/workd/FontSave/Garamond-Light
```

where Garamond-Light is the Type I font saved by the FontSave utility that will be used whenever the PostScript job calls for the Garamond-Light font.

If this directory and these files are not present, ensure that you have made the changes to both the **ps2afpd.cfg** or the **3160d.cfg** files. Also, check the PostScript job that you submitted from Infoprint Submit to ensure that it contained inline fonts.

10. To verify that the PostScript fonts now reside on your AIX system, preflight another PostScript job from Infoprint Submit that references the fonts that had

been inline. If the PostScript interpreter can find and load these fonts successfully (without font substitution messages displaying on the Infoprint Submit shared ticket directory or in the **ps2afpd.log** file), the process works correctly.

**Note:** You should never modify either the **FontSave.wrk** or the **FontSave.bak** files because it can affect the path to the Adobe Type I fonts that now reside on AIX.

### Deactivating the FontSave Utility

Because the FontSave utility can degrade performance when running large PostScript jobs, you might want to deactivate it after saving the most commonly used inline fonts.

To deactivate the FontSave utility so that new inline fonts are not saved, but the fonts you have already saved as Adobe Type I are still used, do the following:

1. From the desktop **Text Editor**, search the **/usr/lpp/psf/workd** directory for the *daemon* file, where *daemon* refers to either the **ps2afpd.cfg** file or the **3160d.cfg** file.
2. From within the *daemon* file, disable the input exit by placing a # in front of the following line:

```
input_exit = /usr/lpp/psf/bin/fontsave
```

The PostScript transform automatically detects these changes after they have been saved to the file.

To deactivate the FontSave utility so that inline fonts are not saved and previously saved inline fonts are no longer used, remove the input exit and change the following lines in both the **ps2afpd.cfg** file and the **3160d.cfg** file:

```
ps_font_map_files = /usr/lpp/psf/ps/psfonts.map :\
 /var/psf/psfonts/user.map
/var/psf/ps2afp/FontSave.map
```

You can always reactivate the FontSave utility by changing these files back.

**Note:** Always verify your changes by preflighting a PostScript job from the Infoprint Submit system (use the **-a NONE** option when printing). If the job runs with the fonts expected, you know that the changes were saved successfully.

## Transforming pfb Fonts to pfa Fonts for Use with Adobe Acrobat Distiller

The following procedure allows you to transform a binary PostScript font (one with a **.pfb** final qualifier) into an ASCII PostScript font (one with a **.pfa** final qualifier) for use with the Adobe Acrobat Distiller. While the Adobe PostScript RIP (**ps2afp**) can run with both binary and ASCII fonts, the Adobe Acrobat Distiller requires ASCII fonts. You can perform this task from Infoprint Manager and transform any valid Type 1 PostScript font file.

1. Move to the directory where the **.pfb** font resides by specifying:

```
cd /usr/lpp/psf/fonts/apl
```

where **/usr/lpp/psf/fonts/apl** represents the directory where your fonts are stored.

2. Use the **makepfa** utility to transform a binary font (such as **APLB.PFB**) into an ASCII font (such as **CourierAPL2-Bold**) by specifying:

```
makepfa /usr/lpp/psf/ps/fonts/ap1/APLB.PFB
```

3. When you receive an AIX command-line prompt, view the directory contents to see the file that you just created by specifying:

```
ls -al
```

The system should return a display similar to the following:

```
:\n:\n:\n-r--r--r-- 1 root printq 50318 Jul 29 20:13 APL.PFB\n:\n:\n-rw-r--r-- 1 root system 95602 Jul 31 13:45 CourierAPL2-Bold\n:\n:\n:
```

**Note:** If you attempt to transform a font file that is not Type 1 PostScript format, you will receive the following message:

```
0423-026 mkfntmap: The file /t is not a valid Type 1 PostScript font file and has been ignored.
```

---

## Fonts for Printing ditroff Data

This section describes the files that Infoprint provides for printing **ditroff** files on AFP printer devices and the directories in which they reside.

### AFP Code Pages for AFP Fonts

Infoprint supplies the following three code pages for use with the AFP fonts for **ditroff**. These code pages map the existing characters in **troff** files to their corresponding AFP characters in the AFP character sets.

**T1001038**

Adobe Symbols (ASCII)

**T1001108**

**ditroff** Base Compatibility

**T1001109**

**ditroff** Specials Compatibility

When you install Infoprint, both the 240-pel and 300-pel code page files are automatically installed in the **/usr/lpp/psf/fontlib** directory.

**Note:** If you transform a file for printing that requires fonts on a font cartridge and the printer device does not have the font cartridge installed that supports the fonts specified in the **/usr/lib/font/devhplj** directory, your file may not print correctly. Refer to your printer documentation to install bit-mapped fonts into the **/usr/lib/font/devhplj** directory.

### AFP Characters Mapped to ditroff Characters

Infoprint supplies AFP character sets in raster format. The character sets, which map to corresponding **ditroff** fonts, are listed in the **devafp.fontmap** file located in the **/usr/lib/font/devafp** directory. The character sets themselves are installed in the **/usr/lpp/psf/fontlib** directory.

Infoprint supplies AFP character sets for the following **troff** type families: B, BI, C, CB, CI, CBI, H, HB, HI, HBI, I, R, SG, and SS.

The following character list provides a mapping from the **ditroff** names of characters to the IBM graphics character identifier. The "IBM Graphic Character Identifier" column can be used to view the printed character as printed in a code

page table. The “**ditroff** Name of Character” column can be used to print any of these characters by typing it into a text file as a special character that is processed by **troff**.

## Mapping for Code Pages T1001038, T1001108, and T1001109

Table 11. Mapping for Code Pages T1001038, T1001108, and T1001109

| <i>IBM Graphic Character Identifier</i> | <i>ditroff Name of Character</i> | <i>Character Description</i> |
|-----------------------------------------|----------------------------------|------------------------------|
| GA010000                                | *a                               | alpha                        |
| GA020000                                | *A                               | capital Alpha                |
| GB010000                                | *b                               | beta                         |
| GB020000                                | *B                               | capital Beta                 |
| GD010000                                | *d                               | delta                        |
| GD020000                                | *D                               | capital Delta                |
| GE010000                                | *e                               | epsilon                      |
| GE020000                                | *E                               | capital Epsilon              |
| GE310000                                | *y                               | eta                          |
| GE320000                                | *Y                               | capital Eta                  |
| GF010000                                | *f                               | phi                          |
| GF020000                                | *F                               | capital Phi                  |
| GG010000                                | *g                               | gamma                        |
| GG020000                                | *G                               | capital Gamma                |
| GH010000                                | *x                               | chi                          |
| GH020000                                | *X                               | capital Chi                  |
| GI010000                                | *i                               | iota                         |
| GI020000                                | *I                               | capital Iota                 |
| GK010000                                | *k                               | kappa                        |
| GK020000                                | *K                               | capital Kappa                |
| GL010000                                | *l                               | lambda                       |
| GL020000                                | *L                               | capital Lambda               |
| GM010000                                | *m                               | mu                           |
| GM020000                                | *M                               | capital Mu                   |
| GN010000                                | *n                               | nu                           |
| GN020000                                | *N                               | capital Nu                   |
| GO010000                                | *o                               | omicron                      |
| GO020000                                | *O                               | capital Omicron              |
| GO310000                                | *w                               | omega                        |
| GO320000                                | *W                               | capital Omega                |
| GP010000                                | *p                               | pi                           |
| GP020000                                | *P                               | capital Pi                   |
| GP610000                                | *q                               | psi                          |
| GP620000                                | *Q                               | capital Psi                  |
| GR010000                                | *r                               | rho                          |

Table 11. Mapping for Code Pages T1001038, T1001108, and T1001109 (continued)

| <b>IBM Graphic Character Identifier</b> | <b>ditroff Name of Character</b> | <b>Character Description</b> |
|-----------------------------------------|----------------------------------|------------------------------|
| GR020000                                | *R                               | capital Rho                  |
| GS010000                                | *s                               | sigma                        |
| GS020000                                | *S                               | capital Sigma                |
| GS610000                                | ts                               | terminal sigma               |
| GT010000                                | *t                               | tau                          |
| GT020000                                | *T                               | capital Tau                  |
| GT610002                                | *h                               | theta                        |
| GT620000                                | *H                               | capital Theta                |
| GU010000                                | *u                               | upsilon                      |
| GU020000                                | *U                               | capital Upsilon              |
| GX010000                                | *c                               | xi                           |
| GX020000                                | *C                               | capital Xi                   |
| GZ010000                                | *z                               | zeta                         |
| GZ020000                                | *Z                               | capital Zeta                 |
| LA010000                                | a                                | a                            |
| LA020000                                | A                                | A                            |
| LB010000                                | b                                | b                            |
| LB020000                                | B                                | B                            |
| LC010000                                | c                                | c                            |
| LC020000                                | C                                | C                            |
| LD010000                                | d                                | d                            |
| LD020000                                | D                                | D                            |
| LE010000                                | e                                | e                            |
| LE020000                                | E                                | E                            |
| LF010000                                | f                                | f                            |
| LF020000                                | F                                | F                            |
| LF510000                                | ff                               | ff ligature                  |
| LF530000                                | fi                               | fi ligature                  |
| LF550000                                | fl                               | fl ligature                  |
| LF570000                                | Fi                               | ffi ligature                 |
| LF590000                                | Fl                               | ffl ligature                 |
| LG010000                                | g                                | g                            |
| LG020000                                | G                                | G                            |
| LH010000                                | h                                | h                            |
| LH020000                                | H                                | H                            |
| LI010000                                | i                                | i                            |
| LI020000                                | I                                | I                            |
| LJ010000                                | j                                | j                            |
| LJ020000                                | J                                | J                            |

Table 11. Mapping for Code Pages T1001038, T1001108, and T1001109 (continued)

| <b>IBM Graphic Character Identifier</b> | <b>ditroff Name of Character</b> | <b>Character Description</b> |
|-----------------------------------------|----------------------------------|------------------------------|
| LK010000                                | k                                | k                            |
| LK020000                                | K                                | K                            |
| LL010000                                | l                                | l                            |
| LL020000                                | L                                | L                            |
| LM010000                                | m                                | m                            |
| LM020000                                | M                                | M                            |
| LN010000                                | n                                | n                            |
| LN020000                                | N                                | N                            |
| LO010000                                | o                                | o                            |
| LO020000                                | O                                | O                            |
| LP010000                                | p                                | p                            |
| LP020000                                | P                                | P                            |
| LQ010000                                | q                                | q                            |
| LQ020000                                | Q                                | Q                            |
| LR010000                                | r                                | r                            |
| LR020000                                | R                                | R                            |
| LS010000                                | s                                | s                            |
| LS020000                                | S                                | S                            |
| LT010000                                | t                                | t                            |
| LT020000                                | T                                | T                            |
| LU010000                                | u                                | u                            |
| LU020000                                | U                                | U                            |
| LV010000                                | v                                | v                            |
| LV020000                                | V                                | V                            |
| LW010000                                | w                                | w                            |
| LW020000                                | W                                | W                            |
| LX010000                                | x                                | x                            |
| LX020000                                | X                                | X                            |
| LY010000                                | y                                | y                            |
| LY020000                                | Y                                | Y                            |
| LZ010000                                | z                                | z                            |
| LZ020000                                | Z                                | Z                            |
| ND010000                                | 1                                | one                          |
| ND020000                                | 2                                | two                          |
| ND030000                                | 3                                | three                        |
| ND040000                                | 4                                | four                         |
| ND050000                                | 5                                | five                         |
| ND060000                                | 6                                | six                          |
| ND070000                                | 7                                | seven                        |

Table 11. Mapping for Code Pages T1001038, T1001108, and T1001109 (continued)

| <b>IBM Graphic Character Identifier</b> | <b>ditroff Name of Character</b> | <b>Character Description</b> |
|-----------------------------------------|----------------------------------|------------------------------|
| ND080000                                | <b>8</b>                         | eight                        |
| ND090000                                | <b>9</b>                         | nine                         |
| ND100000                                | <b>0</b>                         | zero                         |
| NF010000                                | <b>12</b>                        | 1/2                          |
| NF040000                                | <b>14</b>                        | 1/4                          |
| NF050000                                | <b>34</b>                        | 3/4                          |
| NF180000                                | <b>18</b>                        | 1/8                          |
| NF190000                                | <b>38</b>                        | 3/8                          |
| NF200000                                | <b>58</b>                        | 5/8                          |
| SA000000                                | <b>\-</b>                        | minus                        |
| SA000000                                | <b>mi</b>                        | minus                        |
| SA010000                                | <b>+</b>                         | plus sign                    |
| SA010000                                | <b>pl</b>                        | math plus                    |
| SA020000                                | <b>+–</b>                        | plus or minus                |
| SA030000                                | <b>&lt;</b>                      | less than sign               |
| SA040000                                | <b>=</b>                         | equal sign                   |
| SA040000                                | <b>eq</b>                        | equal sign                   |
| SA050000                                | <b>&gt;</b>                      | greater than sign            |
| SA060000                                | <b>di</b>                        | divide sign                  |
| SA070000                                | <b>mu</b>                        | multiplication sign          |
| SA160000                                | <b>ap</b>                        | approximates                 |
| SA240000                                | <b>ib</b>                        | improper subset              |
| SA270000                                | <b>ip</b>                        | improper superset            |
| SA380000                                | <b>ca</b>                        | intersection                 |
| SA390000                                | <b>cu</b>                        | union                        |
| SA400000                                | <b>sb</b>                        | subset                       |
| SA410000                                | <b>sp</b>                        | superset                     |
| SA450000                                | <b>if</b>                        | infinity                     |
| SA470000                                | <b>pt</b>                        | proportional to symbol       |
| SA480000                                | <b>==</b>                        | identity                     |
| SA490000                                | <b>pd</b>                        | partial differential symbol  |
| SA510000                                | <b>is</b>                        | integral symbol              |
| SA520000                                | <b>&lt;=</b>                     | less than or equal           |
| SA530000                                | <b>&gt;=</b>                     | greater than or equal        |
| SA540000                                | <b>!=</b>                        | not equal                    |
| SA670000                                | <b>mo</b>                        | element of                   |
| SA700000                                | <b>≈</b>                         | approximately equal          |
| SA800000                                | <b>sr</b>                        | square root                  |
| SA870000                                | <b>es</b>                        | empty set                    |



Table 11. Mapping for Code Pages T1001038, T1001108, and T1001109 (continued)

| <b>IBM Graphic Character Identifier</b> | <b>ditroff Name of Character</b> | <b>Character Description</b> |
|-----------------------------------------|----------------------------------|------------------------------|
| SC030000                                | \$                               | dollar sign                  |
| SC040000                                | ct                               | cent sign                    |
| SD110000                                | '                                | acute accent                 |
| SD110000                                | aa                               | acute accent                 |
| SD130000                                | `                                | grave accent                 |
| SD130000                                | ga                               | grave accent                 |
| SD150000                                | ^                                | circumflex accent            |
| SD190000                                | ~                                | tilde accent                 |
| SD410000                                | cd                               | cedilla accent               |
| SF640000                                | br                               | box rule                     |
| SA860000                                | rn                               | root extender                |
| SV300600                                | ul                               | underrule                    |
| SV300200                                | ru                               | rule                         |
| SG050000                                | lc                               | left ceiling                 |
| SG060000                                | lf                               | left floor                   |
| SG070000                                | rc                               | right ceiling                |
| SG080000                                | rf                               | right floor                  |
| SG090000                                | lt                               | upper left curly bracket     |
| SG100000                                | lk                               | left middle curly bracket    |
| SG110000                                | lb                               | lower left curly bracket     |
| SG120000                                | rt                               | upper right curly bracket    |
| SG130000                                | rk                               | right middle curly bracket   |
| SG140000                                | rb                               | lower right curly bracket    |
| SG170000                                | bv                               | vertical bold                |
| SL030000                                | gr                               | gradient                     |
| SM010000                                | #                                | number sign                  |
| SM020000                                | %                                | percent sign                 |
| SM030000                                | &                                | ampersand                    |
| SM040000                                | *                                | asterisk                     |
| SM040002                                | **                               | math star                    |
| SM050000                                | @                                | at                           |
| SM060000                                | [                                | left bracket                 |
| SM070000                                | \                                | backslash                    |
| SM070000                                | \e                               | backslash                    |
| SM080000                                | ]                                | right bracket                |
| SM110000                                | {                                | left brace                   |
| SM130000                                | or                               | or bar                       |
| SM130000                                |                                  | or bar                       |
| SM140000                                | }                                | right brace                  |

Table 11. Mapping for Code Pages T1001038, T1001108, and T1001109 (continued)

| <b>IBM Graphic Character Identifier</b> | <b>ditroff Name of Character</b> | <b>Character Description</b>                       |
|-----------------------------------------|----------------------------------|----------------------------------------------------|
| SM190000                                | de                               | degree                                             |
| SM240000                                | sc                               | section                                            |
| SM300000                                | <-                               | left arrow                                         |
| SM310000                                | ->                               | right arrow                                        |
| SM320000                                | ua                               | up arrow                                           |
| SM330000                                | da                               | down arrow                                         |
| SM340000                                | dg                               | dagger                                             |
| SM350000                                | dd                               | double dagger                                      |
| SM450000                                | sq                               | open square                                        |
| SM470000                                | bx                               | solid square, histogram, square bullet, filled box |
| SM520000                                | co                               | copyright                                          |
| SM530000                                | rg                               | registered                                         |
| SM540000                                | tm                               | trade mark                                         |
| SM570000                                | bu                               | bullet                                             |
| SM590000                                | rh                               | right hand                                         |
| SM630000                                | lh                               | left hand                                          |
| SM660000                                | no                               | logical not                                        |
| SM750000                                | ci                               | circle                                             |
| SM900000                                | em                               | em dash                                            |
| SP020000                                | !                                | exclamation point                                  |
| SP040000                                | "                                | double quote                                       |
| SP050000                                | fm                               | foot mark (minutes symbol)                         |
| SP060000                                | (                                | left paren                                         |
| SP070000                                | )                                | right paren                                        |
| SP080000                                | ,                                | comma                                              |
| SP090000                                | \_                               | underscore                                         |
| SP090000                                | _                                | underscore                                         |
| SP100000                                | hy                               | hyphen                                             |
| SP110000                                | .                                | period                                             |
| SP120000                                | /                                | slash                                              |
| SP120001                                | sl                               | fraction                                           |
| SP130000                                | :                                | colon                                              |
| SP140000                                | ;                                | semicolon                                          |
| SP150000                                | ?                                | question mark                                      |
| SP190000                                | \‘                               | open quote                                         |
| SP200000                                | \’                               | close quote                                        |
| SS000000                                | bs                               | smiley face                                        |
| SS680000                                | -                                | dash, minus sign (en dash)                         |

Table 11. Mapping for Code Pages T1001038, T1001108, and T1001109 (continued)

| <b>IBM Graphic Character Identifier</b> | <b>ditroff Name of Character</b> | <b>Character Description</b> |
|-----------------------------------------|----------------------------------|------------------------------|
| SS680000                                | en                               | dash, minus sign (en dash)   |

### Special Symbols Added for Code Page T1001038

The following non-standard special symbols were added:

Table 12. Special Symbols Added for Code Page T1001038

| <b>IBM Graphic Character Identifier</b> | <b>ditroff Name of Character</b> | <b>Character Description</b>      |
|-----------------------------------------|----------------------------------|-----------------------------------|
| SA370000                                | tf                               | therefore, math and proof symbols |
| SS020000                                | ht                               | heart                             |
| SS030000                                | dm                               | diamond                           |
| SS040000                                | cl                               | club                              |
| SS050000                                | sd                               | spade                             |

### Special Symbols Added for Code Page T1001108

The following non-standard special symbols were added:

Table 13. Special Symbols Added for Code Page T1001108

| <b>IBM Graphic Character Identifier</b> | <b>ditroff Name of Character</b> | <b>Character Description</b> |
|-----------------------------------------|----------------------------------|------------------------------|
| SM790000                                | hs                               | house character              |
| ND011000                                | s1                               | One superscript              |
| ND021000                                | s2                               | Two superscript              |
| ND031000                                | s3                               | Three superscript            |
| ND041000                                | s4                               | Four superscript             |
| ND051000                                | s5                               | Five superscript             |
| ND061000                                | s6                               | Six superscript              |
| ND071000                                | s7                               | Seven superscript            |
| ND081000                                | s8                               | Eight superscript            |
| ND091000                                | s9                               | Nine superscript             |
| ND101000                                | s0                               | Zero superscript             |

### Special Symbol Added for Code Page T1001109

The following non-standard special symbol was added:

Table 14. Special Symbol Added for Code Page T1001109

| <b>IBM Graphic Character Identifier</b> | <b>ditroff Name of Character</b> | <b>Character Description</b> |
|-----------------------------------------|----------------------------------|------------------------------|
| SV300400                                | ol                               | overrule                     |

## Adding Other troff Fonts

Infoprint provides AFP fonts that map to existing **troff** fonts in the Courier, Helvetica, and Times type families and AFP fonts for special characters. The font-mapping table contained in the **devafp.fontmap** file maps the AFP fonts to the corresponding **troff** fonts.

If you want to add **troff** fonts or special characters, contact your IBM Printing Systems representative.

## ditroff Font Files

Infoprint installs other files for **ditroff** in the **/usr/lib/font/devafp** directory, including the following:

### **devafp.fontmap**

File that maps **ditroff** fonts to AFP fonts.

### **\*.d2afp**

Special versions of the **ditroff** font descriptions. The **d2afp** command uses these files.

### **DESC** (no extension)

**troff** device description, ASCII version.

### **DESC.out**

**troff** device description, binary version.

**\*.out** **troff** font descriptions, binary version.

---

## Fonts for Printing DBCS ASCII and EUC Data

In ideographic languages, like Japanese, Chinese, and Korean, there are thousands of characters. A single byte of information cannot represent all of these characters because a single byte only accommodates 256 characters. Therefore, at least one more byte of information is required.

For DBCS ASCII files, each ideographic character is exactly two bytes. For Extended UNIX Code (EUC) files, each ideographic character may be two, three, or four bytes, depending on the EUC implementation and language. Single-byte ASCII characters may be mixed in with DBCS ASCII and EUC characters.

Infoprint supports printing DBCS ASCII and EUC files in the following formats:

- DBCS ASCII files in the Japanese and Traditional Chinese languages, which can contain formatting controls for the IBM 5577 or 5587 printers.
- EUC files in the Japanese, Traditional Chinese, and Korean languages. EUC files cannot contain any formatting control characters.

## Fonts Required to Print a Double-Byte Transformed File

You can use the **db2afp** transform command to transform input files that use the following code pages:

- Japanese PC (code page IBM-932)
- Japanese EUC (code page IBM-eucJP)
- Traditional Chinese PC (code page IBM-938)
- Traditional Chinese EUC (code page IBM-eucTW)
- Korean EUC (code page IBM-ecuKR)

The transformed files contain font references to the double-byte character set. You set the character set, code page, you want by setting the **PSFDBLANG** environment variable; see Chapter 11, “Setting Infoprint and AIX Environment Variables” on page 139.

After you have used the **db2afp** command to transform DBCS ASCII and EUC files into AFP data stream files, you must have access to DBCS fonts when you print the transformed files. The DBCS fonts for Japanese, Traditional Chinese, and Korean are not part of Infoprint but are available for the MVS, VM, and AIX operating systems as separately orderable licensed programs.

## Installing DBCS Fonts on AIX

To make the fonts available on your system and to Infoprint, once you have the licensed programs, you must do one of the following:

- Use the AIX licensed programs to install the fonts onto your AIX system.
- Use the AIX licensed programs to install the fonts onto a AIX system other than yours and use the Network File System (NFS) **mount** command to mount the AIX file system onto your AIX system.
- Use the NFS **mount** command to mount the MVS or VM minidisk to your AIX system.

## Setting Up Font Resources for DBCS ASCII and EUC Printing

To print the transformed files that contain font references to the double-byte character set, you must make the double-byte fonts known to Infoprint through one of the following methods:

- Create a resource-context object that identifies the location of the double-byte fonts and associate the resource-context object with a default-document object and an Infoprint logical printer; see Chapter 8, “Creating and Managing Resource-Context Objects (PSF, Fax, Email, and Infoprint 2000 DSS Only)” on page 109 for these procedures. Using this method makes the fonts known to Infoprint for any job submitted to the logical printer associated with the default-document object.
- Add the directories to the search path for physical printers using the Infoprint VSM administrator’s GUI physical printer notebook Resource context for fonts field; see “Assigning Resource-Context Objects to an Actual Destination” on page 111 for the procedure. Using this method makes the fonts known to Infoprint for any job processed by those physical printers.
- Set and export the **PSFPATH** environment variable to your environment by entering the following command:

```
export PSFPATH=$PSFPATH:path1:path2:pathN
```

Using this method makes the fonts known to Infoprint for all print jobs submitted from the AIXwindows or High Function Terminal session in which the **PSFPATH** environment variable was set.

- Set and export the **PSFPATH** environment variable in your **.profile** file (Korn and Bourne shells) or **.cshrc** file (C shells) by adding the following line to the file:

```
export PSFPATH=$PSFPATH:path1:path2:pathN
```

Using this method makes the fonts known to Infoprint for any job you submit.

- Set the **PSFPATH** environment variable in the **/etc/environment** file by adding the following line to the file:

PSFPATH=path1:path2:pathN

Using this method makes the fonts known to Infoprint for all users on the system.

---

## Fonts for Printing Line Data

When you specify a coded font name with the **chars** keyword of the **line2afp** command or with the **chars** document attribute, the font name is limited to four characters, excluding the two-character prefix.

Table 15 provides a list of the IBM Expanded Core Fonts for use with unformatted ASCII input data. Because these fonts have eight-character names, the table also provides a list of six-character short names. Infoprint stores these coded fonts in the **/usr/lpp/psf/reslib** directory. There are symbolic links of the eight-character names that correspond to the six-character names. You may use these short names, *without* the X0 prefix, to satisfy the four-character limitation for specifying font names with the **chars** keyword of the **line2afp** command.

For the names of other coded fonts, refer to *IBM AFP Fonts: Font Summary*.

Table 15. Font Mapping Table for Use with the **chars** keyword

| <i>Type Family</i> | <i>Point Size</i> | <i>Coded Font Name</i> | <i>Linked Short Name<br/>(for chars keyword)</i> |
|--------------------|-------------------|------------------------|--------------------------------------------------|
| Courier            | 7                 | X0423072               | X04272                                           |
| Courier            | 8                 | X0423082               | X04282                                           |
| Courier            | 10                | X0423002               | X04202                                           |
| Courier            | 12                | X04230B2               | X042B2                                           |
| Courier            | 14                | X04230D2               | X042D2                                           |
| Courier            | 20                | X04230J2               | X042J2                                           |
| Helvetica          | 6                 | X0H23062               | X0H262                                           |
| Helvetica          | 7                 | X0H23072               | X0H272                                           |
| Helvetica          | 8                 | X0H23082               | X0H282                                           |
| Helvetica          | 9                 | X0H23092               | X0H292                                           |
| Helvetica          | 10                | X0H23002               | X0H202                                           |
| Helvetica          | 11                | X0H230A2               | X0H2A2                                           |
| Helvetica          | 12                | X0H230B2               | X0H2B2                                           |
| Helvetica          | 14                | X0H230D2               | X0H2D2                                           |
| Helvetica          | 16                | X0H230F2               | X0H2F2                                           |
| Helvetica          | 18                | X0H230H2               | X0H2H2                                           |
| Helvetica          | 20                | X0H230J2               | X0H2J2                                           |
| Helvetica          | 24                | X0H230N2               | X0H2N2                                           |
| Helvetica          | 30                | X0H230T2               | X0H2T2                                           |
| Helvetica          | 36                | X0H230Z2               | X0H2Z2                                           |
| Times New Roman    | 6                 | X0N23062               | X0N262                                           |
| Times New Roman    | 7                 | X0N23072               | X0N272                                           |
| Times New Roman    | 8                 | X0N23082               | X0N282                                           |
| Times New Roman    | 9                 | X0N23092               | X0N292                                           |

Table 15. Font Mapping Table for Use with the chars keyword (continued)

| <b>Type Family</b> | <b>Point Size</b> | <b>Coded Font Name</b> | <b>Linked Short Name<br/>(for chars keyword)</b> |
|--------------------|-------------------|------------------------|--------------------------------------------------|
| Times New Roman    | 10                | X0N23002               | X0N202                                           |
| Times New Roman    | 11                | X0N230A2               | X0N2A2                                           |
| Times New Roman    | 12                | X0N230B2               | X0N2B2                                           |
| Times New Roman    | 14                | X0N230D2               | X0N2D2                                           |
| Times New Roman    | 16                | X0N230F2               | X0N2F2                                           |
| Times New Roman    | 18                | X0N230H2               | X0N2H2                                           |
| Times New Roman    | 20                | X0N230J2               | X0N2J2                                           |
| Times New Roman    | 24                | X0N230N2               | X0N2N2                                           |
| Times New Roman    | 30                | X0N230T2               | X0N2T2                                           |
| Times New Roman    | 36                | X0N230Z2               | X0N2Z2                                           |





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## Chapter 15. Using Global Resource Identifiers

Infoprint can identify the fonts required for a job, access AFP font files that are installed on or NFS-mounted to the RS/6000, and download the appropriate fonts to an Infoprint-managed printer device. However, some Infoprint printers can use fonts that are resident in the printer, saving the time it takes to download these fonts. Because the font files on the RS/6000 do not share the same names as the printer-resident fonts, Infoprint uses global resource identifiers (GRIDs) to map the RS/6000-resident fonts to the printer-resident fonts. Use the information in this chapter to work with GRIDs.

This chapter consists of the following topics:

- “How Can You Use GRIDs?”
- “What GRID Files Ship With Infoprint?”
- “Where Does Infoprint Search for GRID Files?” on page 189
- “Understanding the General Syntax Rules and Allowable Values for GRID Files” on page 189
- “Modifying GRID Files” on page 191
- “Preventing Infoprint From Using GRID Files” on page 194

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### How Can You Use GRIDs?

GRID files contain pre-assigned mappings that you can modify to map RS/6000-resident font file names to printer-resident font identifiers. These pre-assigned mappings include both single-byte character set (SBCS) and double-byte characters set (DBCS) outline fonts.

If you have a printer that supports outline fonts, you can use the GRID files to map raster character-set names to outline font global identifiers.

A third use of GRID files is to support Mixed Object Document Content Architecture for Presentation (MO:DCA-P) files that specify fonts using GRIDs rather than character-set names. You can customize the GRID files to define which fonts Infoprint uses when the data stream of the job specifies GRIDs.

---

### What GRID Files Ship With Infoprint?

Infoprint ships four GRID files that you can customize for use with the types of printer devices that you use and the types of jobs that you print. These files are **charset.grd.sample**, **codepage.grd.sample**, **cpgid.grd.sample**, and **fgid.grd.sample**, and they are installed in the `/usr/lpp/psf/grd` directory. The following describes each file:

#### **charset.grd.sample**

Specifies which printer-resident fonts are activated for the character-set names found within the data stream of the job.

This file maps the font character-set name to a:

- Font global identifier (**fgid**)
- Graphic character set global identifier (**gcsgid**)
- Font width
- Vertical size value

- Set of font attributes (bold, italic, and doublewide)

Figure 46 shows an example of the format of a line in the character set sample file.

```
FCS name -> fgid gcsgid width vsize attr
#-----#
C0L00GSC 398 - 96 120 - # GOTHIC CONDENSED 1
```

Figure 46. Sample File for a Character Set

### codepage.grd.sample

Specifies which printer-resident fonts are activated for the code page names found within the data stream of the job.

This file maps a code page to the:

- Code page global identifier (**cpgid**)
- Graphic character set global identifier (**gcsgid**)

Figure 47 shows an example of the format of a line in the code page sample file.

```
code page name -> cpgid gcsgid
#-----#
T1000038 38 123 # US-ASCII Character Set 1
```

Figure 47. Sample File for a Code Page

### fgid.grd.sample

Specifies which font character set Infoprint should download when substituting for a global resource identifier that it finds in the data stream of the job.

This file maps the following to a font character set (FCS) name:

- A font global identifier (**fgid**)
- A graphic character set global identifier (**gcsgid**)
- A font width
- A vertical size value

Figure 48 shows an example of the format of a line in the font global identifier sample file.

```
fgid gcsgid width vsize -> FCS name
#-----#
3 0 144 240 C0E0DE10 # DELEGATE 12 POINT 1
```

Figure 48. Sample File for a Global Identifier

### cpgid.grd.sample

Specifies which code page Infoprint should download when substituting for a global resource identifier that it finds in the data stream of the job.

This file maps a code page global identifier and a graphic character set global identifier to a code page name. Figure 49 on page 189 shows an example of the format of a line in the code page identifier sample file.

```

cpgid gcsgid -> code page name
#-----#
 29 0 T1V10871 # OLD ICELANDIC 1

```

Figure 49. Sample File for a Code Page Identifier

For a detailed explanation of how the different types of identifiers combine to produce fonts, see *AFP Fonts: Font Summary*

If you have a job that specifies a font that is not resident on your printer, you can use the GRID files to map the missing font to one with the same point size that does reside on your printer. To understand what fonts your printer device has, consult both your printer documentation and *Advanced Function Presentation: Printer Information*.

---

## Where Does Infoprint Search for GRID Files?

Infoprint searches the following directories, in the order shown, for GRID files:

1. An internal list that matches the **charset.grd.sample** file.
2. **/usr/lpp/psf/grd**
3. **/var/psf/printername**, where *PrinterName* is the name of a valid Infoprint physical printer.

**Note:** When the same mapping is found in one of these files, Infoprint uses the last one (**/var/psf/PrinterName**).

When you install Infoprint, sample GRID files are installed in the **/usr/lpp/psf/grd** directory. You can maintain a central location for new or modified GRID files for specific printers by storing files in the **/var/psf/PrinterName** directory.

If you are mapping raster fonts to outline fonts, you can map multiple names to the same GRID part so that different sized fonts can apply to your print job.

### Notes:

1. The new or modified GRID files you create have the same names as the sample files except that you delete **.sample** from each file name.
2. After creating or modifying GRID files, you must shut down and restart the Infoprint physical printer represented by *PrinterName* for the changes in the file to take effect.

---

## Understanding the General Syntax Rules and Allowable Values for GRID Files

To tailor the Infoprint-supplied GRID files for your own system needs, you need to understand the general syntax rules for the four GRID files and the allowable values for the fields within the files.

### Syntax Rules Applying to All Types of GRID Files

The GRID files are simple ASCII text files that you can modify through any standard AIX text editor. The following rules apply to all of the GRID files:

- Each line in the file cannot contain more than 255 characters
- Separate fields within a line with one or more delimiters (spaces)
- A pound sign (#) indicates the start of comments, which causes Infoprint to ignore the remainder of that line

- A dash, `-`, indicates the absence of a particular value, for which Infoprint substitutes a zero (0)
- An asterisk, `*`, indicates that a wildcard value (any numeric decimal) is accepted.
- Infoprint ignores blank lines and extraneous fields

## Allowable Values for the `charset.grd` File

You can specify the following values for fields in the GRID file for a character set for a font:

### *fgid*

Identifies the character set identifier for the font. Specify a numeric value from 1 to 65534 or enter a dash, `-`, if you want to disable the mapping of this character set to GRID values.

### *gcsgid*

Identifies a global identifier for the font. Specify a numeric value from 0 to 65534 or enter a dash, `-`, to specify no **gcsgid**. If you specify an asterisk, Infoprint issues an error message.

### *width*

Identifies the width specified in the character set. Specify a numeric value from 0 to 65534 or enter a dash, `-`, to specify no width. If you specify an asterisk, Infoprint issues an error message.

### *vertical\_size*

Identifies the vertical size specified in the character set. Specify a numeric value from 0 to 65534 or enter a dash, `-`, to specify no vertical size. If you specify an asterisk, Infoprint issues an error message.

### *attribute\_field*

Indicates the attributes of the character set. Specify a lowercase `b` (bold), `i` (italic), `d` (doublewide), or enter a dash, `-`, to specify no attribute.

## Allowable Values for the `codepage.grd` File

You can specify the following values for fields in the GRID file for a code page for a font:

### *cpgid*

Identifies the code page identifier for the font. Specify a numeric value from 1 to 65534 or enter a dash, `-`, if you want to disable the mapping of this character set to GRID values.

### *gcsgid*

Identifies a global identifier for the code page. Specify a numeric value from 0 to 65534 or enter a dash, `-`, to specify no **gcsgid**. If you specify an asterisk, Infoprint issues an error message.

## Allowable Values for the `fgid.grd` File

You can specify the following values for fields in the GRID file for a font global identifier:

### *fgid*

Identifies the global identifier for the font. Specify a numeric value from 1 to 65534 or enter an asterisk, `*`, to indicate a wildcard value. If you specify a dash, Infoprint issues an error message.

### *gcsgid*

Identifies the global identifier for the font. Specify a numeric value from 0 to 65534 or enter an asterisk, \* , to indicate a wildcard value. If you specify a dash, Infoprint issues an error message.

### *width*

Identifies the number of characters per horizontal inch. Specify a numeric value from 1 to 65534 or enter an asterisk, \* , to indicate a wildcard value. If you specify a dash, Infoprint issues an error message.

### *vertical\_size*

Identifies the vertical size of the font. Specify a numeric value from 1 to 65534 or enter an asterisk, \* , to indicate a wildcard value. If you specify a dash, Infoprint issues an error message.

## Allowable Values for the *cpgid.grd* File

You can specify the following values for fields in the GRID file for a code page global identifier:

### *cpgid*

Identifies code page identifier for the font. Specify a numeric value from 1 to 65534.

### *gcsgid*

Identifies the global identifier for the font. Specify a numeric value from 0 to 65534 or enter an asterisk, \* , to indicate a wildcard value. If you specify a dash, Infoprint issues an error message.

---

## Modifying GRID Files

The following section describes the two ways you can modify GRID files to support the printer devices and types of jobs in your production printing environment.

**Note:** If you are using Infoprint to print from the IBM 6400 Line Matrix printer in either native or 4234 emulation mode, you must modify both the **charset.64xx.grd** and the **codepage.64xx.grd** files as described in “Modifying the charset and codepage GRID Files” and “Modifying the FGID and CPGID GRID Files” on page 192.

## Modifying the charset and codepage GRID Files

You can avoid having Infoprint download fonts by adding font entries that map the font character set or code page that is most referenced in jobs to a global identifier for a resident font.

For example, if many of your jobs specify the Prestige 10-point font, which is character set C0S0PR10, and that font is not resident on your IBM 3812 printer diskette, you can map the Prestige 10-point font to a similar font that does reside on your IBM 3812 printer diskette. In the following procedure, you map the Gothic 10-point font, character set C0D0GT10, that is a printer-resident font to the Prestige 10-point font.

Perform the following steps:

1. From the AIX command line, change to the */var/psf/PrinterName* directory, where *PrinterName* is the name of the Infoprint physical printer representing the 3812 printer device.

2. Create the **charset.grd** file from the **charset.grd.sample** file. Enter the command:  

```
cp /usr/lpp/psf/grd/charset.grd.sample charset.grd
```
3. Using an AIX editor, such as vi, edit the **charset.grd** file you just created and copy the following line for the Gothic 10-point printer-resident font:  

```
C0D0GT10 40 - 144 240 # GOTHIC TEXT 10
```
4. Change the first entry in the copied line, in the **FCS name** column, to the character set identifier of the Prestige 10-point font that you want to map to the Gothic 10-point font. You can change the comment at the end of the copied line to identify the mapping change you are making.  

```
C0S0PR10 40 - 144 240 # PRESTIGE 10 mapped to GOTHIC TEXT 10
```
5. Search the remainder of the **charset.grd** file to ensure that it contains no other C0S0PR10 entries. A later entry of the same character set would replace the entry you just made.
6. Save your changes and close the file.

If you print many jobs that specify the personal computer ASCII codepage for Iceland, T1000861, but that codepage is not resident on your printer diskette, you can map codepage T1000861 to a similar codepage that does reside on your printer diskette, the personal computer multilingual codepage for ASCII data, T1000850.

Perform the following steps:

1. From the AIX command line, change to the **/var/psf/PrinterName** directory, where *PrinterName* is the name of the Infoprint physical printer representing the printer device.
2. Create the **codepage.grd** file from the **codepage.grd.sample** file. Enter the command:  

```
cp /usr/lpp/psf/grd/codepage.grd.sample codepage.grd
```
3. Using an AIX editor, such as vi, edit the **codepage.grd** file you just created and copy the following line for the personal computer multilingual codepage for ASCII data:  

```
T1000850 850 980 # PC MULTILINGUAL
```
4. Change the first entry in the copied line, in the **code page name** column, to the codepage identifier of the personal computer ASCII codepage for Iceland font that you want to map to the multilingual codepage. You can change the comment at the end of the copied line to identify the mapping change you are making.  

```
T1000860 850 980 # ICELAND MAPPED TO MULTILINGUAL
```
5. Search the remainder of the **codepage.grd** file to ensure that it contains no other T1000860 entries. A later entry of the same character set would replace the entry you just made.
6. Save your changes and close the file.

## Modifying the FGID and CPGID GRID Files

You can add new entries to map your GRID data to the resident fonts in your printer by modifying either the **fgid.grd.sample** file or the **cpgid.grd.sample** file. If you have a printer that does not support the outline font technology (such as the IBM 3835 Advanced Function Printer), IBM recommends that you map all the **CZnnnn** entries to raster font character-set names. If you do not create this mapping, Infoprint issues an error message and does not print the job.

For example, if you wanted to map the Times New Roman Latin 1 character set to the raster version, you would perform the following:

1. From the AIX command line, change to the `/var/psf/PrinterName` directory, where *PrinterName* is the name of the Infoprint physical printer representing the printer device.
2. Create the **fgid.grd** file from the **fgid.grd.sample** file. Enter the command:  

```
cp /usr/lpp/psf/grd/fgid.grd.sample fgid.grd
```
3. Using an AIX editor, edit the file that you just created and copy the following line:  

```
2308 2039 * * CZN200 # Times New Roman Latin1
```
4. Change the entry in the **FCS name** column to `CON20000`.  

```
2308 2039 * * CON20000 # Raster version of TNR Latin 1
```
5. Save your changes and close the file.

After this substitution, Infoprint prints jobs that specify the font character-set name `CZN200` and that processed on the physical printer for which you made the change using the raster version of the font. The `CZN200` character set now maps to:

- An FGID of 2308
- A GCSGID of 2039
- A vertical size of 65535
- A width of 0

**Note:** For more information about the different values available for font character sets and code pages, see "IBM Font Interchange Information" in *IBM Data Stream and Object Architectures Mixed Object Document Content Architecture Reference*.

Because the IBM 3835 Advanced Function Printer does not support any resident outline fonts, the **fgid.grd.sample** file maps the **FGID** and the **GCSGID** back to the `CON20000` character set. Then, Infoprint searches the resource library search path to locate the `CON20000` character for downloading with the job.

To modify the **cpgid** file so that the personal computer ASCII codepage for Iceland maps to the multilingual codepage for ASCII data as described in "Modifying the charset and codepage GRID Files" on page 191, perform the following steps:

1. From the AIX command line, change to the `/var/psf/PrinterName` directory, where *PrinterName* is the name of the Infoprint physical printer representing the printer device.
2. Create the **cpgid.grd** file from the **cpgid.grd.sample** file. Enter the command:  

```
cp /usr/lpp/psf/grd/cpgid.grd.sample cpgid.grd
```
3. Using an AIX editor, such as `vi`, edit the **cpgid.grd** file you just created and copy the following line for the personal computer multilingual codepage for ASCII data:  

```
850 980 T1000850 # PC MULTILINGUAL
```
4. Change the first entry in the copied line, in the **cpgid** column, to the codepage identifier of the personal computer ASCII codepage for Iceland font that you want to map to the multilingual codepage. You can change the comment at the end of the copied line to identify the mapping change you are making.  

```
861 980 T1000850 # ICELAND MAPPED TO MULTILINGUAL
```
5. Search the remainder of the **cpgid.grd** file to ensure that it contains no other 861 entries. A later entry of the same character set would replace the entry you just made.
6. Save your changes and close the file.

## Verifying the GRID Files

During physical printer initialization, Infoprint examines the contents of the GRID files. If Infoprint detects any syntax errors, it reports an error condition and fails to enable the physical printer. To correct these errors, you must edit the failing GRID files. For information on what files, lines, or fields are in error, you must access the GRID **error.log** file for the physical printer that is located in `/var/psf/PrinterName`.

---

## Preventing Infoprint From Using GRID Files

If you have obtained a 300-pel printer but print 240-pel jobs, the printer-resident fonts may have different line spacings and endings in the printed output. For some types of billing statements, these line endings are inappropriate. You can solve this problem by preventing Infoprint from using the GRID files. This prevents the use of the printer-resident fonts. Perform the following procedure:

1. Using the AIX **mv** command, rename your customized GRID files. For example, if you are in the `/var/psf/PrinterName` directory and you want to rename the **charset.grd** to `charset.grd.bak`, enter:  

```
mv charset.grd charset.grd.bak
```
2. Copy the `/usr/lpp/psf/grd/charset.grd.sample` file to **charset.grd** in the `/var/psf/PrinterName` directory.
3. Using an AIX editor, such as **vi**, edit the copied **charset.grd** file and place a dash (-) in the **fgid** column.
4. Copy the `/usr/lpp/psf/grd/codepage.grd.sample` file to **codepage.grd** in the `/var/psf/PrinterName` directory.
5. Edit the copied **codepage.grd** file and place a dash (-) in the **cpgid** column.



---

## Chapter 16. Printing Data Sets from an MVS System Through MVS Download

This section contains information on setting up and using the MVS Download daemon supplied with IBM Infoprint Control (Infoprint) to print MVS jobs on Infoprint-managed printers. The MVS jobs must come from an MVS system that has the MVS Download feature of IBM Print Services Facility/Multiple Virtual Storage (PSF/MVS) program product installed.

The Infoprint MVS Download daemon allows MVS users to print data sets from the MVS JES spool on Infoprint-managed printer devices. The MVS data sets may contain S/370 line data, MO:DCA data, or S/370 mixed-mode data. You can also print MVS data sets containing PostScript data or data in any of the other formats supported by Infoprint.

The PSF/MVS MVS Download feature uses a routing-control data set residing on the MVS system to map any combination of the **CLASS**, **FORMS**, and **DEST** JCL parameters to a specific Infoprint server.

See the *PSF/MVS MVS Download Guide*, for information about the MVS Download feature and tasks performed on the MVS system.

This chapter contains the following topics:

- “Preparing to Work with MVS Download”
- “Modifying the Infoprint mvsprpsm.sh Shell Script” on page 197
- “Passing the Parameter List from the mvsprsd Daemon to the Shell Script” on page 199
- “Translating Print Options to Infoprint Attributes and Values” on page 200
- “Using the mvsprsd Command to Start the Daemon” on page 202
- “Using MVS Download Support for Multi-Data Set Jobs” on page 203
- “Resubmitting or Deleting MVS Download Orphaned Files” on page 205

---

### Preparing to Work with MVS Download

Read through the following topics to become familiar with MVS Download terms and components.

#### Why Use MVS Download?

When you have data on an MVS system that you want to print on an Infoprint-managed printer device, you can use the MVS Download feature of PSF/MVS and the Infoprint MVS Download daemon. The PSF/MVS feature and the Infoprint daemon:

- Provide a high-speed data transfer utility for high-volume jobs.
- Restart from a checkpoint if something interrupts the data transmission.
- Do not require separate spool management and queueing on MVS because of seamless integration with System Display and Search Facility (SDSF).

## What Is the MVS Download Daemon?

Infoprint provides a daemon, **mvsprsd**, which receives data sets from one or more MVS systems. If you expect a high volume of data, you can configure several **mvsprsd** daemons to receive the data sets from MVS.

To configure an **mvsprsd** daemon, you must perform these tasks:

1. Make the Advanced Function Presentation (AFP) resources on the MVS system available to Infoprint if they are not already available.
2. Use the default version or a customized version of the shell script **mvsprpsm.sh** supplied with Infoprint. See “Modifying the Infoprint mvsprpsm.sh Shell Script” on page 197 for more information.
3. Assign a port number to the Infoprint daemon and start the daemon using the **mvsprsd** command.

See “Using the mvsprsd Command to Start the Daemon” on page 202.

## How Do You Make AFP Resources Available?

Some jobs may require AFP resources located on the MVS system. You can use the Network File System (NFS) **mount** command to make MVS file systems containing resources accessible to the AIX system on which Infoprint is running. Or you may have the resources located on the AIX system. You use the shell script **mvsprsd.sh**, supplied with Infoprint in the **/usr/lpp/pd/bin** directory, to specify the location of the resources.

## How Are Print Options Passed to Infoprint?

MVS users submitting MVS data sets for printing on Infoprint-managed printer devices can pass a number of options that further define the requirements of their jobs. The Infoprint daemon receives the options with the data set and passes the options to the shell script.

See “Passing the Parameter List from the mvsprsd Daemon to the Shell Script” on page 199 for information on the options.

## What Does the mvsprpsm.sh Shell Script Do?

The Infoprint MVS Download shell script translates the print options specified with a downloaded MVS file into Infoprint attributes and values. The shell script then builds an Infoprint **pdpr** command using the **-x** flag to submit the attributes and values; it builds the name of the file to print from information received from the MVS system and the date and time the MVS file was received. The shell script then creates a log file and submits the **pdpr** command. A check is made to determine if Infoprint accepts the command. If Infoprint accepts the command, the Infoprint MVS Download shell script deletes the log file and the data set received from the MVS system. Otherwise, the log and file remain in the defined file system.

## What Does the Log File Generated by the mvsprpsm.sh Shell Script Contain?

The filename of the log file has the following format:

```
jobname.dataset_name.forms_name.yyddd.log
```

The log file generated by the Infoprint MVS Download shell script contains the following information:

- The date Infoprint received the MVS data set and print options

- The print options sent to the shell script by the **mvsprsd** daemon
- A copy of the **pdpr** command issued by the shell script to print the file
- Any error messages issued in response to the **pdpr** command
- The return code from the **pdpr** command

**Note:** If Infoprint accepts the command, the Infoprint MVS Download shell script deletes the log file and the data set received from the MVS system. If you are having problems, you may want to comment out this behavior while debugging.

If the **pdpr** command fails, you can use the log file located in the file system you defined with the **-d** flag of the **mvsprsd** utility.

- Ensure the shell script received the correct parameters
- Perform Infoprint troubleshooting procedures, such as using the **pdmsg** command to determine the cause of the problem with the **pdpr** command.

---

## Modifying the Infoprint **mvsprpsm.sh** Shell Script

You can use the default version of the **mvsprpsm.sh** shell script, located in the **/usr/lpp/pd/bin** directory, or modify the shell script to meet the needs of your production printing environment. For example, you might include the path to AFP resources on the AIX system or change how the shell script generates the file name for the data set received from the MVS system. Or you might want to specify a default page definition.

When modifying the **mvsprpsm.sh** script, note that parameters you comment out do not get dropped but get sent passthrough to the actual destination. For example, if you comment out the value for copies defined in the script:

```
cop) outputstr="$outputstr results-profile=::{optparm#}" ;;
```

the script passes the original JCL copy-count value to the printer. Instead of commenting out the line in the shell script, change the name of the parameter to something that will be read as a value, but not passed onto the Infoprint printer, such as **junk**:

```
cop) junk="$outputstr results-profile=::{optparm#}" ;;
```

### Recommendation

Copy the shell script to another directory such as **/var/pd** and modify the copy. This eliminates the possibility of service overwriting your modifications.

## Specifying AFP Resource Directories

The **mvsprpsm.sh** shell script contains the following lines, which are commented out by default:

```
NOTE: Add resource-context-xxx search paths to the pdpr options
if necessary. For example:
#outputstr="$outputstr resource-context-font=/font/reslib"
#outputstr="$outputstr resource-conctect-page-def=/dept123/pagedef:/acme/pagedef"
```

Use the format shown in the third and fourth lines to specify the paths to the directories containing AFP resources. Do not include the pound sign, #, when

specifying the directories. You can specify multiple directories by separating them with colons. You can also specify MVS file systems accessed through the NFS **mount** command.

## Changing How the Shell Script Generates the File Name

The **mvsprpsm.sh** shell script contains the following lines, which cause the Infoprint MVS Download shell script to include the MVS job identifier in the name of the file generated by the shell script:

```
Rename the downloaded file to include the MVS job id (comment out
if this behavior is not desired)
if ["$paopt" != "" ; then
 JID=${paopt##*jobid=}
 if ["$JID" != "$paopt"] ; then
 JID=${JID%%, *}
 if ["$sdq.$JID" != "" &rbrk, ; then
 mv $filename $JID.$filename
 filename=$JID.$filename
 mv $logfile $JID.$logfile
 logfile=$JID.$logfile
 fi
 fi
fi
```

If you do not want the MVS job identifier included, comment out the lines.

## Using Multiple Printers with MVS Download

By default, an MVS download process submits all jobs to the same logical printer. A parameter that specifies this logical printer starts the **mvsprsd** daemon. This printer is fixed for the duration of the process. If you want to send MVS Download jobs to multiple Infoprint Manager printers, then multiple daemons must be started for each printer.

If you want a single **mvsprsd** daemon process to route MVS Download jobs to different printers, you can uncomment the following lines from the **mvsprpsm.sh** shell script:

```
#####
The following code-segment should be uncommented if dynamic printer
assignment is desired. Uncomment lines that are singly (#) commented.
Lines with double comment (##) should remain commented.
##
The MVS parameter DEST=xxxx is used to assign the logical printer
(thereby making the MVS Download daemon's startup queue irrelevant).
##
The assumption below is that the DEST passed is the actual name
of an IPM logical destination. Note that both JES2 and JES3 will
pass the DEST in the NJE header in UPPER CASE but the code below
will convert it to lower-case.
#####

#####
Begin dynamic printer assignment from DEST
#####

MVSdest=${paopt##*destination=}
if ["$MVSdest" != "$paopt"] ; then
MVSdest=${MVSdest%%,*}
MVSdest=${MVSdest% }
if ["$MVSdest" != ""] ; then
outputstr="$outputstr mvs-destination=$MVSdest"
paopt=${paopt##*destination=$MVSdest}
```

```
#####
The following typeset converts to lower-case (-l flag)
#####

typeset -l lname=$MVSdest
fi
fi

#####
End dynamic printer assignment from DEST
#####
```

Once this code has been uncommented, the MVS operators merely need to specify the target Infoprint Manager logical destination through the **DEST=** parameter on each job that is submitted through MVS download.

If you will be sending jobs that do not specify a value for the **DEST=** parameter in the JCL, the MVS configuration substitutes a default value, which is typically LOCAL. If your Infoprint configuration does not have a destination with the same name, those jobs fail and Infoprint issues the following message:

```
5010-056 Cannot find object 'local' rc=1
```

To ensure that these jobs do not fail, define either an Infoprint Manager logical destination or an actual destination named **local** (or whatever serves as a lower-case equivalent for the default value on your MVS configuration) that addresses the appropriate printer.

## Specifying a Default Page Definition

All line-data jobs downloaded from MVS systems require a page definition before you can print them using Infoprint. If no page definition is specified, an error occurs. By default, the shell script contains the following line:

```
pagedef) outputstr="$outputstr page-definition$optparm" ;;
```

This causes the shell script to set the value for the **page-definition** attribute based on a value passed to the shell script by the **mvsprsd** daemon. The value passed by the daemon depends on options downloaded from MVS with the data set. You can add conditional processing to the shell script to specify a page definition if no page definition specification is downloaded with the file.

---

## Passing the Parameter List from the mvsprsd Daemon to the Shell Script

The Infoprint **mvsprsd** daemon passes a parameter list for each data set it receives to the Infoprint MVS Download shell script. The parameter list contains the following information:

1. The name of the downloaded data set in the format:

```
MVS_system_name.job_name.dataset_name.forms_name.yyddd.hhmmsstABCD.PRD
```

where:

*MVS\_system\_name*

Specifies the name of the MVS system that downloaded the data set.

*job\_name*

Specifies the name of the job containing the data set.

*dataset\_name*

Specifies the name of the data set.

*forms\_name*

Specifies the name of the form identified with the MVS **FORMS** parameter.

*yyddd* Specifies the year followed by the number of the day of the year.

*hhmsstABCD*

Specifies the time the data set was received in hours, minutes, seconds, tenths of a second, hundreds of a second, thousands of a second, and hundred thousands of a second.

**PRD** Specifies the type of file that contains print data. PRD is the suffix used by PSF for AIX, Infoprint Manager for AIX, or Infoprint Manager for Windows NT and Windows 2000 servers to identify the data file received and other information needed to create the final print job.

2. The print-options string, which is a series of options and values. See Table 16 for the list of options. When you specify the **-k** flag with the **mvsprsd** command, Infoprint also stores the options in a file whose name is in the following format:

MVS\_system\_name.job\_name.dataset\_name.forms\_name.yyddd.hhmsstABCD.JCL

where all the qualifiers in the name are the same as those for the name of the data set, with the exception of **JCL**. The **-k** flag specifies that the file contains print options.

3. The logical printer name, which was specified with the **-q** flag of the Infoprint **mvsprsd** command when the daemon was started.

---

## Translating Print Options to Infoprint Attributes and Values

Table 16 shows the print options and values passed to the shell script in the print-options string, the corresponding Infoprint attribute, and the attribute value used for the **pdpr** command for that job.

- MVS sends print option values in either uppercase or lowercase characters. MVS sends all print option values shown in italics in Table 16, such as *pagedef*, *formdef*, and *font1*, in upper case. It sends other values as shown in the table.
- Infoprint sets most attribute values to exactly the same values received from the print-option values; Table 16 lists these values in italics within the **Infoprint Attribute and Value** column.

Table 16. Print Options Passed to Infoprint MVS Download Shell Script

| <i>Print Option Passed to Shell Script</i>                  | <i>Infoprint Attribute and Value</i>                                                                                                                                                                                                                                                                                      |
|-------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>-oac=account</i>                                         | " <i>account-text=account</i> "                                                                                                                                                                                                                                                                                           |
| <i>-oaddress1=address1</i>                                  | " <i>address1-text=address1</i> "                                                                                                                                                                                                                                                                                         |
| <i>-oaddress2=address2</i>                                  | " <i>address2-text=address2</i> "                                                                                                                                                                                                                                                                                         |
| <i>-oaddress3=address3</i>                                  | " <i>address3-text=address3</i> "                                                                                                                                                                                                                                                                                         |
| <i>-oaddress4=address4</i>                                  | " <i>address4-text=address4</i> "                                                                                                                                                                                                                                                                                         |
| <i>-obu=building</i>                                        | " <i>building-text=building</i> "                                                                                                                                                                                                                                                                                         |
| <i>-occtype=a</i><br><i>-occtype=m</i><br><i>-occtype=z</i> | " <i>carriage-control-type=ansi-ebcdic</i> "<br>" <i>carriage-control-type=machine</i> "<br>" <i>carriage-control-type=ansi-ascii</i> "<br><b>Note:</b> The shell script checks if the job uses carriage control characters. If they are used, then Infoprint sets this attribute and value based on the input parameter. |

Table 16. Print Options Passed to Infoprint MVS Download Shell Script (continued)

| <b>Print Option Passed to Shell Script</b>                                                                                    | <b>Infoprint Attribute and Value</b>                                                                                                                                                                                                                  |
|-------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>-ochars=font1,font2,font3,font4</b>                                                                                        | " <b>chars=font1,font2,font3,font4</b> "                                                                                                                                                                                                              |
| <b>-ocop=nnn</b>                                                                                                              | " <b>copy-count=nnn</b> "                                                                                                                                                                                                                             |
| <b>-odata=line</b>                                                                                                            | " <b>document-format=line-data</b> "<br>Note: If the input value is not <b>line</b> , this value is not set and Infoprint attempts to identify the correct format. If Infoprint cannot identify the format, Infoprint uses a format of <b>ascii</b> . |
| <b>-odatac=blkchar</b><br><b>-odatac=blkpos</b><br><b>-odatac=block</b><br><b>-odatac=unblock</b>                             | " <b>data-fidelity-problem-reported=position</b> "<br>" <b>data-fidelity-problem-reported=character</b> "<br>" <b>data-fidelity-problem-reported=none</b> "<br>" <b>data-fidelity-problem-reported=all</b> "                                          |
| <b>-ode=department</b>                                                                                                        | " <b>department-text=department</b> "                                                                                                                                                                                                                 |
| <b>-odu=no</b><br><b>-odu=normal</b><br><b>-odu=tumble</b>                                                                    | " <b>sides=1 plex=simplex</b> "<br>" <b>sides=2 plex=simplex</b> "<br>" <b>sides=2 plex=tumble</b> "                                                                                                                                                  |
| <b>-of=F1formdef</b>                                                                                                          | " <b>form-definition=F1formdef</b> "                                                                                                                                                                                                                  |
| <b>-ofileformat=record</b><br><b>-ofileformat=stream</b>                                                                      | " <b>new-line-option=counted-4-octet-aligned</b> "<br>" <b>new-line-option=lf</b> "                                                                                                                                                                   |
| <b>-oin=nnn</b>                                                                                                               | " <b>printer-pass-through='-obinnn'</b> "                                                                                                                                                                                                             |
| <b>-ojobn=job_name</b>                                                                                                        | " <b>job-name=job_name</b> "                                                                                                                                                                                                                          |
| <b>-ona=name</b>                                                                                                              | " <b>name-text=name</b> "                                                                                                                                                                                                                             |
| <b>-ono=nodeid</b>                                                                                                            | " <b>node-id-text=nodeid</b> "                                                                                                                                                                                                                        |
| <b>-ooffxb=nnn^.nnn  </b>                                                                                                     | " <b>x-image-shift-back=nnn^.nnn  </b> "                                                                                                                                                                                                              |
| <b>-ooffxf=nnn^.nnn  </b>                                                                                                     | " <b>x-image-shift=nnn^.nnn  </b> "                                                                                                                                                                                                                   |
| <b>-ooffyb=nnn^.nnn  </b>                                                                                                     | " <b>y-image-shift-back=nnn^.nnn  </b> "                                                                                                                                                                                                              |
| <b>-ooffyf=nnn^.nnn  </b>                                                                                                     | " <b>y-image-shift=nnn^.nnn  </b> "                                                                                                                                                                                                                   |
| <b>-opa=</b><br><b>class=output_class</b><br><b>destination=destination</b><br><b>forms=form_name</b><br><b>segmentid=nnn</b> | " <b>printer-pass-through=</b><br><b>'-oclass=output_class'</b><br><b>'-odestination=destination'</b><br><b>'-oforms=form_name'</b><br><b>'-osegmentid=nnn'</b> "                                                                                     |
| <b>-opagedef=P1pagedef</b>                                                                                                    | " <b>page-definition=P1pagedef</b> "                                                                                                                                                                                                                  |
| <b>-opr=programmer_name</b>                                                                                                   | " <b>programmer-text=programmer_name</b> "                                                                                                                                                                                                            |
| <b>-oprmode=SOSI1</b><br><b>-oprmode=SOSI2</b>                                                                                | " <b>shift-out-shift-in=one</b> "<br>" <b>shift-out-shift-in=two</b> "                                                                                                                                                                                |
| <b>-ore=P240</b><br><b>-ore=P300</b>                                                                                          | " <b>font-resolution=240</b> "<br>" <b>font-resolution=300</b> "                                                                                                                                                                                      |
| <b>-oro=room</b>                                                                                                              | " <b>room-text=room</b> "                                                                                                                                                                                                                             |
| <b>-oti=title</b>                                                                                                             | " <b>title-text=title</b> "                                                                                                                                                                                                                           |
| <b>-otrc=no</b><br><b>-otrc=yes</b>                                                                                           | " <b>table-reference-characters=false</b> "<br>" <b>table-reference-characters=true</b> "                                                                                                                                                             |
| <b>-ous=userid</b>                                                                                                            | " <b>user-id-text=userid</b> "                                                                                                                                                                                                                        |

---

## Using the `mvsprsd` Command to Start the Daemon

To start the `mvsprsd` daemon whenever the Infoprint system starts, you can include the `mvsprsd` command in either the `/etc/rc` or the `/etc/inittab` file. Both files execute when the AIX operating system is initialized. The `/etc/inittab` file has an entry for another file called `/etc/rc`. This shell script (`/etc/rc`) performs normal startup initialization for the system; its contents are installation-specific. Because this file is not usually replaced when a new release of the operating system is installed (unlike `/etc/inittab`), you can use it to start the `mvsprsd` daemon. One can edit the `/etc/rc` to call and execute another shell script called `/etc/rc.local` if it exists.

Use the following procedure to start the `mvsprsd` daemon through the `/etc/rc` and the `/etc/rc.local` files:

1. Using your AIX editor of choice, edit the `/etc/rc` file and find the following lines:

```
Manufacturing post install process
This must be at the end of this file, /etc/rc.
if [-x /etc/mfg/rc.preload]
then
/etc/mfg/rc.preload
fi
```

2. Insert the following lines just prior to the code example provided in the preceding step:

```
[-s /etc/rc.local]
then
sh /etc/rc.local
fi
```

3. Save and close the `/etc/rc` file.
4. Using your AIX editor of choice, edit the `/etc/rc.local` file. If this file does not exist on your AIX system, you must create it as `root`.
5. Add lines similar to the following to this file:

```
This is a comment to document that the following command
starts the mvsprsd daemon automatically at system startup
/usr/lpp/psf/bin/mvsprsd -p 5400 -d /files1 -d /files2 \
-x /usr/lpp/pd/bin/mvsprpsm.sh -q serv2-lp
```

Note that this example uses the default shell script (`mvsprpsm.sh`) and specifies the `serv2-lp` Infoprint AIX server.

6. Save and close the `/etc/rc.local` file.

If the daemon stops for some reason or you want to restart it using different start-up options, you can use the Infoprint `mvsprsd` command to start the Infoprint `mvsprsd` daemon. With the command, you specify an AIX file system in which to store downloaded data sets, a shell script name, a logical printer name, and whether print-option information is stored in a file. You start the daemon on the AIX processor that has Infoprint installed. Once the `mvsprsd` daemon is operational, you can use MVS Download to submit a job to Infoprint where the Infoprint MVS Download shell script translates the JCL keywords and values to Infoprint attributes and values and issues a `pdpr` command.

For the syntax and flags of the `mvsprsd` command, and for examples of its use, refer to *Infoprint Manager: Reference* or the `mvsprsd` man page.



---

## Using MVS Download Support for Multi-Data Set Jobs

MVS Download sends each JES SYSOUT data set separately to the **mvsprsd** daemon on AIX. By default, the **mvsprsd** daemon spools each data set as a separate file. On MVS, a job can contain multiple data sets. By using the following procedure to customize your installation for MVS Download multi—data set job support, you may be able to cause the data sets in a job sent to Infoprint Manager through MVS Download to print in sequence, with no intervening files, no NPRO processing between files, and only one header and trailer page for the set.

Infoprint Manager now enables multiple data sets to be received, individually transformed by ACIF into MO:DCA-P, and then combined into a single file and spooled. Infoprint Manager uses the medium maps (copy groups) from the form definition that is associated with each data set to build a comprehensive inline form definition that it inserts at the beginning of the combined file.

The following describes what you must do to install and configure the MVS Download support for printing multi-data set jobs received from PSF/MVS on Infoprint Manager for AIX. It consists of the following sections:

- “Description of Multi-Data Set Support on both PSF/MVS and Infoprint Manager for AIX”
- “Procedures for Installing Multi-Data Set Support”
- “Limitations of Multi-Data Set Support” on page 204
- “Technical Description of Multi-Data Set Support” on page 205

### Description of Multi-Data Set Support on both PSF/MVS and Infoprint Manager for AIX

To support the printing of multiple data sets in a job as a single unit, you must:

- Install a special MVS Download user exit 15 program (**apsux15m**) on MVS
- Start the **mvsprsd** daemon with the *-n 1* option on AIX

The sample user exit 15 program (**apsux15m**) provided with PSF/MVS, adds a parameter that identifies data sets that belong to multi-data set jobs and indicates whether the data set is first, next, or last in a job. To use that sample user exit with PSF/MVS 2.20, you must install APAR OW41905. To use it with PSF 3.1.0 for OS/390, you must install APAR OW42117. For higher levels of PSF/MVS, you do not need to install any maintenance; the sample exit is part of the base product.

The *-n 1* option ensures that the **mvsprsd** daemon receives the data sets in the correct sequence by creating no more than one child process. If more than one child process were created, MVS Download might concurrently send more than one data set from a multi-data set job. If the second data set was shorter than the first, it might be received before the first, causing it to print out of sequence or causing the first data set to be left unprinted.

### Procedures for Installing Multi-Data Set Support

Use the following procedure to install the MVS Download multi-data set support:

1. Install the MVS Download user exit 15 program, **apsux15m**, on MVS. The program must be assembled and linked into a data set referenced in the **STEPLIB** of your MVS Download startup **PROC**.
2. Run MVS Download on MVS using **SEND\_REC\_LENGTH=YES** either by specifying it explicitly in the MVS Download Routing Control data set on MVS or by allowing it to default. If you specify **SEND\_REC\_LENGTH=NO**, ACIF may be unable

to process some variable length line mode data. In these cases ACIF issues a message that it cannot read the input file with a return code of 310.

3. Because the **mvsprpsm.sh** sample shell script has been updated, you must update any customized versions of this shell script. Specify the name of the shell script using the **"-x"** option when you start the **mvsprsd** daemon:

```
mvsprsd -n 1 -qlp -p6250 -d/mvsdl -x/mvsdl/mvsprpsm.sh
```

4. Ensure that the **PATH** environment variable when the **mvsprsd** daemon is started includes the **/usr/lpp/psf/bin** directory. You can set default values for environment variables like **PATH** using the **/etc/environment** file:

```
PATH=/usr/bin:/etc:/usr/sbin:/usr/lpp/pd/bin:/usr/lpp/psf/bin:.
```

You must delimit each directory using a colon (:), not a semi-colon (;). Do not include spaces in the assignment. A period designates the current directory.

5. Ensure that ACIF can locate your resources. It looks in both the **/usr/lpp/psf/reslib** directory and the directories specified by the **PSFPATH** environment variable. If you specify resource directories using the following attributes, you must specify those same directories in the **PSFPATH** environment variable:

- **resource-context**
- **resource-context-font**
- **resource-context-overlay**
- **resource-context-page-segment**
- **resource-context-page-definition**
- **resource-context-form-definition**

You can set default values for environment variables like **PSFPATH** using the **/etc/environment** file:

```
PSFPATH=/usr/xyz_corp/reslib:/usr/xyz_corp/fontlib
```

You must delimit each directory using a colon (:), not a semi-colon (;). Do not include spaces in the assignment.

6. Do not specify the following attributes either directly or in Initial Value Job or Initial Value Document objects:

- **transform-message-file-name**
- **resource-context-page-definition**

You may use the **resource-context** attribute instead of the **resource-context-page-definition** attribute.

7. Specify the **-n 1** option when you start the **mvsprsd** daemon:

```
mvsprsd -n 1 -qlp -p6250 -d/mvsdl -x/mvsdl/mvsprpsm.sh
```

This option directs the daemon to create exactly one child process to receive data sets from MVS. Most customers use a shell script to run the **mvsprsd** daemon and specify its arguments. Using a shell script ensures that the daemon is always started correctly, with the same arguments. You should add the **-n 1** option to the shell script.

## Limitations of Multi-Data Set Support

This support has the following four limitations:

1. This solution applies only to line mode, mixed mode, or MO:DCA-P data sets that do not have inline resources.

2. You must specify the `-n 1` option when you start the **mvsprsd** daemon on AIX. This support restricts the **mvsprsd** daemon to receiving one data set at a time. If you did not previously specify the `-n 1` argument and received multiple files concurrently, you may wish to start more than one instance of the **mvsprsd** daemon (using different port numbers) and configure new MVS Download printers on MVS to communicate with them.
3. You must have enough disk space on the AIX system to receive and transform all of the data sets in a multi-data set job. If you do not use this solution, data sets may be received and transformed individually, so less space may be required.
4. This solution does not create three types of form definition (**FORMDEF**) statements in the generation of a comprehensive inline form definition:
  - MSU (Map Suppression)
  - PFC (Presentation Fidelity Control)
  - MFC (Medium Finishing Control)

## Technical Description of Multi-Data Set Support

The following describes the sequence of the multi-data set support:

1. The **mvsprsd** daemon receives each data set into a file, then invokes a shell script (specified using the `-x` option when the **mvsprsd** daemon is started) to spool the file.
2. The sample **mvsprsm.sh** shell script does not immediately spool a file which was identified by the user exit 15 program on MVS as being part of a multi-data set job. Instead, the **mvsprsm.sh** shell script invokes a second shell script, **mvsprsmd.sh**, which invokes ACIF to transform the file into MO:DCA-P.
3. After the last file in a multi-data set job is transformed into MO:DCA-P, the **mvsprsmd.sh** shell script invokes the **afpconcat** program to create one file with a comprehensive inline form definition and all the MO:DCA-P documents concatenated afterward. The comprehensive inline form definition contains medium maps (copy groups) from all of the form definitions associated with the individual data sets.
4. If medium map names collide, the **afpconcat** program assigns unique names and updates references in the MO:DCA-P documents.
5. The **mvsprsmd.sh** shell script then invokes the **mvsprsm.sh** shell script to spool the combined MO:DCA-P file.

---

## Resubmitting or Deleting MVS Download Orphaned Files

Orphaned files are old files left in the AIX file system because errors prevented Infoprint from processing them; their file names follow the MVS Download file name format, such as:

```
MVS_system_name.job_name.dataset_name.forms_name.yyddd.hhmmssstABCD.PRD.
```

You should either correct the problem that prevented the job from processing and then resubmit the job or delete the files.

## Resubmitting an Orphaned File

If you started the **mvsprsd** daemon with the `-k` flag, Infoprint saves print options downloaded with MVS data sets. By default, Infoprint also stores the downloaded data set. Infoprint saves both the data set and the print-options file in the directory you specify with the `-d` flag when you start the daemon. See “Passing the

Parameter List from the mvsprsd Daemon to the Shell Script” on page 199 for the format of the file names for the data set and print-options file. If errors occur that prevent Infoprint from processing the job, you can correct the errors and then resubmit the job.

For example, to resubmit the file

bldmvs1.records.records.form1.9701.1147351234.PRD using the print-options file bldmvs1.records.records.form1.9701.1147351234.JCL and requesting logical printer srv1-lp, enter the command:

```
/usr/lpp/pd/bin/mvsprsm.sh bldmvs1.records.recorda.form1.9701.1147351234.PRD
"$(bldmvs1.records.recorda.form1.9701.1147351234.JCL) srv1-lp
```

**Note:** This example shows the command spanning across lines for readability. When actually entering the command, allow it to wrap on the AIX command line.

---

## Part 5. Appendixes



---

## Appendix. Using the Infoprint SMIT Operator's GUI

You can perform most Infoprint operations tasks and some Infoprint administrative tasks by using the Infoprint SMIT operator's GUI.

This chapter provides information on customizing, starting, and accessing help for the Infoprint SMIT operator's GUI. It also includes a brief description of the tasks you can perform through the interface.

---

### Customizing the Infoprint SMIT Operator's GUI

Before using the Infoprint SMIT operator's GUI, you specify which Infoprint components and attributes you want to monitor by setting environment variables in one or more environment files. Initially, you can use the default environment file that is supplied with Infoprint. During installation, Infoprint adds information about the environment file in the `/etc/environment` file to provide system-wide defaults.

#### Customizing the Default Infoprint SMIT Operator's GUI Environment File

The default Infoprint SMIT operator's GUI environment file is `ppo.env`, which Infoprint stores in the `/usr/lpp/pd/bin` directory during installation. The `ppo.env` file contains a series of `export` statements for environment variables that specify information about your Infoprint system. Infoprint bases the setting of some environment-variable values on objects that are created during installation. Other environment variables have no values; you can update them as you expand your Infoprint system. Figure 50 on page 210 shows the default environment file.

```

Set up the PPO environment variables

if ["$PPO_BIN" = ""] ; then
 export PPO_BIN=/usr/lpp/pd/bin"
fi

if ["$PPO_QUEUE_INFO_FILE" = ""] ; then
 export PPO_QUEUE_INFO_FILE="$PPO_BIN/queue_info"
fi

export PPO_JOB_DETAILS_ATTRS="\
job-identifier,\
job-name,\
current-job-state,\
job-state-reasons,\
required-resources-not-ready\
intervening-jobs,\
job-priority,\
actual-destination-requested,\
destinations-assigned,\
submission-time,\
started-printing-time,\
pages-completed,\
default-medium"
export PPO_QUEUE_ATTRS="queue-name,queue-state,\
actual-destinations-ready,actual-destinations-assigned"
export PPO_PP_ATTRS="destination-name,destination-state,enabled,\
assoc-queue,problem-message,media-ready,job-batches-ready"
export PPO_FORM=""
export PPO_RETENTION="48:00"
export PPO_SERVER=`hostname`
export PPO_LP=LP-NAME
export PPO_LPS="LP-NAME"
export PPO_QUEUE=Q-NAME
export PPO_PPS="PP-NAME"
export PPO_JOB_BATCH=""
export PPO_CANCEL_ALL_OPTION="1"

```

Figure 50. Default Environment File - Infoprint SMIT Operator's GUI

You can make copies of the default Infoprint SMIT operator's GUI environment file and customize the copies to match your Infoprint system. You should create an environment file for each queue you have. Refer to *Infoprint Manager: Reference* for a table of environment variables that affect the Infoprint SMIT operator's GUI. Then use an AIX editor to make changes to the environment file.

## Customizing the Queue Information File

While you are using the Infoprint SMIT operator's GUI, you can change the queue you are monitoring if you previously set up a queue information file. A queue information file maps queue names to their corresponding environment files. Figure 51 shows the contents of the default queue information file, `/usr/lpp/pd/bin/queue_info`.

```

queue_name_1 pathname-of-the-corresponding-ppo.env-file
queue_name_2 pathname-of-the-corresponding-ppo.env-file

```

Figure 51. Queue Information File - Infoprint SMIT Operator's GUI

To set up and use a queue information file, complete the following steps:

1. Create an environment file for each queue that you want to monitor through the Infoprint SMIT operator's GUI. Specify the appropriate values for the



environment variables. Store the environment files in either the directory represented by the **PDBASE** environment variable or the directory represented by the **PDNAMESP** environment variable. If operators on different AIX systems will share the files, store them in the directory represented by the **PDNAMESP** environment variable. For more information, see “Customizing the Default Infoprint SMIT Operator’s GUI Environment File” on page 209.

2. Update the **queue\_info** file in the **/usr/lpp/pd/bin** directory. For example, you have two queues, **ksrv-q1** and **ksrv-q2**. Their respective environment files are **q1.env** and **q2.env**, located in the **/usr/lpp/pd/bin** directory. Update the **queue\_info** file with the following entries:

```
ksrv-q1 /usr/lpp/pd/bin/q1.env
ksrv-q2 /usr/lpp/pd/bin/q2.env
```

**Notes:**

1. You must include the full path for each environment file you specify.
2. If you create a queue information file with a different name or store it in a different directory, ensure that the **PPO\_QUEUE\_INFO\_FILE** environment variable in all of your environment files specifies the correct directory and file name.
3. To use the queue information file, you must start the Infoprint SMIT operator’s GUI with the **startppo** command. For more information, see “Starting the Infoprint SMIT Operator’s GUI”.

## Specifying Your Default Environment File

The **PPO\_ENV\_FILE** environment variable controls the environment file that the Infoprint SMIT operator’s GUI uses when you start the interface. During installation, the following line was added to the **/etc/environment** file:

```
PPO_ENV_FILE=/usr/lpp/pd/bin/ppo.env
```

This statement defines the environment file that is shipped with Infoprint as the default. To use a different environment file, update the statement in the **/etc/environment** file.

For example, if you have a customized environment file that is called **master.env** located in the **/var/pd** directory, use the following export statement:

```
PPO_ENV_FILE=/var/pd/master.env
```

---

## Starting the Infoprint SMIT Operator’s GUI

There are two methods of starting the Infoprint SMIT operator’s GUI:

- If you are at an AIX command prompt, enter one of the following commands:
  - To access the **Production Print Operations** panel in the AIXwindows mode, enter:  

```
startppo
```
  - To access the **Production Print Operations** panel in the ASCII mode, enter:  

```
startppo -t
```

All Infoprint SMIT operator’s GUI SMIT panels display in ASCII mode; however, status windows display as graphical motif windows.

- If you are using the Infoprint SMIT administrator’s interface, follow these steps:
  1. Return to the main panel titled **Infoprint Production Printing System**.
  2. Select **Production Print Operations**.

**Notes:**

1. You cannot change queues as specified by the queue information file if you access the Infoprint SMIT operator's GUI through a SMIT session that was not started with the **startppo** command.
2. The **startppo** command also has a **-g** flag that you can use to control the initial size and position of the Infoprint SMIT operator's GUI window. Specify the value for the flag in the form:

width×height+xoffset+yoffset

For example, if you enter `startppo -g 800×500+100+200`, the window that opens is 800 pels wide, 500 pels high, offset 100 pels from the left edge of the terminal display, and down 200 pels from the top of the display.

3. You cannot start the ASCII mode of the Infoprint SMIT operator's GUI in the background. For example, do not use the following command:

```
startppo -t &
```

---

## Accessing the Online Help for the Infoprint SMIT Operator's GUI

The online help for the Infoprint SMIT operator's GUI provides descriptions of panel controls, such as buttons, entry fields, and lists. You can access the help information by using standard AIX SMIT help actions. If you are not familiar with using SMIT help, you can use the **Help** pull-down menu at the upper right corner of any AIXwindows SMIT panel. If you are using SMIT in the ASCII mode, access the main **System Management** panel. Highlight the panel title and press **F1** to access help on using SMIT.

## Requesting Help for Menu Selections on a SMIT Panel

The method of accessing help for a SMIT panel depends on whether you are in AIXwindows mode or ASCII mode.

### AIXwindows Mode

Complete the following steps to receive contextual help on a menu selection:

1. Press **Ctrl + F1**. All the menu selections on the panel are highlighted. The mouse pointer changes to a question mark. A **Help Message** window opens with instructions on how to access help. Figure 52 on page 213 shows an example of the results of pressing **Ctrl + F1** for a SMIT panel.

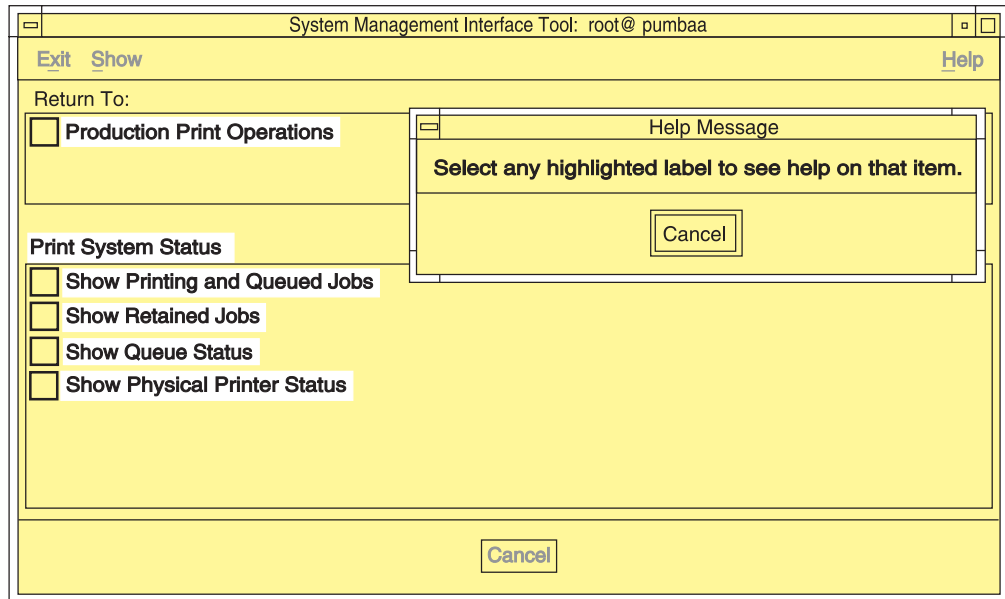


Figure 52. Help for SMIT Panel Menu Selections

2. Select any highlighted menu selection on the panel. An **Informational Message** window opens.
3. Select the **OK** button on the **Information Message** window after you have read the information. All menu selections on the panel remain highlighted.
4. If you want to view the help for another item, select it.
5. When you have completed viewing the information, select the **Cancel** button on the **Help Message** window to remove the highlighting and return to normal SMIT operations.

**Note:** You can also manually highlight a menu selection by using the Tab and arrow keys to navigate to the selection. Pressing **F1** for a highlighted menu item opens the help window for that item.

### ASCII Mode

Complete the following steps to receive contextual help on a menu selection:

1. Use the arrow keys to highlight a menu selection.
2. Press **F1**. A **CONTEXTUAL HELP** window opens.
3. When you have completed viewing the help information, press the **Enter** key. The window closes.

Complete the same steps to view the help for any other menu selections.

## Requesting Help for Fields and Buttons on a SMIT Window

The method of accessing help for fields and buttons on a SMIT window depends on whether you are in AIXwindows mode or ASCII mode.

### AIXwindows Mode

Complete the following steps to receive help for fields and buttons on a SMIT window that was accessed from a SMIT panel:

1. Select the button labeled with a question mark at the bottom right of the window. A **Help** window displays beneath the SMIT window. Figure 53 on page 214 shows the results of selecting the question mark button.

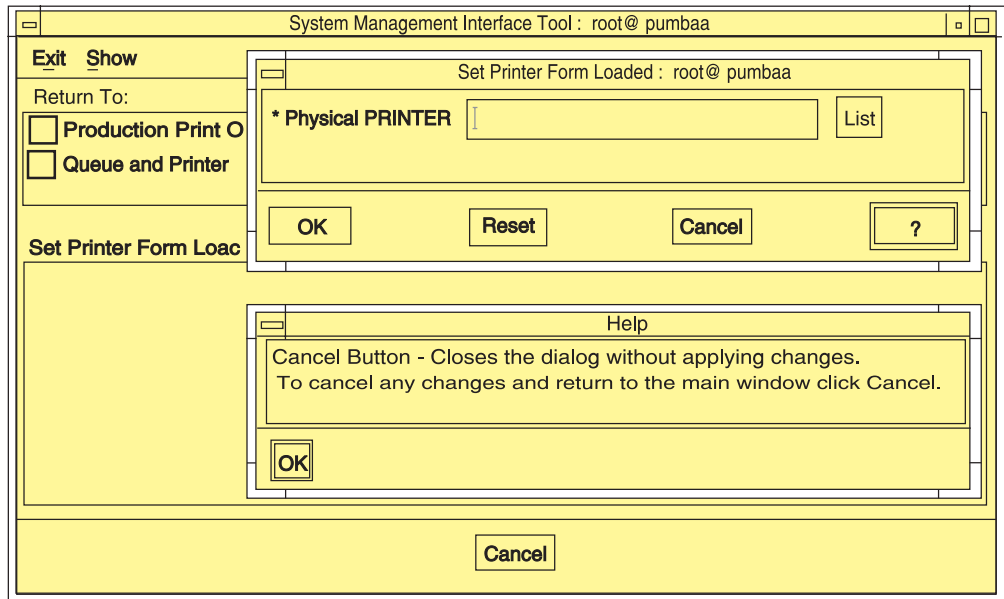


Figure 53. Help for SMIT Window Fields and Buttons

2. Move the mouse pointer over the fields and buttons in the window. The text in the **Help** window changes, displaying help for the field under the mouse pointer.
3. When you have completed viewing all of the information, select the **OK** button on the **Help** window to close it and return to normal SMIT operations.

### ASCII Mode

Complete the following steps to receive help for fields on a SMIT panel in which you can enter or list information:

1. Use the arrow keys to highlight a field name.
2. Press **F1**. A **CONTEXTUAL HELP** window opens.
3. When you have completed viewing the help information, press the **Enter** key. The window closes.

Complete the same steps to view the help for any other field selections.

## Requesting Help for SMIT Status Windows

The Infoprint SMIT operator's GUI displays separate status windows that show the results of queries you make. The status windows also provide help for the tasks you can perform from them. The status windows are the same for both AIXwindows mode and ASCII mode. Figure 54 on page 215 shows a status window.

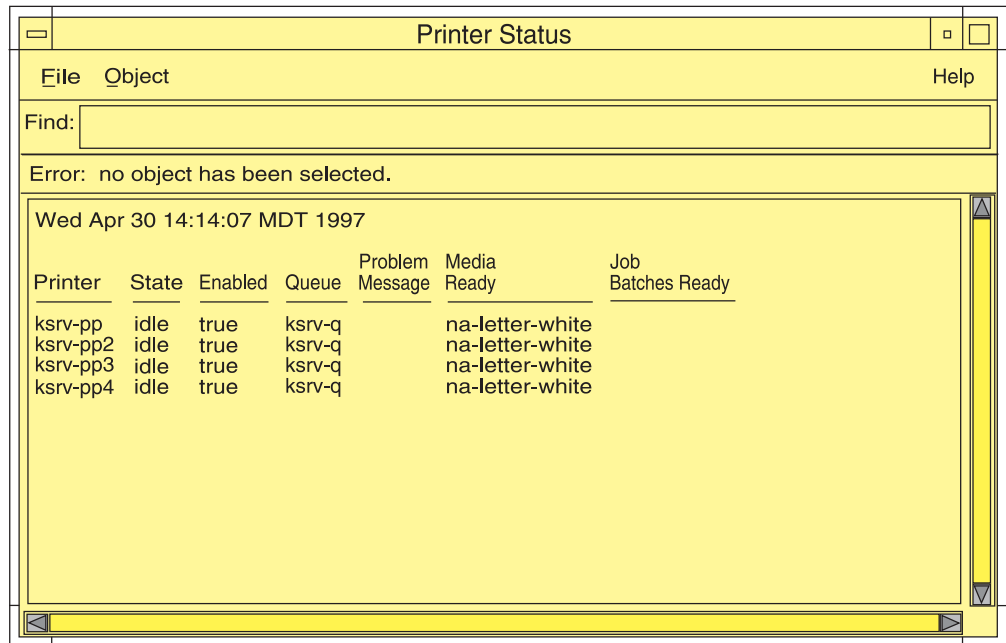


Figure 54. Help for SMIT Status Windows

Complete the following steps to receive help for menu selections on SMIT status windows.

1. Select the **Help** menu at the far right of the menu bar for the status window. A pull-down menu displays with one entry for each of the tasks you can perform from the window.
2. Select an item from the list. A help window displays providing instructions on performing the task.

## Tasks You Can Perform Using the Infoprint SMIT Operator's GUI

The following is a brief description of the tasks you can perform using the Infoprint SMIT operator's GUI. Use the online help for more detailed information. You can perform tasks in four major areas: monitoring print system status, controlling jobs, controlling queues, and controlling actual destinations .

### Monitoring Print System Status

The Infoprint SMIT operator's GUI menu selections for system status allow you to perform the following tasks:

- List pending, processing, and printing jobs for the queue you are monitoring.
- List retained jobs in the queue.
- Show the status of the queue.
- Show the status of the actual destination or destinations that receive jobs.

You can customize the job, queue, and actual destination information that you receive by editing the environment file for the Infoprint SMIT operator's GUI.

### Controlling Jobs

The Infoprint SMIT operator's GUI menu selections for controlling jobs allow you to perform the following tasks:

- Pause and resume jobs.

- Hold and release jobs.
- Cancel active and retained jobs.
- Assign **job-batch** values to jobs.
- Change the priority of jobs.
- Assign jobs to specific actual destinations.
- Specify the forms that jobs require.
- View the status of jobs.
- View summaries of jobs that require specified forms or that belong to specified job batches.

## Controlling Queues

The Infoprint SMIT operator's GUI menu selections for controlling queues allow you to perform the following tasks:

- Pause and resume queues. Paused queues continue to receive jobs, but Infoprint does not schedule the jobs to actual destinations.
- Change the queue you are monitoring. You use the queue information file to control the queues that you can switch to, as well as the actual and logical destinations that are associated with the queue.

## Controlling Actual Destinations

The Infoprint SMIT operator's GUI menu selections for controlling actual destinations allow you to perform the following tasks:

- Pause and resume actual destinations. Paused actual destinations still accept jobs from their queues, but they do not process and print the jobs.
- Disable and enable actual destinations. Disabled actual destinations process jobs already assigned to them but do not accept new jobs from their associated queues.
- Backspace and forward space actual destinations. You can cause Infoprint to back up or skip forward a specified number of pages in the job currently printing on a specific actual destination.
- Specify the forms that are currently loaded in the printer device. You can specify the type of form that is loaded in each input tray of the printer.
- Specify **job-batches-ready** values for actual destinations. You can set up actual destinations so that they will process jobs that request a specific **job-batch** value.
- Shut down an actual destination so that it no longer processes jobs. You can specify how you want to shut down the actual destination with regards to how the shutdown process saves checkpoint information about the current job.

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## Notices

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## **EuroReady**

Infoprint Manager is capable of processing data containing the euro sign. Font character sets and code pages that contain and map the euro sign consistently with the application must be present either in a host library or in the printer. AFP fonts that support the euro sign are included in the AFP Font Collection (Program Number 5648-B33).

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## **Year 2000 Ready**

Infoprint Manager is Year 2000 ready. When used in accordance with its associated documentation, Infoprint Manager is capable of correctly processing, providing, and receiving date data within and between the twentieth and twenty-first centuries, provided all other products used with Infoprint Manager (including software, hardware, and firmware) properly exchange accurate date data with it.



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## Glossary

This glossary provides definitions of specialized terms used by Infoprint. This glossary does not define terms that are defined in non-technical dictionaries or that have no special meaning in information processing.

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## Sources and References

This glossary includes definitions from the following sources:

- Definitions reprinted from a published section of the International Organization for Standardization's (ISO) *Vocabulary—Information Processing* or from a published section of the ISO *Vocabulary—Office Machines* are identified by the symbol (I) following the definition.
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- Definitions from *IBM Dictionary of Computing*.
- Definitions that are specific to IBM products are so labeled, for example, "In Infoprint", or "In DCE".

This glossary uses the following cross-references:

**Contrast with.** This refers to a term that has an opposed or substantively different meaning.

**Synonym for.** This indicates that the term has the same meaning as a preferred term, which is defined in its proper place in the glossary.

**Synonymous with.** This is a backward reference from a defined term to all other terms that have the same meaning.

**See.** This refers you to multiple-word terms that have the same last word.

**See also.** This refers you to terms that have a related, but not synonymous, meaning.

## Special Characters

**.Guidefaults file.** A file created by Infoprint in the home directory of a person using the Infoprint GUI. Infoprint uses this file to save and reference information about the servers you are monitoring and the windows you are working in.

## A

**Access Control List (ACL).** (1) In computer security, a collection of all access rights for one object. (2) In DCE, a list associated with each object in the namespace that specifies the access authorization level for each user or user group.

**ACL.** Access Control List.

**acl editor.** A command line interface that allows you to view, add, update, and delete access authorization records in an ACL.

**action.** In the Infoprint GUI, an icon that represents an operation that you can perform on an Infoprint object. You drag and drop the action onto an object to initiate the operation for that object. For example, using the **Enable** action to enable a disabled actual destination.

**actual destination.** In Infoprint, an object that represents the output device that performs the printing or transmission function. See *email destination*, *fax destination*; see also *physical printer*, *printer device*; contrast with *logical destination*.

**additive color system.** A system that reproduces an image by mixing (adding) appropriate quantities of red, green, and blue light (the additive primary colors) to create all other colors of light, either direct or transmitted. When the additive primaries are superimposed on one another, they create white light. Contrast with *subtractive color system*.

**administrator.** In Infoprint, the person who creates and manages one or more components of a printing system, such as servers and actual destinations. By default, Infoprint gives administrators authorization to

perform some Infoprint operations and to access certain information that is not available to the operators or job submitters.

**Adobe Acrobat.** An Adobe software program that provides instant access to documents in their original format, independent of computer platform. With the Adobe Reader, you can view, navigate, print, and present any Portable Document Format (.pdf) file.

**Adobe PageMaker.** A desktop publishing program that produces PostScript documents.

**Adobe PostScript Raster to Image Transform (RIP).** See *raster image processor (RIP)*.

**ADSM/6000.** Advanced Distributed Storage Manager.

**Advanced Distributed Storage Manager (ADSM/6000).** A program that provides storage management for archived files.

**Advanced Function Common Control Unit (AFCCU).** An IBM RISC-based control unit with code common to all printers that use the AFCCU.

**Advanced Function Presentation (AFP).** A set of licensed programs, together with user applications, that use the all-points-addressable concept to print data on a wide variety of printers or to display data on a wide variety of display devices. AFP includes creating, formatting, archiving, retrieving, viewing, distributing, and printing information.

**Advanced Function Presentation data stream (AFP data stream).** (1) The printer data stream used for printing AFP data. The AFP data stream includes composed text, page segments, electronic overlays, form definitions, and fonts downloaded from the operating system to the printer. (2) A presentation data stream that is processed in AFP environments. The AFP data stream includes MO:DCA-P-based data streams.

**Advanced Interactive Executive (AIX).** An operating system used with RS/6000 computers. The AIX operating system is IBM's implementation of the UNIX operating system.

**AFCCU.** Advanced Function Common Control Unit.

**AFP.** Advanced Function Presentation.

**AFP data stream.** Advanced Function Presentation data stream.

**ainbe.** The printer input/output backend program used by the PSF DSS to send jobs to printer devices. Depending on the incoming data stream of the job, the PSF DSS may have transformed the data stream of the job prior to the backend program sending it to the printer device.

**AIX.** Advanced Interactive Executive.

**AIX-attached printer.** (1) A printer device, attached to an RS/6000 through the network or through a serial or parallel port, that receives jobs from an AIX print queue. (2) In Infoprint, a PSF physical printer that represents an AIX-attached printer device. See also *channel-attached printer*, *direct-attached printer*, *TCP/IP-attached printer*, *upload-SNA-attached printer*, *upload-TCP/IP-attached printer*.

**AIX destination support system.** In Infoprint, the destination support system that communicates with the standard AIX print backend (**piobe**), or with certain variations of the **rembak** print backend, to print jobs.

**AIX physical printer.** In Infoprint, the object representing a printer device that uses the AIX destination support system.

**aliasing.** In a digitized image, the creation of diagonal lines by combining short horizontal and vertical line segments that approximate the path of the desired line.

**all-points-addressability (APA).** The capability to address, reference, and position text, overlays, and images at any defined point of the printable area of the paper or display medium.

**alphameric.** Synonym for *alphanumeric*.

**alphanumeric.** Pertaining to a character set containing letters, digits, and other symbols such as punctuation marks. Synonymous with *alphameric*.

**AMPV.** Average monthly print volume.

**analog.** Pertaining to a continuous variable sampling of information between two points that achieves an even, smooth transition of photographic material.

**analog color proof.** An off-press color proof made from separation films.

**anti-aliasing.** (1) The rendering of hard-edged objects so that they blend smoothly into the background. PhotoShop offers anti-aliasing when rasterizing an EPS file. (2) Removing the jagged "stairstep" quality in diagonal lines produced on a computer screen by aliasing. This removal is effected by creating less densely shaded fields parallel to the diagonal line.

**APA.** All-points-addressability.

**API.** Application Program Interface.

**Application Program Interface (API).** The call interface between a client program and the procedures that implement the printing system, as defined by the specification. Clients use the API to access servers. (P)

**architecture.** The set of rules and conventions that govern the creation and control of data types such as text, image, graphics, font, fax, color, audio, bar code, and multimedia.

**archiving.** The transfer of digital information from an online system onto magnetic tape, floppy disk, compact disc, or other media for offline storage. The original copy is deleted from the online system. See also *retrieval*.

**array inkjet.** An ordered collection of multiple print heads used in an inkjet printer.

**ASCII.** American National Standard Code for Information Exchange. The standard code, using a coded character set consisting of 7-bit coded characters (8 bits including a parity check). The ASCII code is used for information exchange among data processing systems, data communications systems, and associated equipment. The ASCII character set includes control characters and graphic characters.

**asynchronous.** (1) Pertaining to two or more processes that do not depend upon the occurrence of specific events, such as common timing signals. (T) (2) In Infoprint, occurring without a regular or predictable time relationship to a specified action. Contrast with *synchronous*.

**attachment type.** Defines the method by which a printer device is attached to the AIX system from which it receives data. See *AIX-attached printer*, *channel-attached printer*, *direct-attached printer*, *TCP/IP-attached printer*, *upload-SNA-attached printer*, and *upload-TCP/IP-attached printer*.

**attribute.** A defined characteristic of an object, such as the number of copies required of a job, or the document formats accepted by an actual destination.

**attribute name.** A string that identifies an attribute. Typically, in Infoprint attribute names consist of two or more words separated by hyphens.

**attribute value.** The element of an attribute that specifies the characteristics relating to the attribute.

**authorization.** In computer security, verification of the eligibility of a user to access an object.

**authorized user.** A person with the appropriate permissions to access an object or to issue a command.

**automatic recovery.** A function of printer logic that permits the printer to reprint a job if the job is misprinted or damaged or if a component has failed.

**auxiliary sheet.** In Infoprint, an object that represents a particular sheet of paper, blank or otherwise, that can precede a job, separate documents within a job, or follow a job.

**auxiliary-sheet selections.** A particular combination of start, separator, and end sheets that print with jobs on a particular printer device.

## B

**backend.** In AIX, the program that is invoked by the *qdaemon* process to run a print or batch job. Synonymous with *backend program*.

**backend program.** Synonym for *backend*.

**backlog.** In Infoprint, the amount of time calculated by Infoprint that is required to print all of the jobs currently in a queue.

**backspace.** In Infoprint, the action used to back up and reprint pages in a job.

**bar code.** (1) A code representing characters by sets of parallel bars of varying thickness and separation that are read optically by transverse scanning. (2) An array of parallel rectangular bars and spaces that together represent data elements or characters in a particular symbology. The bars and spaces are arranged in a predetermined pattern following unambiguous rules defined by the symbology.

**BCOCA.** Bar code object content architecture.

**Bezier curves.** A method of defining curves using anchor points, control handles, and tangent lines. The PostScript path passes through anchor points. Its approach direction is along the tangent lines that are controlled by the control handles. Many personal computer programs use this drawing method. Type 1 PostScript fonts are defined using Bezier curves.

**binding.** (1) The cover and materials that hold a book together. See *edition binding*, *perfect binding*, *spiral binding*, *wire-o binding*. (2) The process of applying the binding to a book. (3) In Infoprint, assigning a job to an actual destination. See *early binding*, *late binding*. (4) In DCE, pointers stored in a DCE cell that are used to connect clients to servers.

**bitmapped.** Pertaining to an image formed by a rectangular grid of pixels. Each pixel is assigned a value to denote its color. One-bit images are black and white; 8-bit images have 256 colors (or grays); 24-bit images have full color. CMYK images have 32-bits per pixel to encode 256 levels in each of four channels. Bitmapped images are also called raster images.

**bleed.** An extra amount of printed image that extends beyond the trim edge of the sheet. Bleed ensures that no white gap appears at the edge of the sheet.

**boot.** To prepare a computer for operating by loading an operating system.

**BSD.** Berkeley Software Distribution.

**BSD destination support system.** In Infoprint, the destination support system that generates a print command string that the shell runs to print jobs.

**BSD physical printer.** In Infoprint, the object representing a printer device that uses the BSD destination support system.

**burn.** (1) In platemaking, an exposure. Burn is named because of the extremely bright ultraviolet lamps used to transfer images from film to plate. (2) In photography, to lengthen the final exposure time to increase the final density of print.

## C

**cathode ray tube (CRT).** A vacuum tube in which a beam of electrons can be moved to draw lines or form characters or symbols on its luminescent (phosphor-coated) screen. CRTs are the heart of all modern computer display screens. Black and white displays have only one phosphor scanned by one electron beam, while color displays have RGB phosphors scanned by three beams.

**CDE.** Common Desktop Environment.

**cell.** Synonym for *DCE cell*.

**Cell Directory Service.** A DCE component that manages a database of information about resources within a cell.

**channel-attached printer.** (1) A printer attached to an RS/6000 by cables, rather than through telecommunication lines. (2) In Infoprint, a PSF physical printer that represents a channel-attached printer device. See also *AIX-attached printer*, *direct-attached printer*, *TCP/IP-attached printer*, *upload-SNA-attached printer*, *upload-TCP/IP-attached printer*.

**child.** See *parent/child relationship*.

**choke.** In color printing, an area whose dimensions have been reduced to avoid overlapping another color. Contrast with *spread*.

**class.** Synonym for *object class*.

**clean.** In Infoprint, an action used to remove all the jobs from specified servers, actual destinations, or queues, or to remove all the jobs submitted to specified logical destinations.

**CLI.** Command Line Interface.

**client.** In Infoprint, the component of the print system that assembles a print request and submits the request to a server. The client generates the local ID numbers for each job, submits the jobs to the servers, and keeps track of where each user's jobs have been submitted. IBM Infoprint Control and IBM Infoprint Submit include clients; you can also install the IBM Infoprint Select clients on workstations.

**CMY.** Cyan, magenta, yellow.

**CMYK.** Cyan, magenta, yellow, black.

**collator.** In some printers, for example, the IBM InfoColor 70, a special-purpose hard drive disk array used to store RIPped files and later transfer them to the LED print heads for imaging.

**color balance.** The relative levels of cyan, magenta, and yellow channels in an image to produce accurate color rendition of an original image.

**color correction.** The adjustment of the color balance in an image to produce accurate color rendition of an original image. Color correction is used for two- or three-spot-color jobs.

**color key.** A color proof similar to Cromalin, but typically not laminated and not necessarily accurate in color. Color keys are used to verify that breaks or color assignments and traps have been made accurately.

**Command Line Interface (CLI).** A type of user interface where commands are specified on the command line. Contrast with *Graphical User Interface*.

**Common Desktop Environment (CDE).** A graphical user interface running on a UNIX operating system.

**complex attribute.** In Infoprint, an attribute that can have multiple values with each value containing multiple components.

**constant data.** Data that does not change between copies of a document and that is merged with variable data to produce personalized documents. For example, a form letter (constant data) can be merged with a customer's name and address (variable data).

**contextual help.** A type of online help that provides specific information about each selectable object, menu choice, notebook tab, field, control, and pushbutton in a window.

**control strip.** A strip of information that can be attached to a print job and used to measure registration and density.

**Cromalin.** The Dupont color proofing system. Four layers (CMYK) of light-sensitive material are exposed through final halftone negative films, then laminated together on an opaque backing to produce a color- and trap-accurate final proof showing actual halftone dot structure. Cromalin is sometimes called an analog proof.

**crop.** To remove unwanted areas of an image, usually indicated by crop marks on the original.

**CRT.** Cathode ray tube.

**CTS.** Cutter-trimmer-stacker.

**cutter-trimmer-stacker (CTS).** A post-processing device attached to a printer device and used for paper handling.

**cyan, magenta, yellow (CMY).** The subtractive primary colors.

**cyan, magenta, yellow, black (CMYK).** The four basic colors used in offset printing, as opposed to the three basic colors of light: red, green, and blue. Magenta, yellow, and cyan are the subtractive primaries. Black is added to provide better density and to produce a true black.

## D

**daemon.** A program that runs unattended to perform a standard service. Some daemons are triggered automatically to perform their tasks; others operate periodically. Daemon processes generally provide a service that must be available at all times to more than one task or user, such as sending data to a printer.

**DAT.** Digital audio tape.

**DataBase 2/6000 (DB2\*/6000).** The component of the Infoprint Library that indexes data for easy retrieval.

**data stream.** (1) All information (data and control commands) sent over a data link. (2) A continuous stream of data that has a defined format. (3) In Infoprint, pertaining to the incoming format of the job and the output format required by the printer device. Infoprint transforms the incoming format into the output format, as required. See also *document format*.

**DB2\*/6000.** DataBase 2/6000.

**DCE.** Distributed Computing Environment.

**DCE authority.** The permission granted by DCE to access an object.

**DCE cell.** The basic unit of operation and administration in DCE. A group of DCE machines that work together and are administered as a unit. A cell represents a group of users, systems, and resources that typically have a common purpose and share common DCE services.

**DCE login ID.** The identifier of a person logging into DCE. DCE uses this ID to determine a user's authenticity and authorization levels for accessing and modifying data in the DCE cell.

**DCE ticket.** The time-limited DCE authority granted whenever a user logs into DCE. When the DCE ticket expires, the user must log into DCE again in order to access objects protected by DCE.

**deadline.** In Infoprint, a queuing technique where the next job assigned to the first position in the queue is

the one whose deadline is closest. Contrast with *FIFO (first-in-first-out)*, *job-priority*, *longest-job-first*, and *shortest-job-first*.

**default document.** In Infoprint, an object that represents default attribute values for a document within a job. Synonymous with *initial value document*.

**default job.** In Infoprint, an object that represents default attribute values for a job. Synonymous with *initial value job*.

**default object.** In Infoprint, a general term that refers either to a *default document* or a *default job*. Synonymous with *initial value object*.

**default value.** A value stored in the system that is used when no other value is specified.

**delete.** In Infoprint, an action used to delete default objects, jobs, logical destinations, actual destinations, or queues from the server.

**desktop publishing.** Performing print-related activities on a personal computer, including but not limited to layout, design, photo manipulation, creating fonts, editing text, color separation, scanning, and animation.

**destination.** See *actual destination*, *logical destination*.

**destination support system (DSS).** In Infoprint, the programs that an actual destination uses to communicate with the output device. Synonymous with *device support system*. See *AIX destination support system*, *BSD destination support system*, *email destination support system*, *fax destination support system*, *PSF destination support system*, and *3170 destination support system*.

**device.** An individual piece of equipment (hardware) that attaches to a computer, such as a printer device.

**device address.** The identification of an input or output device by its channel and unit number.

**device driver.** A file that communicates with a specific device such as a printer, disk drive, or display. An application that sends output to a device controls the actions of the device through the device driver. See *printer driver*.

**device support system (DSS).** Synonym for *destination support system*.

**DFS.** Distributed File Service.

**digital.** Pertaining to data represented by digits, sometimes with special characters and the space character.

**digital audio tape (DAT).** A high-capacity, low-cost bulk storage system used for archiving, copying (for

backup purposes), and transferring large files. Typical DAT units store 1.3 GB on inexpensive cassette tapes.

**digital color proof.** An off-press color proof made from a color printer attached to a computer.

**digital printing.** A filmless and plateless printing process in which digital data for each page is transferred directly to a light-sensitive drum and then to paper for a final image.

**direct-attached printer.** (1) A printer device, attached to an RS/6000 through the network or through a serial or parallel port. (2) In Infoprint, a PSF physical printer that represents a direct-attached printer device. See also *AIX-attached printer*, *channel-attached printer*, *TCP/IP-attached printer*, *upload-SNA-attached printer*, and *upload-TCP/IP-attached printer*.

**disable.** In Infoprint, an action used to stop the acceptance of jobs on destinations, queues, or servers, or to stop writing information to logs.

**Distributed Computing Environment (DCE).** A software system from the Open Software Foundation (OSF). DCE provides the services that allow a distributed application to interact with a collection of possibly heterogeneous computers, operating systems, and networks as if they were a single system.

**Distributed File System (DFS).** A DCE component consisting of a single, integrated file system that is shared among all DCE users and host computers in a DCE cell. DFS allows users to access and share files stored in a network, without having to know the physical location of the files. It also prevents users from simultaneously modifying the same information.

**distributed print system.** A computer system with the ability to interchange print data and controls among different computing environments with the intent of printing the data on a different system from the one where the print request was generated. For example, in host-to-LAN distributed printing, data that resides on the host is printed on printers attached to a local area network.

**dithering.** A technique of filling the gap between two pixels with another pixel having an average value of the two to minimize the difference or to add detail in order to smooth the result.

**document.** In Infoprint, an object representing a grouping of data within a job. A job can contain one or more documents. The documents in a job can differ from each other in some ways. For example, they can contain different data and can have different document formats. A document within a job can contain printable data or a resource that is not printable by itself. See *file-reference document*, *printable document*, and *resource document*.

**document element.** A portion of a document at least a single page in size.

**document format.** In Infoprint, a document format describes the type of the data and control characters in the document, such as line data or PostScript. The format of the data determines which printer devices are capable of printing the document and whether Infoprint must transform the format.

**document identifier.** A string that identifies a document within a job. It consists of a job ID followed by a period (.) and a document sequence number. For example, 12.2. Document sequence numbers are integers starting at 1.

**Document Printing Application (DPA).** An ISO/IEC 10175 standard that addresses those aspects of document processing that enable users in a distributed open systems environment to send electronic documents to shared, possibly geographically-dispersed printers. Infoprint supports the DPA standard.

**document transfer method.** In Infoprint, the transfer method describes how documents are transferred to, or acquired by, servers. See *pipe-pull* and *with-request*.

**document type.** In Infoprint, the document type describes the kind of data in the document. A *printable document* can only contain printable data. A *resource document* can only contain data such as fonts or form definitions that are not printable. A *file reference document* can only contain names of files entered on separate lines.

**dot.** The individual elements of a halftone.

**dot gain.** An increase in the size of a halftone dot during printing, caused by ink spreading. Generally, this value is known precisely, and the scanning and filming production process is calibrated to compensate for it. The Cromalin proofing system simulates this effect.

**dots per inch (dpi).** A measure of data density per unit distance. Typical values for desktop publishing range from 200 to 300 dpi. Values for printing with the IBM InfoColor 70 range as high as 600 dpi.

**DPA.** Document Printing Application.

**dpi.** Dots per inch.

**drag and drop.** In graphical user interfaces, a procedure by which you perform actions and tasks. Using the mouse, you drag (move) an action or object icon to a new position where you want the action or task to occur.

**DSS.** Destination support system.

**dummy.** A rough paste-up or hand-drawn representation of the anticipated finished product. A dummy is used for basic design and pagination.

**duplex printing.** (1) Printing on both sides of the paper. Contrast with *simplex printing (1)*. (2) Printing on both sides of the paper, placing output images on the media in a head-to-head format, so that the top of one image is at the same edge as the top of the next image. Contrast with *tumble duplex printing*; see also *simplex printing (2)*.

## E

**early binding.** In Infoprint, assigning a job to an actual destination as soon as it is accepted. Early binding permits Infoprint to estimate the time when the job will be completed. Contrast with *late binding*.

**edition binding.** A type of book binding in which printed sheets are folded into 16- or 32-page signatures. Four-page endleaves are pasted on the outside of the first and last signature. The signatures are then collated by machine and sewn together using special sewing machines. Contrast with *perfect binding*, *spiral binding*, and *wire-o binding*.

**electronic document.** A document stored in a computer instead of printed on paper.

**electronic mail.** Correspondence in the form of messages transmitted between workstations over a network. Synonymous with *email*.

**electrophotographic.** Pertaining to a type of printer technology that creates an image on paper by uniformly charging the photoconductor, creating an electrostatic image on the photoconductor, attracting negatively charged toner to the discharged areas of the photoconductor, and transferring and fusing the toner to paper.

**em.** In composition, a unit of measurement exactly as wide and as high as the point size of the font being set. The name is derived from the fact that the letter M in early typefaces was usually cast on a square body.

**email.** Electronic mail.

**email destination.** In Infoprint, an actual destination representing an electronic mailing system.

**email destination support system.** In Infoprint, the destination support system that supports email destinations.

**embellishments.** Variable data added to all copies of assembled pages to make the unit appear like a whole; for example, headers, footers, a table of contents, and chapter separations.

**en.** In composition, exactly one-half an em.

**enable.** In Infoprint, the action that makes a destination, queue, or server able to accept jobs, or a log able to accept information.

**end sheet.** The sheet of paper, blank or otherwise, that can follow a job. See also *auxiliary sheet*.

**Enhanced X-Windows.** A tool designed to permit multiple application processes to operate within multiple windows displayed on a virtual terminal. See *X-Windows*.

**environment variable.** Any one of a number of variables that describe the way an operating system runs and the devices it recognizes.

**error log.** A data set or file in a product or system where error information is stored for later access.

**estimate.** The professional cost analysis made by a print shop in response to a customer's request for a price quotation on a print job.

**event.** In Infoprint, an occurrence in the printing system during an operation; for example, the completion of a command.

**event log.** In Infoprint, a collection of messages about events that have occurred.

**event notification.** The notification that is sent by Infoprint for an event.

**extensions.** An IBM program-provided software component that enables users to incorporate variable data into fixed-text documents to produce personalized or customized documents.

## F

**fax destination.** In Infoprint, an actual destination representing a fax device.

**fax destination support system.** In Infoprint, the destination support system that supports fax destinations.

**FIFO (first-in-first-out).** In Infoprint, a queuing technique where the next job assigned to the first position in the queue is the job that has been in the queue for the longest time. Infoprint processes jobs in the order in which they are received. Contrast with *deadline*, *job-priority*, *longest-job-first*, and *shortest-job-first*.

**file-reference document.** In Infoprint, a file containing the names of other files, each entered on a separate line. Job submitters can specify this file for printing when they specify a document type of **file-reference**; Infoprint prints each file listed in the reference document.

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

**finisher.** A hardware device attached to a printer that performs such operations as folding or stapling the printed pages.

**finishing.** In a print shop, the final operations on a printed product, such as stapling, trimming, drilling, folding, embossing, varnishing, gluing, shrink wrapping, perforating, laminating, collating, and so on.

**flag.** A modifier of a command that specifies the action of the command. A dash usually precedes a flag. Synonymous with *option*. See also *keyword*.

**FOCA.** Font object content architecture.

**folder.** In the Infoprint GUI, an object that represents a container for a collection of similar objects. For example, the Retained Jobs folder contains retained jobs.

**font.** (1) A family of characters of a given size and style; for example, 9-point Helvetica. (2) One size and one typeface in a particular type family, including letters, numerals, punctuation marks, special characters, and ligatures. (3) A paired character set and code page that can be used together for printing a string of text characters. A double-byte font can consist of multiple pairs of character sets and code pages.

**form definition.** A resource object used by Infoprint that defines the characteristics of the form or printed media, which include: overlays to be used, the paper source (for cut-sheet printers), duplex printing, text suppression, and the position of composed-text data on the form.

**forward space.** In Infoprint, the action used to move ahead and skip the printing of a specified number of pages in a job.

**FPO.** Low-quality (sometimes photographic) images placed in a dummy to represent final images. Desktop publishing software produces images as display-screen resolution FPOs.

**front panel.** In the CDE, a workspace area containing controls that represent various tasks you can perform and workspace switches.

**FTP.** File Transfer Protocol.

## G

**GCR.** Gray component replacement.

**GIF.** Graphics Interchange Format.

**global change.** In the Infoprint GUI, an action used to make changes to one or more attributes of several objects at once. You can also perform the same action on several objects of the same object class at the same time; for example, disabling two or more actual destinations at the same time.

**global character.** A character or set of characters used to specify an unknown number or set of characters in a search string. In Infoprint, a global character is represented by an asterisk (\*).

**global ID.** Global job identifier.

**global job identifier.** An unambiguous job identifier. In Infoprint, it is represented as the name of the server managing the job followed by a colon (:) and a generated integer. This ID uniquely identifies the job within the Infoprint server.

**glyph.** An image, usually of a character, in a font.

**GOCA.** Graphics object content architecture.

**graphic character.** A visual representation of a character, other than a control character, that is normally produced by writing, printing, or displaying.

**Graphical User Interface (GUI).** A type of user interface that takes advantage of a high-resolution monitor and includes a combination of graphics to implement an object-action paradigm, the use of pointing devices, menu bars, overlapping windows, and icons. Contrast with *Command Line Interface*.

**Graphics Interchange Format (GIF).** A compressed graphics format widely used on the Internet.

**gray component replacement (GCR).** Synonym for *under color removal (UCR)*.

**gray scale.** A strip of standard gray tones, ranging from white to black, placed at the side of the original copy during photography to measure the tonal range and contrast obtained.

**GUI.** Graphical User Interface.

**gutter.** The blank area or inner margin from the printing area to the binding.

## H

**halftone.** A printing method that simulates continuous-tone shading using dots of varying sizes laid out on a rectangular grid. Larger dots simulate darker tones and smaller dots simulate lighter tones. Typical grid spacings are 85 lines per inch (lpi) (newspaper), 133 lpi (low end), 150 lpi (midrange), and 175+ lpi (high quality).

**help.** (1) In the Infoprint GUI, an action used to display the online help for a specific template, object,



action, button, control, or area in an application window. (2) The name of a button used to access the online help.

**hold.** An indication determined by the **job-hold** attribute that is used to keep a job in the queue and prevent Infoprint from scheduling it.

**hostname.** The name given to an AIX system.

**hot folder.** A workstation directory where users copy jobs to submit them to print.

**hypertext.** A way of presenting information online with connections between one piece of information and another. These connections are called hypertext links. See also *hypertext link*.

**hypertext link.** A connection between one piece of information and another. Selecting a link displays the target piece of information.

## I

**IBM InfoColor 70.** A duplex, process color, web-fed printer with 600-dpi resolution.

**IBM Infoprint.** A solution of software and hardware products that can supplement or replace the offset presses and copiers in print shops with high-quality, non-impact, black and white or process color printers. Infoprint takes documents from creation to the published, kitted, and shipped product.

**IBM Infoprint Control.** The administration and management component of IBM Infoprint Manager for AIX. It runs on AIX and provides a complete set of system administrator and operator functions to control all aspects of a print environment, as well as job submitter printing functions to submit and control jobs.

**IBM Infoprint Library.** A component of IBM Infoprint Manager for AIX. IBM Infoprint Library is a document archival and retrieval system in which job tickets and their associated resource files (graphics, fonts, images, and PostScript data) are stored and from which these data types can be retrieved for reuse.

**IBM Infoprint Manager for AIX.** The software component of IBM Infoprint. IBM Infoprint Manager for AIX handles the scheduling, archiving, retrieving, and assembly of a print job and its related resource files. It also tracks the finishing and packaging of the printed product.

IBM Infoprint Manager for AIX is based on Palladium technology developed at MIT/Project Athena. It conforms to the ISO DPA and POSIX standards.

**IBM Infoprint Network.** The local area network running TCP/IP protocol that Infoprint uses to communicate among servers, clients, and output devices.

**IBM Infoprint Scan.** The component of IBM Infoprint Manager for AIX that allows users to scan images as TIFF files to be included in jobs submitted by Infoprint Submit from a Windows workstation.

**IBM Infoprint Select.** The component of IBM Infoprint Manager for AIX that allows users to submit jobs from an OS/2 or Windows workstation.

**IBM Infoprint Submit.** The component of IBM Infoprint Manager for AIX that allows users to submit jobs with a job ticket from a Windows or Macintosh workstation.

**Infoprint 20.** A black and white, large-format, cut-sheet, workgroup laser printer with optional duplexing and 600-dpi resolution.

**IBM Infoprint 60.** A duplex, black and white, cut-sheet printer with 600-dpi resolution.

**IBM Infoprint 62.** A non-impact, continuous-forms printer that runs at a maximum of 62 impressions-per-minute (depending on forms size), and is factory set to run at either 240 or 300 dpi on a maximum paper size of 370.8 mm (14.6 in.).

**IBM Infoprint 4000.** A duplex, black and white, continuous-forms printer with 600-dpi resolution.

**icon.** A graphic symbol displayed on a screen that a user can select to invoke a function or software application.

**image.** Toned and untoned pels arranged in a pattern.

**image data.** Rectangular arrays of raster information that define an image.

**imagesetter.** A high resolution (1270–3600+ dpi) printer that uses an Argon (green) laser to write to film using digital input. Imagesetting is the step before Cromalin proofing and platemaking.

**imposition.** The process of arranging pages on a press sheet to ensure the correct order during final cutting, folding, and binding. Electronic imposition builds press sheets automatically during the RIP and outputs film formatted for immediate use in platemaking.

**InfoPrint.** (1) IBM Infoprint. (2) In IBM Infoprint software publications, IBM Infoprint Manager for AIX or any of its components, especially IBM Infoprint Control.

**initial value document.** Synonym for *default document*.

**initial value job.** Synonym for *default job*.

**initial value object.** Synonym for *default object*.

**initially settable attribute.** An attribute whose value can be established when an object is created but cannot

be subsequently set or modified. See also *resettable attribute*; contrast with *non-settable attribute*.

**input focus.** The area of a window where user interaction is possible from either the keyboard or the mouse.

**input tray.** For a printer device, the container that holds the medium upon which the printer prints its output.

**Intelligent Printer Data Stream (IPDS).** (1) An all-points-addressable data stream that enables users to position text, images, and graphics at any defined point on a printed page. (2) Information that the host sends to IBM IPDS printers. This information generally contains basic formatting, error recovery, and character data and enables the printers to make decisions. (3) An architected host-to-printer data stream that contains both data (text, image, graphics, and bar codes) and controls defining how the data is to be presented. IPDS provides a device-independent interface for controlling and managing all-points-addressable (APA) printers.

**International Organization for Standardization (ISO).** An organization of national standards bodies from various countries established to promote development standards to facilitate international exchange of goods and services, and develop cooperation in intellectual, scientific, technological, and economic activity.

**Internet.** A wide area network connecting thousands of disparate networks in industry, education, government, and research. The Internet network uses TCP/IP as the protocol for transmitting information.

**Internet Protocol.** The set of rules that determines how to route data from its source to its destination in an internet environment.

**intervening jobs.** In Infoprint, the number of jobs in a queue that are scheduled to print before the job in question.

**IOCA.** Image object content architecture.

**IP address.** The Internet Protocol address of the server in a dotted decimal format where each node is an integer. (For example, 9.99.9.143).

**IPDS.** Intelligent Printer Data Stream.

**ISO.** International Organization for Standardization.

## J

**job.** In Infoprint, an object that represents a request to print or transmit one or more documents together in a single session. A job includes the data to be printed or transmitted and resources such as fonts, images, and overlays. Depending on how it was submitted, it may also include a job ticket. Synonymous with *job bundle* and *print job*.

**job bundle.** Synonym for *job*.

**job data.** The page descriptions, merge data, and embellishments that compose a document in a job, either directly or by reference.

**job ID.** A local or a global identifier that identifies a job to a job submitter, administrator, operator, or Infoprint. See *local job identifier*, *global job identifier*.

**job-priority.** In Infoprint, a queuing technique where the next job assigned to the first position in the queue is the one with the highest priority. Contrast with *deadline*, *FIFO (first-in-first-out)*, *longest-job-first*, and *shortest-job-first*.

**job submitter.** In Infoprint, the person who submits jobs for printing. Often, this person is an application programmer who maintains applications that generate data to be printed.

**job ticket.** The customer's hardcopy or electronic instructions listing all the variables describing a print job, either directly or by reference. The print shop can add specifications to the job ticket and can print the job ticket.

**Joint Photographic Experts Group (JPEG).** A compressed graphics format widely used on the Internet.

**JPEG.** Joint Photographic Experts Group.

## K

**Kerning.** In typesetting, adjusting the relative spacing of two characters to improve their appearance and readability. Kerning pairs are specific sets of characters with built-in relative spacing. Some typefaces have as many as 100 kerning pairs.

**keyword.** (1) A name or symbol that identifies a parameter. (2) Part of a command operand that consists of a specific character string, such as **DSNAME=**.

**kitting.** In a print shop, packaging the completed published work with attendant binders, tabs, diskettes, and other equipment or information, before shipping the finished product.

## L

**LAN.** Local Area Network.

**laser (light amplification by stimulated emission of radiation).** In IBM printers, a device that emits a beam of coherent light that forms the image on the photoconductor that is subsequently transferred to the paper.

**late binding.** In Infoprint, waiting to assign a job to an actual destination until it is about to be processed.

Late binding permits Infoprint to route a job to the first suitable actual destination that becomes available. Contrast with *early binding*.

**LED.** Light-emitting diode.

**light-emitting diode (LED).** The imaging device element for electrophotographic print units.

**lines per inch (lpi).** A measure of the density of the grid used to space halftone dots. Typical grid spacings are 85 lpi (newspaper), 133 lpi (low end), 150 lpi (midrange), and 175+ lpi (high quality).

**Local Area Network (LAN).** A computer network at one location that consisting of devices connected to one another and communicating. This network can also be connected to a larger network.

**local ID.** Local job identifier.

**local job identifier.** In Infoprint, a job identifier automatically generated by the server, identifying the job to the person who submitted it. Infoprint maps a local job ID to a global job ID.

**locale.** (1) The human language and character set of information presented to a user. (2) In Infoprint, the language Infoprint uses when sending notification and error messages or displaying the Infoprint graphical user interfaces.

**log.** (1) A collection of messages or message segments added to a file for accounting or data collection purposes. (2) To record messages in a file.

**logical destination.** In Infoprint, an object to which users submit their jobs. The logical destination routes jobs to one or more actual destinations representing output devices such as printers, electronic mail systems, or fax machines. See also *logical printer*; contrast with *actual destination*.

**logical printer.** In Infoprint, a type of logical destination. The logical printer routes jobs to one or more physical printers representing printing devices.

**logical unit (LU).** A type of network accessible unit that enables end users to gain access to network resources and communicate with each other.

**logical unit (LU) 6.2.** A type of logical unit that supports general communication between programs in a distributed processing environment. LU 6.2 is characterized by (a) a peer relationship between session partners, (b) efficient utilization of a session for multiple transactions, (c) comprehensive end-to-end error processing, and (d) a generic application program interface (API) consisting of structured verbs that are mapped into a product implementation.

**longest-job-first.** In Infoprint, a queuing technique where the next job assigned to the first position in the

queue is the longest job in the queue. Contrast with *deadline*, *FIFO (first-in-first-out)*, *job-priority*, and *shortest-job-first*.

**lpi.** Lines per inch.

**LU.** Logical unit.

## M

**magnetic ink character recognition (MICR).** Identification of characters printed with ink that contains particles of magnetic material.

**mainframe processor.** A functional unit that interprets and executes instructions in a large computer to which other computers are connected so that they can share the facilities the mainframe provides.

**makeready.** All the setup work involved in preparing a press for a print run.

**manage.** In the Infoprint GUI, the action used to put an object into a mode where its icon reflects changes of status.

**mechanical.** A camera-ready layout. The mechanical can consist of multiple sheets or overlays for each spot or process color used. Final images, if not stripped in later, should be at final size, cropped and screened to the correct line frequency.

**medium.** In Infoprint, an object representing the physical material upon which a job is printed.

**merge data.** Data that is unique to each copy of a document and that customizes the document; for example, serial numbers or mailing information. Merge data is typically a small percentage of the total data in the document.

**message catalog.** A file of all the possible messages than can display during the processing of an application.

**MICR.** Magnetic ink character recognition.

**Mixed Object Document Content Architecture (MO:DCA).** An architected, device-independent data stream for interchanging documents.

**MO:DCA-P.** Mixed Object Document Content Architecture Presentation.

**modify.** In Infoprint, an action used to modify the values of attributes within the object attributes notebook.

**moire.** Undesirable interference patterns caused by two overprinting halftone screens with incorrect halftone dot angles.

**monospaced.** In typesetting, pertaining to a typeface in which all the characters have equal widths. Monospaced typefaces are useful for tabulating figures.

**Multiple Virtual Storage (MVS).** An operating system developed by IBM. The design of MVS incorporates an addressing architecture that provides a unique address space to each job in the system.

**MVS.** Multiple Virtual Storage.

## N

**N\_UP.** Pertaining to the number of forms placed together in a layout. Typical layouts are 2\_UP, 4\_UP, 8\_UP, 16\_UP, and so on. N\_UP printing is done to use the maximum area of the print sheet.

**name service.** The DCE service that administers the namespace and provides the network binding information that a client requires to access the server.

**namespace.** A global name repository available to all utilities and API procedures. The namespace contains mappings of object names to other related objects. For example, the namespace provides the mapping of a logical destination to the server in which it resides.

**Network File System (NFS).** A protocol developed by Sun Microsystems that uses Internet Protocol to allow a set of cooperating computers to access each other's file systems as if they were local.

**newline options.** The different ways in which the printer determines how lines are delimited in a document data stream.

**NFS.** Network File System.

**non-process-runout (NPRO).** A printer function that moves the last printed sheet to the stacker of the printer device.

**non-settable attribute.** An attribute that is neither initially settable nor resettable. The values for these attributes are controlled by Infoprint. Contrast with *initially settable attribute* and *resettable attribute*.

**notification.** (1) The act of reporting the occurrence of events. (2) In Infoprint, notification of events appears as messages in event logs or messages sent to administrators, operators, and job submitters. In the Infoprint GUI, notification of events also appears as changes to the appearance of icons.

**notification-profile.** In Infoprint, an attribute associated with an object that contains information designating the people to whom Infoprint sends notification about events for that object, which event information it sends, and how it sends the information.

**NPRO.** Non-process-runout.

## O

**object.** A collection of attributes that represent a physical or logical entity in the print system. For example, a specific printer device is represented by an actual destination (physical printer) object. An object is identified by its object name. Objects are grouped into classes. See also *object class*.

**object class.** A group of objects that share a common definition and therefore share common properties, operations, and behavior as defined by their attributes. For example, all Infoprint queue objects are in the same object class and each queue has the same set of queue attributes. However, the values for those attributes can differ for each queue within the queue object class.

**Object Identifier (OID).** In architecture, a notation that assigns a globally unambiguous identifier to an object or a document component. The notation is defined in international standard ISO.IEC 8824(E).

**object name.** The alphanumeric term that identifies an object.

**object state.** The state of an object indicates its availability and readiness for performing its functions. An object can be in one of a number of states such as ready, busy, or unknown.

**OCR.** Optical character recognition.

**octet.** A byte that consists of eight binary digits (bits).

**offset stacking.** In certain printer devices, a function that allows the printer to offset the printed output pages for easy separation of the jobs.

**OID.** Object Identifier.

**open destinations window.** In the Infoprint GUI, the action used to open a new application window displaying the logical and actual destinations associated with a queue.

**Open Prepress Interface (OPI).** An industry standard for replacing low-resolution images in review documents with high-resolution images needed for high-quality final output.

**Open Software Foundation (OSF).** A nonprofit research and development organization created by a consortium of companies that work together to develop software in the open systems market. OSF developed the Distributed Computing Environment (DCE).

**open window.** In the Infoprint GUI, the action used to open a new application window representing one or more objects displayed in the currently open application window.

**operation.** An action performed on one or more data items.

**operator.** In Infoprint, the person responsible for printer devices. Also, this person performs a subset of tasks for Infoprint queues and actual destinations and performs some job-related tasks.

**OPI.** Open Prepress Interface.

**optical character recognition (OCR).** Conversion of scanned text to editable ASCII characters.

**option.** A modifier of a command that specifies the action of the command. A dash usually precedes an option. Synonymous with *flag*. See also *keyword*.

**orphan logical destination.** In the Infoprint GUI, an object that represents a logical destination that is not associated with an existing queue.

**orphan logical printer.** In the Infoprint GUI, an object that represents a logical printer that is not associated with an existing queue.

**OSF.** Open Software Foundation.

**overlay.** A collection of constant data, such as lines, shading, text, boxes, or logos, that is electronically composed in the host processor and stored in a library, and that can be merged with variable data during printing.

## P

**PAC.** Privilege Attribute Certificate.

**page definition.** (1) A resource that contains the formatting controls for line data. (2) In Infoprint, a resource that defines the rules of transforming line data into composed pages and text controls.

**page segment.** A resource that contains composed text and images, which are prepared before formatting and included during printing.

**Palladium.** A distributed print system developed at MIT/Project Athena with participation from Digital Equipment Corporation (DEC), International Business Machines (IBM), and Hewlett-Packard (HP). It is a reference implementation for the OSI Document Printing Architecture (DPA) standard, ISO/IEC 10175. Palladium was selected in 1990 as the DCE distributed printing technology. Infoprint was designed using Palladium concepts.

**pane.** In the Work Area of the Infoprint VSM administrator's GUI, an area containing a group of objects of a specific type, such as an actual destinations pane.

**parent/child relationship.** In Infoprint, servers, queues, and destinations are related to one another in a parent/child relationship. For example, a server is the parent of all the queues that reside in that server, and these queues are its children.

**pass through.** In Infoprint, referring to options submitted with a job that are used by the device driver, but not Infoprint. Infoprint does not process or validate this information; it passes it along to the device driver. See *printer driver*.

**path.** The route used to locate files; the storage location of a file. A fully qualified path lists the drive identifier (if any), directory name, subdirectory name (if any), and file name with the associated extension.

**pause.** In Infoprint, the action used to temporarily halt the printing or transmission of jobs on actual destinations or the distribution of jobs from servers or queues.

**pdcreds.** In Infoprint, a utility used to create directories within the DCE namespace.

**pdcreate.** In Infoprint, the command used to create a new object and set its attributes to specified values.

**PDF.** (1) Portable Document Format. (2) Printer description file.

**pdmsg.** In Infoprint, a utility used to display information about a message.

**pdpr.** In Infoprint, the command used to create and submit a job, consisting of one or more documents, to a server for printing or transmission.

**perfect binding.** A type of book binding in which the pages are held together with flexible adhesive. Contrast with *edition binding*, *spiral binding*, and *wire-o binding*.

**permissions.** In AIX, codes that determine who can access a file and what operations they can perform on the file.

**physical printer.** In Infoprint, a type of actual destination that represents a printer device. See also *printer device*.

**pioibe.** The standard printer input/output backend program used by AIX for printing. See also *ainbe*.

**pipe-pull.** In Infoprint, a document transfer method where Infoprint saves the documents in a file and transfers the address of the file to the server. Infoprint transfers the file to the server upon the request from the server. This is an efficient transfer method for large jobs and is the default transfer method at job submission. Contrast with *with-request*.

**plex.** A document or actual destination attribute used to define the placement of output images on the page. See the plex values *simplex* and *tumble*.

**plug-ins.** A component of Adobe PageMaker that enables users to incorporate variable data into fixed-text documents to produce personalized or customized documents.

**Portable Document Format (PDF).** An Adobe PostScript data format that can be viewed or printed.

**Portable Operating System Interface for Computer Environments (POSIX).** An Institute of Electrical and Electronics Engineers (IEEE) standard for computer operating systems.

**POSIX.** Portable Operating System Interface for Computer Environments.

**PostScript.** Adobe's page description language. PostScript has become a standard for graphic design and layout software. PostScript files can contain both vector and raster data. Fonts are described using PostScript coding. Many desktop publishing systems produce PostScript data as their output data stream.

**PostScript printer description (PPD).** A file that contains options for printing PostScript data on various printer devices.

**PPD.** PostScript printer description.

**preflight.** To assess all resources for a job before the actual print run.

**prepress.** Work done in the print shop before printing a job, such as preparing data and art, page imposition, color retouching, electronic editing, and page layout.

**print database.** The set of files on disk that provide a permanent repository for the attributes of all print objects, such as logical destinations, queues, and actual destinations.

**print job.** Synonym for *job*.

**Print Quality Enhancement (PQE).** A printer facility that provides edge smoothing along diagonal lines, fine fidelity protection, and independent boldness control.

**Print Services Facility (PSF).** Any of several programs, including PSF for AIX, PSF/MVS, PSF/VM, and PSF/VSE, that produce printer commands from the data sent to them.

**print system.** A group of one or more print servers and one or more printing devices, which may or may not be located in the same geographical area. The components of a print system are assumed to be interconnected in some manner, providing at least one network interface to print clients, and acting synergistically to supply the defined document print service. (D)

**printable document.** In Infoprint, an object that represents text or data to be printed by a job. Contrast with *resource document*.

**printer description file (PDF).** A file that contains options for printing PostScript data on a specific printer device.

**printer device.** The physical output device that performs the printing function. See also *physical printer*.

**printer driver.** A file that describes the physical characteristics of a printer or other peripheral device. This file is used to convert graphics and text into device-specific data at the time of printing or plotting. Synonymous with *device driver*.

**priority.** In Infoprint, a number assigned to a job that determines its precedence in being printed. Jobs with higher priority numbers are handled before jobs with lower priority numbers.

**Privilege Attribute Certificate (PAC).** In DCE, a certified set of access privileges that can be presented by a user or administrator to establish access rights to objects.

**process color.** Color made up of CMYK links simulating a specified color. This is the traditional method of reproducing continuous tone color images (color separations). Because of the nature of color inks, certain inks do not reproduce well.

**processor.** In a computer, a functional unit that interprets and executes instructions. A processor consists of at least an instruction control unit and an arithmetic and logic unit. (T)

**promote.** In Infoprint, the action used to move a job to the beginning of the queue so that it will print on the next available printer that can handle that job.

**protocol.** A set of semantic and syntactic rules that determines the behavior of functional units in achieving communication.

**PSF.** Print Services Facility.

**PSF destination support system.** In Infoprint, the destination support system that communicates with PSF for AIX to print jobs.

**PSF physical printer.** In Infoprint, the object representing a printer device that uses the PSF destination support system.

## Q

**QuarkXpress.** A desktop publishing system produced by Quark, Incorporated.

**queue.** (1) In Infoprint, an object that manages a collection of jobs that are waiting to print. A queue receives jobs from one or more logical destinations and sends jobs to one or more actual destinations. (2) A line or list formed by items waiting for processing.

## R

**raster.** A pattern of dots defined at varying data depths. Black and white images are one-bit (on/off); grayscale images are 8-bit (256 levels); RGB images are 24-bit; CMYK images are 32-bit.

**raster image processor (RIP).** A processor in which a PostScript data stream is converted into dot patterns that are transferred to the final print medium. Infoprint uses an Adobe RIP to convert PostScript to IPDS for such printers as the Infoprint 4000 and Infoprint 60.

**rc.pd.** In Infoprint, a utility used to start the Infoprint servers listed in the `/etc/pd.servers` file.

**read-only.** In Infoprint, describes an attribute value that cannot be set by the user but may change based on other activity.

**ready.** (1) A state in which an object is ready and able to perform tasks. (2) An available resource, such as a value of the **media-ready** attribute. Contrast with *supported*.

**red, green, blue (RGB).** The colors of CRT display phosphors. RGB images are for screen display only. They must be converted to CMYK images before printing.

**registration.** (1) The accuracy of printing on paper relative to the edges of the paper. (2) The accuracy of printing a single color (cyan, magenta, or yellow) relative to black. (3) The accuracy of printing on one side of a page relative to printing on the reverse side of the page.

**Remote Procedure Call (RPC).** A DCE component that manages communication between clients and servers in a DCE environment. It allows requests from a client program to access a procedure anywhere in the network.

**reprographics.** The process of copying or duplicating documents or information.

**requested.** In Infoprint, pertaining to the specific values of attributes requested by a job when it is submitted. The requested attribute values of a job are validated against supported attribute values for an actual destination to determine if the printer can handle that job. Contrast with *supported*.

**resettable attribute.** An attribute whose value can be set or modified after an object has been created, assuming the object is in an appropriate state to be modified. See also *initially settable attribute*; contrast with *non-settable attribute*.

**resource.** In AFP, a file containing a collection of printing instructions used when printing a job. Resources include fonts, overlays, form definitions, page definitions, and page segments.

**resource context.** In Infoprint, an object that contains directory path information that helps the print system locate resources needed for printing a job. The resources include fonts, overlays, form definitions, page definitions, and page segments.

**resource document.** In Infoprint, an object that represents a resource, such as graphics or fonts, used by a job to print a printable document. Contrast with *printable document*.

**resubmit.** In Infoprint, an action used to reroute pending or retained jobs to a different logical destination than the one through which the job was originally submitted.

**resume.** In Infoprint, the action used to resume the printing of paused jobs or resume the distribution of jobs from paused servers or queues.

**retained job.** In Infoprint, an object that represents a job that is being stored in the print system for a specified amount of time, normally after the completion of printing the job. A retained job does not reside in a queue.

**retention.** The process of storing data after completion of a process for a certain length of time.

**retrieval.** The process of bringing digital archived data out of storage and into online memory for reuse. See also *archiving*.

**RGB.** Red, green, blue.

**RIP.** (1) Raster image processor. (2) To convert data to dot patterns using a raster image processor.

**root user.** In the AIX environment, the system user with the most authority who can log in and execute restricted commands, shut down the system, and edit or delete protected files. Synonymous with *superuser*.

**RPC.** Remote Procedure Call.

**RS/6000.** A family of workstations and servers based on IBM's POWER architecture. They are primarily designed for running multi-user numerical computing applications that use the AIX operating system.

## S

**scanner.** A device that converts hardcopy source data into digital format (halftone dots) to avoid retyping the data.

**scheduler.** In Infoprint, the scheduling method that the queue uses when assigning a job to an actual destination.

**separator sheet.** The sheet of paper, blank or otherwise, that separates documents within a job. See also *auxiliary sheet*.

**server.** In Infoprint, the object that accepts configuration, management, and printing requests, performs the requested operations, and sends responses back as a result of the operation.

**settable attribute.** See *initially settable attribute*, *resettable attribute*.

**severity.** An indication of how serious an error condition is.

**shell.** In the AIX operating system, a command interpreter that acts as an interface between the user and the operating system. In Infoprint documentation, all shell examples use the Korn shell.

**shift-out, shift-in code.** Control characters used to indicate the beginning and end of a string of double-byte, ideographic characters.

**shortest-job-first.** In Infoprint, a queuing technique where the next job assigned to the first position in the queue is the shortest job in the queue. Contrast with *deadline*, *FIFO (first-in-first-out)*, *job-priority*, and *longest-job-first*.

**shut down.** In Infoprint, the action used to halt all server or actual destination processes without deleting the server or actual destination.

**signature.** A group of pages that are printed, folded, cut, and bound together. Manual placement of pages in the signature is determined using a folding dummy.

**simplex.** In Infoprint, the value of the document or actual destination **plex** attribute indicating that output images are placed on the media in a head-to-head format, so that the top of one image is at the same edge as the top of the next image. Depending on the value of the document or actual destination **sides** attribute, the document may be printed on one or both sides of the paper. Contrast with *tumble*; see also *simplex printing* and *duplex printing*.

**simplex printing.** (1) Printing on only one side of the paper. Contrast with *duplex printing (1)*. (2) Printing on one or both sides of the paper, placing output images on the media in a head-to-head format, so that the top of one image is at the same edge as the top of the next image. Contrast with *tumble duplex printing*; see also *duplex printing (2)*.

**SMIT.** System Management Interface Tool.

**SNA.** Systems Network Architecture.

**spiral binding.** A type of book binding in which wire or plastic coils are threaded through a series of holes or slots in the binding edge. Contrast with *edition binding*, *perfect binding*, and *wire-o binding*.

**spot color.** Individual colored inks formulated to exactly match a specified color. Spot color is used when

CMYK process color is unable to produce a reasonable facsimile of the color or when vivid color is needed. Spot color is also used when fluorescent or metallic colors are needed.

**spread.** In color printing, an area whose dimensions have been enlarged to eliminate white space between it and another color. Contrast with *choke*.

**start sheet.** The sheet of paper, blank or otherwise, that can precede a job. See also *auxiliary sheet*.

**state.** Synonym for *object state*.

**stripping.** The process of mechanically assembling film into plate layouts. Page imposition takes place during stripping.

**subnet mask.** A bit template indicating which part of an IP address represents the network. A 1 in the subnet mask means that the corresponding bit in the IP address is part of the network address; a 0 means that it is not. For example, if the IP address is 9.99.12.137 and the subnet mask is 255.255.255.0, the network address is 9.99.12.0.

**subnetwork.** (1) Any group of nodes that have a set of common characteristics, such as the same network ID. (2) In the AIX operating system, one of a group of multiple logical divisions of another network, such as can be created by TCP/IP.

**subtractive color system.** A system that reproduces an image by mixing (adding) appropriate quantities of cyan, magenta, and yellow paints on white paper. These paints reflect certain colors and absorb—or subtract—others. Contrast with *additive color system*.

**superuser.** Synonym for *root user*.

**supported.** In Infoprint, pertaining to the specific job attribute values that the actual destination can accept during job validation. Infoprint validates the requested attribute values of the job against the supported attribute values of the actual destination to determine whether the actual destination can handle that job. Contrast with *requested*.

**synchronous.** Occurring with a regular or predictable time relationship to a specified action. Contrast with *asynchronous*.

**system administrator.** Synonym for *administrator*.

**System Management Interface Tool (SMIT).** In the AIX operating system, an interface tool for installation, maintenance, configuration, and diagnostic tasks. SMIT allows you to perform tasks without entering any commands.

**Systems Network Architecture (SNA).** The description of IBM's logical structure, formats,



protocols, and operational sequences for transmitting units through, and controlling the configuration and operation of, networks.

## T

**table reference character (TRC).** An optional control character in a print data set. The TRC identifies the font used to print the record and can be used to select a font during printing.

**Tagged Image File Format (TIFF).** A digital format for storing scanned images. TIFF files are also referred to as raster format files (as opposed to vector format files). When used in desktop publishing, TIFF files produce only a low-resolution FPO image; the high-resolution data remains on the hard disk.

**task help.** A type of online help that provides a list of tasks that can be completed with a selected object. When you select a task, the help provides step-by-step information about how to complete the task.

**TCP/IP.** Transmission Control Protocol/Internet Protocol.

**TCP/IP-attached printer.** (1) A printer device attached to an RS/6000 through telecommunication lines using the TCP/IP protocol. (2) In Infoprint, a PSF physical printer that represents a TCP/IP-attached printer device. See also *AIX-attached printer*, *channel-attached printer*, *direct-attached printer*, *upload-SNA-attached printer*, *upload-TCP/IP-attached printer*.

**template.** In the Infoprint VSM administrator's GUI, an object that represents a set of default attribute values that has been defined for creating a particular type of object, such as an actual destination.

**ticket.** See *job ticket* and *DCE ticket*.

**TIFF.** Tagged Image File Format.

**Transmission Control Protocol/Internet Protocol (TCP/IP).** A set of communication rules used in the Internet and in any network that follows the U.S. Department of Defense standards for inter-network protocol. TCP provides a reliable host-to-host protocol between hosts in packet-switched communications networks and in interconnected systems of such networks. It assumes that the Internet Protocol (IP) is the underlying protocol. See also *Internet Protocol*.

**trapping.** In desktop publishing, the amount of overlap in overprinting colors. Trapping prevents white paper showing through gaps caused by normal errors in registration. On sheet-fed presses, trapping is usually 0.25 point. See also *choke* and *spread*.

**TRC.** Table Reference Character.

**tumble.** In Infoprint, the value of the document or actual destination **plex** attribute indicating that output

images are placed on the media in a head-to-toe format, so that the top of one image is at the same edge as the bottom of the next image. The document must be printed on both sides of the paper. Contrast with *simplex*.

**tumble duplex printing.** Printing on both sides of the paper, placing output images on the media in a head-to-toe format, so that the top of one image is at the same edge as the bottom of the next image. Contrast with *simplex printing (2)*, *duplex printing (2)*.

## U

**UCR.** Under color removal.

**under color removal (UCR).** Conversion of neutral color areas to black ink that reduces use of CMY inks, improves trapping, and reduces setup time. Generally, UCR is performed during image scanning, but some RIPs perform it during processing. Synonymous with *gray component replacement (GCR)*.

**unmanage.** In the Infoprint VSM administrator's GUI, the action used to put an object into a mode where its icon does not reflect the changes of status for the object.

**upload printer.** See *upload-SNA-attached printer*, *upload-TCP/IP-attached printer*.

**upload-SNA-attached printer.** In Infoprint, a PSF physical printer that represents a printer device attached through an MVS system and managed by PSF/MVS. Infoprint communicates with the MVS system through the SNA network. See also *AIX-attached printer*, *channel-attached printer*, *direct-attached printer*, *TCP/IP-attached printer*, *upload-TCP/IP-attached printer*.

**upload-TCP/IP-attached printer.** In Infoprint, a PSF physical printer that represents a printer device attached through an MVS system and managed by PSF/MVS. Infoprint communicates with the MVS system through the TCP/IP network. See also *AIX-attached printer*, *channel-attached printer*, *direct-attached printer*, *TCP/IP-attached printer*, and *upload-SNA-attached printer*.

## V

**validate.** In Infoprint, to compare the attribute values requested by a job with the supported attribute values of the actual destinations in the system and to determine whether there is an actual destination capable of printing or transmitting the job.

**value.** A specific characteristic of an attribute.

**variable.** A name used to represent a data item whose value can change while the program is running.

**variable data.** Data that can be changed between copies of a document. For example, a form letter (constant data) can be merged with variable data, such as a customer's name and address to produce personalized documents.

**varnish.** A protective layer applied to a finished sheet, usually for photos, but sometimes used as a design element because of its reflective qualities. Varnishes can be tinted.

**vector.** An absolute coordinate point and line in space. PostScript files can contain vector artwork. Vector files are converted to rasters during the RIP process.

**velox.** A black and white photographic print made from a halftone negative, to be used as a proof copy.

**vignette.** An image with soft, fade-away edges.

**Virtual Machine (VM).** (1) An IBM licensed product that manages the resources of a single computer so that multiple computing systems appear to exist. (2) A virtual data processing system that appears to be at the exclusive disposal of a particular user, but whose functions are accomplished by sharing the resources of a real data processing system. (T)

**Virtual Storage Extended (VSE).** An IBM licensed program whose full name is the Virtual Storage Extended/Advanced Function. It is a software operating system controlling the execution of programs.

**Visual Systems Management (VSM).** In AIX, a type of graphical user interface that allows system management through the direct manipulation of objects.

**VM.** Virtual Machine.

**VSE.** Virtual Storage Extended.

**VSM.** Visual Systems Management.

## W

**web.** A roll of paper used in web or rotary printing.

**well.** In the Infoprint VSM administrator's GUI, an area within a pane that contains a group of objects related to the objects in the pane; for example, a queues well within a servers pane.

**what you see is what you get (WYSIWYG).** Refers to the fact that the composite image displayed on the screen at a computer workstation has the appearance of the final printed image.

**window.** A rectangular area of the screen that you can move about, place on top of, or pull under other windows, or reduce to an icon.

**wire-o binding.** A continuous double series of wire loops run through punched slots along the binding side of a booklet. Contrast with *edition binding*, *perfect binding*, and *spiral binding*.

**with-request.** In Infoprint, a document transfer method where the client transfers the documents directly to the server. Contrast with *pipe-pull*.

**workstation.** A terminal or microcomputer, usually one that is connected to a mainframe or to a network, at which a user can use applications.

**write access.** A level of authorization that grants the ability to modify data.

**WYSIWYG.** What you see is what you get.

## X

**X-Windows.** A network-transparent windowing system developed by MIT. It is the basis for Enhanced X-Windows, which runs on the AIX Operating System.

**xerography.** A dry printing process using corona-charged photoconductive surfaces to hold latent images that are developed with a dry toner and then transferred to paper and fused with heat.

**Xstation.** A terminal that is connected through a network to an RS/6000 system, from which a user can perform command-line functions and run X-Windows based applications.

**Xtensions.** A UNIX-provided software component that enables users to incorporate variable data into fixed-text documents to produce personalized or customized documents.

## Numerics

**3170 destination support system.** The destination support system used by the IBM InfoColor 70 to print jobs.

**3170 physical printer.** A physical printer representing an IBM InfoColor 70 printer device.

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