InfoPrint Manager for AIX: Procedures

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InfoPrint Manager for AIX: Procedures

> **Note:**
> Before using this information and the product it supports, read the information in "Notices" on page 447.

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About this publication

This publication helps you use InfoPrint® Manager for AIX®. This manual assumes that you are up and running. It contains procedures to help you perform various tasks and troubleshoot problems. It also contains procedures for using orderable features you can use with InfoPrint Manager.

Who should read this publication

This publication contains advanced configuration and operation tasks for the administrators who configure the InfoPrint environment.

Consult the *InfoPrint Manager: Reference* for information about the various InfoPrint commands, utilities, and attributes available to you while maintaining the system.

Most recent information

For the most recent information about InfoPrint Manager, go to the InfoPrint Solutions Company Web site at `http://www.infoprint.com` and click Support and downloads. Select your software product from the Software support list.

The InfoPrint publication library

For the most current information, see the InfoPrint Solutions Company Web site at **`http://www.infoprint.com.`**

InfoPrint Manager common publication library

These publications are common to both InfoPrint Manager for AIX and InfoPrint Manager for Windows®:

- *InfoPrint Manager: SAP R/3 Planning and Configuration Guide*, S550-1051. For print administrators who need to create and configure both the SAP R/3 environment. we recommend that users possess a detailed knowledge of a SAP R/3 environment, as well as administering and maintaining either AIX or Windows operating systems. This publication describes how a business enterprise that uses SAP R/3 can use either InfoPrint Manager for AIX or InfoPrint Manager for Windows to manage its print environment.
- *InfoPrint Manager: Reference*, S550-1052. For print 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.
- *InfoPrint Manager: PSF and Server Messages*, G550-1053. This publication lists the PSF and Server messages and explanations from InfoPrint Manager.
- *InfoPrint Manager Print-on-Demand Feature: Submit Express User's Guide*, S544-5894. This publication is for the user who installs, configures, and uses Submit Express on a Windows or Macintosh workstation. Although you can use this publication for general guidance in using Submit Express, you should use the online Help to find more detailed instructions.
- *InfoPrint Job Ticketer: Job Ticketer User's Guide*, S550-0419. This publication is a guide for using the InfoPrint Job Ticketer Web application. This guide provides

descriptions of tasks and procedures that an end-user needs to know to set up their workstation to use the application, and then to create, layout, store, retrieve print jobs, and submit the jobs to a print server for printing.

- *InfoPrint Job Ticketer: Administrator's Guide*, S550-0420. This publication is a guide for system administrators who are responsible for the InfoPrint Job Ticketer Web application. This guide provides information about the Job Ticketer system requirements, installation and configuration, system maintenance, security, and problem determination.

InfoPrint Manager for AIX publication library

InfoPrint Manager for AIX includes publications in PDF format on a CD-ROM supplied with the product.

The publications for InfoPrint Manager for AIX are:

- *InfoPrint Manager for AIX: Installation Instructions*, G544-5891. This publication provides updated migration and installation information from the instructions available in the *InfoPrint Manager for AIX: Getting Started* manual.
- *InfoPrint Manager for AIX: Introduction and Planning Guide*, G550-1060. This publication gives an overview of InfoPrint Manager for AIX, introduces its concepts, and helps you prepare to use it. It addresses migration from previous versions of the product. Finally, this publication explains the differences between the AIX and Windows versions of InfoPrint.
- *InfoPrint Manager for AIX: Getting Started*, G550-1061. This publication helps you install and configure InfoPrint Manager for AIX. It focuses primarily on server and client system software configuration.
- *InfoPrint Manager for AIX: Configuration and Tuning Guide*, S544-5892. This publication provides information about configuring and tuning the InfoPrint Manager for AIX, Version 4.2. This book is designed for the InfoPrint Manager administrator who needs to understand the topics necessary to configure and tune an InfoPrint Manager system. It should help administrators to evaluate, develop, and maintain both a logical and hardware configuration for their environment.
- *Guidelines for Installing InfoPrint Manager for AIX 4.2 in an HACMP Configuration*, G544-5818. This publication helps you install and configure HACMP™ with InfoPrint Manager for AIX. It also tells you how to use HACMP with InfoPrint Manager for AIX.
- *InfoPrint Manager for AIX: Using Generalized Fax*, S544-5893. This publication describes the primary tasks necessary for configuring and using the Generalized Fax support that is included with InfoPrint Manager for AIX. This includes sending and receiving faxes from an InfoPrint Manager Server.
- *InfoPrint Manager for AIX: Impositioning Assist*, G544-5910. This publication describes how commercial print shops can use InfoPrint Manager for AIX to make frequent layout changes to signature-based documents with relatively static content. As a prerequisite, this solution requires the InfoPrint Manager for AIX: Print-On-Demand feature, an InfoPrint 4100 Advanced Function Printing™ System, and a third-party impositioning product, such as ScenicSoft Preps.
- *InfoPrint Manager for AIX: Procedures*, G550-1066. This publication describes the primary tasks necessary for setting up an InfoPrint environment, submitting print jobs, scheduling jobs, and managing the print environment.
- *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 InfoPrint

Manager for AIX that allows a PSF program (PSF for z/OS®, PSF/390, PSF/400, PSF/MVS, PSF/VM, 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.

- *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 LU 6.2 protocol.
- *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.

InfoPrint Manager for Windows publication library

InfoPrint Manager for Windows includes publications in PDF format on a CD-ROM supplied with the product.

The publications for InfoPrint Manager for Windows are:

- *InfoPrint Manager for Windows: Introduction and Planning Guide*, G550-1071. This publication gives an overview of InfoPrint Manager for Windows, introduces its concepts, and helps you prepare to use it. It describes features of this product and compares its functions to those of IBM® Print Services Facility for OS/2® (PSF for OS/2). It addresses migration from PSF for OS/2 at a high level. Finally, this publication explains the differences between the AIX and Windows versions of InfoPrint.
- *InfoPrint Manager for Windows: Getting Started*, G550-1072. This publication helps you install and configure InfoPrint Manager for Windows. It focuses primarily on server and client system software configuration, but it also includes information for the IBM 4159 Model 001 S/390® Parallel Channel Emulator Card.
- *InfoPrint Manager for Windows: Procedures*, G550-1073. This publication describes the primary tasks necessary for setting up an InfoPrint environment, submitting print jobs, scheduling jobs, and managing the print environment.

Related publications

Please refer to the following publications for more information when they are referenced in this manual:

- Font Summary for AFP Font Collection, S544-5633
- Data Stream and Object Architectures: Mixed Object Document Content Architecture™ Reference, SC31-6802
- Data Stream and Object Architectures: Graphics Object Content Architecture for Advanced Function Presentation™ Reference, S544-5498
- EtherShare Version 2.6 User Manual,
- EtherShare OPI Version 2.1 User Manual,
- InfoPrint 4005 Hi-Lite Color Application Design Reference, S544-5794
- InfoPrint Hi-Lite Color Introduction and Planning Guide for 4005, G544-5741

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:

- **listconv**
- **lprafp**
- **lsippgw**
- **mkfntmap**
- **pdaccount**
- **pdclean**
- **pdcreate**
- **pddelete**
- **pddeviceop**
- **pddisable**
- **pdenable**
- **pdls**
- **pdmod**
- **pdpause**

- **pdpr**
- **pdpromote**
- **pdq**
- **pdreorder**
- **pdresubmit**
- **pdresume**
- **pdrm**
- **pdset**
- **pdshutdown**
- **pdspace**
- **psfstat**
- **podelete**
- **polist**
- **uconv**

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**
- **ainurpt7**
- **ainurpt8**
- **ainurpt9**
- **allocatefs**
- **cfu**
- **cmt**
- **ipguiadv**
- **ipguibasic**
- **ipguiadvadm**
- **ipguibasicadm**
- **jsmigr**
- **opergui**
- **pdadmin**

- **pdcrcds**
- **pdcrdflt**
- **pdcrmed**
- **pdinitports**
- **pdmigpp**
- **pdmincfg**
- **pdmsg**
- **pdnetifspri**
- **pdwsinitports**
- **rc.iprsap**
- **rc.pd**
- **setup**
- **startppo**
- **start_server**
- **startsrv**
- **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**
- **startcbd**
- **startippgw**
- **startnotd**

- **startsapconnectd**
- **stopcbd**
- **stopippgw**
- **stopnotd**
- **stopsapconnectd**

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

- **db2afp**
- **d2afp**
- **gif2afp**
- **img2afp**
- **jpeg2afp**
- **line2afp**
- **pcl2afp**

- **pdf2afp**
- **ppml2afp**
- **ps2afp**
- **sap2afp**
- **tiff2afp**
- **xml2afp**
- **xml2pdf**

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

Part 1. Administrative procedures: Configuring InfoPrint Manager

Chapter 1. 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.

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 on the same machine, 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 (2050 through 2059 in the display above), 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" on page 4.

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 *InfoPrint Manager for AIX: Getting Started*.

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.

   Important:

   Following Daylight Savings Time changes, some customers have reported discrepancies in their server accounting logs and others have reported job submission failures. The problem was resolved by stopping and starting the InfoPrint Manager server. If you are already experiencing these symptoms or want to avoid them in the future, arrange to have your servers restarted immediately following a Daylight Savings Time change.

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 Express, JobTicketer, 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 13, "Setting InfoPrint Manager and AIX environment variables," on page 157.

Shutting down a server

You can shut down a server 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 4 for the restart procedure.

You can shut down 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 *InfoPrint Manager for AIX: Planning and Installation*.

To shut down an existing server:
1. From the `InfoPrint Printing System` panel, select **Start/Stop Servers**. A new menu displays.
2. Select **Stop a Server**. The `Stop 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. Press **Enter**. The result of this step depends on whether the server is running:
   - If the server is currently running, InfoPrint issues a message when it successfully stops the server.
   - If the server is not running, InfoPrint issues a message to indicate that the server is not 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.

Chapter 2. Installing and configuring printer devices and related hardware

For information on printers not included in this chapter, please go to the Printing Systems Web site. You can access this site from the InfoPrint Solutions Company Web site at http://www.infoprint.com.

To create and configure the InfoPrint actual destinations that represent printer devices, see "Creating and managing actual destinations" in *InfoPrint Manager for AIX: Getting Started*.

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 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.
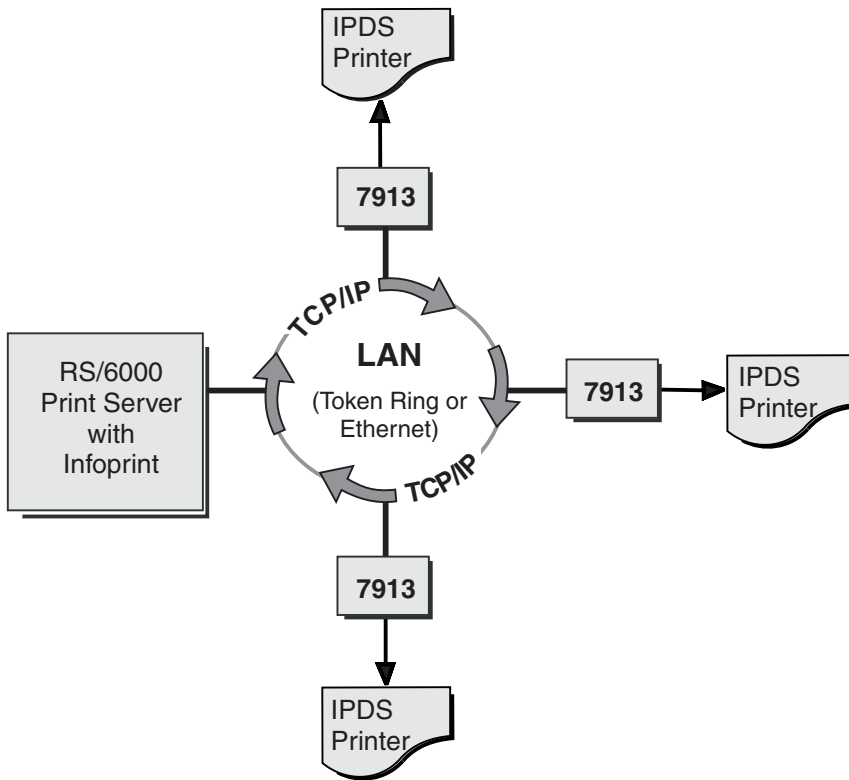
Figure 1. i-data 7913 IPDS Printer LAN Attachment in a TCP/IP LAN environment

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 2 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.
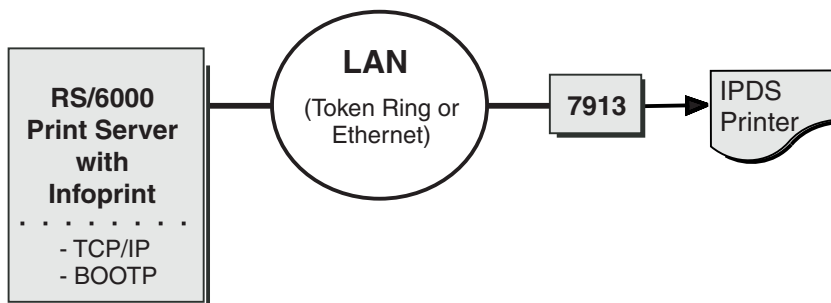
Figure 2. Network configuration for new TCP/IP installations

Use the configuration in Figure 3 on page 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.
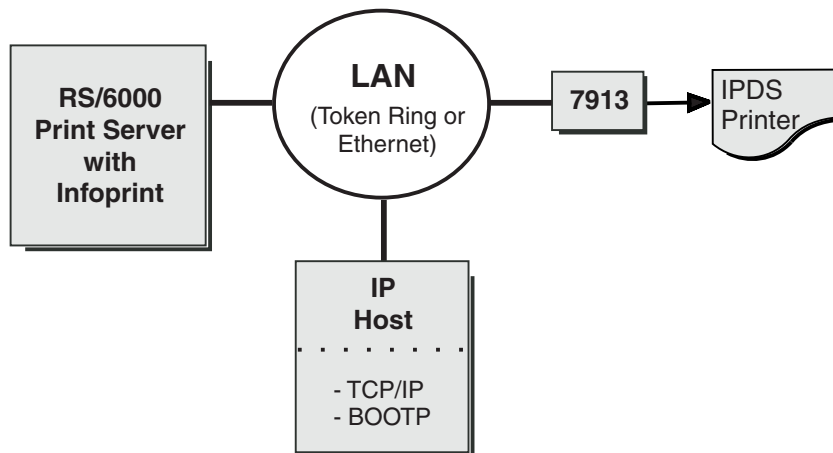
Figure 3. Network configuration for separate Internet Protocol hosts

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

     Note: InfoPrint does not support twinaxial connections for this printer device.
   - InfoPrint 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 5.1 or higher for the RS/6000.
   - The TCP/IP option (**bosnet.tcpip.obj**) of the AIX operating system
   - InfoPrint Version 4.2 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.
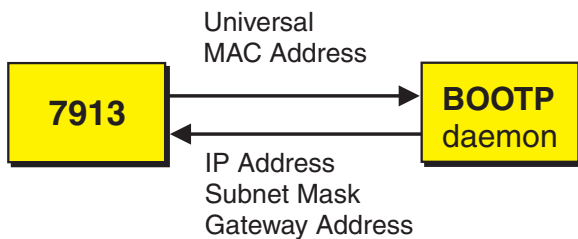
Figure 4. Data Flow between the i-data 7913 IPDS Printer LAN Attachment and the bootp daemon

Figure 4 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 5 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 5. A simple bootptab file

The keywords and fields in Figure 5 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 6 shows a more complex way to describe the same **bootp** configuration as in Figure 5 on page 11. 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 6. A more complex bootptab file

In addition to the keywords you saw in Figure 5 on page 11, Figure 6 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 7 on page 14 shows the i-data 7913 IPDS Printer LAN Attachment Model 03 for IBM token-ring networks.
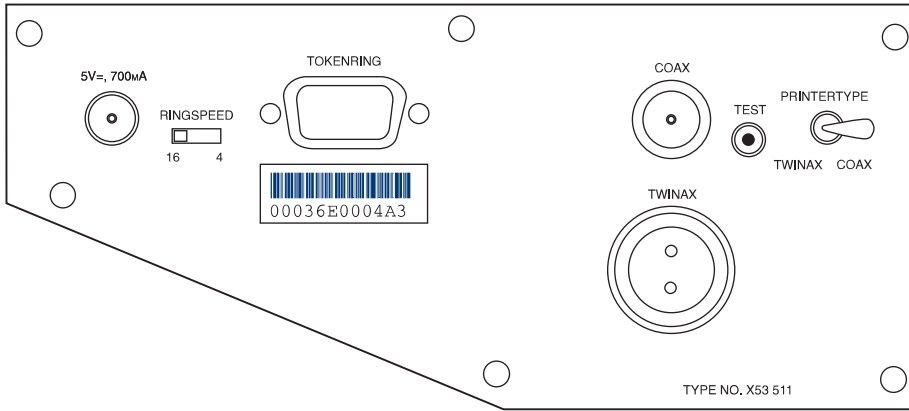
Figure 7. i-data 7913 IPDS Printer LAN Attachment Model 03 for IBM token-ring networks

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 8 shows the i-data 7913 IPDS Printer LAN Attachment Model 04 for Ethernet LANs.
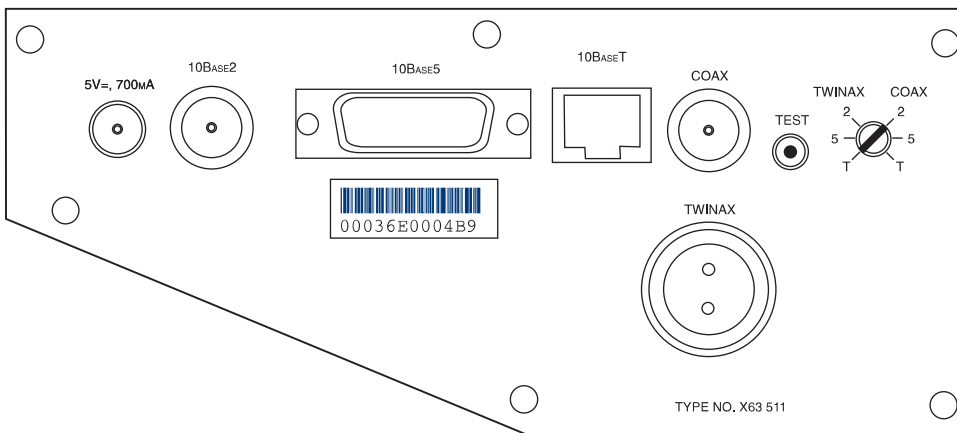
Figure 8. i-data 7913 IPDS Printer LAN Attachment Model 04 for Ethernet LANs

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.
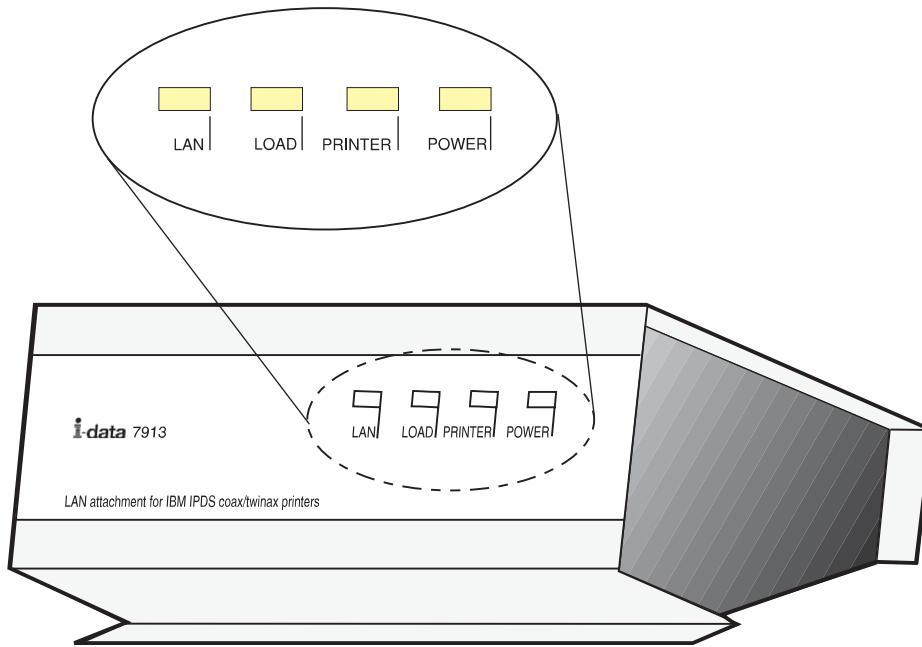
Figure 9. Status indicators on the i-data 7913 IPDS Printer LAN Attachment

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 and 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. The InfoPrint Color 130 Plus system processes and prints high quality color AFP™ output at high speeds. It also processes and prints PDF or PostScript® documents that include high resolution color images.

The InfoPrint Color 130 Plus combines job management and page-level error recovery capabilities with the ability to print full-color applications and documents. This printer can support applications that use data formats, such as Encapsulated PostScript (EPS), and Portable document format (PDF), as resources for variable data AFP documents. The AFP architecture allows you to use the Rasterized Image Processor (RIP) to process these resources in the Advanced Function Common Control Unit™ (AFCCU™) and save them in the printer. This capability improves performance by eliminating the need to re-RIP these resources. It is not necessary to convert single page PDF and EPS, objects to color images prior to sending them to the printer. These objects can be RIPped directly in the AFCCU™, increasing performance.

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 just installed InfoPrint Manager on this system. Your InfoPrint Manager server should 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** actual destination. The actual destination represents the physical output device. The InfoPrint Color 130 Plus must be a PSF

TCP/IP printer. Use the **Create Printer Wizard** in the InfoPrint Manager Administration GUI to create an actual destination.

Follow this procedure to define the printer using the InfoPrint Manager Administration GUI.

Note: You create and configure the logical destination when you create the actual destination with the Create Printer wizard.

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 actual destination 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 actual destination and click **Next**.
5. In the third panel, type a name for the queue that will submit jobs to this actual 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**.

   Note: Refer to the worksheets found in "Creating and managing actual destinations" in *InfoPrint Manager for AIX: Getting Started* when providing the information as prompted by the wizard.

Configuring the PSF TCP/IP printer in InfoPrint Manager

Once you have created the actual destination 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"
- "Identifying where to store AFP resources" on page 20
- "Specifying the color rasterized image processor (RIP) on this server" on page 21
- "Changing the color rendering value" on page 22

Once you have completed these steps, refer to Chapter 27, "Using InfoPrint Manager with the InfoPrint Color 130 Plus," on page 323 for additional information on sending print jobs to the InfoPrint Color 130 Plus.

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.

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. See "Transforming color images" on page 323.

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.

In addition, you should tell InfoPrint Manager whether your presentation object containers are **private** or **public**. Private resources cannot be reused by other print jobs; public resources can be used by anyone in a variety of print jobs. For example, you might make signature files **private**, so that no one could use them inappropriately in correspondence or on checks. In addition, you might make your company's logo **public**, so you only need to store one copy of it for everyone to use. By default, all presentation object containers are considered private.

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 InfoPrint Manager Administration 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 18.

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.

11. If all of your presentation object containers are private, continue with step 13. If some or all of your presentation object containers are public, select **Printer → Change Tuning** to open the **Change Tuning** dialog.

12. In the **Public presentation object containers** field, type the path where your public resources are stored. If your resources are stored in more than one location, list them all here separated with colons (:), for example:

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

13. Click **OK** to apply the settings and close the dialog.

Specifying 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 specify the color RIP from the **ps2afp** data stream transform before you send color documents to your InfoPrint Color 130 Plus.

To make the necessary configuration changes and start the color RIP, use the following procedure:

1. You first need to stop the ps2afpd daemon:
   a. Find the process id number: **ps | grep ps2afp**
   b. Stop the daemon: **kill -9 <process id number>**

2. Edit the **ps2afpd.cfg** daemon transform configuration file that resides in the **/usr/lpp/psf/ps2afp/** directory on the AIX server using your editor of choice.

3. Change the **ps_output_type** value to FS45, as shown in the following example:
   ```
   ps_output_type = FS45  # -a        type of AFP image to generate
   ```

4. Save and close the file.

5. Start the daemon again: **/usr/lpp/psf/bin/ps2afpd -C /usr/lpp/psf/ps2afp/ ps2afpd.cfg**

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 changing the **ps_output_type** value back to the default value of I01_G4, as shown in the following example:

```
ps_output_type = I01_G4  # -a        type of AFP image to generate
```

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 Infoprint Manager Administration GUI.

1. Start the InfoPrint Manager Administration GUI.
2. If you have not already customized the Infoprint Manager Administration 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** with the pragma **colorRendering**, 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
colorRendering=perceptual'" PS.doc
```

The single quotes are a syntax requirement.

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 InfoPrint 2000 model MS1 (non-AFCCU)

The 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 InfoPrint Solutions Company 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 the appropriate destination support system (DSS). If you are using the InfoPrint 2000 AFP printer, then you should use the PSF DSS. If you are using the standard InfoPrint 2000 printer, then you must use the IP2000 DSS, (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 InfoPrint 2000 printer.

Matching media on the printer

Before you can send jobs to the 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 Manager Administration Interface 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 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 57.

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 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, we recommend 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 35.

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:

- **base-printer**
- **carriage-control-type**
- **chars**
- **color-mapping-table**
- **convert-to-ebcdic**
- **data-fidelity-problem-reported**
- **default-printer-resolution**
- **document-finishing**
- **explicit-page-placement**
- **font-fidelity-action**
- **font-processing-messages**
- **font-resolution**
- **form-definition**
- **halftone**
- **image-fit**
- **image-length**
- **image-out-format**
- **image-width**
- **input-exit**
- **input-tray-select**
- **job-terminate-message-count**
- **jog-between-job-copies**
- **maximum-messages-printed**
- **maximum-transform-pages-ahead**
- **mvs-segment-id**
- **new-line-option**
- **new-line-option-data-encoding**
- **number-up**
- **other-transform-options**
- **output-appearance**
- **output-bin**
- **output-format**
- **overlay**
- **overlay-back**
- **overlay-front**
- **page-definition**
- **page-media-select**
- **page-select**
- **resource-context**
- **resource-context-font**
- **resource-context-form-definition**
- **resource-context-overlay**
- **resource-context-page-definition**
- **resource-context-page-segment**
- **resource-context-user**
- **resource-exit**
- **reverse-page-order**
- **scanner-correction**
- **screen-frequency**
- **segment-file-size**
- **shared-formdef**
- **shift-out-shift-in**
- **start-on-new-sheet**
- **table-reference-characters**
- **transform-message-file-name**
- **transform-output-file-name**
- **x-image-shift**
- **x-image-shift-back**
- **y-image-shift**
- **y-image-shift-back**

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 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 Interfaces 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 InfoPrint Manager to use the InfoPrint 2090ES, 2105ES, 2060ES, 2075ES, 2085, and 2105 printers

These printer models support a variety of data streams and provide a wide range of finishing options. Depending upon how you plan to use these printers, you configure them in two different ways:

1. To use Send and Save functions.
2. To use the Bookletmaker (see "Configuring as TCP/IP printers to use Booklet Maker" on page 30).

Using Send and Save functions

If you define these printer models as either AIX or PSF Other actual destinations, you can take advantage of the Send and Save options to enhance printer throughput.

To pass data streams through InfoPrint Manager to the printer without transforming them, complete the following steps:

1. From the main window of the InfoPrint Manager Administration GUI, select **Printer → Create → AIX** or **PSF Other** destinations.
2. Fill in the necessary fields in the Create Printer Wizard to create an actual destination for these printers. Refer to "Creating and managing actual destinations" in *InfoPrint Manager for AIX: Getting Started* for detailed instructions.

   Note: You must install the **pioibmdpm** backend that comes with these printers in order to ensure accurate job accounting. When the Create Printer Wizard prompts you for a Printer Command, you can specify one similar to the following for the InfoPrint 2105ES Printer:

```
/usr/lib/lpd/pio/etc/pioibmdpm 9.99.99.51
```

where **9.99.99.51** is the printer's IP address. The port for the **pioibmdpm** backend defaults to 2501 and does not have to be specified.

3. If you have created a PSF Other destination, select **Printer → Properties**.

4. Select the **Documents** tab and make sure that the **Formats to RIP at destination** field is set to pass PostScript or PCL data streams.

Using Send and Save in InfoPrint Manager

The following describes how you can specify Send and Save functionality from the command line and how account information is gathered when Send and Save is active.

Note: If jobs that contain requests for function specific to these printers, such as Send and Save function, are sent to printers other than these models, the function will not be honored. In addition, jobs that are transformed by InfoPrint Manager will not contain the function.

Invoking Send and Save from the command line:

If you are sending a job to a printer that supports Send and Save functionality (and it is not already specified in the data stream), you can specify it from the command line. Send and Save is invoked by using the **-S** flag and you can choose from the following options:

- `0 Print now (Default)`
- `1 Print one copy and hold job`
- `2 Hold job until you enter PIN`

  Ensure that you set your Personal Identification Number (PIN) by specifying `-S2 -y`*nnnn*. The PIN is the number you need to enter on your printer's **Saved Jobs** menu to release the document for printing. If you do not fill in the *nnnn* with your PIN, the printer forces this number to 0000.

- `3 Print later`
- `4 Print now and save`
- `5 Save`
- `6 Print Now and Archive to Document Server`
- `7 Archive to Document Server (without a PIN)`
- `7 Archive to Document Server (with a PIN)`

  Ensure that you set your PIN by specifying `-S7 -y`*nnnn*. The PIN is the number you need to enter on your printer's **Saved Jobs** menu to release the document for printing. If you do not fill in the *nnnn* with your PIN, the printer forces this number to 0000.

Notes:

1. If the **-S** flag is not set to anything other than either option 2 or 7, the printer ignores the PIN (**-y**) number.

2. Options 6 and 7 are not available with InfoPrint 2085 and InfoPrint 2105.

For example, if you are submitting to an AIX actual destination and you want your printer to print one copy of `job1` and then save it, enter the following command:

```
pdpr -d ldname -x "destination-pass-through='-S4'" job1
```

where *ldname* is the name of the logical destination associated with your InfoPrint 2090ES, 2105ES, 2060ES, 2075ES, 2085, or 2105 actual destination in InfoPrint Manager.

If you are submitting to a PSF-Other actual destination, you must put a "-BE" value in the **destination-pass-through** attribute in front of the **-S** flag in order for the Send and Save commands to work correctly. For example, if you want your PSF-Other actual destination printer to print one copy of job1 and then save it, enter the following command:

```
pdpr -d ldname -x "destination-pass-through='-BE -S4'" job1
```

where *ldname* is the name of the logical destination associated with your printer.

If you are submitting to an AIX actual destination and you want your InfoPrint 2090ES printer to hold your job until you enter a PIN, enter the following command:

```
pdpr -d ldname -x "destination-pass-through='-S2 -ynnnn'" job1
```

where *nnnn* is your four-digit PIN.

Logging accounting information:

The **wait-for-job-completion** attribute (**Report job completed when printed** label on the InfoPrint Manager Administration GUI) indicates whether InfoPrint Manager for AIX:

- Waits for the job to print completely before reporting the job as completed (**Yes**).
- Reports the job as completed as soon as all the data has been sent to the printer (**No**).

If this attribute is set to **No**, InfoPrint Manager will log the number of pages submitted, regardless of whether they printed or not.

If the **wait-for-job-completion** attribute is set to **Yes** and you are using Send and Save options 1 through 5 or 7, 0 pages will be logged as having printed, regardless of whether they print or not. If you are using either the `0 Print now (Default)` option or the `6 Print Now and Archive to Document Server` option, InfoPrint Manager will log the actual number of pages printed.

To change this attribute from the InfoPrint Manager Administration GUI:

1. Select **Printer → Properties**.
2. Select the **Job** tab.
3. If the **Report job completed when printed** radio button does not appear at the bottom of the window, click **Show more**.

Troubleshooting

If an AIX DSS printer is not waiting long enough to show a successfully-printed job in the Job Management Information Base (MIB), you can configure settings on the actual destination so it does not time out. First, ensure that the **wait-for-job-completion** attribute (**Report job completed when printed** field on the Job tab of the Printer Properties notebook) is set to **Yes**. Then, you can use the following procedure to set **wait-for-job-completion-snmp-timeout** (**Report job completed when printed timeout (sec)** field on SNMP tab of the Printer Properties notebook) so that it will not time out as quickly.

1. From the main window of the InfoPrint Manager Administration GUI, select the InfoPrint 2090ES, InfoPrint 2105ES, InfoPrint 2060ES, InfoPrint 2075ES, InfoPrint 2085, or InfoPrint 2105 actual destination.
2. Click **Printer ➔ Properties**.
3. Click the **SNMP** tab.
4. Enter a higher value in the **Report job completed when printed timeout (sec)** field.
5. Click **OK** or **Apply**.

Note: Increasing this value will increase the amount of time it takes to report that a job has failed. If you decrease this value, you may get false failures.

Configuring as TCP/IP printers to use Booklet Maker

If you are interested in using the Booklet Maker function, you must configure these printers as PSF TCP/IP printers.

To pass data streams through InfoPrint Manager to the printer without transforming them, complete the following steps:

1. From the main window of the InfoPrint Manager Administration GUI, select **Printer ➔ Create ➔ PSF ➔ TCP/IP**.
2. Fill in the necessary fields in the Create Printer Wizard to create an actual destination for these printers. Refer to "Creating and managing actual destinations" in *InfoPrint Manager for AIX: Getting Started* for detailed instructions.

Booklet Maker

If you have either an InfoPrint 2090ES, InfoPrint 2060ES, or InfoPrint 2075ES, you can use the Booklet Maker feature to use the **fold-in-and-staple** finishing function. Booklet Maker supports jobs that are a maximum of 15 pages in length.

When installed, the Booklet Maker feature is in output bin 3, which is called the **Shift Tray Lower**. InfoPrint Manager selects Booklet Maker for a job only when the job specifies:

1. **center-stitch**
2. Output bin 3

Note: If you specify output bin 3, but do not specify **center-stitch**, pages will be routed to output bin 3 but booklets will not be created.

For more information about specifying the Booklet Maker bin for either PostScript, PCL, or AFP jobs, refer to your printer documentation.

Configuring InfoPrint Manager to use the InfoPrint 2190, InfoPrint 2210, and InfoPrint 2235

These printer models support a variety of data streams and provide a wide range of finishing options. Depending upon how you plan to use these printers, you configure them in two different ways:

1. To use Send and Save functions.
2. To use the Bookletmaker (see "Booklet Maker" on page 33).

Using Send and Save functions on the InfoPrint 2190, InfoPrint 2210, and InfoPrint 2235

If you define these printer models as either AIX or PSF Other actual destinations, you can take advantage of the Send and Save options to enhance printer throughput.

To pass data streams through InfoPrint Manager to the printer without transforming them, complete the following steps:

1. From the main window of the InfoPrint Manager Administration GUI, select **Printer → Create → AIX** or **PSF Other** destinations.
2. Fill in the necessary fields in the Create Printer Wizard to create an actual destination for these printers. Refer to "Creating and managing actual destinations" in *InfoPrint Manager for AIX: Getting Started* for detailed instructions.

   Note: You must install the **pioipdm** backend that comes with these printers in order to ensure accurate job accounting. When the Create Printer Wizard prompts you for a Printer Command, you can specify one similar to the following for the InfoPrint 2190 Printer:

   `/usr/lib/lpd/pio/etc/pioipdm` **9.99.99.51**

   where **9.99.99.51** is the printer's IP address. The port for the **pioipdm** backend defaults to 2501 and does not have to be specified.
3. If you have created a PSF Other destination, select **Printer → Properties**.
4. Select the **Documents** tab and make sure that the **Formats to RIP at destination** field is set to pass PostScript or PCL data streams.

Using Send and Save in InfoPrint Manager

The following describes how you can specify Send and Save functionality from the command line and how account information is gathered when Send and Save is active.

Note: If jobs that contain requests for function specific to these printers, such as Send and Save function, are sent to printers other than these models, the function will not be honored. In addition, jobs that are transformed by InfoPrint Manager will not contain the function.

Invoking Send and Save from the command line:

If you are sending a job to a printer that supports Send and Save functionality (and it is not already specified in the data stream), you can specify it from the command line. Send and Save is invoked by using the **-S** flag and you can choose from the following options:

Table 3. -S flag options

Option	Job Type	Description
0	Normal Print [default]	Prints the job immediately.
1	Sample Print	Prints one copy of job and saves the job in the Sample Print Job list.

Option	Job Type	Description
2	Locked Print	Holds the job until you enter your PIN. Ensure that you set your Personal Identification Number (PIN) by specifying **-S2 -y**nnnn. The PIN is the number you need to enter on your printer's **Saved Jobs** menu to release the document for printing. If you do not fill in the nnnn with your PIN, the printer forces this number to 0000.
3	Hold Print	Saves the job in the Hold Print Job list for printing later.
4	Stored Print	Saves the job in the Stored Print Job list.
5	Store and Print	Prints and saves the job in the Stored Print Job list.
6	Documents Server	Saves the job on the printer Document Server

Note: If the **-S** flag is not set to anything other than option 2, the printer ignores the PIN (**-y**) number.

For example, if you are submitting to an AIX actual destination and you want your printer to print one copy of job1 and then save it, enter the following command:

```
pdpr -d ldname -x "destination-pass-through='-S5'" job1
```

where *ldname* is the name of the logical destination associated with your InfoPrint 2190, 2210, or 2235 actual destination in InfoPrint Manager.

If you are submitting to a PSF-Other actual destination, you must put a "**-BE**" value in the **destination-pass-through** attribute in front of the **-S** flag in order for the Send and Save commands to work correctly. For example, if you want your PSF-Other actual destination printer to print one copy of job1 and then save it, enter the following command:

```
pdpr -d ldname -x "destination-pass-through='-BE -S5'" job1
```

where *ldname* is the name of the logical destination associated with your printer.

If you are submitting to an AIX actual destination and you want your InfoPrint 2190, 2210, or 2235 printer to hold your job until you enter a PIN, enter the following command:

```
pdpr -d ldname -x "destination-pass-through='-S2 -ynnnn'" job1
```

where *nnnn* is your four-digit PIN.

Logging accounting information:

The **wait-for-job-completion** attribute (**Report job completed when printed** label on the InfoPrint Manager Administration GUI) indicates whether InfoPrint Manager for AIX:

- Waits for the job to print completely before reporting the job as completed (**Yes**).
- Reports the job as completed as soon as all the data has been sent to the printer (**No**).

If this attribute is set to **No**, InfoPrint Manager will log the number of pages submitted, regardless of whether they printed or not.

If the **wait-for-job-completion** attribute is set to **Yes** and you are using Send and Save options 1 through 6, 0 pages will be logged as having printed, regardless of whether they print or not. If you are using either the 0 Normal Print(Default) option, InfoPrint Manager will log the actual number of pages printed.

To change this attribute from the InfoPrint Manager Administration GUI:

1. Select **Printer → Properties**.
2. Select the **Job** tab.
3. If the **Report job completed when printed** radio button does not appear at the bottom of the window, click **Show more**.

Troubleshooting

If an AIX DSS printer is not waiting long enough to show a successfully-printed job in the Job Management Information Base (MIB), you can configure settings on the actual destination so it does not time out. First, ensure that the **wait-for-job-completion** attribute (**Report job completed when printed** field on the Job tab of the Printer Properties notebook) is set to **Yes**. Then, you can use the following procedure to set **wait-for-job-completion-snmp-timeout** (**Report job completed when printed timeout (sec)** field on SNMP tab of the Printer Properties notebook) so that it will not time out as quickly.

1. From the main window of the InfoPrint Manager Administration GUI, select the InfoPrint 2190, InfoPrint 2210, or InfoPrint 2235 actual destination.
2. Click **Printer → Properties**.
3. Click the **SNMP** tab.
4. Enter a higher value in the **Report job completed when printed timeout (sec)** field.
5. Click **OK** or **Apply**.

Note: Increasing this value will increase the amount of time it takes to report that a job has failed. If you decrease this value, you may get false failures.

Configuring as TCP/IP printers to use Booklet Maker

If you are interested in using the Booklet Maker function, you must configure these printers as PSF TCP/IP printers:

Booklet Maker

If you have an InfoPrint 2190, InfoPrint 2210, or InfoPrint 2235, you can use the Booklet Maker feature to use the **fold-in-and-staple** finishing function. Booklet Maker supports jobs that are a maximum of 15 pages in length.

When installed, the Booklet Maker feature is in output bin 3, which is called the **Shift Tray Lower**. InfoPrint Manager selects Booklet Maker for a job only when the job specifies:

1. **center-stitch**
2. Output bin 3

Note: If you specify output bin 3, but do not specify **center-stitch**, pages will be routed to output bin 3 but booklets will not be created.

For more information about specifying the Booklet Maker bin for either PostScript, PCL, or AFP jobs, refer to your printer documentation.

Configuring InfoPrint Manager to use the InfoPrint 4000 and 4100

Perform the following procedure with the help of your InfoPrint service representative to ensure that the actual destination, the InfoPrint 4000 or InfoPrint 4100 printer, 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 an actual destination" from the *InfoPrint Manager for AIX: Procedures* to specify the media that the actual destination representing the InfoPrint 4000 or 4100 supports.
2. On the printer, define forms that correspond to the media you specified in step 1, for example:

Medium Object Name	Printer_Form Name	Printing_Form Description
letter	na letter	2-Up letter (8.5 by 11)
legal	na legal	2-Up legal (8.5 by 14)
ledger	ledger	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.

Displaying the InfoPrint Manager Operations GUI from the Enhanced Operator Console

You can display the InfoPrint Manager Operations GUI from either the InfoPrint 4000 or InfoPrint 4100 Enhanced Operator Console by ordering and installing Feature Code 4560 (Part Number 54P1446) with your printer. For information about installing this feature on your printer, contact your InfoPrint Solutions service representative.

To configure this support from your InfoPrint Manager AIX server, you must ensure that the remote execution daemon (**rexecd**) process is running on the server.

Also, you must update the **/etc/hosts** file to include the printer's IP address. To perform this task, follow these steps::

1. Edit the **/etc/hosts** file with your AIX editor of choice.
2. Insert the printer's IP address in a line as shown below:

   xx.xx.xx.xx   printer   # ethernet name/address

   where *xx.xx.xx.xx* is the IP address of the printer control unit that is to display the InfoPrint Manager Operations GUI, and `printer` is a printer host name that is unique to your network.

Note: If you have multiple Enhanced Operator Consoles that can display the InfoPrint Manager Operations GUI, the **/etc/hosts** file must contain the IP address for each printer control unit.

Configuring the Halftone Management System

The Print on Demand feature offers the Halftone Management System (HMS). The HMS supports printer calibration on devices such as the InfoPrint 20 and the InfoPrint 4000 series. The Halftone Management System gives you the ability to calibrate halftones for each screen frequency on most Intelligent Printer Data Stream (IPDS) printers. The result is consistent grayscale for each appearance selection. For a complete list of supported printers, see the **calibd.src** file located in the **/usr/lpp/pd/ipcal/server** directory.

With the Halftone Management System, you can run multiple InfoPrint 4000 and 4100 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, JPEG, PostScript, and Portable Document Format (PDF).

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 that are only installed with the Print-on-Demand feature:
1. A client process that can be run from any InfoPrint for AIX server.
2. A server process that runs on all InfoPrint for AIX servers.

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.

This topic describes the following procedures that you should ensure have been completed before attempting to use the Halftone Management System:
1. "Starting the Halftone Management System server" on page 37
2. "Starting the Halftone Management System client" on page 37
3. "Calibrating a densitometer" on page 38

Using the correct halftones for the installed toner version

Multiple versions of toner are available for the InfoPrint 4000 and InfoPrint 4100 printers. For some printer models, InfoPrint Manager ships different halftone curves for different toners and provides scripts to replace or install the correct ones. Make sure you have the correct ones installed for your toner to achieve the best print quality

The toner characteristics can require changes in the halftone resources. When the toner in the printer is replaced with a different version of toner, you must run the associated AIX script from the command line.

Notes:
- When you apply InfoPrint Manager PTFs, the appropriate AIX script must be run again, because the PTF replaces the existing halftone files with the standard halftone files.
- Not all different versions of toner require different halftones, so there might not be an AIX scriptprovided.

These scripts are located in **/usr/lpp/psf/config**:
- IP4000-ID5-6.Std
- IP4000-ID5-6.V2toner
- IP4000-ID5-6.V3toner
- IP4000-IR1-2.Std
- IP4000-IR1-2.V2toner
- IP4000-IR1-2.V3toner
- IP4000-IR3-4.Std
- IP4000-IR3-4.V2toner
- IP4000-IR3-4.V3toner
- IP4100-HD3-HD4.RTtoner
- IP4100-HD3-HD4.Stdtoner
- IP4100-HD3-HD4.V3toner
- IP4100-HD3-HD4.V5toner
- IP4100-MD1-2.Stdtoner
- IP4100-MD1-2.V2toner
- IP4100-MD1-2.V2_PQItoner
- IP4100-PD1-2.Std
- IP4100-PD1-2V3toner

Each script file changes the InfoPrint Manager system to use the relevant toner; Std or Stdtoner is the default.

Limitations of actual screen frequencies and angles on InfoPrint 4000 and 4100 printers

If you change the version of toner used with your printer, you should recalibrate all customized calibration curves to ensure that they print correctly. The screen frequencies shown in this topic presume the use of a 600 dots per inch (DPI®) printer. Frequencies at other DPI are proportionally lower. For example, an 85 lines per inch (LPI) screen used on a 300 DPI printer will be 43 LPI. Screen frequencies match the requested screen frequency as closely as possible, based on constraints of the halftone design.

For the actual screen frequencies and angles for both InfoPrint 4000 and InfoPrint 4100 printers, see Table 4 on page 37, Table 5 on page 37, and Table 6 on page 37.

Table 4. Screen Frequencies for InfoPrint 4000 IR3/IR4 and ID5/ID6 and InfoPrint 4100 HD3/HD4 and HS2 printers with Version 3 Toner

Submit Screen Frequency (LPI)	71	85	106	141
Actual screen frequency (LPI)	74	85	96	117
Actual Screen Angle (Default ° Set)	35.5°	45°	51.3 °	59°
Actual Screen Angle (90° Set)	54.5°	45°	38.7°	31°

Table 5. Screen Frequencies for InfoPrint 4000 IR3/IR4 and ID5/ID6 and InfoPrint 4100 HD1/HD2, HD5/HD6, PD1/PD2, HS1, HS3, and PS1 printers with Version 2 (enhanced printing toner) or Standard Toner

Submit Screen Frequency (LPI)	71	85	106	141
Actual screen frequency (LPI)	71	85	103	141
Actual Screen Angle	45°	45°	31°	45°

Table 6. Screen Frequencies for InfoPrint 4000 IR1/IR2 Printers with Version 2, 3, or Standard Toner

Submit Screen Frequency (LPI)	71	85	106	141
Actual screen frequency (LPI)	71	83	106	141
Actual Screen Angle	45°	34°	45°	45°

Starting the Halftone Management System server

The Halftone Management System server must be started from the command line:

1. Navigate to **`/usr/lpp/pd/ipcal/bin`**.
2. Enter **`./runcalibd&`** to initiate the server-starting script.
3. You can ensure that your Halftone Management System server is running by entering:

   `ps -ef | grep server`

   You should see a response that shows the server running. For example:

root 23830 20954   0   Oct 22   pts/0   0:43 java calibd /usr/lpp/pd/ipcal/server/calibd.src /usr/lpp/pd/ipcal/server/calibd.msg trace.log /usr/lpp/pd/ipcal/bin

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

Starting the Halftone Management System client

On the front panel, open the extended menu above the InfoPrint icon, and click on **Start Calibration GUI** .

Figure 10. Starting calibration

You can also start the Halftone Management System client from the command line:

1. Enter: **./usr/lpp/pd/ipcal/bin/runcalib&**

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

   If you invoke the Halftone Management System client before starting the Halftone Management System server, InfoPrint Manager displays an error pop-up message:

   `Error in connecting to host` *fully_qualified_server_name* `-- A remote host refused an attempted connect operation.`

   To resolve this problem, you must close the Halftone Management System client window and restart the client after you start the Halftone Management System server.

2. Once you have completed these steps, see "Defining InfoPrint servers to the Halftone Management System client" on page 40.

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."

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" on page 42
3. "Calibrating a halftone" on page 43
4. "Measuring optical density with a densitometer" on page 47

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`, while the **Hostname** field value could be either `sage.infoprint.com` 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.
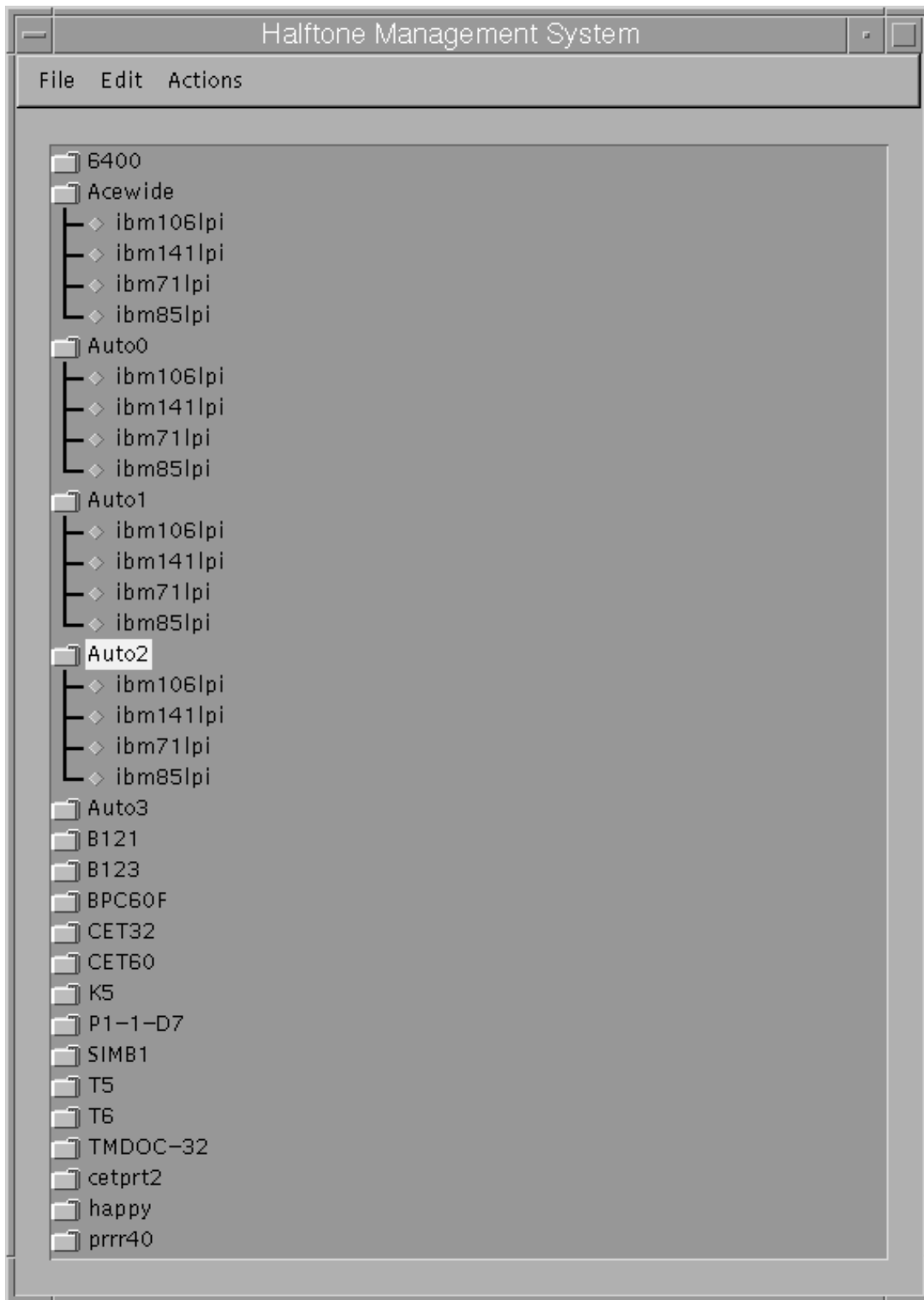
Figure 11. Halftone Management System Main window

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.

Patch set patches11

File
Save
Save As
Close

	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	
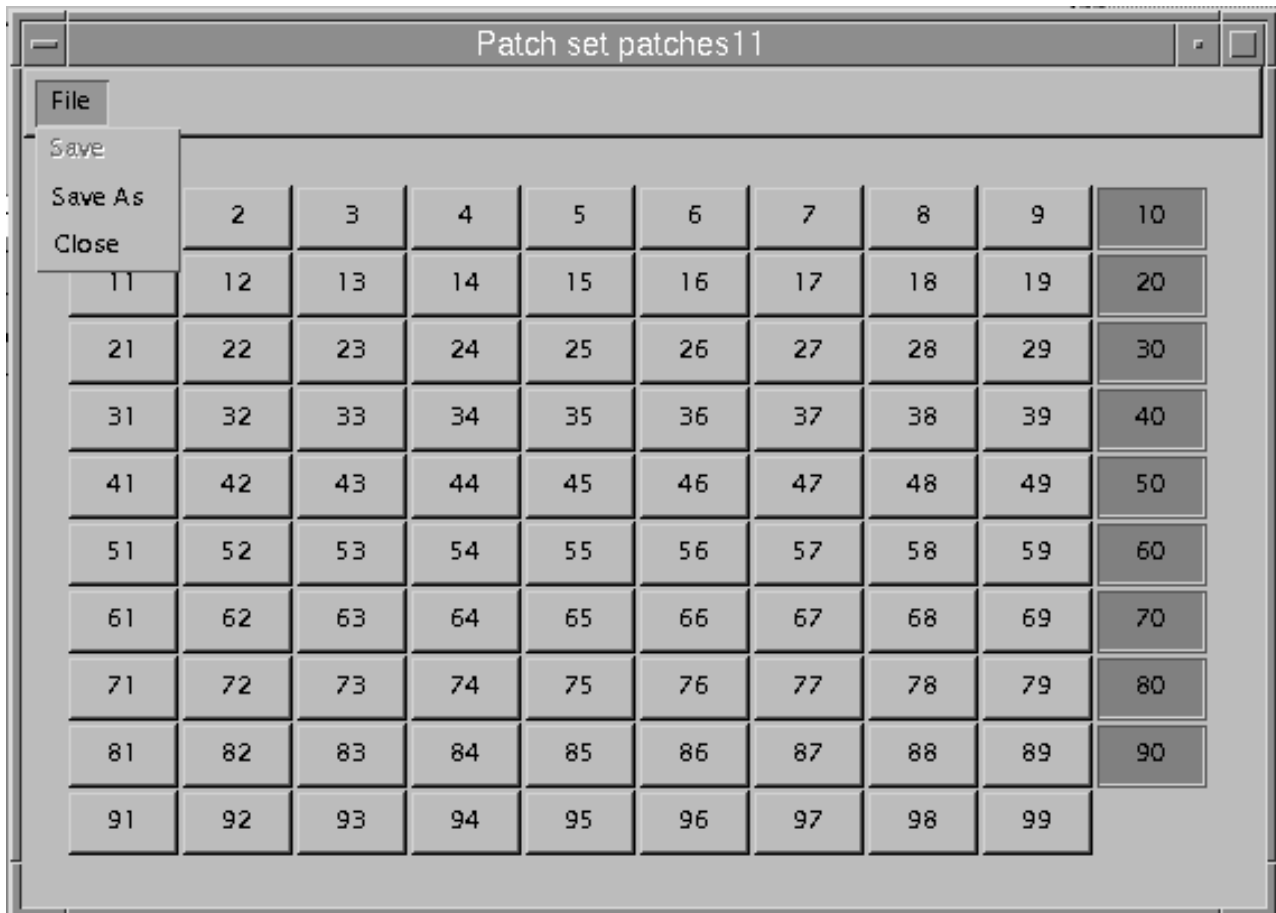
Figure 12. Patch set name window

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 on page 43).

   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: `default`

% gray	Entry	Average	Min	Max	# entries
0%				0	Clear
10%				0	Clear
20%				0	Clear
30%				0	Clear
40%				0	Clear
50%				0	Clear
60%				0	Clear
70%				0	Clear
80%				0	Clear
90%				0	Clear
100%				0	Clear

Do | Cancel

Figure 13. 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`.

Enter calibration values	

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 14. First_run calibration

12. Once you have filled in your calibration values, press the **OK** button. Your calibration is saved in the **/usr/lpp/psf/config/custom** 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.

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

   The density reading will appear as X.XXD.
4. 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 Express 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 Express

You can print using a particular halftone for printing a grayscale file from a job ticket (*name*.jtk file) in InfoPrint Submit Express. Begin by selecting a value in the **Halftone** field of the **Look** tab. Note that all halftones shipped with the product have the term 'ibm' prepended to their identifier. If you are accessing this interface for the first time, all of 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 halftone in a default document or job object.

Note: InfoPrint Submit Express is part of the InfoPrint Manager Print-on-Demand feature.

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:

```
pdpr -p sip20-sage -x halftone=ibm106lpi:highlight-midtones grayscale.ps
```

where the **-x** value is the customized calibration file and `grayscale.ps` is the file to be printed.

Note: When submitting a **pdpr** command from the AIX command line, you can specify the **halftone** attribute. The actual halftone name for this example

(ibm106lpi:highlight-midtones) can be found either by using the **Infoprint Manager Administration Interface** to look up the halftones supported for the actual destination, or enter the following at the command line: pdls -cp -r halftones-supported *ActualDestination name*.

Chapter 3. Working with SNMP printers

About SNMP communication

For network printers that work with Simple Network Management Protocol (SNMP) and the standard printer management information block (MIB) RFC 1759, the InfoPrint Manager server can use SNMP to automatically:

- Set the default of several InfoPrint Manager actual destination attributes in the printer to the values returned in the standard printer MIB. The actual destination attributes pertain to trays, media, bins, plexes, and sides. This process is called *smart–defaulting* the attributes.
- Detect, report, and recover from printer problems for several conditions, even if no jobs are currently being printed.
- Assess device specific information directly.
- Execute device commands directly on the device.

Smart-defaulting actual destination attributes

The InfoPrint Manager server can automatically smart-default an actual destination attribute for an SNMP printer **only** if an InfoPrint Manager user does one of these:

- Does **not** explicitly set the attribute when creating or modifying the actual destination
- Resets the attribute to the InfoPrint Manager default

Before you create the actual destination and let the server smart-default one or more actual destination attributes for a printer, we recommend that you:

1. Turn the printer on.
2. Make sure the printer is connected to the network.

The actual destination attributes that the server can smart-default are:

- **destination-model**
- **input-trays-medium** (also smart-defaults the attributes **input-trays-supported** and **media-ready**)
- **media-ready**
- **media-supported**
- **output-bin-numbers** (also smart-defaults the attribute **output-bins-supported**)
- **plexes-supported**
- **psf-tray-characteristics** (also smart-defaults the attributes **input-trays-supported** and **media-ready**)
- **sides-supported**

For media, smart-defaulting only detects the **size** of the medium. If you have different media that are the same size (for example, three different letter-size preprinted forms) and you need to differentiate between them in the attributes, you must explicitly set the attributes instead of using smart–defaulting.

Detecting, reporting, and recovering from printer problems

The InfoPrint Manager server can automatically detect, report, and recover from printer problems for several **needs key operator** and **needs attention** conditions as

it periodically queries an SNMP printer, even if no jobs are currently being printed. (To turn off automatic recovery, a key operator can manually disable the actual destination.)

For example, the server detects that a printer is out of toner, disables the actual destination, requeues the jobs, and sets the actual destination state to **needs attention** or **needs key operator**. Then, when a key operator replaces the toner, the server detects that the printer is running again, sets the actual destination state to **idle**, and re-enables the actual destination.

Besides automatically managing the state of the actual destination, the InfoPrint Manager server also updates its **problem-message**, **warning-message**, and **snmp-device-conditions** attributes and sends out printer-needs-attention and printer-needs-key-operator notifications. The actual destination's state, which message attribute is updated, and what type of notification is sent depends on the severity of the condition reported by the printer, such as error, warning, or report.

This is the list of SNMP printer conditions that InfoPrint Manager reports:
- Cover open
- Input tray empty
- Interlock open
- Media empty
- Media missing
- Offline
- Paper jam
- Power off
- Service requested
- Fuser over temp
- Input tray missing
- Marker supply empty
- Marker supply missing
- Marker waste full
- Output bin full
- Output bin missing
- Fuser under temp
- Marker supply low
- Marker waste almost full
- Media low
- Moving offline
- Moving online
- Output bin near full
- Warmup

Note: Not all printers report all these conditions. For example, most printers do not report the Warning conditions.

The same condition can be reported with a different severity depending on the situation. For example, a printer may report an input tray empty condition as an error or a warning. It could be a warning if the printer had multiple input trays linked together with the same media and only one of them is empty. If a condition is reported as an error, InfoPrint Manager reports these conditions as needs-key-operator as opposed to needs-attention:
- **fuser-over-temp**
- **fuser-under-temp**
- **marker-supply-empty**
- **marker-supply-low**

- **marker-supply-missing**
- **marker-waste-full**
- **marker-waste-almost-full**
- **media-missing**
- **output-bin-missing**
- **service-requested**
- **warmup**

Regardless of the severity, InfoPrint Manager lists all conditions on the **snmp-device-conditions** attribute.

Accessing device information

You can use the InfoPrint Manager Administration GUI or the **pdls** command to access information about SNMP devices.

Besides providing information about the actual destination object, InfoPrint Manager allows you to access information directly from the printer. InfoPrint Manager uses device-specific attributes to provide this function. While device-specific actual destination attributes are accessed through an actual destination, the information comes from the physical printer. The device-specific attributes are not returned when you ask for all the actual destination's attributes. You have to request the device-specific attributes specifically or you can use `-r all-device` to query all the device-specific attributes.

This is the list of non-settable device-specific actual destination attributes:
- **device-description**
- **device-input-trays**
- **device-ip-address**
- **device-manufacturer**
- **device-marker-supplies**
- **device-media-supported**
- **device-model**
- **device-op-panel-locked**
- **device-output-bins**
- **device-printer-name**
- **device-ready-media**
- **device-serial-number**
- **device-state**
- **device-version**

This is the list of settable device-specific actual destination attributes:
- **device-contact**
- **device-location**

Notes:

1. Not all printers report all these attributes.
2. The information returned is not translated.

The InfoPrint Manager Administration Interface can launch a Status window that displays information returned from SNMP. The window lets you see a detailed view of the status of an SNMP printer. It includes a graphic representation of the printer and its current status, such as whether it has a paper jam or a door open.

To see the Status window from the InfoPrint Manager Administration Interface:

1. Select an SNMP printer.
2. Select **Check Status**.
3. Select **More Information**.

You can use the **pdls** command to access SNMP device information with the **-r** flag, such as output-bins, like this:

```
pdls -c destination -r device-output-bins prt5-ad
```

Note: You can filter for specific device information with the **-f** flag.

You can also use the **pdls** command to access all the information for an SNMP device by specifying the **-r** flag with the **all-device** value.

For more information on the **pdls** command, see Chapter 2, "InfoPrint Manager Tools" in the *InfoPrint Manager: Reference*.

Changing device information

You can use the InfoPrint Manager Administration GUI, the **pddeviceop** command, and the **pdset** command to change information for SNMP devices.

The value of the **snmp-active** actual destination attribute must be **true** and the printer device associated with the actual destination must support the operation. You must have write permission to the actual destination, and **smnp-write-community-name** actual destination attribute must be set properly for the **pddeviceop** command or GUI commands to work.

From the **Device Information** window in the InfoPrint Manager Administration GUI, you can reset the specific device, take it offline, or put it online. You can also change the contact or location information.

You use the **pddeviceop** command to reset a specific device, take it offline, put it online, as well as lock and unlock the operation panel for the specific device.

You can use the **pdset** command or the InfoPrint Manager Administration GUI to change the contact or location information for SNMP devices.

Note: You cannot combine setting device-specific and actual destination attrributes in the same **pdset** command.

For more information on the **pddeviceop** and **pdset** commands, see Chapter 2, "InfoPrint Manager Tools" in the *InfoPrint Manager: Reference*.

Setting up and using SNMP

To set up and use SNMP with InfoPrint Manager, you must check and set the appropriate InfoPrint Manager attributes when you create or modify the physical printer in InfoPrint Manager.

This section explains:
- Determining if a printer works with SNMP
- Using the InfoPrint Manager Administration Interface
- Procedures

Determining if a printer works with SNMP

Not all printers work with SNMP and the standard MIB. In addition, only printers that are attached to a network can work with SNMP. Printers that are parallel-attached or channel-attached cannot use SNMP.

To determine if a printer works with SNMP:

1. Set the actual destination attribute **destination-tcpip-internet-address** to the IP address of the printer to indicate that InfoPrint Manager should try to communicate with the printer using SNMP. The server sets the actual destination attribute **use-snmp** to "true".

   Note: For PSF TCP-IP attached printers, a destination TCP-IP port number of 5002 must be used when driving the second engine in an InfoPrint 4000 or InfoPrint 4100 dual simplex configuration for SNMP support to work. If 5002 is used for a printer other than one using SNMP, the actual destination for that printer will not work. The server will set the actual destination attribute **use-snmp** to "false".

2. If the server cannot communicate with the printer using SNMP, it **pings** the printer. If the ping command:
   - **Works**, the server concludes that the printer is not an SNMP printer. It sets **use-snmp** to "false".
   - **Does not work**, the server concludes that the printer is turned off or is not currently connected to the network. It leaves **use-snmp** set to "true" and continues trying to establish an SNMP connection with the printer.

3. Check the actual destination attribute **snmp-active**. If it is "true", the printer works with SNMP.

Using the InfoPrint Manager Administration Interface

To use the InfoPrint Manager Administration Interface to check and set the attributes:

1. From the menu bar, select **Printer** or **Server**, as appropriate.
2. Select **Properties**. You see the printer properties or server properties notebook.
3. Select the **SNMP** tab.
4. Check and set the appropriate attributes on the SNMP tab as explained in "Procedures."

Procedures

Do these steps to check and set the attributes:

1. Check these actual destination attributes:
   - **snmp-community-name**

     Indicates the name of the SNMP community that the printer belongs to. The default is "public". The field on the SNMP tab is Community name".
   - **snmp-write-community-name**

     Indicates the name of the SNMP write community that the printer belongs to. There is no default. The field on the SNMP tab is Write community name".

When the **snmp-write-community-name** attribute is set properly and you have write permission to the actual destination, you can set the contact and location information and execute device commands on the printer associated with an actual destination.

- **snmp-retry-count**

  Indicates the number of times the server should retry an SNMP request if it fails. The higher the number, the more network traffic. Using a lower number can improve performance. The default is "2". The field on the SNMP tab is "Number of times to retry".

- **snmp-timeout**

  Indicates the number of seconds the server should wait for the printer to respond to an SNMP request. Using a lower number can improve performance. The default is "5". The field on the SNMP tab is "Timeout".

- **use-snmp**

  Indicates whether the server should try to use SNMP to communicate with the printer. The default is "true". The field on the SNMP tab is "Use SNMP".

2. If the defaults in Step 1 on page 53 in this section are correct, set this actual destination attribute:

   - **destination-tcpip-internet-address**

     Indicates the IP address of the SNMP printer. The field on the tab is "TCP/IP address".

3. Check this actual destination attribute:

   - **snmp-active**

     Indicates whether the server has been able to establish an SNMP session with the printer. The field on the SNMP tab is "SNMP is active".

4. Set these server attributes:

   - **snmp-discovery-during-startup**

     Indicates whether the server queries the printer MIB when InfoPrint Manager starts, or whether the server gets the printer status when it periodically polls the printer. The default is "true", but you might want to set it to "false" if you have several SNMP printers and you want to make the server start faster. The field on the SNMP tab is "Discover printers at startup".

   - **snmp-normal-poll-interval**

     Indicates the number of seconds that the server should wait after sequentially polling all the SNMP printers **without** known problems. Increasing the polling interval causes the server to use less CPU and network resources for SNMP polling, but it makes the currently shown printer status (for printers that are not currently printing) less accurate. The field on the SNMP tab is "Normal poll interval".

   - **snmp-problem-poll-interval**

     Indicates the number of seconds that the server should wait after sequentially polling all the SNMP printers **with** known problems. Increasing the polling interval causes the server to use less CPU and network resources for SNMP polling, but it makes the currently shown printer status (for printers that are not currently printing) less accurate. The field on the SNMP tab is "Problem poll interval".

For more information on the SNMP actual destination attributes, see Chapter 3, "InfoPrint Object attributes" in the *InfoPrint Manager: Reference*.

Effects on performance with SNMP

The performance areas that SNMP can influence are:

- Server start-up
- Actual destination queries
- SNMP polling
- Number of SNMP printers on a server

Server start-up

If you set **snmp-discovery-during-startup** to "true", the server start-up might be slow because the server queries the printer MIB for each SNMP enabled actual destination for the most current information. Setting this attribute to "false" can improve startup performance. However, the initial actual destination status is not current and won't be until because the server polls the printer next.

Actual destination queries

On an SNMP printer, when you query an actual destination attribute that might be affected by the printer MIB (for example, **destination-state**), the default is that the server uses SNMP at the same time to get the relevant information from the printer. If the printer is turned off or not connected to the network, it might take a long time before the printer times out, which delays the response to your query.

If this is a problem, you can use the **pdls** command with the **when=now** attribute to return the current information instead of querying the printer MIB. Using this attribute can improve performance.

SNMP polling

The server periodically polls the SNMP printers to get their latest status. If a printer condition changes while the server is polling a printer (for example, a user closes an open cover), the server might temporarily miss one of the changes. However, during the next polling cycle, the server automatically picks up any changes that it missed.

If the server cannot discover an SNMP printer when InfoPrint Manager starts, it shows the printer status from the last time the server was shut down.

Increasing the polling interval causes the server to use less CPU and network resources for SNMP polling, but it makes the currently shown printer status (for printers that are not currently printing) less accurate.

Chapter 4. Configuring media

This section describes how to create, configure, and manage media. Use the InfoPrint Manager Administration Interface or the AIX command line to complete these tasks.

Determining the media that are in the servers

You can use the InfoPrint Manager Administration Interface or the AIX command line to show the media in the servers being monitored.

Using the InfoPrint Manager Administration Interface

Start the InfoPrint Manager Administration Interface by double-clicking the icon or by entering `ipguiadvadm` at the AIX command line. From the **Server** menu on the Main window, select **Media → Show Media**. This dialog displays the media that resides in all servers currently being monitored.
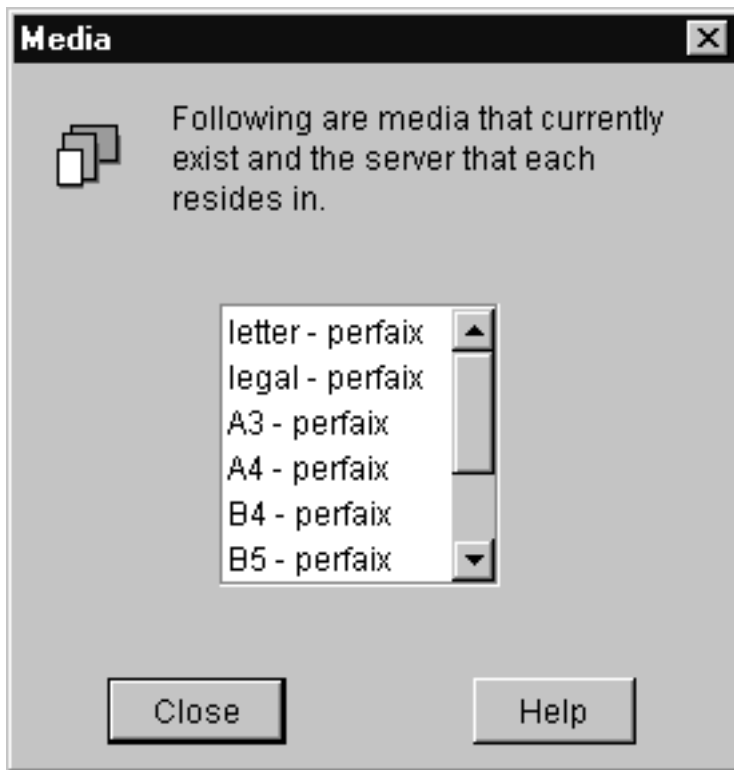
Figure 15. Media dialog

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 media object

You can use the InfoPrint Manager Administration Interface or the AIX command line to create a media object.

Using the InfoPrint Manager Administration Interface

From the **Server** menu, select **Media ▸ Create** or **Copy** (and select a media in the **Select Media to Copy** dialog) to open the **Create Media** dialog. You use this dialog to create a media in the specified server.

Figure 16. Create Media dialog

The InfoPrint Manager Administration Interface creates a new media with property settings based on whether you choose to create a new media or copy an existing media:

- Use the **Create** option when you want to create a unique media (with default settings) without copying properties from an existing media.

- Use the **Copy** option when you want to create a new media using properties from an existing media.

Enter values in the following fields:

Name Media names can contain up to 255 characters and are case-sensitive.

Server Displays the names of all servers being monitored. Select a server from the list; this is the server that will contain the media. When you are copying a media, the server containing the media being copied is initially selected.

Type Displays a list of predefined media types. Select a media type from the list. When you are copying a media, the type of the media being copied is initially selected.

Untrimmed width and length
Specifies the physical size of the media. The width is usually the shorter dimension with respect to how the medium is loaded into the printer device. The length or height is usually the longer dimension with respect to how the media is loaded into the printer. Enter a positive real number for the width and the length fields. When you are copying a media, the untrimmed width and length (in inches or mm) of the media being copied is displayed.

Weight
Identifies the media weight. Enter a positive integer. When you are copying a media, the weight of the media being copied is displayed.

Color Displays a list of predefined media colors. Select a color from the list. When you are copying a media, the color of the media being copied is initially selected.

Details
Provides a text entry area for a message to be associated with the media object. Enter description information about the media. When you are copying a media, the message for the media being copied is displayed.

Select **OK** and you have created a new media.

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 actual destinations 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** man page.

Viewing or changing attributes of a medium

You can use the InfoPrint Manager Administration Interface or the AIX command line to view or change attributes of a medium.

Using the InfoPrint Manager Administration Interface

1. From the **Server** menu, select **Media → Properties** to open the **Select Media** dialog.
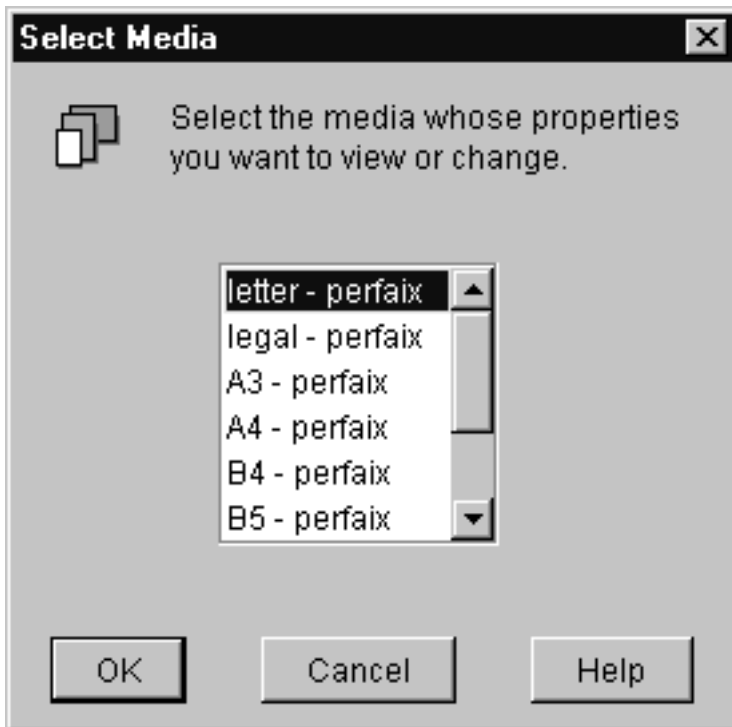
Figure 17. Select Media dialog

2. Select the medium whose properties you want to view or change.
3. Select **OK**. The Media Properties notebook for that medium opens and you can view all its attributes.
4. Make any changes and select **OK** to save those changes.

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** and **pdset** man pages.

Associating a medium with an actual destination

You can use the InfoPrint Manager Administration Interface to associate a medium with an actual destination.

Using the InfoPrint Manager Administration Interface

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 **Change Media** dialog (**Printer → Change Media**) for an actual destination to define the different paper types that operators can load in the printer on the **Media Allowed** tab.

To specify the media supported by the actual destination:

1. From the **Printer** menu, select **Change Media** to open the **Change Media** dialog.
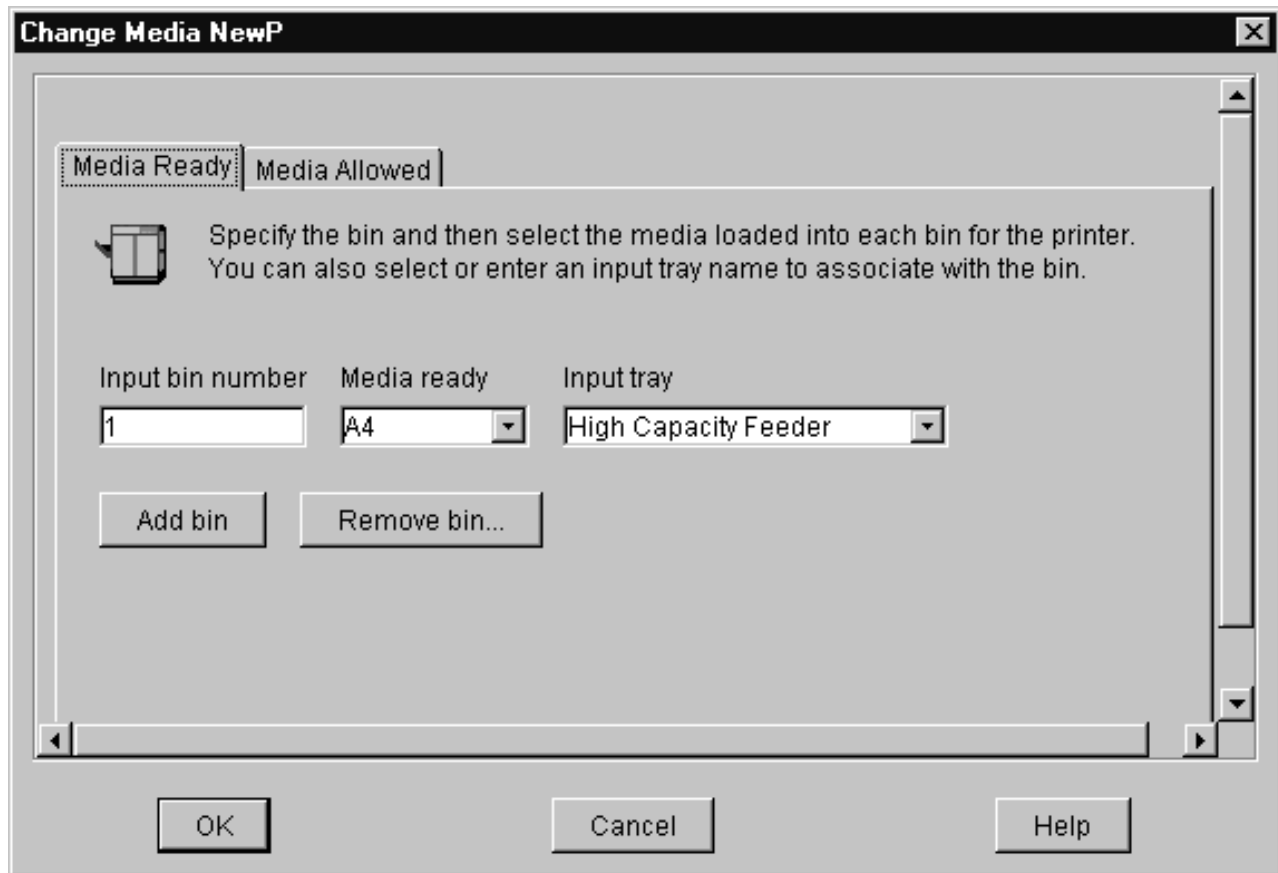
Figure 18. Change Media dialog

2. On the **Media Ready** tab, specify the bin and then select the media loaded into each bin for the printer. You can also specify an input tray name to associate with the bin.

3. Select **OK**. InfoPrint updates the actual destination properties notebook with the values you specified.

Chapter 5. InfoPrint Email support

InfoPrint Email can be used for interoffice communication or to send emails to other addresses around the world. You can take advantage of the Email option to format documents that are both viewable and printable at company workstations. Send and receive data from a wide variety of sources, whether the data is PCL, PDF, PostScript, GIF, JPEG, TIFF, or a native SAP R/3 data stream (ABAP or OTF). Incoming data can be all these types; the Email DSS converts the data to PDF for viewing. To view output, you can use Adobe® Acrobat Reader (for more information and available downloads, see the Adobe web site at **http://www.adobe.com**).

Note: Color PDF and PostScript jobs will be converted to black and white PDF emails if not handled appropriately.

Configuring InfoPrint Email

Before you can send Email through InfoPrint Manager for AIX, you must ensure your SMTP Email server is correctly configured and defined to InfoPrint and create an InfoPrintEmail destination.

Defining the SMTP Email server to InfoPrint

The InfoPrint Manager for AIX Email DSS uses a Simple Mail Transfer Protocol (SMTP) server to send email. The SMTP server must have MIME support. The SMTP server used is defined by the InfoPrint Manager server attributes **smtp-server-host** and **smtp-server-port**. These attributes default to the local AIX SMTP server. If you want to use a different SMTP server, you can modify these server attributes.

Note: Your SMTP server must be correctly configured to get outside the firewall if you plan to send emails outside your firewall.

If you want to change the SMTP server for the InfoPrint AIX server, use the following procedure to accomplish this task.

1. To set the mail server at installation, start the **InfoPrint Manager Administration Interface** by entering the following from the AIX command line: `ipguiadvadm`.
2. From the InfoPrint Manager Administration Servers main window, click **Server → Properties**.
3. From the **Server Properties** dialog (Figure 19 on page 64), specify your installation's mail server in the **SMTP server** field and the port in the SMTP **port** field.

   Note: Note that the **SMTP server port** field defaults to 25, which is the default port for the SMTP server on most AIX servers. Figure 19 on page 64 displays the default values for this panel.
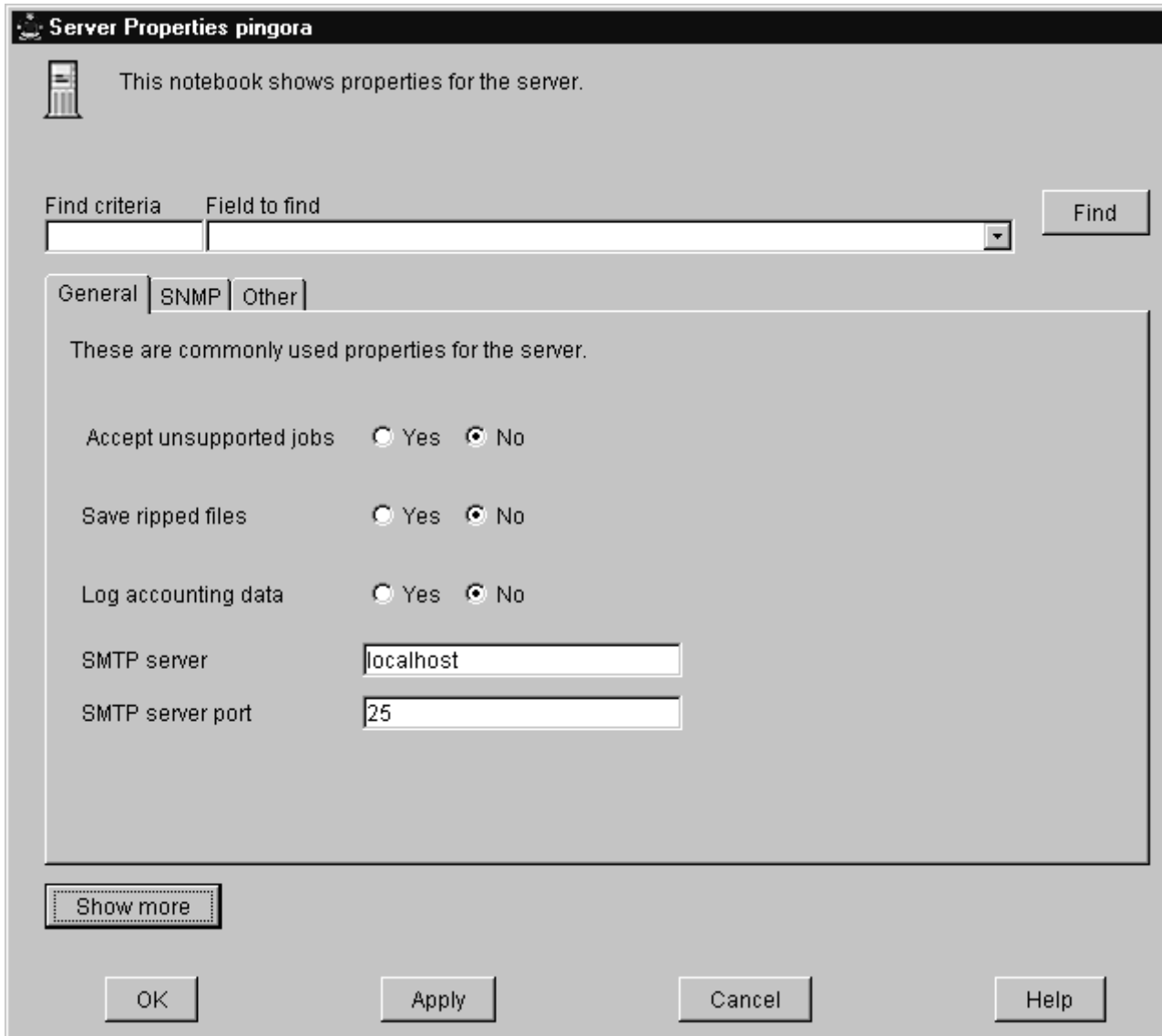
Figure 19. Server properties dialog for setting the mail server

Note that if you plan to use Email to send large PDF files consisting of fifty pages or more, you will need to expand the size of the **/var/psf/segments** file system to 500 MB.

Creating an InfoPrint Email destination

Before you can send email output through InfoPrint Manager, you must create an email destination on your InfoPrint AIX server. Please note that you should use the **Advanced InfoPrint Manager Administration Interface** to perform this task.

Note: While users who have purchased the Print-On-Demand feature can use the **Basic InfoPrint Manager Administration Interface** , we recommend against it because you will not be able to view queue objects. This means you cannot select the queue to add to a logical destination.

1. Start the **Advanced InfoPrint Manager Administration Interface** by entering the following from the AIX command line: `ipguiadvadm`.

2. From the main window, select **Other → Create → Email Destination**.

   Note: If the **Email Destination** option is not available under the **Other →
   Create** path, click on the **Options → Add/Remove Menu Items** path and check
   the **Create Email Destination** from the **Customize** dialog (see Figure 20). Note
   that you can specify any actions (delete, enable, disable, etc.) from this
   particular dialog.
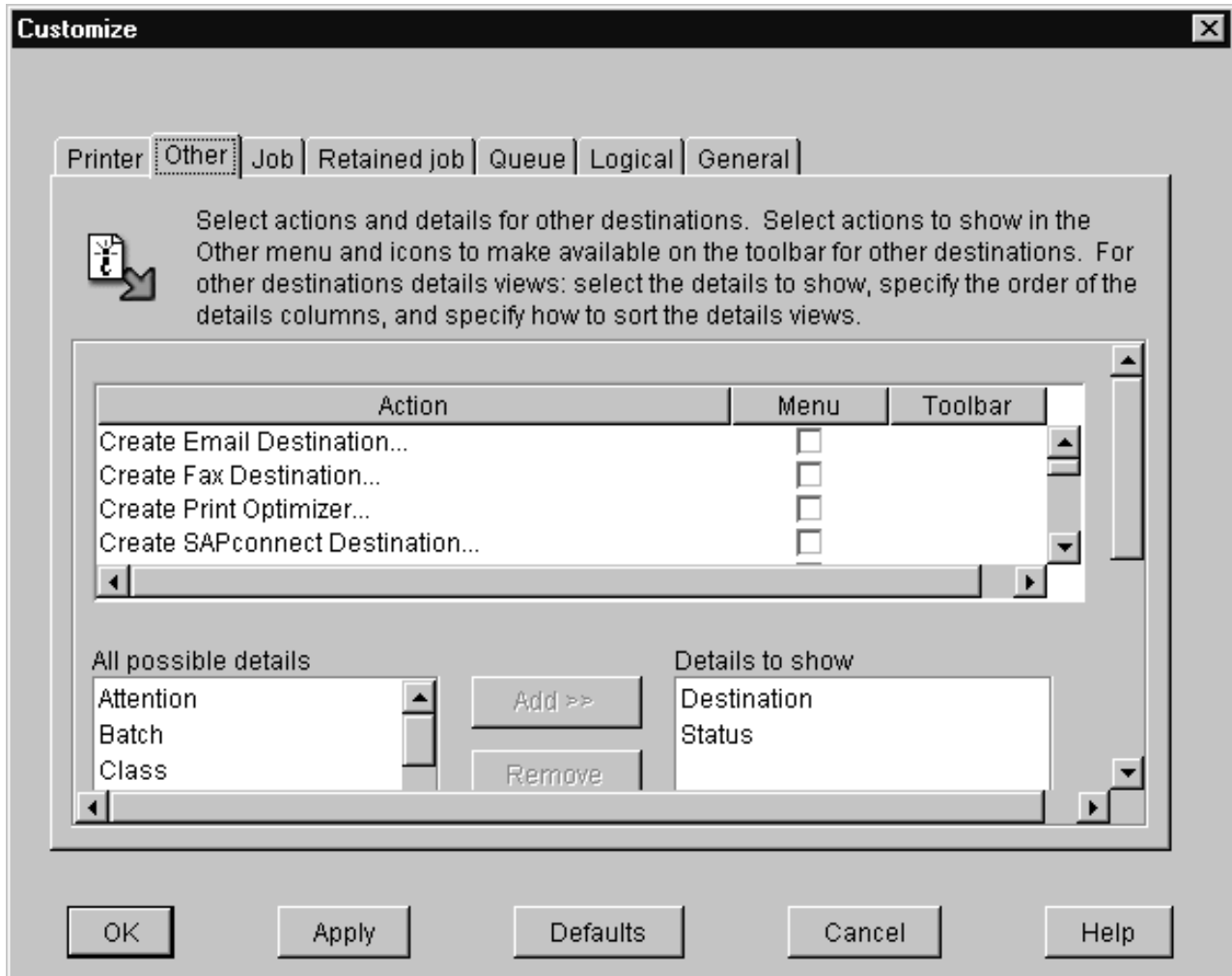
Figure 20. Customize dialog for adding the Email option

3. In the first panel of the Create Email Destination Wizard:
   a. Specify a **Name** for the Email destination, such as `email1`.
   b. Specify the InfoPrint AIX **Server** where you are creating the Email
      destination, such as `server1`.
4. In the second panel of the Create Email Destination Wizard, select a logical
   destination to feed this Email actual destination.

   We recommend that you create a separate logical destination object (`email-ld`),
   so that the same logical destination does not feed jobs to both a printer and an
   email destination. This step will make it easier for operators to monitor the
   progress of email jobs through the system and make it easier to diagnose any
   potential email problems.

5. In the third panel (if you have decided to create a separate logical destination object in the preceding step), you can choose which queue in which to put the new logical destination object.

6. In the fourth panel of the Create Email Destination Wizard, you can decide to take the default configuration or to further customize this destination by:
   - Changing the InfoPrint logical destination to which jobs are routed (if different from the logical destination defined in the preceding step).
   - Specifying particular job batch values.
   - Modifying actual destination properties.

   For purposes of this example, we take the default and apply the standard configuration.

7. In the fourth panel of the Create Email Destination Wizard, accept the default to enable the destination so that you have an Email destination with a status of **ready**.

Submitting Email jobs

Once you have installed and configured the Email option, you can submit jobs to a particular output destination by using the command line anywhere that you have the **pdpr** command installed. This topic shows the command syntax and provides three examples for submitting email jobs:

- "Submitting a basic email job"
- "Submitting attributes through a file with the -Z option" on page 67
- "Submitting files with a Korn shell script" on page 67
- "Submitting text files with a Korn shell script" on page 68
- "Using the InfoPrint Select client" on page 69

Submitting a basic email job

For specific information about the *pdpr* command and its attributes, refer to the *InfoPrint Manager: Reference*, on the web or the **pdpr** man page.

To submit a basic email job, you can use the following syntax:

```
pdpr -p email-ld -Z emailfilename
```

For an explanation of each variable on the command-line, consult the following table:

Variable	Definition
logical_destination Example: -p email-ld	Specifies the logical destination that you defined when configuring the Email option through the **Advanced InfoPrint Manager Administration Interface**. For more information about configuring both logical and actual destinations and using the **pdpr** command, see the *InfoPrint Manager: Reference*.

emailfilename Example: -Z /email_script/samp.script	Specifies a file that contains the job attributes, the name of the file you are sending, and the email destination to which you are sending the email. Email attributes include cover sheet information, billing code information, and other options. Note that **subject-text**, **email-body**, and **email-signature** are the only required attributes.

We recommend that you create sample attribute scripts that you can customize for your particular site. While you can specify email attributes on the command line, We recommend using an attribute file.

Submitting attributes through a file with the -Z option

You can create a sample attribute file using an input date type of AFP, PostScript, or Portable Document Format and submit it as the *emailfilename* for the syntax listed above:

```
-x email-from-address=root@serv.us.name.com
-x email-to-address=johndoe@us.name.com
-x subject-text="Test Script"
-x document-type=printable
   /usr/lpp/ps/sample.pdf
-x document-type=email-body
   /email_script/body.txt
-x document-type=email-signature
   /email_script/sig.txt
```

At the command-line, use the following syntax to use this attribute file:

```
pdpr -p logical_destination -Z emailfilename
```

where *logical_destination* is **email1-ld** and *emailfilename* could be named /**email_script/samp.script** and stored on your local system. Note that you must have defined a **body.txt** file and a **sig.txt** file for this script to work correctly.

This attribute file sends a report to a 'johndoe' Internet ID, using a logical destination (printer) named **email1-ld** that you specify from the command line. Note that the convention *us.name.com* is used to indicate a company-wide addressing system, where it indicates the country (*us*), the company name (*name*) and the communications name (*com*) for all fully-qualified addresses in the company.

Note that you cannot put comments in an attributes file using the **-Z** option.

This script does not print ASCII input data. To print ASCII input files, see Submitting Text Files with a Korn Shell Script.

Submitting files with a Korn shell script

You can create a Korn shell script (named **sendfile** for this example) with a simpler command syntax because the **pdpr** command is included within the shell script.

Create a file that contains the **pdpr** command and all its attributes. Create the following Korn shell script and place it in a directory on the AIX system where you have installed the **pdpr** command.

The file should look similar to the following:

```
# Sample Attribute File for InfoPrint Manager Email
    # using a script to submit
    # sendemail $1 $2
    # $1 is required as the name of the file to send.
    # $2 is optional as the recipient of the email.
    #
    #! /usr/bin/ksh
    if [[ -a $1 && -n $1] ]
    then
    if [ $2 ]
    then
    WHOTO=$2
    else
    WHOTO="johndoe@us.name.com"
    fi
    /usr/lpp/pd/bin/pdpr -p email1-ld \
    -r brief \
    -x email-to-address=$WHOTO \
    -x email-from-address=root@serv.us.name.com \
    -x "subject-text='Your requested Email file'" \
    -x document-type=printable $1 \
    -x document-type=email-body /email_script/body.txt \
    -x document-type=email-signature /email_script/sig.txt
    else
echo " sendfile: could not locate file [$1]"
    fi
```

At the command-line, this Korn shell script would use the following syntax:

sendfile *outputfilename [destination]*

where *outputfilename* specifies the file that you are sending (**sample.pdf**) and destination is the email address (**johndoe**) to which you are sending the file.

This script sends an email to either the *destination* value that you specify as the second argument on the AIX command line, or to 'johndoe' Internet ID, if you take the default. The script uses a logical destination (printer) named **email1-ld** on your InfoPrint AIX server.

Note that the convention *us.name.com* is used to indicate a typical Internet address for a business.

Submitting text files with a Korn shell script

You can create a Korn shell script (named **sendtxtfile** for this example) to submit ASCII text files as Email.

Create a file that contains the **pdpr** command and all its attributes. Create the following Korn shell script and place it in a directory on the AIX system where you have installed the **pdpr** command.

The file should look similar to the following:

```
# Sample Korn Shell
# Script for InfoPrint Manager Email Text
    # Uses a script to submit:
    # sendtxtemail $1 $2
    # $1 is required as the name of the file to send.
    # $2 is optional as the recipient of the email.
    #
    # This script takes an ASCII file as input and creates
```

```
#PostScript output that is submitted with the pdpr command
# as email.
#! /usr/bin/ksh
if [[ -a $1 && -n $1] ]
then
if [ $2 ]
then
WHOTO=$2
else
WHOTO="johndoe@us.name.com"
fi
# Make temporary PostScript file
enscript -p /tmp/$$email.txt $1
/usr/lpp/pd/bin/pdpr -p email1-ld \
-r brief \
-x email-to-address=$WHOTO \
-x email-from-address=root@serv.us.name.com \
-x "subject-text='Your requested Email file'" \
-x document-type=printable /tmp/$$email.txt \
-x document-type=email-body /email_script/body.txt \
-x document-type=email-signature /email_script/sig.txt
# Delete temporary PostScript file
rm /tmp/$$email.txt
else
echo " sendtxtfile: could not locate file [$1]"
fi
```

At the command-line, this Korn shell script would use the following syntax:

```
sendtxtfile outputfilename [destination]
```

where *outputfilename* specifies the file that you are sending (**email.txt**) and destination is the email address (**johndoe**) to which you are sending the file.

This script sends an email to either the destination value that you specify as the second argument on the AIX command line, or to 'johndoe' Internet ID, if you take the default. The script uses a logical destination (printer) named **email-ld** on your InfoPrint AIX server. This file uses the **enscript** AIX command to convert the text file to PostScript, stores that PostScript file in the /**tmp** directory on the submitting AIX system, and then deletes that file once the **pdpr** command has submitted the PostScript file to the InfoPrint AIX server.

Note that the convention *us.name.com* is used to indicate a typical Internet address for a business.

Using the InfoPrint Select client

Once you have successfully installed InfoPrint Select and defined an Email destination (refer to ″Chapter 11. Using InfoPrint Select to submit a job″ in *InfoPrint Manager for AIX: Getting Started* for more information), you can use the following procedure to email.

Note: In order to configure the port for the InfoPrint server email destination on your client workstation, the email logical destination (in our example, **email-ld**) on the InfoPrint AIX server must have a value filled in for the **client-driver-names** logical destination attribute. If this value is not filled in, you will not be able to display printers from the InfoPrint AIX server when you click the **Refresh Printers Selection List** button.

You must also set the **destination-support-system** logical destination attribute to **email** in order for InfoPrint Select to send emails.

1. Specify **Print** from the screen menu.
2. From the **Print** window, ensure that the **Name** field contains the name of the logical destination that you defined to the InfoPrint AIX server, then click on the **OK** button.
3. From the **InfoPrint Email** pop-up window, specify the attribute information in the fields as indicated.

Color Email

If you have color Portable Document Format (PDF) or PostScript files, you can send these files to target email address through InfoPrint Manager and receive color output.

Ensure that your color PDF files pass through the Email DSS without being transformed no matter what method you use to submit the job to the InfoPrint Manager AIX server. To do this specify job attribute `job-ripped-by-server = false`. Alternatively, you can set the actual destination to not RIP PDF document formats. However, that would apply to all PDF jobs submitted.

You don't want to lose the color information contained in color PostScript files.

Note: Color Email is not supported if your Email job sent to an Actual Destination contains any of the attributes specified in the lists that follow. If these attributes or conditions are sent to an Actual Destination, the file will print as black-and-white (MO:DCA-P) output.

Any job or document attributes that require the Email DSS to transform the data are not supported. For a list of these attributes and for more information about the `job-ripped-by-server` attribute, refer to *InfoPrint Manager: Reference*.

Submitting color Email attributes through a file

You can print a color Email job with a batch file that contains the following:
- Job name
- Email body text
- Email to address
- Email from address

Here is the sample file:

```
-x job-name="Titleist"
-x job-ripped-by-server=false
-x email-from-address=gopher1@gopher.com
-x email-to-address=gopher@gopher.com
-x subject-text="testing"
-x document-type=email-body
-f d:\bsi\data\body.txt
-x document-format=pdf
-x document-type=printable
```

To submit this job to the InfoPrint AIX server, specify the following at an AIX command line:

```
c:\Infoprint\pdpr -p email -Z d:\bsi\options\em_rip.txt  \
d:\bsi\data\LogoOnly.pdf
```

where **em_rip.txt** is the **-Z** file above.

Chapter 6. User-exit programs (PSF, Generalized Fax, and Email DSS only)

This section describes the sample user-exit programs supplied with InfoPrint Manager and how you can create your own user-exit programs.

What type of user-exits does InfoPrint Manager support?

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

InfoPrint Manager allows eight different types of user-exits. InfoPrint Manager calls the user-exits in the following order:

- Header (Start) page user-exit
- Separator page user-exit
- Input data user-exit
- Output data user-exit
- Accounting user-exit
- Audit user-exit
- Trailer (End) page user-exit
- Post-print accounting user-exit
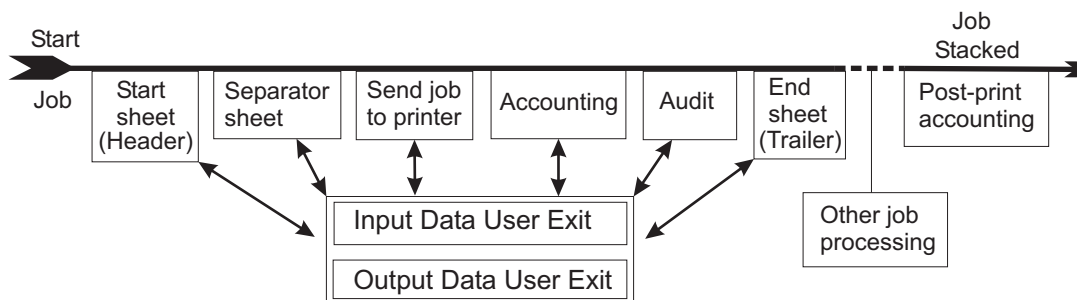
Figure 21. Sequence of user-exit programs for InfoPrint Manager

What sample user-exit programs are available?

InfoPrint Manager supplies sample user-exit programs for the header, separator, and trailer pages, for accounting and audit data, and for post-print accounting data. The sample header, separator, and trailer page user-exit programs generate Advanced Function Presentation (AFP) data stream pages. The sample accounting and audit user-exit programs generate ASCII data in a report file format or write to a log file. The sample post-print accounting user-exit program only writes to a log file. InfoPrint Manager 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/usr/lpp/psf/exits** directory. InfoPrint Manager supplies the following sample programs:

Table 7. Sample user-exit programs

Type of user-exit	File Name	Description
Header Page	ainuxhdr.c	Generates brief style start sheet.
	ainuxhdr2.c	Generates full style start sheet.
	ainuxhdrp.c	Generates start sheet with job ticket information.
	ainuxhdrx.c	Generates start sheet without vertical lines.
	pduxblkh.c	Generates a blank start sheet.
Separator Page	ainuxsep.c	Generates brief style separator sheet
	ainuxsep2.c	Generates full style separator sheet.
	ainuxsepp.c	Generates separator sheet with job ticket information.
	ainuxsepx.c	Generates separator sheet without vertical lines.
	pduxblks.c	Generates a blank separator sheet.
Trailer Page	ainuxtlr.c	Generates brief style end sheet.
	ainuxtlr2.c	Generates full style end sheet.
	ainuxtlrp.c	Generates start sheet with job ticket information.
	ainuxtlrx.c	Generates end sheet without vertical lines.
	pduxblkt.c	Generates a blank end sheet.
Accounting	ainuxacc.c	Generates brief style accounting sheet.
	ainuxacc2.c	Generates full style accounting sheet.
	ainacclog.c	Generates accounting log information.
	ainuxaccp.c	Generates accounting sheet log with job ticket information.
Post-print Accounting	ainuxjobcompletion.c	Generates accounting log information on printed ("stacked") sheets.

Table 7. Sample user-exit programs (continued)

Type of user-exit	File Name	Description
Audit	ainuxaud.c	Generates brief style audit sheet.
	ainuxaud2.c	Generates full style audit sheet.
	ainuxaudp.c	Generates audit sheet with job ticket information.
	ainaudlog.c	Generates audit log information.
Input Data	ainuxind.c	Provides template for writing your own user-exit program.
Output Data	ainuxout.c	Provides template for writing your own user-exit program.

See "User-exit programs for the line-data transform" on page 89 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

ICONV

If you have written any user-exit programs that use ICONV, you must alter them to use UCONV instead. See the *InfoPrint Manager: Reference* for more information.

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 Manager 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 Manager, 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 Manager executable code, a defective user-exit program could cause problems with InfoPrint Manager.

Compile and install your user-exit program

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

Notes: 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 Manager, 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 Manager.

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 Manager can locate the module.

2. You can only specify one user-exit program for each function name provided by InfoPrint Manager 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
   - JOBCOMPLETION
   - 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 Manager 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 Manager 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.

From an AIX command line, complete the following steps:

1. Enter the following: `pdls -caux -rall` *servername*`:`, where *servername* refers to the name of the server you are using.

   This command displays the attributes for all current auxiliary sheet objects available on the server. You can also view attributes for a specific auxiliary sheet object. For example, to view attributes for the accounting log, enter the following command: `pdls -caux -rall` *servername*`:accounting-log`

2. Use the **pdset** command to change the values of any of the auxiliary sheet objects, as necessary.

To perform this task from the InfoPrint Manager Administration Interface, you must select the printer that you want to associate with an auxiliary sheet (in this case, prt1) and then use the **Printer —> Properties** menu to access the **Printer Properties** notebook. To complete this task, refer to the online help topic **Using auxiliary-sheet objects** in the InfoPrint Manager Administration Interface.

Perform the following procedure from the AIX command line.

1. To create a new auxiliary-sheet object, type:

   `pdcreate -c aux-sh -x psf-exit-prog-name=/usr/lpp/psf/`*exit_name*
   `server1:`*auxiliary_sheet_name*

2. Shut down the actual destination (in this case, prt1).

   `pdshutdown -cp prt1`

3. Associate this new auxiliary-sheet object (in this case, an audit exit) with the actual destination.

   `pdset -cp -x dest -x audit-exit=auxiliary_sheet_name prt1`

   Note: For the post-print accounting exit, instead of this step you will set the attribute in the accounting auxiliary sheet object for the actual destination, using this command: `pdset –c auxiliary-sheet –x psf-post-print-accounting-program-name=/usr/lpp/psf/`*exit_name* `servername:accounting-log`

   By default, the accounting-log auxiliary sheet object is available for all destinations. This object can point to any combination of the accounting and post-print accounting exits. For example, you can set either one, both, or neither of the following attributes at the same time:

   `psf-exit-program-name=`*name of accounting exit*
   `psf-post-print-accounting-program-name=`*name of post-print accounting exit*

   If you want some printers to have different accounting configurations than others, you must create a new auxiliary sheet object for each configuration.

4. Enable the actual destination (in this case, `prt1`).

   ```
   pdenable prt1
   ```

See Chapter 7, "Creating and managing auxiliary sheets and user-exit programs," on page 99 for the procedures to activate the various user-exit programs.

User-exit program structures

All input and output variables used in InfoPrint Manager 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 input, output, header, trailer, separator, accounting, audit, and post-print accounting exits, while the **ainuprt.h** file formats data for the following executable reporting utilities that apply to the accounting, audit, and post-print accounting exits:

- Accounting Log
  - **ainurpt1**
  - **ainurpt2**
  - **ainurpt3**
- Audit Log
  - **ainurpt4**
  - **ainurpt5**
  - **ainurpt6**
- Post-print Accounting Log
  - **ainurpt7**
  - **ainurpt8**
  - **ainurpt9**

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 Manager user-exit programs, which are imbedded as part of the user-exit program.

Common input and output fields

The following fields may be found in the user-exit programs. For a detailed list of input and output fields according to user-exit, see the **/usr/lpp/psf/exits/ainuexit.h** file. This information can be specified from:

- Migrated jobs
- MVS Download jobs
- Fields set in the InfoPrint Manager Administration Interface Job and Document Defaults notebook
- Fields in the InfoPrint SMIT administrator's interface `Submit an InfoPrint Job` panel

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 Manager 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 Manager creates a temporary file for the transform output. InfoPrint Manager uses the temporary file name for the job name.

SpoolID

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

PrinterName

Identifies the first eight characters of the InfoPrint Manager destination name.

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.

PagePointer

Points to a buffer containing the data produced by any of these exits:
- Header page
- Trailer page
- Separator page
- Accounting
- Audit

PageSize

Indicates the size of the data returned by these exits:
- Header page
- Trailer page
- Separator page
- Accounting
- Audit

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.

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

The **Name** field value can be any null-terminated (X′00′) character string. This value can be any null-terminated (X′00′) character string no greater than 24 characters in length.

Userid

Identifies the userid information provided when the job is submitted.

The **Userid** field value can be any null-terminated (X′00′) character string. This value can be any null-terminated (X′00′) character string no greater than 10 characters in length.

Nodeid

Identifies the nodeid information provided when the job is submitted.

The **Nodeid** field value can be any null-terminated (X′00′) character string. This value can be any null-terminated (X′00′) character string no greater than 10 characters in length.

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. This value can be any null-terminated (X′00′) character string no greater than 57 characters in length.

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. This value can be any null-terminated (X′00′) character string no greater than 57 characters in length.

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. This value can be any null-terminated (X′00′) character string no greater than 57 characters in length.

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. This value can be any null-terminated (X'00') character string no greater than 57 characters in length.

Account

Identifies the account information provided when the job is submitted.

The **Account** field value can be any null-terminated (X'00') character string. This value can be any null-terminated (X'00') character string no greater than 20 characters in length.

Building

Identifies the building information provided when the job is submitted.

The **Building** field value can be any null-terminated (X'00') character string. This value can be any null-terminated (X'00') character string no greater than 24 characters in length.

Department

Identifies the department information provided when the job is submitted.

The **Department** field value can be any null-terminated (X'00') character string. This value can be any null-terminated (X'00') character string no greater than 24 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. This value can be any null-terminated (X'00') character string no greater than 24 characters in length.

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

The **Room** field value can be any null-terminated (X'00') character string. This value can be any null-terminated (X'00') character string no greater than 24 characters in length.

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

The **Title** field value can be any null-terminated (X'00') character string. This value can be any null-terminated (X'00') character string no greater than 24 characters in length.

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.

LongPrinterName

The full name of the InfoPrint destination.

Note: Because InfoPrint Manager only allows eight character names, PrinterName and LongPrinterName are the same.

The header page and trailer page user-exit programs

Because the InfoPrint Manager 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 73 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 78.

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 of the input and output data needed to communicate between InfoPrint Manager and the user-exit programs.

See "Common input and output fields" on page 78 and the **ainuexit.h** file for explanations of the function and structure of the various components of this user-exit.

After you create your header page 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 75).

The separator page user-exit program

The InfoPrint Manager separator page user-exit program is called before copies of a job (including the very first copy) print.

The source code (in the C programming language) for the sample separator page user-exit programs listed on page 73 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 78.

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 Manager and the user-exit program.

See "Common input and output fields" on page 78 and the **ainuexit.h** file for explanations of the function and structure of the various components of this user-exit.

The following field is also found in the separator page user-exit program and provides 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.

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 75).

The accounting, post-print accounting, and audit user-exit programs

The InfoPrint Manager accounting and audit user-exit programs require the same inputs and produce the same outputs so the program descriptions are the same. The post-print accounting user-exit program requires more inputs and produces more outputs.

The source code (in the C programming language) for the sample user-exit programs listed on page 73 are in the **/usr/lpp/psf/exits** directory. 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.

ainurpt7
> Provides post-print accounting data stored in **jobcompletion.log**, sorted by actual destination.

ainurpt8
> Provides summary post-print accounting data stored in **jobcompletion.log**, sorted by job submitter.

ainurpt9
> Provides detailed entries of times and pages printed for a specific job submitter in **jobcompletion.log**.

The source code for these reporting utilities is also located in the **/usr/lpp/psf/exits** directory.

These executable reporting utilities are located in the **/usr/lpp/psf/bin** 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 these exits to generate the log files used by these report programs. For more information on activating these exits, see "Activating the user-exit program" on page 77.

The data structures for the accounting, audit, and post-print accounting 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 78.

The declarations of these exits are:

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

After you create your user-exit program, you must use the AIX **make** command to compile the code (see "Compiling and installing the user-exit program" on page 75).

See "Common input and output fields" on page 78 and the **ainuexit.h** file for explanations of the function and structure of the various components of this user-exit.

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

The following fields are also found in the accounting, audit, and post-print accounting user-exit programs:

Pages Printed (accounting and audit user-exit only)
> Shows the total number of impressions processed for this job.

Bin One Sheets Processed (accounting and audit user-exit only)
> Shows the total number of processed sheets that were selected from the primary bin.

Bin Two Sheets Processed (accounting and audit user-exit only)
> Shows the total number of processed sheets that were selected from bins other than the primary bin.

User Pages Stacked by Bin (post-print accounting user-exit only)
> Shows the total number of stacked pages in the user print file. It does not include system pages, such as the header page, in the count.

User Sheets Stacked by Bin (post-print accounting user-exit only)
>Shows the total number of stacked sheets in the user print file. It does not include system pages, such as the header page, in the count.

Pages Stacked by Bin (post-print accounting user-exit only)
>Shows the total number of pages stacked for this job by bin.

Sheets Stacked by Bin (post-print accounting user-exit only)
>Shows the total number of sheets stacked for this job by 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.

Job Copies Requested (post-print accounting user-exit only)
>Shows the total number of **results-profile** job copies requested in the job.

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.

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.

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.

ExtStart Date
>Identifies the date the job started processing.

Start Date
>The date the job started processing.

Start Time
>The time the job started processing.

ExtStop Date
>The date the job finished processing.

Stop Date
The date the job finished processing.

Stop Time
The time the job finished processing.

Completion Date (post-print accounting user-exit only)
The date all pages in the job printed and stacked.

Note: If errors or operator commands affect the job so that all pages are not sent to the printer, this field indicates the time when these pages have been printed and stacked.

Completion Time (post-print accounting user-exit only)
The time all pages in the job printed and stacked.

Note: If errors or operator commands affect the job so that all pages are not sent to the printer, this field indicates the time when these pages have been printed and stacked.

DORU
The data object resources used (DORU) by the exit.

DOFU
The data object fonts used (DOFU) by the exit.

The input data user-exit program

The InfoPrint Manager input data user-exit program can be used to:
- Monitor the incoming print data stream to InfoPrint Manager
- Discard an input record before it is processed
- Replace an existing input record with one or more records (which may include the original record or a modified version of the original record)
- Continue processing with the input record unchanged

This exit may be called for all parts of the job (see Figure 21 on page 73).

Note: The input data user-exit program only processes MO:DCA™ data.

If you are using the exit to insert extra input records, the original input record that is passed to the exit can be processed before or after the extra input records. This means that the extra input records can be inserted before or after the current structured field depending on where the current structured field is placed in the list of structured fields to insert.

> **Important considerations**
>
> - Code processing becomes an integral part of PSF and can affect performance and reliability.
> - User-exits should be coded by experienced programmers who are aware of overall system implications.
> - Any delays caused by this exit will translate into a PSF processing delay and **could affect printer performance**.
> - This exit is not passed any structured fields that are contained in resources that are processed. This includes: form definitions, overlays, page segments, fonts, data object resources, internal medium maps, and data object fonts.
> - Code processing must be able to handle PSF repositioning.
>
> Repositioning may occur as a result of errors or operator commands. PSF may reposition items forward into the print job, skip structured fields, or reposition items back into previously processed data. If PSF repositions back into the print file, it is the responsibility of the exit to return the same data in the same sequence to PSF, just as it did when the structured field was originally passed to the exit.
>
> Because of the constraints outlined above, you should first consider using the transform subsystem to process data, because the transform subsystem does not have these limitations. For example, a transform object would have access to all of the input data (no restrictions) and could add, delete, and modify both resources and pages. In addition, the transform subsystem processing is performed before printing begins, so it would have no impact on printer performance or behavior.
>
> The input data user-exit is not capable of identifying individual document boundaries within a data stream. For example, your job may have 5 separate documents that each contain 10 pages of data. This is viewed by the exit as 50 pages of data, not 5 units of 10. The transform subsystem does not have this limitation.

The PSF Input Record Exit is responsible for managing any memory it allocates. It can reuse the memory across calls through the use of a work area pointer provided in **ainuexit.h**. PSF does not free any memory that may be pointed to by fields in either the `INDATA_EXITDATA` structure or the `PSFINSERTRECS` structure. The exit can point to memory that it has defined or allocated. The exit can reuse allocated memory or free memory when it is appropriate. PSF may run out of memory if the PSF Input Record Exit mismanages memory.

The source code (in the C programming language) for the sample input data user-exit program listed on page 73 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 declaration of this exit is:

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

The **INDATA_EXITDATA** input/output parameter contains all of the input and output data needed to communicate between InfoPrint Manager and the user-exit program.

The following fields are also found in the input data user-exit:

version

This variable was formerly called `reserved1`. It is designed for use as a migration aid for future variants of this exit. It contains a version identifier for this structure:

- X'00'= previous version (before August, 2005)
- X'01'= August, 2005 version adding support for deletion and insertion of input records

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

Contains the length of the input data record

DataPointer

Points to the input data record to be processed.

DataType

Always set to 0 (AFP; MO:DCA data only).

> **Notes:** If the exit is being called to indicate end of job processing:
> - DataSize is set to 0,
> - DataPointer is set to NULL
> - DataType is set to 0 — no record is passed in at that time

The **PSFINSERTRECS** structure contains information about a structured field that is to be inserted at the request of the input data exit. The **PSFINSERTRECS** structure contains the following fields:

version

Version identifies to PSF the version of the **PSFINSERTRECS** structure that is being supplied. The exit must supply a value of 0x01 or the record (including the `next_p` pointer) is ignored.

next_p

Contains the pointer to the next record to insert.

record_p

Contains the pointer to the MO:DCA (AFP) structured field to be inserted.

Important:

See more data definitions and comments in the **`ainuexit.h`** source file located in **/usr/lpp/psf/exits/**.

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 75).

Note: The input information fields used by some of the sample programs (see "Common input and output fields" on page 78 for a complete list) are available through the alternate sample user-exits. InfoPrint Manager does not provide an alternate input data user-exit.

The output data user-exit program

The InfoPrint Manager output data user-exit program is used to monitor the outgoing print data stream from InfoPrint Manager. 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 73 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 78.

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 Manager and the user-exit program.

The following fields are also found in the output data user-exit program:

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.

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 75).

Note: The output information fields used by some of the sample programs (see "Common input and output fields" on page 78 for a complete list) are available through the alternate sample user-exits. InfoPrint Manager does not provide an alternate Output Data user-exit.

User-exit programs for the line-data transform

InfoPrint Manager 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 the *InfoPrint Manager: Reference*.

InfoPrint Manager 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 Manager 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 75.

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 **inpexit** 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 Manager can process is 32756 bytes. This exit is not called when the line-data transform is processing resources from directories.

Figure 22 contains a sample C language header that describes the control block that is passed to the exit program.

```
/********************************************************************/
/* INPEXIT STRUCTURE                                                */
/********************************************************************/
typedef struct _INPEXIT_PARMS /* Parameters for input record exit    */
{
   char            *work;      /* Address of 16-byte static work area */
   PFATTR          *pfattr;    /* Address of print file attribute info*/
   char            *record;    /* Address of the input record         */
   unsigned short in_CCSID;    /* input CCSID for translating    @06a*/
   unsigned short out_CCSID;   /* output CCSID for translating   @06a*/
   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                       */
} INPEXIT_PARMS;
```

Figure 22. 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 96 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.

in_CCSID (Bytes 13-14)

The value from the **INPCCSID** parameter on the **line2afp** command.

out_CCSID (Bytes 15-16)

The value from the **OUTCCSID** parameter on the **line2afp** command.

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. If **recordln** is 0 when the exit program returns, **line2afp** will terminate with a return code of 99.

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 one code character set (CCSID) to another. You should use this exit when your job uses fonts such as GT12, which has code points that are different from your data file. The default translation is from ASCII (code set 00850) to EBCDIC (code set 00037) if the **INPCCSID** and **OUTCCSID** parameters are not specified on the **line2afp** command. **INPCCSID** specifies the input code page, and **OUTCCSID** specifies the output code page.

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 translates data that is encoded in one code character set (CCSID) to another. You should use this exit when your job uses fonts such as GT12, which has code points that are different from your data file. The default translation is from ASCII (code set 00850) to EBCDIC (code set 00037) if the **INPCCSID** and **OUTCCSID** parameters are not specified on the **line2afp** command. **INPCCSID** specifies the input code page, and **OUTCCSID** specifies the output code page.

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 prologue of the **asciinp.c** source file that is provided with InfoPrint Manager 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 23 contains a sample C language header that describes the control block passed to the exit program.

```
typedef struct _OUTEXIT_PARMS /* Parameters for resource 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 23. 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 96 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 Manager. You could code this exit program to contain a table of all fonts shipped with InfoPrint Manager 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 24 on page 95 contains a sample C language header that describes the control block that is passed to the exit program.

```
/********************************************************************/
/* RESEXIT STRUCTURE                                                */
/********************************************************************/
typedef struct _RESEXIT_PARMS /* Parameters for resource record exit */
{
   char            *work;       /* Address of 16-byte static work area */
   PFATTR          *pfattr;     /* Address of print file attribute info*/
   char            resname[8]; /* Name of requested resource (8 byte) */
   char            restype;    /* Type of resource                    */
   char            request;    /* Ignore or process the resource      */
   char            eof;        /* Last call indicator                 */
   unsigned short resnamel;    /* Length of resource name        @05A*/
   char            pad1[3];    /* padding byte                   @05A*/
   char            resnamf[250]; /* Rsrc name if more than 8 bytes@05A*/
} RESEXIT_PARMS;
```

Figure 24. 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 96 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.

resnamel
Specifies the length of the meaningful characters in the **resnamef** field.

pad1
A padding byte to get the **resnamef** on a word boundary.

resnamef
The actual name of the resource if it is greater then 8 characters in length. If the name is 8 characters or less in length, the name is stored in the **resname** field instead.

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 25 on page 97 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 25. 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 7. 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.

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 and AIX actual destinations print auxiliary sheets.

Auxiliary-sheet object
Represents a set of user-exit programs that you can specify for Infoprint PSF, generalized fax, and E-mail 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 actual destinations print auxiliary sheets, but they do not support auxiliary-sheet objects. Generalized 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 8, "Gathering accounting and auditing data about print jobs," on page 113 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
- Post-print accounting (log file only)

Note: Generalized fax and e-mail destinations support only the log, input data stream, and output data stream user exits.

See "Sequence of user-exit programs" on page 105 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 audit 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.

Interrupt Message Pages
IMPs are pages that are similar to the message pages that print at the end of a print job, but IMPs are printed at the point of an error where a possible data loss has occurred. See "Using Interrupt Message Pages" on page 109 for more information.

InfoPrint default auxiliary-sheet objects

InfoPrint Manager provides default auxiliary-sheet objects which it creates when you first create a server. InfoPrint Manager automatically identifies these as supported values for PSF actual destinations. The default auxiliary-sheet objects with their associated user-exit programs and form definitions are shown in Table 8 on page 101.

Table 8. Default auxiliary sheet objects

Auxiliary sheet object	Form definition	Description	User exit program	Additional Information
none	n/a	InfoPrint generates no auxiliary sheet.	n/a	n/a
brief	F1A10110	Start sheet	ainuxhdr	
		Separator sheet	ainuxsep	
		End sheet	ainuxtlr	
		Accounting exit	ainuxacc	
		Audit exit	ainuxaud	
full	F1A10110	Start sheet	ainuxhdr2	
		Separator sheet	ainuxsep2	
		End sheet	ainuxtlr2	
		Accounting exit	ainuxacc2	
		Audit exit	ainuxaud2	
blank	F1A10110	Start sheet	pduxblkh	Blank sheet of paper
		Separator sheet	pduxblks	
		End sheet	pduxblkt	
accounting-log	n/a	Accounting exit	ainacclog	Writes accounting information to the **/var/psf/ accounting.log** file. Does not produce a printed sheet.
		Audit exit	ainaudlog	Writes audit information to the **/var/psf/ audit.log** file. Does not produce a printed sheet.
		Post-print accounting exit	ainuxjob completion	Writes post-print accounting information to the **/var/psf/ jobcompletion.log** file if the auxiliary sheet object's *psf-post-print-accounting-program-name* is set to ainuxjobcompletion. Does not produce a printed sheet.
job-ticket	n/a	Start sheet	ainuxhdrp	
		Separator sheet	ainuxsepp	
		End sheet	ainuxtlrp	
		Accounting exit	ainuxaccp	Writes accounting information to the **/var/psf/ podaccount.log** Does not produce a printed sheet.
		Audit exit	ainuxaudp	

Table 8. Default auxiliary sheet objects (continued)

Auxiliary sheet object	Form definition	Description	User exit program	Additional Information
64xx, 65xx printers	F1A10110	Start sheet	ainuxhdrx	
		Separator sheet	ainuxsepx	
		End sheet	ainuxtlrx	

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 107 for the procedure.

Examples of Brief-Style and Full-Style Auxiliary Sheets

These examples of auxiliary-sheet printouts were produced using the InfoPrint **brief** and **full** default auxiliary-sheet objects.

Start Sheet Examples

In Figure 26, 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.
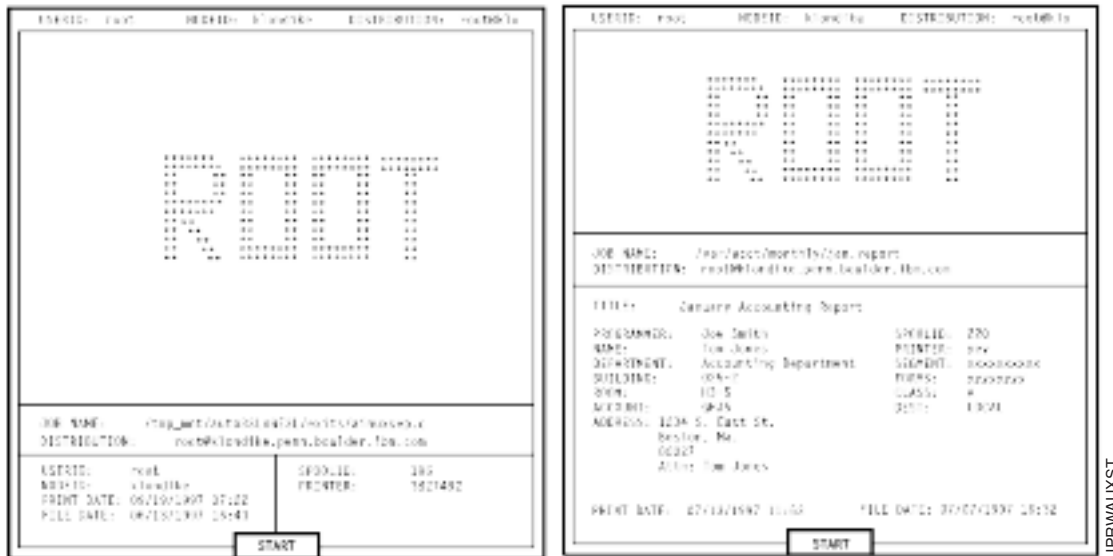
Figure 26. Brief and Full Styles of Start Sheets

Separator Sheet Examples

In Figure 27 on page 103, 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.
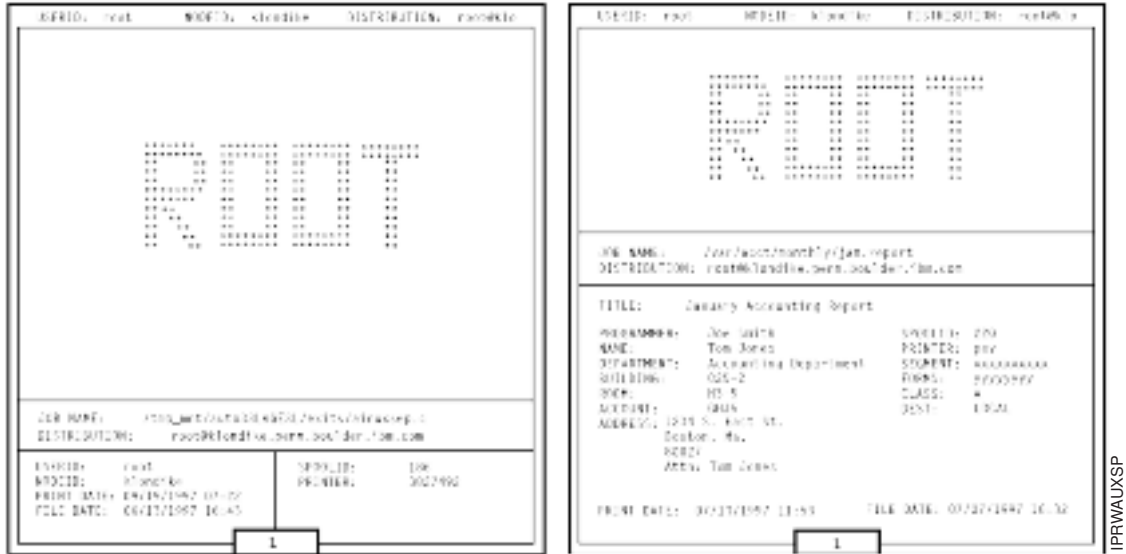
Figure 27. Brief and Full Styles of Separator Sheets

End Sheet Examples

In Figure 28, the user-exit program **ainuxtlr** generated the brief style of the end sheet and user-exit program **ainuxtlr2** generated the full style of the end sheet.
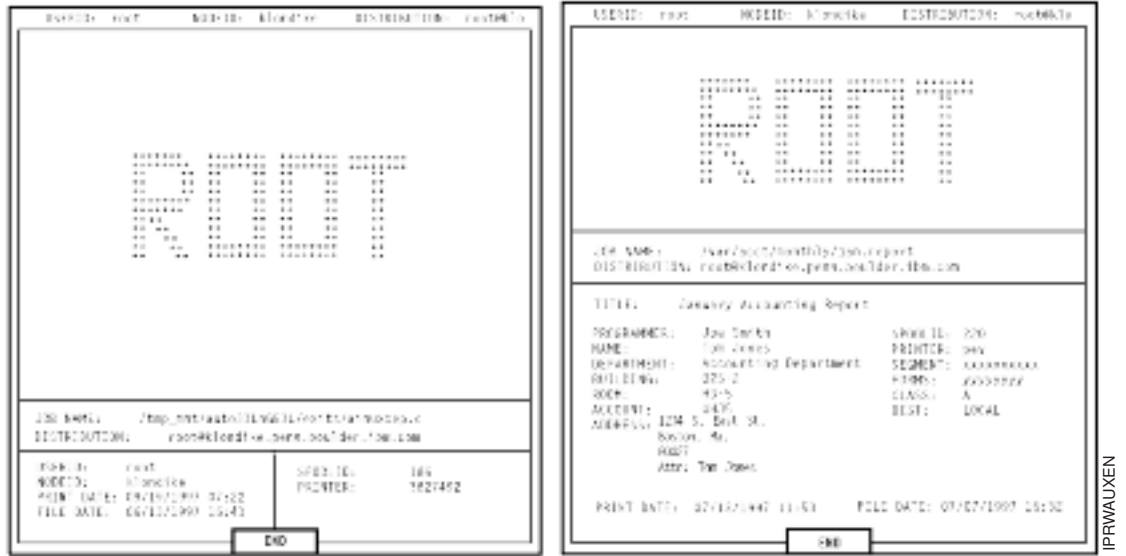
Figure 28. Brief and Full Styles of End Sheets

Accounting Sheet Examples

In Figure 29 on page 104, 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.

```
ACCOUNTING:                                ACCOUNTING:
UserID=root                                System   UserID=root
NodeID=starwars                            System   NodeID=starwars
JobName=/info/afp/twopage.afp              JobName=/info/afp/twopage.afp
SpoolID=1366                               SpoolID=1367
PrinterName=psf4317                        PrinterName=psf4317
PagesPrinted=3                             PagesPrinted=3
BinOneSheets=3                             BinOneSheets=3
BinTwoSheets=0                             BinTwoSheets=0
FontsUsed=2                                FontsUsed=2
ResidentFontsUsed=0                        ResidentFontsUsed=0
OverlaysUsed=0                             OverlaysUsed=0
HardSegmentsUsed=0                         HardSegmentsUsed=0
SoftSegmentsUsed=0                         SoftSegmentsUsed=0
DataObjectResources=0                      DataObjectResourcesUsed=0
StartDate=11/01/2000                       StartDate=11/01/2000
StartTime=14:50:14                         StartTime=14:51:46
EndDate=11/01/2000                         EndDate=11/01/2000
EndTime=14:50:15                           EndTime=14:51:48
FileDate=05/05/2000                        FileDate=05/05/2000
FileTime=07:59:13                          FileTime=07:59:13
ExtendedSpoolID=

                                           Name=
                                           Supplied   Userid=
                                           Supplied   Nodeid=
                                           Address1=
                                           Address2=
                                           Address3=
                                           Address4=
                                           Account=
                                           Building=
                                           Department=
                                           Programmer=
                                           Room=
                                           Title=
                                           Segmentid=
                                           Class=
                                           Forms=
                                           Destination=
                                           Passthru=
                                           ExtendedSpoolID=
```

Figure 29. Brief and Full Styles of Accounting-Log Sheets

Audit Sheet Examples

In Figure 30 on page 105, 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.

```
A U D I T :
U s e r I D = r o o t
N o d e I D = s t a r w a r s
J o b N a m e = / i n f o / a f p / t w o p a g e . a f p
S p o o l I D = 1 3 6 6
P r i n t e r N a m e = p s f 4 3 1 7
P a g e s P r i n t e d = 3
B i n O n e S h e e t s = 3
B i n T w o S h e e t s = 0
F o n t s U s e d = 2
R e s i d e n t F o n t s U s e d = 0
O v e r l a y s U s e d = 0
H a r d S e g m e n t s U s e d = 0
S o f t S e g m e n t s U s e d = 0
D a t a O b j e c t R e s o u r c e = 0
S t a r t D a t e = 1 1 / 0 1 / 2 0 0 0
S t a r t T i m e = 1 4 : 5 0 : 1 4
E n d D a t e = 1 1 / 0 1 / 2 0 0 0
E n d T i m e = 1 4 : 5 0 : 1 5
F i l e D a t e = 0 5 / 0 5 / 2 0 0 0
F i l e T i m e = 0 7 : 5 9 : 1 3
E x t e n d e d S p o o l I D =
```

```
A U D I T :
S y s t e m    U s e r I D = r o o t
S y s t e m    N o d e I D = s t a r w a r s
J o b N a m e = / i n f o / a f p / t w o p a g e . a f p
S p o o l I D = 1 3 6 7
P r i n t e r N a m e = p s f 4 3 1 7
P a g e s P r i n t e d = 3
B i n O n e S h e e t s = 3
B i n T w o S h e e t s = 0
F o n t s U s e d = 2
R e s i d e n t F o n t s U s e d = 0
O v e r l a y s U s e d = 0
H a r d S e g m e n t s U s e d = 0
S o f t S e g m e n t s U s e d = 0
D a t a O b j e c t R e s o u r c e s U s e d = 0
S t a r t D a t e = 1 1 / 0 1 / 2 0 0 0
S t a r t T i m e = 1 4 : 5 1 : 4 6
E n d D a t e = 1 1 / 0 1 / 2 0 0 0
E n d T i m e = 1 4 : 5 1 : 4 8
F i l e D a t e = 0 5 / 0 5 / 2 0 0 0
F i l e T i m e = 0 7 : 5 9 : 1 3

N a m e =
S u p p l i e d    U s e r i d =
S u p p l i e d    N o d e i d =
A d d r e s s 1 =
A d d r e s s 2 =
A d d r e s s 3 =
A d d r e s s 4 =
A c c o u n t =
B u i l d i n g =
D e p a r t m e n t =
P r o g r a m m e r =
R o o m =
T i t l e =
S e g m e n t i d =
C l a s s =
F o r m s =
D e s t i n a t i o n =
P a s s t h r u =
E x t e n d e d S p o o l I D =
```

IPRWAUXAU

Figure 30. Brief and Full Styles of Audit Sheets

Sequence of user-exit programs

Figure 31 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.
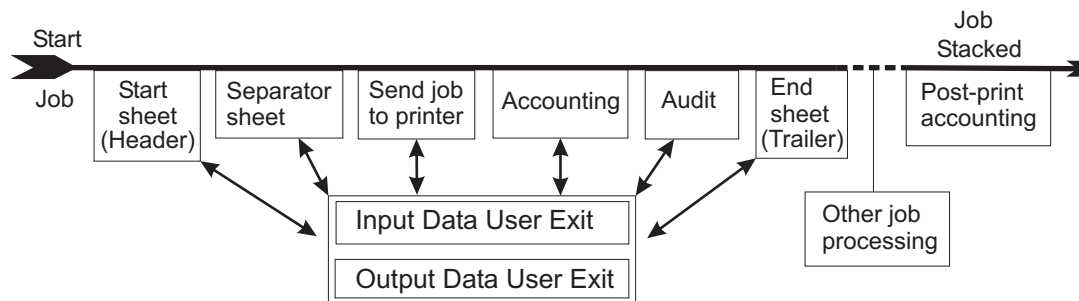
Figure 31. User exits for InfoPrint

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 Infoprint Manager Administration Interface 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 9 shows the sample executable user-exit programs that InfoPrint supplies.

Table 9. User-exit programs

Program	*Description*
Start Sheets	
/usr/lpp/psf/bin/pduxblkh	Prints a blank start sheet.
/usr/lpp/psf/bin/ainuxhdr	Prints a brief-style start sheet.
/usr/lpp/psf/bin/ainuxhdr2	Prints a full-style start sheet.
/usr/lpp/psf/bin/ainuxhdrp	Prints job ticket information on the start sheet.
/usr/lpp/psf/bin/ainuxhdrx	Prints a start sheet without vertical lines for 64*xx* & 65xx printers.
Separator Sheets	
/usr/lpp/psf/bin/pduxblks	Prints a blank separator sheet.
/usr/lpp/psf/bin/ainuxsep	Prints a brief-style separator sheet.
/usr/lpp/psf/bin/ainuxsep2	Prints a full-style separator sheet.
/usr/lpp/psf/bin/ainuxsepp	Prints job ticket information on the separator sheet.
/usr/lpp/psf/bin/ainuxsepx	Prints a separator sheet without vertical lines for 64*xx* & 65xx printers.
End Sheets	
/usr/lpp/psf/bin/pduxblkt	Prints a blank end sheet.
/usr/lpp/psf/bin/ainuxtlr	Prints a brief-style end sheet.
/usr/lpp/psf/bin/ainuxtlr2	Prints a full-style end sheet.
/usr/lpp/psf/bin/ainuxtlrp	Prints job ticket information on the end sheet.
/usr/lpp/psf/bin/ainuxtlrx	Prints an end sheet without vertical lines for 64*xx* & 65xx printers.
Accounting	
/usr/lpp/psf/bin/ainuxacc	Prints a brief-style accounting sheet.
/usr/lpp/psf/bin/ainuxacc2	Prints a full-style accounting sheet.
/usr/lpp/psf/bin/ainuxaccp	Writes accounting information to **/var/psf/podaccount.log**.
/usr/lpp/psf/bin/ainacclog	Writes accounting information to **/var/psf/accounting.log**.
Post-print Accounting	
/usr/lpp/psf/bin/ainuxjobcompletion	Writes accounting information to **/var/psf/jobcompletion.log**.
Audit	
/usr/lpp/psf/bin/ainuxaud	Prints a brief-style audit sheet.
/usr/lpp/psf/bin/ainuxaud2	Prints a full-style audit sheet.

Table 9. User-exit programs (continued)

Program	Description
/usr/lpp/psf/bin/ainuxaudp	Prints job ticket information on the audit sheet.
/usr/lpp/psf/bin/ainaudlog	Writes accounting information to **/var/psf/audit.log**.
Input Data	
/usr/lpp/psf/bin/ainuxind	Performs no tasks; use it as a model for writing your own user exit program.
Output Data	
/usr/lpp/psf/bin/ainuxout	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, Generalized 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 100. The following topics describe how you can create and configure auxiliary-sheet objects.

Creating new auxiliary-sheet objects using the pdcreate command

Create auxiliary-sheet objects from the AIX command line; you cannot create them through the InfoPrint Manager Administration Interface. 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
```

Refer to "Attributes for Auxiliary Sheet Objects" in Chapter 7 of *InfoPrint Manager: Reference* for more information.

Associating auxiliary-sheet objects with PSF printers

Use the **InfoPrint Manager Administration Interface** to associate auxiliary sheet objects with PSF printers. Start the Infoprint Manager Administration Interface and

select the printer that you want to associate with an auxiliary sheet. Then, click **Printer** → **Properties** to open the **Printer Properties** notebook. To complete this task, refer to the online help in the **Infoprint Manager Administration Interface**, starting with the topic *Using auxiliary-sheet objects*.

Associating auxiliary sheets for accounting or audit information

You can use the **InfoPrint Manager Administration Interface** to specify auxiliary sheet objects to collect accounting and audit information about jobs processed (as opposed to printed) by a selected PSF printer. Start the InfoPrint Manager Administration Interface and select the printer that you want to associate with an auxiliary sheet. Then, click **Printer** → **Properties** to open the **Printer Properties** notebook. To complete this task, refer to the online help in the **InfoPrint Manager Administration Interface**, starting with the topic *Using auxiliary-sheet objects*.

To activate the accounting user-exit program , specify one of the accounting user-exit programs names as the value for the psf-exit-program-name (for example, `psf-exit-program-name=ainacclog`) in the auxiliary sheet object associated with the destination. To activate the audit user-exit program, specify one of the audit user-exit program names as the value for the psf-exit-program-name (for example, `psf-exit-program-name=ainaudlog`) in the auxiliary sheet object associated with the destination.

Each PSF actual destination can have one, both, or neither or the two accounting methods (accounting and post-print accounting) active. If the accounting setup is intended to be the same for all PSF printers, this can all be done with one auxiliary sheet object, which can either be one you have created or the default accounting-log auxiliary sheet object supplied by InfoPrint.

Associating the post-print accounting user-exit program with an actual destination

You can use the **InfoPrint Manager Administration Interface** to specify auxiliary sheets to collect post-print accounting information about jobs processed (as opposed to printed) by a selected PSF printer. Start the InfoPrint Manager Administration Interface and select the printer that you want to associate with an auxiliary sheet. Then, click **Printer** → **Properties** to open the **Printer Properties** notebook. To complete this task, refer to the online help in the **InfoPrint Manager Administration Interface**, starting with the topic *Using auxiliary-sheet objects*. Then set the attribute of the auxiliary sheet object using the command shown in "Activating the user-exit program" on page 77.

To activate the post-print accounting exit program, specify `psf-post-print-accounting-program-name=ainuxjobcompletion` in the auxiliary sheet object associated with the destination.

Each PSF printer actual destination can have one, both, or neither of the two accounting methods (accounting and post-print accounting) active. If the accounting setup is intended to be the same for all PSF printers, this can all be done with one auxiliary sheet object, which can either be one you have created or the default accounting-log auxiliary sheet object supplied by InfoPrint.

Associating an input data user-exit program with an actual destination

You can use the input data user-exit program to monitor the contents of the data stream coming into InfoPrint Manager from the **InfoPrint Manager Administration Interface**. Start theInfoPrint Manager Administration Interface and select the printer that you want to associate with an auxiliary sheet. Then, click **Printer → Properties** to open the **Printer Properties** notebook. To complete this task, refer to the online help in the **InfoPrint Manager Administration Interface**, starting with the topic *Using auxiliary-sheet objects*.

Associating an output data user-exit program with an actual destination

You can use the output data user-exit program to monitor the contents of the data stream created by InfoPrint from the **Infoprint Manager Administration Interface**. Start the InfoPrint Manager Administration Interface and select the printer that you want to associate with an auxiliary sheet. Then, click **Printer → Properties** to open the **Printer Properties** notebook. To complete this task, refer to the online help in the **Infoprint Manager Administration Interface**, starting with the topic *Using auxiliary-sheet objects*.

Using Interrupt Message Pages

Interrupt Message Pages (IMPs) provide a way for printer operators to find the cause and location of a printing problem. IMPs are pages that are similar to the message pages that print at the end of a print job, but IMPs are printed at the point of an error where a possible data loss has occurred. This will allow the operators to make sure that no data is missing, or to compensate for issues during the post-processing phase of the print job.

IMPs are for use with PSF TCP/IP attached printers using the PSF DSS or the Distributed Print Function (DPF). They are associated with an Actual Destination (AD), and cannot be changed for each job. IMPs will not work with other PSF attachment types or PSF Direct. IMPs and finishing processes are incompatible and we do not recommend combining these functions.

Scenario/Condition	Produce interrupt message page?
Pause/Resume job	Yes
Pause/Resume printer	No
AD shutdown - *Synchronous* (same as pause job)	Yes
AD shutdown - *Now* (stop as soon as possible)	No
Recoverable data and hardware exceptions (including paper jams, pre-/post-processor exceptions)	Yes
Back/Forward spacing	Yes
Back/Forward spacing with no pages committed	No
Print a page range	No

Cancel job
  - Pdrm/pddelete
  - Cancel button on the printer
	No
	Yes

Scenario/Condition	Produce interrupt message page?
Stop button on the printer	No - on **ready/not ready**
Communication lost	No

Activating IMPs

Follow this procedure to enable a printer to produce IMPs:

1. Open the InfoPrint Manager Administration GUI.
2. Right click on the printer that you want to enable and select **Properties**. The properties notebook will open for that printer.
3. Select the **Auxiliary/Separator Sheets** tab.
4. Click the **Yes** button next to **Activate interrupt message page**.
5. If you want to use a form definition that is different than the default, enter the name of the definition in the **Interrupt message page form definition** entry field.
6. If you want to use page marks, click the **Yes** button next to **Interrupt message page edge marks**. The **Interrupt message page edge marks** setting prints a mark on the edge of the forms so that the mark is visible in a stack of paper when viewed from the side. Continuous forms printers that are folding the forms will print the mark where the fold in the pages occurs.

IMPs have a default message page form definition that is already assigned and is designed to print on all paper sizes. This form definition is named **F1MG0110**, and has the following default settings:

- One copy
- No overlay
- Use paper from bin 1

There is also a new form definition named **F1MGIMP** that is identical to the default form definition, except that it specifies offset stacking.

You may create your own form definition, but be aware that doing so may alter the ability of your form definition to print on all paper sizes. To create a form definition, you must use the Page Printer Formatting Aid (PPFA) feature. See the *InfoPrint Page Printer Formatting Aid: User's Guide*, S550-0801, for more information.

If you are creating your own form definition and wish to use offset stacking, you can use PPFA and specify **JOG YES** within the form definition.

Allowing the auxiliary-sheet-selection job attribute with the BSD DSS

BSD actual destinations do not generate auxiliary sheets. The system where the printer device is attached may create auxiliary sheets, but you cannot control them using InfoPrint Manager attributes. For example, an auxiliary sheet, such as a header sheet, could be printed if the job was sent to a remote queue that is actually printing auxiliary sheets.

BSD actual destinations do not support the **auxiliary-sheet-selection** attribute. Many print command options generate an **auxiliary-sheet-selection** attribute, and the BSD actual destinations will reject these jobs. Some examples for the AIX client follow:

Command	Action
`qprt -Pbsdld -Bnn file`	Sets **auxiliary-sheet-selection=none** in the job.
`lpr -Pbsdld file`	Sets **auxiliary-sheet-selection=start** in the job.
`lpr -Pbsdld -h file`	Sets **auxiliary-sheet-selection=none** in the job.

You can use the following procedure to allow BSD DSS actual destinations to accept jobs with an **auxiliary-sheet-selection** attribute. Although this procedure allows BSD DSS destinations to accept jobs with the **auxiliary-sheet-selection** specified, the BSD DSS does not process or print auxiliary sheets.

1. Use the **pddisable** command to disable the BSD actual destination.
2. Issue the following **pdset** command:

   ```
   pdset -cp -x "auxiliary-sheet-selections-supported=none
                 job-attribute-supported+=auxiliary-sheet-selection" bsdad
   ```

   where `bsdad` is the BSD actual destination on which you are working.
3. Determine the queue associated with the destination, and then issue the following **pdset** command to unregister the actual destination from its queue:

   ```
   psdet -cp -x "associated-queue==" bsdad
   ```
4. Issue the following **pdset** command to re-register the actual destination to its queue:

   ```
   psdet -cp -x "associated-queue=bsdq" bsdad
   ```

   where bsdq is the queue identified in the previous step. This command tells the queue about the new actual destination attribute settings so it can schedule jobs correctly.
5. Use the **pdenable** command to enable the BSD actual destination.

Note: You could modify this procedure to specify other values for **auxiliary-sheet-selection** since the BSD DSS ignores these values as well.

Chapter 8. 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, Generalized FAX, and Email DSSs). For more information, see "Working with PSF accounting, post-print accounting, and auditing user-exit programs" on page 118.

  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 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* or the **pdaccount** man page.

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 `rwx` (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.

We recommend 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. InfoPrint Manager **does not** log jobs that are not completed when the printer is shutdown because of a printer problem, but puts them back in the queue.

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.

  Note: If your physical printer has a time-out setting, make sure it is disabled when you specify **True** or **Yes** for **wait-for-job-completion**

- 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.

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 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.

Metacode DSS

The page count recorded in the accounting log for destinations using the Metacode 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.

Generalized Fax DSS

The page count recorded in the accounting log for destinations using the Generalized Fax DSS reflects the number of pages generated and sent to the destination by InfoPrint Manager. It is not based on the number of pages processed by the fax machine.

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.

Working with PSF accounting, post-print accounting, and auditing user-exit programs

The accounting, post-print accounting, and audit PSF DSS user-exit programs record data about jobs. For each job printed, InfoPrint Manager activates the accounting and audit user-exit programs *before* processing the print job's trailer page. InfoPrint Manager activates the post-print accounting user-exit program *when* the job stacks. More than one InfoPrint Manager actual destination can use the same user-exit program to write into the same log file.

What do these user-exit programs provide?

The accounting and auditing user-exit programs record statistical data on jobs processed by InfoPrint actual destinations. Table 10 shows the most common accounting and auditing user-exit programs, the files where they record data, and the types of data that they record.

Table 10. PSF DSS accounting, post-print, and audit user-exit programs

Program	Log File	Records
/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

Program	Log File	Records
/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/ ainuxjobcompletion	/var/psf/ jobcompletion.log	Job submitter, job ID, job name, spool ID, actual destination, global ID, user pages stacked by tray, user sheets stacked by tray, actual pages stacked by tray, actual sheets stacked by tray, copies requested, fonts and resident fonts used, overlays used, hard and soft segments used, processing start and stop date/time, job completion date/time, file date/time, extended user ID, extended job ID, address, account, building, department, programmer, room, title, job ticket name
/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
Note: /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.

The **ainuxjobcompletion** exit is called when the printer reports back to InfoPrint Manager that all of the pages for a job have printed. This includes a partial job (due to a datastream error or because the job was paused/canceled or forward-spaced) and also any extra pages produced as a result of a backspace or other recovery. For the last job that prints on a continuous forms printer, the exit is not called until an NPRO (non-process run out) is done, either by an operator or automatically by InfoPrint Manager.

Only one record is written for a job that prints, unless a job is paused. In this case, a record is written for the part of the job that was printed up to the pause point; later, if the job is resumed another record is written for the rest of the job.

Note: If InfoPrint Manager does not receive feedback from the printer that all pages have stacked, such as when the printer is shut down in the middle of a job or when an error such as a server failure occurs, no record is written.

A new procedure has been added to the Infoprint Manager Administration GUI to show you how to activate the default PSF **ainuxjobcompletion** accounting logs.

The **ainuxjobcompletion** accounting exit interface can be used for PSF-driven IPDS printers. It provides actual (versus projected) accounting data and provides additional information about completed print jobs.

Customers who migrate from an existing V4.1 InfoPrint Manager server to InfoPrint Manager V4.2 will continue to find the previous accounting exit interface intact. Accounting programs that count on the previous accounting interface, which includes the InfoPrint supplied samples, will function without modification.

Customers installing a InfoPrint Manager V4.2 server for the first time will see the post-print accounting exit activated and the accounting data will be written to /var/psf/jobcompletion.log.

The intent is to minimize migration issues for existing customers, but to start new customers out with the preferred accounting exit. The default installation for new machines will not activate both accounting exits. However, when V4.2 is installed, both new and migrated customers can choose to have the old, preferred, or both accounting exits active.

If a migrating installation wants to activate the preferred (new) exit, the administrator must set the **psf-post-print-accounting-program-name** auxiliary sheet attribute in the appropriate auxiliary sheet object to provide the name of either the InfoPrintsupplied sample exit or a custom version of the preferred exit. The administrator may also choose to deactivate the old exit by resetting the value of the **psf-exit-program-name** auxiliary attribute in the appropriate auxiliary sheet object to **<not set>**.

If a new installation wants to deactivate the preferred exit and instead run the old exit, the administrator must reset the **psf-post-print-accounting-program-name** auxiliary sheet attribute in the appropriate auxiliary sheet object to **<not set>**. The administrator may also choose to activate the old exit by setting the value of the **psf-post-print-accounting-program-name** auxiliary sheet attribute in the appropriate sheet object to the name of either the InfoPrint supplied sample exit or a custom version of the old exit.

In both cases, the administrator may also choose to have both exits active by setting the **psf-exit-program-name** and the **psf-post-print-accounting-program-name** auxiliary sheet attributes to the names of the two accounting programs (old and preferred). The administrator may also choose to deactivate both exits by leaving both attributes unset.

How do you format PSF DSS accounting, post-print 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.

ainupod3
> Reports times and pages printed by the job submitter from **podaccount.log**.

ainurpt1

Reports accounting data stored in **accounting.log**, sorted by actual destination.

ainurpt2

Reports accounting data stored in **accounting.log**, sorted by job submitter.

ainurpt3

Reports times and pages printed by the job submitter from **accounting.log**.

ainurpt4

Reports audit data stored in **audit.log**, sorted by actual destination.

ainurpt5

Reports audit data stored in **audit.log**, sorted by job submitter.

ainurpt6

Reports times and pages printed by the job submitter from **audit.log**.

ainurpt7

Reports post-printing accounting data stored in **jobcompletion.log**, sorted by actual destination.

ainurpt8

Reports summary post-printing accounting data stored in **jobcompletion.log**, sorted by job submitter.

ainurpt9

Reports detailed entries of times and pages printed for a specific job submitter in **jobcompletion.log**.

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.

We recommend 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 9. Creating and managing resource-context objects

Resource-context objects identify the locations of different types of Advanced Function Presentation (AFP) resources that jobs sent to PSF physical printers 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 changes, you only need to modify the path name specified in the corresponding resource-context object.

The different types of AFP resources are:

Color management resources (CMRs)
> CMRs are the foundation of color management in AFP print systems. They provide all the color management information, such as ICC profiles and halftones, that an AFP system needs to process a print job and maintain consistent color from one device to another.
>
> **Notes:**
> 1. CMRs are stored in resource libraries that use resource access tables (RATs). When you update an existing CMR or add a new CMR to a resource library, the RAT is updated. You must restart PSF so the changes take effect.
> 2. CMRs are considered data objects for accounting purposes.
> 3. For retention of resources across print jobs, CMRs are counted as part of the **maximum-presentation-object-containers-to-keep**.

Data object font resources
> A data object font resource can be an OpenType font collection, an OpenType set of linked fonts, or OpenType fonts that are installed in one or more directories on your InfoPrint Manager server. Data object font resources are the only fonts registered through a RAT that resides in the same directory as the fonts. For more information about using data object font resources with InfoPrint Manager, see "Using OpenType Fonts" on page 268.

Data objects
> Data objects can be IOCA files or types of files natively supported by a particular model of printer (for example, an EPS file on an InfoPrint Color 130 Plus). In addition, if you use the transforms that come with InfoPrint Manager to convert objects into AFP first, these non-native types of files can be used as data objects. In InfoPrint Manager, data objects are grouped with BCOCA and GOCA objects, and they are collectively known as *presentation object containers*.
>
> **Note:** Data objects are stored in resource libraries that use RATs. When you update an existing data object or add a new data object to a resource library, the RAT is updated. You must restart PSF so the changes take effect.

Fonts A font is a single size and typeface in a particular type family, including letters, numerals, punctuation marks, special characters, and ligatures.

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.

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 **AFP Resources** tab of the actual destination and default document attributes notebooks in the InfoPrint Manager Administration GUI, or the **Command Prompt** window from an InfoPrint Manager for Windows server, 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.

You may also purchase additional resources or even create your own custom resources. To create page definitions and form definitions, you can purchase the Page Printer Formatting Aid (PPFA) for Windows, which is an optional feature of InfoPrint Manager for Windows.

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**, **qprt**, 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.

   If you are using OpenType Fonts, you must allow the Infoprint Fonts product to install its resource access table for keeping track of these fonts in the default directory. On an InfoPrint Manager Windows server, if you change the location of this table from the folder where it was installed, you can update the global search path on your Windows system with the global resource path for these fonts.

7. The paths specified by the resource-context attributes of the actual destination.
8. For fonts, the directory where your fonts are installed.

Once a resource is located, the search ends, and the located resource is used to process the job, as long as the user can access the resource. If InfoPrint Manager ultimately cannot find a required resource, it prints an error message advising you of the missing resource. InfoPrint Manager reports that the job completed successfully.

If the only AFP resources you use are the AFP resources that shipped with InfoPrint Manager, there is no need to use resource-context objects. All of your resources are located automatically because these resources reside in the **reslib**, **fontlib**, and font directories described above. If, on the other hand, you have custom AFP resources, make sure that you *do not* store them in the **reslib**, **fontlib**, or font directories listed. Any custom resources stored in these locations may be corrupted by installing, uninstalling, or servicing the software. Store any custom AFP resources in a directory outside these locations and use resource-context objects to provide access to them.

When InfoPrint Manager puts together the total of all resource contexts for a particular resource type, InfoPrint Manager tries this list of extensions in order while searching each directory for a particular resource. For example, InfoPrint Manager is searching for a 300–pel raster font named C0H20000 and the following conditions are true:

- Document attributes are set to `resource-context-font=\myfonts`
- `resource-context=\all_resources`
- The **$PSFPATH** environment variable has not been set.
- The **resource-context-font** actual destination attribute has not been set.

A list of files similar to the following would be checked in sequence:

1. `x:\myfonts\C0H20000.300`
2. `x:\myfonts\C0H20000.FONT300`
3. `x:\myfonts\C0H20000`
4. `x:\all_resources\C0H20000.300`
5. `x:\all_resources\C0H20000.FONT300`
6. `x:\all_resources\C0H20000`
7. With InfoPrint Manager for AIX:
   a. The `/usr/lpp/psf/reslib` directory.
   b. For fonts, the `/usr/lpp/afpfonts` directory.
   c. For fonts, the `/usr/lpp/psf/fontlib` directory.

Once InfoPrint Manager finds a matching file, the search ends.

If InfoPrint Manager cannot find the resource in any of the paths, it stops the job and prints an error message at the end of the job.

CMRs and data objects search order

The search order for CMRs and data objects is different from the order used for other AFP resources.

CMRs and data objects must reside in the same directory as the RAT where the resources are identified. That is, the CMR RAT and the data object RAT can be located in different directories, but the resources that are associated with the specific RAT must reside in the same directory as the RAT.

The InfoPrint 5000 printer Models AS1 and AD1/2 and InfoPrint 4100 printers support CMRs and data objects.

The search order for CMRs

InfoPrint Manager searches for CMRs in different locations and in a different order than it uses for other AFP resources.

InfoPrint Manager searches for CMRs in these locations in this order:

1. Inline objects
2. The path specified by the **resource-context-presentation-object-container** document attribute
3. The path specified by the **resource-context** document attribute
4. The path specified by the **PSFPATH** environment variable
5. The path specified by the **resource-context-presentation-object-container** actual destination attribute
6. The path specified by the **resource-context** actual destination attribute
7. The system dependant library:

    For AIX, `/usr/afp/reslib/legacy`

Notes:

1. InfoPrint searches for CMRs using the UTF-16 name provided in the datastream.
2. If a CMR changes after a job prints, recycle the actual destination by disabling and enabling the connection.

The search order for data objects

InfoPrint Manager searches for data objects in different locations and in a different order than it uses for other AFP resources.

InfoPrint Manager searches for data objects in these locations in this order:

1. Inline objects
2. The path specified by the **resource-context-page-segment** document attribute if object is IOCA that is not installed in a data object RAT
3. The path specified by the **resource-context-presentation-object-container** document attribute
4. The path specified by the **resource-context** document attribute
5. The path specified by the **PSFPATH** environment variable

6. The path specified by the **resource-context-presentation-object-container** actual destination attribute
7. The path specified by the **resource-context** actual destination attribute
8. The system dependant library:

   For AIX, `/usr/afp/reslib/legacy`

Notes:

1. InfoPrint Manager searches for data objects using the UTF-16 name and the eight-character name provided in the datastream.
2. If a data object changes after a job prints, recycle the actual destination by disabling and enabling the connection.

Reuse of CMRs and data objects across printer jobs

Using CMRs and data objects in more than one print job can improve printer performance. InfoPrint Manager includes two actual destination attributes that you can use to specify reuse: **maximum-presentation-object-containers-to-keep** and **capture-inline-cmr-resources**.

If you use the same resources (such as company logos) in different print jobs, you can improve print performance by storing those resources on the printer.

Use the **maximum-presentation-object-containers-to-keep** actual destination attribute to specify the maximum number of CMRs and data objects to store in the memory of the printer device between jobs. The default value is 100 objects. Both CMRs and data objects are included in this count.

The printers control the actual retention of resources based on the value of the **maximum-presentation-object-containers-to-keep** actual destination attribute and the available resources downloaded to the printer.

Note: If the printer is reset, the printer memory is cleared.

If you include CMRs inline with your print jobs, you can use the **capture-inline-cmr-resources** actual destination attribute to indicate whether inline CMRs can be captured and reused by PSF TCP/IP or PSF Channel printers. Capturing a CMR means the resource is downloaded to the printer and remains resident in the printer memory for future reuse. The default for this attribute is **false** (not active).

File extensions for resources

This table contains file extensions for specific types of resources and lists the order that the extensions are tried by InfoPrint when searching for that resource.

Type of Resource	File Extensions Searched (see note)
BCOCA (bar code) objects	No file extension
Code pages	1. No file extension 2. **FONT3820** 3. **FONT38PP** 4. **CDP** 5. **FONT300**

Type of Resource	*File Extensions Searched (see note)*
Coded fonts	1. No file extension 2. **FONT3820** 3. **FONT38PP** 4. **CFT** 5. **FONT300**
Font character sets, 240-pel resolution	1. No file extension 2. **240** 3. **FONT3820** 4. **FONT38PP** 5. **CFT** 6. **CDP**
Font character sets, 300-pel resolution	1. No file extension 2. **300** 3. **FONT300** 4. **CFT** 5. **CDP**
Outline fonts	1. No file extension 2. **OLN** 3. **FONTOLN** 4. **CFT** 5. **CDP**
TrueType and OpenType fonts, CMRs, and data object resources	Entire file name, including extension; comes from the Resources Access Tables (RATs) creaetd by the AFP Resource Installer. If a CMR or a data object RAT is altered, PSF must be restarted for the changes to take effect.
Form definitions	1. No file extension 2. **FDEF3820** 3. **FDEF38PP** 4. **FDE** 5. **FIL**
BCOCA (bar code) objects	1. No file extension 2. **OBJ** 3. **OBJECT**
GOCA (graphics) objects	1. No file extension 2. **OBJ** 3. **OBJECT**
IOCA (IO image) objects	1. No file extension 2. **OBJ** 3. **OBJECT**
MO:DCA Objects	1. No file extension 2. **OBJ** 3. **OBJECT**

Type of Resource	File Extensions Searched (see note)
Overlays	1. No file extension 2. **OVLY3820** 3. **OVLY38PP** 4. **OVL** 5. **OLY** 6. **OVR**
Page definitions	1. No file extension 2. **PDEF3820** 3. **PDEF38PP** 4. **PDE**
Page segments	1. No file extension 2. **PSEG3820** 3. **PSEG38PP** 4. **PSG** 5. **PSE**
Color mapping table	1. No file extension 2. **SETUP** 3. **SET**
Presentation object container For data object resources not installed in a Resource Access Table (RAT).	1. No file extension 2. **DOR**
Setup data	1. No file extension 2. **SETUP** 3. **SET** 4. **COMSETUP**
Note: All file extensions must be in upper case.	

Processing resources installed with Resource Access Tables

Before AFP color management was added to InfoPrint Manager, **line2afp** resource names were limited to eight characters plus an extension. Now, with changes to MO:DCA architecture and the use of Resource Access Tables (RATs), **line2afp** no longer has this limitation on AIX or Windows systems.

A RAT is an index of a resource directory; it maps a resource name specified in the MO:DCA-P data stream to information used to find and process the resource. When you install resource using the AFP Resource Installer or a similar application, a RAT is created automatically. The resources that are installed using the AFP Resource Installer include:

- TrueType and OpenType fonts
- Color management resources (CMRs)
- Data objects

In order for **line2afp** to process these resources, you must:

1. Use the InfoPrint AFP Resource Installer or a similar product to install the resources and create RATs in the appropriate resource directories on your system.
2. When invoking **line2afp**, use these parameters on AIX and Windows systems to specify the path names where the RATs and resources reside:

Parameter	Resource Type
FONTPATH	TrueType and OpenType fonts
OBJCONDDD, RESLIB, and USERLIB	Object containers (including data objects) and CMRs
USERPATH	Any RAT-installed resource

3. Modify your application to include the resources in a page definition, form definition, or Map Data Resource (MDR) structured field. Refer to *InfoPrint Page Printer Formatting Aid for Windows: User's Guide*, S550-0801, for more information about including resources. You can use the RESTYPE parameter with **line2afp** to control what type of resources are included in the resource type.

How InfoPrint Manager provides resource access for PSF DSS printers

By default, InfoPrint allows all users to access the resource by setting all resource permissions to **-r--r--r--**. The instance of the program that attempts to access a resource is created with an id of **root** and a group of **printq**.

PSF DSS printers limit resource access based on the userid of the person that submitted the job. The userid must have a local ID defined, or InfoPrint uses anonymous resource access (requiring a minimum of **-r--r--r--** access permissions to access the resource).

Access for PSF DSS resources is granted if the userid:
1. Exists locally (in the local **/etc/passwd** file), and they are a member of the **system** group.
2. Owns the resource.
3. Can access the resource with group permissions.
4. Can access the resource because global access is allowed for that resource.

If all these checks fail, the userid cannot access the resource and InfoPrint Manager issues an error message indicating that the resource could not be found.

Creating a new resource-context object

You create resource-context objects from the AIX command line; you cannot create them through the InfoPrint Manager Administration GUI.

To create a new resource-context object from the command line, type a **pdcreate** command using **-c resource-context** and typing:
1. The **context-address**
2. The server name
3. The resource-context object name

For example, to create a resource-context object named `Resfont1` contained in server `Server1` that identifies `x:\resource\fonts\group1` as the **context-address** or directory containing AFP font resources, enter the command:

```
pdcreate -c resource-context -x "context-address=/resource/fonts/group1"
        Server1:Resfont1
```

Note:

1. 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 **Printer Properties** window. Two servers can each contain a resource-context object with the same name, but possibly with different values for their attributes.

2. InfoPrint uses **resource-context** object names as values for the lists associated with the fields in the actual destination attributes notebook (**Printer Properties** window) 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 more information about the attributes used in creating resource-context objects, refer to "Attributes for Resource Contexts" in the *InfoPrint Manager: Reference*.

Changing a directory path for a resource-context object

If you need to change the path to a resource-context object, 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

You can use either the InfoPrint Manager Administration GUI or the AIX command line to assign resource-context objects to a PSF actual destination, fax destination, or e-mail destination.

Using the AIX command line

To assign resource-context objects to a PSF actual destination, 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 actual destination `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 Manager 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

You can use either the InfoPrint Manager Administration GUI or the AIX command line to assign resource-context objects to a default-document object.

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 10. Using InfoPrint Manager notifications

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 134 for more information.

Delivery method
> How the messages are delivered. See "Delivery method and delivery address" on page 134 for more information.

Delivery address
> Where the messages are sent. See "Delivery method and delivery address" on page 134 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 need only 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 138 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 11 on page 135 lists the delivery methods, along with descriptions and how to set the delivery address for each type. [1]

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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 11. InfoPrint notification delivery method characteristics

Delivery Method	Description	Delivery address
message Message is the default delivery method for all objects.	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.	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 **Settings** 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.
electronic-mail (synonyms: **e-mail**, **email**)	Sends an E-mail to the address listed in the delivery address,	The E-mail address that you want notification messages to be sent to. For example, **kjones@printerco.com**.
exit	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 137 for more information.	The full path to the notification exit program or script (with hard-coded arguments, if any).
delivery-method-wireless	Sends notifications to wireless devices, such as pagers, cellular phones, palm pilots, and laptop computers.	Because wireless notifications are delivered as emails, you must set both the **smtp-server-host** and the **smtp-server-port** server attributes on this InfoPrint server. If your InfoPrint server resides behind a firewall, you may have to configure your SMTP server. For information on this task, refer to *Configuring and Using InfoPrint Email* on the web at **http://www.infoprint.com**. Note that this URL has been divided so it prints correctly in the text.

Table 11. InfoPrint notification delivery method characteristics (continued)

Delivery Method	Description	Delivery address
file	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.	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.
file-add-to	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.	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.
job-log Only valid for jobs.	Writes messages into the **job-log** attribute of the job. To see the messages, issue the pdls command for the job-log attribute on the job you want to know about.	No value needed.
none	Does not send any notifications; turns notification off.	No value needed.

Working with Select notifications

By default when you submit a job using InfoPrint Select, a notification profile is sent with the job. If you have the Select message windows running when you submit a print job using InfoPrint Select, notifications are requested. If the Select message window is not running, notifications are not requested. When notifications are requested, they are delivered by e-mail. InfoPrint Select does not use the standard e-mail port for notifications to avoid conflict with other SMTP servers. If you have a conflict with the port that Select is using for notification, you can choose another port by following: **Start → Programs → Infoprint Select → Infoprint Select Notification → Infoprint Manager Message Port**, and entering another port.

The InfoPrint Select Notification message window usually starts automatically when Windows first loads, but if you need to start the Notification message Window at another time, go to **Start → Programs → Infoprint Select → Infoprint Select Notification**.

To turn off the Notification message window, click the **X** in the upper right corner of the screen and then click **OK** on the warning message.

Note: If you receive a communication error when using the Select Message Window with Windows XP with Service Pack 2 or Windows 2003 with Service Pack 1, you may have to include `ipnotify.exe` on the **Exceptions** tab of the **Windows Firewall** dialog.

Setting up your own InfoPrint Select notification profile:

The Select notification profile overrides any notification settings that you configure in a default job. If you don't want to use the Select notification profile, use the appropriate procedure for your operating system:

- **Windows XP**
  1. On the Windows system that InfoPrint Select is installed on, right click on **My Computer** and select **Properties**.
  2. Select the **Advanced** tab, and click the **Environment Variables** button.
  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 12. Default notification profile settings

Object	Events
Actual destination	• destination-needs-administrator • destination-needs-attention • destination-needs-operator • destination-timed-out • object-cleaned • object-deleted
Default Job	No defaults set. Refer to "Using notification profiles with default jobs" on page 139 for more information.

Table 12. Default notification profile settings (continued)

Job	• destination-needs-attention • destination-needs-operator • destinations-not-ready-for-job • document-aborted-by-destination • document-aborted-by-server • document-cancelled-at-destination • job-aborted-by-server • job-cancelled-by-operator • job-cannot-be-scheduled • job-completed • past-discard-time
Logical destination	• object-cleaned • object-deleted
Queue	• object-cleaned • object-deleted • queue-backlogged
Server	• internal-server-error • low-on-memory • memory-exhausted • object-cleaned • object-deleted • out-of-disk-space • out-of-dpf-haids • out-of-dpf-job-numbers • out-of-dpf-raids • sapcbd-down • sapconnect-down • 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 12 on page 138. (If you submit jobs using InfoPrint Select, the default notification profile is different. Refer to "Working with Select notifications" on page 136 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 "Working with Select notifications" on page 136 for information about overriding Select notifications.

Changing notification profiles

For jobs, default jobs, servers, queues, and actual destinations

You can use the properties notebooks in the InfoPrint Manager Administration GUI to change notification profiles for jobs, default jobs, servers, queues, 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.infoprint.com
Subject: 5010-192 Message from InfoPrint server: MainServer
********
[05/30/97 07:26:381]  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**, **message**, **exit** and **wireless** 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 11 on page 135 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 (whether or not a job is currently being printed) 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 must resume the actual destination and the job prints. This function should be set for the first in a series of jobs, once you are certain that there are no jobs printing on the printer. Because it compels InfoPrint Manager to pause the printer for every job with `job-start-wait=true`, you should not specify this value on the default job.

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.

Chapter 11. 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 adminstrator 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 Managment 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 Manager Administration Interface running. If the ticket expires while the InfoPrint Manager Administration Interface 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 lsdceseccert** 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.

```
                          Security
Move cursor to desired item and press Enter.
  Access Control for Destinations
  Access Control for Queues
  Access Control for Servers
1=Help              F2=Refresh          F3=Cancel          F8=Image
F9=Shell            F10=Exit            Enter=Do
```

Figure 32. SMIT Security panel

3. Select **Access Control for Servers**. The `Access Control for Servers` panel is displayed.

```
                    Access Control for Servers
Move cursor to desired item and press Enter.
  Show Access Control List
  Change Access Control List
  Remove Access Control List Entry
1=Help              F2=Refresh          F3=Cancel         F8=Image
F9=Shell            F10=Exit            Enter=Do
```

Figure 33. 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 34 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 34. 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 InfoPrintcell 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 InfoPrintenvironment 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.

```
                              Name Spaces
Move cursor to desired item and press Enter.
  Show the Default Infoprint Name Space
  Change the Default Infoprint Name Space
  List Additional Infoprint Name Spaces
  Add an Additional Infoprint Name Space
  Remove an Additional Infoprint Name Space
1=Help                F2=Refresh              F3=Cancel              F8=Image
F9=Shell              F10=Exit                Enter=Do
```

Figure 35. SMIT Name Spaces panel

3. Select **Add an Additional Infoprint Name Space**. The Add an Additional Infoprint Name Space panel is displayed.

```
                 Add an Additional Infoprint Name Space
Type or select values in entry fields.
Press Enter AFTER making all desired changes.
                                                   ^Entry Fields|
* Additional Name Space to Add                     ^|
1=Help                F2=Refresh              F3=Cancel              F4=List
F5=Reset              F6=Command              F7=Edit                F8=Image
F9=Shell              F10=Exit                Enter=Do
```

Figure 36. 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.

```
                         Network Interfaces
Move cursor to desired item and press Enter.
  List Network Interfaces Ignored by Infoprint
  Start Ignoring a Network Interface
  Stop Ignoring a Network Interface
1=Help                F2=Refresh              F3=Cancel              F8=Image
F9=Shell              F10=Exit                Enter=Do
```

Figure 37. SMIT Network Interfaces panel

3. Select **Start Ignoring a Network Interface**. The Start Ignoring a Network Interface panel is displayed.

```
                       Start Ignoring a Network Interface
Type or select values in entry fields.
Press Enter AFTER making all desired changes.
                                                    ^Entry Fields|

* Interface to Ignore                                           +
1=Help              F2=Refresh          F3=Cancel          F4=List
F5=Reset            F6=Command          F7=Edit           F8=Image
F9=Shell            F10=Exit            Enter=Do
```

Figure 38. 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 1, "Creating and managing servers," on page 3 for instructions.
2. Create a printer operator group for each room. See "Creating a DCE group" on page 144 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 146 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 144 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. Type the following command at the AIX command line: `pdset -c dest -x "authorize-job=true"` *ldname*, where *ldname* refers to the name of the logical destination that sends jobs to the actual destination that represents the output device. 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. Refer to "Creating a DCE group" on page 144 for more information.

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 of the functions of the output device and the other to support only the functions that everyone is permitted to use.

   a. Create one logical destination with values of **1** and **2** for the **Sides Supported** attribute field and a second logical destination with a value of **2** for the **Sides Supported** field.

   b. Associate an **initial-value-document** with the logical destination, and specify `sides=2`.

   This prevents jobs without sides specified from passing through the logical destination and using the printer default.

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.

Chapter 12. Managing non-DCE security for InfoPrint Manager for AIX

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**, **write**, and **delete**. The levels provide the following types of access:

- **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 her **read** permission, she can send her print jobs to it and can open the "print2ld" object to see its properties. However, she cannot make changes to those properties. If she tried to change any of them or tried to delete the destination, she would receive an error message. If you decide that userA needs to be able to do more and give her **write** permission as well, she will be able to change the properties of "print2ld," but still will not be able to delete it.

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 sub-sets of objects by using object-level ACLs.

All InfoPrint object names, including security groups and ACL members, are case sensitive.

For operations, there is only one level of permission: **read**. If a user has **read** permission, he can perform that action; if he does not, he 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 operation **Reorder Job** to allow him to do his job. On the other hand, userC submits print jobs from his office workstation and doesn't like to wait for the jobs ahead of his in the queue to print. If you want to prevent him from moving jobs, don't put him on the ACL for the **Reorder Job** operation. When he tries to move his job to the top of the queue, the action will be 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 the Management Console by selecting the **Security-ACL-Operations** item in the left pane. 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 permission (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 that object if he has both **read** permission for the operation and the appropriate level of permission for the object. If the object is not protected, only users in the default admin or oper groups are able to perform the action. If a user is added to a non-standard group, they are not able to perform the action unless they are the owner of the job in question.

If the object has an ACL the permission needed depends on the operation. For example, **List** requires read, **Set** requires write, and **Delete** requires delete.

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*, 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 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:

- **acl_admin**

  Users who have authority to manage security by changing access control lists and groups. The default members are **administrator** and the user who was logged on when InfoPrint Manager was installed.

- **admin**

  Users who have administrator authority. The default members are **administrator** and the user who was logged on when InfoPrint Manager was installed.

- **oper**

  Users who have operator authority. The default member is **administrator**.

  Notes:

  1. There is another security group called **JobTicketer** that is created if you have installed InfoPrint Job Ticketer as part of the Print-on-Demand feature. Unlike

the other groups, there are no default users created during installation. See *InfoPrint Job Ticketer: Administrator's Guide* for more information.

2. You can modify these groups as needed. In the example above, 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.

3. AIX is case sensitive when it comes to user IDs, whereas Windows is not. When you are using AIX and Windows machines together, make sure that you take this into consideration. For example, you might want to add both **Administrator** and **administrator** to your ACLs.

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** as 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 example above, 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.

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 person 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—you can use wildcarding instead. When you use wildcarding, you replace the computer name or user ID with the wildcard character (*) when you add a member to an ACL or Security Group. The wildcard character stands for "any computer" or "any user ID." 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 ***@computer**, 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 System will appear as an option. By following the menu item to the right with your cursor, you can navigate the following directory structure of menu choices:

Tab #1	Tab #2	Tab #3	Choices
Infoprint Printing Systems→	Security→	Groups→	Add Group
			Show Group
			Add User to Group

| | | | | Remove User from Group |
| | | | | |

Tab #1	**Tab #2**	**Tab #3**	**Tab #4**	**Choices**
Infoprint Printing Systems→	Security→	Access Control→	Operations→	Show Access Control List
			Servers→	Change Access Control List
			Destinations→	Remove Access Control List
			Queues→	

Note that the following three groups are created for you by default and display when you choose the **Groups→Show Group** option: **acl_admin, admin, and oper**. The root user is placed in the **acl_admin** group. To have the access necessary to modify the security characteristics, the user must be a member of the **acl_admin** group. There is another security group called **JobTicketer** that is created if you have installed InfoPrint Job Ticketer as part of the Print-on-Demand feature. Unlike the other groups, there are no default users created during installation. See *InfoPrint Job Ticketer: Administrator's Guide* for more information.

For specific information supporting a menu choice, press **F1** for help.

Chapter 13. Setting InfoPrint Manager and AIX environment variables

InfoPrint Manager 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 interface

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 Manager environment variables and AIX environment variables that affect InfoPrint Manager.

Preparing to work with InfoPrint Manager 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 interface 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 interface.

/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 Manager environment variables in the **/etc/environment** file or in the InfoPrint SMIT operator's interface 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 Manager 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 Manager directories in the value you specify, you will not have automatic access to InfoPrint Manager.
  - 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 Manager uses default values for some InfoPrint Manager 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 157 and "What restrictions apply?" on page 158 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 158 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 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 14. Monitoring memory and space on your AIX system

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.

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 InfoPrint Solutions Company service representative.

Monitoring memory use on your InfoPrint AIX server

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 39 on page 165, 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 ad*n*) 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
pdenable 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 Interface or the InfoPrint Manager Operations GUI.
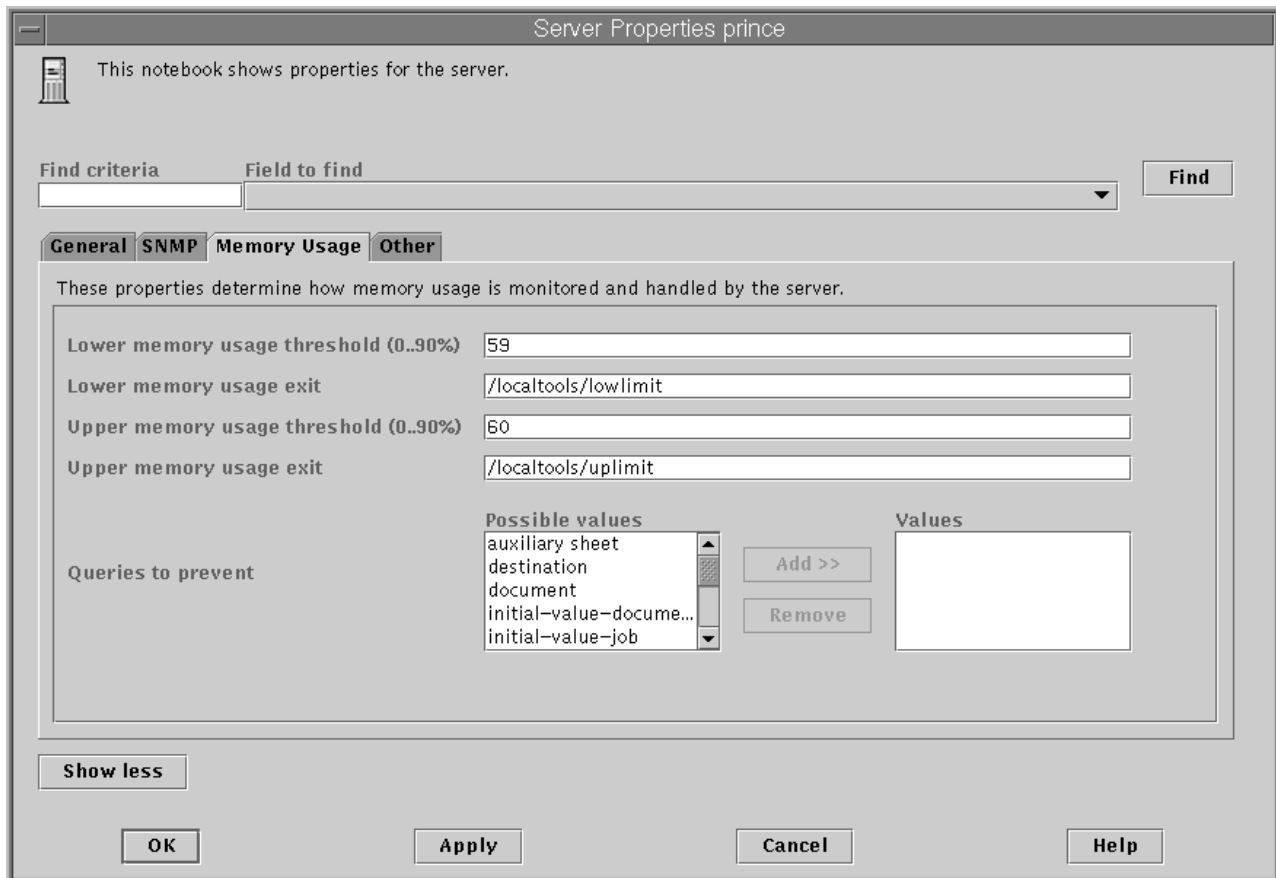
Figure 39. Memory usage page from the Server Properties notebook

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.

Monitoring file system use (automatically)

InfoPrint Manager includes support to help you monitor file system usage. The InfoPrint Manager Server polls these critical file systems at regularly scheduled intervals, and it increases the polling as the usage increases. Initially, the file system is polled for usage every 16 minutes.

Here is the polling schedule:
80% usage
      Every 8 minutes
90% usage
      Every 4 minutes
95% usage
      Every 2 minutes

97.5% usage
Every minute

If the usage for a file system goes above the InfoPrint Manager pre-defined threshold of 80%, InfoPrint Manager logs a message and generates a **disk-space-low** notification event. As usage increases above each threshold, more messages and **disk-space-low** events are logged and generated. See "Configuring your notification profile for disk-space-low events" for information on how to configure your notification profile so you can be notified of the **disk-space-low** event.

Each time usages goes above the 80, 90, 95, and 97.5 percent usage levels, the **disk-space-low** event is generated and logged. However, InfoPrint Manager only issues one event for each usage level.

Note: The threshold is reset if the file system usage drops below the previous threshold; for example, when the file system usage drops to 70% after an 80% **disk-space-low** event, it is reset.

Configuring your notification profile for disk-space-low events

It is recommended that you include both the **disk-space-low** and **out-of-disk-space** events in your notification profiles. The InfoPrint Manager server sends **out-of-disk-space** notifications by default, so that when your file system usage reaches 100%, this event is generated. You can modify the server notification profile to add the **disk-space-low** event. However, the messages from the file system usage monitoring are always logged; regardless of the events in the server notification profile.

To add a **disk-space-low** event notification, open the Administration GUI and select **Server→Properties→Other→Notification Profile** and click **Add**. Add the **disk-space-low** event to the notification profile. You must also select the notification method to use on the same panel.

InfoPrint Manager for AIX monitors these file systems:
- PDBASE
- PDNAMESPACE
- /var/psm
- /var/psf
- /var/psf/segments
- /var
- /var/spool/lpd
- /tmp

Monitoring file system use (manually)

Using the disk usage tool

The **Disk Usage** icon on the front panel of the CDE allows you to manually display information about total space and available space on a file system. To find this icon:

- With the POD feature, click on the **User Tools** icon (the paper and pencil) to open a subpanel.
- Without the POD feature, 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 manually 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. See Chapter 33, "Customizing error logs in the InfoPrint Manager AIX server," on page 399 for more information that will help reduce the amount of clean up that is necessary.

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 InfoPrint service representative to determine whether you need to clean out files or modify any configuration settings. You might consider removing some files, such as large error or accounting logs. You can find these files in the following locations:

- Server accounting logs: /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 115 in Chapter 8, "Gathering accounting and auditing data about print jobs," on page 113.
- PSF accounting logs: /var/psf/. See "How do you manage the contents of the PSF DSS accounting data file?" on page 121.
- Error logs: /var/pd/*server*.BAK/error.log.BAK.*timestamp*

For more information on accounting logs, see the topics "How does the **pdaccount** command collect InfoPrint AIX server information?" and "How do you manage the contents of the InfoPrint AIX server accounting logs?" in "Chapter 12. Gathering accounting and auditing data about print jobs" from the *InfoPrint Manager for AIX: Procedures* manual.

If you want to customize your log settings, see Chapter 33, "Customizing error logs in the InfoPrint Manager AIX server," on page 399.

Segment Size parameter

The **Default SEGMENT SIZE** parameter affects the disk I/O performance of the **/var/ psf/segments** file system. This parameter determines the maximum size of any temporary file created by the Input Manager component that is stored in **/var/ psf/segments**. This setting determines the number of temporary files that Input Manager requires for all print jobs submitted to InfoPrint Manager: the smaller the setting, the more files required to process the AFP input data. This parameter can be set by using SMIT: **Infoprint Printing System→Miscellaneous→Customize the Input Manager**.

For Basic Server configurations, the default setting of 5000 KB per segment can be raised to reduce the disk I/O usage associated with reading and writing data to the **/var/psf/segments** file system.

For Advanced Server configurations, the default setting of 1000 KB per segment can be raised to reduce the disk I/O usage associated with reading and writing data to the **/var/psf/segments** file system; however, the default setting usually works well with most AFP production applications.

Part 2. Administrative procedures: Customizing for special jobs

Chapter 15. Working with transforms

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
- XML data
- PPML 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 actual destination, 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* or to the transforms' man pages. 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.

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 13 shows the default configuration files that InfoPrint provides. You can either modify these files or create your own.

Table 13. Default PCL, Postscript, and PDF transform configuration files

Data Stream	Transform	Configuration File	Daemon Configuration File
PCL	**pcl2afp**	**/psf/pcl2afp/pcl2afp.cfg**	**/psf/pcl2afp/pcl2afpd.cfg**
PostScript	**ps2afp**	**/psf/ps2afp/ps2afp.cfg**	**/psf/ps2afp/ps2afpd.cfg**
PDF	**pdf2afp**	**/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 40 shows an example of a configuration file for the PostScript and PDF transforms. The configuration file for the PCL transform is similar, although it does not contain a **pcl_server_timeout** keyword. As a result, the PCL transform does not support the **-s** flag from the command line for the **pcl2afp** command described in "Hierarchy of transform options" on page 173.

```
# 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 = IO1_G4  # -a          type of AFP image to generate
```

Figure 40. 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.

Improving performance in the PDF RIP

You can improve the performance of the PDF RIP by configuring it to run parts of itself in parallel. These changes improve the performance of the core RIP; for improving performance by running multiple PDF RIPs on an AIX multi-processor, see "Using the PDF Parallel RIP" on page 187. If you have a multi-processor AIX server, make the changes described below to the PDF RIP daemon configuration file (**ps2afpd.cfg**) that are shown below in **boldface** text in Figure 41 on page 173.

Notes:

1. If your InfoPrint AIX server has only a single processor, you should not make these configuration changes because they would result in reduced performance.

2. Both **-pragma bwModel=banded** and **-pragma beThread=yes** can also improve performance of the PostScript RIP.

3. If you are processing double-byte fonts (for example, with Kanji printing), you must set pdfParallel=no.

```
# ps2afpd configuration file
# KEYWORD           EQUIVALENT ps2afp FLAG                PURPOSE
##################################################################
port = 8251              # -P              which TCP/IP port to use
work_directory = /var/psf/ps2afp
                         #                 directory to put work files into
log_file = /var/psf/ps2afp/ps2afpd.log
                         #                 where to write log messages
notify = root            #                 who to notify if problems encountered
mail_command = /usr/bin/mail
                         #                 program used to send notifications
ps_program = /usr/lpp/psf/bin/ps2api
                         #                 name of the PostScript interpreter program
ps_init_file = /usr/lpp/psf/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   # -M          maximum amount of memory that
                         #         PostScript uses; the 'K' is ignored
ps_job_timeout = 999     # -j          maximum number of minutes
                         #                 to process PostScript job
ps_server_timeout = 180  # -s          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         # -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 = IO1_G4  # -a          type of AFP image to generate
pragma = pdfParallel=yes ;\
         beThread=yes    ;\
         bwModel=banded
```

Figure 41. Sample High Performance PDF Daemon configuration file

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 **ps2afp.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 13 on page 171.

5. Values specified in a customized configuration file identified with the **-C** flag of the **pcl2afpd** or **ps2afpd** command when the transform daemon started.

6. Values specified in the default transform daemon configuration file named in Table 13 on page 171.

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.

Stapling and punch options available from the ps2afp transform

You can use the **ps2afp** transform to specify both staple and punch finishing options. However, you must:

1. Ensure that the IPDS (Intelligent Printer Data Stream) capable printer supports either staple or punch finishing options.

2. Ensure that the PostScript input file contains either staple or punch information.

3. Ensure that the keyword `finishing` is assigned to the **device_controls** option within the **ps2afpd.cfg** configuration file, as shown in the bold-faced example in Figure 42 on page 175.

4. Ensure that the application or driver that generated the PostScript supports the subset of staple or punch operations enabled in the **ps2afp** transform. See "Staple and punch operations supported by the ps2afp transform" on page 175 for a list of these staple and punch options.

If you are interested in using this finishing support, the PostScript drivers available with the following printers contain this support. These InfoPrint printers should be specified within a TCP/IP DSS:

- InfoPrint 2085
- InfoPrint 2105
- InfoPrint 2060ES
- InfoPrint 2075ES
- InfoPrint 2090ES
- InfoPrint 2105ES

Specifying finishing in the ps2afpd.cfg file

The following shows how you can specify finishing values in the **ps2afp** data stream transform:

1. From a command line, access the **ps2afpd.cfg** file that resides in the **/usr/lpp/psf/ps2afp/** directory.

2. Using your editor of choice, edit the file.

3. Find the heading **#ENABLING STAPLING OR PUNCH FINISHING OPTIONS THROUGH THE TRANSFORM** and remove the hash mark (#) that comments out the following line:

   `device_controls=finishing`

4. Save and close the file.

Notes:

1. The **device_controls** option also accepts bin numbers and **plex** key words.

2. If you omit **plex**, the **ps2afp** transform creates duplex output.

3. If you omit bin numbers, the **ps2afp** transform creates output that indicates that the first input tray should be used.

4. Not all printers support using the staple and punch options that the **ps2afp** transform generates. If you send a document with staple or punch operations to an IPDS printer that does not support the request, InfoPrint Manager issues a message and completes the job, without either staples or punch holes. Refer to your printer documentation to determine which (if any) staple or punch operations are available.

For further examples, see the **ps2afpd.cfg** file shipped with the latest version of InfoPrint Manager, which includes the **device_controls** option.

```
# ps2afpd configuration file
# KEYWORD             EQUIVALENT ps2afp FLAG              PURPOSE
################################################################


port = 8251               #                     which TCP/IP port to use

work_directory = /var/psf/ps2afp
                          #           directory to put work files into
log_file = /var/psf/ps2afp/ps2afpd.log
                          #                 where to write log messages

notify = root             #       who to notify if problems encountered
mail_command = /usr/bin/mail
                          #           program used to send notifications
ps_program = /usr/lpp/psf/bin/ps2afpi
                          #         name of PostScript interpreter program
ps_init_file = /usr/lpp/psf/ps2afp/ps2afpe.ps
                          #             name of PostScript interpreter
                          #                       initialization file
ps_files_path = /usr/lpp/psf/ps2afp :\
              /usr/lpp/psf/config
      #             path to search for jobInit files
:
:
:
######################################################################

# ENABLING STAPLING OR PUNCH FINISHING OPTIONS THROUGH THE TRANSFORM
# If you want to use the stapling or punch finishing options and have
# ensured that your PostScript driver supports these options,
# use the following options:

device_controls=finishing
```

Figure 42. Sample PostScript Daemon configuration file sections with staple and punch options

Staple and punch operations supported by the ps2afp transform

The following tables list the subset of PostScript information transformed to Advanced Function Presentation (AFP) MO:DCA-P structured fields and triplets to support staple and punch operations. The changes described below should only be performed by someone with extensive knowledge of the PostScript language, such as someone writing their own PostScript driver.

The << /Staple 3 information below is a particular example drawn from Table 14 and Table 15. Both tables contain pertinent information for adding stapling operations to your PostScript data stream.

```
{ << /Staple 3  /StapleDetails << /Type 17 /Position 17 >> >> setpagedevice }
{ << /Staple 3  /StapleDetails << /Type 17 /Position 18 >> >> setpagedevice }
```

This example indicates that the printer will place two staples at the top of a page, whether the page has either a Portrait or a Landscape orientation.

/Staple 3
> The key that introduces the StapleDetails Dictionary.

/Type 17
> A required key reserved for future use.

/Position
> A key that indicates the placement of the staples, using the settings displayed in Table 15.

The << /Punch 4 information below is a particular example drawn from Table 16 on page 177, Table 17 on page 178, and Table 18 on page 178. All three tables contain pertinent information for adding stapling operations to your PostScript data stream.

```
{ << /Punch 4 /PunchDetails << /Type 7 /HoleType 0 /Pattern 0 /Position 1 >> >> setpagedevice }
{ << /Punch 4 /PunchDetails << /Type 7 /HoleType 0 /Pattern 0 /Position 5 >> >> setpagedevice }
```

This example indicates that the printer will place a punch on the left side of a page, whether the page has either a Portrait or a Landscape orientation.

/Punch 4
> The key that introduces the PunchDetails Dictionary.

/Type 7
> A required key reserved for future use.

/Pattern 0
> A key that indicates the default punch setting, using the settings displayed in Table 18 on page 178.
>
> **Note:** Most PostScript drivers use /Pattern 0 because Finishers tend to have one particular setting. /Pattern 0 works with all Finishers. If you specify /Pattern 6 in the PostScript driver and your Finisher only supports two-hole punch, InfoPrint Manager will print the job and generate an error message without performing the finishing.

/Position
> A key that indicates the placement of the staples, using the settings displayed in Table 17 on page 178.

Table 14. Default staple locations

Staple	Key name	PostScript Staple
Do not staple	None	/Staple 0
Staple	Not supported	/Staple 3

Table 15. Additional PostScript staple details

Staple details	Key name	PostScript staple details

Table 15. Additional PostScript staple details (continued)

Do not staple	None	**Portrait:** /Position 0 **Landscape:** /Position 0
Single left diagonal	LeftDiagonal	**Portrait:** /Position 1 **Landscape:** /Position 5
Single left horizontal	LeftHorizontal	**Portrait:** /Position 3 **Landscape:** /Position 7
Single left vertical	LeftVertical	**Portrait:** /Position 2 **Landscape:** /Position 6
Single right diagonal	RightDiagonal	**Portrait:** /Position 9 **Landscape:** /Position 13
Single right horizontal	RightHorizontal	**Portrait:** /Position 11 **Landscape:** /Position 15
Single right vertical	RightVertical	**Portrait:** /Position 10 **Landscape:** /Position 14
Double left	DoubleLeft	**Portrait:** /Position 4 **Landscape:** /Position 8
Double right	DoubleRight	**Portrait:** /Position 12 **Landscape:** /Position 16
Double top	DoubleTop	**Portrait:** /Position 17 **Landscape:** /Position 18
Booklet	Booklet	**Portrait:** /Position 20 **Landscape:** /Position 20

Table 16. Default punch locations

Punch	**Key name**	**PostScript Punch**
Do not punch	None	/Punch 0
Punch	Not supported	/Punch 4

Table 17. Additional PostScript punch details

Punch details	Key name	PostScript punch details
Do not punch	None	**Portrait:** /Position 0 **Landscape:** /Position 0
Left	PunchLeft	**Portrait:** /Position 1 **Landscape:** /Position 5
Top	PunchTop	**Portrait:** /Position 3 **Landscape:** /Position 7
Right	PunchRight	**Portrait:** /Position 2 **Landscape:** /Position 6
Bottom	PunchButtom	**Portrait:** /Position 4 **Landscape:** /Position 8

Table 18. Punch Setting for the /Pattern value

Punch	Key Name	PostScript Punch Details
Default	Punch*	/Pattern 0
2–holes	Punch*2	/Pattern 6
3–holes	Punch*3	/Pattern 5
4–holes	Punch*4	/Pattern 7

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 19 shows the default configuration files that InfoPrint provides. You can either modify these files or create your own.

Table 19. Default TIFF, JPEG, and GIF transform configuration files

Data Stream	Transform	Configuration Files
TIFF	**tiff2afp**	**/usr/lpp/psf/tiff2afp/tiff2afp.cfg** **/usr/lpp/psf/tiff2afp/tiff2afp.3160cfg** **/usr/lpp/psf/tiff2afp/tiff2afp.3900cfg**
JPEG	**jpeg2afp**	**/usr/lpp/psf/jpeg2afp/jpeg2afp.cfg** **/usr/lpp/psf/jpeg2afp/jpeg2afp.3160cfg** **/usr/lpp/psf/jpeg2afp/jpeg2afp.3900cfg**

Table 19. Default TIFF, JPEG, and GIF transform configuration files (continued)

Data Stream	Transform	Configuration Files
GIF	gif2afp	/usr/lpp/psf/gif2afp/gif2afp.cfg /usr/lpp/psf/gif2afp/gif2afp.3160cfg /usr/lpp/psf/gif2afp/gif2afp.3900cfg

InfoPrint uses the **.3160cfg** and **.3900cfg** configuration files to transform documents that have been submitted to print on an InfoPrint 60 printer or InfoPrint 4000 laser printer respectively.

Sample configuration file

Figure 43 shows an example of a configuration file for the TIFF transform. The configuration files for the JPEG and GIF transforms are similar.

```
a=ioca10
choice=full
cmp=g4
ms=5120
msf=0.01
nosniff=yes
noterm=yes
v=yes
pagetype=page
r=600
x=0
y=0
```

Figure 43. 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 19 on page 178.
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.

Customizing the img2afp transform

The **img2afp** transform can be used to transform color (FS45) images into monochrome bilevel (FS10) images for printing. This transform is valuable for transforming color images so that they print well in black-and-white. You can customize the **img2afp** transform only by specifying options on the command line. Unlike other transforms shipped with the InfoPrint Manager, this transform is not invoked automatically. Instead, you must specify it at the command line to preprocess the data prior to printing. For specific information about the syntax and use of this command, see the InfoPrint Manager Reference.

While you can create an **img2afp.cfg** file, InfoPrint Manager supplies a series of **img2afp.cfg** configuration files that are based on the printer model. For example, the **img2afp.4000–708cfg** file on an InfoPrint Manager for AIX server contains the following settings:

```
#img2afp Infoprint 4000-708 configuration file

a=fs10
respath=.:/usr/lpp/psf/config
thresh=4000-708.ibm106lpi.ta.ps
gcorr=4000-708.ibm106lpi.tf.dt.ps
pagetype=page
v=yes
r=600
```

img2afp.cfg files observe the following basic rules:

Notes:

1. Any item specified in a configuration file can be overridden on the command line.
2. Configuration file syntax is *attribute = value*.
3. A hash mark (#) indicates a comment to the end of the line.
4. All attribute names are the same as the command-line names.

5. For options that do not take values, you must type `yes` in the configuration file (as shown below).

```
#sample img2afp configuration file

v = yes  #equivalent to -v flag
a = fs10 #bilevel output
```

To invoke the transform from the command line, you must specify at least:
- **-a fs10** to indicate bilevel output .
- **-thresh** {*name*} to specify the PostScript level 3 halftone dictionary that you are using.

  When you install some printers with InfoPrint Manager, the product makes PostScript level 3 halftone dictionaries available on your server. For example, on an AIX server an InfoPrint HD1-HD2, HD3-HD4, HD5-HD6, HS1, HS3, MD1-MD2, MS1, PS-1, PD1-PD2 or 4100 printer provides the following:
  - **/usr/lpp/psf/config/4100.ibm71lpi.ta.ps**
  - **/usr/lpp/psf/config/4100.ibm85lpi.ta.ps**
  - **/usr/lpp/psf/config/4100.ibm106lpi.ta.ps**
  - **/usr/lpp/psf/config/4100.ibm141lpi.ta.ps**
  - **/usr/lpp/psf/config/4100.ibm71lpiRot90.ta.ps**
  - **/usr/lpp/psf/config/4100.ibm85lpiRot90.ta.ps**
  - **/usr/lpp/psf/config/4100.ibm106lpiRot90.ta.ps**
  - **/usr/lpp/psf/config/4100.ibm141lpiRot90.ta.ps**
- **-gcorr** *filename* to specify grayscale mapping tables to halftone the grayscale and color images to bilevel for output.

  When you install particular printers with InfoPrint Manager, you also install the following grayscale mapping tables for each type of PostScript level 3 halftone dictionary option.

  For example, on an AIX server an InfoPrint HS1, HD1-HD2, HD5–HD6, HS3, PS-1, PD1-PD2 or 4100 printer provides printer provides the following:
  - **/usr/lpp/psf/config/4100.ibm71lpi.tf.ap.ps** for dark halftones
  - **/usr/lpp/psf/config/4100.ibm71lpi.tf.dt.ps** for midtone halftones
  - **/usr/lpp/psf/config/4100.ibm71lpi.tf.lr.ps** for standard halftones
  - **/usr/lpp/psf/config/4100.ibm85lpi.tf.ap.ps** for dark halftones
  - **/usr/lpp/psf/config/4100.ibm85lpi.tf.dt.ps** for midtone halftones
  - **/usr/lpp/psf/config/4100.ibm85lpi.tf.lr.ps** for standard halftones
  - **/usr/lpp/psf/config/4100.ibm106lpi.tf.ap.ps** for dark halftones
  - **/usr/lpp/psf/config/4100.ibm106lpi.tf.dt.ps** for midtone halftones
  - **/usr/lpp/psf/config/4100.ibm106lpi.tf.lr.ps** for standard halftones
  - **/usr/lpp/psf/config/4100.ibm141lpi.tf.ap.ps** for dark halftones
  - **/usr/lpp/psf/config/4100.ibm141lpi.tf.dt.ps** for midtone halftones
  - **/usr/lpp/psf/config/4100.ibm141lpi.tf.lr.ps** for standard halftones

  For example, on an AIX server an Infoprint HD3–HD4, HD5–HD6, HS3, MD1–2 MS1, PD1–PD2, or PS1 4100 printer provides printer provides the following:
  -
  - **/usr/lpp/psf/config/4100.ibm71lpi.tf.ap.ps** for dark halftones
  - **/usr/lpp/psf/config/4100.ibm71lpi.tf.dt.ps** for midtone halftones
  - **/usr/lpp/psf/config/4100.ibm71lpi.tf.lr.ps** for standard halftones

- **/usr/lpp/psf/config/4100.ibm71lpi.tf.ls.ps** for accutone halftones
- **/usr/lpp/psf/config/4100.ibm71lpi.tf.oc.ps** for dark2 halftones
- **/usr/lpp/psf/config/4100.ibm85lpi.tf.ap.ps** for dark halftones
- **/usr/lpp/psf/config/4100.ibm85lpi.tf.dt.ps** for midtone halftones
- **/usr/lpp/psf/config/4100.ibm85lpi.tf.lr.ps** for standard halftones
- **/usr/lpp/psf/config/4100.ibm85lpi.tf.ls.ps** for accutone halftones
- **/usr/lpp/psf/config/4100.ibm85lpi.tf.oc.ps** for dark2 halftones
- **/usr/lpp/psf/config/4100.ibm106lpi.tf.ap.ps** for dark halftones
- **/usr/lpp/psf/config/4100.ibm106lpi.tf.dt.ps** for midtone halftones
- **/usr/lpp/psf/config/4100.ibm106lpi.tf.lr.ps** for standard halftones
- **/usr/lpp/psf/config/4100.ibm106lpi.tf.ls.ps** for accutone halftones
- **/usr/lpp/psf/config/4100.ibm106lpi.tf.oc.ps** for dark2 halftones
- **/usr/lpp/psf/config/4100.ibm141lpi.tf.ap.ps** for dark halftones
- **/usr/lpp/psf/config/4100.ibm141lpi.tf.dt.ps** for midtone halftones
- **/usr/lpp/psf/config/4100.ibm141lpi.tf.lr.ps** for standard halftones
- **/usr/lpp/psf/config/4100.ibm141lpi.tf.ls.ps** for accutone halftones
- **/usr/lpp/psf/config/4100.ibm141lpi.tf.oc.ps** for dark2 halftones

and **-gcorr** and **-thresh** must be used to select an appropriate halftone.

Limitations of the img2afp transform

When using the **img2afp** transform, be aware of the following limitations:

- Only jobs that contain either pure IOCA data or IOCA overlaid by other bilevel-compatible OCAs print correctly.
- **img2afp** does not support one bit per spot CMYK data (FS42) data conversions.

Examples

For each of these examples, the user has an AFP input file of an FS45 image that they are converting to an FS10 file for printing on a black-and-white printer. To obtain their FS45 input file, they might have used either the **tiff2afp**, **gif2afp**, **jpeg2afp**, **pdf2afp**, or **ps2afp** transform to convert an image file from one of those formats

To convert an FS45 image (sampleFS45.afp) to an FS10 image (outFS10.afp) from an InfoPrint command line for printing on an InfoPrint 21 printer, type the following on the command line:

```
img2afp -a fs10 -thresh 4322.ibm106lpi.ta.ps -gcorr 4322.ibm106lpi.tf.dt.ps sampleFS45.afp \
-o outFS10.afp
```

To print the resulting FS10 image (outFS10.afp) on an InfoPrint 21 printer, type the following on the command line:

```
pdpr -p ip21-ld outFS10.afp
```

To convert an FS45 image (DSC011FS45.afp) to an FS10 image (DSC011FS10.afp) with standard halftones from an InfoPrint command line for printing on an InfoPrint 4100–HD3/HD4 Advanced Function Printing System printer, type the following on the command line:

```
img2afp -a fs10 -thresh 4100-HD3-HD4.ibm106lpi.ta.ps -gcorr 4100-HD3-HD4.ibm106lpi.tf.lr.ps \
DSC011FS45.afp -o DSC011FS10.afp
```

To print the resulting FS10 image (DSC011FS11.afp) on an InfoPrint
4100–HD3/HD4 Advanced Function Printing System printer, type the following on
the command line:

```
pdpr -p silver-ld DSC011FS10.afp
```

To convert an FS45 image (DSC015FS45.afp) to an FS10 image (DSC011FS15.afp)
with dark halftones from an InfoPrint command line for printing on an InfoPrint
4000 Advanced Function Printing System printer, type the following on the
command line:

```
img2afp -a fs10 -thresh 4000.ibm106lpi.ta.ps -gcorr 4000.ibm106lpi.tf.ap.ps \
DSC015FS45.afp -o DSC015FS10.afp
```

To print the resulting FS10 image (DSC011FS15.afp) on an InfoPrint 4000 Advanced
Function Printing System printer, type the following on the command line:

```
pdpr -p ip40001-ld DSC015FS10.afp
```

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: 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.
See the *ACIF User's Guide* for more information about the ACIF command.

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 InfoPrint printers and are often used on non-InfoPrint 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 but are processed correctly if there is a length prefix that matches the structured field length.

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 two-byte 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 default delimiter is X'0A'. If the file uses EBCDIC encoding, the default newline character is X'25'. Use the **fileformat=stream** keyword and value to designate files that use newlines to indicate record boundaries.

You can also specify the explicit newline characters that InfoPrint should use to delimit records. This is specified as a subparameter of the **fileformat** keyword. For example, **fileformat=stream, (newline=CRLF,ASCII)**. For details, see the description of the **line2afp** command in the *InfoPrint Manager: Reference*.

If you do not explicitly specify the newline characters, 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, you should specify newline on the file format keyword to make sure that InfoPrint will use the correct characters.

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 InfoPrint Solutions Company do, however, accept IOCA data as well as IM1
image data.

We recommend 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 **inpexit**, **outexit**, and **resexit** keywords. Each
of these keywords is described in *InfoPrint Manager: Reference* or the **line2afp** man
page. If you are using InfoPrint's sample user exits or your own user exit to
convert incoming data streams from one code page to another code page, then the
INPCCSID parameter indicates the codepage of the incoming datastream. The
OUTCCSID parameter indicates the code page of the output from UCONV.

ICONV:

If you have written any user-exit programs that use ICONV, you must alter them
to use UCONV instead. See the *InfoPrint Manager: Reference* for more information.

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 [2]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.

---

2. The default conversion is from code page 805 to code page 037. You can override the defaults with the **inpccsid** and **outccsid**
 parameters.

/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[1] stream data.

/usr/lpp/psf/acif/dbblank
>   Processes EBCDIC double-byte line data downloaded from the z/OS spool by
>   adding an extra blank to the end of the input record if:
>   1. The last byte in the record is a blank (x'40' in EBCIDIC).
>   2. The second to the last byte is **not** a blank.
>   3. The input record is line data; that is, it is not a structured field.
>
>   This exit also updates the record length by 1 if the blank is added. The exit has
>   no way of determining if the data is DBCS or not, so this will happen to every
>   input record that ends in a single blank. The exit assumes that the input data is
>   EBCIDIC, and that the output data is also EBCIDIC. In other words, the exit
>   does **not** perform any code page translation, but it simply adds an extra blank
>   if needed.
>
>   **Notes:**
>   1. This exit is only intended to be used if the spool file consists of double-byte
>   or mixed single- or double-byte data that has blank truncation. Adding a
>   blank to other types of data files could cause formatting errors, depending
>   on how the page definition is coded.
>   2. This exit only checks for a **single** trailing blank, so if a different number of
>   odd blanks is present in the data, it is up to the user to ensure the data is
>   formatted with the correct font.

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**

The source code for the sample exits is provided in /usr/lpp/psf/acif. You can
modify these source files or create your own. In order to compile and build your
exit, you must have the XL C Compiler and the bos.adt components of the Base
Application Development Toolkit of the AIX operating system installed. You can
use the /usr/lpp/psf/bin/Makefile as an example of how to compile the exits.

For more information about compiling user exit programs, refer to "Compiling and
installing the user-exit program" on page 75.

Using the PDF Parallel RIP

InfoPrint Manager for AIX provides the PDF Parallel RIP to improve the speed of
PDF transforms for most color 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.

Installing the PDF Parallel RIP client

The Parallel PDF RIP client (**pdfprs**) 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. We recommend you set up a configuration to allow for system memory use like that displayed in Table 20.

Table 20. Processors required to use the Parallel PDF RIP client

Processors Allocated	Function Performed
1	network traffic, I/O processes, and general system overhead.
1	**pdfprs** client as defined in "Sample configuration file for the pdfprs client" on page 190.
1	This first RIP transforms PDF into PostScript data. Each RIP is likely to use an entire processor to RIP the PDF files.
1 to *n*	For each additional daemon RIP as defined in "RIP Daemon configuration files" on page 190.

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 45 on page 191 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 21 on page 190 shows the default configuration files that InfoPrint provides. You can either modify these files or create your own.

Table 21. Default parallel PDF transform configuration files

Data Stream	Transform	Configuration File	Daemon Configuration Files
PDF	**pdf2afp**	**/usr/lpp/psf/ps2afp/pdf2afp.cfg** The **pdfprs** configuration file.	**/var/psf/pdf2afp/8261.cfg** **/var/psf/pdf2afp/8262.cfg** **/var/psf/pdf2afp/8263.cfg** **/var/psf/pdf2afp/8264.cfg** **Note:** 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 44 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
[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 44. 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, InfoPrint recommends naming these daemons after the ports that they are running on. For this document, the configuration example begun in

Figure 44 on page 190 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 45 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/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 searhc 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 = FS45    #         type of output to generate
pragma = resources=none        ;\
        printerSpeed=130       ;\
        linkBandWidth=6000000 ;\
        resourceNameFilename=../.resNames;
```

Figure 45. 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 45. 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* or man pages 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 searhc 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 = IO1_G4  #             type of output to generate
```

Figure 46. 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 46 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 21 on page 190.

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 20 on page 188. For more information about defining RIPs across AIX servers, see 191.

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, we recommend 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.

Working with the InfoPrint PPML transform program

The Print-on-Demand feature of InfoPrint Manager for AIX provides a transform program to convert Personalized Print Markup Language (PPML) data streams into the Advanced Function Presentation (AFP) format. PPML is an emerging XML-based print data stream that is divided into subsets. InfoPrint Manager for AIX supports the Graphic Arts Conformance Subset for processing objects within the data stream that can consist of PostScript, PDF, TIFF, and JPEG objects. Sample files that demonstrate the power of this transform are provided in the default directory of **/usr/lpp/psf/ppml2afp** with the names **samplePS.ppml**, **samplePDF.ppml**, **sampleJPEG.ppml**, and **sampleTIFF.ppml**.

Users can submit PPML jobs to InfoPrint through the following methods:
- Hot folder interfaces from PC or Macintosh systems.
- Use of the **pdpr** command from the AIX command line.
- Use of the standard AIX print commands (**enq**, **lp**, **qprt**) from an AIX command line.
- Use of the **lprafp** command from other UNIX® systems.

For more information about how to submit PPML jobs to InfoPrint Manager, refer to *InfoPrint Manager: Reference*.

When a PPML print job is submitted to print on a PSF actual destination, InfoPrint automatically invokes the 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.

The PPML transform has options that you can use to specify processing information. For a list of the options 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 options on the command line whenever you run a transform.

Customizing the PPML transform

You can customize the transform for PPML data by specifying values in the transform configuration files. Table 13 on page 171 shows the default configuration files that InfoPrint provides. You can either modify these files or create your own.

Table 22. Default PPML transform configuration file

Data Stream	Transform	Configuration File
PPML	ppml2afp	/psf/ppml2afp/ppml2afp.cfg

Sample PPML configuration file

Figure 47 on page 195 shows an example of a configuration file for the PPML transform.

```
# default ppml2afp configuration file
#

# directory where PPML2AFP can create and maintain other files
ppml_work_directory = /var/psf/ppml2afp

# port number of the server running the PS2AFP transform
ps_server_port = 8251

# server name of the server running the PS2AFP transform
ps_server_name = 127.0.0.1

# resolution of the AFP being created; only supported values are 240, 300, 480
# and 600
ppml_resolution = 600

# output type format; only supported values are FS45 (color), FS10 (monochrome)
# or IO1_G4 (monochrome)
ppml_outdatatype = FS45

# page height (measurement units: i (inches), c (centimeters), m (milimeters))
page_height = 11i

# page width (measurement units: i (inches), c (centimeters), m (milimeters))
page_width = 8.5i

# ignore all relative paths from the zip file and store all the resources under
# a single directory
ignore_path = true

# enable tracing
trace = off
```

Figure 47. Sample PPML configuration file

The configuration file uses keyword equivalents of the transform options. Refer to *InfoPrint Manager: Reference* for the keywords and values that you can specify in the configuration file.

Hierarchy of PPML transform options

InfoPrint assigns a hierarchy to its use of options and configuration-file information when it runs the PPML transform program. The following lists the order in which InfoPrint uses options 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** 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 option to determine the value to use. For example, if you specify the following command:

    ```
    ppml2afp -C config.file -r240 -r300 myfile.ps
    ```

    The **ppml2afp** command transforms the file using 300-pel resolution. InfoPrint ignores the resolution value specified in the configuration file `config.file` and the first **-r240** option and value.

2. Values are specified in the default transform command configuration file, which is **/usr/lpp/psf/ppml2afp/ppml2afp.cfg**. InfoPrint ignores values in the default transform command configuration file if you invoke the transform command indirectly by submitting a job to print."

3. Default values that are built into InfoPrint. These are the same as the transform defaults.

Working with the XML transforms

XML provides a standard method for the exchange and processing of data across different computing platforms. XML data is structured according to standards from the World Wide Web Consortium (W3C). Specifically designed for Web applications, XML differs from HTML in that, while HTML contains information about how data is formatted for presentation on Web pages, XML contains data with no presentation information. A W3C standard stylesheet language, called Extensible Stylesheet Language (XSL), uses formatting objects to describe how XML data is presented. XML data containing XSL formatting objects is called XSL-FO. XSL-FO describes document presentation details, such as pagination, layout, and styling information.

Using the XML transforms with InfoPrint Manager

XML has become the key standard in the deployment of new technologies for Web services, data interchange, messaging, and application integration. Support for XML is found in several printing products, including XML Extender and Print Services Facility (PSF) for z/OS.

The XML transforms are the preferred method for printing highly-dynamic XML data on AFP printers because the transforms can efficiently process data that changes from job to job. The XML transforms are also an efficient, cost-effective alternative to paper-based communication because it can transform XML data to PDF documents for electronic delivery to customers.

Other benefits of using **xml2afp** and **xml2pdf** to transform XML data to AFP or PDF include:
- You can use your existing AFP output system to print or view your XML data without worrying about compatibility issues.
- The XML transforms provide you with significant formatting flexibility for your XML documents.
- Print delivery is guaranteed when you transform your XML data to AFP and then print to an AFP printer.
- Once XML data is transformed, you can use different tools to:
  - Print to an AFP printer or transform AFP data to PostScript (PS) or printer control language (PCL) for printing on a PS or PCL printer.
  - Send PDF data to an electronic destination.
  - View or archive AFP or PDF data.

The XML transforms let you take advantage of XML for data interchange and content management while using AFP's print and presentation technology and PDF's electronic document exchange. Figure 48 on page 197 shows what you can do with XML data when you use the XML transforms.
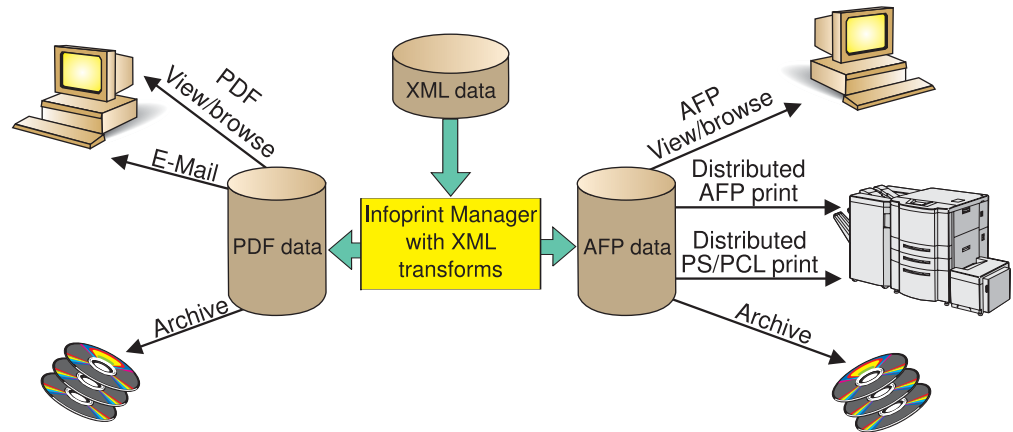
Figure 48. Scenarios for using XML data that has been transformed to AFP or PDF

The InfoPrint products you can use with the AFP or PDF output include:

AFP view/browse
AFP Viewer plug-in or Content Manager OnDemand

PDF view/browse
Content Manager OnDemand

Distributed AFP print
InfoPrint Manager and PSF for z/OS

Distributed PS/PCL print
InfoPrint Manager, Infoprint Server, and Infoprint Server Transforms

E-mail IP PrintWay™ component of Infoprint Server

Archive
Content Manager OnDemand

How do the XML transforms work?

You use the **xml2afp** and **xml2pdf** to transform XML data to an AFP or a PDF data stream. To do this, you must supply one of these to the XML transforms::

- XML files (or data sets), which do not contain data placement and presentation information, and an accompanying XSL style sheet
- XSL-FO files (or data sets), which contain XML data with XSL formatting objects

To transform XML data to AFP or PDF, the XML transforms use the data you supply and do one of these:

- Uses the XSL style sheet to transform the XML files into XSL-FO and then completes the transformation to AFP or PDF
- Directly transforms your supplied XSL-FO files to AFP or PDF

Figure 49 on page 198 shows how the XML transforms process data from XML to AFP or PDF data.
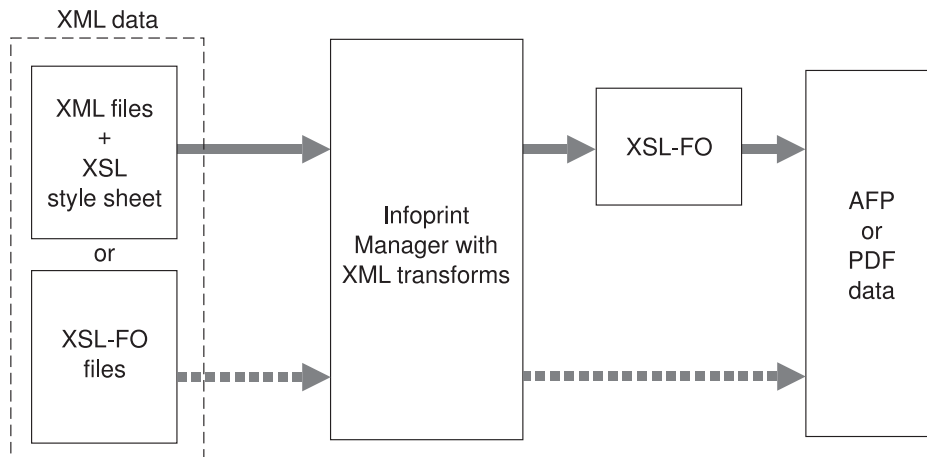
Figure 49. Process for transforming XML data to AFP or PDF

Running the XML transforms

You can run the XML transforms as:

- A standalone transform
- A transform managed by InfoPrint Manager

Capabilities and limitations

The XML transforms have these capabilities and limitations, depending on how data is being transformed:

- Capabilities and limitations for transforming all data
- Capabilities and limitations for transforming data to AFP
- Capabilities for transforming data to PDF

General capabilities and limitations for transforming all data

Output document size
>Output document size is dependent on the amount of memory available; however, no checking is done between document size and available memory. If the output document is too big for the available memory, you receive an out of memory error and the transform stops processing.

XSL support
>The transforms support most, but not all, formatting objects, properties, and features of the XSL Version 1.0 standards as documented by the W3C (http://www.w3.org/TR/xsl/).
>
>Style sheets embedded and referenced in XML files are not supported.

Capabilities and limitations for transforming data to AFP

Bar code support
>The transform does not support bar codes.

Font support
>The first font in the font index with properties that most closely match the desired characteristics is used. Condensed and expanded fonts are usually only used when the font-stretch property is selected. Italic and oblique fonts are considered the same and are used interchangeably.

The XML transforms support converting double-byte character set (DBCS) fonts from one code page to another.

The XML transforms work with the OpenType fonts from the command line. For more information about OpenType Fonts, see *Using OpenType Fonts in an AFP System*.

Graphic support

You can specify graphic data in one of these AFP resources:

Overlay

An overlay contains a collection of constant image data (such as lines, shading, boxes, or logos) that can be merged with variable data during printing. The AFP output file references the name of an overlay, which is located in a resource directory. Because the overlay is not included but is only referenced in the output file, you must specify the image size in the XSL external-graphic formatting object. For example:

```
<fo:external-graphic src="overlay:corplogo" content-height="4in"
content-width="2in"/>
```

Page segment

A page segment contains image data (such as bar codes, signatures, logos, or graphics in image format) that can be merged with variable data during printing. The AFP output file references the name of a page segment, which is located in a resource directory. Because the page segment is not included but is only referenced in the output file, you must specify the image size in the XSL external-graphic formatting object. For example:

```
<fo:external-graphic src="pageseg:corpsign" content-height="4in"
content-width="2in"/>
```

IOCA object

An Image Object Content Architecture (IOCA) object contains a series of picture elements (pels) arranged in rows and columns, and specifies where the image is placed on a page. The XML transforms access the first IOCA object in a specified MO:DCA-P file and place it inline in the AFP output file (only MO:DCA-P image data is supported). The transforms obtain the actual size from the image; therefore, you do not need to specify the size in the XSL external-graphic formatting object. If you do specify the size with the external-graphic formatting object, the transforms crop the image to make it the specified size or add whitespace to the bottom-right corner, so the image appears in the upper-left portion of the allotted space. Here is an example of the formatting object you specify for an IOCA object:

```
<fo:external-graphic src="myfile/image.afp"/>
```

MO:DCA-P output

Output from the transform conforms to the MO:DCA Interchange Set 1 (IS/1) architecture (refer to *Mixed Object Document Content Architecture Reference*, SC31-6802).

Capabilities for transforming data to PDF

PDF output

The transform converts XML data to PDF 1.1 data streams.

Customization tasks for the XML transforms

The system administrator can customize the XML transforms as standalone transforms or as transforms managed by InfoPrint Manager. If you have InfoPrint Manager installed, InfoPrint recommends you use it to manage the XML transforms.

This section details the common, standalone, and InfoPrint Manager customization tasks the administrator must perform before the job submitter can run the XML transforms. The administrator performs the common customization tasks and either the standalone or InfoPrint Manager customization tasks, depending on whether the XML transforms are run as a standalone transform or managed by InfoPrint Manager.

Common customization tasks

The common customization tasks you perform depend on whether you are using the XML to AFP transform or the XML to PDF transform.

Tasks for using the XML to AFP transform: The sample **xml2afp** configuration file is provided in /usr/lpp/psf/xml2afp/xml2afp.cfg. These items are set in the file and can be modified:
1. The default location of the AFP fonts.
2. The default paper size.

Additionally, defaults for all the **xml2afp** options can be set in the configuration file.

The syntax of the configuration file is exactly the same as the command line syntax with these additional rules:
1. Blank lines are ignored.
2. All data on a line after a pound sign is ignored. The pound sign may occur anywhere on a line.
3. To include a pound sign in parameter data, it must be escaped; that is, it must be preceded by a backwards slash.
4. White space before and after parameter data is removed.
5. Parameter data on successive lines is concatenated with a single space between them.
6. Parameters may span lines as long as they follow rules 1 through 5.

Customizing the xml2afp.cfg file:

You can either create a new configuration file or modify the sample that is provided:
1. Create a new **xml2afp** configuration file, **xml2afp.cfg**, which lets you configure the **xmp2afp** transform.

   To create the file on AIX, copy the sample configuration file, **/usr/lpp/xml2afp/samples/xml2afp.cfg** to **/etc/xml2afp.cfg**:

   ```
   cp /usr/lpp/xml2afp/samples/xml2afp.cfg /etc/xml2afp.cfg
   ```

   Note: If you want to modify the sample configuration file, you still need to copy it.
2. Edit the file using your preferred editor, such as **vi** or **notepad**.
   a. On the FONTLIB keyword, specify the location of the AFP font libraries to be used by the **xml2afp** transform. For example,

```
FONTLIB="//SYS1.FONTOLN://SYS1.FONT300"
```

You can use MVS partitioned data set names, which are fully-qualified and prefixed with two slashes. Use colons to separate entries in the list.

b. If necessary, customize these items:
- Font index files

  If you want to customize the way the **xml2afp** transform maps character data from your documents to AFP fonts, create or modify a font index file and then specify, under the XML2AFP_CUSTOM keyword, the directory where your font index file is located. Font index files are located in the same directory as the device types file (for example, **/etc/xml2afp**).

  You can create your own font index file or use the ones supplied with the **xml2afp** transform.. The font index files describe the file syntax and include one file that specifies outline fonts (**/usr/lpp/psf/xmltransform/ outline_font_index** and one file that specifies raster fonts (**/usr/lpp/psf/xmltrasnform//raster_font_index**. See either of those font index files for information to help you create a font index file.

- XML Toolkit location with the TOOLKIT and CLASSPATH keywords
- Java™ executable location with the JAVA keyword
- The **xml2afp** tranform location with the XML2AFP_BASE keyword, if it is installed in a location other than **/usr/lpp/psf/xml2afp**.
- Memory the Java virtual machine uses to run the transform with the HEAP_SIZE keyword

  Keep in mind: The configuration file is a shell script. You can use any commands that are valid according to **/bin/sh**. However, because the script runs for each invocation of **xml2afp** transform when it is not managed by InfoPrint Manager, avoid using any commands that take a long time to complete.

See "xml2afp Command: transforms XML data to AFP" in Chapter 2, "InfoPrint Manager Tools" in *InfoPrint Manager: Reference* for the sample XML transforms configuration file, **/usr/lpp/psf/xml2afp/samples/xml2afp.cfg**, that is shipped with the **xml2afp** transform.

Customizing the font index file for xml2afp:

The sample font index file for **xml2afp** is provided in **/usr/lpp/psf/xmltransform**. The samples include a outline_font_index and a raster_font_index that you use to map XML font names to both outline FOCA fonts and raster fonts in the font path.

Note: If you are using OpenType fonts, the font index files are not necessary.

A font is referenced in XSL-FLO using these attributes:
- **family**
- **size**
- **style**
- **weight**

Font index files describe AFP fonts using these attributes. In addition, a map is defined that maps unicode code points into AFP code points.

The font index file consists of a sequence of key and value pairs, separated by whitespace (such as a space, tab, or a newline). Comments may be inserted

anywhere between the delimiters /* and */. You can also use // to indicate that the remainder of the current line is a comment.

The keys and their meanings are:

Key   **Meaning**

map   Select the named character map, creating it if it does not exist. A character map is used to map unicode code points to AFP code page names and code points. The default is <u>**default**</u>.

codepage
    Set the code page to use for subsequent character mappings.

to   End a range of mapped unicode code points. The value must be an integer representing a valid unicode code point, and it must be greater than the beginning value of the range given by the closest preceding value for the **char** keyword. The value must be a valid unicode code point.

at   Creates a mapping using the closed range given by a preceding **char** value and an optional **to** value. The unicode characters from begin to end are mapped to the AFP code point range from the **at** value to the **at** value + end - begin, inclusive, using the closest preceding **codepage** value. This value must be an integer from 0 to 65535.

family   Establish the current font family name. The value must be a string containing no whitespace characters.

size   A font size, expressed as a floating point value giving the vertical size of the font, in points (1/72nds inches). Size must be omitted when defining outline technology fonts, since they may take any size.

style   A font style. The value must be one of these keywords:
       normal
       italic
       oblique
       backslant

    The default is **normal**.

weight
    A font weight. The value may be one of these keywords:
       normal
       bold

    The value may also be one of the values between 100 and 900 inclusive, in increments of 100. The keyword **normal** is equivalent to 400®, and the keyword **bold** is equivalent to 700. The default value is **normal** (400).

charset
    Define a font with the preceding values given for the font properties (family, size, style, and weight), or default values if no preceding property values have been established. The currently selected character map is associated with the font, and it is used for mapping unicode code points when the font is selected. If modifications are made to the map later in the file, those changes do not affect the defined font.

alias   Establish a font family alias for the current family.

    Of the keywords listed, only two are active: **at** and **charset**. The other keywords collect values used when an active keyword is encountered. This allows for a variety of possible arrangements for a font index. For example:

```
        family courier
        alias monospace
         size 7
           weight normal
             style normal
               charset C04200070
             style italic
               charset C0430070
           weight bold
            style normal
               charset C0440070
            style italic
               charset C0450070
```

Defines the same set of fonts as:

```
family courier size 7 weight normal style normal charset C0420070
family courier size 7 weight normal style italic charset C0430070
family courier size 7 weight bold style normal charset C0440070
family courier size 7 weight bold style italic charset C0450070
alias monospace
```

But may be considered more difficult to read.

Tasks for using the XML to PDF transform: The sample **xml2pdf** configuration file is provided in /usr/lpp/psf/xml2pdf/xml2pdf.cfg. The default paper size can be modified. Additionally, defaults for all the **xml2pdf** options can be set in the configuration file.

The syntax of the configuration file is exactly the same as the command line syntax with these additional rules:

1. Blank lines are ignored.
2. All data on a line after a pound sign is ignored. The pound sign may occur anywhere on a line.
3. To include a pound sign in parameter data, it must be escaped; that is, it must be preceded by a backwards slash.
4. White space before and after parameter data is removed.
5. Parameter data on successive lines is concatenated with a single space between them.
6. Parameters may span lines as long as they follow rules 1 through 5.

These are the common tasks you must perform when using the XML to PDF transform:

1. Create the XML Extender configuration file, **xml2pdf.cfg**, which lets you configure XML Extender. To create the file:
   - Copy the sample configuration file, **/usr/lpp/xml2afp/samples/xml2pdf.cfg**, to **/etc/xml2pdf.cfg**:

     ```
     cp /usr/lpp/xml2afp/samples/xml2pdf.cfg /etc/xml2pdf.cfg
     ```

     Note: If you want to modify the sample configuration file, you still need to copy it.
2. Edit the file using your preferred editor.

   If necessary, customize these items:
   - Java executable location with the JAVA keyword
   - The **xml2pdf** transform location with the XML2PDF_BASE keyword, if it is installed in a location other than **install_path\xml2pdf**

- Memory the Java virtual machine uses to run the transform with the HEAP_SIZE keyword

Keep in mind: The configuration file is a shell script. You can use any commands that are valid according to **/bin/sh**. However, because the script runs for each invocation of the **xml2pdf** transform when it is not managed by InfoPrint Manager, avoid using any commands that take a long time to complete.

See "xml2pdf Command: transforms XML data to PDF" in Chapter 2, "InfoPrint Manager Tools" in *InfoPrint Manager: Reference* for the sample XML transforms configuration file that is shipped with the **xml2pdf** transform.

Chapter 16. Understanding transform objects and the configurable transform subsystem

This chapter contains information about the following:
- "Transforms"
- "Defining a transform sequence" on page 206
- "Configuring transforms" on page 208
- "Examples of creating transform objects" on page 214

Transforms

Transforms are InfoPrint objects (like queues and destinations) that you create and configure in InfoPrint Manager. Transforms receive data in a particular format or formats, process the data in some way, and output the changed data. When you create a transform, you have complete control over what data format or formats it operates on and what type of processing it does. The processing that the transform performs can be anything from simply copying the data to a different place on disk, to filtering the data stream that the transform receives (for example, to remove a particular PostScript order), to transforming the data to a completely different format (for example, converting PCL to AFP).

When you create a transform, you specify several things, including:

- **Input data format**

  The data stream that is sent to the transform. The input data format is what the transform uses to determine whether or not it has any work to do. If you send a PostScript job through a transform that has its input data stream set only to **PCL**, the job will bypass the transform without being changed at all. You can set the transform to accept multiple input data formats.

- **Transform options**

  The program or command that actually does the work of the transform; what happens during the *processing* stage. The transform options can be system commands (such as **copy**), programs provided with InfoPrint Manager (such as **ps2afp**), or your own custom transform programs (for example, **mypclfixup**).

  When you create a transform, you specify the complete command line needed to invoke this program or command. Within this command line, you can also specify various *substitution variables*, place holders which InfoPrint Manager replaces with a value when InfoPrint Manager runs the transform. For example, if you include %i in the line, InfoPrint Manager will replace it with the name of the file that the transform receives; if you include %o, it will be replaced with the name of the file that the transform needs to put the changed data into.

- **Output data format**

  The output data format is the data stream that results from the transform. You can only specify one output data format.

In addition, you can specify whether or not you want the file that the transform produces to be printed. If the transform doesn't return the file to be printed (for example, if the transform completes its processing and saves the file to a different location), it is called a *terminating transform*. In addition to the *terminating transform*, you can also create a *conditionally-terminating transform*. If you want to specify that

the transform may or may not terminate, define a unique return code to indicate the transform was successful but does not return data to print.

Transforms do not do anything by themselves. They remain inactive until you associate them with an actual destination as a transform sequence. A *transform sequence* is an attribute of an actual destination that contains an ordered list of transforms. Every job that is submitted to that actual destination is sent through that list of transforms in the order specified before it is printed.

InfoPrint Manager allows you to create a sequence for transforming print data before the system sends it to a printer. This provides users with a feature similar to the configurable transform sequences that you could create in PSF/2 using the **XFMFLTR** utility. For more information about creating transform sequences, see "Defining a transform sequence."

Notes:
1. If you include a terminating transform in a transform sequence, it must be the last transform in the sequence.
2. If you invoke a terminating transform for a document in a job, the entire job ends after all the documents in that job finish processing. It does not matter whether any other documents in the job use the terminating transform.

Defining a transform sequence

A transform sequence allows you to string together a series of transform objects to perform a series of tasks. This topic provides an example of a transform sequence, followed by the specific procedure you can use to create a sequence of transform objects.

You want to define an actual destination that will copy AFP versions of all print jobs sent to it into a directory on your InfoPrint Manager server system. This directory is used as an archive of AFP versions of print jobs that may need to be viewed later.

To accomplish this, you use the InfoPrint Manager Administration GUI to create these three transforms:
1. **tranps**

   You set the input data format to PostScript, the Transform options to use `ps2afp`, and the output data format to MODCA-P (Mixed Object Document Content Architecture).
2. **transpcl**

   You set the input data format to PCL, the Transform options to use `pcl2afp`, and the output data format to MODCA-P.
3. **saveafp**

   You set the input data format to AFP, the Transform options to issue a **copy** command, and the output data format to MODCA-P. In addition, you make this a terminating transform by selecting **Transform only** in the **Create Transform** dialog.

Then, create an actual destination that you want to perform the transform sequence. When the Printer Creation wizard asks if you want to change the configuration for the printer, select yes, then click the **Configuration** tab to define the transform sequence as follows:
1. transps

2. transpcl

3. saveafp

Note: If you already have the destination created, open the properties notebook for that actual destination and click the **Configuration** tab to define the transform sequence.

Now, when you send a job to this actual destination, the following sequence of actions occurs:

1. **transps** checks to see if the incoming data is PostScript. If it is PostScript,**transps** transforms the data into AFP using ps2afp. If it is not PostScript, **transps** does nothing.

2. **transpcl** checks to see if the incoming data is PCL. If it is PCL, **transpcl** transforms it to AFP using pcl2afp. If it is not PCL, **transpcl** does nothing.

3. **saveafp** copies the AFP file produced by either of the above steps into a specific directory.

4. Since **saveafp** is a terminating transform, the job is not printed but is marked complete at this point.

To create a transform sequence, use the following procedure from the **Inforprint Manager Administration** GUI:

1. Select the printer that you want to send the job to.

2. Click **Printer → Properties** to open the **Printer Properties** notebook for the selected printer.

3. In the **Printer Properties** notebook, click the **Configuration** tab.

    The data stream transforms that this printer can use are listed in the **Transforms to use** field.

    Note: If you can't see the **Transforms to use** field, click **Show more**.

4. Use the **Add** and **Remove** buttons to specify the transforms in the sequence that they should be run in the **Values** field.

    For example, you might want to create the three-step transform sequence that runs the **tranps** , **transpcl**, and **saveafp** transforms in sequence as described above. To accomplish this task, the **Values** field would contain the following:
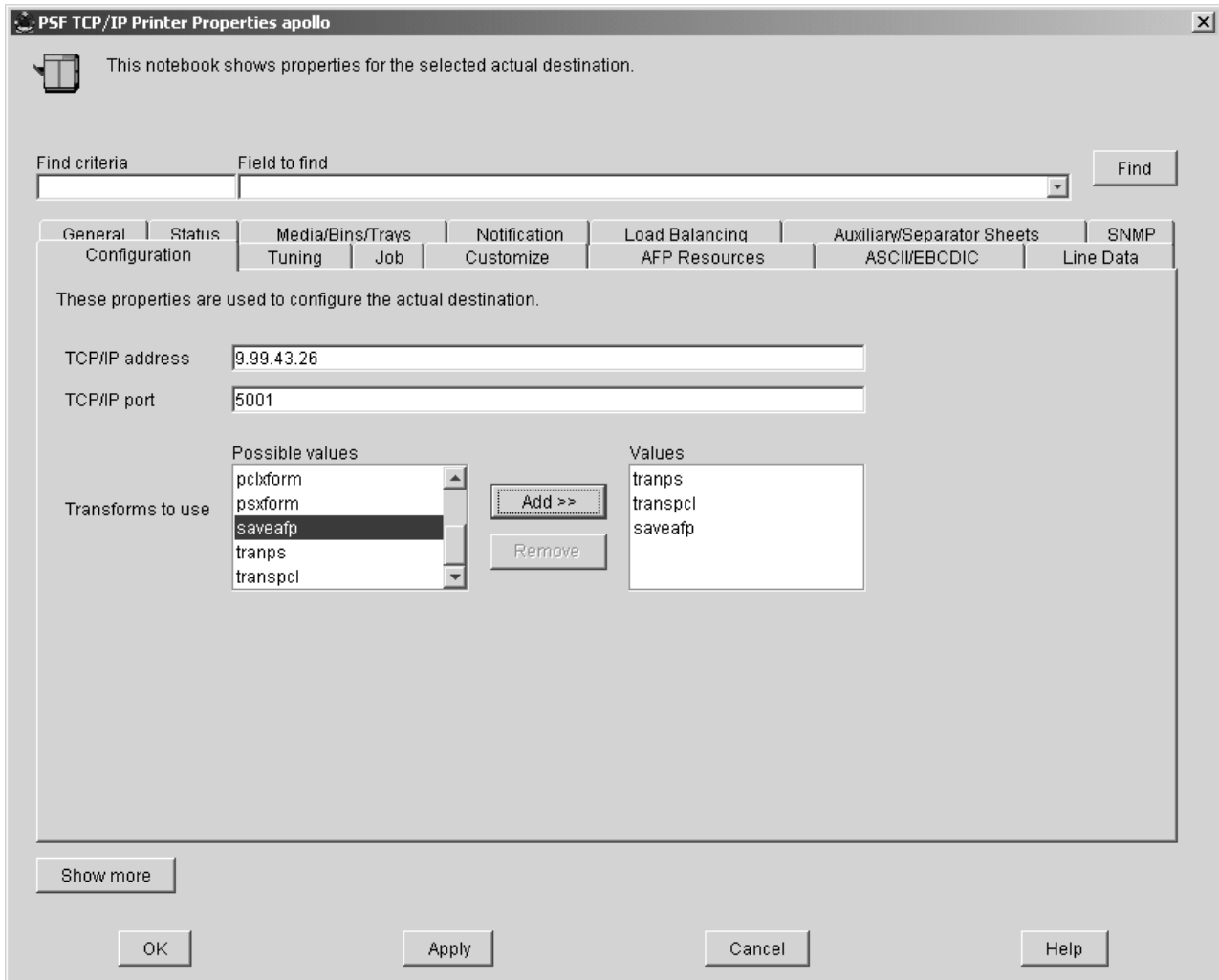
Figure 50. Printer Properties notebook: Transforms to use

> 5. When you have entered the transforms in the correct sequence, click **Apply** to associate this transform sequence with the selected printer.

Configuring transforms

To configure a transform, you must perform the following two tasks:

1. "Creating transforms."
2. "Associating a transform with an actual destination" on page 212.

Creating transforms

You can create a transform sequence through the **InfoPrint Manager Administration GUI** (for more specific information, see the online help topic in this GUI entitled "Server transform tasks").

To create a transform using the **InfoPrint Manager Administration GUI**, an InfoPrint Manager system administrator must set the following values on the **Create Transform** window. You can access this window by clicking the **Server** menu, and select **Transform → Create**.

1. Start the **InfoPrint Manager Administration GUI**.

2. Select **Server** → **Transform** → **Create**.
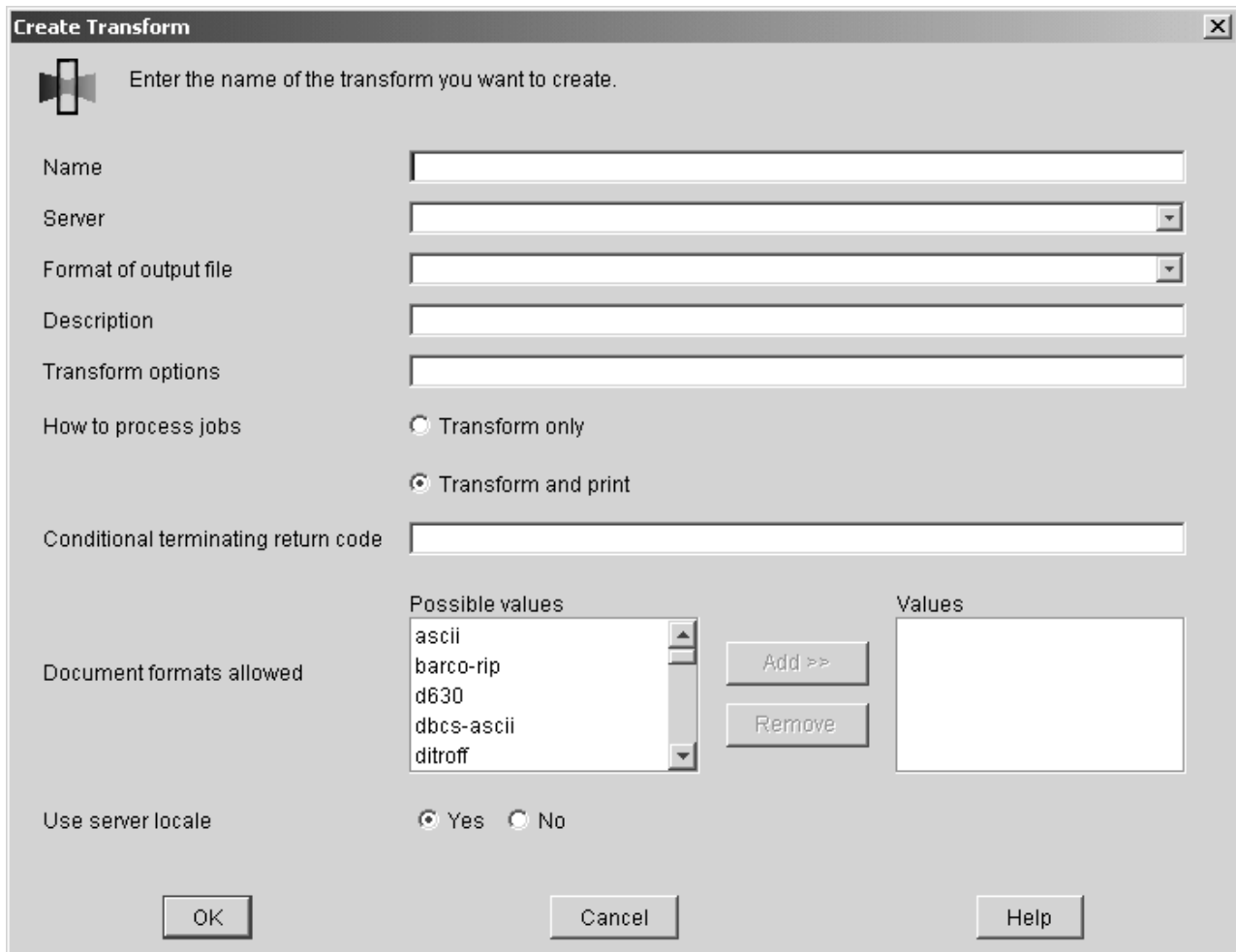
Figure 51. Create Transform window of InfoPrint Manager Administration GUI

3. Fill in the following values:

Name   Type a meaningful name for the transform.

InfoPrint Manager references the transform name in transform sequences that are associated with actual destinations.

Server If not filled in, either type or select the InfoPrint Manager server in which you want to create the transform.

Transforms can only be associated with actual destinations in the same server. If the InfoPrint Manager Administration GUI is only monitoring one server, this field contains that server name.

Format of output file
Select a format for the output file produced from this transform.

Description
Type a description of this transform that will appear whenever you show this transform through the **InfoPrint Manager Administration GUI**.

Transform options

Type the command-line transform and its options, including any InfoPrint Manager substitution variables.

How to process jobs

Select how to process jobs. The options are:

a. A transform that returns the transformed data to InfoPrint Manager for printing (**Transform and print** radio button with the **Conditional terminating return code** field left blank).

b. A terminating transform that completes without returning data to InfoPrint Manager to print (**Transform only** radio button).

c. A conditionally terminating transform that may or may not print the data after it has been transformed (**Transform and print** radio button with the **Conditional terminating return code** field set to a value that tells InfoPrint Manager not to print the data if the transform returns that return code value).

Document formats allowed

Add a format for the input file or file(s) that are being transformed as **Values** in the **Document formats allowed** field.

Note: You can specify either one or many document formats as **Values**. The format of the input file determines whether or not this transform is called for a job sent to this actual destination.

Use server locale

Decide whether InfoPrint Manager should pass the values of attributes specified in the **%%** substitution variables in the **Transform options** field in the language of the InfoPrint Manager server or in English, by using the **Use server locale** radio button. By default, this radio button passes information in the language of the server (**Yes**).

The transform examples that follow demonstrate common uses of transform objects, using the substitution values shown in Table 23. Some of these examples presume that an application programmer has created a program with the name specified at the start of the **Transform options** field.

Notes:

1. If you are specifying any substitutions for which the passed values may contain a blank space, such as `job name`, be sure to put quotes around the substitution so it is passed correctly. Note that this only applies to single % substitution variables. Do not put quotes around any %% substitution variables.

2. The examples that follow presume that the **PATH** environment variable has been set to the appropriate path so you do not have to specify the fully-qualified path name in the **Transform options** field.

Table 23. Transform substitution variables

Transform options substitution variables	Meaning
%i	The name of the input file to transform.
%o	The name of the file in which to store the output of the transform. **Note:** If this is a non-terminating transform, data must be stored in the file named by %o.

Table 23. Transform substitution variables (continued)

Transform options substitution variables	Meaning
%e	The name of the file in which to store any transform information or error messages. If anything is written to this file, it is logged in the InfoPrint Manager server log. **Notes:** 1. If the transform exits with an exit code of 0 or the value set in the **Conditional terminating return code** field, the error messages from the transform are logged as **debug** severity. 2. If the transform exits with a non-zero return code, but not with the value set in the **Conditional terminating return code** field transform attribute, the error messages from the transform are logged as **error** severity. 3. InfoPrint Manager writes transform error messages to either the file specified through this substitution variable, or to standard error (**stderr**). You should not mix output to **%e** and **stderr** within a single run of the exit program. You should use either one or the other in any given run.
%u	The name of the file for updating the **pages-completed** and **job-page-count** job attributes. **Note:** This file should only be accessed through the **transform_update** utility.
%j	The name of the original print file, minus the path (from the **document-file-name** attribute). **Note:** This should only be used to construct another name, such as a temporary file.
%n	The name of the original print file, minus the path and minus the extension (from the **document-file-name** attribute). **Note:** This should only be used to construct another name, such as a temporary file.
%d	A text string that represents the document format of the input file. This value may be: • **ASCII** for ASCII line data. • **AFPDS** for Advanced Function Presentation data • **PCL** for Printer Control Language data • **PS** for PostScript data **Note:** You can also acquire document format through the **%%Ddocument-format** substitution value.
%p	The value of the document's **destination-pass-through** attribute. **Note:** This value is passed to all subsequent transforms and the actual destination.

Table 23. Transform substitution variables (continued)

Transform options substitution variables	Meaning
%q	The actual destination that is processing the job.
%s	The **document-sequence-number** for the document.
%t	The value of the document's **other-transform-options** attribute. **Note:** If you want to write one transform, but use it differently for different actual destinations or jobs, you can pass values into the transform with this parameter.
%g	The global job identifier for the job.
%#	The job-identifier (10 digits maximum).
%%A*ad_attribute***%%**	The value of the InfoPrint Manager actual destination attribute specified. For example, if %%Aresource-context%%, InfoPrint Manager passes the actual destination's **resource-context** attribute value. **Note:** See the "Considerations when using the *%%Nattributename* substitution control sequences" topic under the "Usage guidelines" for the **other-transform-options** attribute in the InfoPrint Manager Reference before using this substitution variable.
%%D*doc_attribute***%%**	The value of the InfoPrint Manager document attribute specified. For example, if you use %%Ddepartment-text%%, InfoPrint Manager passes the document's **department-text** attribute value. **Note:** See the "Considerations when using the *%%Nattributename* substitution control sequences" topic under the "Usage guidelines" for the **other-transform-options** attribute in the InfoPrint Manager Reference before using this substitution variable.
%%J*job_attribute***%%**	The value of the InfoPrint Manager job attribute specified. For example, if you use %%Jjob-owner%%, InfoPrint Manager passes the **job-owner** attribute value of the job that owns the document being transformed. **Note:** See the "Considerations when using the *%%Nattributename* substitution control sequences" topic under the "Usage guidelines" for the **other-transform-options** attribute in the InfoPrint Manager Reference before using this substitution variable.

Associating a transform with an actual destination

Now that you have created a transform object, you must associate it with an actual destination before you can use it.

To associate a data stream transform with an actual destination from the **Infoprint Manager Administration GUI**, use the following procedure:

1. Select the printer that you want to send the job to.
2. Click **Printer → Properties** to open the **Printer Properties** notebook for the selected printer.
3. In the **Printer Properties** notebook, click the **Configuration** tab.

   The data stream transforms that this printer can use are listed in the **Transforms to use** field.

   Note: If you can't see the **Transforms to use** field, click **Show more**.
4. Use the **Add** and **Remove** buttons to specify the transform in the **Values** field (the equivalent of setting the **transforms-sequence** actual destination attribute from the command line).

   Note: You can string multiple transforms together to perform a sequence of tasks. For more information about this feature, see "Defining a transform sequence" on page 206.
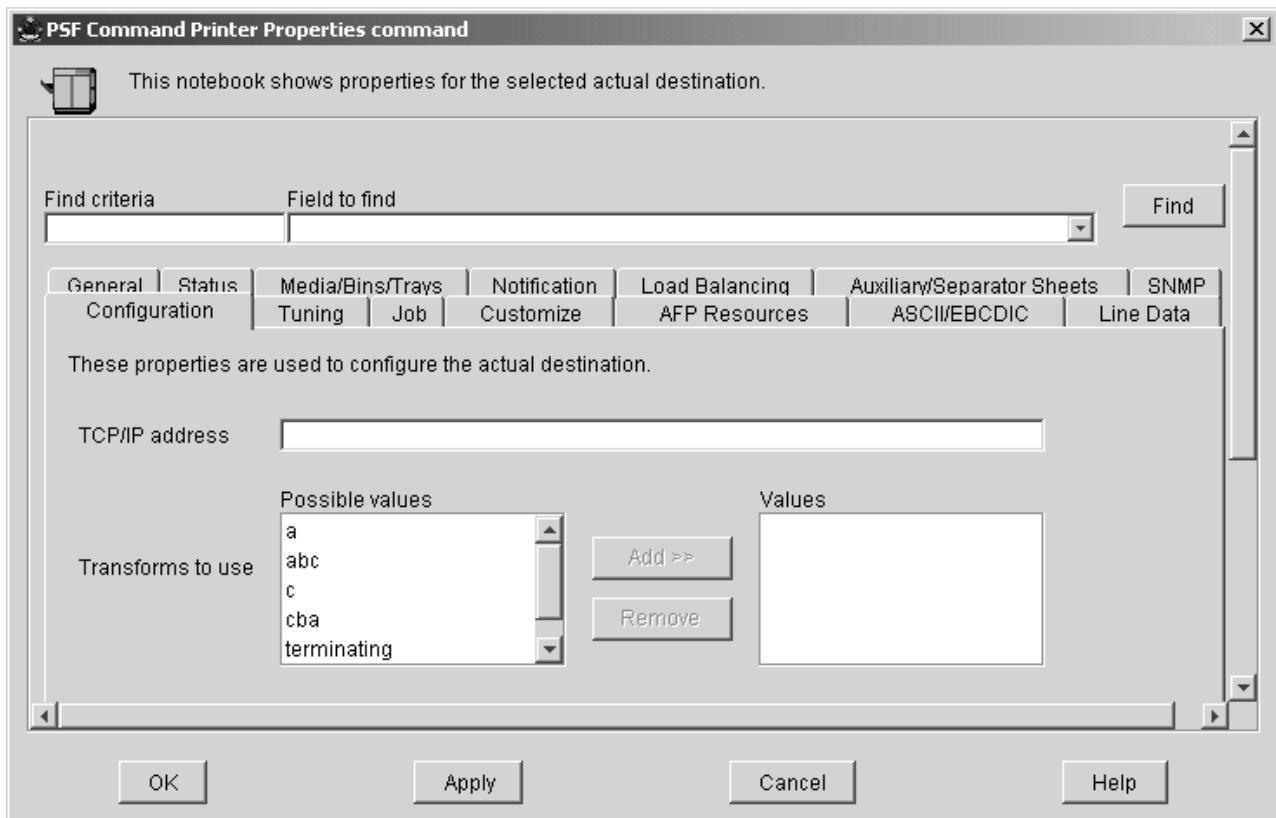
Figure 52. Printer Properties notebook: Transforms to use

5. When you have entered the transforms in the correct sequence, click **Apply** to associate this transform sequence with the selected printer.

If you prefer to use the command line, you can use the following InfoPrint commands from either an AIX command line or an MS/DOS window with **transform** objects:

- **pdcreate**
- **pddelete**
- **pdset**

- **pdls**

For more information about the attributes in creating transform sequences, refer to the **Attributes for Transforms** topic in the "InfoPrint Object Attributes" chapter of the *InfoPrint Manager: Reference*.

Examples of creating transform objects

The following shows three specific examples (from simple to more advanced) for creating transform objects. Note that the second and third examples require additional programming to create the programs that are called from the **Transform options** field. This topic should suggest how you can use transform objects to customize your InfoPrint Manager installation.

Creating a transform object to copy to a file without printing

To define a data stream transform object from the **InfoPrint Manager Administration GUI** that takes an AFP input file and copies it to a file location on the hard drive without printing the output, use the following procedure:

1. Start the **InfoPrint Manager Administration GUI**.
2. Click the **Server** menu, and select **Transform ⊁ Create**.
3. In the **Create Transform** dialog, fill in the fields as shown in either Figure 53 on page 215 or Figure 54 on page 216, depending upon your operating system. These values create a transform that copies AFP input data to an **\afp** folder on a specific drive on Windows or a **/usr/samp** file system on AIX. Also, it names the transformed file with the name of the original file name because of the **%n** substitution variable.
4. Since you do not want the job to be printed, select the **Transform only** radio button to indicate that this transform is a terminating transform.
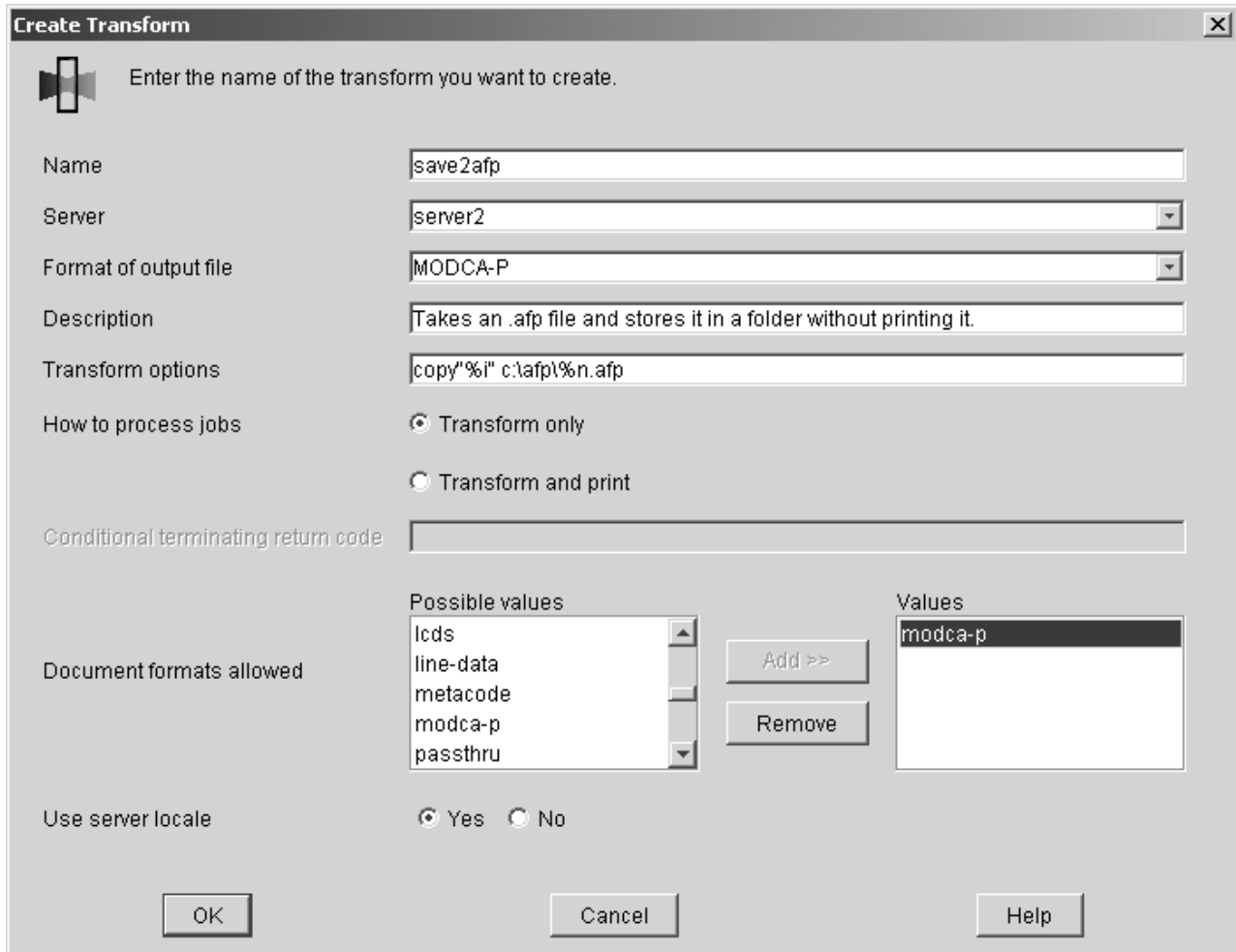
Figure 53. Create Transform dialog: Define a transform that copies an AFP file to a folder without printing on Windows
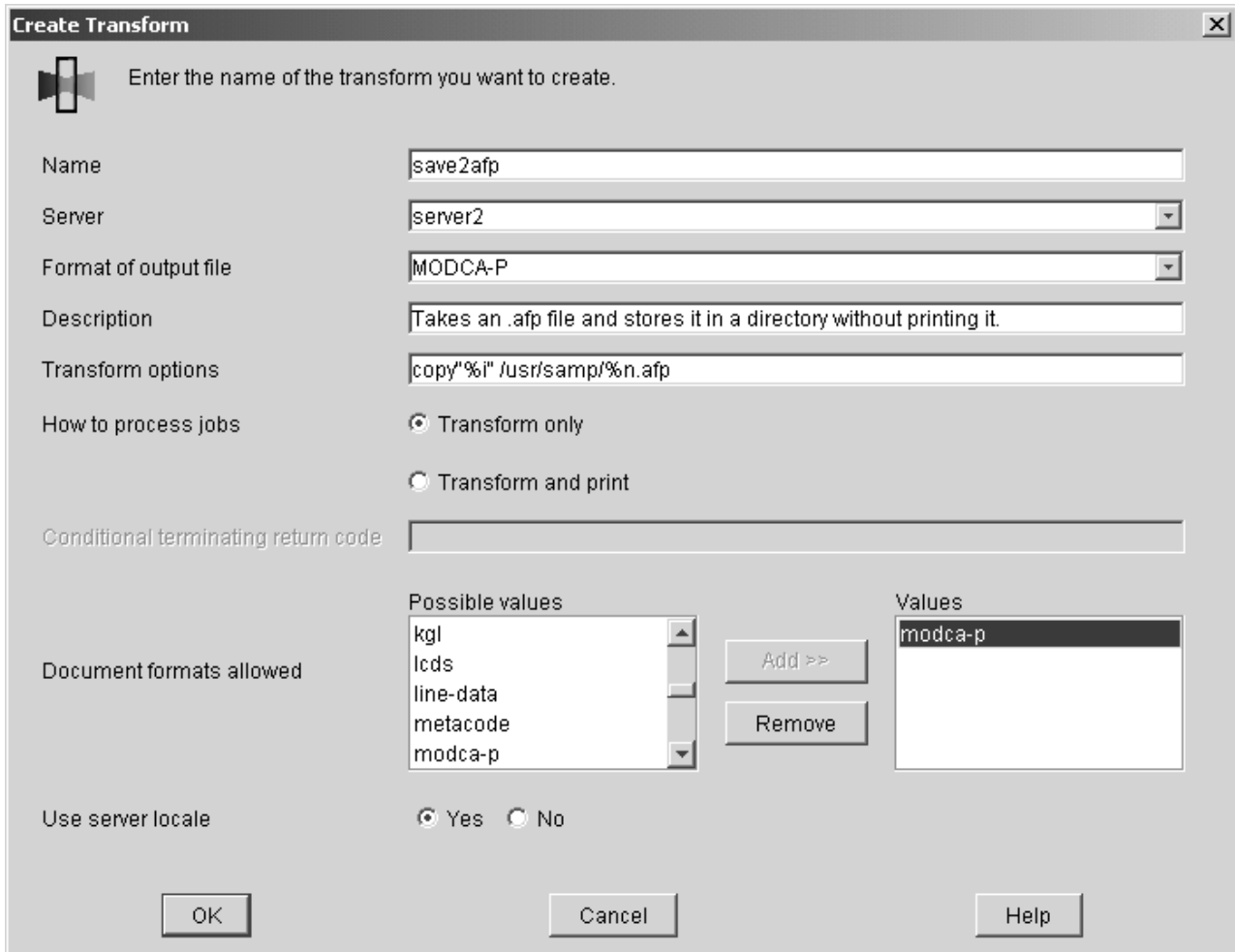
Figure 54. Create Transform dialog: Define a transform that copies an AFP file to a directory without printing on AIX

5. Click **OK**.

InfoPrint Manager creates a transform object under the name you provided in the **Name** field so that you can see its values by selecting **Transform ➔ Properties** from the **Servers** menu.

Creating a transform object to convert data and print only smaller files

If your transform might want to terminate the processing of the job in some cases but return data to be printed in other cases, you can create a conditionally terminating transform. For example, you might want to transform and store some documents but transform and return for printing other documents. You can define a return code that your transform can return to indicate when it has completed its task successfully, but is not returning any data for printing.

In the example below, the actual destination activates the **pics2gif** transform when incoming JPEG and TIFF jobs enter the system. These jobs are transformed into GIF format and then uploaded to the Internet by an application outside of InfoPrint Manager. When the transformed GIF files are smaller than 3 KB, they are returned to InfoPrint Manager for printing on a proof printer. To observe cost-cutting mandates across the installation, transformed GIF files that are larger

than 3 KB are not printed. The transform checks the size of the transformed file and sends a return code of 5 if the job is too big to be printed.

To define a data stream transform object from the **InfoPrint Manager Administration GUI** as a *conditionally-terminating transform*, use the following procedure:

1. Start the **InfoPrint Manager Administration GUI**.
2. Click the **Server** menu, and select **Transform → Create**.
3. In the **Create Transform** dialog, fill in the fields as shown in Figure 55. These values create a transform that transforms both JPEG and TIFF input data into GIF output and then provides a return code of 5 if the transform has completed successfully without returning to InfoPrint Manager for printing.

   In the **Transform options** field, you can use a series of substitution variables to provide special options for the transform sequences. In this example, besides the standard input (**%i**) and output (**%o**), this transform object also uses the **%q** flag so the InfoPrint server passes the name of the actual destination processing the job.
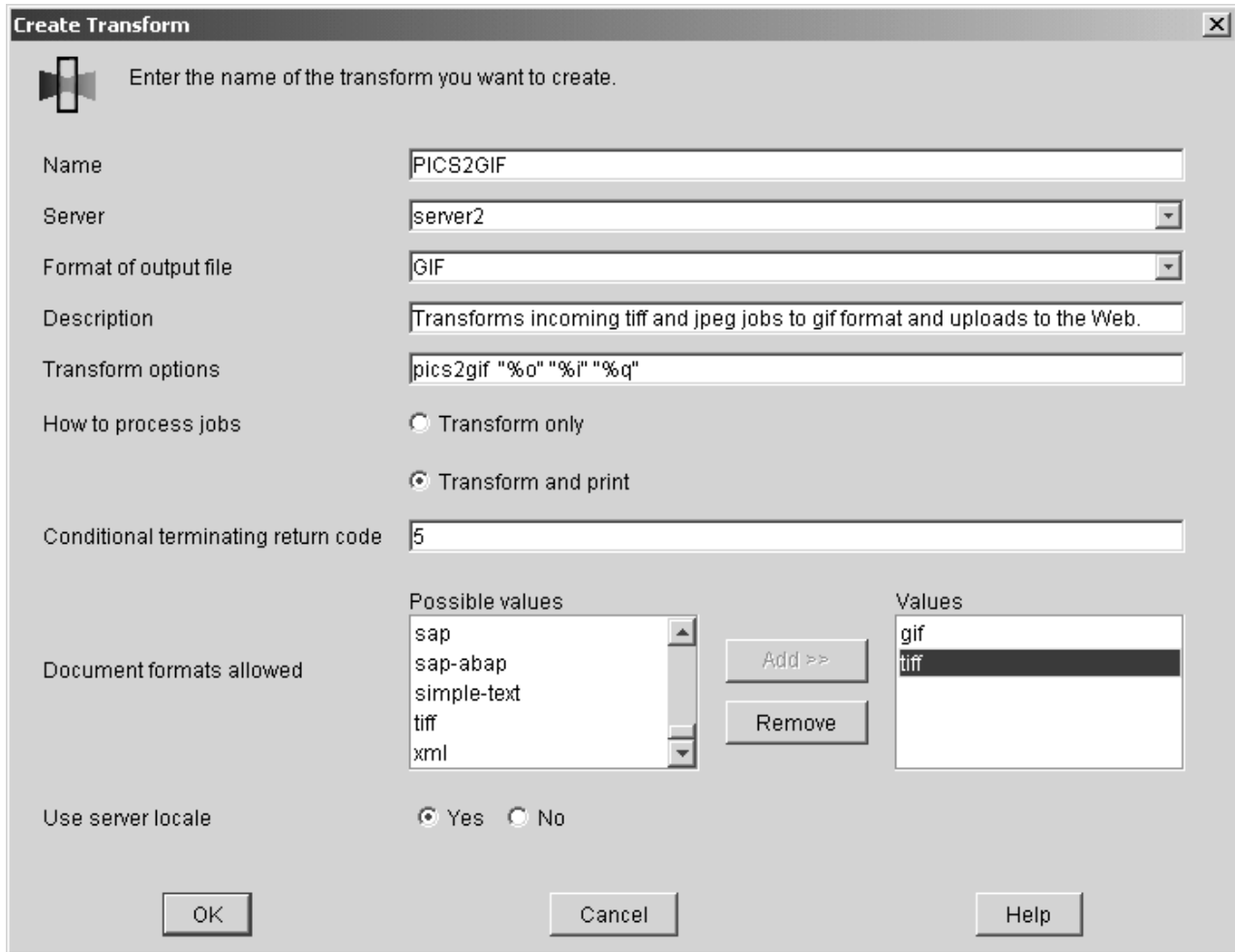
Figure 55. Create Transform dialog: Define a conditionally terminating transform

4. Click **OK**.

InfoPrint Manager saves the transform under the name you provided in the **Name** field so that you can see its values by selecting **Transform → Properties** from the **Servers** menu.

Creating a transform object that updates the job's page count

By default, InfoPrint Manager has no knowledge of the number of pages in a transformed job. However, if you have a transform that knows how many pages are in the job, you can create a transform object that can update InfoPrint Manager with this information. InfoPrint Manager can pass transform objects an *update_file* with the %u option. This update_file can be updated with how many pages are in the transformed job, and InfoPrint Manager then updates the job with this information. To modify the update_file, the user supplied transform needs to call the transform_update utility that is supplied with InfoPrint Manager. For the syntax of the **transform_update** utility, see"Using the transform_update utility" on page 219.

To define a data stream transform object from the **Infoprint Manager Administration GUI**, use the following procedure:

1. Start the **InfoPrint Manager Administration GUI**.
2. Click the **Server** menu, and select **Transform → Create**.
3. In the **Create Transform** dialog, fill in the fields as shown in Figure 56 on page 219.

   For this example, the **passvals** program that is called by the **PASSVALUES** transform object gets passed both the **resource-context** document attribute and the **job-owner** job attribute, as well as an update file. You should change the **passvals** program to your transform program that knows how many pages are in the job, and then change the parameters in "Transform options" to what your program expects with the "%u" being the update_file that will be passed to the transform_update utility when your transform calls it. Other attributes, like **resource-context** and **job-owner**, can be included or omitted as required by the needs of your transform.
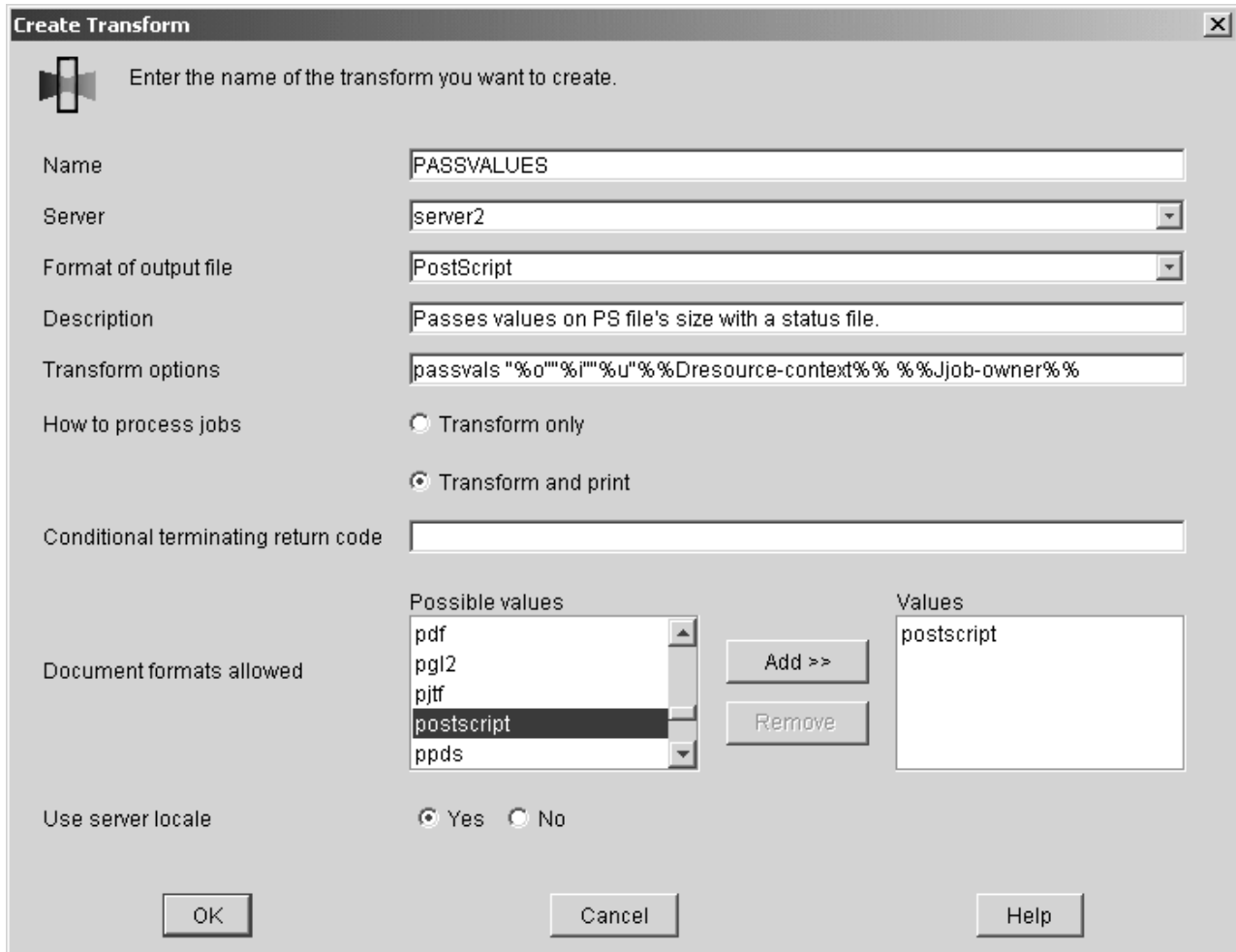
Figure 56. Create Transform dialog: Define a transform to pass job attributes

4. Click **OK**.

InfoPrint Manager saves the transform under the name you provided in the **Name** field so that you can see its values by selecting **Transform → Properties** from the **Servers** menu.

Using the transform_update utility

Use the **transform_update** utility to update InfoPrint Manager about the job page count or number of pages completed.

You can use the **%u** transform option to access an update file that allows you to update the document page count or the job's **pages-completed** attribute. Never access the file identified with **%u** directly. The transform should only use the **transform_update** utility. InfoPrint Manager only checks for updates while the transform is running and immediately after it completes. The **transform_update** utility can be called either once or multiple times while the transform is running. Once the transform returns, InfoPrint Manager deletes the update file.

The **transform_update** utility provides the following return codes:

1   An English message for basic problems, including:

  * Invalid option specified.
  * No option or option value specified.

- No status file name specified.
- Cannot open status file named ____.
- Cannot read status file named ____.

0   A successful update

-1   The update of the status file was not successful.

transform_update [**-t** delta_pages_transformed]
                      [**-d** delta_pages_delivered]
                         update_file

-t   Specifies the number of additional pages since the last update in the transformed document file. InfoPrint Manager uses this information to recalculate the job's **job-page-count** attribute. The total of values that this option passes cannot exceed 2,147,483,647.

-d   Specifies the number of additional pages delivered by the transform since the last update. InfoPrint Manager uses this information to update the job's **pages-completed** attribute. The total of values that this option passes cannot exceed 2,147,483,647.

        Often, it is unnecessary for transforms to update the **pages-completed** attribute because it indicates how many pages have actually printed or stacked for the job, and this attribute is updated by the print backend in InfoPrint Manager with the number of pages that were printed. Any pages referenced here should have been removed from any file returned to InfoPrint Manger for further processing.

update_file
        The file passed to the transform through the **%u** option.

Notes:
1. If a transform calls the **transform_update** utility more than once, each call should pass a value for the change since the last call, not a cumulative value.
2. If InfoPrint Manager can neither open nor read the file, it logs an error and continues processing.
3. If you use a transform to update the **job-page-count** attribute, you must provide a page-count for the document. This page-count information provided by the transform should be the pages in the transformed document for a single copy of that document.
4. If a transform updates the **pages-completed** attribute and returns a job for printing, the pages the actual destination completes are added to the pages the transform reported it had completed.

Chapter 17. Printing PCL or PostScript to PSF destinations: Specifying which paper bin to use

In general, when you submit a print job through a PCL or PostScript driver, you can use the printer options to specify which input paper bin you want the printer to use. For example, if you know that white 8.5×11 inch paper is always loaded in bin one and letterhead is always in bin two, you can select bin one when you want to print a draft and bin two when you're ready to print a real letter.

When you send PCL or PostScript print jobs to a PSF Destination in InfoPrint Manager, the data stream is transformed into Advanced Function Presentation (AFP) before it is printed. By default, most PCL jobs that are transformed use paper bin one, regardless of the bin you specify. Transformed PostScript jobs default to letter-sized paper if no other options are specified, and look for a bin that contains that size paper; they either print on paper from the first bin that contains the right size or fail because they don't find the right paper.

If you want the transform program to check for your bin selection and include it in the AFP data that is sent to the printer, you must specify mappings between the PCL and PostScript bins and the AFP bins. The transform will use your mappings to convert the bin number it finds in the PCL or PostScript into an AFP bin number. You can configure InfoPrint Manager so that you can specify up to 20 different input paper bins. For information about how to figure out which PCL and PostScript bins map to which AFP bins, refer to "Determining bin mappings."

To set up bin mapping, refer to "Editing configuration files" on page 226.

Determining bin mappings

PCL printing

When you submit a print job through a PCL print driver and select a paper bin to print from, the driver generates a bin number and puts it into the data stream. Unfortunately, different drivers generate different bin numbers for the same bin. For example, one driver might make "Tray 1" equal to bin 4 and "Auxiliary tray" equal to bin 2, while another driver makes "Tray 1" equal to bin 1 and "Auxiliary tray" equal to bin 8. To add more difficulty, the generated PCL bin numbers can range from 0 to 59. While most drivers use low numbers (0 through 10), keep in mind the other possibilities.

During the transformation from PCL to AFP, InfoPrint Manager takes the bin number that the driver generated and compares it to the bin mappings you set. The pcl2afp transform inserts the AFP bin number that you assigned and sends the job to the destination you requested. The printer prints the job on paper from the bin you chose. As a result, it is essential that all of the users who submit jobs to a given InfoPrint Manager printer use the same driver. If they do not, the mappings you set up will not work correctly for them.

The first challenge for you in setting up the mappings is determining what bin number the PCL driver places in the data stream. For various InfoPrint printers, the drivers actually generate the same bin numbers. If you are using the PCL5e driver for an InfoPrint Network Printer 12, Network Printer 17, Network Printer

24, InfoPrint 20, InfoPrint 21, InfoPrint 32, or InfoPrint 40, the numbers listed in
Table 24 are placed in the data stream.

Table 24. InfoPrint PCL5e bin numbers

Tray (what you select in Device Settings)	PCL bin number (what the driver puts in data stream)
Automatically Select	0
Tray 1	1
Manual feed paper	2
Manual feed envelope	3
Auxiliary tray	4
Tray 2	5
Envelope feeder or Envelope tray	6
Tray 3	7
Tray 4	8
Tray 5 or 2000 sheet input tray	9

If you are using a different driver, the documentation that came with your printer
may provide these numbers ; look for a section on the PCL driver. Alternatively, if
you are able to capture the PCL data that is sent to a specific bin in your printer,
you can look for the bin number in the data stream. In some cases, however, it
might be just as easy to use trial and error to determine the correct mappings.
Again, keep in mind that PCL bin numbers can range from 0 to 59.

The second challenge is in determining the AFP bin numbers that correspond to
your printer. AFP bin numbers range from 1 to 255, and are not standard from
printer to printer. Some printers have hard-coded bin numbers: each bin on the
printer actually has a number written on it. In other cases, the AFP bin numbers
are more difficult to discover. In fact, the numbering scheme for some printers
changes completely when you add one of the optional paper bins, and still other
printers allow you to change the bin numbers yourself. As a result, it is difficult to
predict exactly what the AFP bin numbers for your printers are. However, there are
some guidelines that you can use.

- Most AFP paper bins use numbers 1 through 10, with 1 being the biggest,
  topmost, or bottommost bin.
- Envelope feeders/bins start at number 65 and can go up to 69.
- The manual feed tray is usually number 100.

If you are printing to InfoPrint printers, the best place to find the default
numbering schemes for each printer is the *IPDS and SCS Technical Reference* and the
IPDS Handbook for printers that use the AFCCU, both of which are available from the
InfoPrint Solutions Company web site at http://www.infoprint.com. (Under **Get
support**, click **Product publications** => **IPDS Technical Reference** and find the
IPDS and SCS Technical Reference and *IPDS Handbook for printers that use the AFCCU*
in the list.

If you find the AFP bin numbers for your printer in this documentation, be aware
that the number is written in hexadecimal notation. You must convert the number
to decimal before you put it in the mapping file. In addition, the numbers that are

listed are the machine numbers, not the numbers the software requires. After you convert the number to decimal, add 1 to it to get the number that you should put in the mapping file.

Given this information, the best way to determine the correct AFP bin numbers is to start with these guidelines and use the trial and error method until you have the mappings set correctly.

For example, if you have a printer with three paper bins and a manual feed bin, you could do the following.

1. On your InfoPrint Manager Windows client system, install the PCL driver that you plan to use.
2. Create a printer that uses the driver you just installed and has a PSF printer as its target destination.
3. From the Windows Client, click the **Start** button and select **Settings → Printers** to open the **Printers** window.
4. Right-click the printer you just created and select **Properties** from the pop-up menu.
5. Click the **Device Settings** tab to show the printer options that are available for this driver. For example, some drivers show a list of "paper trays" and allow you to select a paper size for each one.
6. Make sure all of the paper trays you plan to use are activated and have the correct size paper selected.
7. Click **OK** to close the dialog and make the settings take effect.
8. Follow the appropriate procedure below: "Editing configuration files" on page 226.

   When you have to enter PCL and AFP bin numbers, start with the guidelines above and create some logical mappings, such as the ones shown in table Table 25 for an InfoPrint 20.

Table 25. Sample mapping table for an InfoPrint 20

Tray selection	PCL bin number	AFP bin number
Tray 1	1	1
Tray 2	5	2
Tray 3	7	3
Manual feed tray	2	100
Envelope tray 1	6	60
Envelope tray 2	4	61

   Complete the procedure.
9. Load each paper bin (including the manual feed bin) with a different kind, color, or specially marked paper.
10. Submit a test job to each bin and see which paper it is printed on. Keep track of your results and use them to change the mappings to meet your configuration.
11. Once you have the mappings worked out correctly, tell your operators the following information:
    - What options to set in the device settings.
    - What kind of paper is in each bin.
    - How to print to each bin.

PostScript printing

PostScript drivers use different methods to determine what paper bin to print a job on. Some drivers allow you to select which paper tray you want the paper to come from. When you submit a job, the driver sends a number to the printer to ask for the corresponding tray. Other drivers allow you to select different paper options (such as size, color, or weight). When you submit a print job, these options are sent with the print job and are used to determine which paper bin to use (paper size is the only option that you have to set for this function to work).

When you configure InfoPrint Manager correctly, it will work with either type of driver. There are three steps involved in performing this configuration:

1. "Gathering paper tray information"
2. "Identifying paper trays to InfoPrint Manager" on page 225
3. "Testing tray mappings" on page 226

Gathering paper tray information

The first step in configuring InfoPrint Manager is to figure out :

- How many paper trays does your printer have?
- What is the AFP bin number for each tray?

  Guidelines for figuring out the bin numbers are provided below.

- What kind of paper will you be loading into each tray?

  At a minimum, you should know what size paper will go in each tray. If you need to, you can also specify a color or weight of the paper.

Use this chart to record your data.

Table 26. Paper tray chart

AFP bin number (in decimal notation)	Paper tray on printer	Paper loaded
100	Manual feed tray	

There is trial and error work involved in figuring out the correct bin numbers. AFP bin numbers range from 1 to 255, and are not standard from printer to printer. Some printers have hard-coded bin numbers; each bin on the printer actually has a number written on it. In other cases, the AFP bin numbers are more difficult to discover. In fact, the numbering scheme for some printers changes completely when you add one of the optional paper bins. Still other printers allow you to change the bin numbers yourself. As a result, it is nearly impossible to predict exactly what the AFP bin numbers for your printers are. However, there are some guidelines that you can use.

- Most AFP paper bins use numbers 1 through 10, with 1 being the biggest, topmost, or bottommost bin.

- Envelope feeders/bins start at number 65 and can go up to 69.
- The manual feed tray is usually number 100.

If you are printing to InfoPrint printers, the best place to find the default numbering schemes for each printer is in the *IPDS and SCS Technical Reference* and the *IPDS Handbook for printers that use the AFCCU*, both of which are available from the InfoPrint Solutions Company web site at http://www.infoprint.com. (Under **Get support**, click **Product publications** => **IPDS Technical Reference** and find the *IPDS and SCS Technical Reference* and *IPDS Handbook for printers that use the AFCCU* in the list.

Important: If you find the AFP bin numbers for your printer in this documentation, be aware that the number is written in hexadecimal notation. You must convert the number to decimal before you put it in the mapping file. In addition, the numbers that are listed are the machine numbers, not the numbers the software requires (they're the *IPDS* bin numbers, not the *AFP* bin numbers). After you convert the number to decimal, add 1 to it to get the number that you should put in the mapping file.

Identifying paper trays to InfoPrint Manager

Once you have the chart filled in with your first attempt at mappings, you can move to the second step: identifying all of the bins to InfoPrint Manager.

By default, InfoPrint Manager assumes that all PostScript printers have only one paper tray. When you identify the trays, you let InfoPrint Manager know how many there really are. Then, when you submit a job, you can choose any one of them.

You identify the paper bins to InfoPrint Manager either in the configuration file or in the transform you create. In this step, you will determine the syntax that you will be able to use in either place. The general syntax of the identification statement is:

input*X***=(***size***,type=***xxx***,weight=***xxx***,color=***xxx***),input***X***=(***size***, type=***xxx***,weight=***xxx***,color=***xxx***)**

Where the following conditions apply:
- Each **input***X* corresponds to a different paper tray. You should have as many **input***X* entries as you have paper trays. Separate them with commas, no spaces.
- The *X* in each **input***X* is replaced with the **AFP bin number** from Table 26 on page 224 for each tray.
- Size is the only required paper attribute. Replace the word *size* with the size of the paper that will be in the tray, such as **letter**, **legal**, **8.5ix11i**, or **A4**.
- Other paper attributes can be specified or left out entirely.

All of the following are valid identification statements:

```
input1=(letter),input2=(legal),input100=(letter)
```

```
input1=(8.5ix11i,color=blue),input2=(8.5ix11i,color=yellow),
input3=(11ix17i),input100=(8.5ix11i)
```

```
input1=(A4,color=white),input2=(A4,color=blue),input3=(A4,color=yellow),
input65=(C5),input100=(A4,type=letterhead)
```

Write out your identification statement before moving on to the next step.

Testing tray mappings

Once you have your identification statement created, you can test your mappings to make sure they are correct. The following procedure explains one way to verify the mappings.

1. On your InfoPrint Manager Windows client system, install the PostScript driver that corresponds to your printer.
2. Create a printer that uses the driver you just installed and has a PSF printer as its target destination.
3. Click the Windows **Start** button and select **Settings → Printers** to open the **Printers** window.
4. Right-click the printer you just created and select **Properties** from the pop-up menu.
5. Click the **Device Settings** tab to show the trays and options that are available.
6. If your driver lists the paper trays that are available, activate them and select paper sizes for each one. Set the options to match your identification statement.
7. Click **OK** to close the dialog and make the settings take effect.
8. Refer to "Editing configuration files"so you can use the same mappings for all of your printers.
9. Follow the appropriate procedure.

   When you have to change the configuration file or enter the command that your transform will use, replace the **input**X=... statement with your identification statement from "Identifying paper trays to InfoPrint Manager" on page 225, and complete the procedure.
10. Load each paper bin (including the manual feed bin) with a different kind, color, or specially marked paper.
11. Test your settings by submitting print jobs to each bin of the Windows gateway printer and making sure that it prints on the correct paper. If a job does not print on the correct paper, adjust your AFP bin numbers and input numbers as necessary.
12. Once you have the mappings worked out correctly, tell your operators the following information:
    - What options to set in the device settings.
    - What kind of paper is in each bin.
    - How to print to each bin.

Editing configuration files

There are five configuration files that come with the InfoPrint Manager PCL to AFP and PostScript to AFP transforms. For the PCL transform, they are: pcl2afp.cfg and pcl2afpd.cfg. For the PostScript transform they are:ps2afp.cfg, ps2afpd.cfg (used with InfoPrint 3000 and InfoPrint 4000 printers), and 3160d.cfg (used with all other IPDS printers). You will only need to edit one of these files based on the data stream that your driver produces, the printer you send your jobs to, and on the following considerations.

- Edit pcl2afpd.cfg, ps2afpd.cfg, or 3160d.cfg if you want everyone to use the same mappings. This method is recommended.
- Edit pcl2afp.cfg or ps2afp.cfg if different people have to use different mappings.

Follow these steps to edit the appropriate file.

1. On the system that your InfoPrint Manager server is installed on, locate the file. It should be in the *install_path*\pcl2afp or the *install_path*\ps2afp directory.

2. Open the file in a text editor, such as Notepad.

   At the bottom of the file, you will see blocks of instructions and sample commands.

3. Modify the file according to the instructions in the file.

   Choose one of the options and uncomment that line, then enter your mapping numbers. If you are using the ps2afp transform, replace the **input***X***=...** portion of the **device_controls** line with your identification statement from "Identifying paper trays to InfoPrint Manager" on page 225.

4. Save the file.

   Note: It is recommended that you save a copy of your changes in a directory outside of the installation path so that you have a copy in case you ever have to re-install or apply service to InfoPrint Manager.

5. Close the file.

6. Restart the computer to have the new settings take effect.

7. Tell your users what kind of paper is in each bin and how to print to each of them.

Creating a transform with bin mappings

You can use the InfoPrint Manager transforms to process print jobs with different options, including which paper bins to use. First, you create a transform using the InfoPrint Manager Administration GUI, specifying an input data stream and an output datastream. Then, you associate it with one or more printers. When you send a print job to that printer, your transform checks to see if the file is the datastream that needs to be transformed. If it does, the transform converts the file as you specified; if it is not, the transform passes the file to the logical destination. As a result, if you don't want to use the same bin mappings for all of your printers, you can create several different transforms, all with different mappings. Then, associate each transform with whichever printer or printers you want.

Note: If you will be sending both PCL and PostScript jobs to the same printer, you can create two transform objects (one that accepts PCL and one that accepts PostScript) and associate them both with that printer.

Follow these steps to create a transform that maps PCL or PostScript bins to AFP bins.

1. In the InfoPrint Manager Administration GUI, click the **Server** menu and select **Transform → Create**.

2. In the **Create transform** dialog, fill in the fields:

   - **Name:** Type a name for the transform.
   - **Server:** Choose the correct InfoPrint Manager server.
   - **Format of output file:** Select **MODCA-P**.
   - **Description:** Type a description that will help you remember which printer uses this transform.
   - **Transform options:** The command line that will execute when the transform runs.

     If this transform accepts PCL, type:

```
pcl2afp -o "%o" "%i" —device
'plex,inputX=(pcl_bin=Z),inputX=(pcl_bin=Z)'
```

Replace the *X*s with the number of the AFP bin (on the printer) and *Z*s with the number of the PCL bin. You can specify up to 20 mappings.

If this transform accepts PostScript, type:

```
ps2afp  -o "%o" "%i" —device
'plex,inputX=(size,type=xxx,color=xxx,weight=nnn),
inputX=(size,type=xxx,color=xxx,weight=nnn)'
```

Replace the **input*X*=**... portion of the command with your identification statement from "Identifying paper trays to InfoPrint Manager" on page 225. Replace *size* with a paper size such as letter, legal, A4, or the dimensions of the paper in inches (8.5ix11i), millimeters (216mx279m), or points (612px792p) and the *X*s with the number of the AFP bin (on the printer). *Size* is the only required value; the others you can either fill in or delete.

- Select **Transform and print**.
- **Document formats allowed:** The data stream that your transform accepts. Select **PCL** or **PostScript** and add it to the allowed values.
- Click **OK**.

3. Select the printer that you want to associate this transform with and open its properties notebook.

4. Click the **Configuration** tab.

5. Find the **Transforms to use** field.

6. Select the transform you just created in the **Possible values** box and add it to the **Values** box.

7. Click **Apply**.

8. Click the **Document** tab.

9. Find the **Formats allowed** section.and look in the **Values** box. Make sure that **modca-p** and either **pcl** or **PostScript** are listed.

10. Click **OK**.

11. Tell your users what kind of paper is in each bin and how to print to each of them.

Chapter 18. Submitting PSF printer input to a PCL or PPDS printer

In addition to AFP printing, InfoPrint Manager allows you to submit PSF printer input data to PCL and PPDS printers as well. There are two methods that you can use to do this: using a PSF command DSS or PSF other-driver DSS. If you choose to use the PSF command DSS, you need to be aware of the following information. See the *InfoPrint Manager for AIX: Getting Started* guide for additional information.

When you use the Create Printer wizard in the InfoPrint Manager Administration GUI to create a printer object that will send jobs to a PCL or PPDS printer, you must specify the path for the command in the **Printer command** field. For example, by default the lpr command is located at c:\winnt40\system32\lpr.exe. Because InfoPrint Manager does not search the **PATH** environment variable for the command, you must either add that directory to the **PATH** for that system or specify the entire path of the command, as in the following example:

```
c:\winnt40\system32\lpr -P printername -S servername
```

If you need to specify a file name in the command in a location other than at the end of the command, you must include the text-string **-IPMF-** in the command string. The temporary file name used to store either the PCL or PPDS data generated by InfoPrint Manager is substituted into the command wherever the **-IPMF-** text-string is located.

Note: The dashes (**-**) on either side of the **-IPMF-** text-string are part of the syntax and cannot be omitted.

You can only specify one **-IPMF-** text-string in a print command, as in the example below:

```
e:\usrapp\copyit -IPMF- /b e:\tmp
```

where `copyit` represents a user-written application for moving either the PCL or PPDS file that InfoPrint Manager generated to the specified directory (in this case, \tmp on the **e** drive), and giving it a unique name.

Setting up PCL tray mappings

Follow these steps to map the input trays requested in the AFP data stream to the input trays on your PCL printer:

1. Determine the AFP bin number and PCL bin number for each input tray. Table 27 on page 230 shows the default bin numbers associated with some standard names for input trays.

   Note: You can use any tray names you wish, but these names are defined by the PCL data stream and are the most common names. For more information on the limitations of trays and paper with a PSF other-driver or PSF command DSS refer to the **psf-tray-characteristics** attribute in the *InfoPrint Manager: Reference*.

Table 27. Default bin mappings

Input tray name	AFP bin number	PCL bin number
alternate	3	5
bottom	2	4
envelope	65	6
manual	100	2
top	1	1

If these mappings are not appropriate for your printer, reverse the process described in "Determining bin mappings" on page 221. In this case, the AFP bin number is the bin number in the data stream and the PCL tray number is the bin number used by the printer. Note that AFP bin numbers must be unique, but different AFP bin numbers can map to the same PCL tray number.

2. Open the InfoPrint Manager Administration GUI.

3. Click the printer that you want to set up trays on.

4. From the **Media/Bins/Trays** tab of the Actual Destination Properties notebook, in the **Media ready** table, select **Add** to define a new tray or **Modify** to change an existing one. You can define up to 15 trays.

5. Complete the following fields:

   Input bin number
   > This field specifies the AFP bin number.

   Media ready
   > This field shows the medium loaded in the input tray. The drop-down list allows you to select from all media supported by the printer.

   Input tray name
   > This field shows the name associated with the input tray. Standard names for PCL input trays are:
   >
   > > **alternate**
   > >
   > > **envelope**
   > >
   > > **lower**
   > >
   > > **manual**
   > >
   > > **upper**
   >
   > Formerly, these were the only names allowed. You can now use any name you like, subject to these restrictions:
   >
   > - Manual trays must have the string **manual** somewhere in the name, in any combination of upper and lower case, for example, `transparentMANUALa4`. You can define multiple manual trays.
   > - Envelope trays must have the string **envelope** somewhere in the name, in any combination of upper and lower case, for example, `Number10Envelope`. You can define multiple envelope trays.

   Tray number
   > This field specifies the PCL bin number.

   Duplex
   > This field specifies whether two-sided printing is possible from this input tray.

6. Click **OK**.

To make your changes take effect, you must now stop and restart PSF, the printer, or both. Follow the steps corresponding to your job submission method.

- If you use PSF Direct to submit jobs:
    1. On your *host* system, stop PSF.
    2. Restart your host PSF. The changes you made are registered when the host PSF restarts.
- If you use DPF to submit jobs:
    1. On your *host* system, stop PSF.
    2. In the InfoPrint Manager GUI, click the printer to select it, then choose **Printer → Stop**.

       Note: If you don't see **Stop** on the Printer menu, use **Add/Remove Menu Items** to add it.
    3. Open the Management Console and click the DPF Host Receivers item in the left pane.
    4. Click the DPF Host Receiver that feeds this printer to select it.
    5. Click **Actions→ Obtain Printer Characteristics**.
    6. Go back to the InfoPrint Manager GUI and start the printer again.
    7. Restart the host PSF.
- If you use any other method to submit jobs:
    1. In the InfoPrint Manager GUI, click the printer to select it, then choose **Printer → Stop**.

       Note: If you don't see **Stop** on the Printer menu, use **Add/Remove Menu Items** to add it.
    2. In the **Stop command** dialog, select **Shut down** and click **OK**.
    3. Select **Printer → Enable** to restart the printer.

Chapter 19. Understanding AFP color management and color management resources

Printing documents in full color or with very high-quality black and white (grayscale) images is more complex than printing black and white or spot-color documents. Understanding some of the principles of color and grayscale printing and how various InfoPrint products can fit into color and grayscale solutions can help you integrate color and grayscale printing with your current operations or expand to implement new color workflows.

InfoPrint AFP color and grayscale solutions

You can assemble printing products from InfoPrint Solutions Company and other companies in different configurations to support Advanced Function Presentation (AFP) color and grayscale printing, including configurations that use the AFP Color Management Object Content Architecture™ (CMOCA™) to provide optimal performance and color accuracy in high-speed color printing.

Color printing without explicit color management

You can include color images or specify colors for AFP objects in your print jobs and send them to an AFP color printer. The color images and objects print in color, based on the default settings in your print server and printer.

If you like the colors that the default color management settings provide, or if it is not essential that you print in exactly the right colors, you probably do not need to implement a full color management solution. However, if you want better control over the consistency and accuracy of your colors across devices, you might consider color management at some point in the future.

To understand some of the basic concepts about color printing, see:
- "Color printing concepts" on page 234
- "Grayscale printing concepts" on page 238

Resources that document composition software includes inline

Most often, print bureaus use document composition software to generate highly customized and personalized color output. AFP color management is largely built into the document composition tools that support their processes. The software puts all the resources that the printer needs into the print job and sends it to an InfoPrint print server. The print server sends the print job to the printer, and the printer uses the resources as appropriate.

Using this method, you know that the required resources, including the resources required for color management, are available for any print job that is sent to the printer. However, including all the resources can make the print job very large, and moving large print jobs through your system might slow down system performance. Also, you might not be able to save resources that are downloaded with a print job on the printer so they can be reused without being downloaded later.

For more information about color printing, see:

- General information about color printing and color management:
  - "Color printing concepts"
  - "Color management" on page 239
- "Tips for images" on page 250
- Scenario describing a possible implementation:

  "Eliminating physical inserts" on page 261

For a list of the companies that participate in the AFP Consortium and support AFP color management in their products, see:

http://www.afpcolor.org

Resources stored and managed centrally

To take full advantage of the AFP CMOCA, you can store your color and image resources in a central resource library, and let your print system manage those resources. This option optimizes system performance by:

- Creating some of the color management resources for you automatically
- Reducing the number of color conversion resources that the system creates at print time by generating link color conversion color management resources in advance
- Reducing the size of some images by removing embedded profiles when you store them, yet still retaining the association between the image and the profile
- Letting you mark resources as *capturable*, so they can be saved on the printer and used in other print jobs without being downloaded again

For an introduction to the full AFP CMOCA and how you might implement it, see:

- General information about color and grayscale printing and color management:
  - "Color printing concepts"
  - "Grayscale printing concepts" on page 238
  - "Color management" on page 239
- "AFP color management" on page 241
- "InfoPrint AFP color and grayscale products" on page 251
- "AFP color solution scenarios" on page 256
- "Related publications" on page 262
- Scenario describing a possible implementation:

  "Replacing pre-printed forms" on page 258

Color printing concepts

Color printing is significantly more complicated than black and white printing. If you understand some of the complexities, you can make the transition from black and white printing to grayscale or color printing more smoothly.

Color spaces and ICC profiles

Presentation devices, such as computer monitors and printers, create colors differently. Because of these differences, colors must be described differently for each device. The different methods of describing colors are called *color spaces*. In addition, each device might have one or more International Color Consortium (ICC) profiles associated with it. ICC profiles are used when an image or another object is converted to the color space of a different device.

Each device has its own individual color space and range of colors that it can display or print. The color space specifies how color information is represented in an image when it is displayed on a particular device. As the image is passed from one device to the next, the color information about the image is converted from the color space of the source device to the color space of the destination device. Because color spaces do not exactly match between devices, some of the color information can be lost or modified in the conversion process.

A *color space* is a representation of the individual colors that can be combined to create other colors. Some color spaces that are relevant to printing are:

- **RGB**

  In an RGB color space, red, green, and blue light are combined in different amounts and intensities to create different colors. RGB colors are often specified as single-byte integers numbered from 0 through 255. You can specify 256 levels of intensity for each of the three colors. For example:
  - R=0, G=0, B=0 yields black
  - R=255, G=255, B=255 yields white
  - R=251 , G=254 , B=141 yields a pale yellow
  - R=210, G=154, B=241 yields a light purple

  Devices such as monitors, digital cameras, and scanners generally use RGB color spaces to describe colors. Two standard implementations of RGB color spaces are **sRGB**, which is most often used for Web graphics, and **Adobe RGB (1998)**, which we recommend for graphics that are printed.

- **CMYK**

  In a CMYK color space, cyan (bright blue), magenta (bright red-pink), yellow, and black pigments are combined to create different colors. CMYK values are often represented as a percentage. The percentage represents the portion of a particular area of paper that is covered by ink or toner. For example:
  - C=0%, M=0%, Y=0%, K=100% yields black
  - C=0%, M=0%, Y=0%, K=0% yields a blank area on the page
  - C=1.6%, M=0%, Y=44.7%, K=.4% yields a pale yellow
  - C=17.6%, M=39.6%, Y=5.5%, K=5.5% yields a light purple

  Color printers use the CMYK color space; they are loaded with ink or toner in each color. When the printer places dots of the correct sizes next to and on top of each other on a page, your eye interprets them as the intended color.

  Implementations of the CMYK color space vary from printer to printer and from paper to paper. Because the original color space of most images is an RGB color space, it is best to leave images in an RGB color space so they retain their original characteristics. That way, your print server or printer has as much of the original color information as possible when it converts the images to the most appropriate CMYK color space for the printer and paper combination.

  If you save an image using the CMYK color space, make sure that you either save an ICC profile for that color space or use a standard non-device specific CMYK color space like **SWOP** or **Coated FOGRA27** and associate the appropriate ICC profile with the image.

Note: Both RGB and CMYK values can be expressed in different ways. For example, in the PostScript data stream, the values range from 0.0 to 1.0, while in some graphic arts programs they can be expressed in hexadecimal numbers or as percentages.

An *ICC profile* contains information for converting an image between a device-specific color space and a *device-independent color space*. A device-independent color space is a color space that does not depend on or relate to the characteristics of any particular device, but rather contains all colors across all gamuts. The ICC identified a specific Profile Connection Space (PCS) as the target device-independent color space for all ICC profiles.

You can use an input ICC profile to translate color data created on one device (such as a digital camera) into the PCS. Then you can use an output ICC profile to convert from the PCS into the native color space of a different device (such as a printer). Converting images from one color space to another is process-intensive and can affect performance in your print system, although it is the best way to maintain consistent color across the devices in your system.

Gamut and rendering intent

Every device has a *gamut*, a range of colors or shades of colors that it can display or print. Some devices have larger gamuts than others; some devices have gamuts that are similar sizes, but that contain slightly different colors. When an image or a print job is created on a device with a gamut that is different from the printer, you can use a *rendering intent* to tell the printer how to adjust the colors that are outside the gamut of the printer.

The gamut of a printer is almost always significantly smaller than the gamut of a monitor, digital camera, or scanner. Images or graphics nearly always have to be adjusted to print appropriately because some of the colors that they require might be outside the gamut of the printer.

A rendering intent tells the printer how to adjust the image when it encounters colors that it cannot reproduce. Each rendering intent has different benefits and trade-offs, so you can choose one based on how the print output should look.

Color mixing and calibration

Four standard colors (cyan, magenta, yellow, and black) are blended to create all the colors in the gamut of a printer. A printer mixes colors by printing four layers of a page or an image, one in each color. If the printer registration is not set correctly, the images do not line up properly and the colors appear wrong. In addition, the printer must be calibrated to ensure that all its systems are functioning correctly and that it is in a known good state.

Using the color information described in its color space, each device determines the amount of cyan, magenta, yellow, or black to use. Dots of each color are printed in overlapping patterns that, when interpreted by your eyes, blend the colors appropriately. To ensure the colors are created accurately, the color planes must be perfectly aligned. If they are not, you might see *moire patterns*, unintended patterns in the printed images, or poorly blended colors, which are especially noticeable on the edges of your images.

Color printers must be calibrated regularly, in some cases daily, to ensure that the colors they produce are consistent. In addition, follow the recommended printhead maintenance procedures and schedule to ensure that the printer operates optimally. Even when a printer is calibrated correctly, its gamut is much smaller than that of any monitor, so images do not look the same when they are printed as they do when they are displayed on a monitor.

Halftones and tone transfer curves

Halftones are used to convert images (such as photographs, drawings, logos, or charts) from the continuous tones that you see on a monitor into a pattern of dots that a printer can put on paper. Tone transfer curves are used to modify the values of a particular color component and thus adjust the look and feel of some of the colors. For example, you can apply a tone transfer curve to emphasize the brightest parts of an image.

Halftones and tone transfer curves are used with both color and grayscale print jobs.

There are several different kinds of halftones, including clustered-dot, stochastic, and error diffusion. For simplicity, this discussion only covers clustered-dot halftones.

Clustered-dot halftones are generally characterized by:

- **Line screen frequency**

  Line screen frequency is a measure of the resolution of a halftone, expressed in lines per inch (lpi). A low line screen frequency, such as 80 lpi, creates coarser images because they use larger halftone dots. A high line screen frequency, such as 150 lpi, can produce higher quality images by using smaller halftone dots.

- **Halftone pattern**

  Halftone dots are printed in various shapes and patterns. For example, dots can generally be round, elliptical, or square, and they can be arranged in slightly different orientations. The halftone pattern also describes how the size of the dot is increased to cover a larger percentage of the total area and yield darker colors. Different patterns might produce better results for some print jobs.

- **Rotation**

  Lines of halftone dots do not run parallel with the top or side of the paper because that could cause unintended patterns to emerge, resulting in lower quality output.

  In addition, the dots for each of the four colors in a CMYK printer cannot all be printed at the same angle because they would overlap incorrectly and the colors would not appear as intended. Instead, the lines of dots are printed on the page at specific angles so your eye blends them appropriately.

  For example, the black layer of an image might be printed so the lines of dots run across the page at a 45 degree angle to the top of the paper, while the cyan layer is printed so that its lines of dots are at a 105 degree angle to the top of the paper.

Tone transfer curves are most often used to offset the effects of dot gain. *Dot gain* is the tendency for printed dots to be larger than intended, often because of the way ink reacts with paper. If the ink soaks into the paper and spreads out, the resulting dot is much larger (and possibly much lighter in color) than the printer intended it to be. Tone transfer curves can increase or reduce the amount of ink used in proportion to the dot gain.

File size

Color print jobs can have a file size that is much larger than black and white print jobs. The larger file size can lead to longer processing times and increased traffic on your network.

Because color images must contain data about each layer of color, the file might contain three to four times more information than a grayscale file and over 24 times more information than a black and white file. In addition, ICC profiles are embedded in some file types (such as TIFF images). While ICC profiles by themselves might not be very large, they do increase the size of an image. If you only have one image repeated throughout a print job, and if you construct your job so the image is downloaded only once, the embedded profile is of little concern.

However, if you use a variety of different images, each with an embedded profile, or if you construct your print job so that each image is downloaded every time it appears, the embedded profiles can add unnecessary volume to the print job. If you plan to use a wide variety of color images, create or save them with the same color space so they all use the same ICC profile. You can also install color images in a resource library so they can be reused.

Grayscale printing concepts

Grayscale printing lets you reproduce color images as high-quality black and white images, using many shades of gray to represent subtle variations in color and light. Printing solutions that produce high-quality grayscale output use color printing concepts with a black and white printer that supports them to achieve that effect.

Moving to grayscale printing might be a first step in a migration to full color printing. You can start to create color print jobs and print them on an existing printer until you are ready to invest in color printers. In addition, you can use a grayscale printer as a backup system for a full color printer.

Some color concepts are much less important in grayscale printing than they are in color printing:

- The gamut of a black and white printer is much smaller than that of a color printer; essentially all the colors in an image must be adjusted.
- The rendering intent you choose has little effect on the appearance of the image because the colors are already being changed significantly.
- Page registration is less important. Because the printer only uses one color, you do not have to line up the color planes to create the correct color.
- Paper characteristics have minimal effect on grayscale output; one output profile is usually adequate for all types of paper.

Other color concepts are more essential to grayscale printing.

Color spaces and ICC profiles

The color space of a black and white printer is much smaller than that of a color printer. Even so, printers that can print grayscale images have output ICC profiles, just like color printers. The ICC profiles for black and white printers map colors from the Profile Connection Space (PCS) to shades of gray. Otherwise, the color conversion process is the same.

The print job should specify the appropriate input profile; if there is no input ICC profile, the printer uses a reasonable default. The printer has its own default ICC profile installed and available; it should be adequate for nearly all print jobs.

Halftones

Grayscale printers apply halftones to print jobs to print them; halftones let the printer produce many shades of gray and high-quality images. Generally, the most important characteristic to consider for halftones in grayscale printing is line screen frequency, expressed in lines per inch (lpi). Each printer supports a set of line screen frequencies natively; when you specify the desired line screen frequency in a print job, the printer chooses the available line screen frequency that best matches it.

Tone transfer curves

Tone transfer curves are used in grayscale printing to adjust the amount of toner that is used at different levels of gray, thus adjusting the appearance of images. You can use the appearance value of a tone transfer curve in grayscale printing to indicate how much the tone transfer curve should adjust the color values. Some sample appearance values could be:

- Dark
- Highlight Midtone
- Standard

Color management

Images, graphics, and photographs often appear different depending on the monitor or the printer you use. The colors printed by one printer might not match the colors printed on another printer, even if they came from the same source. If it is important that colors stay consistent from camera, scanner, or monitor to printer, you must use *color management* practices.

It is virtually impossible to accurately reproduce the colors that you see on your monitor on a printed page. Because printers typically have smaller color gamuts than other devices, some of the colors must always be adjusted when images are transformed for printing. With color management, you can control the adjustments so they are less noticeable than they might be if you use the default settings of your image creation software, print server, and printer.

Several factors play significant roles in color management, including ICC profiles, rendering intents, and paper characteristics.

ICC profiles

The International Color Consortium (ICC) is an organization that has established open standards for color management. These standards help products work together by identifying a device-independent color space and defining the elements of an ICC profile.

The device-independent color space that the ICC defined is called the profile connection space (PCS). The PCS is a color space large enough to include all the color gamuts of different input, display, and output devices. An ICC profile contains methods that map the colors that a device can create or display to the values of the corresponding colors in the PCS. The ICC profile can be used to convert an image from a device-specific color space to the PCS, or from the PCS to a device-specific color space.

Product manufacturers create ICC profiles that you can use with their devices. For example, if you take a photograph with a digital camera, you can associate the

photograph with the ICC profile for your camera. Then, when you want to print that photograph, the color management system converts the color data from the camera into the PCS. The printer then uses its ICC profile to convert the photograph data from the PCS into its color space, and prints the photograph as accurately as it can.

For more information about the ICC, ICC profiles, and the PCS, see the ICC Web site:

http://www.color.org

Rendering intents

Rendering intents indicate what you want a printer to do with colors that are outside its gamut.

ICC profiles support these rendering intents:

- **Perceptual**

  If an image includes any colors that are out-of-gamut for the printer, the printer adjusts all the colors in the image, even those that are already in the gamut of the printer, so they are all in-gamut and maintain their color relationships to each other. The result is an image that is visually pleasing, but is not colorimetrically accurate. The perceptual rendering intent is useful for general reproduction of images, particularly photographs.

- **Saturation**

  If a print job includes colors that are out-of-gamut for the printer, the printer replaces the out-of-gamut color with the nearest color in the gamut. It also adjusts the in-gamut colors so that they are more vivid. Saturation is the least used rendering intent, but it is useful for business graphics, such as images that contain charts or diagrams.

- **Media-relative colorimetric**

  If a print job includes colors that are out-of-gamut for the printer, the printer substitutes the nearest in-gamut color; in-gamut colors are not adjusted. Colors printed on papers with different media white points might not match visually. The *media white point* is the color of the paper that the print job is printed on. For example, if you print an image on white paper, on off-white paper, and on blue paper using the media-relative colorimetric rendering intent, the printer uses the same amount of ink or toner for each one and the resulting color is technically the same. However, the images might seem different because your eyes adjust to the color of the background and interpret the color differently. This rendering intent is typically used for vector graphics.

- **Absolute colorimetric**

  All colors are mapped using the same method as the media-relative colorimetric rendering intent, however, all colors are adjusted for the media white point. For example, if you print an image on white paper, on off-white paper, and on blue paper using the media-relative colorimetric rendering intent, the printer adjusts the ink or toner used for each one. The resulting color is technically not same, but the images might look the same because of the way your eyes interpret them in relationship to the color of the paper. The absolute colorimetric rendering intent is typically used for logos.

Paper characteristics

The paper that you use has a significant impact on the colors that you see. Even if you use the same ICC profile and the same printer, printing on a different paper can result in a very different color appearance.

Colors can change from paper to paper, particularly if you change from coated to uncoated paper or from sheet-fed to continuous forms paper. The changes can be so noticeable that printer manufacturers generally test and certify papers with certain characteristics for use with their printers. They also create different ICC profiles for their printers based on paper characteristics. Some ICC profiles can be used for groups of papers that have similar characteristics.

When you load paper, you set certain paper characteristics on the printer. When the printer chooses the correct device-specific output profile to use, it takes the characteristics into consideration. The paper characteristics are:

- **Media brightness**

  The percentage of light that the paper reflects
- **Media color**

  The color of the paper
- **Media finish**

  The characteristics of the surface of the paper, such as: glossy, satin, matte
- **Media weight**

  The basic weight of the paper

AFP color management

You can use various ways to print color data with Advanced Function Presentation (AFP). However, to implement an AFP color printing solution with full color management, you must use color management resources (CMRs). We also recommend that you install all of your color images as data objects and associate CMRs with them.

Color management resources

Color management resources (CMRs) are the foundation of color management in AFP print systems. They are AFP resources that provide all the color management information, such as ICC profiles and halftones, that an AFP system needs to process a print job and maintain consistent color from one device to another.

CMRs share some characteristics with other AFP resources, but are different in some important ways.

CMRs are similar to other AFP resources in these ways:

- CMRs can be associated with elements of a print job at various levels of the hierarchy.

  Normal hierarchy rules apply, so CMRs specified at lower levels override those at the higher level. For example, a CMR set on a data object overrides a default CMR set on a print file.
- CMRs can be included in a print job in an inline resource group and referenced in a form definition, page environment, object environment, or an include Object (IOB) structured field.

> Note: CMRs can vary in size from several hundred bytes to several megabytes. If your print job uses relatively few CMRs, including them in the print file might not have an impact on the performance of your system. However, if your print job uses more than 10 CMRs, the size of the print job can increase so much that file transfer rates and network traffic are affected.

- CMRs can be stored centrally in a resource library, so you do not need to include them in every print job.

  You can configure all your print servers so they can access the CMRs.

- For the print server to find CMRs, the resource library must be listed in the AFP resource search path on the print server.

CMRs are different from other AFP resources in these ways:

- You cannot copy CMRs into a resource library as you can other AFP resources.

  To store CMRs in a central resource library, you must install them using an application such as AFP Resource Installer.

- CMRs and data objects must be stored in resource libraries that have resource access tables (RATs).

  AFP Resource Installer creates the RAT when CMRs and data objects are installed. We recommend that CMRs and data objects be installed in separate resource libraries and that you store resources that do not require RATs (such as form definitions, page definitions, and overlays) in other resource libraries.

- CMRs installed in a resource library can have names longer than 8 characters, and you can use the names in the print data stream.

  These names are created when you install the CMR using AFP Resource Installer and are UTF-16BE encoded.

Types of CMRs

Different situations call for different types of CMRs. Some CMRs are created by product manufacturers so you can download and use them, while others are created by your printer or other color management software. If you have the appropriate information, you can also create CMRs yourself.

Some CMRs are used to interpret input files (similar to the function performed by ICC input profiles), while others are used to prepare the final print job output for a specific printer (similar to the function performed by ICC output profiles).

Color conversion CMRs:

Color conversion CMRs are used to convert colors to and from the ICC Profile Connection Space (PCS), a device-independent color space. You can use them to prepare images for color or grayscale printing.

Color conversion CMRs are an essential element of any AFP color management system because they are ICC profiles encapsulated in AFP structures. The AFP structures add information that your color management system can use, but it leaves the ICC profile unaltered.

You can use color conversion CMRs to produce consistent colors on different devices. In a color system, they help ensure that the colors on your monitor are as close as possible to those that are printed. If you move the print job to a different printer, the colors are adjusted again to match the new printer.

In a grayscale system, color conversion CMRs map colors to appropriate shades of gray to produce high-quality black and white images.

Link color conversion CMRs:

Link color conversion CMRs combine the processing information required to convert an image from the color space of an input device to the PCS, and then from the PCS to the color space of the output device. Essentially, link color conversion CMRs replace a pair of color conversion CMRs.

Converting color images to and from the PCS takes a significant amount of processing resources, in part because the process includes two conversions. Link color conversion CMRs combine the two conversions and make them more efficient. The printer can use the link color conversion CMR to convert colors directly from the color space of the input device to the color space of the output device with the same color fidelity they would have if the printer did both of the conversions. As a result, link color conversion CMRs can improve system performance.

Link color conversion CMRs are unique. You cannot create a link color conversion CMR yourself and you do not include references to link color conversion CMRs in your print jobs. The print system creates and uses link color conversion CMRs automatically.

If you use AFP Resource Installer, link color conversion CMRs are generated automatically when you create or install a color conversion CMR. As a result, your resource library always contains link color conversion CMRs for every combination of color conversion CMRs in audit (input) and instruction (output) processing modes. When link color conversion CMRs are created, AFP Resource Installer marks them as *capturable*, so the printer can save them to be used in other print jobs.

If you do not use AFP Resource Installer, your printer might create link color conversion CMRs when it processes print jobs. For example, if you send a print job to an InfoPrint 5000, the printer controller looks at the audit color conversion CMRs that are specified. Then, the print controller looks at the link color conversion CMRs that it has available to find one that combines the audit color conversion CMR with the appropriate instruction color conversion CMR. If it does not find one, the print controller creates the link color conversion CMR and uses it. The print controller might save the link color conversion CMRs that it creates, but they can be removed during normal operation; for example, if the printer runs out of storage or is shut down. If the link is removed, the printer must create a new link color conversion the next time it is needed.

When a link color conversion CMR is created, the print system evaluates the conversion algorithms to and from the PCS. The system then combines the algorithms, so a data object can be converted directly from one color space to the other without actually being converted to the PCS.

Halftone CMRs:

Halftone CMRs carry the information that a printer uses to convert print jobs into a pattern of dots that it can put on paper. Halftone CMRs can be used with both color and grayscale print jobs.

Halftone CMRs generally specify the line screen frequency, halftone pattern, and rotation of the halftone that they carry. Device-specific halftone CMRs might also include the printer resolution.

A printer that uses AFP color management to print color or grayscale print jobs must use a halftone CMR to convert the print job into a format that the printer can reproduce in ink or toner. If a halftone CMR is not specified in the print job, the printer applies a default halftone CMR.

Note: If you send your color print jobs to an InfoPrint 5000 printer, halftones are applied by the print engine. As a result, the printer ignores halftone CMR requests.

You can associate device-specific halftone CMRs or generic halftone CMRs with print jobs:

- If you know which printer is printing the job, you can associate a device-specific halftone CMR with the print job (or with AFP resources inside the print job). The printer uses the halftone CMR that you specify.
- If you do not know which printer is printing the job, but you want to ensure that it uses a halftone CMR that has certain characteristics, such as a specific line screen frequency, you can associate a generic halftone CMR with the print job.

Because it is difficult to know which halftone CMRs should be used for the current conditions on the current printer, we recommend that you specify halftone CMRs generically and let the printer choose the most appropriate CMR that it has available.

Generic halftone CMRs

You can use generic halftone CMRs when you want to choose one or more characteristics of the halftone CMR for a print job, but you do not know exactly which halftone CMRs are available.

When a print job specifies a generic halftone CMR, the print server looks in the resource library for halftone CMRs that match the printer device type and model. If the print server finds an appropriate CMR, it sends the device-specific halftone CMR to the printer with the print job. If the print server does not find an appropriate halftone CMR, it sends the generic halftone CMR to the printer.

If a print job arrives at the printer requesting a generic halftone CMR, the printer compares the requested characteristics with the available device-specific halftone CMRs. If there is a match, the printer uses the selected device-specific halftone CMR when it processes the print job. If there is no match, the printer uses the halftone CMR whose line screen frequency value is closest to the one requested.

The Color Management Object Content Architecture (CMOCA) has defined a variety of generic halftone CMRs, which cover the most common line screen frequencies and halftone types. A print server that supports CMOCA can interpret generic halftone CMRs if it has device-specific halftone CMRs available to it in a resource library. If you use AFP Resource Installer, the generic halftone CMRs are installed in every resource library that you create and populate using AFP Resource Installer.

Printers that support CMOCA should be able to interpret those generic CMRs and associate them with device-specific halftone CMRs.

Tone transfer curve CMRs:

Tone transfer curve CMRs are used to carry tone transfer curve information for an AFP print job, so you can modify the values of a particular color component and

adjust the appearance of some of the colors by increasing or decreasing the amount of ink used to emphasize or reduce the effects of dot gain on the final output.

Like halftone CMRs, tone transfer curve CMRs are associated with print jobs specifically or generically. If they are specified generically, the print server looks in the resource library for tone transfer curve CMRs that match the printer device type and model. If the print server finds an appropriate CMR, it sends the device-specific tone transfer curve CMR to the printer with the print job. If the print server does not find an appropriate tone transfer curve CMR, it sends the generic tone transfer curve CMR to the printer.

If a print job arrives at the printer requesting a generic tone transfer curve CMR, the printer compares the requested characteristics with the device-specific tone transfer curve CMRs that it has available. If there is a match, the print server or printer uses the selected device-specific tone transfer curve CMR when it processes the print job. If the printer cannot find a good match for the generic tone transfer curve CMR, it ignores the request and uses its default tone transfer curve CMR.

The Color Management Object Content Architecture (CMOCA) defines several generic tone transfer curve CMRs with different appearance values. The appearance values let you specify how to print your job with regard to the reported dot gain of the printer.

Generic tone transfer curves can be used to select these appearance values:
* **Dark**

  The output is adjusted to show a dot gain of 33% for a 50% dot.
* **Accutone**

  The output is adjusted to show a dot gain of 22% for a 50% dot.
* **Highlight Midtone**

  The output is adjusted to show a dot gain of 14% for a 50% dot. This appearance might be used to emphasize the brightest part of an image.
* **Standard**

  The output is adjusted just enough to account for the effects of dot gain, effectively counteracting the dot gain.

If you use AFP Resource Installer, it installs the generic tone transfer curve CMRs on your system automatically.

CMR processing modes

CMR processing modes tell the print system how to apply a CMR to the print data it is associated with. You specify a CMR processing mode whenever you specify a CMR, although not all modes are valid for all CMR types.

Audit processing mode:

CMRs with the audit processing mode refer to processing that has already been applied to a resource. In most cases, audit CMRs describe input data and are similar to ICC input profiles.

The audit processing mode is used primarily with color conversion CMRs. In audit processing mode, those CMRs indicate which ICC profile must be applied to convert the data into the Profile Connection Space (PCS).

For example, to take a photograph with a digital camera and then include the photograph in an AFP print job, you can use AFP Resource Installer to:

1. Create a color conversion CMR using the ICC profile of your camera.
2. Install your photograph in a resource library.
3. Associate the color conversion CMR with the data object, indicating the audit processing mode.

Then, you create a print job that includes the data object. When processing the print job, the system uses the color conversion CMR to convert the colors in the image into the PCS. The colors can then be converted into the color space of the printer that is printing it.

Instruction processing mode:

CMRs with the instruction processing mode refer to processing that is done to prepare the resource for a specific printer using a certain paper or another device. Generally, instruction CMRs refer to output data and are similar to ICC output profiles.

The instruction processing mode is used with color conversion, tone transfer curve, and halftone CMRs. In instruction processing mode, these CMRs indicate how the system must convert a resource so it prints correctly on the target printer. The manufacturer of your printer should provide ICC profiles or a variety of CMRs that you can use. Those ICC profiles and CMRs might be installed in the printer controller, included with the printer on a CD, or available for download from the manufacturer's Web site.

If you send a color AFP print job to a printer that supports AFP Color Management, color conversion and tone transfer curve CMRs in instruction processing mode can be associated with the job. When the printer processes the print job, it applies the CMRs in this order:

1. Color conversion CMRs in audit processing mode, to convert the resources into the ICC Profile Connection Space (PCS)
2. Color conversion and tone transfer curve CMRs in instruction processing mode, to convert the resources into the color space of the printer
3. Halftone CMR in instruction processing mode, to convert the job pages from their digital format into the pattern of dots that the printer can produce

In some cases, CMRs that are usually used as instruction CMRs can be used as audit CMRs. For example, if you send a very large print job to a high-speed printer, the images in the print job are converted into the color space of that printer using a color conversion CMR with the instruction processing mode. However, if you have to reprint part of the job on a different printer, the system must convert the print job into the color space of the second printer. In that case, the color conversion CMR of the first printer is used in the audit processing mode to move the images back into the PCS. Then, the system uses a color conversion CMR of the second printer in instruction mode to convert the images into its color space.

Link processing mode:

CMRs with the link processing mode are used to replace a selected pair of color conversion CMRs. Only link color conversion CMRs can use the link processsing mode.

You can install both audit and instruction color conversion CMRs in your resource library using AFP Resource Installer or a similar software product. AFP Resource Installer then creates link color conversion CMRs for every combination of audit and instruction color conversion CMR.

When a print job calls for a given combination, the print server checks the resource library for a link color conversion CMR for that combination. If the print server finds an appropriate link color conversion CMR, it sends the CMR to the printer with the print job. Your printer can use the link CMRs whenever a print job indicates that it uses a particular combination of audit and instruction CMRs.

If you do not use AFP Resource Installer or a similar program to install your resources, your color printer must either create link CMRs while it processes your print jobs or convert the colors in your jobs twice, first from the original color space to the PCS and then from the PCS to the color space of the printer.

An InfoPrint 5000 printer creates link color conversion CMRs so it only has to do one conversion, and saves them so they can be used with other print jobs. The InfoPrint 5000 might save the link color conversion CMRs, but they can be removed during normal operation; for example, if the printer runs out of storage or is shut down.

CMR creation and installation

Device manufacturers and groups that support AFP color standards create CMRs that you can use in your color printing systems. You can also create CMRs yourself, based on your needs.

The AFP Consortium, the group that defined the AFP Color Management Object Content Architecture (CMOCA), identified a set of color conversion CMRs that are most often used in audit processing mode. The set includes color conversion CMRs for common color spaces, such as:
- Adobe RGB (1998)
- sRGB
- SMPTE-C RGB
- SWOP CMYK

The standard CMRs are included with AFP Resource Installer, although they are not installed by default. You can install the standard CMRs that you plan to use. In addition, AFP Resource Installer automatically installs all the generic halftone and tone transfer curve CMRs in any resource library you create.

You can download device-specific CMRs for InfoPrint printers such as the InfoPrint 5000 from the InfoPrint Solutions Company Web site:

http://www.infoprint.com

If you need more CMRs, you can create them using wizards provided in AFP Resource Installer. See the online help for details about the wizard.

If you use AFP Resource Installer to create a CMR, the software automatically installs the CMR in a resource library. You can also use AFP Resource Installer to install CMRs that you get from your printer manufacturer.

Data objects

Presentation data objects contain a single type of data (such as TIFF, GIF, and JPEG images) and can be used in your print jobs. These data objects can be placed directly in a page or overlay or can be defined as resources and included in pages or overlays. Using a data object as a resource is more efficient when that object appears more than once in a print job; resources are downloaded to the printer just once and referenced as needed.

Data objects can either be included inline with a print job or installed in a resource library using software such as AFP Resource Installer. If you install your data objects in a resource library, you can associate color conversion CMRs with them.

Types of data objects

Image data objects can be stored in a number of different formats, including EPS, GIF, IOCA, JFIF (JPEG), PDF, and TIFF. These image types are device-independent so they can be used by different systems and still be interpreted consistently.

- Encapsulated PostScript (EPS)

  EPS is a PostScript graphics file format that follows conventions that Adobe Systems defined. EPS files support embedded ICC profiles.

- Graphics Interchange Format (GIF)

  GIF files are bitmap image files that are limited to a palette of 256 RGB colors. Because of the limited color range that it can contain, GIF is not a good format for reproducing photographs, but it is generally adequate for logos or charts. GIF images are widely used on the Internet because they are usually smaller than other image formats. GIF files use the file extension .gif.

- Image Object Content Architecture (IOCA)

  IOCA is an architecture that provides a consistent way to represent images, including conventions and directions for processing and exchanging image information. The architecture defines image information independently of all data objects and environments in which it might exist and uses self-identifying terms; each field contains a description of itself along with its contents.

- JPEG File Interchange Format (JFIF)

  JFIF files are bitmap image files that are compressed using Joint Photographic Experts Group (JPEG) compression. As a result, JFIF files are most commonly referred to as JPEG files. JPEG files most commonly use the file extension .jpg, but can also use .jpeg, .jpe, .jfif, and .jif.

  JPEG compression deletes information that it considers unnecessary from images when it converts them. JPEG files vary from having small amounts of compression to having large amounts of compression. The more an image is compressed, the more information is lost. If the image is compressed only once, there usually is no noticeable effect on the image. However, if the image is compressed and decompressed repeatedly, the effects of deleting information become more noticeable.

  JPEG compression is commonly used for photographs, especially photographs that are transmitted or displayed on Web pages. The compression makes the files small enough to transmit across a network efficiently, but leaves enough information that the image is still visually appealing.

- Portable Document Format (PDF)

  PDF is a standard file format that Adobe Systems developed.

  PDF files can be used and stored on various operating systems and contain all the required image and font data. Design attributes in a PDF are kept in a single compressed package.

Note: PDF files can contain multiple pages. However, only single-page PDF files can be used as data objects in AFP print jobs.

- Tagged Image File Format (TIFF)

  TIFF files are bitmap image files that include headers to provide more information about the image. TIFF files use the file extensions .tif or .tiff.

  TIFF files support embedded ICC profiles. If an ICC profile is embedded in a file, the characteristics of the input color space are known whenever the file is used; however, the profiles increase the file size. When you save a file in the TIFF format, you can use various compression algorithms.

Not all printers support all types of data objects.

The embedded ICC profiles in EPS, JPEG, and TIFF files contain the information that a printer uses to convert colors in the image from an input color space into the Profile Connection Space (PCS). The input color space might be an industry-standard space or it can describe the color reproduction capabilities of a device, such as a scanner, digital camera, monitor, or printer.

Data object creation and installation

You can use a wide variety of software applications to create or manipulate images to include in print jobs. If you want to store them in central resource repositories, you can use AFP Resource Installer to install them.

Data object creation

Most types of data objects are images of some kind. They might be photographs taken using a digital camera, charts or diagrams generated by a software tool, or digital drawings created using graphics software. Regardless of how images are created, you generally need to manipulate them to include them in print jobs.

The changes include:

- Convert the image into a file type that is appropriate for printing. For example, the file types that many graphics applications (such as Adobe Illustrator, CorelDRAW, and Corel Paint Shop Pro) use to store images while you work on them are not appropriate for printing. To use images that you create using any of those programs, you can save or export those files as a different file type, such as EPS, JPEG, or TIFF.
- Make sure that your image files are associated with an appropriate color space or input profile. Follow the instructions provided with your graphics software to set up color management, including installing and using ICC profiles for digital cameras and monitors, and customizing color management settings. The instructions should also explain how to change the color profile that an image uses and how to save an image with an embedded profile.
- Follow the tips and best practices provided in the other sections below for creating images and managing them as data object resources.

Data object installation

You can use AFP Resource Installer to install your images in a resource library. AFP Resource Installer includes wizards that can guide you through the process of installing an image as a data object. When you install an EPS, JPEG, or TIFF image with an embedded ICC profile using AFP Resource Installer, you can choose how you want to handle the profile:

- Leave the profile in the file without creating a CMR.

- Leave the profile in the file, but also copy the profile and create a CMR from the copy. Associate the new CMR with the data object.
- Remove the profile from the file (to reduce the file size) and make the profile into a CMR. Associate the new CMR with the data object.

Resource library management

If you store CMRs and data objects in central resource libraries, you must understand some of the characteristics of resource libraries to make sure that your resources are available when and where you need them.

Resource libraries that AFP Resource Installer creates use a *resource access table* (RAT) as the index of the resource library. The index is stored as a file in the library that it refers to. You must store CMRs in resource libraries that use a RAT. We recommend that you store data objects in resource libraries that use a RAT as well.

When you use AFP Resource Installer to create a resource library, it creates a RAT and stores it in the library. When you install a CMR or data object, AFP Resource Installer updates the RAT with information about the resource. When a print server looks in a resource library for a resource, it first looks in the RAT to see if the resource is listed.

The print server relies on the RAT; if it is incorrect, the print server cannot find resources in the resource library. As a result, you must always use AFP Resource Installer to manage your resource libraries, including to:

- Add CMRs and data objects to a resource library.

  Do not copy CMRs or data objects directly into the resource libraries that AFP Resource Installer uses. If you copy CMRs or data objects into these resource libraries, the RAT is not updated so the print server cannot use it to find the CMRs or data objects.

- Modify properties of data objects and CMRs listed in the RAT.

  Do not directly edit the RAT or any of the files in a resource library. Do not replace an existing version of a CMR or data object with a new version by copying the new version directly into the resource library; use AFP Resource Installer to update the resource.

- Install CMRs or data objects in a different resource library or replicate a resource library in a different location.

  Do not copy CMRs or data objects from a resource library and store them in another location.

For more information about completing these tasks, see the AFP Resource Installer online help.

Tips and best practices

These general guidelines about creating and managing images and other color resources can improve the performance of your AFP color printing system.

Tips for images

To optimize the performance of your AFP color printing system, we recommend that you follow some guidelines for creating and including images in print jobs.

When you want to use color images in your print jobs:

- Get the original electronic versions of images instead of scanning existing documents.

  Almost unnoticeable specks of color in the background of images that have been scanned can greatly increase the size of the image. If you must scan an image, use an image editing tool to clean up the background as much as possible.
- Save all images in the same standard color space so you only need one input profile for all of them.

  Adobe RGB (1998) is the recommended color space for images that are to be printed.
- Flatten multi-layer images (such as the ones you can create in graphics tools like Adobe Illustrator and Corel Paint Shop Pro) before including them in print jobs.

  Unflattened images are extremely large and more difficult to work with. Save a copy of the original image for future editing, but flatten the version that you include in your print job.

Tips for resources

To optimize the performance of your AFP color printing system, we recommend that you follow some guidelines for managing color resources.

You can use AFP Resource Installer to:
- Install all the CMRs for your printer in a resource library.
- Install the data objects that you use frequently in a resource library.
- Mark the CMRs and data objects that are reused regularly as non-private, capturable resources so they can be saved on the printer and used for other print jobs without being downloaded every time.

  Note: This option is not advisable for secure resources, such as signature files.
- Install CMRs and data objects in resource libraries that the print server can access, so they only need to be stored in one place and can be used by all print servers.
- Associate audit color conversion CMRs with data objects that require color management, so the embedded profiles can be removed from the image files.

InfoPrint AFP color and grayscale products

InfoPrint Solutions Company provides a variety of products that support AFP color and grayscale printing. They can be used in various combinations to create color workflow solutions.
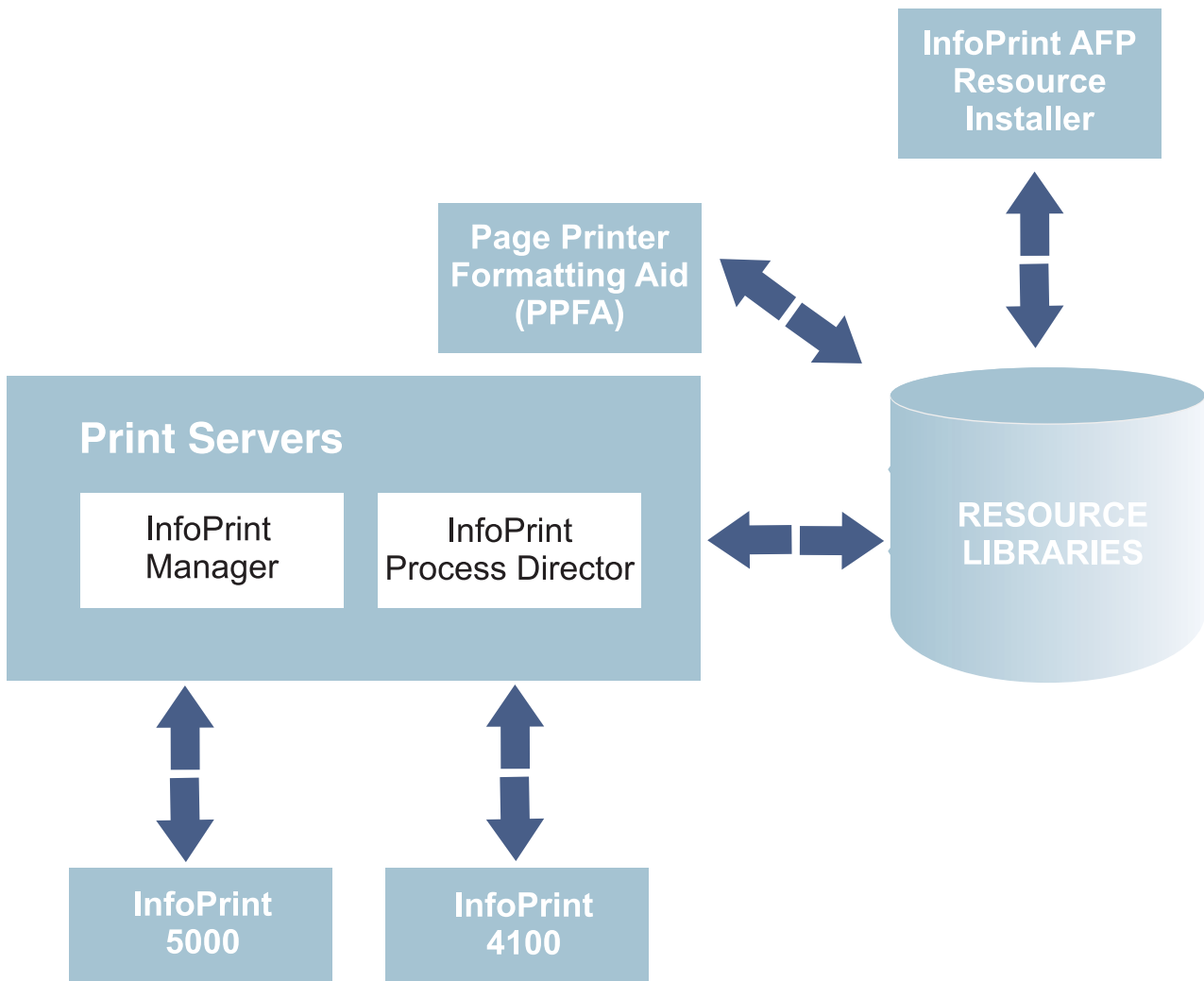
Figure 57. The InfoPrint products that support AFP color management

Printers

Some InfoPrint Solutions Company printers support color or grayscale printing with full AFP color management, while others support AFP color printing without color management.

InfoPrint 5000

The InfoPrint 5000 is a full-color, high-speed, continuous forms Intelligent Printer Data Stream (IPDS) printer that supports AFP color management.

The InfoPrint 5000 uses piezo-electric drop-on-demand inkjet technology with water-based pigment inks that are designed to resist fading and smearing.

The InfoPrint 5000 receives AFP print jobs from InfoPrint print servers. When used as part of a full AFP color management system, the InfoPrint 5000 can receive color conversion, link, and tone transfer curve CMRs and apply them to print jobs. Because the printer engine applies its own halftones, it does not support halftone CMRs.

The InfoPrint 5000 can capture resources and store them in a repository in its controller so they can be reused in other print jobs. The printer only captures resources that are marked non-private and capturable using an application such as AFP Resource Installer.

You can also submit PostScript and Portable Document Format (PDF) jobs to hot folders on the InfoPrint 5000, but those print jobs are not processed using AFP color management.

InfoPrint 4100

The InfoPrint 4100 family of printers uses a laser, electrophotographic print technology and Advanced Function Presentation (AFP) licensed programs to create high-quality text and graphics output. InfoPrint 4100 printers with the InfoPrint POWER™ architecture and microcode release 15.4 or later support the AFP color management architecture and can be used to print very high-quality grayscale images.

The base level of AFP color management support in InfoPrint 4100 printers with the InfoPrint POWER architecture and microcode release 15.4 or later lets you apply color management to grayscale text, graphics (GOCA), bi-level images (IOCA FS10), and bar codes. To use color management functions with other types of objects, the AFP Color Emulation feature is required.

The AFP Color Emulation feature lets you print color objects in grayscale. When the feature is installed, AFP Color Management lets you natively print GIF, IOCA FS11, IOCA FS45, JPEG, and TIFF images in high-quality grayscale.

Note: Single-page PDF and EPS data objects are not supported on the InfoPrint 4100.

InfoPrint 4100 printers support these types of CMRs:
- Color conversion
- Link color conversion
- Tone transfer curve
- Halftone

For even better images on InfoPrint 4100 Models MS1, MD1, and MD2, you can also install the Image Enhancement feature. Benefits of this feature include:
- Enhanced fusing technology to minimize toner distortion
- Optimized developer unit for high coverage and high-density applications
- Improved halftones tailored to new hardware and toner technology

InfoPrint 1xxx series

The InfoPrint 1xxx series of workgroup printers and multifunction devices includes a wide range of cut-sheet color and monochrome devices, although they do not support AFP Color Management.

For general office purposes, the InfoPrint 1000 series lets you manage color output efficiently and cost-effectively through advanced technologies such as access controls, confidential print, and data stream encryption. Through the 1000 family of printers, InfoPrint Solutions Company offers output strategies and InfoPrint color printers that address diverse requirements for high quality, security, and cost.

InfoPrint AFP Resource Installer

InfoPrint AFP Resource Installer is a key element of an AFP color management system when resources are stored in central libraries. You can use it to create, install, and manage color management resources (CMRs) and data objects for use in your system.

AFP Resource Installer is a Java application that you install on a Windows workstation. You can use it to install and work with fonts in addition to CMRs and data objects.

You can use AFP Resource Installer to:

- Create CMRs from existing data, including ICC profiles.

  You can use a wizard to guide you through the process.
- Install CMRs, fonts, and data objects in resource libraries on the local system or on any system that you can access using FTP.
- Associate CMRs with data objects, so data objects can be reproduced accurately on different printers.

  In some cases, you can reduce the file size of your images by removing the embedded color profile from the file and using an associated CMR.
- Mark resources as capturable.

  Capturable resources can be captured and saved in the printer for use with other print jobs, which can help improve system performance. The print server queries the printer before it sends any resources; if the printer already has the resource, the print server does not have to send it.
- Mark resources as private.

  Private resources cannot be captured in the printer and must be downloaded with every print job that uses them. For example, you can mark signature files used for company checks as private for security reasons.

When you use AFP Resource Installer to install a color conversion CMR, the software automatically creates link color conversion CMRs between the new color conversion CMR and the existing color conversion CMRs. When a print file references the new CMR, the print server automatically downloads the link CMRs that match the target device type and model and sends them to the printer with the print job. If one of those link CMRs is appropriate, the printer can use it instead of having to spend extra time creating a link CMR.

To let a print server use resources installed by AFP Resource Installer, you must add the path to the resource libraries to the AFP resource path in the server.

Print servers

InfoPrint print servers receive print jobs from various sources and prepare them to be sent to a printer. After print jobs have been prepared, the print server interacts with the printer to make sure that all the required resources are available, then sends the print job data to be printed.

Several different print servers are available. Although they provide much of the same function, they are appropriate for different environments.

InfoPrint Manager

InfoPrint Manager is a flexible and scalable print management solution for AIX or Windows that provides many choices in expanding and managing your print

environment. InfoPrint Manager can process print jobs that contain references to color management resources and interact with centralized resource libraries.

When InfoPrint Manager receives AFP or line data print jobs, it processes CMRs and data objects similar to the way it processes other AFP resources. You can add the resource libraries that you create using AFP Resource Installer to the Location of presentation object containers property (also called the resource-context-presentation-object-container attribute) of your actual destinations. Then, InfoPrint Manager can search those resource libraries to find data objects and CMRs when print jobs request them.

Enabling capture for CMRs:

If the jobs that run through your system use the same CMRs, you might want to enable your actual destination to capture inline CMRs.

These inline CMRs must have an object identified (OID) so InfoPrint Manager can capture them.

From the **InfoPrint Manager Administration GUI**:
1. Click on the actual destination and select **Printer** → **Properties**.
2. From the actual destination's **Printer Properties** notebook, click the **Tuning** tab.
3. Find the **Capture inline CMR resources** radio button. If you can't see the **Capture inline CMR resources** radio button, click **Show more**.
4. Scroll to the bottom of the screen and click the **Yes** radio button for the **Capture inline CMR resources** setting.

Page Printer Formatting Aid (PPFA):

PPFA is a feature of InfoPrint Manager that lets you create form definitions and page definitions for use with your AFP print jobs. You can use PPFA to associate CMRs with form definitions and page definitions for your color print jobs.

The form definitions and page definitions that you create using PPFA can be used in print jobs that are sent to InfoPrint Manager and InfoPrint ProcessDirector.

InfoPrint ProcessDirector

InfoPrint ProcessDirector is a database-driven print workflow system that lets you manage all aspects of your printing process. The server runs on an AIX or Linux® system and is accessed using a Web browser-based interface. InfoPrint ProcessDirector can receive and process AFP print jobs that include AFP color management objects.

InfoPrint ProcessDirector can also receive line data print jobs that refer to CMRs and data objects and convert them into AFP using a step based on the **ConvertLineDataJobIntoAFP** step template.

InfoPrint ProcessDirector processes CMRs and data objects similar to the way it processes other AFP resources. You can add the resource libraries that you create using AFP Resource Installer to the AFP resource path property on a print job or in the job defaults for your job types. Then, InfoPrint ProcessDirector can search those resource libraries to find data objects and CMRs when print jobs request them.

AFP color solution scenarios

AFP color solutions from the InfoPrint Solutions Company can be assembled in a variety of configurations based on your environment and needs.

Printing high-quality grayscale output on an InfoPrint 4100 printer

An insurance company wants to migrate to AFP color printing slowly, so they start the process by using AFP color management to print high-quality grayscale output on their InfoPrint 4100 printers.

The insurance company runs an in-house print shop that has four duplex InfoPrint 4100 lines. They use a document composition tool to create AFP print jobs and submit the jobs to InfoPrint Manager for Windows, which they use to balance the printing loads and keep all the printers running as much as possible.

They have decided that they want to add images to some of their output. To start, they want to add photographs of their insurance agents to the letterhead on letters to their clients. They are not ready to move into full color printing, so they want to print black and white images using their existing printers. Unfortunately, they have not been satisfied with the appearance of the images; they are too black and one-dimensional, so they look unprofessional.

The solution

The InfoPrint Solutions Company team suggests these changes to improve image quality:

- Upgrade the printer to use a controller with the InfoPrint POWER architecture with microcode release 15.4 or later.

  This update adds support for the AFP color management, which includes high-quality grayscale printing using halftones and tone transfer curves.
- Purchase and install the AFP Color Emulation feature for the printer.
- Use AFP Resource Installer to manage the images, including associating them with the correct halftones and tone transfer curves to create the best quality output.

☐ Existing system objects

☐ New system objects

Print Jobs

The company installs the AFP Resource Installer, then uses it to install color images in a resource library. They upgrade some of their print jobs to refer to those images using the names given to them when they installed.

InfoPrint AFP Resource Installer

Print Jobs are submitted to an InfoPrint Manager logical destination that sends jobs to the printer with the upgraded features. InfoPrint Manager processes the jobs, getting the images and CMRs from the resource library, then sending them to the right printer.

InfoPrint Manager for AIX

RESOURCE LIBRARY

InfoPrint 4100 Line 4

with:
- Microcode Release 15.4
- AFP Color Emulation Feature

InfoPrint 4100 Line 1

InfoPrint 4100 Line 2

InfoPrint 4100 Line 3

Figure 58. Solution diagram for adding AFP Resource Installer and a resource library, and updating one InfoPrint 4100 printer line to use microcode release 15.4 and the AFP Color Emulation Feature.

Implementation

To implement the solution, the print shop works with their InfoPrint Solutions Company representatives to upgrade one of their print lines to try the new function. They:

- Upgrade the print controller to the microcode release 15.4 or later.
- Install the AFP Color Emulation feature on the printer controller.
- Install AFP Resource Installer.
- Use AFP Resource Installer to:
  - Create and install the color conversion CMRs for the InfoPrint 4100 printer and for the digital camera used to take the photographs.
  - Choose the generic halftone and tone transfer curve CMRs to use with the InfoPrint 4100 based on the line screen frequency and appearance values that you want to use.
  - Install the photographs of the insurance agents in a resource library, then associate them with the appropriate CMRs.

- Update the InfoPrint Manager destinations so they send the print jobs that contain photographs to the printer line that has the AFP Color Emulation feature installed.
- Create print jobs that call the images using the names that they were given when they were installed.

Replacing pre-printed forms

A bank wants to reduce the amount of paper that it stores. If the bank eliminates some of the pre-printed forms that they use by printing some statements on a color printer, they can use the same type of plain paper for various applications.

Over the last five years, the bank has purchased ten smaller banks and is in negotiations for several others. The parent bank uses an AFP system to print statements in-house on pre-printed forms. All the pre-printed forms contain color logos. Some of them also contain background images or blocks of color that divide the page into regions. The existing system consists of:

- InfoPrint Manager for AIX, including the Page Printer Formatting Aid (PPFA) feature
- Three duplex InfoPrint 4000 lines
- Two duplex InfoPrint 4100 lines

Print jobs are submitted as line data and InfoPrint Manager transforms them into AFP. AFP resources are stored in a central location. There are no color production printers in use.

The banks that were acquired handled printing in different ways. Some of them had their own print shops; some of them outsourced print to other companies. The print staff at the parent bank has spent a significant amount of time moving the printing operations of the acquired banks to their in-house print operation, starting with the ones that outsourced their print. Five of them have been converted. The print shop administrators are starting to face some interesting issues:

- The increased workload for the in-house operation means that they need to increase their print capacity.
- Each of the banks that the parent has purchased has maintained its own logo and branding. Each time one of the banks has been integrated with print operations, it has brought with it at least five different pre-printed forms that need to be ordered and stored.
- Even though each kind of pre-printed form comes from the same vendor, the colors vary noticeably.
- The acquired banks will eventually replace their old logos and forms with the logo and forms of the parent bank, but the dates are not yet planned.

With the increase in the number of forms that must be stored, space is becoming a problem. The team knows that they have to expand printing capacity, but they do not have space for a new duplex line. If they could eliminate some of the paper that they have to store, they could use that space for the new line.

The solution

The InfoPrint Solutions Company team proposes an AFP color solution to:

- Transform their pre-printed forms to simple color statements and eliminate the need for pre-printed forms, thus reducing the paper that needs to be stored.

- Streamline the process of moving the acquired banks to the parent bank's logo and forms.
- Optimize resource management to maximize throughput.
- Make the colors more uniform from job to job.

The solution adds a duplex InfoPrint 5000 line and AFP Resource Installer to the existing system and updates the other components to add AFP color support. The bank can choose which applications to move to the color workflow, taking into consideration the fact that the throughput of the InfoPrint 5000 line is less than that of an InfoPrint 4100 line. In addition, those print jobs cannot be run on the existing InfoPrint 4100 or InfoPrint 4000 printers, since those printers cannot print the required color elements.

As the printing staff becomes proficient in using the system, they can start to prepare more applications for an eventual move to color by migrating them to use the high-quality grayscale function available on their InfoPrint 4100 printers. Then, when they are ready to add another color line (either by eliminating more paper storage or by replacing one of the InfoPrint 4000 lines), they can move those print jobs to the color printers.

Existing system objects

New system objects

Pre-press processing

Get the PDF file of the preprinted sheet
and install it as a simple page PDF object.
Install the input profile for that object, if needed.
Use PPFA to update the FORMDEF to call the
object as a medium overlay.

PDF background image

Color resources (input profile, background image)

PPFA

Resource Management

InfoPrint AFP Resource Installer

AFP Resource Library

AFP Resource Library

InfoPrint Manager

IPDS exchange with printer to see if resources are
already present; download those that are needed
(including all color profiles that have not been
captured) along with job data.

InfoPrint 5000 printer

Downloaded resources

Captures resources

a
b

Figure 59. Solution diagram for adding InfoPrint AFP Resource Installer and an InfoPrint 5000 printer

Implementation

To implement the color solution, the bank printing staff works with the InfoPrint Solutions Company team through several phases:

- **Planning the color solution**
  - Determine where the resource library should be located so that it is accessible to all the applications that need to use it.
  - Determine which types of resources can or should be saved on the printer for reuse. For example, signature files should probably not be saved on the printer; company logos and background images probably should be saved.
- **Installing and configuring the system**
  - Install the InfoPrint 5000 printers.
  - Apply service updates to InfoPrint Manager for AIX and PPFA to add color support.
  - Install AFP Resource Installer.
- **Configuring resource management for optimal performance**
  - Use AFP Resource Installer to install the CMRs for the InfoPrint 5000 printers.
  - Get the PDF file of the pre-printed form or use graphic art software to create a full page image to use as the background image.
  - Use AFP Resource Installer to install the PDF or image as a data object resource and associate a color conversion CMR with it.
  - Configure InfoPrint Manager for AIX to recognize the resource libraries that AFP Resource Installer uses and to send print jobs to the new printer.
  - Use PPFA to create a form definition and page definition that calls the new data object resource.

    Refer to the object using the ID that you specified when you installed it.
  - Copy any new form definitions or page definitions that you created into an existing resource library.
- **Testing system operations**
  - Create a print job that calls the form definition and page definition, and that points to the new resource libraries.
  - Submit the print job.
  - Check the color output.

Eliminating physical inserts

A print service bureau wants to reduce the number of physical inserts that they have to add to envelopes by printing full color electronic inserts in blank areas on credit card statements.

The print service bureau prints statements and one-to-one advertising brochures for variety of customers. The customers send their resources and print job data to the service bureau. The pre-press staff uses a document composition tool to create AFP jobs. The AFP print jobs are submitted to InfoPrint ProcessDirector for Linux, which sends them to ten duplex InfoPrint 4100 systems. After the jobs are printed, they go to post-processing to be folded, inserted, and mailed.

The service bureau asks all their customers to submit required resources with every print job; they do not store resources indefinitely. Many of their customers (such as credit card companies) include inserts in the envelope with their statements. Some problems with this arrangement are:

- Inserters often ruin mailpieces, so they frequently have to reprint individual statements. Reprinting adds time and cost to the process.
- Customers tend to ignore the inserts, separating them from the statement immediately after opening the envelope and discarding them.

The service bureau would like expand its offerings to include full-color variable-data printed using an AFP color solution. They also think that they can save time, money, and paper by reducing the complexity of the tasks that their inserters do. If the inserter only has to fold each statement and put it in an envelope (instead of adding two more sheets of paper, folding, and inserting), it has fewer opportunities for ruining mailpieces.

The solution

The service bureau works with the InfoPrint Solutions Company team to create a solution based on its existing process and environment that will help their customers move away from using physical inserts for advertising and toward electronic inserts. They hope to eliminate one of their inserters by printing full color ads directly in blank areas or on sides of customer statements.

If a credit card company can identify data and rules that determine the characteristics of each customer, the electronic inserts can be targeted for each statement. For example, the bill could show an ad for a minivan, a sports car, or a motorcycle depending on the demographics of the customer.

Implementation

To take advantage of this new color capability, the service bureau makes a few changes to their workflow:
- They add a duplex InfoPrint 5000 system and configure InfoPrint ProcessDirector to submit print jobs to it.
- They give guidelines to their customers so that it includes guidelines for using color images and logos in addition to fonts and graphics.
- They train the pre-press department is trained to use a graphics application for color profile management and image normalization.
- They add a step to their process to make sure that their customers have followed the guidelines. If they have not, the pre-press staff adjusts the resolution and input color profiles to conform to the guidelines before they submit the print job.

Related publications

You can find more information about AFP color printing on the Web sites of InfoPrint Solutions Company and the AFP Color Consortium™.

For more information about the AFP color management and the Color Management Object Content Architecture, see:
- *AFP Color Management Architecture*™, G550-0526
- *Color Management Object Content Architecture Reference*, S550-0511

These AFP Architecture reference books contain information about color management resources:
- *Mixed Object Document Content Architecture Reference*, SC31-6802

- *Advanced Function Presention: Programming Guide and Line Data Reference*, S544-3884
- *IPDS Reference*, S544-3417

You can download or order these publications from:

http://www.infoprint.com

For more information about the activities and publications of the AFP Color Consortium, see the Consortium Web site:

http://www.afpcolor.org

For more information about the ICC, ICC profiles, and the PCS, see the ICC Web site: http://www.color.org

Chapter 20. 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.

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.
- Fonts cannot span network file systems.

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

Sometimes jobs request fonts that are neither included inline with the job nor resident on the printer. If InfoPrint Manager cannot find the fonts that the job requires, the job may fail. To avoid job failure because of missing fonts, you can issue a PostScript command that substitutes a Courier font to ensure that the job prints.

To perform this task, use the following procedure:

1. From a command line, access the **UserInit** file that resides in either the **/var/psf/ps2afp2** directory on an InfoPrint Manager AIX server or the *install_path***var****psf****ps2afp2** folder on an InfoPrint Manager Windows server. If you are using a configuration file and daemon other than the default **3160d.cfg** postscript daemon configuration file, the you will need to determine which daemon is being used and change the initialization file for that daemon.

2. Using your editor of choice, edit the file.

3. Add the following to the **UserInit** file to ensure that missing fonts are replaced by Courier fonts to allow the job to print :

```
%!
turnFontSubstitutionOn
```

Note: If you want to ensure that fonts not inline with the job or resident on your printer do not print, type the following change in the **UserInit** file:

```
%!
turnFontSubstitutionOff
```

4. Save and close the file.

Note: For your convenience, InfoPrint has provided a sample **UserInit** file, **UserInit.turnFontSubstitutionOn.sample**, in either the **/var/psf/ps2afp2** directory on an InfoPrint Manager AIX server or the *install_path***var****psf****ps2afp2** folder on an InfoPrint Manager Windows server.

You can use the desktop **Text Editor** to rename the **UserInit.turnFontSubstitutionOn.sample** file 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.

Adding Type 1 fonts to a personal font library

You can add **.pfa** or **.pfb** files that print regularly at your installation to your InfoPrint Manager AIX server by using the **/var/psf/fonts** directory. Use the following procedure, ensuring that you are the **root** user:

1. Open a dtterm session on your InfoPrint Manager AIX server.
2. From the AIX command line, access the correct directory by typing:

   ```
   cd /var/psf/psfonts
   ```

   Note: To further qualify the location of your personal fonts, you may want to create a subdirectory or directories, such as **pkg_a** or **pkg_b**, using the **mkdir** command.
3. From either a CD-ROM or your location of choice, download the files to your InfoPrint Manager AIX server, ensuring that you copy the files in binary format.
4. From your InfoPrint Manager AIX server in either the **/var/psf/fonts** directory or the subdirectory you created, ensure that the downloaded files have the correct permissions by entering the following commands:

   a. `chown root.printq *`

      to ensure that the **/root/printq** ID owns all downloaded files.

   b. `chmod 444 *`

      to ensure that all files have read access.

   c. `chmod 664 user.map`

      to ensure that you can write to the **user.map** file.
5. From the AIX command line in either the **/var/psf/fonts** directory or the subdirectory you created, create a font mapping file that lists PostScript Type 1 font names and their locations on the InfoPrint Manager AIX server by typing:

   ```
   mkfntmap pkg_a/*.pfb pkg_b/*.pfb >> user.map
   ```

   InfoPrint Manager appends the *.pfb files that you stored in the **pkg_a/*.pfb** and **pkg_b/*.pfb** subdirectories to the **user.map** file. This **user.map** file is referenced in the **ps_font_map_files** resource path in the **/usr/lpp/psf/ps2afp/ps2afpd.cfg**file:

```
ps_font_map_files = /usr/lpp/psf/psfonts.map :\
                        /var/psf/psfonts/user.map
```

The >> option adds the names to the **user.map** file without overwriting existing information.

Note: If you did not create a subdirectory, you can map the files to the **user.map** file by entering the following command:

```
mkfntmap *.pfb >> user.map
```

Create a backup directory on your InfoPrint Manager AIX server where you can store system changes. For example, if you create a **/customSYS** directory at / on your server, you can then copy both the new font and the resulting **user.map** file to that directory:

```
cp /var/psf/psfonts/CodeZ /customSYS/
cp /var/psf/psfonts/user.map /customSYS
```

Using OpenType Fonts

This section describes what you need to use OpenType Fonts for printing with InfoPrint Manager.

These fonts offer many benefits over printing with standard font resources. They provide users with these benefits:

* A wide range of non-Latin typefaces from which to choose
* A multilingual presentation environment through the support of Unicode
* A migration path towards a single font technology across all presentation environments

OpenType Fonts have the following three characteristics within the font file:

1. A Microsoft® Unicode version of Version 3 Release 1.
2. Microsoft Unicode Full Font Names
3. A Unicode character map (CMAP)

   A CMAP defines the mapping of code points to glyph indices, which are used to index the actual character shape information.

If your fonts do not contain all these elements, they cannot be used with InfoPrint Manager. If the InfoPrint AFP Resource Installer (Program Number 5639-EE2) does not install a font, that font does not meet this criteria.

Note: You can use the standard AFP code pages you use for other font resources with OpenType fonts. For more information about performing this task, see *Using OpenType Fonts in an AFP System*.

Using the Resource Installer to install OpenType fonts

If you have OpenType fonts, you must install them using the InfoPrint AFP Resource Installer (Program Number 5639-EE2). If you create a new library or subdirectory for these fonts, you must also update the global search path on your InfoPrint Manager server. If you place them in an existing subdirectory, InfoPrint Manager should already have this location in its global search path.

Each time you either add new OpenType fonts or modify existing ones, you must reinstall them with the Resource Installer to ensure that InfoPrint Manager can access them correctly. The search order of directories for a data object font

resources is the same as the search order for AFP font resources. Ensure that the path where you install the OpenType Fonts is in the font search order that InfoPrint Manager uses. For more information about how the font search order is defined see "The search order for AFP resources" on page 124.

An administrator installs the OpenType fonts in a particular directory on each system. On an AIX server, the default path for installing these fonts is the **/usr/lpp/ipfonts** directory. On a Windows server, the default path is set up by the administrator who configured the system.

Once the OpenType fonts have been installed through the IBM Infoprint Fonts for Multiplatforms product, you must run the Resource Installer to create the Resource Access Table (**IBM_DataObjectFont.rat**) and store it in the same directory where the fonts reside. The Resource Installer does not prompt you to perform this task because the Resource Installer is not aware of changes to the directory. As a result, the system administrator who installed the new fonts must perform this task whenever fonts are either added or removed from the directory.

The Resource Access Table contains an entry for each installed font so that InfoPrint Manager can access it.

For more information on how to use the Resource Installer of IBM Infoprint Fonts, either access the online help system of the Resource Installer or see *Using OpenType Fonts in an AFP System*.

Using font capture with OpenType fonts

Font capture allows a printer to capture a downloaded font and treat it as if it were a printer-resident font. Treating a downloaded font as a printer-resident font improves performance for future jobs that use the same fonts. Printers retain captured fonts across job boundaries and power cycles. Captured fonts may be deleted from the printer when additional space is required. Because OpenType fonts are large, you may want to ensure that your InfoPrint printer is set to support font capture.

If you want to capture OpenType fonts that reside in a library on a particular drive, click on the Font Installer's **Capture** check box. (far right column of the Top pane) for each font that you want to capture. For more information, consult the Resource Installer online help system.

Note: Do not capture sensitive fonts, such as signatures, because an unauthorized person could access the captured font, even from another system.

Enabling font capture for inline fonts

If the jobs that you run through your system use the same fonts, you may want to enable your actual destination to capture inline font resources. These inline fonts must have an object identifier (OID) so InfoPrint can capture them.

Note: For many systems, this procedure is not recommended because captured inline fonts may be deleted when your printer needs more storage. If InfoPrint Manager cannot access these fonts, the jobs can either fail or print incorrectly.

From the **Infoprint Manager Administration GUI**:
1. Click on the actual destination and select **Printer → Properties**.

2. From the actual destination's **Printer Properties** notebook, click the **Tuning** tab.
3. Find the **Capture inline OTF resources** radio button. If you can't see it, click **Show more**.
4. Scroll to the bottom of the screen and click the **Yes** radio button for the **Capture inline OTF resources** setting.

Using multiple fonts with limited printer memory

When you are using the OpenType fonts and you receive the `Out of memory` error message, you can decrease the **Maximum fonts to keep** configuration item for InfoPrint Manager or increase the size of the character cache from the Printer console.

To decrease the number of **Maximum fonts to keep**, complete these steps:

1. Right click on the actual destination in the InfoPrint Manager GUI and select **Properties**.
2. Select the **Tuning** tab.
3. Find and change the **Maximum fonts to keep** value to a smaller number, such as **5**.

To increase the character cache size from the Printer's console, complete these steps:

1. Select **Printer Definition**.
2. Select **Printer**.
3. Select **Resource Utilization**.
4. Increase **Font Usage** to the highest setting.

Updating the global search path on an InfoPrint AIX server

If you did not use default directories when installing OpenType fonts on your system, you must update the global search path on an InfoPrint Manager AIX server. You update the global search path by updating the **PSFPATH** environment variable to point to the directory or directories where you have installed the OpenType fonts.

Note: If you do not update the global search path, you must update each actual destination that you use to print OpenType fonts.

To set the **PSFPATH** environment variable, use the procedure "Editing the /etc/environment file" from *InfoPrint Manager for AIX: Procedures* to add the following line:

PSFPATH=$PSFPATH:*path1*:*path2*

where *path* is the path name to the directory containing the AFP resources. You can specify multiple path names, just separate these with a colon (**:**).

Specify these values in the **/etc/environment** file so that the system retains them after your InfoPrint Manager AIX server is rebooted.

Using OpenType fonts with line data

When printing line data with OpenType fonts through InfoPrint Manager, you need to specify the appropriate parameters on the **line2afp** command. To define

the location of the OpenType fonts to the **line2afp** command, you can either use the InfoPrint Manager global search path (using "Updating the global search path on an InfoPrint AIX server" on page 270) or use the appropriate values on the **line2afp** command. For more information about these values, see either *Using OpenType Fonts in an AFP System* or *ACIF: User's Guide*.

For more information about either creating or modifying page definitions for line data jobs to print with OpenType fonts, see *Page Printer Formatting Aid: User's Guide*.

Limitations when printing line data with OpenType fonts

Before you can print this data, you must transform it to Unicode Transformational Format (UTF-16), with big-endian byte order. Big-endian byte order means that within a two-byte UTF-16 code point the high-order byte is specified first, followed by the low-order bytes. You can transform it through the **uconv** utility, or any other application that transforms ASCII to Unicode. For more information about the **uconv** utility see the AIX operating system documentation.

Line data using OpenType fonts supports using the Byte Order Mark (BOM) and little endian data

InfoPrint Manager can process the Unicode Byte Order Mark (BOM) when printing line data with OpenType fonts. (For UTF8 or UTF16-BE data, the BOM is skipped and not printed. For UTF16-LE, the data is reversed to BE before it is printed, and the BOM is not printed.) In addition, InfoPrint Manager can now recognize multi-byte carriage return and line feed characters when parsing Unicode line data.

This support allows you to process UTF8 and UTF16 line data in either little-endian or big-endian order using a traditional line data or record-format page definition. As many Windows and AIX editors default to UTF8 or UTF16LE encodings and automatically insert a BOM at the beginning of the file, you can now print documents created with these editors using Unicode-enabled Open Type Fonts.

Mixed mode data is line data mixed with MODCA structured fields. You can use mixed mode data with UTF8, UTF16LE, and UTF16BE with a BOM as long as the BOM is the first bytes (following any cc or trc bytes) of the first line of data.

If you want to mix UTF8 or UTF16BE data with other data encodings, you can do that if there is **no** BOM. In this case, the font selected for the data tells InfoPrint Manager the data encoding. You can't do this with UTF16LE data because it always requires a BOM.

This support includes a **-o newlineencoding** flag for the **-o** flag, a **stream,(newline=*characters,encoding)*** value for the **fileformat** parameter on the **line2afp** transform, and a **new-line-option-data-encoding** document/default document attribute. For more information on this support, see *InfoPrint Manager: Reference*.

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 28. Mapping for code pages T1001038, T1001108, and T1001109

IBM Graphic Character Identifier	ditroff *Name of Character*	*Character Description*
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

IBM Graphic Character Identifier	ditroff *Name of Character*	*Character Description*
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
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

IBM Graphic Character Identifier	ditroff *Name of Character*	*Character Description*
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
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

IBM Graphic Character Identifier	ditroff *Name of Character*	*Character Description*
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
ND080000	**8**	eight
ND090000	**9**	nine
ND100000	**0**	zero
NF010000	**12**	1/2
NF040000	**14**	1/4
NF050000	**34**	3/4
NF180000	**18**	1/8
NF190000	**38**	3/8
NF200000	**58**	5/8
SA000000	**\-**	minus
SA000000	**mi**	minus
SA010000	**+**	plus sign
SA010000	**pl**	math plus

IBM Graphic Character Identifier	ditroff *Name of Character*	*Character Description*
SA020000	+-	plus or minus
SA030000	<	less than sign
SA040000	=	equal sign
SA040000	eq	equal sign
SA050000	>	greater than sign
SA060000	di	divide sign
SA070000	mu	multiplication sign
SA160000	ap	approximates
SA240000	ib	improper subset
SA270000	ip	improper superset
SA380000	ca	intersection
SA390000	cu	union
SA400000	sb	subset
SA410000	sp	superset
SA450000	if	infinity
SA470000	pt	proportional to symbol
SA480000	==	identity
SA490000	pd	partial differential symbol
SA510000	is	integral symbol
SA520000	<=	less than or equal
SA530000	>=	greater than or equal
SA540000	!=	not equal
SA670000	mo	element of
SA700000	~=	approximately equal
SA800000	sr	square root
SA870000	es	empty set
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

Table 28. Mapping for code pages T1001038, T1001108, and T1001109 (continued)

IBM Graphic Character Identifier	ditroff *Name of Character*	*Character Description*
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
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

Table 28. Mapping for code pages T1001038, T1001108, and T1001109 (continued)

IBM Graphic Character Identifier	ditroff *Name of Character*	*Character Description*
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)
SS680000	**en**	dash, minus sign (en dash)

Special symbols added for code page T1001038

The following non-standard special symbols were added:

Table 29. Special symbols added for code page T1001038

IBM Graphic Character Identifier	ditroff *Name of Character*	*Character Description*
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 30. Special symbols added for code page T1001108

IBM Graphic Character Identifier	ditroff Name of Character	Character Description
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 31. Special symbol added for code page T1001109

IBM Graphic Character Identifier	ditroff Name of Character	Character Description
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 InfoPrint Solutions Company 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 13, "Setting InfoPrint Manager and AIX environment variables," on page 157.

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 9, "Creating and managing resource-context objects," on page 123 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 actual destinations using the InfoPrint Manager Administration Interface Printer Properties notebook. In the AFP Resources tab, enter the directory path in the `Location of fonts` field. Refer to "Assigning resource-context objects to an actual destination" on page 131 for an AIX command line equivalent of 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

Improve flexibility by specifying the fonts that you want to use for printing line data in your page definition. See the *PPFA User's Guide* or the *PPFA Quick Reference* for more information. The **chars** keyword can also be used.

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 32 on page 282 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. You can use either the coded font name or the page definition.

For the names of other coded fonts, refer to *IBM AFP Fonts: Font Summary*.

Table 32. Font mapping table for use with the chars keyword

Type Family	*Point Size*	*Coded Font Name*	*Linked Short Name* (for **chars** *keyword*)
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
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

Printing with the DBCS Simulation Fonts with the font metric adjustment triplet

PTF U807769 includes support for printing the DBCS Simulation Fonts (available with Infoprint Fonts for Multiplatforms, Version 1 Release 1 Modification 0, Program Number 5648-E77) with the font metric adjustment triplet. The DBCS Simulation Fonts are available on the AIX and Windows operating systems.

Note: When you use the DBCS Simulation Fonts, set the **requested-font-resolution** appropriately or use the NORES grid files.

Installing the Japanese PostScript font feature

You can install Japanese PostScript fonts on your InfoPrint Manager server to print documents requiring these specialized fonts.

To enable your InfoPrint Manager server to support Japanese PostScript fonts, use the InfoPrint installer located on the InfoPrint Manager CD-ROM. You will be prompted to supply your customer ID as well as the access key located on the invoice that was shipped with your CD.

Chapter 21. 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.

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.

Note: If a data stream specifies only GRID parts instead of specific names, then the **fgid.grd** table is used to find the name of the font to download or the outline font to activate. In this case, the data stream must specify a specific width value.

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.

Note: You can either shut down and restart the InfoPrint server (**pdserver** process) or shut down and restart all your printers to ensure that **.grd** file changes are applied.

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 60 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 60. 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 61 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 61. 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 62 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 62. 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 63 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 63. Sample file for a code page identifier

For a detailed explanation of how the different types of identifiers combine to produce fonts, see *InfoPrint 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 32767 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 32767 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 32767 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 32767 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 InfoPrint 6400 or 6500 series of 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 290.

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 InfoPrint 3812 printer diskette, you can map the Prestige 10-point font to a similar font that does reside on your InfoPrint 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 InfoPrint 3835 Advanced Function Printer), We recommend that you map all the

CZ*nnnn* 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 *InfoPrint Data Stream and Object Architectures Mixed Object Document Content Architecture Reference*.

Because the InfoPrint 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 C0N20000 character set. Then, InfoPrint searches the resource library search path to locate the C0N20000 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 289, 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.

Using the 'no resident' version of the sample grid files

There may be situations when you do not want InfoPrint Manager to use printer-resident fonts.

If you do not have customized GRID files and want to use the 'no resident' version of the sample grid files shipped with InfoPrint Manager, complete the following procedure:

1. From the AIX command line:

   ```
   cd /var/psf/PrinterName
   ```

   Where *PrinterName* is the name of the InfoPrint physical printer that represents the actual printer device.

2. Create the charset.grd file from the charset.grd.nores file:

   ```
   cp /usr/lpp/psf/grd/charset.grd.nores charset.grd
   ```

3. Create the codepage.grd file from the codepage.grd.nores file:

   ```
   cp /usr/lpp/psf/grd/codepage.grd.nores codepage.grd
   ```

Chapter 22. Configuring and using cut-sheet emulation

To enable cut-sheet emulation, ensure that your printer has a microcode level of at least 9.216, then ensure that the appropriate personnel perform the following tasks at your installation on the systems specified:

1. At the InfoPrint AIX server, the print administrator for your installation must disable the physical printer that you intend to run in cut sheet emulation mode.
2. At the printer console, an operator must set the printer to cut-sheet emulation mode.
3. The operator must then restart the printer.
4. At the InfoPrint AIX server, the print administrator must create a logical printer for the physical printer.
5. The print administrator must ensure that both the logical and physical printer has been enabled.

To submit a job, see "Using Cut Sheet Emulation."

Using cut sheet emulation

Job submitters must specify a form definition that will print using cut sheet emulation through the following application programming interfaces:

- "Using InfoPrint Submit Express"
- "Using InfoPrint Job Ticketer"
- "Using the PSF actual destination properties notebook" on page 294
- "Using the pdpr command" on page 294

Before using any of these interfaces, ensure that you are aware of this support's "Defaults and limitations of cut sheet emulation support" on page 294.

Using InfoPrint Submit Express

From the **Resources** tab of the InfoPrint Submit Express Job Ticket window, you can leave the **Use form definition** field blank to get the default form definition on the InfoPrint AIX server, or specify a specific form definition.

By using the default form definition, cut sheet emulation will be invoked.

Note: InfoPrint Submit Express is part of the Print-on-Demand feature that is a separately orderable feature.

Using InfoPrint Job Ticketer

From the **AFP Resources** page of the InfoPrint Job Ticketer window, you can leave the **Form definition** field blank to get the default form definition on the InfoPrint AIX server, or specify a specific form definition.

By using the default form definition, cut sheet emulation will be invoked.

Note: InfoPrint Job Ticketer is part of the Print-on-Demand feature that is a separately orderable feature.

Using the PSF actual destination properties notebook

1. From the InfoPrint Administration *servername* window, use the middle mouse button to drag the printer notebook action icon onto the Actual Destination (printer) that you want to use for cut-sheet emulation.
2. From the View and Change PSF Actual Destination Properties window, select the **Customization** tab.
3. Specify the form definition of choice in the form definition field.
4. Click **OK** or **Apply** to ensure that this form definition is applied.

Using the pdpr command

The **form-definition** document, default document, or actual destination attributes on the **pdpr** command also change the form definition on a printer.

For specific examples of how to modify these values on the printer, refer to the *InfoPrint Manager: Reference*.

Defaults and limitations of cut sheet emulation support

When a form definition is explicitly named, any attribute found in both the form definition and either the InfoPrint Manager graphical user interface or the **pdpr** command reverts to the value specified in the form definition.

Note that corresponding values specified on the **printer-pass-through** (or **destination-pass-through**) attribute override the values specified in either the **PSF Resource** tab of the PSF printer notebook or the **form-definition** document, default document, or actual destination attribute.

If you use a form definition that contains a medium map using **N_UP** commands, the printer will go out of cut sheet emulation mode while processing that **N_UP** command. If the **N_UP** processing ends, the printer will return to cut sheet emulation mode. This scenario can occur when printing a large image in the middle of a job.

Chapter 23. Generating and submitting color mapping table source and output files

A color mapping table is a printer resource object that defines a translation from certain MO:DCA structured fields to new color structured fields used by newer printers. Color mapping tables are used to provide support for highlight color attachments with black-and-white printers, such as using the InfoPrint 4005 attachment with the InfoPrint 4000 printer. You can also use a color mapping table to map highlight colors into richer colors on a color printer like the InfoPrint Color 130 Plus printer. To apply color to black and white documents, you must use the following procedure to create Color Mapping Table Source and Output Files. Refer to the *InfoPrint Manager: Reference* for information about the cmt utility or to the appropriate man page.

You can define translations from non-color fields to color, old color fields to new color fields, and from new color fields to different new color fields. Therefore, you can use existing applications and documents with new color fields without having to change the documents or applications. Also, you can use various color mappings with a single document to print the document using color in different ways without changing the original document.

Using the AFP architectural reference, you can apply color to existing black and white documents. The sample configuration file **cmt.cfg** contains user-defined specifications, and should be available in the **usr/lpp/psf/config** directory. The **cmt** utility that uses the **cmt.cfg** configuration file should be available in the **/usr/lpp/psf/bin** directory on your InfoPrint AIX server. Note that a MOD:CA sample color mapping table, named **cmtsampl**, can be found in **usr/lpp/psf/config/**. This color mapping table was produced by the sample **cmt.cfg** file.

The **cmt** utility allows you to create color mappings in a variety of different color modes that are defined through the **ColorSpace** parameter. For example, the **Highlight** value can be used when printing to an InfoPrint 4000 printer with an InfoPrint Highlight Color Model HC2 Post-Processor (HCPP). For more information on the HCPP, see the *InfoPrint Hi-Lite Color Printer: Library Catalog*.

Parts of a color mapping table

A color mapping table consists of a base part, a set of source groups, and a set of target groups. The base part identifies the color mapping table with a type of either `reset` or `normal`.

The simplest possible color mapping table is a reset color mapping table, which tells the printer to do no transformations on the color information found in the document. A reset color mapping table has no source or target groups; all other color mapping tables have at least one source and one target group.

Using source groups

Each source group has an identification (ID) number, which is used to match the source group with a corresponding target group. You may have unique ID numbers; however, if you create the color mapping table without the **cmt** Utility and want to map several source groups to a single target group, you can use the same ID number on multiple source groups. Valid ID values are 1–127.

Note: The **cmt** Utility generates pairs of sources and targets, then assigns increasing, sequential IDs to each pair. For more information about the **cmt** Utility, refer to the *InfoPrint Manager: Reference*.

Each source group must be classified as one of the following color spaces:

Highlight color
> Highlight color is used when your existing documents describe color in terms of the percent to be covered and the percent to be shaded for a color number. The colors are device dependent. For example, you may have a printer that allows the use of three colors for highlighting. You could specify percent coverage and percent shading for colors 1, 2, or 3. Your printer setup would determine the actual colors.

Standard Object Content Architecture (OCA)
> Standard OCA uses defined combinations of red, green, and blue to create: blue, red, pink, magenta, green, turquoise/cyan, and yellow. Standard OCA also defines several defaults such as white on a black medium, black on a white medium, and the same color as the medium. The medium could be, for example, paper or a display.

GOCA pattern fill
> GOCA pattern fill defines patterns for filling areas that you may want to map to colors with a color mapping table.

For detailed explanations about these color spaces, refer to *Mixed Object Document Content Architecture Reference*.

You can use a color mapping table to pick specific object types to map, such as:
- Object area
- IM image data
- PTOCA data
- Page presentation space
- GOCA data
- Overlay presentation space
- BCOCA data
- IOCA data (bi-level, FS10)
- All PTOCA, GOCA, BCOCA, IOCA, FS10, and IM object data
- All objects, object areas, and presentation spaces

After you pick the color spaces and object types you want to map, you can specify exact values for the fields you want to map.

Using target groups

If you create the color mapping table without the **cmt** Utility, you must specify a target group ID number to match the source groups for a target. Valid ID values are 1–127.

Note: The **cmt** Utility generates pairs of sources and targets, then assigns increasing, sequential IDs to each pair. For more information about the **cmt** Utility, refer to the *InfoPrint Manager: Reference*.

Each target group must be classified as a color space, which is the kind of color you want as output. The color spaces defined in the matching source groups are

transformed to this color space. The color mapping table allows RGB CMYK, highlight, and CIELAB, but your actual hardware determines your available choices. For example, if your printer supports only highlight color, then your target group must use highlight color.

You can specify exact values for output colors. For example, if your printer supports three highlight colors, you can specify colors 1, 2, or 3 with coverage and shading percentages that are supported by your printer.

Other publications that have helpful references regarding color devices include:
- *InfoPrint 4005 Hi-Lite Color Application Design Reference*, available from your InfoPrint marketing representative.
- *InfoPrint Hi-Lite Color Introduction and Planning Guide for 4005*.

Creating a color mapping table

In the procedure described below, we create a color mapping table to print an Advanced Function Presentation (AFP) file that contains pie charts in the color green.

For our AFP files, this pie chart appears as a series of horizontal lines. By accessing the chapter on "Graphic primitives and attributes" in the *Graphics Objects Content Architecture for Advanced Function Presentation Reference* manual, we can see that these horizontal lines are created by a Pattern Output Primitive with a hexadecimal value of '0B'(11).

To turn these horizontal lines into a shade of green when using a **ColorSpace** source group of GOCA to map to a target group value of RGB, ensure that you specify a low value for red (12), a high value for green (252), and a value under 50 for blue (42) to provide a clear contrast.

You must perform the following tasks from the AIX command line:
1. From the **usr/lpp/psf/config** directory, specify:
   ```
   cp cmt.cfg pie1.cfg
   ```

   This copies the Color Mapping Table configuration file into a file you can customize for your own purposes (in this case, pie1.cfg)
2. Specify vi pie1.cfg.

   This allows you to edit the configuration file and insert the applicable values to create the appropriate color mapping (whether GOCA to RGB or OCA to CIELAB) table. See the sample **cmt.cfg** configuration file below:
   ```
   # *****************************************************-
    # Required, starts  a Color Mapping Definition.
    # One definition for each Source to Target mapping.
   # *****************************************************-
   # *****************************************************-
    # BeginSourceDef:
    # Required, starts the Source Parameters
   # *****************************************************-
    BeginSourceDef:
   # *****************************************************-
    # ColorSpace:
    # Required, values= OCA | Highlight | GOCA
   # *****************************************************-
    ColorSpace: GOCA
   # *****************************************************-
   ```

```
                 # ColorValue:
                 # Required, values depend on Color Space
                 # *******************************************************-
                 ColorValue: 11
                 # *******************************************************-
                 # ObjectType:
                 # Optional, values= ObjArea | ImageData | PTOCData |
                 # GOCAData | BCOCAData | AllOCA | Page | Overlay |
                 # ObjsAll
                # default= ObjsAll
                # *******************************************************-
                ObjectType: GOCAData
                  # *******************************************************-
                  # PercentShading:
                  # Optional, only valid for SourceColorSapce: Highlight,
                  # values= 0 .. 100, 255 (all percentages),
                  # default= 100
                  # *******************************************************-
                  # PercentShading:
                  # *******************************************************-
                  # PercentCoverage:
                  # Optional, only valid for SourceColorSpace: Highlight,
                  # values= 0 .. 100, 255 (all percentages),
                  # default= 100
                  # *******************************************************-
                  # PercentCoverage:
                # *******************************************************-
                # EndSourceDef:
                # Required, ends the Source Parameters
                # *******************************************************-
                EndSourceDef:
                # *******************************************************-
                # BeginTargetDef:
                # Required, starts the Target Parameters
                # *******************************************************-
                BeginTargetDef:
                  # *******************************************************-
                  # ColorSpace:
                  # Required, values= RGB | CMYK | Highlight | CIELAB
                  # *******************************************************-
                  ColorSpace: RGB
                  # *******************************************************-
                  # ColorValue:
                  # Required, values depend on Color Space
                  # *******************************************************-
                  ColorValue: 12 252 42
                  # *******************************************************-
                  # PercentShading:
                  # Optional, only valid for TargetColorSpace: Highlight,
                  # values= 0 .. 100, default= 100
                  # *******************************************************-
                  # PercentShading:
                  # *******************************************************-
                  # PercentCoverage:
                  # Optional, only valid for TargetColorSpace: Highlight,
                  # values= 0 .. 100, default= 100
                  # *******************************************************-
                  # PercentCoverage:
                # *******************************************************-
                # EndTargetDef:
                # Required, ends the Target Parameters
                # *******************************************************-
                EndTargetDef:
                # *******************************************************-
                # Required, ends a Color Mapping Definition.
                # *******************************************************-
                # EndMappingDef:
```

3. Once you have finished editing the `pie1.cfg` file, save the file.

4. To create the Color Mapping Table object (MODCA) file that will be used when you submit the job for printing, run the **cmt** Utility as the input file (**-i** flag):

   `cmt -i pie1.cfg -o pie1.set`

   This command produces a **pie1.set** output file.

5. To verify your color mapping table values, or to create a configuration file from a MODCA object file, specify the **cmt** utility again, using the newly created **pie1.set** as the input file and **pie2.cfg** as the output file:

   `cmt -i pie1.set -o pie1.cfg`

   Note: **pie2.cfg** is specified so that you don't overwrite the original file. You can then compare **pie1.cfg** to **pie2.cfg**.

6. Before you attempt to use this color mapping table to submit a job to InfoPrint Manager, verify that the source file contains the intended values. In this case, the **pie1.cfg** file should resemble the following, where the source definition represents the input file (in this case AFP) that you are converting to the target definition (an RGB color value of green):

```
BeginMappingDef:
 BeginSourceDef:
  ColorSpace: GOCA
  ColorValue: 11
  ObjectType: GOCADATA
 EndSourceDef:
 BeginTargetDef:
  ColorSpace: RGB
   ColorValue: 12 252 42
  EndTargetDef:
EndMappingDef:
```

7. Once you have verified the contents of the source file, see " Submitting jobs using a color mapping table."

Submitting jobs using a color mapping table

To submit a job using the color mapping tables for spot color, you must ensure that you also specify a resource-context attribute so that the server knows the location of the color mapping table. Once you have configured a Color Mapping Table, you must have defined a logical destination (named `prt1` for this example) to which you can send the job.

Submitting jobs through the AIX command line

Once the logical destination has been defined, you can submit a job to an InfoPrint Manager printer by specifying the following from the command line:

Command Values	Meaning
`pdpr -d prt1`	Print Command with logical destination name.
`-t <jobname>`	Specifies the name that you want to assign to the job (optional).
`-x resource-context=/usr/lpp/psf/config`	Explicit path name where the AFP file (in this case `pie1`), resides on your InfoPrint AIX server.
`-x color-mapping-table=pie1.set`	Color Mapping Table that you created in "Creating a color mapping table" on page 297 for printing this file.

`<path and file to print>`	Explicit path to the AFP file that you want to print.

Note: `/usr/lpp/psf/config` is a directory that is created automatically.

Example:

`pdpr –d ld1 –x resource-context=/usr/lpp/psf/config –x color-mapping-table=pie1.set /home/user1/test.afp` This command will print the input file **test.afp** located in the directory **/home/user1/** using the color mapping table **pie1.set** located in **/usr/lpp/psf/config** to the logical destination **ld1**.

-x attributes:

Submitting a job with **-x** attributes overrides any actual destination configuration settings. Actual destination settings only take effect by default if no parameters are passed to InfoPrint Manager when submitting a job. The hierarchy is:

1. **-x** attribute upon job submission
2. Job and document defaults; color-mapping-table attribute
3. Actual destination color-mapping-table attribute

Configuring an actual destination

When configuring an actual destination with the InfoPrint Manager Administration GUI, it is important to include the name of the color mapping table. Use this procedure to configure an actual destination to use the appropriate color mapping table:

1. From the **InfoPrint Administration Servers** main window, enable the appropriate actual destination (in this case, NewP, as shown below) by right-clicking the actual destination and then selecting **Enable**.
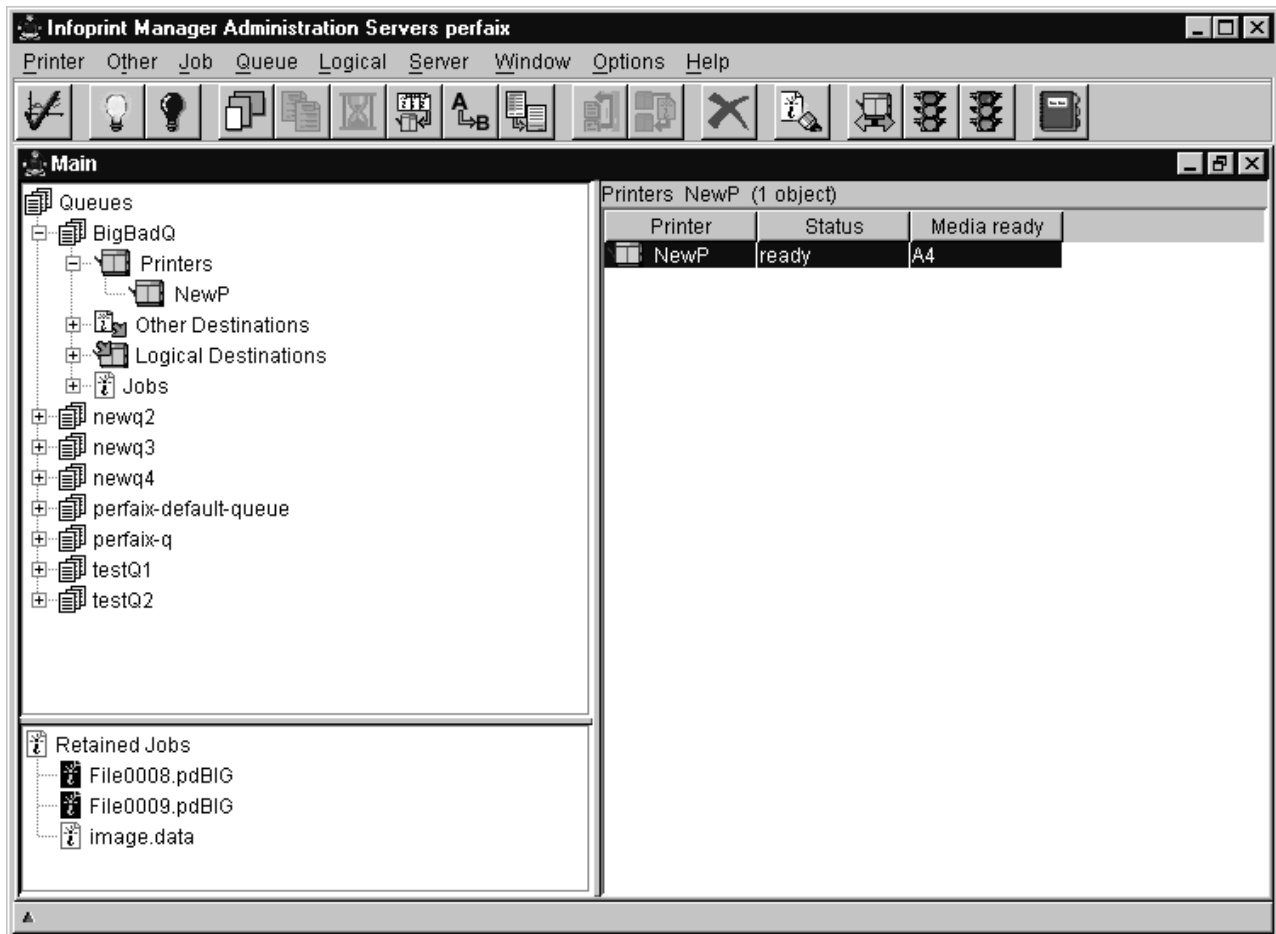
Figure 64. InfoPrint Administration Servers main window

2. Ensure that the **Color mapping table** (`pie1.set`) has been specified on the **AFP Color** tab of the **Printer Properties** notebook and that the **Location of resources** (`/usr/lpp/psf/config/`) has been specified on the **AFP Resources** tab.

3. Submit your job to InfoPrint Manager, using either the command line or the InfoPrint Select client.

   Using the InfoPrint Select client to submit a job

   There are 3 ways to designate a color mapping table when using InfoPrint Select:

   a. Use the **Logical destination** to designate the color mapping table. Specify the **color-mapping-table** attribute in the **Job and document defaults** associated with the logical destination to which you are sending the job.

   b. Use the **Actual destination** to designate the color mapping table. Specify the **color-mapping-table** attribute of the Actual destination to which you are sending the job.

   c. Use the **File → Print** method to designate the color mapping table. If you are using a newer version of InfoPrint Select, a **Job settings dialog** appears after the **Print** button is clicked on the **Print** window. Specify the name of the color mapping table by clicking the **Other** tab of **Job settings dialog**. Enter `color-mapping-table=pie1.set`, where `pie1.set` is the name of the color mapping table.

Chapter 24. Configuring InfoPrint systems for interoperability

This chapter contains the following sections:
- "Understanding interoperating environments"
- "Configuring a primary AIX server with a secondary AIX server" on page 305
- "Configuring a primary AIX server with a secondary Windows server" on page 305

Primary Windows servers:

If you are using a Windows operating system for your primary server, see *InfoPrint Manager for Windows: Procedures* for interoperability instructions.

Note: This information does not apply if you are using the Advanced Security/Scalability Feature.

Understanding interoperating environments

When you install an InfoPrint Manager server on a system, the install process creates a namespace for that server. The *namespace* is a directory structure where InfoPrint Manager stores the location information of all of your InfoPrint objects, including the server itself, queues and destinations, and the Access Control Lists (ACLs) used by InfoPrint Manager Security.

If you install a second InfoPrint Manager server on another system on your network, that server will create its own namespace and the two servers will operate entirely independent of each other. In some cases, however, you may want your servers to be able to work together. To make InfoPrint Manager servers work together, you set up an *interoperating environment* in which two or more InfoPrint Manager servers share the same namespace. The namespace resides in a directory on one of the servers and the other servers are granted permissions that allow them to use that directory.

When configuring InfoPrint Manager servers to support interoperability, ensure that the following two rules are followed:

1. Each InfoPrint Manager server must be accessible by all of the other InfoPrint Manager servers using the same IP address.

   For example, if **Server1** is an InfoPrint Manager AIX server with an IP address of `9.99.155.122`, then all other InfoPrint Manager servers must use `9.99.155.122` to access **Server1**.

2. The IP address for each InfoPrint Manager server must be the address that is identified for the first (or primary) network card that is defined to that server.

Reasons for setting up an interoperating environment

Not every printing system needs multiple InfoPrint servers. In fact, in many environments one InfoPrint server is adequate. However, in print environments that do very high volume printing or that print in remote locations (for example, a main office with branch offices in different parts of the city), interoperating InfoPrint servers may provide important benefits:

- Interoperating servers are much more scalable than single servers.

- If your print volume increases and you find that you need more processing power or memory to be able to meet the demand, you can add a second server. However, by making the servers interoperate, you still only have one printing system to administer.
- If your business expands and you add another office, you can add another server to the namespace. You'll have to define any new printers that you add to the network, but you won't have to redefine existing printers or move resources again to be able to use them from the new location.

- Interoperating servers allow you to distribute print server functions across systems.

  Remote locations can have their own local servers, but you can administer them from a central location. This should result in lower costs.

Multiserver configuration examples

There are various ways to set up multiple InfoPrint Manager servers and have them work together. Below are some example configurations and the benefits they provide.

- **Install two InfoPrint Manager servers in the same physical location.**

  One of the servers contains all of the InfoPrint print queues and logical destinations, and the other contains all of the actual destinations. In this setup, you balance processing between the two systems by spooling and scheduling on one system and transforming and printing on the other.

- **Install one InfoPrint Manager server in the main office and one in each branch office.**

  The namespace resides on the InfoPrint Manager server in the main office, and the other two servers are set up to share it. All three servers have logical destinations, queues, and actual destinations defined in them, and the users submit their print jobs to their local server. About 90% of the time, the servers handle local print jobs, so it makes sense for each location to have its own server. However, several times each week, the main office generates reports that are needed at the branches. Instead of printing the reports and sending them across town or faxing several hundred pages to each office, they simply send the print job to printers at the branch offices. If necessary, the branch offices can do the same thing.

  In addition, because of the common namespace, the system administrator can monitor all of the servers from a central location; if there's a problem at one of the branches, he can investigate it from the main office.

Important issues in interoperating environments

Before you set up an interoperating environment, consider these issues.

- **Software**

  All interoperating systems must be at the same InfoPrint Manager software level. Older versions of InfoPrint Manager will not work with newer versions of InfoPrint when interoperating.

- **Backups**

  You should always backup your systems before making any major configuration changes. Follow the recommendations found in *InfoPrint Manager for AIX: Installation Instructions* about which file systems should be backed up.

- **How many servers can be interoperated?**

In theory, you can interoperate as many servers as you would like, however, the performance of the servers will depend upon the primary server hardware. For best performance, use the most powerful system that you have available for the primary server.

- **Which system should contain the namespace?**

  The namespace does not contain large volumes of data (so it doesn't have to reside on the system with the most disk space) and it doesn't move a lot of data across the network. However, because all of the other servers will rely on the namespace server, it must be available and reliable. Put the namespace on the system that has the most availability (always running), most reliability (doesn't have to be rebooted often), and is the most powerful. **The namespace must be located on an AIX system.**

- **InfoPrint Manager Security**

  All of the information that InfoPrint Manager Security uses to protect your printing system (groups and Access Control Lists (ACLs)) is stored in the namespace. When you share the namespace, the groups and ACLs that you set on the namespace server apply to all of the servers; the groups and ACLs that you set on the other servers before they joined the common namespace disappear. As a result, you should wait until you have the interoperating environment set up before you set up any security on the systems.

Configuring a primary AIX server with a secondary AIX server

Follow the appropriate instructions according to your configuration needs:

New secondary InfoPrint for AIX server

If you are installing InfoPrint Manager for the first time on an AIX system, and you want to make the new system a secondary InfoPrint server, refer to *InfoPrint Manager for AIX: Installation Instructions* for information about doing this during the installation.

Once InfoPrint is installed on the secondary system, see "Installing secondary InfoPrint servers" in *InfoPrint Manager for AIX: Getting Started*.

Creating a secondary InfoPrint server from a primary InfoPrint server

If you have two or more independent InfoPrint Manager primary servers that you want to change into secondary servers, see "Migrating from a primary server to a secondary server" in the *InfoPrint Manager for AIX: Installation Instructions*.

Configuring a primary AIX server with a secondary Windows server

Important:

In order to interoperate InfoPrint Manager for Windows with InfoPrint Manager for AIX:

- The AIX system must have AIX Fast Connect installed or another Server Message Block (SMB) solution.

  OR

- The Windows systems must have Microsoft Windows Services for UNIX installed.

AIX Fast Connect is server software that allows AIX servers and workstations to share files and printers with personal computer clients running Windows operating systems. Because AIX Fast Connect uses industry-standard Microsoft networking protocols, PC clients can access AIX files using Microsoft networking client software. PC users can use remote AIX file systems directly from their machines like local file systems. The namespace will appear on the network just like any other Windows shared folder. AIX Fast Connect provides these services by implementing the SMB networking protocol to run on NetBIOS over TCP/IP.

Microsoft PCNFS (Microsoft Windows Services for UNIX) allows a Windows system to mount the exported AIX Network File System (NFS) that InfoPrint uses to share the namespace.

By performing the following set of procedures on both an InfoPrint AIX server and an InfoPrint Windows workstation, you can configure InfoPrint Manager to support interoperability between InfoPrint AIX servers and InfoPrint Windows servers.

When configuring InfoPrint Manager for AIX and Windows servers to support interoperability, ensure that the following rules are followed:

1. Each InfoPrint Manager server must be accessible by all other InfoPrint Manager servers using the same IP address.

   For example, if **Server1** is an InfoPrint Manager AIX server with an IP address of `9.99.155.122`, then all other InfoPrint Manager servers must use `9.99.155.122` to access **Server1**.

2. The IP address for each InfoPrint Manager server must be the address that is identified for the first (or primary) network card that is defined to that server.

3. All printer objects (whether logical destination, actual destination, or queue) must have unique names if they are used by interoperating InfoPrint servers.

   If the printer objects do not possess unique names, you may have trouble viewing them through the **Infoprint Manager Interface** from a non-namespace server.

4. InfoPrint Manager Notifications should only run on the primary server and should be stopped on the secondary servers.

LPD service for AIX can be used however, by submitting jobs with the **lpr** command to actual destinations on the AIX server. The **lpr** command can also still be used as before with Windows printer destinations (just not InfoPrint Manager printers).

Setting up the InfoPrint AIX server for interoperability

Perform the following procedures on your InfoPrint AIX server to prepare for interoperability with an InfoPrint Windows server. The following presumes that you have installed InfoPrint Manager for AIX on your AIX server and have logged onto the server as **root**.

Starting NFS and connecting the secondary server

1. Open a dtterm window and type: `/etc/rc.nfs` to either start the NFS daemon or ensure that it has been started.

2. Open a dtterm window, type `smit`. The following screen displays.
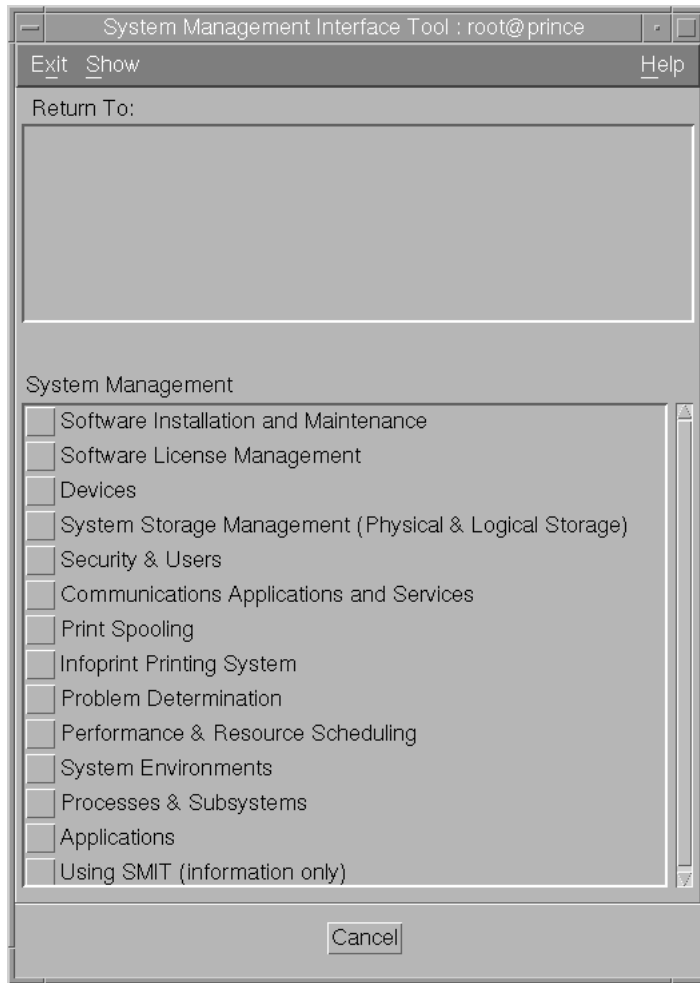
Figure 65. Main SMIT Panel

3. From this panel, specify the **Infoprint Printing System → Infoprint Utilities → Configure Secondary Servers (NFS) → Link from Primary Server to Secondary Server** path.

4. Specify both the host name and the IP address of the InfoPrint Windows server with which you intend to interoperate for the **Secondary Server Host Name** and the **Secondary Server IP Address** fields respectively. For example, `wserv1` and `9.99.193.120` represent the InfoPrint Windows server in the pop-up panel displayed below:
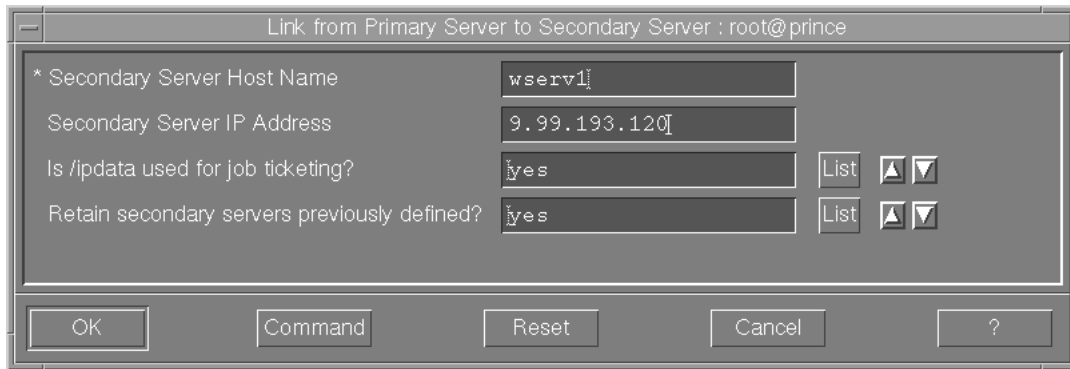
Figure 66. Link from Primary to Secondary Server Panel

You should specify no for the **Is /ipdata used for job ticketing?** field, unless you are using this AIX InfoPrint Manager server with AIX Fast Connect to allow for file sharing with an InfoPrint Submit Windows client for preflighting jobs and saving RIPed files.

You should also allow the **Retain secondary server previously defined?** field to default to yes if you have more than one InfoPrint server functioning as a secondary server.

5. Once verified, click **OK**, and then click **Done**.

6. Return to the first SMIT panel displayed in step 2.

Adding users to and modifying permissions for FST security groups

1. Set up the FST Security groups on your AIX server by taking the **Infoprint Printing System → Security → Groups → Show Group** path. From the **Single Select List** pop-up dialog, you should see the following three groups: **acl_admin**, **admin**, and **oper**. There may be a fourth group, **jobticketer**, if the Job Ticketer option of the POD feature is also installed.

2. Once you have verified the existence of these two groups, you should ensure that users in the **admin** group can issue all the InfoPrint **pd∗** commands. From SMIT, take the **Infoprint Printing System → Security → Access Control → Access Control for Operations → Show Access Control List** path.

3. From the **Single Select List** pop-up dialog, highlight each command and ensure that GROUP:admin: r∗∗ displays for each command.

   If a particular pd command does not show **admin** group read authority, use the SMIT **Infoprint Printing System → Security → Access Control → Access Control for Operations → Change Access Control List** path to specify GROUP:admin in the **Users or Groups** field of the **Change Access Control List** panel for that pd command. Note that the **admin** group requires only read authority for each **pd** command.

   Note that you may have to perform the preceding task only if you are migrating from an InfoPrint Manager 3.1 system or earlier. If you have installed InfoPrint Manager on a ″clean″ machine, the **admin** group will have read authority for all **pd** commands by default.

4. Once complete, return to the first SMIT panel displayed in Step 2.

5. Take the **Infoprint Printing System → Security → Groups → Add Users to a Group** path. Then specify acl_admin for the **Group Name** field. Enter the name of the Windows administrative user you normally log in to the InfoPrint Manager for Windows server machine as for the **User or Users to Add** field.

For the remainder of this procedure we will refer to this Windows administrative user as `ipwinadmin*`. Note that `ipwinadmin` must be followed by an asterisk (*) to account for the fully-qualified host name. (For example, `ipwinadmin@ipwinservermachine.infoprint.com`.)

From the **Add Users to a Group** panel, specify `admin` for the **Group Name** field. Enter the name of the Windows administrative user you normally log in to the InfoPrint Manager for Windows server machine as for the **User or Users to Add** field. Note that you do not have to perform this step for the `oper` group.

6. Once complete, click OK to ensure the changes take effect and return to the first SMIT panel displayed in Step 2 on page 308.

Now you can proceed to "Setting up the ipwinadmin id on a Windows domain controller."

Setting up the ipwinadmin id on a Windows domain controller

On the Windows domain controller server for the domain where your servers reside, you must perform this task to ensure that the InfoPrint Manager Windows servers can access the namespace.

1. Log on to the Primary Domain Controller for the domain that your InfoPrint Manager servers operate in as a domain administrator.
2. From the **Start** menu, access the **Programs → Administrative Tools → Computer Management** path.
3. From the **Computer Management** window, click the plus (**+**) sign next to the **Local Users and Groups** list.
4. Click the **Users** folder and choose **New User** from the **Action** pull down menu at the top.
5. In the **User name** field type `ipwinadmin`. In the **Password** and **Confirm Password** fields type a password value.

   We recommend that you select **Password never expires** so you don't have to change the password and update all of your servers on a regular basis.
6. Click the **Create** button and close the dialog (it will be prompting you to add another user's information).
7. From the **User** window, open the **ipwinadmin** that you just finished creating by double-clicking on the list item.
8. Click on the **Member Of** tab, click **Add**, then double-click **Administrators**.
9. Click **OK**.
10. Click **OK** a second time to finish.

Creating the 'ntuser' ID on the InfoPrint AIX server

The following procedure creates the example **ntuser** ID that the InfoPrint Windows server will use to share and manage namespace directories and files that reside on the InfoPrint AIX server.

1. Install AIX Fast Connect.
2. Enable namespace sharing: run **SMIT** and proceed to **Infoprint Printing Systems → Infoprint Utilities → Configure Fast Connect for Infoprint Manager → Enable Windows NT/2000 namespace sharing with AIX server**. This will share the **/var/pddir/default_cell** for Windows systems.
3. Click **OK** to save the changes and exit the SMIT interface.
4. Login to the server as **root** and set the initial password.

5. Login as `ntuser` with the initial password, then change the password for `ntuser`. Remember this password, as you will need it later in this procedure.

Ensuring correct AIX file permissions for interoperability

1. Log on to the server as `root`.
2. From a dtterm window, type `cd /var/pddir/default_cell`.
3. Ensure that all the files residing in this directory have the correct permissions to be read by the InfoPrint Windows server by typing `chmod -R 774 *` .
4. Ensure that all the files residing in this directory belong to the correct group by typing `chgrp -R printq *` .

   If these last two steps have been performed correctly, entering an `ls -l` at the command line should display the following permissions and group values:

```
drwxrwxr**      3 root            printq          512      ....            acl
drwxrwxr**      3 root            printq          512      ....            printers
drwxrwxr**      2 root            printq          512      ....            queues
drwxrwxr**      2 root            printq          512      ....            servers
-rwxrwxr**      1 root            printq          4        ....            version
```

5. Complete your preparations on the InfoPrint AIX server by logging in as `ntuser`.

Once you have completed these steps, the InfoPrint AIX server is ready for interoperability.

Configure Windows servers for interoperability

Some print environments require more than one InfoPrint Manager server to handle their print management. If you are adding one or more InfoPrint Manager for Windows servers to your print environment, this topic will tell you what you need to do to make those servers work with the InfoPrint Manager for AIX server.

Notes®:

1. In an interoperating environment that includes an AIX server and Windows servers, the namespace will reside on the AIX server.
2. You can only install one InfoPrint Manager server on a given Windows workstation or server.
3. If your users will be submitting jobs directly to actual destinations, the actual destination and the associated queue and logical destination must be on the same server.
4. Once you have your multiserver system running, if one of your Windows servers shuts down or is restarted, that InfoPrint Manager server will not restart automatically when the system restarts. You must open the Management Console for that server and start it manually.

Installing MS Services for UNIX on the InfoPrint Windows servers

You must perform the following task on each Windows server:

1. Create a new user account: **ntuser**.
2. Using the CD-ROM, install Microsoft Windows Services for UNIX from the ″Add-on Pack for Microsoft Windows.″
3. Reboot each InfoPrint Windows server.

Note: There are other solutions that enable mapping from an NFS file system to a Windows system, but we recommend the simplest: Microsoft Windows Services for UNIX (PCNFS).

Grant appropriate user rights to the domain user on all InfoPrint Manager Windows servers

To ensure that the Windows InfoPrint Manager servers can run as a Windows service using the domain userid **ntuser**, you must ensure that this userid has the proper level of authority on each Windows InfoPrint Manager server system.

1. Log on to one of the systems as a user who is a member of the Domain Administrators group.
2. Click the Windows **Start** button and select **Settings → Control Panel**.
3. In the **Control Panel** window, double-click the **Administrative Tools** icon.
4. In the **Administrative Tools** window, double-click the **Local Security Policy** icon.
5. In the right pane of the **Local Security Settings** Window, double-click **Local policies**.

6. Double-click **User Rights Assignment** in the right pane.

7. In the list of user rights, select **Act as part of the operating system** and double click it.
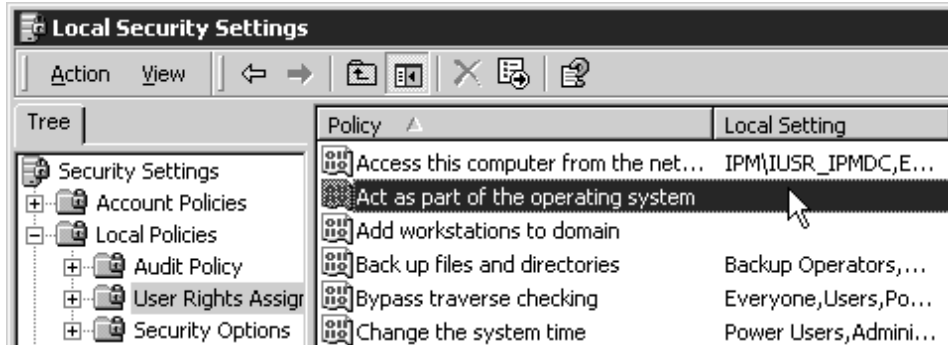
8. In the **Local Security Policy Setting** dialog, click **Add**.
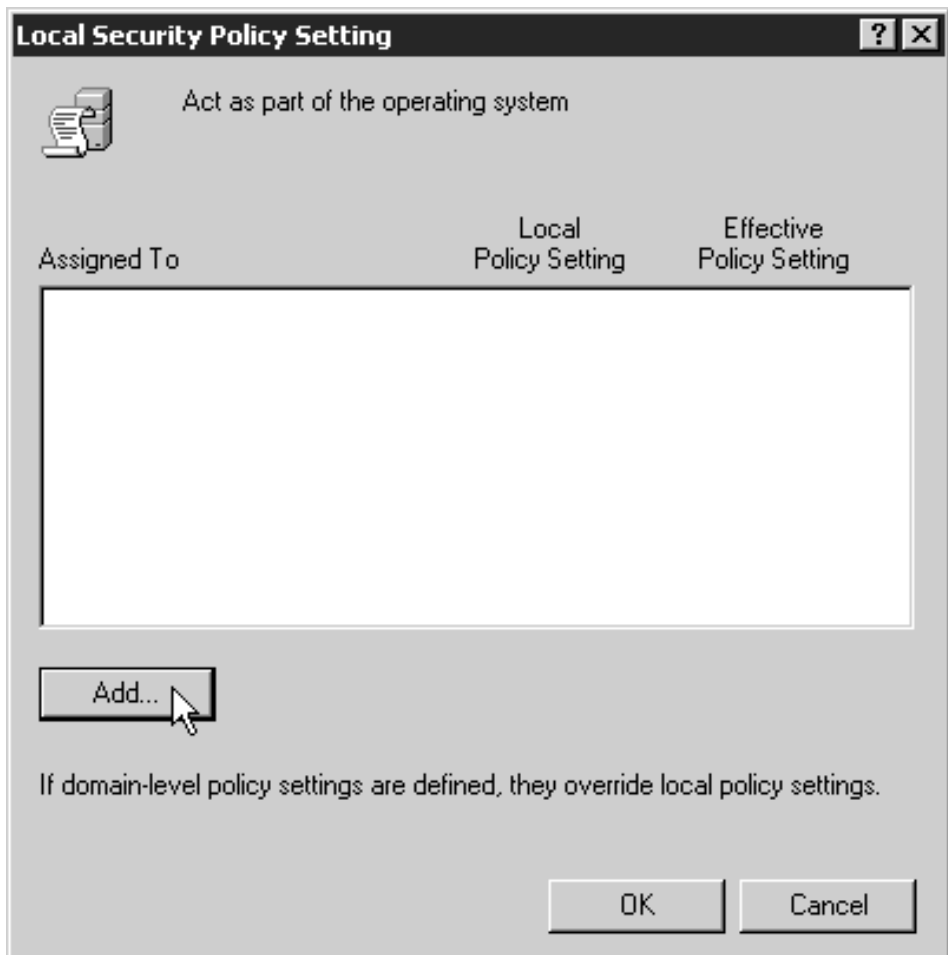
9. In the **Select Users or Groups** dialog, click the arrow on the drop-down list box and select the domain that your InfoPrint Manager servers exist in.
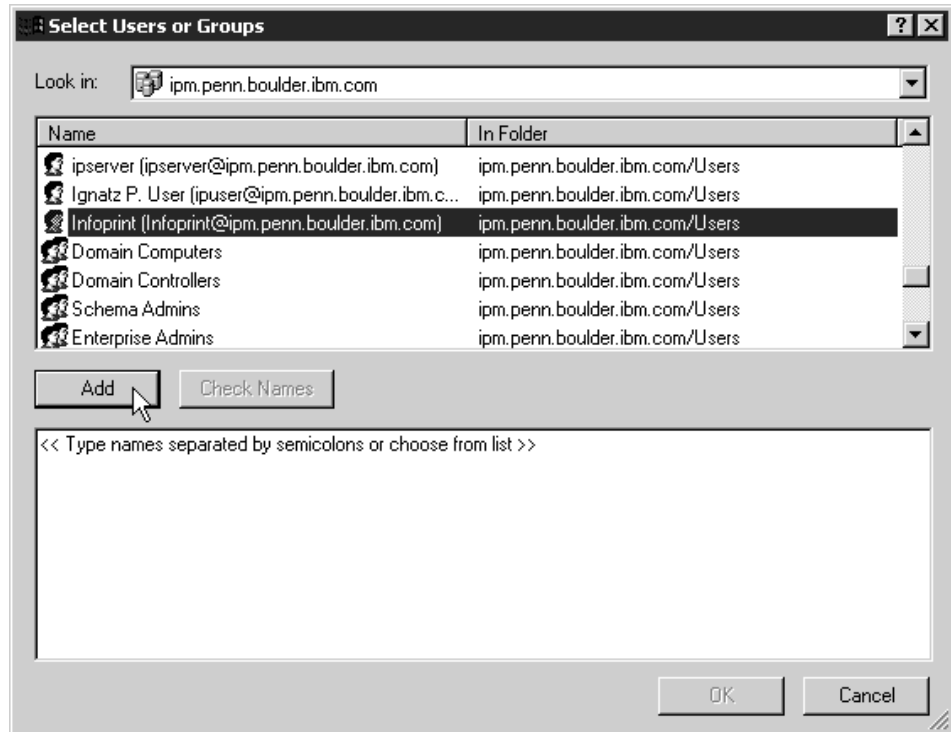
Find and select the domain user you created, and click **Add**.

10. Click OK in the **Select Users or Groups** dialog.

11. Click OK in the **Local Security Policy Setting** dialog.

12. Repeat from step 7 on page 311 for two other user rights: **Create permanent shared objects** and **Log on as a service**.

Verifying access to the AIX namespace that allows interoperability on Windows

From each InfoPrint Windows server, you must verify that you have access to the namespace on the InfoPrint AIX server. You can do this by mapping a network drive (as **ntuser** with the **ntuser** password from step 5 on page 310 from the Windows server to the shared namespace on the InfoPrint AIX server.

1. From the main Windows view, right click the **My Network Places** icon, choose **Map Network Drive**. In the dialog, use the **Folder** field to specify:

   `\\aix_servername\var\pddir\default_cell`

   Where *aix_servername* is the name of the InfoPrint AIX server.

2. Check the **Reconnect at Login** check box.

3. Click on the **Connect Using Different User Name** link.

4. A dialog box will open asking for a username and password associated with `ntuser`. Specify the `ntuser` password from step 5 on page 310 in the **Password** field.

5. Click **OK** and the **NFS Client** window opens.

6. Click **OK** again. A small notification window should appear that says `NFS Login Successful`.

   Since the NFS Client was set up in the section **Configuring the NFS Client to Access the Namespace**, click **OK**.

7. Click **Yes** to accept the current login and **Finish** to map the drive.

If the drive mapped correctly, a new window should open to the mapped drive's contents, and the **NFS Client** and **Map Network Drive** windows should be gone.

Configuring the 'ntuser' ID for interoperability on the InfoPrint Windows servers

Ensure that you complete the following procedure on all InfoPrint Windows servers.

Note: Once this procedure is completed, ensure that you perform all namespace administration from the Management Console on the InfoPrint Windows server, not the InfoPrint AIX server.

On all Windows servers, do the following:

1. Log on as user `ipwinadmin`.
2. From the **Start** menu, click on the **Programs → Infoprint Manager → Management Console** path.
3. Stop the server by either clicking the **Stop** toolbar button or clicking **File → Stop Server**.
4. Access the **Edit → Service Account/Domain** path.
5. Specify the domain name in the **Domain** field, the account you created in the **User account** field, and the password in the **Password** field.
6. Click **OK**.

    Note: A notification server was installed with each of your InfoPrint Manager servers. However, now that the namespace is shared, you only need to run one of them . The notification server must be run on the namespace server. Disable all but one of the InfoPrint Manager Notification servers.

7. Click on the **Edit → Service Configuration** path.
8. In the **Settings** group box, clear both the **Run notification server on this system** and **Run Infoprint Manager LPD service** check boxes.
9. Clear the **Base namespace path** field and type the drive letter that you want to use to link to the namespace followed by a colon (for example, type `x:`). Use the same drive letter that you used when mapping the network drive.
10. In the **Remote namespace folder** field, enter the Universal Naming Convention (UNC) name of the shared directory on the namespace server in this format: *namespaceserver**sharename.* The sharename of the namespace on an AIX server is *default_cell.* For this example, \\`prince\var\pddir\`
    `default_cell`.
11. Click **OK**.
12. Restart all of the InfoPrint Manager servers by selecting **File → Start Server** on each Management Console.
13. Verify that all of the servers are now sharing the namespace.
    - Log on to any one of the machines that holds an InfoPrint Manager server, open a command prompt.
    - Start the InfoPrint Manager Administration Interface.
    - Click on **Server → Show All Servers**.

    You should see a list of all of the servers that are using the namespace. If any of them do not appear, stop the servers and check the settings that you changed in step 7 for that server.

Verifying the authority of the ipwinadmin ID

Use the following procedure to verify that the `ipwinadmin` id has permission to both modify security groups and issue all the InfoPrint **pd*** commands.

1. Verify that the InfoPrint servers are interoperating by performing step 13 of "Configuring the 'ntuser' ID for interoperability on the InfoPrint Windows servers" on page 314.
2. Ensure that you created a user named `ipwinadmin` in the domain.
3. Log on to the InfoPrint Windows server as user `ipwinadmin`.
4. From the **Start** menu, click on the **Programs → Infoprint Manager → Management Console** path.
5. From the left pane, click on the **Security** item.
6. Double-click on **Groups** item.
7. From the Groups view in the right pane, highlight the **acl_admin** item and choose **open** from the drop-down menu.
8. Click on the **Add...** button.
9. In the **Add Member to Group** dialog, type `ipwinadmin*` in the field provided.

   In the **Groups** view, you should be able to see `ipwinadmin` listed in the **Members** column for the **admin** group.
10. From the Groups view in the right pane, highlight the **admin** item and choose **open** from the drop-down menu.
11. Click on the **Add...** button.
12. In the **Add Member to Group** dialog, type `ipwinadmin*` in the field provided.

    In the **Groups** view, you should be able to see `ipwinadmin` listed in the **Members** column for the **admin** group.
13. Log on to the InfoPrint Windows server as `ipwinadmin`.

    You should be able to create and modify security groups and issue all the InfoPrint **pd*** commands.

Chapter 25. Setting up high speed printers for spacing

In InfoPrint Manager, moving from page to page in a job is called *spacing*:

- *Forward spacing* is moving to a point later in the job (such as skipping from page 10 to page 15).
- *Backspacing* is moving to a point earlier in the job (such as backing up from page 40 to page 20).

For spacing to work effectively on the InfoPrint 2000 for AFP printing, InfoPrint 3000, InfoPrint 4000, and InfoPrint 4100, you must first enable the printer to work with the Simple Network Management Protocol (SNMP) and allow SNMP to configure the printer. These settings allow you to use the InfoPrint Manager GUI to stop a printer very quickly (in ten seconds or less) when you need to, instead of having to wait for all of the pages of a job that have been buffered to print.

Enabling SNMP on an InfoPrint 2000 for AFP printing

1. On the display/touch screen on the touch screen/printer console, open the **Printer definition** pull-down menu.
2. Select **Remote Access**.
3. On the **SNMP** tab:
   - Select the **Enable SNMP Agent** and **Allow SNMP to configure the printer** check boxes.
   - In the **Communities** list, touch the name of the community you will be using to access the printer and verify the settings. Make sure that the community has **Write** access to the printer.
4. Touch **OK** to close the window.
5. On the main screen of the console, make sure that the attachment type you will be using is enabled.
6. If you changed the **Enable SNMP Agent** or the **Allow SNMP to configure the printer** setting, shutdown and restart the printer to make the changes take effect.
7. Disable the printer and enable it again to refresh the printer configuration information in the server.
   a. Start the InfoPrint Manager Administration GUI.
   b. In the GUI, find the InfoPrint Manager printer (actual destination) that corresponds to this printer and select it.
   c. Use the GUI to disable the printer.
   d. Use the GUI to enable the printer again.

Enabling SNMP on an InfoPrint 3000 or an InfoPrint 4000 printer that uses the operator console

The Operator console is the standard console for the InfoPrint 3000 and the InfoPrint 4000.

1. On the display/touch screen on the Operator console, open the **Configure** pull-down menu.
2. Select **Remote Access**.

3. Under **Select a Remote Access**, select **SNMP**.

4. Under **Enabled**, select **Yes**.

5. Under **Allow to Configure**, select **Yes**.

6. Touch **OK** to close the window.

7. You will be prompted to restart the printer so that these settings can take effect. Restart the printer, and wait for it to power back up before you continue.

8. Disable the printer and enable it again to refresh the printer configuration information in the server.

   a. Start the InfoPrint Manager Administration GUI.

   b. In the GUI, find the InfoPrint Manager printer (actual destination) that corresponds to this printer and select it.

   c. Use the GUI to disable the printer.

   d. Use the GUI to enable the printer again.

Enabling SNMP on a printer that uses the Enhanced Operator Console

The Enhanced Operator Console is the standard console for the InfoPrint 4100 and is available as an upgrade for the InfoPrint 4000.

1. On the Enhanced Operator Console, touch **Printer definition** at the top of the screen.

2. On the left side of the screen, touch **Remote Access**.

3. In the **Communities** list, select the name of the community you will be using to access the printer and verify the settings. Make sure that the community has **Write** access to the printer.

4. Select the **SNMP Agent Enabled** and **Allow SNMP to Configure Printer** checkboxes, so they both say **Yes**.

5. Touch **OK** to save the settings.

6. You may be prompted to restart the printer so that these settings can take effect. Restart the printer, and wait for it to power back up before you continue.

7. Disable the printer and enable it again to refresh the printer configuration information in the server.

   a. Start the InfoPrint Manager Administration GUI.

   b. In the GUI, find the InfoPrint Manager printer (actual destination) that corresponds to this printer and select it.

   c. Use the GUI to disable the printer.

   d. Use the GUI to enable the printer again.

Chapter 26. Configuring InfoPrint Manager for AIX to support the InfoPrint 5000 printer Models CS1 and CD1/2

The InfoPrint 5000 printer Models CS1 and CD1/2 are set up so that PDF Level 1.6 and PostScript Level 3 jobs are submitted by dropping them into printer hot folders. The printer controller uses Microsoft Shared Folders as hot folders to receive the print jobs. From a print submission workstation or server, you can map the top-level hot folder directory to your local system and copy files to the individual hot folder to get the jobs to the printer. Hot folders can be configured with unique job attributes.

Note: All hot folders must be created from the InfoPrint 5000 printer operator panel.

The InfoPrint 5000 printer features a simple 2-up function that can be used for slit-merge finishing applications. Any other changes to document format and layout might require additional processing with impositioning software before a file is submitted for printing. InfoPrint Manager attributes are not passed to the InfoPrint 5000 printer. For each hot folder that is defined by the printer operator, a corresponding logical/actual destination pair needs to be defined on InfoPrint Manager. The InfoPrint 5000 printer requires a 1:1 relationship for logical to actual destinations.

If you need to configure the InfoPrint Manager for AIX to support the InfoPrint 5000 printer Models CS1 and CD1/2, follow these steps:

1. (Optional) If you do not need to support the AFP or line data input data types, please ignore this step.

    If you want to support the AFP or line data input data types, install the **afp2pdf** PRPQ for InfoPrint Manager or **afp2pdf** PRPQ for InfoPrint Transform Manager.

    See the related documents in PRPQ offerings for detailed instructions.

2. Map a network drive from the local machine to the printer's hot folder named `SV-110 HotFolder`. `SV-110 HotFolder` is the required name. Ask your System Services Representative for the InfoPrint 5000 printer's userid and password. You can have up to 100 hot folders under `SV-110 HotFolder`. See "Mapping the Hot Folder" on page 320 for more information.

3. Run the scripts to create a new BSD DSS printer and the custom transforms to be assembled into the transforms list of the BSD DSS printer. Depending on your workflow, you might need to run the scripts many times: once to reference each PostScript shared folder on the InfoPrint 5000, and again to reference each PDF shared folder on the InfoPrint 5000.

    You need a unique hot folder subdirectory under the `SV-110 HotFolder` for each type of PDF and PostScript that you send to the InfoPrint 5000, and you also need a unique actual destination/logical destination pair for each type of PDF and PostScript. Let's say you have two types of PDF and three types of PostScript, see Table 33 on page 320 for sample names.

Table 33. Suggested naming convention for InfoPrint 5000 hot folders

Type of PDF or Postscript	Actual Destination name (limited to 8 characters)	Logical Destination name	Hot Folder subdirectory name
PDF ledger	5K-PDF1	5k-pdf1-ld-ledger	PDF ledger
PDF letter	5K-PDF2	5k-pdf2-ld-letter	PDF letter
PostScript ledger size	5K-PS1	5k-ps1-ld-ledger	PS ledger
PostScript letter size	5K-PS2	5k-ps2-ld-letter	PS letter
PostScript ABC Statement size	5K-PS3	5k-ps3-ld-abc	PS ABC Statement

See "Running scripts" on page 321 for detailed instructions.

Note: Only the System Services Representative can change the user name and the password from the Infoprint 5000 printer control panel. Work with your System Services Representative if you need to have them change the user name and password.

4. After a PDF or PostScript print job is copied to the appropriate Infoprint 5000 hot folder, the print job is no longer available on Infoprint Manager unless the **job-retain-until** or **job-retention-period** job attributes are specified for the job.

Mapping the Hot Folder

You should map or mount the Hot Folder provided by the InfoPrint 5000 printer onto your local system. To implement this, you need to install and configure the Server Message Block Filesystem (SMBFS) on the AIX operating system. The SMBFS allows access to shares on SMB servers as local filesystems on AIX. In this filesystem, users can create, delete, read, write, and modify the access times of files and directories. But the owner or access mode of files and directories cannot be changed.

To install and configure the SMBFS on the AIX operating system, follow these steps:

1. Install the **bos.cifs_fs** package from the AIX installation kit, with administrative right on the AIX operating system. Then the device **nsmb0** will be created. This device allows the **mount** command to establish a connection between the client and the Server Message Block (SMB) server.

   Note: This works only for AIX version 5.2 and AIX version 5.3, but not for AIX version 5.1, because SMBFS only exists for AIX version 5.2 and AIX version 5.3.

2. Create a directory that will be used as the local mount point, such as ip5k.
3. Ping the printer either by the printer name or the printer's IP address.
4. Map the directory to the local system. Ask your System Services Representative for the Infoprint 5000 printer's userid and password. To implement this, you can choose either of the following two methods:

   - Use the smitty utility, **smitty fs**, which is entered from the command line to run the **mount** command after gathering all the necessary information:

     ```
     smitty fs
       Mount a File System
       File System name: "/sv-110 hotfolder"
     ```

```
                DIRECTORY over which to mount: name of the local mount point, such as /ip5k
                TYPE of file system: press F4 and select cifs
                REMOTE NODE containing the file sytem to mount: printername/userid/pw
```

Where:

> *printername* is the printer's IP address or a printer name like ipc01.
>
> *userid* is the userid supplied when the printer was installed
>
> *pw* is the password that was supplied when the printer was installed

- Use the AIX **mount** command:

```
mount -v cifs -n server/user/pass remotePathOfHotFolder localPathOfHotFolder
```

> where:
>
> **server** Specify the name of the remote server.
>
> **user**   Specify the name of the remote user.
>
> **pass**   Specify the password of the remote server for the user name that the
>   **user** parameter specifies.
>
> **remotePathOfHotFolder**
> > Specify the complete name of the Hot Folder on the InfoPrint 5000
> > Controller.
>
> **localPathOfHotFolder**
> > Specify the complete name of the Hot Folder as it will appear on the
> > local system.

Attention:

1. Use quotes to enclose the name ("/sv-110 hotfolder") because the hot folder
   name contains spaces.
2. The **mount** command does not persist across AIX operating system reboots.
   You must rerun the **mount** command after a system reboot. Follow step 4 to
   issue the **mount** command again.

Running scripts

When you need to enable the InfoPrint 5000 support, some scripts should be run
on the InfoPrint Manager server, in order to create a new BSD DSS printer
(together with a new logical destination and a new or existing queue), to create the
custom transforms that allows the InfoPrint Manager product to convert the input
data to the corresponding output data format, and to assemble the list of transform
objects previously created into the BSD DSS printer. To run these scripts, you can
call an AIX script **run_customization_1.sh**, with administrative rights both on the
AIX system and on the InfoPrint Manager server.

The **run_customization_1.sh** script has the following syntax:

```
run_customization_1.sh nameOfServer nameOfAD nameOfQueue nameOfLD nameOfLocalFolder
```

where:

nameOfServer
> Specify the name of the InfoPrint Manager server where to create the
> destination.

nameOfAD
> Specify the name of the new actual destination that will be created.

nameOfQueue

Specify the name of an existing queue or a new one that will be created, if there is no queue named *nameOfQueue*.

nameOfLD

Specify the name of the new logical destination that will be created.

nameOfLocalFolder

Specify the name of the local mapped directory for the Hot Folder provided by the InfoPrint 5000 printer.

For example:

```
run_customization_1.sh sage ip5k ip5k-q ip5k-ld "/ip5k/Default PS"
```

Where:

ip5k is the local folder

Default PS is the remote sub-folder

Limitations of InfoPrint 5000 printer support

This support has the following limitations:

1. The **afp2pdf** transform does not support n-up.
2. The **afp2pdf** transform supports black and white text, color text and GOCA.
3. The **afp2pdf** transform does not support CMR.
4. The number of copies is limited to 1.
5. Input data streams are limited to line-data, AFP, PDF, and PS data types.
6. There are limitations for output print fidelity of the **afp2pdf** transform.
7. The accounting information is available only when the **pdaccount** administrative command is used.
8. No accurate job completion status is available. Only the page count is provided as feedback.
9. AIX version 5.1 is not supported.
10. Any attributes relevant to PS and PDF input files are not supported, because these files will be simply passed through.
11. InfoPrint Manager submission clients Submit Express and InfoPrint JobTicketer are not supported.
12. The input AFP files together with the **formdef** are the only formatting controls of the input job. Other formatting controls such as output format (booklet, reverse order) are not supported.

Chapter 27. Using InfoPrint Manager with the InfoPrint Color 130 Plus

This procedure takes you through steps to submit different kinds of jobs to the InfoPrint Color 130 Plus using different methods. The following list describes these scenarios:

- An Advanced Function Presentation™ (AFP) document created in a page layout application is submitted through InfoPrint Manager for printing to the InfoPrint Color 130 Plus using the command line. Color images are transformed offline using the AIX command line.
- A PostScript document is submitted for printing to the InfoPrint Color 130 Plus using InfoPrint Submit Express.
- A document is submitted for printing to the InfoPrint Color 130 Plus using MVS Download.

Setting up

The scenarios in this procedure assume that you have completed the following tasks prior to submitting the job to the printer, if they are applicable.

- Built a data stream
- Transformed color images

Refer to "Configuring and Using InfoPrint Manager with the InfoPrint Color 130 Plus" on page 17 for specific information on configuring InfoPrint Manager for AIX with the InfoPrint Color 130 Plus.

Building a data stream

Build your AFP data stream by using any AFP statement generator or application. Refer to "Understanding Form Definitions and Page Definitions" in *Print Services Facility for z/OS: User's Guide* for more information about AFP architecture.

Build your PostScript data stream with any application that generates PostScript, such as Microsoft Word with a PostScript driver. InfoPrint Manager sends PostScript data streams to be transformed and RIPped at the server.

Transforming color images

Color images are transformed automatically at the server when you submit the job to the printer. However, you can transform your images separately by running transforms from the AIX command line without printing the generated output prior to submitting the job. Jobs run more quickly if the images have already been transformed.

InfoPrint Manager provides transform programs for most data streams, such as GIF, PS, and PDF. The transforms convert the incoming data stream into the AFP format. For example, to transform the file mypicture to AFP using the **gif2afp** transform, enter the following command:

```
gif2afp mypicture
```

By default, these transform programs produce monochrome FS10 output. To produce finely-tuned color FS45 output, refer to the list of flags or options and values for each transform in "InfoPrint Object Attributes" in the *InfoPrint Manager: Reference*.

Note: For best results, transform TIFF, JPEG, and GIF images from the AIX command line.

Using and changing color and resource attributes

You need to decide which color and resource attributes you use or need to change when you submit your job. The color and resource attribute-value pairs that are specific to the InfoPrint Color 130 Plus include the following:

- **color-profile**
- **color-profiles-supported**
- **color-bits-per-plane**
- **color-bits-per-plane-supported**
- **color-rendering-intent**
- **color-toner-saver**
- **color-toner-saver-supported**
- **resource-context-presentation-object-container**
- **presentation-object-container-extraction-mode**

Refer to "InfoPrint Object Attributes" in the *InfoPrint Manager: Reference* for more information on these attributes.

Using color attributes

The color attributes can be modified from the command line using the **pdset** command or in the InfoPrint Manager Administration GUI. Refer to "InfoPrint Object Attributes" in the *InfoPrint Manager: Reference* for the correct command syntax when using the command line.

color-profile

Use this attribute to specify the color profile, if any, to be used by PostScript jobs. This attribute can be equal to:

- **SWOP**
- **Euroscale**
- **none**

The default value is **none**, which means that the color rendition will be dependent on the output device.

The title of this attribute in the InfoPrint Manager Administration GUI is **Color profile**.

color-profiles-supported

Use this attribute to identify which color profiles can be used by the actual destination when printing a document. This attribute can be equal to one or more of the following:

- **SWOP**
- **Euroscale**
- **none**

The default values for the InfoPrint Color 130 Plus are **SWOP**, **Euroscale**, and **none**. For all other actual destinations the default is equal to **none**.

The title of this attribute in the InfoPrint Manager Administration GUI is **Color profiles allowed**.

color-bits-per-plane

This attribute specifies whether the transform is to produce monochrome (FS10) or color images (FS42 or FS45). You can set this attribute equal to:

* **0–bits** (monochrome FS10)
* **1–bit** (color FS42)
* **8–bits** (color FS45)

The default for InfoPrint Color 130 Plus is **8–bits**. For all other actual destinations, the default is **0–bits**.

Note: If the attribute is set to **1–bit** for a PostScript data stream it will fail.

The title of this attribute in the InfoPrint Manager Administration GUI is **Color bits per plane**.

color-bits-per-plane-supported

This attribute specifies the types of images supported on the actual destination when printing a document. This attribute can be equal to one or more of the following:

* **0–bits** (monochrome FS10)
* **1–bit** (color FS42)
* **8–bits** (color FS45)

The default values for InfoPrint Color 130 Plus are:

* **0–bits** (monochrome FS10)
* **1–bit** (color FS42)
* **8–bits** (color FS45)

The title of this attribute in the InfoPrint Manager Administration GUI is **Color bits per plane allowed**.

color-rendering-intent

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** 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. The title of this attribute in the InfoPrint Manager Administration GUI is **Color rendering intent**.

color-toner-saver

When cyan, magenta, and yellow are combined in a certain proportion, the result approximates black. When the color-toner-saver attribute is set to **yes**, the proportion of cyan, magenta, and yellow are reduced and substituted with black toner, which reduces the amount of color toner used. You can enter the values:

* **true** or **yes**
* **false** or **no**

The default value is **false**, meaning that you do not want to use this attribute.

The title of this attribute in the InfoPrint Manager Administration GUI is **Color toner saver**.

color-toner-saver-supported

This attribute identifies the values that can be specified for color-toner-saver.

The title of this attribute in the InfoPrint Manager Administration GUI is **Color toner saver allowed**.

Using resource attributes

The resource attributes can be modified from the command line using the **pdset** command or in the InfoPrint Manager Administration GUI. Refer to "InfoPrint Object Attributes" in the *InfoPrint Manager: Reference* for the correct command syntax when using the command line.

resource-context-presentation-object-container

This attribute adds paths to the directory that InfoPrint searches for presentation object containers (also called data object resources), such as EPS or PDF pages, for the actual destination.

The title of this attribute in the InfoPrint Manager Administration GUI is **Location of presentation object containers**.

presentation-object-container-extraction-mode

This attribute specifies the degree of optimization attempted by color transforms. The possible values are:

* **ignore** (generates the document without resources by ignoring presentation object containers)
* **inline** (identifies and extracts the resources within a document for use)

The default value is **ignore**.

Note: Inline transforms always use an extraction mode of **ignore**.

The title of this attribute in the InfoPrint Manager Administration GUI is **Presentation object container extraction mode**.

Using the InfoPrint Manager Administration GUI to change color and resource attributes

The InfoPrint Manager Administration GUI is an interface for managing InfoPrint Manager jobs, queues, logical destinations, and actual destinations, such as printers. It runs on multiple platforms, so you can use it either from a Windows workstation, an AIX workstation, or directly on the AIX InfoPrint Manager server console.

From the server or from remote work stations, operators can use this interface to monitor all jobs and printers in the system and to route jobs appropriately to increase enterprise-wide printing productivity. With the Infoprint Manager Administration GUI, you can change the color and resource attributes.

Starting the InfoPrint Manager Administration GUI

To open the InfoPrint Manager Administration GUI from the Windows desktop, double-click any of the **Infoprint Administration** icons.

You can start the InfoPrint Manager Administration GUI from an **aixterm** window. For example, to open an advanced view, type `ipguiadvadm` at the AIX command line. You can also use the basic (ipguibasicadm) view.

Changing the attributes

Now that you have opened one of the views of the InfoPrint Manager Administration GUI, you can change the attributes in the actual destination. Follow this procedure to set the attributes using the GUI.

1. Click your InfoPrint Color 130 Plus actual destination.
2. Select **Options → Customize**.
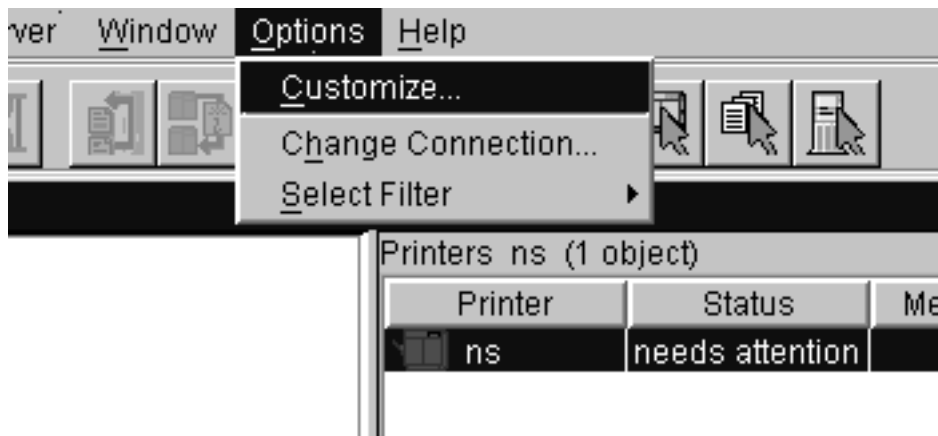
Figure 67. Options menu

3. In the **Customize** dialog, click the **Printer** tab.
4. In the **Action** column, find **Change Tuning**, **Change AFP Resources**, and **Change AFP Color**, and select the check boxes in the **Menu** column next to them.
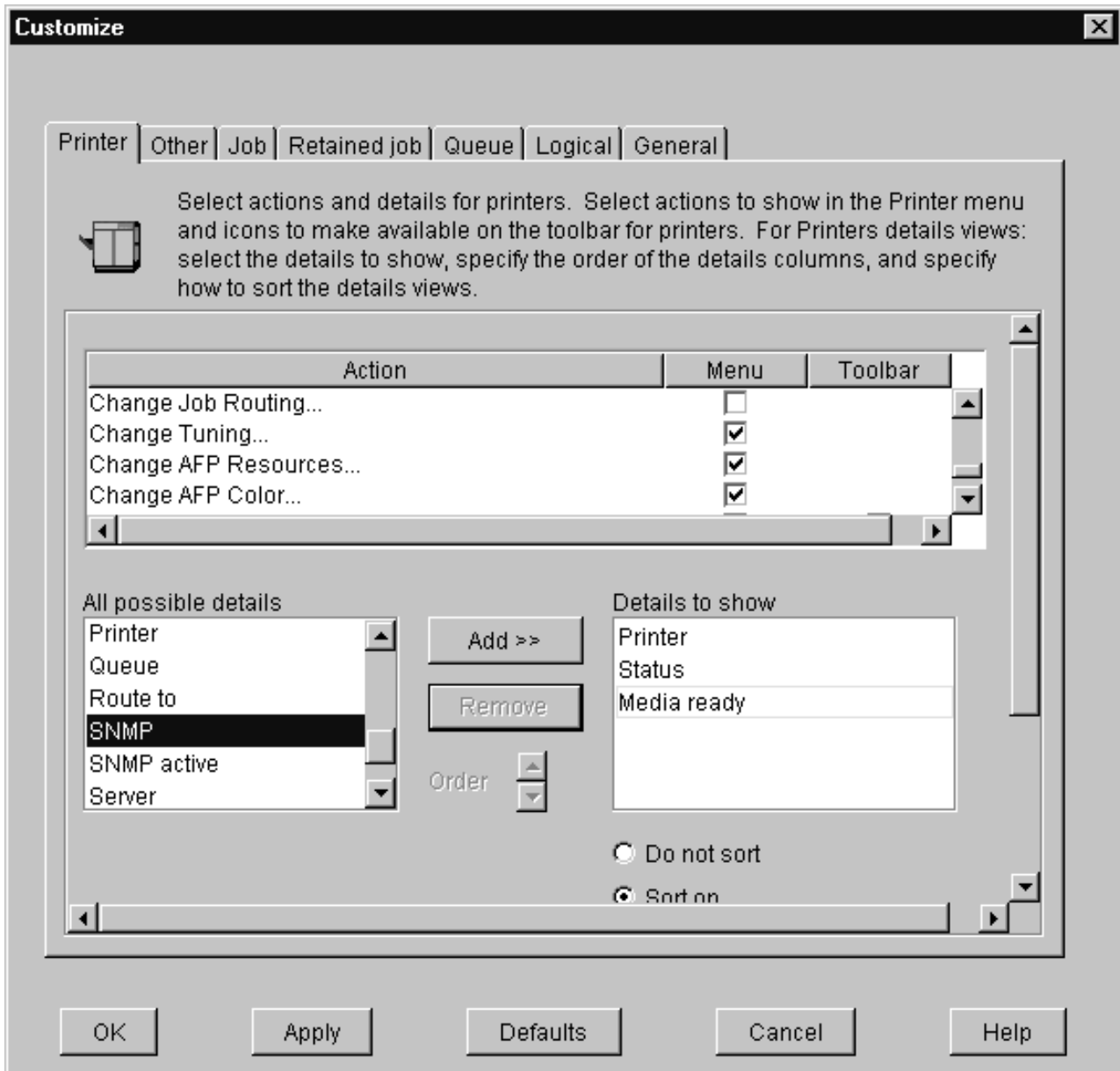
Figure 68. Printer menu

This step adds these tasks 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 **Printer → Change AFP Resources** to open the **Change AFP Resources** dialog. These fields allow you to specify where resources, such as fonts and presentation object containers, are located. Refer to "Identifying where to store AFP resources" on page 20.

7. In the **Change AFP Resources** dialog, find the **Location of presentation object containers** field and 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/priv-pres-obj- containers:/dept123/
public-pres-obj-containers
```
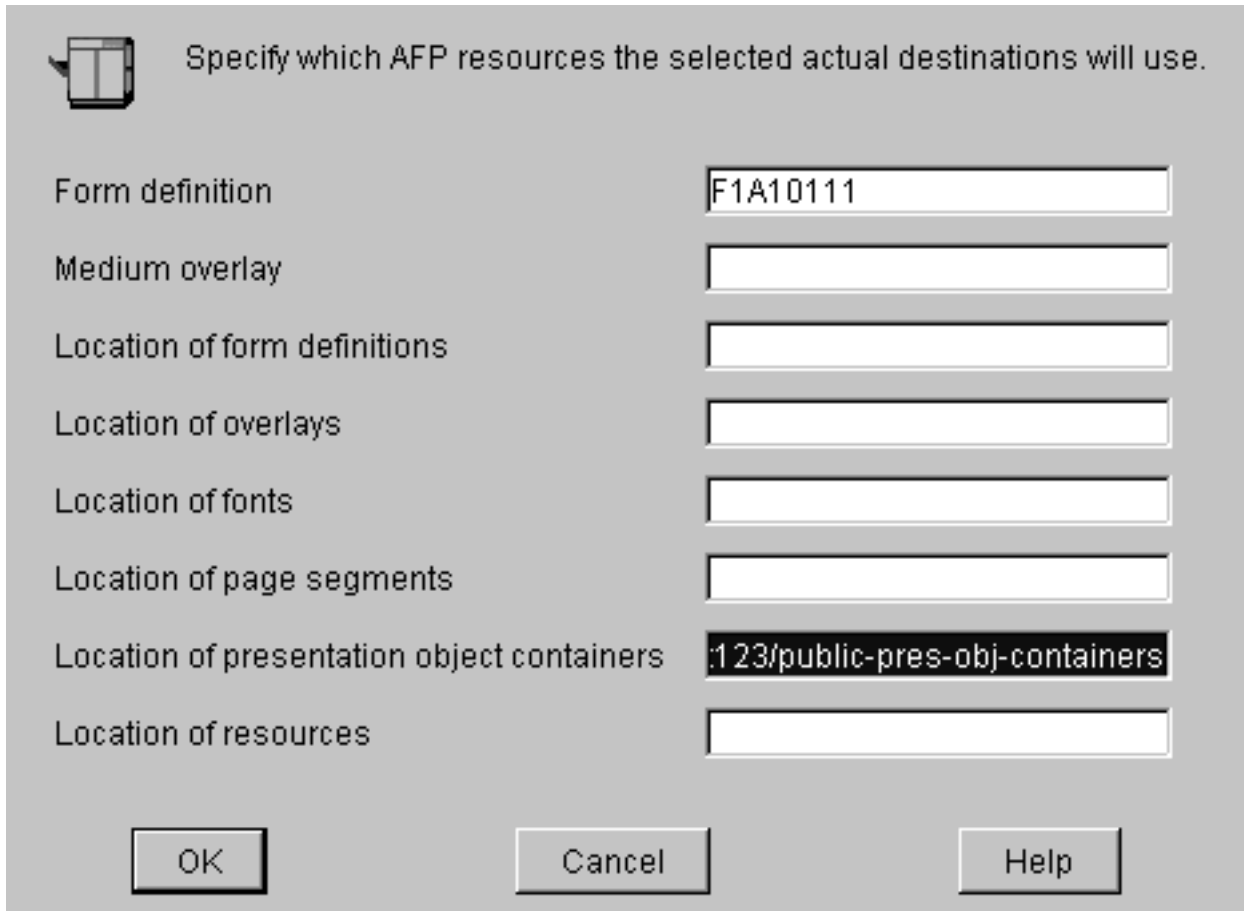
Figure 69. Change AFP Resources dialog

8. Fill in any other fields that are appropriate. For example, if you use form definitions, fill in the **Location of form definitions** field.

9. Click **OK** to apply the settings and close the dialog.

10. Select **Printer → Change AFP Color** to open the **Change AFP Color** dialog. These fields allow you to modify the color attributes in your job. Refer to "Using color attributes" on page 324 for more information.
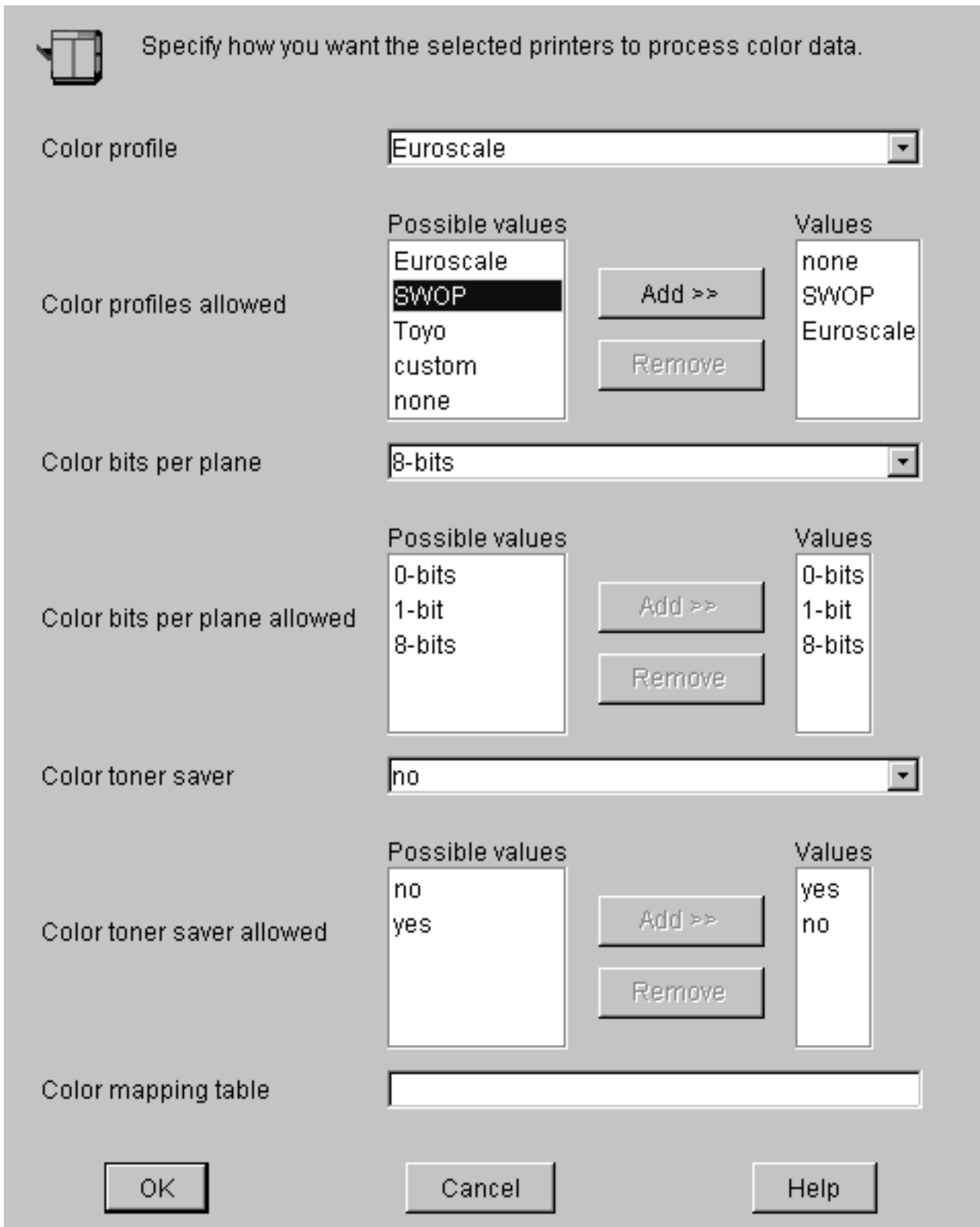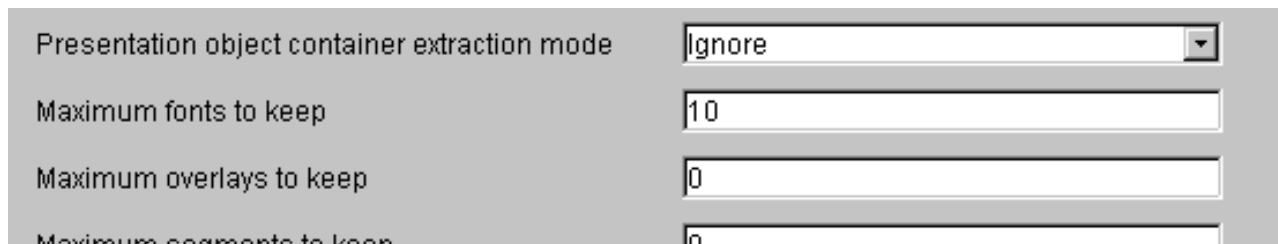
Figure 70. Change AFP Color dialog

11. Click **OK** to apply the settings and close the dialog.

12. Select **Printer → Change Tuning** to open the **Change Tuning** dialog. These fields allow you to modify resource attributes in your job. Refer to "Using

Presentation object container extraction mode	Ignore
Maximum fonts to keep	10
Maximum overlays to keep	0
Maximum segments to keep	0

Figure 71. Change Tuning dialog

13. Click **OK** to apply the settings and close the dialog.

Sending an AFP job to the printer using the AIX command line

In this example, you have created a document using an AFP statement generator. This job contains color images that you decide to transform offline. You now want to submit that document through InfoPrint Manager to the InfoPrint Color 130 Plus using the command line.

Setting up assumptions

This scenario assumes that you have completed the following tasks:

- Built an AFP data stream
- "Identifying where to store AFP resources" on page 20
- Transformed color images

See "Setting up" on page 323 for more information.

Using AIX commands

On any AIX system, the InfoPrint AIX client allows authorized users to use the following InfoPrint commands:

- **pdls**

  Lists selected attribute values for a job, destination, or other InfoPrint object.
- **pdpr**

  Submits a job to a logical destination.
- **pdq**

  Queries the status of selected jobs, of all jobs submitted to a logical destination, or of all jobs assigned to an actual destination.

Refer to *InfoPrint Manager: Reference* or the associated man pages for a complete list of flags and attributes to use with these commands.

Submitting the job

Complete the following steps to submit the job.

1. To determine whether the logical destination IC130P-ld is ready to receive jobs, type:

   ```
   pdls -c destination -r "enabled" IC130P-ld
   ```

   You will see the following message if the logical destination is enabled:

```
enabled=true
```

2. To submit the file MyJob to the logical destination IC130P-ld and request two-sided printing and the **color-toner-saver** attribute, type:

```
pdpr -d IC130-ld -x "sides=2 color-toner-saver=true" MyJob
```

   Note: The page size and orientation that is specified in the job and in InfoPrint Manager must match that specified at the AFCCU. Otherwise, the job will print on the page size and with the orientation specified at the AFCCU.

3. To query all the jobs that you submitted to logical destination IC130P-ld, type:

```
pdq -d IC130P-ld
```

In the previous examples *–d* refers to the logical destination and *–x* refers to the attribute string that contains the attribute-value pairs you want to include.

You can use the following attributes from the AIX command line or you can change them in the InfoPrint Manager Administration GUI:

- **color-bits-per-plane**
- **color-bits-per-plane-supported**
- **color-rendering-intent**
- **color-toner-saver**
- **color-toner-saver-supported**
- **resource-context-presentation-object-container**

Refer to "Using and changing color and resource attributes" on page 324 for details on when and how to use these attributes.

Sending an AFP job with color images to the printer using InfoPrint Submit Express

You have created an AFP document using a page layout application and are using InfoPrint Submit Express to send it to the InfoPrint Color 130 Plus.

Note: The following example uses InfoPrint Submit Express for Windows.

Setting up assumptions

This scenario assumes that you have completed the following tasks:

- Built a data stream
- Installed InfoPrint Submit Express

See "Setting up" on page 323 for more information.

Submitting the job

When using InfoPrint Submit Express to create the job ticket, you must consider a number of things to prepare a job for printing. Primarily, however, during this phase of the process, you will identify and organize the printable files and other resources that make up the job. As you complete the job ticket, Submit Express provides a format in which you can specify the details necessary to process a job effectively. You generate the printable files that you submit to InfoPrint Manager file by file from the application that you use for authoring.

Note: Use the **Help** menu from the Job Ticket window or the **Help** button on the dialogs to guide you.

Creating a new job ticket

In this example, you will create a new job ticket named MyJob.jtk. You adjust color attributes and then submit the job.

Note: When you use InfoPrint Submit Express to send a job to the printer, you do not need to have previously created a form definition. If you have a form definition it overrides the attributes you specify in InfoPrint Submit Express.

1. Start InfoPrint Submit Express. The **Job Ticket** window displays.
2. Fill in all the fields with appropriate information.
3. Insert the files into your job ticket that you want to include in the job. Click **Help → Help...** if you have questions.
   - To insert new files into the document, click **Item → Insert File** on the menu bar. The Select files dialog box displays. Select the file(s) you want to add to the document from the Select files dialog box and click **Select**.
4. From the **Print** tab, select InfoPrint Color 130 Plus from the **Printer type** drop-down list and specify the layout you want in the **Layout** field.
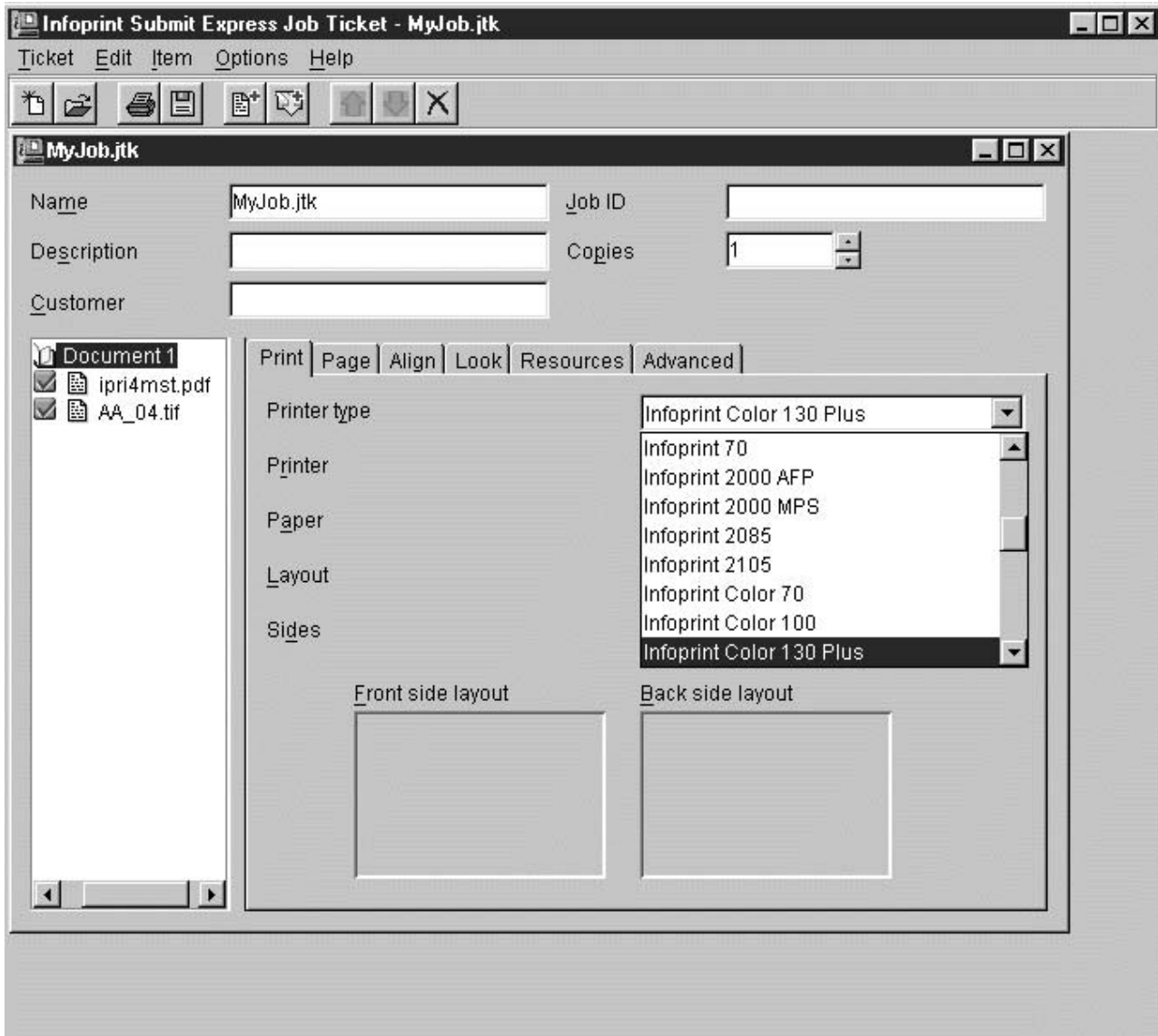
Figure 72. Print tab

5. Specify page alignment on the **Align** tab.

   Note: You must specify the same page size and orientation at the AFCCU as you do in the job, otherwise the page size and orientation specified in the AFCCU will override that specified in the job.

6. Choose the values for the color attributes on the **Look** tab. You can use the following attributes in InfoPrint Submit Express:
   - **Color rendering intent**
   - **Color profile**
   - **Color bits per plane**
   - **Color toner saver**
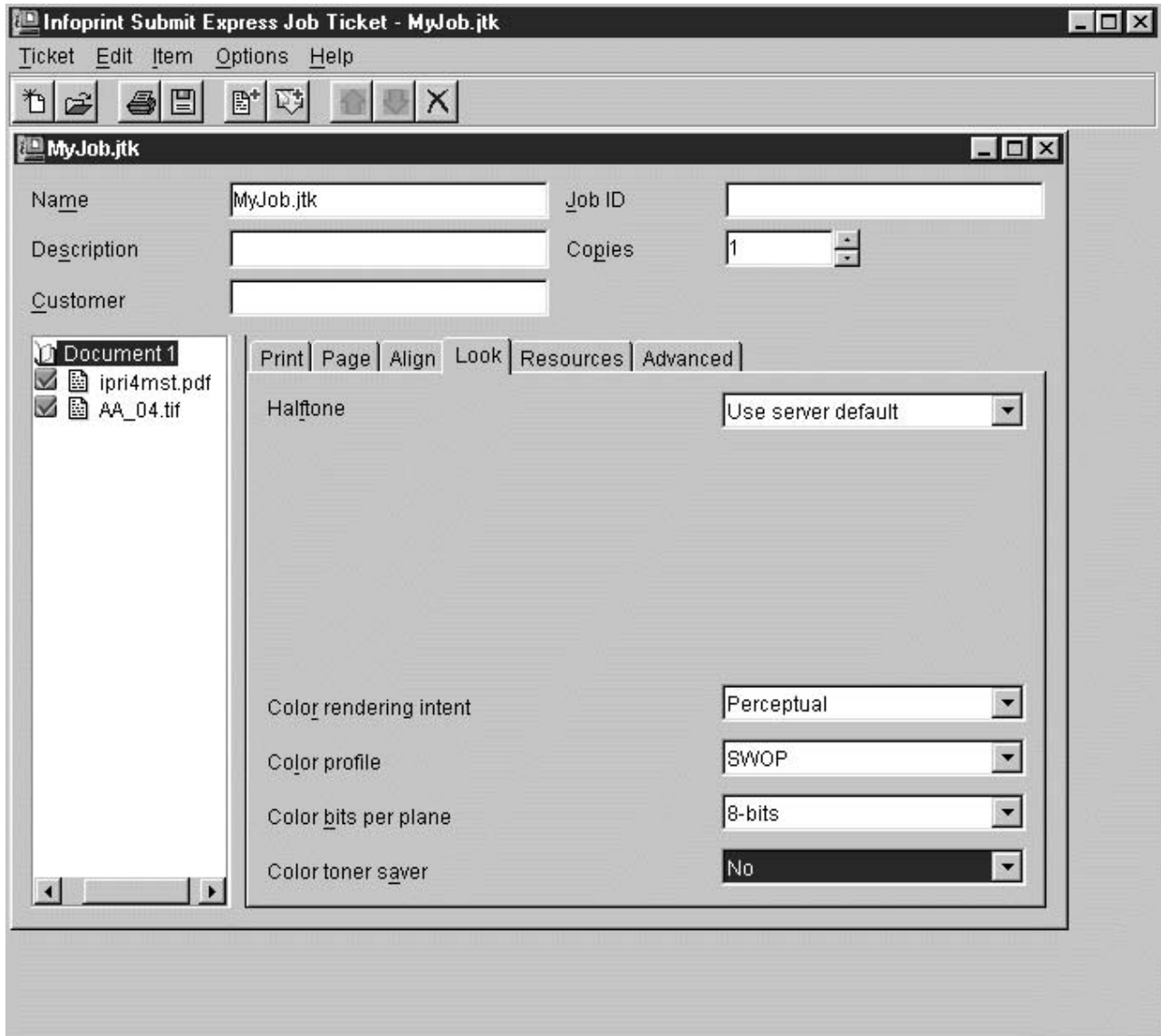
Figure 73. Look tab

Refer to "Using and changing color and resource attributes" on page 324 for details on when and how to use these attributes.

7. Click the **Advanced** tab, find **RIP for**, and select **InfoPrint Color 130 Plus** from the drop-down list.
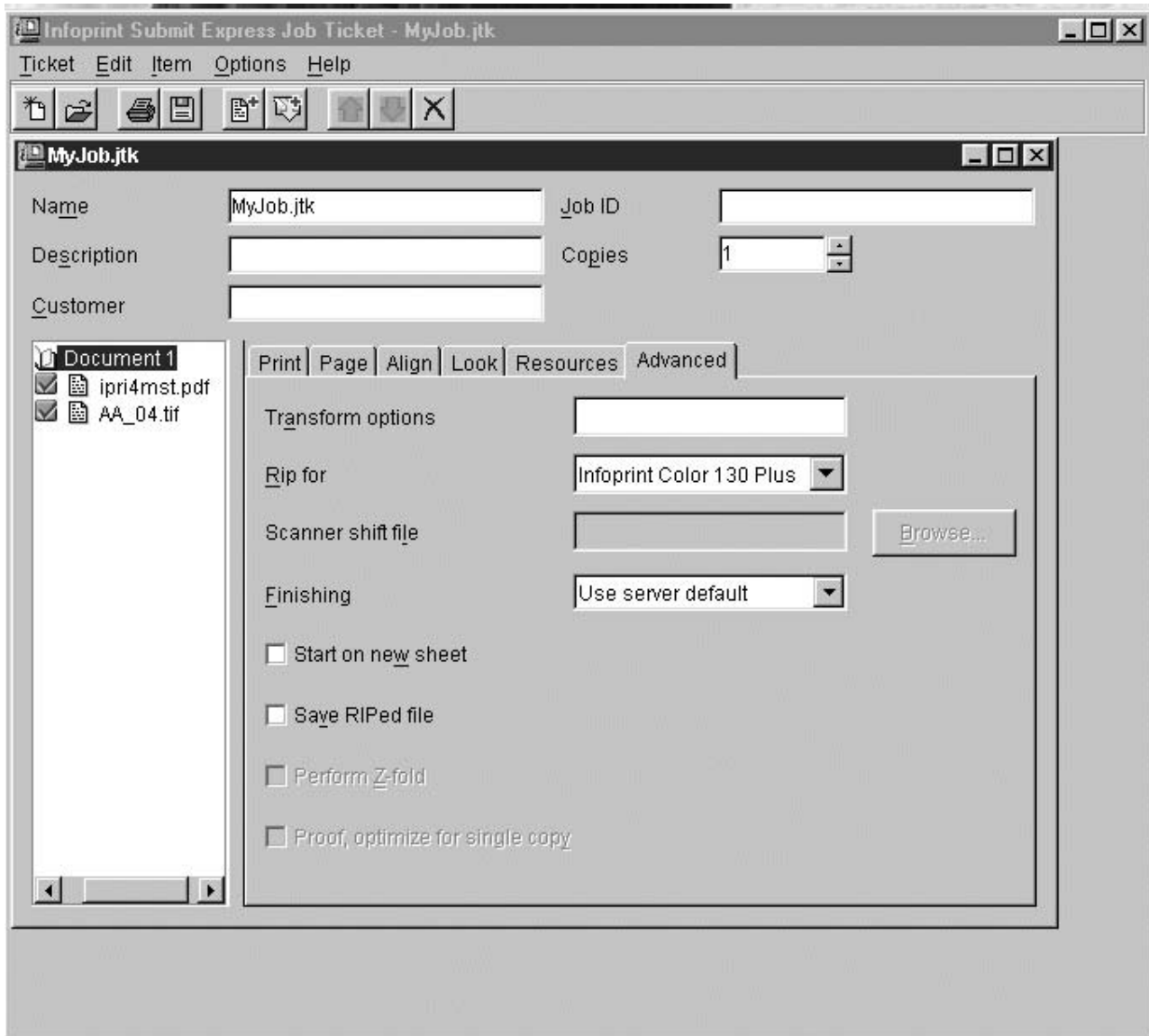
Figure 74. Advanced tab

8. Save the job ticket by clicking **Ticket → Save As...**.
9. Submit the job by clicking **Ticket → Submit Job**.

Refer to *InfoPrint Manager for AIX Print-On-Demand Feature: Submit Express for Windows User's Guide* for the latest available version on the Web at **http://www.infoprint.com**.

Sending a job using Download for z/OS

You have created an AFP document using a page layout application and are using Download for z/OS to send it to the InfoPrint Color 130 Plus.

Download for z/OS automatically transmits data from the job entry subsystem (JES) spool to remote systems using TCP/IP. This eliminates the need for manual print file transfer using File Transfer Protocol. A cooperating print server running on a remote system receives the data sets for printing with InfoPrint Manager for

AIX. For most jobs, you can use the same job control language (JCL) that you would use for non-AFP printers, changing only the MVS routing information to direct your job to the InfoPrint Color 130 Plus.

Note: You can use InfoPrint's Page Printer Formatting Aid (PPFA) to create form definitions and page definitions when creating the data stream. See http://www.infoprint.com for information on how to use PPFA.

If you are using Download for z/OS to submit jobs to the printer, refer to "Using JCL for Advanced Function Presentation" and "Printing Tasks and Examples" in the *Print Services Facility for z/OS: User's Guide* for specific printing tasks and examples. You can also refer to *Print Services Facility for z/OS: Download for z/OS* for more information.

Chapter 28. InfoPrint Manager's impositioning solution

In the printing world, impositioning consists of the arrangement of pages so they will appear in proper sequence after press sheets are folded and bound. Commercial printers who create signature-based documents with frequent layout changes, while the content remains relatively static, will find value in InfoPrint Manager for AIX's impositioning solution.

Users can take advantage of the wide-carriage web of the InfoPrint 4100 Advanced Function Printing System to print up to 19.5 inches across for the creation of signature-based documents. Most importantly, this solution allows for frequent minor adjustments to existing signature document layouts, without reRIPping the entire job at the InfoPrint AIX server. See "Prerequisites for the InfoPrint impositioning solution" on page 340 for a list of the prerequisites necessary to implement this impositioning solution.

For example, if a publishing house decides to use a heavier bond of paper that results in significant page creep, or if pages need to be rotated differently because a different sequence of folds is required for an available postprocessor, InfoPrint Manager's impositioning solution allows them to make changes to the layout without having to submit and reRIP the job content. This flexibility is the result of InfoPrint Manager for AIX's Print Optimizer.

The rest of this chapter describes how you can install and configure impositioning support in order to submit Adobe Portable Job Ticket (*.**pjtf**) files to the InfoPrint Manager server so you can better manage and track print jobs containing signatures that will be folded and stitch-bound into books. You can create ***.pjtf** files using the third party ScenicSoft Preps version 4.0 or higher impositioning product, submit those jobs using an InfoPrint Manager hot folder, and use the InfoPrint 4100 Advanced Function Printing System to print out the results. Additionally, by sending only the *.**pjtf** files (see "InfoPrint impositioning terms" on page 342) to the server when changes only affect the layout or page order, you should experience significant performance benefits.

The following topics describe InfoPrint Manager's Impositioning Assist feature:
- "An overview of the print optimizer"
- "Prerequisites for the InfoPrint impositioning solution" on page 340
- "Guidelines for using ScenicSoft Preps Pro" on page 341
- "InfoPrint flow for impositioning jobs" on page 342
- "Configuring InfoPrint Manager for impositioning" on page 353
- "Managing impositioning resources with the print optimizer" on page 359
- "Troubleshooting impositioning" on page 360

An overview of the print optimizer

The InfoPrint Manager for AIX Print Optimizer works in the background to maintain a database of RIPped page images. These RIPped page images contain only the information about a page's content and have no information about page layout. If only the layout is modified and the page content remains unchanged, these images do not change. The print jobs consist of signatures (a sheet with many pages and optional marks for later folding and trimming), which will be

folded and stitch-bound into books. Print jobs can also contain content. When you re-print a job changing only its layout, the page images stored at the printer are used, resulting in significant network traffic reduction. If the printer has been shut down before the job is re-printed, these RIPped page images are obtained from the InfoPrint AIX server and do not have to be reRIPped. Also, printer marks that do not change are not reRIPped.

The Print Optimizer:

1. Uniquely identifies each page in a PostScript or PDF source file.
2. Converts the PostScript or PDF page into an Advanced Function Presentation (AFP) resource.
3. Stores the RIPped pages as resources that are accessible by InfoPrint Manager.

Prerequisites for the InfoPrint impositioning solution

To use the InfoPrint Manager Impositioning solution described in this document, you must install the following components.

Note: If you are running DCE for on your InfoPrint Manager for AIX server, you cannot use this Impositioning solution.

- InfoPrint 4100 Advanced Function Printing System

  Make sure that this printer contains the Version 11.4.30 or higher release of the Advanced Function Common Control Unit (AFCCU) microcode for High End Continuous Forms Printers. This microcode level is the first to incorporate the new IPDS pre-RIP (**RPO**) command that reduces overhead before printing the first page of a job that has been printed previously. This command is essential for the impositioning solution because it prevents the printer from clutching (waiting on data to finish processing in the middle a job printing) on Impositioning jobs.

  On the printer, make sure that you install and enable the Request for Price Quotation (RPQ) 8B4053 for supporting the 54 inch paper required for this solution. While installing this RPQ, note that it checks the memory available on the printer and requires additional memory if the minimum amount required for the RPQ is not available. In addition, you can order a hardware buffer unit to reside on the floor in the paper path following engine #1 to accommodate the larger paper size. For more information, access the "Signature Page" option from chapter 1 of the *InfoPrint 4000 and InfoPrint 4100 Models with Enhanced Operator Console: Planning and Configuration Guide*, G544–5798–01, or consult your InfoPrint Solutions sales representative.

  Note: To use the Impositioning solution, you must ensure that Print On Demand (POD) mode is turned off at the InfoPrint 4100 Advanced Function Printing System's controller console.

- InfoPrint Manager Version 4 Release 1 with the Print-On-Demand feature

  For more information about applying service, see *InfoPrint Manager for AIX: Getting Started*.

- A third-party impositioning product, such as ScenicSoft Preps, to produce the Portable Adobe Job Ticket files

  When using Adobe Portable Job Ticket Format (PJTF) job tickets, the recommended impositioning software is ScenicSoft Preps Pro (R) Version 4.0 or higher. When using PJTF job tickets, configure Preps Pro 4.0 or higher to place printer marks in a separate file.

You must create a customized PPD for the 4100 printer, using the following procedure:

1. From the Adobe web site (**http://www.adobe.com**), download the PPD file for the InfoPrint 4000 printer (**Ibmifp4k.ppd**).

   While web sites are often subject to change, you should be able to find the PPDs as one of a collection of downloadable PPDs that are categorized by operating system (either Windows or Macintosh).

2. Using either Notepad or Wordpad, edit the file, renaming it to **IP4000.ppd** and making the following changes:

   a. For the fields **ModelName**, **ShortNickName**, and **NickName**, change the value to IBM Infoprint 4100.

   b. Change the value of the **PCFileName** field to IP4100.PPD.

   c. Towards the bottom of the file in the **Custom Page Sizes** section,

      1) Change the **ParamCustomPageSize Width** field value to 1 points 1 1404.

         You derive 1404 by multiplying the maximum width of 19.5 inches by 72.

      2) Change the **ParamCustomPageSize Height** field value to 1 points 1 3816.

         You derive 3816 by multiplying the maximum height of 53 inches by 72.

      3) Change the **MaxMediaWidth** field value to "1404".

      4) Change the **MaxMediaWidth** field value to "3816".

3. Save the **IP4100.PPD** file in either the **\Preps 4.1\Printers\ppd** folder on your Windows client, or the **Preps 4.1:Printers:ppd** folder on your Macintosh client.

   Note: If you are using ScenicSoft Preps 4.0, the first qualifier is folder is **Preps 4.0**.

Once you have created this PPD, customize the logical device in Preps to use the PPD by following the instructions in the *Learning Preps 4.1 Guide*, which is available from ScenicSoft. You can download a PDF version of this document from their web site by accessing the Technical Support page on their web site and looking under the **Preps** category (**http://www.scenicsoft.com/support/index.html**).

When creating a job in Preps, you must use a Mixed Files workflow. The Mixed Files workflow places printer marks in a separate file which must be sent to the printer with the **pjtf** files (as described in "InfoPrint flow for impositioning jobs" on page 342).

Note: PJTF files created in a PDF-to-PDF workflow are not supported by InfoPrint Manager and cannot be used for this solution.

Guidelines for using ScenicSoft Preps Pro

The following are important considerations when using the ScenicSoft Preps Pro third-party impositioning product in conjunction with InfoPrint Manager for AIX 4.1:

- While other software impositioning products can output ***.pjtf** files, the InfoPrint impositioning solution has only been tested using ScenicSoft Preps 4.0 and ScenicSoft Preps 4.1.

- When using Preps, ensure that the finished page size is the same page size as the **content file** (see "InfoPrint impositioning terms") page size.

  For example, if your **content file** is an Adobe Acrobat file (PDF format) containing pages 6 inches by 9 inches in size, then you should set your `finished page size` in Preps to 6 inches by 9 inches.
- InfoPrint impositioning does not support scaling.
- Page cropping causes difficult to predict page offsets and trimming equal to the amount of difference between defined page size in the **pjtf** file and the actual page size.

  For example, if you have a 7 x 9 inches definition and the pages are 6.994 x 9.002 inches, then the difference does not cause a fatal processing error and may print acceptable looking output.

InfoPrint flow for impositioning jobs

This section presumes that you have already:

1. Created the appropriate PDF and PostScript documents through a software package like QuarkXPress.
2. Run these files though an impositioning program like ScenicSoft's Preps to create the Adobe Portable Job Ticket (***.pjtf**) files.

InfoPrint impositioning terms

Before describing the job flow and eventual output, the following impositioning terms must be defined:

content files
One or more PDF (*.**pdf**) or PostScript (*.**ps**) files that contain the print data from a commercial software program (such as QuarkXPress or Adobe Photoshop) that has been submitted to the ScenicSoft Preps impositioning software in order to create the **layout files**.

layout file
The Adobe Portable Job Ticket files (*.**pjtf**) that are the output of the ScenicSoft Preps impositioning software. These files contain the layout specifications in a signature format derived from the specific **content files**.

original job
One or more files submitted to InfoPrint Manager for impositioning, usually through a hot folder.

The **original job** is either:

- split into a **printing job** and a **priming job**

or

- turned into just a **priming job** (if **prime-only=true**).

priming actual destination
Indicates the print optimizer actual destination.

priming job
A job sent to the priming logical destination and subsequently processed by the **priming actual destination**.

priming logical destination
Indicates the InfoPrint logical destination that feeds jobs to the Print Optimizer actual destination. This object is created by the Print Optimizer creation wizard with the naming convention *adname*-**ld** where *adname*

represents the name you choose in "Creating the priming (print optimizer DSS) destination and queue" on page 353.

printing actual destination
> Indicates the PSF DSS actual destination that prints the job.

printing job
> A job sent to the printing actual destination and subsequently processed by the PSF DSS.

printing logical destination(s)
> Indicates the logical destination or destinations that send **priming jobs** to the **priming logical destination** and send **printing jobs** to the **printing actual destination**.

print optimizer
> Indicates the priming destination, which identifies each page in either a PostScript or PDF source file, converts those source files into an AFP resource, and stores the RIPped pages as resouces that are accessible by InfoPrint Manager.

printer marks file
> Indicates a PostScript file containing symbols widely dispersed on a sheet of paper that aligns post-processing equipment.

Impositioning job flow overview

Now, you are ready to print the **content files** (***.ps** and *.pdf) with both the **printer marks** file and the layout specification file (***.pjtf**) to an InfoPrint 4100 Advanced Function Printing System. Throughout this chapter, the term **original job** implies both the source PostScript or PDF files and the Adobe Portable Job Ticket file (***.pjtf**) in the same job, unless otherwise stated.
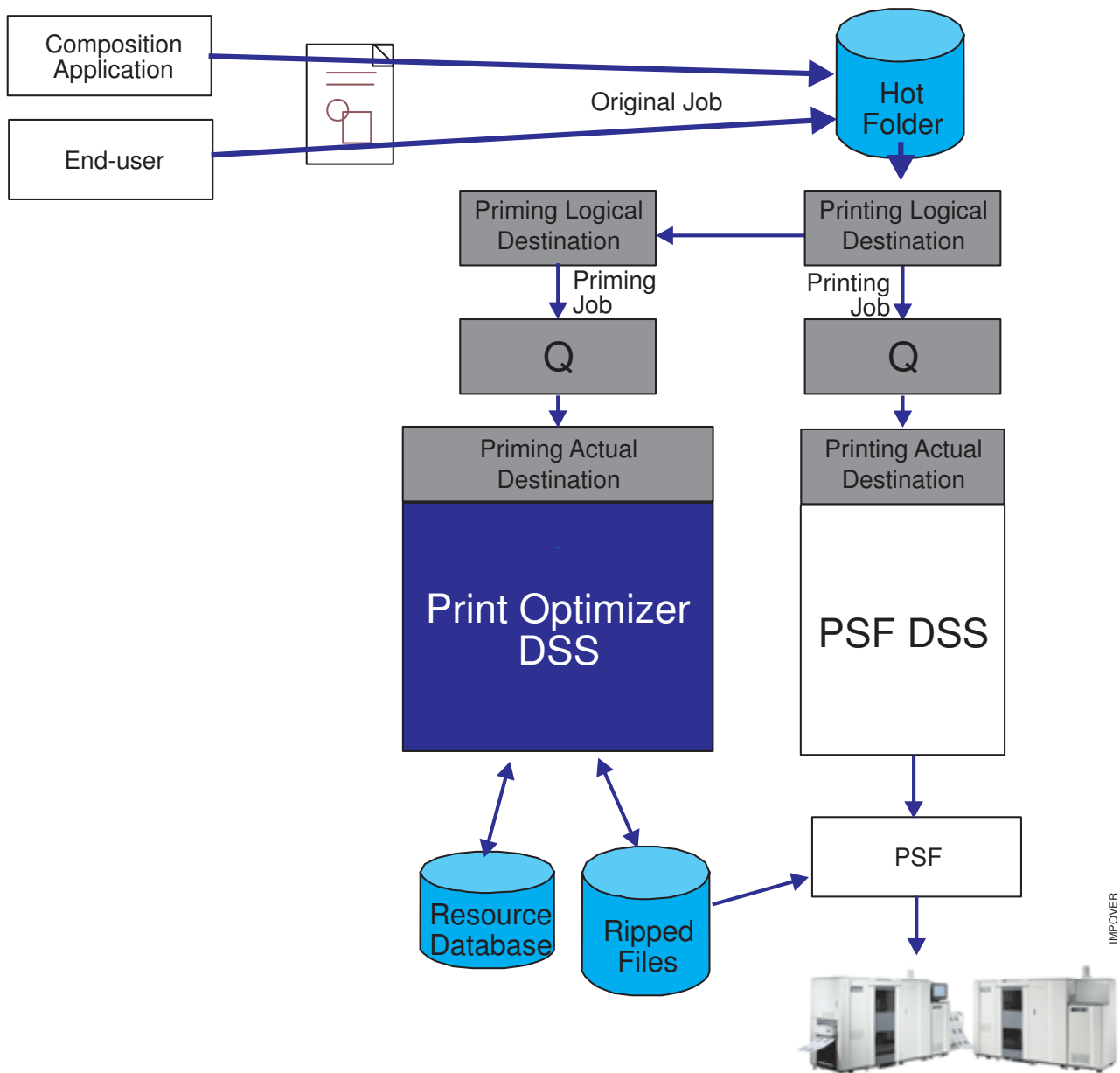
Figure 75. Overview of the InfoPrint job flow for impositioning jobs

Figure 75 provides a high-level view of the processing flow of impositioning jobs in an InfoPrint system. Note that the **original job** coming from either the end user or the composition application (such as QuarkXPress) travels through the Software impositioning program (the unlabeled page, representing a *.**pjtf** file or files that has been processed by an impositioning software program, such as Preps) before it is placed in the hot folder on the InfoPrint AIX server. Then, the printing logical destination picks up the **original job** from the hot folder. At this time, InfoPrint Manager assigns a job ID to the **printing job** for tracking purposes.

The **printing logical destination** then sends the **priming job** to the **priming logical destination**. At this time, InfoPrint Manager assigns a job ID to this **priming job** (still both the PostScript or PDF source files and the Portable Adobe Job Ticket File)

for tracking purposes. This explains why there are two InfoPrint Manager job IDs that you can track, using the tools described in "Troubleshooting impositioning" on page 360.

The **priming logical destination** feeds the Print Optimizer queue, which funnels jobs to the **priming actual destination**. Once the **priming actual destination** starts processing the **priming job**, the **printing logical destination** starts processing the **printing job**. As it needs AFP pages to print, the **printing logical destination** queries the **priming actual destination**. If these pages have not finished processing at the Print Optimizer, the **printing logical destination** waits for them to finish processing.

Guidelines for submitting impositioning jobs to InfoPrint Manager

The following guidelines should be followed when creating and submitting Impositioning jobs to InfoPrint Manager.

1. If a prime-only job was used, the corresponding impositioning jobs should be submitted through the same logical destination where the prime-only job was submitted.

2. If you use the same actual destination for both general printing and impositioning, use two separate logical destinations to feed it jobs.

3. To increase throughput at the **printing actual destination**, you should specify `job-rip-action=rip-and-hold` for each prime-only job.

   Specifying this setting prevents large jobs from delaying the printing of other jobs at the actual destination.

4. If you are compelled to shut down the **printing actual destination** while an impositioning job is processing, the job will not print and you will need to place the ***pjtf** file in the hot folder again.

5. Specify high values for both the **Release time (sec)** and the **Maximum presentation object containers to keep** fields as shown in Figure 77 on page 348.

   Setting the **Maximum presentation object containers to keep** field (or the **maximum-presentation-object-containers-to-keep** attribute on the command line) to a high value ensures that data stays at the printer for a longer period, reducing network traffic when reprinting jobs. Please note that the size of this attribute depends upon the size of the largest PostScript or PDF source file that you are processing.

   Set this attribute by taking the largest possible value (32511) and subtracting the largest number of pages in your largest PDF or PostScript source file (for example, 500). Then subtract that number again to account for **printer marks**. For example, if your largest PDF or PostScript source file is 500 pages when printed, you should set the **Maximum presentation object containers to keep** field to 31511((32511– 500) – 500).

6. Ensure that **Optimize for copies** is set to `no`, as shown in Figure 77 on page 348.

7. Impositioning jobs must be no larger than 19.5 X 53 inches for each sheet.

8. Do not submit multiple Adobe Portable Job Tickets within the same job.

9. Because plex values (whether the job is to be printed simplex, duplex, or tumble) are ignored within the Adobe Portable Job Tickets, you must use the following InfoPrint Manager attributes to specify these settings:
   - **plex**
   - **plex-supported**

- **sides**
- **sides-supported**

The **plex-supported** actual destination attribute can be modified when you define the printing actual destination in step 5 of "Creating a printing (PSF DSS) destination to use the print optimizer" on page 355.

You can specify the **sides** document attribute in the initial value document (**ivj**) of the printing logical destination through the following procedure:

a. From the main view of the **InfoPrint Manager Administration GUI**, click on the **Logical Destinations** icon.

b. From the **Logical Destinations** view that appears in the right pane, right-click on the printing logical destination that you defined in "Creating a printing (PSF DSS) destination to use the print optimizer" on page 355 and select **Job and Document Defaults ➔ Modify....**

c. From the **Job and Document Defaults** view, select the **Document Layout** tab.

d. From the **Document Layout** tab view, you can specify duplex jobs by defining the Sides to print field (the **Sides** attribute) as 2 and allowing all other attributes to take the default, as shown in Figure 76 on page 347.
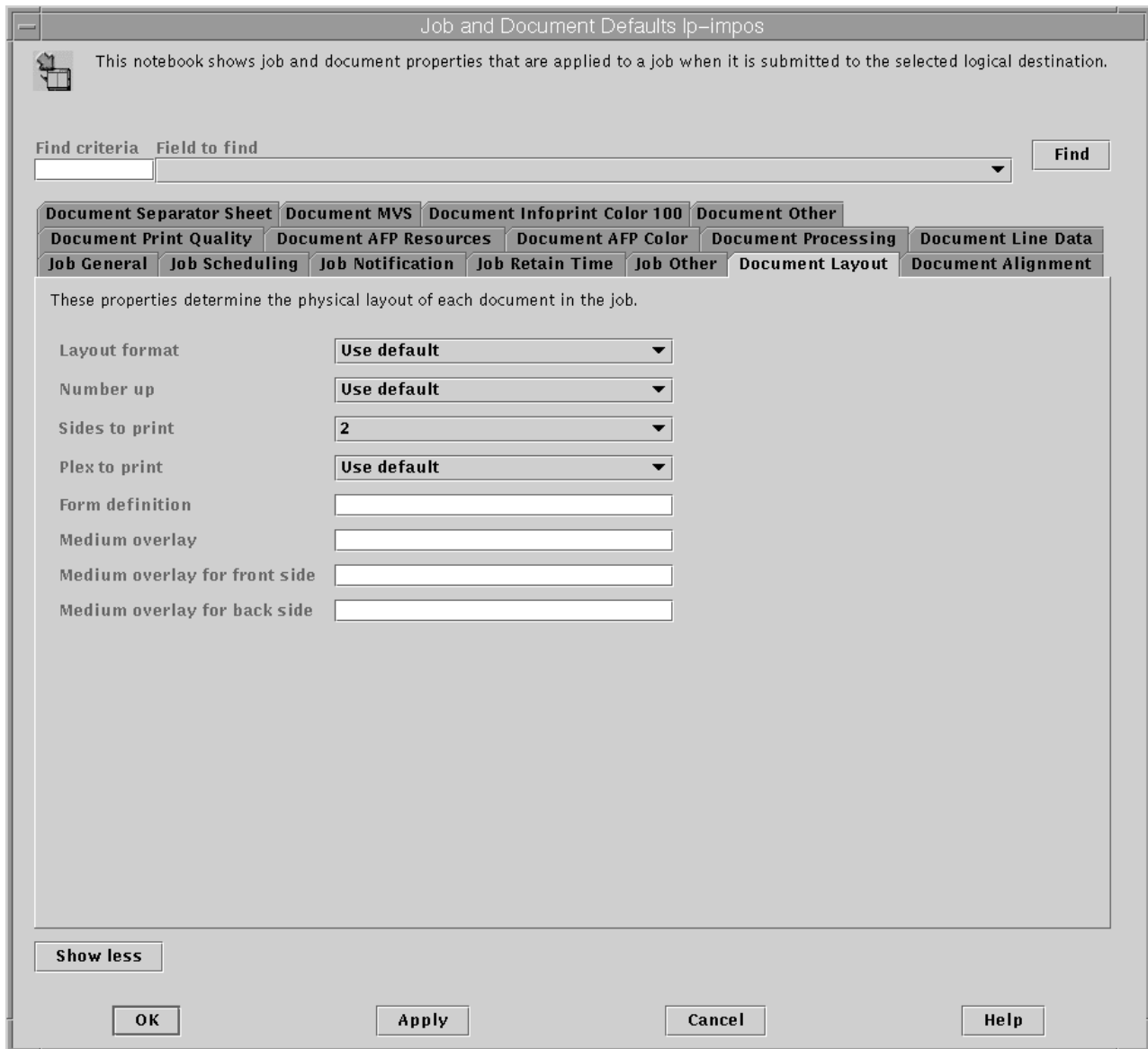
Figure 76. Document Layout tab view

10. Because positioning of the job on the page should be left to the Adobe Portable Job Ticket, ensure that the following attributes are set to 0 in an Impositioning job:

- **x-image-shift** (**Move image right (inches or (mm)** field)
- **x-image-shift-back** (**Move image right (inches or (mm)** field)
- **y-image-shift** (**Move image down (inches or (mm)** field)
- **y-image-shift-back** (**Move image down (inches or (mm)** field)
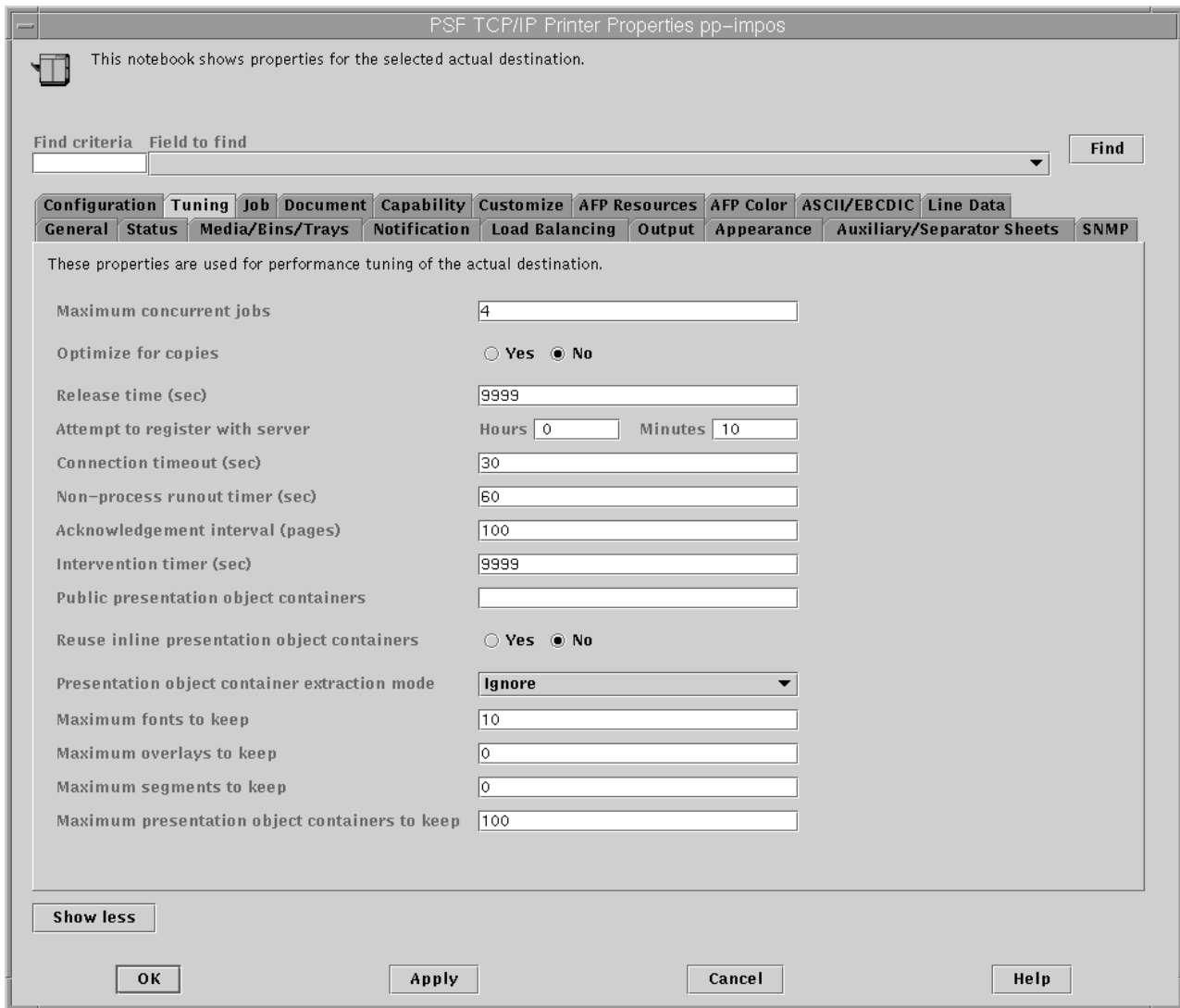
Figure 77. PSF DSS Actual Destination Properties notebook

Submitting both the content and the layout of impositioning jobs

This job flow describes what happens when both the impositioning job's contents and layout specifications must be processed through InfoPrint Manager. You will use this scenario the first time a print installation submits an impositioning job to InfoPrint Manager. Please note that the first time you submit any job to the Print Optimizer through the hot folder, you must include all the print files (either *.**ps** or *.**pdf** files) and the **pjtf** file required with the job.

Once it has been optimized, you need only specify the Adobe Portable Job Ticket file (*.**pjtf**) and the **printer marks** file, if it has been changed: the print files will be run without your having to specify them again.

Note that Figure 78 on page 350 displays the job flow described in the following, step-by-step sequence.

1. The **original job** (consisting of the *.**pjtf** file and the all print file(s)) is submitted through the hot folder.
2. The **printing logical destination** picks up the **original job** from the hot folder.
3. The **printing logical destination** sends the **priming job** to the Print Optimizer through the **priming logical destination**.
4. The **printing logical destination** sends the **printing job** to the printing actual destination that is associated with it.
5. Both jobs process in parallel in the **priming actual destination** (Print Optimizer) and the printing actual destination .
6. As content pages get processed to print, the printing actual destination queries the Print Optimizer and waits for the pages, if necessary.

   Use the **print-optimizer-synchronization-time-out** actual destination attribute to control the time limit allowed. In the InfoPrint Manager Administration GUI, this attribute is located on the **Configuration** tab of the **Properties** window for the **printing actual destination**.
7. The Print Optimizer completes processing the **priming job** and saves all changes in the Resources (defaults to **/var/pd/**_servername_**/resources/**) data base.
8. The printing actual destination finishes the **printing job** from the .**pjtf** file.
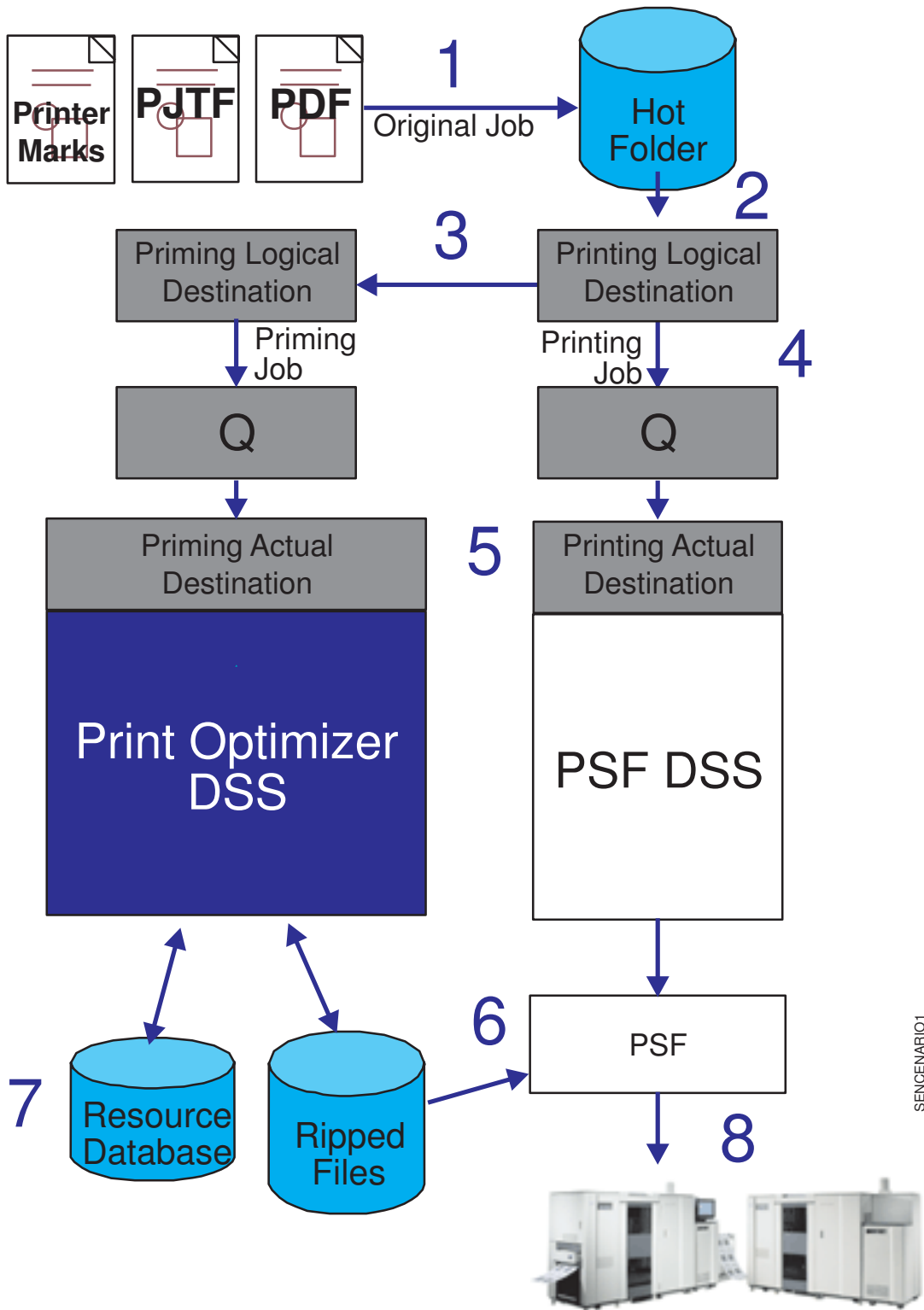
Figure 78. Job flow for modifying both content and layout

Submitting impositioning jobs with layout changes without changing content

A user may need to make layout changes to an impositioning job without altering the job content created with the **original job**. To accomplish this task, they use the following scenario.

Note that Figure 79 on page 352 displays the job flow described in the following, step-by-step sequence.

1. The **original job** (consisting of the changed *.**pjtf** file and the **printer marks** file, if the printer marks have changed) is placed in the hot folder.
2. The **printing logical destination** picks up the **original job** from the hot folder.
3. The **printing logical destination** sends the **priming job** to the Print Optimizer through the **priming logical destination**.
4. The **printing logical destination** sends the **printing job** to the **printing actual destination** that is associated with it.
5. Both jobs process in parallel in the Print Optimizer and the **printing actual destination**.
6. The Print Optimizer completes processing, with no changes occurring in the Resources (defaults to **/var/pd/***servername***/resources/**) data base because no **content files** were submitted with the job.
7. The **printing actual destination** gets the AFP pages from the Print Optimizer resource data base.
8. The printing actual destination finishes the **printing job** from the .**pjtf** file, with no changes to content, and no waiting for Print Optimizer resources.
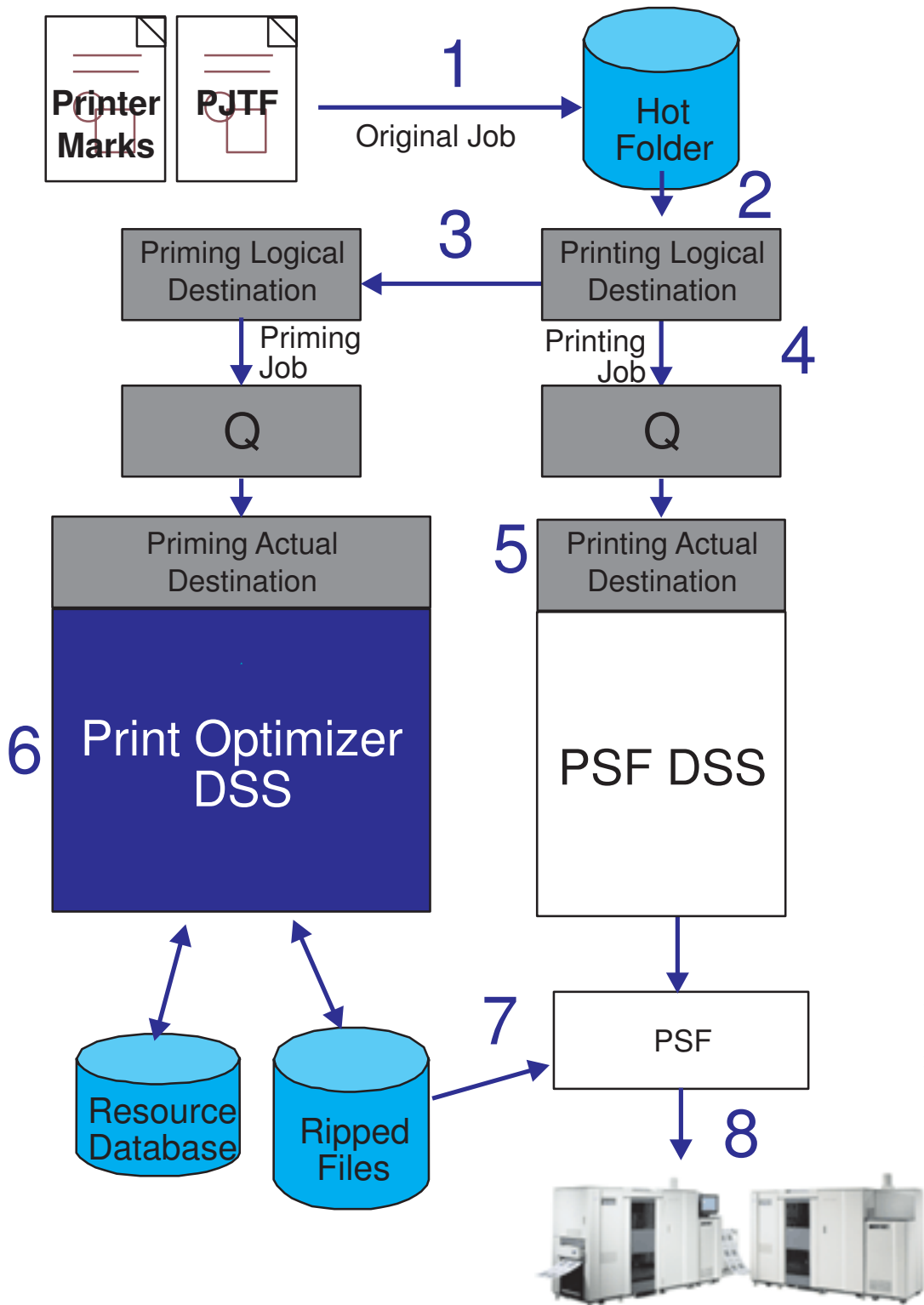
Figure 79. Job flow for modifying job layout only

Configuring InfoPrint Manager for impositioning

Before you can use impositioning function in InfoPrint Manager, you must complete the following configuration tasks on your InfoPrint AIX server.

- "Creating the priming (print optimizer DSS) destination and queue."
- "Creating a printing (PSF DSS) destination to use the print optimizer" on page 355.
- "Connecting the printing logical destination to the logical destination created with the print optimizer" on page 356.
- "Setting up hot folders to submit impositioning jobs" on page 358.

Creating the priming (print optimizer DSS) destination and queue

The **priming** (Print Optimizer DSS) **actual destination** processes the job layout specifications for impositioning jobs, before a printing actual destination (PSF DSS) sends the printing job to the InfoPrint 4100 Advanced Function Printing System. The Print Optimizer primes the server with **content pages** that are necessary before a job can be processed by the **printing actual destination** (the PSF DSS actual destination that prints the job).

The **priming logical destination** feeds jobs to the **priming** (Print Optimizer DSS) **actual destination**. Once the **priming actual destination** begins processing a job, the PSF actual destination can begin processing the job. The data is formatted into one-page AFP resources, and the output data stored in the database and resources directory.

This following procedure creates a **priming actual destination**, a **priming logical destination**, and a queue. If you are using the **Basic Infoprint Administration GUI**, the queue is not visible. Use the **Create Other Destination Wizard** in the basic view of the **InfoPrint Manager Administration GUI** to create an actual destination.

Note: You can only create a single Print Optimizer actual destination on an InfoPrint AIX server.

1. Start the **InfoPrint Manager Administration GUI**.
   - From the AIX desktop in a basic environment, you can select the arrow over the *Infoprint* icon to display the **Infoprint** pop-up, and then select the **Basic Administration GUI** view.
   - From the command line, enter `ipguibasicadm`.

2. Select **Other ➔ Create ➔ Print Optimizer**.

   Note: If you do not have this option, select **Options ➔ Customize**. In the **Customize** dialog, click the **Other** tab. In the **Action** column, find **Create Print Optimizer** and select the check box in the **Menu** column next to it. This step adds this task to the **Other** menu. Click **OK** to apply the settings and close the dialog.

3. In the first panel of the Create Other Destination Wizard (displayed below), do the following:
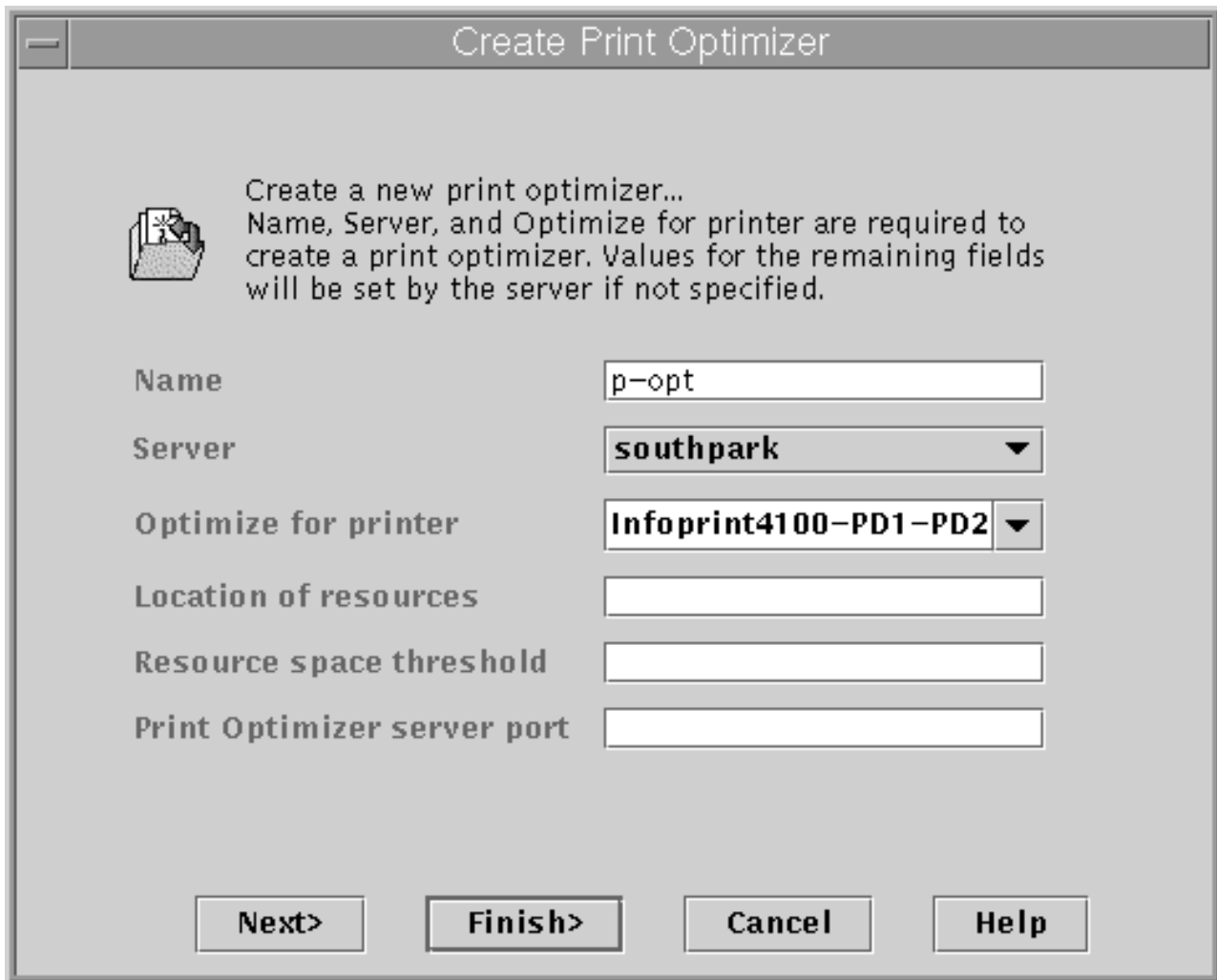
Figure 80. First dialog of the Create Print Optimizer Wizard

    a. Type a name for the printer in the **Name** field (for this example, `p-opt`).

    b. Verify that the server is correct in the **Server** field.

    c. Select the appropriate InfoPrint 4100 model from the **Optimize for printer** drop-down list. For an example, this procedure references the **Infoprint4100–PD1–PD2** value.

       Note: If that model is not shown, you must update InfoPrint Manager to the current service level as described in "Prerequisites for the InfoPrint impositioning solution" on page 340.

    d. Specify a full directory path for the **Location of Resources** field if you want a location other than the default (**/var/pd/***servername***/resources/**).

       Note: If you want a hot folder location other than the default, you must create the full directory path on your AIX system before specifying it on this panel of the GUI.

    e. Click either **Next** or **Finish**.

If you click **Finish**, InfoPrint Manager creates a Print Optimizer actual destination, logical destination, and queue, taking all the system defaults and enabling these InfoPrint objects. If you click **Next**, you continue onto the next step.

Note: InfoPrint Manager creates a logical destination (in the form *adname*-**ld**, where *adname* is the name you provided for the print optimizer) and queue (in the form *server_name*-**print-optimizer-q**) for you. Remember the logical destination name because you will need it when configuring the logical destination in the next section.

4. In the second panel, you can customize job and document defaults, and change the default hot folder location, or select **Next**.
5. In the third panel, you can choose to change the actual destination configuration or click **Next**.
6. On the final panel click **Finish**.

Now you have a Print Optimizer actual destination, a logical destination, and queue which will feed jobs to it. In the next procedure, you will configure a PSF DSS actual destination that will handle the content of the impositioning job.

Creating a printing (PSF DSS) destination to use the print optimizer

This step is necessary to create a PSF DSS actual destination that will use the configuration created in "Creating the priming (print optimizer DSS) destination and queue" on page 353. The **printing actual destination** represents the physical output device, the InfoPrint 4100 Advanced Function Printing System. The **printing logical destination** that sends priming jobs to the priming logical destination before sending printing jobs to the printing actual destination, is created as a result of the procedure in the next section: "Connecting the printing logical destination to the logical destination created with the print optimizer" on page 356.

The InfoPrint 4100 must be a PSF DSS printer, so use the **Create Other Destination Wizard** in the **InfoPrint Manager Administration GUI** to create an actual destination.

1. Start the **InfoPrint Manager Administration GUI**.
   - From the AIX desktop in a basic environment, you can select the arrow over the *Infoprint* icon to display the **Infoprint** pop-up, and then select the **Basic Administration GUI** view.
   - From the command line, enter `ipguibasicadm`.
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 **Infoprint4100–PD1–PD2** from the **Model** drop-down list.

   Note: If that model is not shown, you must update InfoPrint Manager to the current service level as described in "Prerequisites for the InfoPrint impositioning solution" on page 340.
   d. Click either **Next** or **Finish**.

If you click **Finish**, InfoPrint Manager creates a PSF TCP/IP actual destination, logical destination, and queue, taking all the system defaults and enabling these InfoPrint objects. If you click **Next**, you continue onto the next step.Click either **Next** or **Finish**.

If you click **Finish**, InfoPrint Manager creates a PSF TCP/IP actual destination, logical destination, and queue, taking all the system defaults and enabling these InfoPrint objects. If you click **Next**, you continue onto the next step.

Note: InfoPrint Manager creates a logical destination for you, in the form *adname*-**ld**).

4. In the second panel, you can customize job and document defaults, and change the default hot folder location, or select **Next**.

5. In the third panel, you can choose to change the actual destination configuration or click **Next**.

The **Plexes-supported** actual destination attribute correctly defaults to `simplex,` `tumble`, while the **plex** document attribute should be set to the value needed for the particular document:

- portrait press documents require `plex = simplex`
- landscape documents require `plex = tumble`

6. On the final panel click **Finish**.

Now you have a PSF TCP/IP actual destination that you can use to print the job output from your impositioning jobs.

Connecting the printing logical destination to the logical destination created with the print optimizer

Now you must link your **printing logical destination** to the **priming logical** destination created in "Creating the priming (print optimizer DSS) destination and queue" on page 353.

Note: Ensure that you repeat this procedure for every logical destination which will be used to feed impositioning jobs to the **printing actual destination**.

1. From the **Main** window of the **InfoPrint Manager Administration Servers** basic view, highlight the **Logical Destinations** icon from the Destinations pane so that all the logical destinations display in the main pane.

2. From the **printing logical destination** (a logical destination feeding the PSF DSS actual destination), right-click and select the **Properties** option from the drop-down menu.

Note: If the **Properties** option does not display, click on the **Add/Remove Menu Items** option and check both the Menu and the Toolbar boxes from the **Customize** dialog to add the **Properties** option.

3. From the **Properties** notebook for the logical destination, specify the name of the logical destination that you created in "Creating the priming (print optimizer DSS) destination and queue" on page 353 in the **Priming Destination** field.

Note: From the **Properties** Notebook window, you may need to click on the **Show more** button in the lower left corner to see the **Priming destination** field as displayed below:
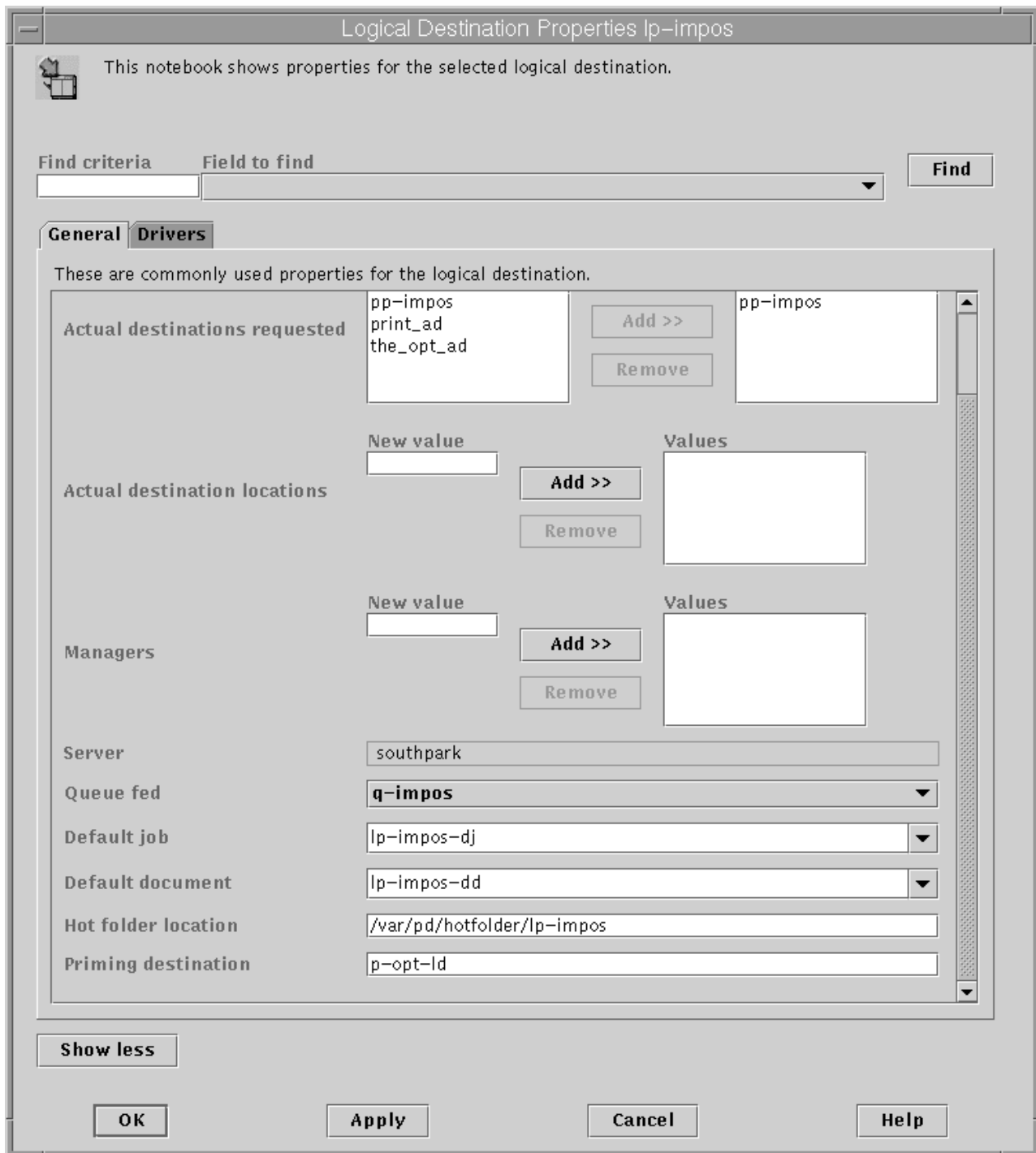
Figure 81. Properties notebook for the Print Optimizer's logical destination

We recommend that you set the **Hot folder location** field to something similar to **/var/pd/hotfolder/***ld_name* to clearly associate the hot folder directory with the logical destination that feeds impositioning jobs into the system. For more information about setting up a hot folder and using it to submit jobs, see "Setting up hot folders to submit impositioning jobs" on page 358.

Note: A hot folder can be associated with only one logical destination; and a logical destination can be associated with only one hot folder.

Setting up hot folders to submit impositioning jobs

The simplest way to submit jobs to InfoPrint is to use a *hot folder*. A hot folder is a directory that is associated with a logical destination. When you copy or move a file to the hot folder, InfoPrint automatically submits that file as a job to that logical destination.

If you do not explicitly specify a hot folder directory, then a logical destination will not have a hot folder (there is no default hot folder). If you explicitly specify a hot folder directory, the server will create it for you; however, the path up through and including the parent directory of the hot folder directory must already exist on your InfoPrint AIX server. For example, if you specify **/var/pd/hotfolders/lp-impos/** as your hot folder, you must have previously created the directory **/hotfolders** and its subdirectory **/lp-impos**.

Note: You should make a copy of any jobs that you will be placing in a hot folder. After you have put them in the folder, files are submitted and then deleted.

For instructions on how to create and access a hot folder, see "Setting up hot folders to submit jobs" in the *InfoPrint Manager for AIX: Getting Started* manual.

Submitting impositioning jobs through a hot folder

To submit a file through a hot folder, simply copy or move it to the hot folder.

Attention: If you want to save the file, copy it. Files are deleted from the hot folder after submission.

Staging impositioning jobs:

Because it takes time to copy or move files, InfoPrint may try to submit a large job before it is completely in the hot folder. You can prevent the submission of partial jobs by *staging* large jobs.

To stage a job the first time you submit it (you submit the source PDF or PS file and a PJTF file):
1. Create a subdirectory in the hot folder called *jobname*.stg, where *jobname* is any name you choose. The .stg extension prevents InfoPrint from processing the directory.
2. Copy your source PDF or PS file or files, the printer marks file, and PJTF file to the newly created subdirectory.
3. When the copy is complete, rename the subdirectory by removing the .stg extension.
4. InfoPrint will now process the impositioning job.

To stage subsequent submissions that take advantage of stored resources (you submit a PJTF file only):
1. Copy the PJTF file and the printer marks file to the subdirectory within the hot folder with extension .stg. InfoPrint ignores files with this extension.
2. When the copy is complete and you are ready to submit the job, rename the subdirectory by removing the .stg extension.

Specifying attributes for impositioning jobs:

By default, jobs submitted through a hot folder use the attribute values in the default document and default job associated with the logical destination.

To override these values the first time you submit an impositioning job (you submit a source PDF or PS file and a PJTF file), complete the following steps:

1. Create an attributes file called *jobname*.att, where *jobname* is the same as the subdirectory name you created with the **.stg** extension, and copy it into the subdirectory.

2. Rename the subdirectory from *jobname*.stg to *jobname*. InfoPrint then submits all the files in the subdirectory as a single job.

   For example, if you have specified /var/pd/hotfolders/lp-impos/ as your hot folder, create a subdirectory named impos_job.stg. Then create an attributes file named impos_job.att. Copy impos_job.att into the impos_job.stg subdirectory, along with the source PDF or PS file and the PJTF file. Then rename impos_job.stg to impos_job. The job is submitted to the Print Optimizer.

For subsequent submissions of impositioning jobs (you submit a PJTF file) , complete the following steps to override these values:

1. Create an attributes file named *filename*.att, where *filename* is the same as the file name of the print file.

   For example, if the print file is report.pjtf, the attributes file is report.pjtf.att. In this file, specify the attributes and values that you want. For example, if you want to print three single-sided copies of report.pjtf, report.pjtf.att looks like this:

   ```
   copy-count = 3
   sides = 1
   ```

   Note that this file is the same format as an attribute file specified with the **-X** flag on a **pdpr** print command. For information about job and document attributes, refer to *InfoPrint Manager: Reference*.

2. Copy or move the attributes file and the printer marks file to the hot folder. The **.att** file extension tells InfoPrint not to print the attributes file. You must ensure that the attributes file is either copied or moved to the hot folder before you copy or move the print file to the hot folder.

   Note that this step is optional because you can create the attributes file within the Hot Folder directory.

3. Copy or move the print file to the hot folder. InfoPrint looks for an attributes file with the same file name and submits the two files together.

By default hot folder jobs are submitted with job notifications turned off. If you want to get notifications on hot folder jobs, you must specify a **notification-profile** with an explicit **delivery-address** in the **.att** file.

Managing impositioning resources with the print optimizer

You can use both the **polist** and the **podelete** commands to help you manage your impositioning environment.

You can use the **polist** command to list either documents or resources in the Print Optimizer. For example, if you wanted to list all the documents in the data base by size, you could specify polist –s s and receive a display similar to the following:

```
DOCUMENT NAME              PAGES         SIZE TRANSFORMED
PS A4.ps                     12      16.6 KB 11/07/01 17:03:39
BackCover.pdf                 1     153.2 KB 11/14/01 11:30:31
BackCover.sep                 1     159.1 KB 11/15/01 13:01:56
BackCover_A4.pdf              1     159.6 KB 11/15/01 11:58:48
Cover.pdf                     1     225.3 KB 11/14/01 11:30:54
Cover_A4.pdf                  1     237.3 KB 11/15/01 11:59:19
Cover.sep                     1     238.9 KB 11/15/01 13:02:23
frontmatter.pdf               7     316.5 KB 11/14/01 11:30:56
frontmatter.sep               7     380.7 KB 11/15/01 13:02:25
frontmatter_A4.pdf            7     388.6 KB 11/15/01 11:59:22
Appendix.pdf                  3     388.7 KB 11/14/01 11:30:29
Appendix_A4.pdf               3     468.1 KB 11/15/01 11:58:45
Appendix.sep                  3     482.3 KB 11/15/01 13:01:54
Card x 60.pdf                60     676.4 KB 11/15/01 13:00:42
Chapter1_11pg.pdf            11    1269.8 KB 11/14/01 11:30:35
Chapter2_12pg.pdf            12    1393.5 KB 11/14/01 11:30:40
Chapter1_11pg.sep            11    1743.3 KB 11/15/01 13:02:01
Chapter3_15pg.pdf            15    1766.8 KB 11/14/01 11:30:45
Chapter1_11pg_A4.pdf         11    1770.0 KB 11/15/01 11:58:54
Chapter2_12pg.sep            12    1875.4 KB 11/15/01 13:02:06
```

Use the **podelete** command to delete documents from the Print Optimizer.

Note: You can use the global character, an asterisk, * , to simplify this command. For example, `podelete stu*` deletes all files whose names begin with the letters STU.

Depending on the shell you are using, you may need to enter control characters to keep the shell from interpreting the asterisk, *, before InfoPrint has a chance to operate on it. For example if you type `podelete *` while in a directory containing files a, b, and c, it is equivalent to typing `podelete a b c`. However, if the current directory is empty, the shell passes the * to the command being run. To keep the shell from expanding the command, type `podelete \*`. For the complete syntax of the **polist** and the **podelete** commands and how they can be used, see *InfoPrint Manager: Reference*.

InfoPrint Manager command processing for managing impositioning resources is similar to the standard command processing, with a few exceptions.

The Print Optimizer DSS does not support the following commands:
- **pdpause** of either the priming actual destination or the priming job.
- **pdresume** of either the priming actual destination or the priming job.
- **pdshutdown** of the priming actual destination.
- **pdspace** of the priming job.

Troubleshooting impositioning

If errors should occur when you are using the InfoPrint Impositioning solution, there are standard diagnostic techniques when resolving any InfoPrint printing problems, and specific guidelines that are unique to impositioning jobs. When looking in the different error and message logs, remember to track both the Print Optimizer job and the printing job:
- InfoPrint server error logs:

  Each InfoPrint server (or **pdserver** process) stores an **error.log** file in the **/var/pd/***server_name* directory. In addition to logging errors, this log maintains a history of requests made to this server by InfoPrint users, other servers, or through the **InfoPrint Manager Administration GUI**.

Note: Print Optimizer transform errors are logged in the server error log.

Each entry is composed of the following seven fields:

Message Severity
Specifies whether a message is of an Error (**E**), Warning (**W**), Audit (**A**), Debug (**D**), or Informational (**I**) severity level.

Date Specifies the date in language-specific format; for example: (11/08/01).

Time Specifies the time in language-specific format; for example: (15:43:09).

Thread ID
Specifies the thread ID of the thread issuing the message.

This value can be useful when debugging a problem; you can search on the unique thread ID of an operation and see all the messages that it issued.

Target of request
Specifies the target, and sometimes the requestor, of a particular action.

Message number
Specifies the number of the InfoPrint Manager message (5010-373). You can use the **pdmsg** command to obtain the help-text of any message by specifying the message number.

For example, if you specify `pdmsg 5010–373`, InfoPrint responds with the following display:

```
5010-373 The server _____ received a _____ signal request
from the destination _____:_____.
5010-373
EXPLANATION: The server is processing the request.
This message goes to the error log only.
SYSTEM ACTION: The request is processing.
RESPONSE: No response is required to this informational message.
```

Message text
Specifies the text of a particular message (`The server mishka completed processing a ready for job signal request from the destination mishka:opt-ph.`)

The following provides a sample error message from the server error log file. Please note that this message has been formatted for purposes of displaying the contents. The actual message is on one line in the **error.log** file:

```
D 11/08/01 15:43:09 [2539 mishka,opt-ph] 5010-373 The server mishka
completed processing a ready for job signal request
from the destination mishka:opt-ph.
```

• Examine the job messages from the job messages log

These low-level errors (such as data stream errors) are detected by the device support system (DSS). These messages go to the message log (see the **/var/psf/***actual_destination_name***/jobmessage.log** file). By default these messages are printed at the end of the job (`dss-job-message-disposition=print` is specified on your printing actual destinations), so you can examine them there.

• Examine the actual destination error logs

These logs display printer errors, and other non-job errors. You can consult the **error.log** file for the actual destinations, which resides in the **/var/psf/***actual_destination_name* directory.

Note: If the Print Optimizer cannot be started and therefore the **podelete** command cannot be run, you must delete all the files in the Print Optimizer resource directory and then restart it.

Specific impositioning problems

The following provides some Impositioning problems that can occur, with potential solutions:

- "Job stays in hot folder and never appears in InfoPrint server."
- "Job remains in the ripping state in printing actual destination and eventually times out."
- "Job prints as unexpected, with truncated pages."

Job stays in hot folder and never appears in InfoPrint server

Has the Logical Destination's hot-folder-directory been set correctly?
Ensure that you have specified the correct name for the hot folder in the **Hot folder location** field of the printing logical destination's **Properties** notebook (see Figure 81 on page 357).

Is the Logical Destination enabled?
Ensure that the logical destinations you defined in "Creating the priming (print optimizer DSS) destination and queue" on page 353 and "Creating a printing (PSF DSS) destination to use the print optimizer" on page 355 have been enabled. If not (a black logical destination printer icon displayed from the **Main** window of the **InfoPrint Manager Administration GUI**), enable the logical destination through the **InfoPrint Manager Administration GUI**.

Has .stg file or directory been renamed?
If you are using a staging file or directory to stage large or multi-document jobs to the hot folder (for more information, see "Staging impositioning jobs" on page 358), ensure you have renamed either the file's or the directory's extension to something other than **.stg** so that the hot folder will submit it to the logical destination.

Job remains in the ripping state in printing actual destination and eventually times out

Is the logical destination's priming-destination set correctly?
Ensure that you have specified the correct priming destination in the **Priming destination** field of the printing logical destination's **Properties** notebook (see Figure 81 on page 357).

Has the Print Optimizer job failed?
Check the server error log cited in "Troubleshooting impositioning" on page 360, then take the appropriate recommended actions.

Is the Print Optimizer actual destination enabled?
Ensure that the actual destination you defined in "Creating the priming (print optimizer DSS) destination and queue" on page 353 has been enabled. If not (a black actual destination printer icon displayed from the **Main** window of the **InfoPrint Manager Administration GUI**), enable the logical destination through the **InfoPrint Manager Administration GUI**.

Job prints as unexpected, with truncated pages

Are the same original jobs being used with new job tickets?
If you use an **original job** that has previously been optimized with a different job ticket file, the size specified the first time the data was processed by the Print Optimizer is the size used until those documents are deleted from the Print Optimizer resource directory.

The Print Optimizer ignores documents it has already processed: the fact
that the job ticket has changed does not cause InfoPrint to reRIP the data.

Chapter 29. Using the LPD gateway with InfoPrint Manager for AIX

You can use the AIX line printer daemon (**LPD**) to submit jobs through the LPD Gateway to an InfoPrint AIX server. **LPD** is a subsystem that allows you to submit print jobs from other operating systems using a Line Printer (**LPR**) client. The AIX **LPD** submits the files it receives directly to an InfoPrint destination and supports the **-o** options that are available with the AIX **LPR** clients. (**-o** options allow you to specify advanced InfoPrint print options, such as form definitions and page definitions. For more information about using **-o** options with AIX print commands, see *InfoPrint Manager: Reference*.)

Submitting print jobs through the LPD from an AIX system

To submit jobs from the **LPD** on an AIX system, you can use the AIX **lpr** command, which accepts the **-o** options.

When you submit print jobs using the **LPR** client, you need to set up a remote queue on the local system. To accomplish this task, consult your AIX system documentation. Once you have defined a remote queue, it identifies the InfoPrint Manager remote server and the name of the InfoPrint destination (either logical or actual) on that InfoPrint Manager remote server. The **LPD** submits the job to the InfoPrint print spool. we recommend that you specify the **LPD** subsystem in the **/etc/inittab** file to ensure that it starts on a system reboot and is always available.

When you issue the **lpr** command, you must specify the option that designates *binary* or *already-formatted* data. For example, on AIX you must use the **-l** (lower case **L**) option on the **lpr**.

If you are printing from an InfoPrint Manager AIX server or an AIX server that has installed the InfoPrint Manager client, you should use the InfoPrint **pdpr** command to submit jobs directly to the InfoPrint print spool.

Submitting print jobs through the LPD from a non-AIX UNIX system

You can use any **LPR** client, but if you want to be able to specify advanced InfoPrint options on the **-o** flag, you must make sure that your **LPR** client supports **-o** options. Sample code for an InfoPrint **LPR** client called **lprafp** is provided with InfoPrint Manager for AIX and is available from the **/usr/lpp/psf/utils/lpr** directory. This directory contains sample code of the **lprafp** client for UNIX platforms. This code must be compiled as described in the **README** file.

Regardless of what **LPD** subsystem you decide to use, we recommend that you specify it in the **/etc/inittab** file to ensure that the client starts on a system reboot and is always available.

Submitting print jobs from a non-AIX UNIX system with the InfoPrint (lprafp) LPR client

When you submit print jobs from the InfoPrint **LPR** client on a non-AIX UNIX system, all you need to specify is the InfoPrint Manager server and the name of an InfoPrint destination (either logical or actual). The **LPD** submits the job to the InfoPrint print spool. If you enter the **LPR** shell script with the **-A** flag, it invokes the **lprafp** command program (**lprafp.c**), which is documented in the *InfoPrint Manager: Reference* (S544–5475). If you enter the **LPR** shell script without the **-A** flag, it invokes the AIX system's LP command, which does not support the InfoPrint **-o** options.

Submitting print jobs through the LPD from a Windows system

You can use any **LPR** client, but if you want to be able to specify advanced InfoPrint options on the **-o** flag, you must make sure that your **LPR** client supports **-o** options. Sample code for an **LPR** client called **lprafp** is provided for download on the InfoPrint Solutions Company Web site. To obtain and install this **LPR** client, see "Install and configure lprafp for Windows from the Web."

Note: If you use another **LPR** client, ensure that you specify the flag for specifying binary data. For example, on the Microsoft TCP/IP Printing **LPD** (the default **LPR** on Windows operating systems), this flag is the –01 or the –o 1 (lower case **L**) option, depending upon your Windows operating system.
.

Install and configure lprafp for Windows from the Web

For Windows operating system clients, the **lprafp** sample code package is available for free download from the InfoPrint Solutions Company Web site at http://www.infoprint.com/printers. Use this procedure to locate and install the package.
1. Navigate to http://www.infoprint.com in your web browser.
2. Under **Get support**, click **Download and drivers**.
3. Under **Print management and driver software**, click **InfoPrint Manger**.
4. On the Downloads page, find **lprafp** and click to download.
5. Use a zip utility to unzip the package.
6. Open the **readme.txt** file and follow the instructions for installing the package on a Windows system.

Chapter 30. Using the OPI server

The InfoPrint Open Prepress Interface (OPI) server allows InfoPrint users working on the Mac operating system to generate low-resolution images (from EPS, TIFF, or JPEG source files) for use in any preprocessing activities outside of InfoPrint Manager. By using this support in an InfoPrint environment, users can:

- Improve performance on print jobs that contain huge image data
- Save space on their personal computers by submitting the low-resolution images to InfoPrint Manager, which contacts the OPI server at RIP time to print the high-resolution images.

While configuration of the OPI server must be performed on a Mac personal computer, you can use the HELIOS PCShare software product to submit OPI server jobs from Windows personal computers.

Note: The OPI server can be used with the Print Optimizer support from InfoPrint Manager as part of the Impositioning solution, but the OPI server is not an essential piece of that solution. For more information about that solution, refer to *InfoPrint Manager for AIX: Impositioning Assist*, which is available with the special feature CD-ROM and from the Web.

Installing the OPI server on AIX

In order to take advantage of the Open Prepress Interface (OPI) server, you must install both EtherShare and EtherShare OPI on your InfoPrint Manager AIX server. You can obtain these products from the Helios CD016 CD-ROM (see the **Helios Software_Currently shipping versions** web page at **http://www.helios.de/products/current.phtml**).

Once you have obtained the latest Helios CD-ROM, as well as both the *EtherShare Version 2.6 User manual* and the *EtherShare OPI Version 2.1 User manual*, you can prepare to install these software products on your InfoPrint AIX server. Both manuals are available in the **/manuals** directory of your Helios CD-ROM. Ensure that you carefully read and review the installation chapters of both manuals before you attempt to install either product.

The following provides a series of guidelines you should follow while performing the installation of both products:

Notes:
1. Ensure that you install Ethershare prior to installing EtherShare OPI.
2. For most fields, you should take the default settings.
3. All Helios software requires a HELIOS Activation Key or password in order to function.

   Refer to both the *EtherShare Version 2.6 User manual* and the *EtherShare OPI Version 2.1 User manual* for information about where you can obtain this material. Once you have purchased a Helios Activation Key, you can download software updates from their web site (**http://www.helios.de/download/**).
4. When you upgrade to new releases of Helios products, keep in mind that you must obtain a new Activation key.

5. If you do not change the default, AFP is the password that Helios sets on your AIX server.

6. When installing the Helios product, ensure that you have adequate space in the directories (**/usr/local/** by default) where the high-resolution images will be stored on your InfoPrint AIX server.

   Note: Ensure that you do not specify the **/var/psf/segments** directory to contain these images when prompted for a directory to share.

Configuring the OPI server

Once you have installed the OPI server on your InfoPrint AIX server, you must perform configuration tasks in two locations:

1. "Configuring OPI server from the Mac system."
2. "Configuring OPI server from the InfoPrint AIX server" on page 372.

The following sections describe how to perform these tasks

Configuring OPI server from the Mac system

Before you can submit jobs to take advantage of the OPI server, you must create a print queue and define layout settings on your Mac personal computer.

1. From the desktop, highlight the **Ether-Share-Admin** icon (see below) and select **File->Login** from the menu bar.

   Note: If the **Ether-Share-Admin** icon is not available on your desktop, select the **Ether-Share Applications** icon (which has been mounted through AppleTalk from your AIX server as shown in "Submitting jobs to the OPI server" on page 373) and open the **Admin** icon.
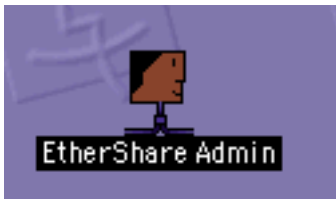
Figure 82. Ether-Share-Admin icon

2. To connect to the OPI server, you must do the following:

   a. From the **Select an EtherShare host** dialog, select the relevant AppleTalk zone on your Mac system, highlight it, and specify the host to which you are connecting (in this case, the InfoPrint AIX server where the OPI server has been installed), and press **Ok**.

   b. From the **Connect to EtherShare server ...** dialog, type your InfoPrint AIX password and press **Ok**.

   Once you have successfully logged in, the **Users**, **Volumes**, **Groups**, and **Printers** file systems will appear cascading on your system. Figure 83 on page 369 separates them into distinct emulations for clarity:
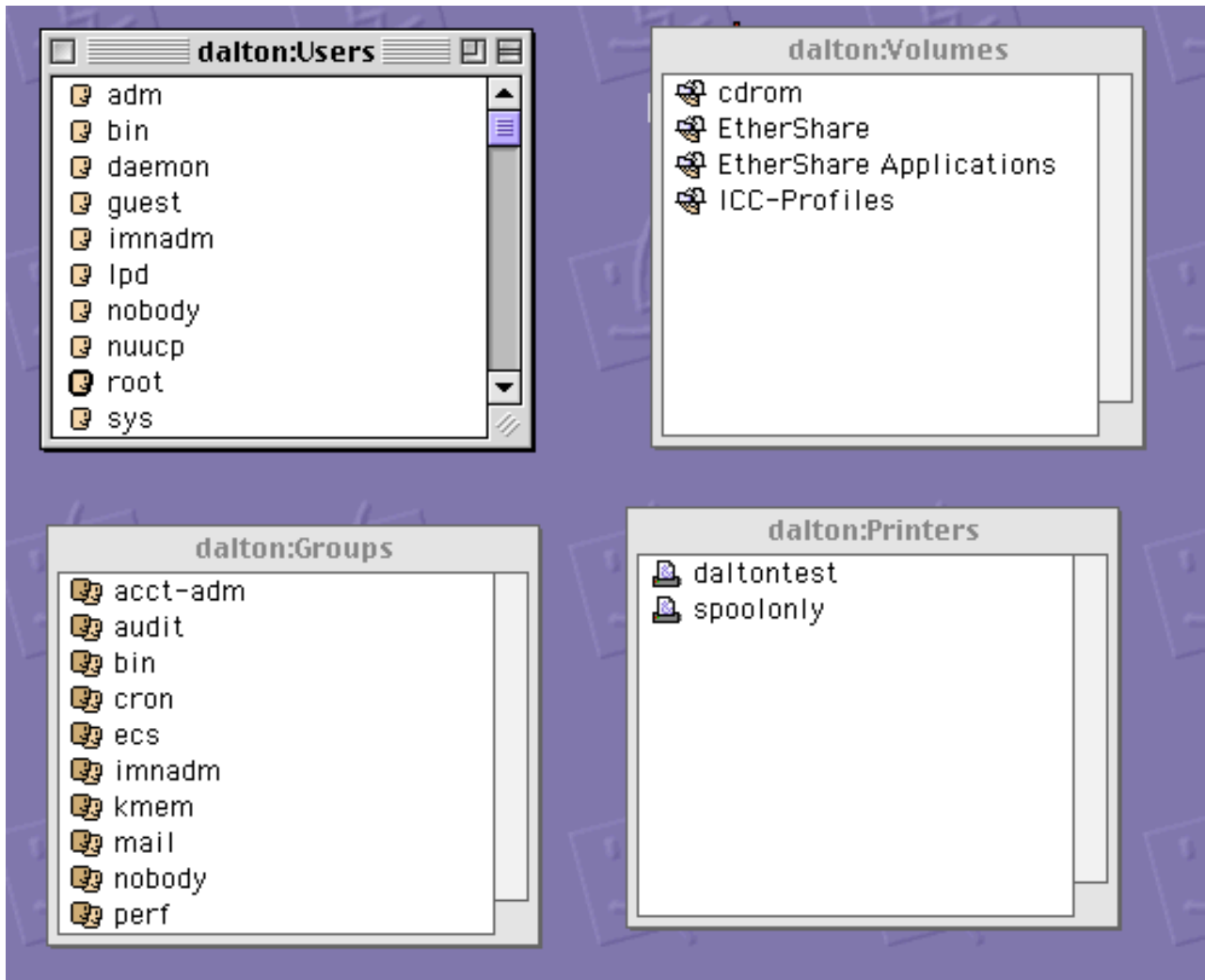
Figure 83. Four InfoPrint file systems on a Mac system

3. To create a print queue on your Mac system that resides on the InfoPrint AIX server, click on the **Printer** window to highlight it, and then take the **File → New** path on the main menu.

4. From the window (displayed in Figure 84 on page 370, select a name for the printer and save the results.
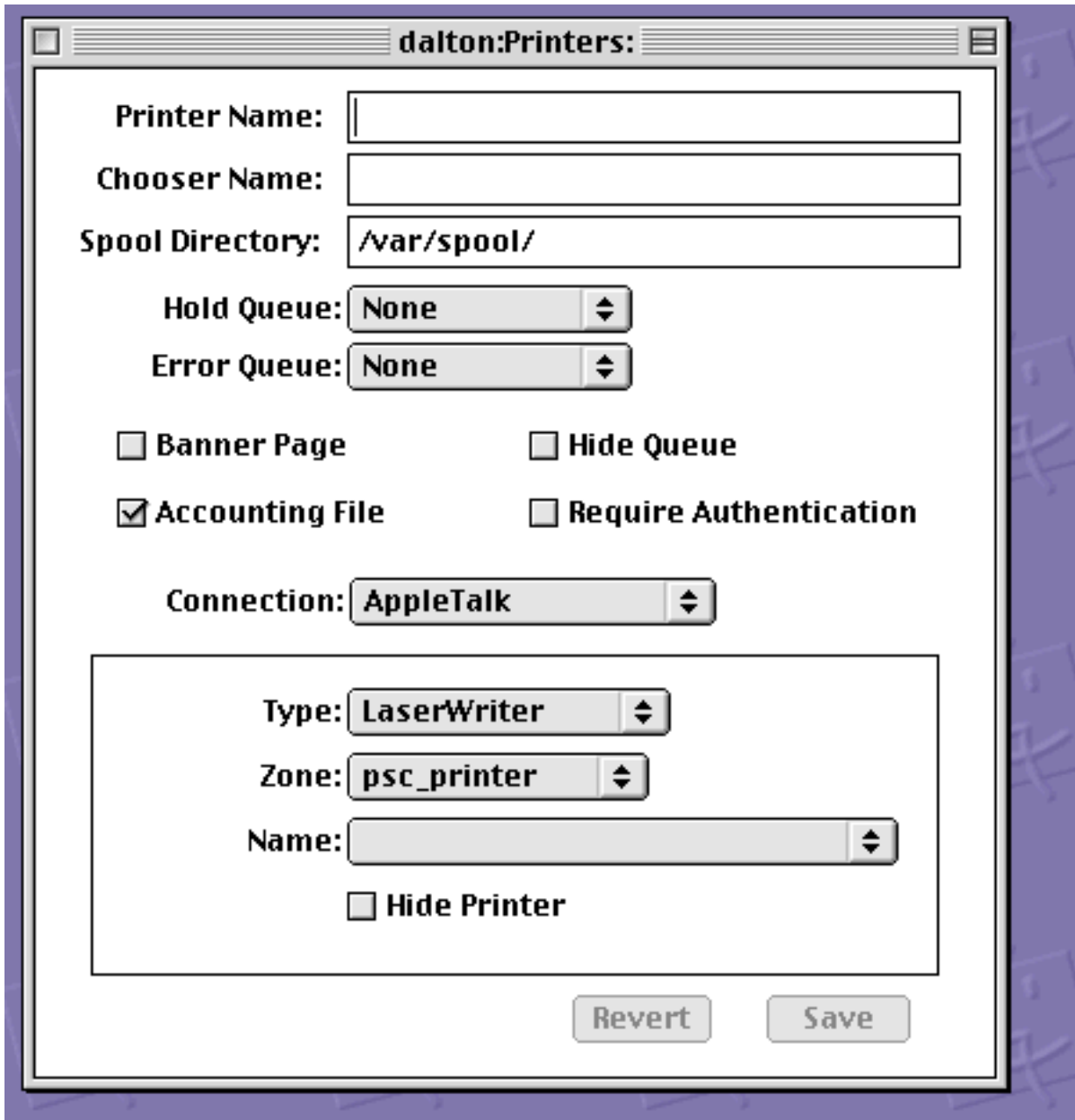
Figure 84. Print Queue window

5. Once you have created the print queue, use the **Lists → OPI/Server Settings** path on the main menu to display the layout and color settings. Usually the default values are sufficient. From the window displayed in Figure 85 on page 371 below, select a name for your print queue and take the defaults before pressing the **Save** button.
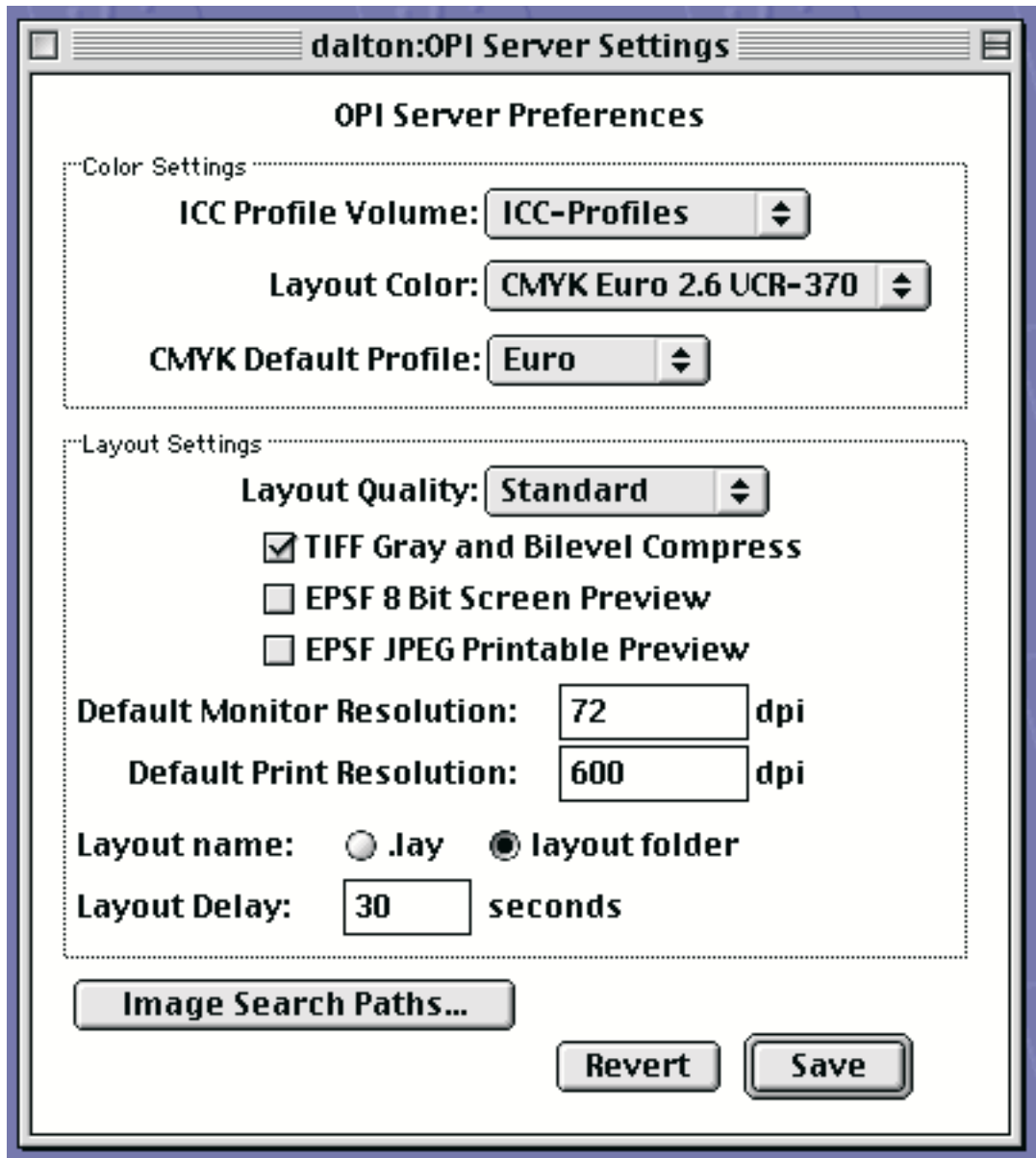
Figure 85. OPI Server Settings window

6. Once you have defined the print queue, highlight it (in this case, `daltontest`) within the **Printer** window and then take the **Printer → OPI/ICC Settings** path on the main menu.

   The International Color Consortium (ICC) format is a cross-platform specification which allows third party vendors – including Adobe Systems Inc., and Agfa-Gevaert – to develop profile tools and applications to support this standard.

7. From the dialog (displayed in Figure 86 on page 372), ensure that the **OPI Active** checkbox is checked.
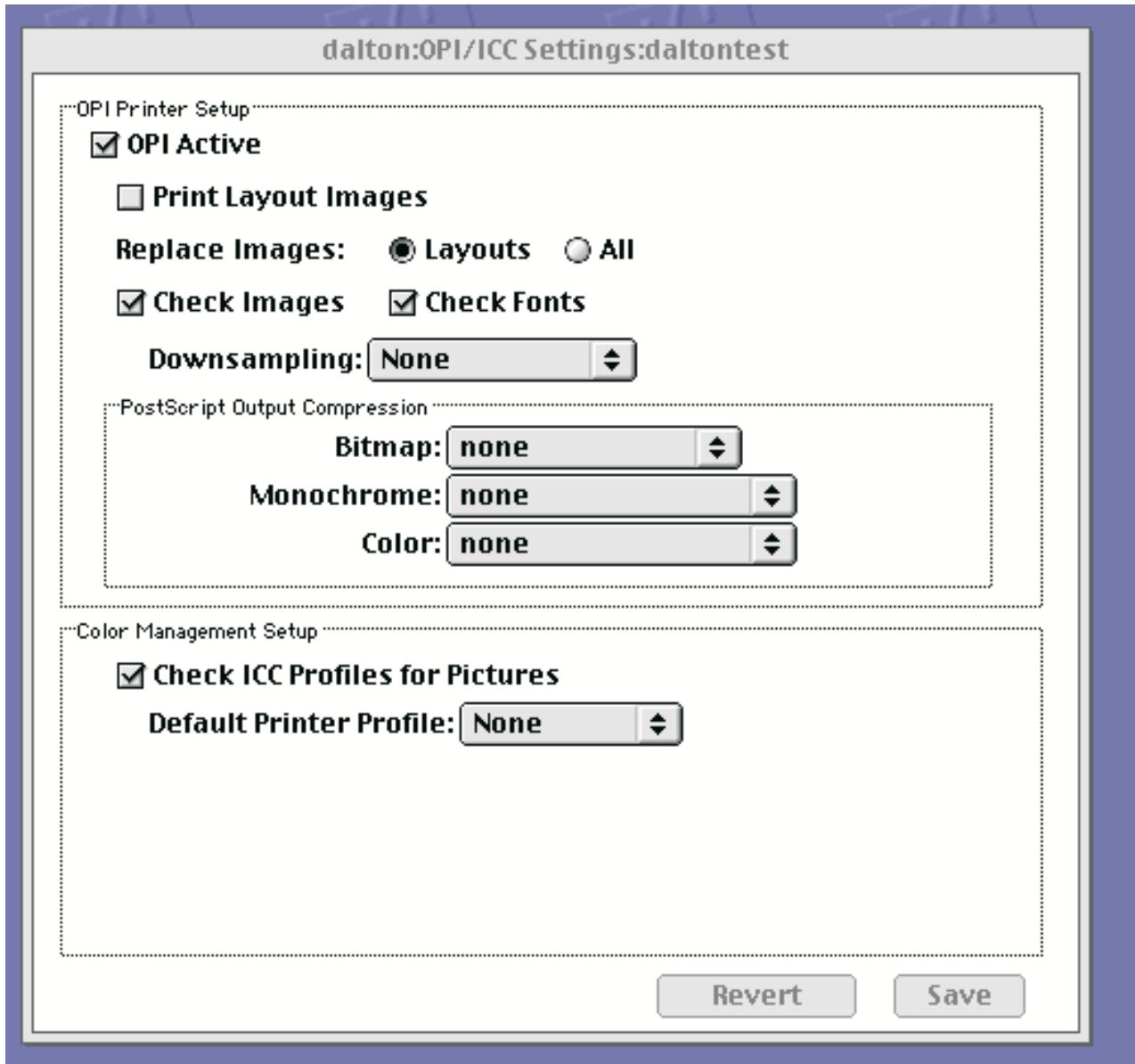
Figure 86. OPI/ICC Settings window

8. Save this setting and exit the dialog by pressing the **Save** button.

Configuring OPI server from the InfoPrint AIX server

Before you can begin to submit jobs to the OPI server on your MAC system , you must configure the PostScript transform to support the OPI server. Use the following procedure.

Note: If your installation uses either an InfoPrint 60 printer, a Network printer, an InfoPrint 2000 printer, or a Lexmark printer, follow these directions substituting **3160d.cfg** for **ps2afpd.cfg**. The **ps2afpd.cfg** file runs the PostScript RIP for the larger printers, including InfoPrint 3000, InfoPrint 4000 (all models), and the InfoPrint 4100.

1. From an AIX command line, access both the **ps2afpd.cfg** and the **3160d.cfg** files that reside in the **/usr/lpp/psf/ps2afp** directory by default.

2. Using your AIX editor of choice, edit the files and remove the comment marks (#) to the left of the `opi_server_resolution_program` near the bottom of both files. When you are finished, the bottom of both files should resemble the following example, where **daltontest** is the Helios print queue name. This sample has been modified so that the final line prints correctly. In the actual file, the last two lines of the file appear as a single line.

   ```
   ####################################################################
   # Enabling OPI Server support:
   # uncomment the line below, and modify the queue name as appropriate
   # use the name of the Helios queue that has the associated color profile
   # to use in place of
   #<heliosprintqueuename> opi_server_resolution_program = /usr/local/es
   /psresolve \-onoincludeheliosdicts daltontest
   ```

   Note: If you did not install the Helios EtherShare program in the default directory, you must ensure that the path is listed correctly for this line in both files.

3. To run the OPI server, you must either stop and restart the PostScript (**ps2afpd**) daemon or shutdown and reboot the InfoPrint AIX server.

   If you choose to stop and restart the PostScript daemon,

   a. From an AIX command line, specify `ps -ef | grep ps2afpd` to find the process number of the PostScript daemon running on your server.

   b. Specify kill *pnumber*, where *pnumber* represents the process number of the PostScript daemon process.

   c. Restart the PostScript daemon by specifying the following command:

      ```
      /usr/lpp/psf/bin/ps2afpd -C /usr/lpp/psf/ps2afp/ps2afpd.cfg
      ```

Submitting jobs to the OPI server

In order to submit jobs to the OPI server, using the following procedure is recommended.

1. On your MAC system, create the high resolution images that you will be incorporating in print jobs.

   These high resolution images can come from a scanner, digital camera, or any other source from which you obtain images.

2. To connect to the shared directory folder on the InfoPrint AIX server, use Chooser (see Figure 87 on page 374).
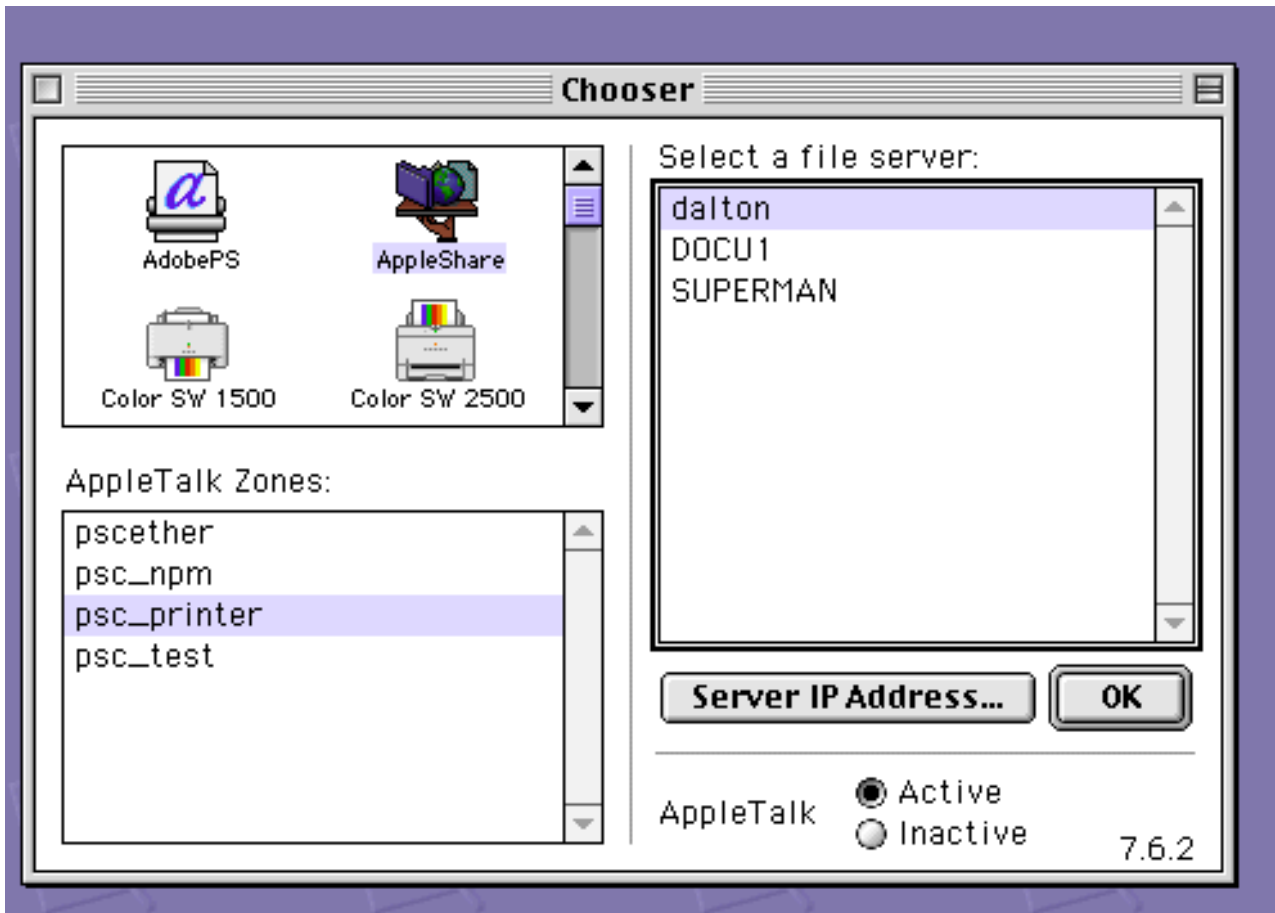
Figure 87. Chooser selections

   a. Highlight the values **AppleShare** (for the communication protocol between
      Mac and AIX), **psc_printer** (for the relevant AppleTalk zone), and **dalton**
      (for the name of the InfoPrint AIX server.

   b. Press **OK**, and then from the next pop-up, press **Connect**.

   c. From the **Dalton** dialogue(displayed in Figure 88 on page 375) – where
      Dalton is the name of the InfoPrint AIX server – press **OK**.
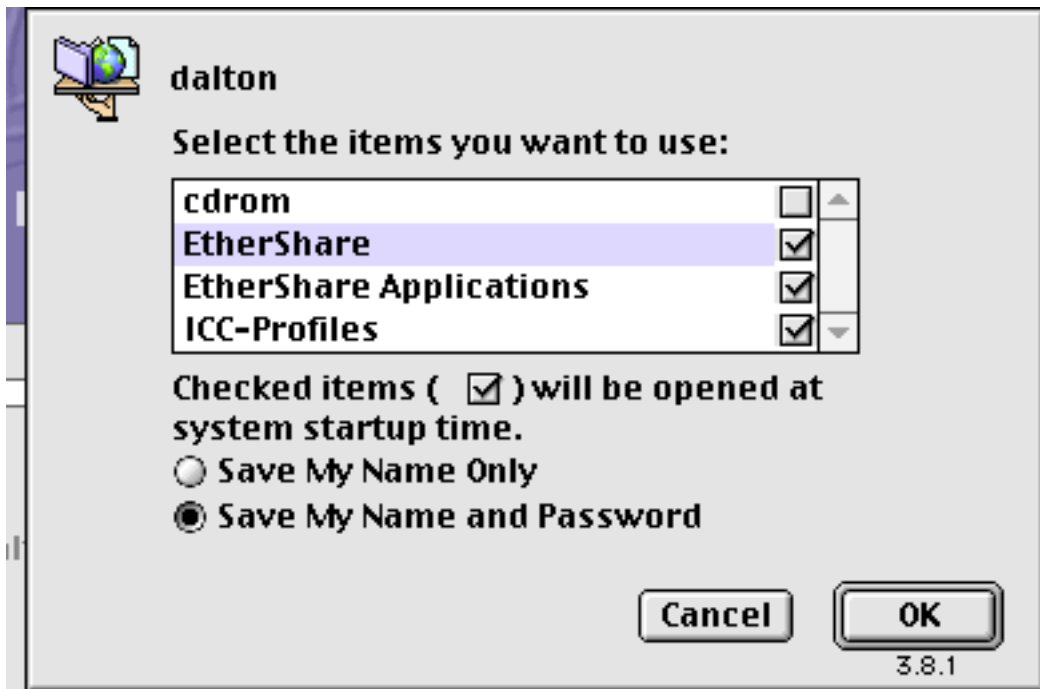
Figure 88. Sample connection dialog

    d. The final dialog will provide a message similar to the following:

        `dalton in psc_printer via AppleTalk`

        where `dalton` is the name of the InfoPrint AIX server and `psc_printer` is the zone in which that queue is defined.

        Select **OK**.

3. From your desktop, click on the **EtherShare** icon to access the shared folder directory.

4. Figure 89 on page 376 shows both the shared directory and the associated layout directory, where the OPI server will put a low resolution image for each image you place in the main shared folder.
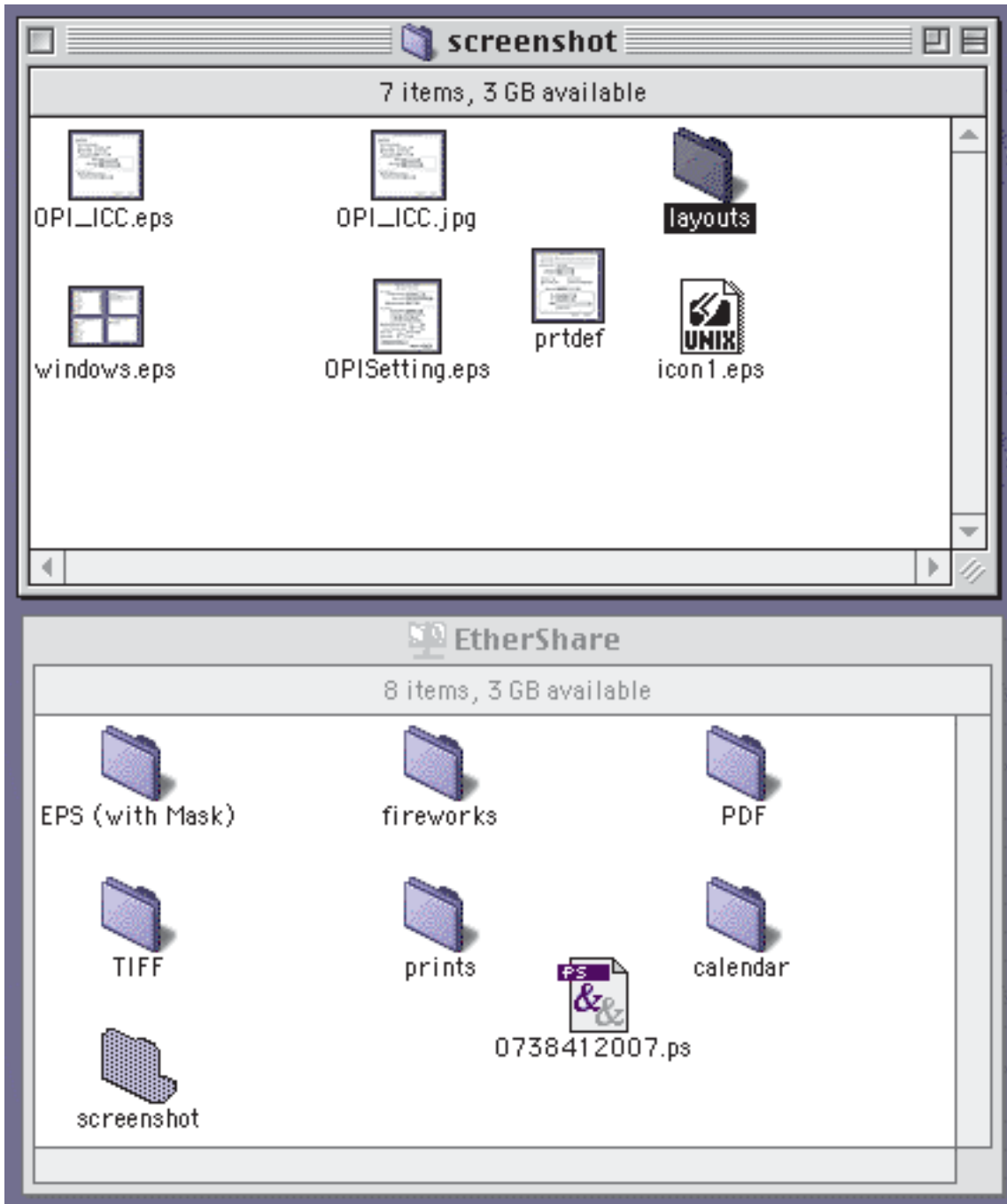
Figure 89. Sample shared directory and layout directory

5. Place the images that you created in step 1 in a directory under the shared folder from Ethershare, creating whatever directory structure you want to organize the files.

   The OPI server automatically creates a layout subdirectory that will contain low resolution images of each high resolution image you put in the main directory.

6. From the desktop, double-click on the **Tagger** icon, then complete the following procedure to tag high resolution images with **ICC** profiles necessary for the scanner that was used to create the images:

   a. From the main menu, select **File → New**.

    b. From the RGB Profile dialog, specify `other`.

    c. Select the correct **ICC** profile for your high resolution images.

       To determine the correct **ICC** profiles required by your particular images, consult the online Helios documentation and help systems.

    d. Within the Tagger program, select your images, specify **high-res** image, and select **Open**.

    e. Tag each image by selecting the **Tag image...** button and the **Open** button in sequence.

       Repeat this step for each image that you plan to use.

7. From your layout application (for example, Quark, Adobe Pagemaker, etc.,), create a document and place the low resolution image from the layout folder in the document.

8. From your layout application, select the print option and select the **OPI setting** so that you can include images in the document.

   Change these settings if you want low resolution images included in the PostScript output file. Because only the high-resolution images are printed, these changes will not affect output. Instead, these changes only affect pre-RIP processing, such as the use of a PostScript file in Preps software if the OPI server is used as part of the InfoPrint impositioning solution.

9. Select the **print to file** option because it generates a PostScript file as output.

10. Using your method of choice (for example, the EtherShare folder you installed on your MAC system, InfoPrint Submit Express, or some form of file transfer protocol), transfer the PostScript file generated in the previous step to your InfoPrint AIX server.

11. On the InfoPrint AIX server, you can either print this PostScript file using a **pdpr** command, or use the PostScript file as input to the Preps software for the first step in the InfoPrint Impositioning Solution.

    For more information, refer to *InfoPrint Manager for AIX: Impositioning Assist*, which is available with the special feature CD-ROM and from the Web.

Troubleshooting the OPI server

The following describes some common errors that you might experience when using the OPI server, with possible recommendations for how to resolve the problems.

A low-resolution image or no image prints
    Attempt to resolve this problem by:

- Checking the OPI/ICC Settings on the Helios print queue (see Figure 86 on page 372). Ensure that the check boxes for **OPI Active**, **Check Images**, **Check Fonts**, and **Check ICC Profile for Pictures** have all been checked. If any are unchecked, check those check boxes, save the settings, and try running the jobs again.

- Check to ensure that the PostScript transform is using the correct configuration file (either **ps2afpd.cfg** or **3160d.cfg**), depending upon the type of printer you are using. Also, check this file to ensure that the OPI server has been enabled (for specific instructions, see "Configuring OPI server from the InfoPrint AIX server" on page 372), and that the OPI server resolution program has specified the correct path (by default, this path is **/usr/local/es/psresolve**, as displayed in 373).

PostScript RIP fails with an OPI error
    Attempt to resolve this problem by:

- Ensuring that you have downloaded and specified the necessary Helios updates from the Helios site at **http://www.helios.de/download**.
- Test the Helios resolution program on an OPI file.

  Do this task by specifying the following from an AIX command line:

  `/usr/local/es/psresolve` *queuename* `<file.ps > fileout.ps`

  where *queuename* represents the printer queue you created in Figure 84 on page 370 and `file.ps` is the name of the PostScript output file that resulted when you specified `Print to File` from your layout application.

  By examining the results of the **fileout.ps** file, error codes, and error messages, you can gather valuable diagnostic information that can be used to resolve the problem.
- Ensure that you have properly tagged the high resolution image as described in "Submitting jobs to the OPI server" on page 373.

Chapter 31. 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 InfoPrint Manager to print MVS jobs on InfoPrint-managed printers. The MVS jobs must come from an MVS system that has the Download for z/OS or AFP Download Plus feature of IBM Print Services Facility for z/OS 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. With Download for z/OS, you can also print MVS data sets containing PostScript data or data in any of the other formats supported by InfoPrint.

The PSF for z/OS 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 MVS Download daemon on a specific InfoPrint Manager server.

See the *PSF for z/OS: Download for z/OS Guide* for information about the MVS Download feature and tasks performed on the MVS system.

The PSF for z/OS AFP Download Plus feature uses parameters in the PRINTDEV to identify a single MVS Download daemon on a specific InfoPrint Manager server. See the *PSF for z/OS: AFP Download Plus Guide* for information about the AFP Download Plus feature and tasks performed on the MVS system.

Preparing to work with MVS Download

Read through the following 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 Download for z/OS or AFP Download Plus feature of PSF for z/OS and the InfoPrint MVS Download daemon. The PSF for z/OS features 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).

For a comparison between the Download for z/OS and AFP Download Plus features, see the *Download for z/OS Guide*.

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 381 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 387.

How do you make AFP resources available?

AFP Download Plus can send all needed AFP resources with the print files. When this is used, the AFP resources do not need to be accessible to the AIX system. If AFP Download Plus is configured to not send all needed AFP resources or Download for z/OS is in use, the AFP resources needed for the jobs need to be accessible to the AIX system.

For jobs that 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.

You can associate named media with the bins where they are loaded. By using Page Printer Formatting Aid (PPFA), you can create form definitions for your MVS jobs that contain MO:DCA medium maps that specify media names. For more information about how to create these form definitions, see the *PPFA: User's Guide and Reference*, S544-5284.

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 384 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.

How do I get page count displayed for AFP Download Plus jobs?

If you want to be able to see the page count for your AFP Download Plus jobs listed in the InfoPrint Manager GUI, turn on the page-accounting-support in AFP Download Plus. See the *PSF for z/OS: AFP Download Plus Guide* for more information.

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.

The **mvsprpsm.sh** shell script and associated scripts have been changed to add support for AFP Download Plus and the multiple data set function of AFP Download Plus. If you already have custom scripts that will be used instead of the InfoPrint Manager provided scripts, ensure that they have been updated with the changes in the new scripts before using AFP Download Plus.

Changes to custom scripts/exits are only required if any of the following new functions are desired:
- AFP Download Plus multiple data set
- Support for the **pdpr** retry count and retry interval
- Displaying the AFP Download Plus page count on the Admin/Operator GUI
- Printing/discarding AFP Download Plus failed jobs
- Using inline resources with MVS Download multiple data set
- Using the new **-w** or **-e** option.

If none of these functions are used, the existing custom scripts can be used.

Please refer to the current sample script/exit provided and the sample script/exit that your custom script/exit is based on to determine the changes. From this, you will identify the proper approach for updating and testing your custom script/exit.

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-contect-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 InfoPrintMVS 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 lpname=$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:
   - For Download for z/OS:

     ```
     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.

     hhmmsstABCD
     > 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 servers to identify the data file received and other information needed to create the final print job.

   - For AFP Download Plus:

     ```
     AFPDP.MVS_system_name.fsa_name.userid.jobid.job_name.step_name.dd_name.forms_name.ccyyddd.hhmmsstABCD.PRD
     ```

     where:

     MVS_system_name
     > Specifies the name of the MVS system that downloaded the data.

     fsa_name
     > Specifies the name of the FSA that processed the data set.

     userid   Specifies the userid of the user who submitted the job.

jobid   Specifies the job identifier that was assigned by the z/OS system.

job_name
Specifies the name of the job containing the data set.

step_name
Specifies the name of the step in the job.

dd_name
Specifies the **DD** name in the step.

forms_name
Specifies the name of the form identified with the MVS **FORMS** parameter.

ccyyddd
Specifies the century and year followed by the number of the day of the year.

hhmmsstABCD
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 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 34 on page 386 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:

   - For Download for z/OS:

     ```
     MVS_system_name.job_name.dataset_name.forms_name.yyddd.hhmmsstABCD.JCL
     ```

   - For AFP Download Plus:

```
AFPDP.MVS_system_name.fsa_name.userid.jobid.job_name.step_name.dd_name.forms_name.ccyyddd.hhmmsstABCD.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.

4. An empty string.

5. An empty string.

6. The port number that was specified with the **-p** flag of the InfoPrint **mvsprsd** command when the daemon was started.

7. The additional script parameters that were specified with the **-X** flag of the InfoPrint **mvsprsd** command when the daemon was started.

8. A non-zero value, if the **-t** flag was specified on the **mvsprsd** command; or a value of zero, if the **-t** flag was not specified.

Translating print options to InfoPrint attributes and values

Table 34 on page 386 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 34, 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 34 lists these values in italics within the **InfoPrint Attribute and Value** columns.

Table 34. Print options passed to InfoPrint MVS Download shell script

Print Option Passed to Shell Script	InfoPrint Attribute and Value for Download for z/OS	InfoPrint Attribute and Value for AFP Download Plus
-oac=*account*	″**account-text=***account*″	″**account-text=***account*″
-oaddress1=*address1*	″**address1-text=***address1*″	″**address1-text=***address1*″
-oaddress2=*address2*	″**address2-text=***address2*″	″**address2-text=***address2*″
-oaddress3=*address3*	″**address3-text=***address3*″	″**address3-text=***address3*″
-oaddress4=*address4*	″**address4-text=***address4*″	″**address4-text=***address4*″
-obu=*building*	″**building-text=***building*″	″**building-text=***building*″
-occtype=a **-occtype=m** **-occtype=z**	″**carriage-control-type=ansi-ebcdic**″ ″**carriage-control-type=machine**″ ″**carriage-control-type=ansi-ascii**″ **Note:** 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.	None (discarded)
-ochars=*font1,font2,font3,font4*	″**chars=***font1,font2,font3,font4*″	None (discarded)
-ocop=*nnn*	″**results-profile=::***nnn*″	″**results-profile=::***nnn*″
-odatat=af	Not applicable	″**document-format=modca-p**″
-odatat=line	″**document-format=line-data**″ **Note:** If the input value is not **line**, this value is not set and InfoPrint attempts to identify the correct format. If InfoPrint cannot identify the format, InfoPrint uses a format of **ascii**.	Not applicable
-odatac=blkchar **-odatac=blkpos** **-odatac=block** **-odatac=unblock**	″**data-fidelity-problem-reported=position**″ ″**data-fidelity-problem-reported=character**″ ″**data-fidelity-problem-reported=none**″ ″**data-fidelity-problem-reported=all**″	″**data-fidelity-problem-reported=position**″ ″**data-fidelity-problem-reported=character**″ ″**data-fidelity-problem-reported=none**″ ″**data-fidelity-problem-reported=all**″
-ode=*department*	″**department-text=***department*″	″**department-text=***department*″
-odu=no **-odu=normal** **-odu=tumble**	″**sides=1 plex=simplex**″ ″**sides=2 plex=simplex**″ ″**sides=2 plex=tumble**″	″**sides=1 plex=simplex**″ ″**sides=2 plex=simplex**″ ″**sides=2 plex=tumble**″
-of=F1*formdef*	″**form-definition=***F1formdef*″	″**form-definition=***F1formdef*″
-ofileformat=record **-ofileformat=stream**	″**new-line-option=counted-4-octet-aligned**″ ″**new-line-option=lf**″	None (discarded)
-ofiletype=message **-ofiletype=userdata**	None (discarded)	None (discarded)
-oformlength=*nnn.nnn*	″**form-length=***nnn.nnn*″	″**form-length=***nnn.nnn*″

Print Option Passed to Shell Script	InfoPrint Attribute and Value for Download for z/OS	InfoPrint Attribute and Value for AFP Download Plus
-oin=*nnn*	″**printer-pass-through=′-obin***nnn*′″	″**printer-pass-through=′-obin***nnn*′″
-ojobn=*job_name*	″**job-name=***job_name*″	″**job-name=***job_name*″
-ona=*name*	″**name-text=***name*″	″**name-text=***name*″
-ono=*nodeid*	″**node-id-text=***nodeid*″	″**node-id-text=***nodeid*″
-ooffxb=*nnn.nnn*	″**x-image-shift-back=***nnn.nnn*″	″**x-image-shift-back=***nnn.nnn*″
-ooffxf=*nnn.nnn*	″**x-image-shift=***nnn.nnn*″	″**x-image-shift=***nnn.nnn*″
-ooffyb=*nnn.nnn*	″**y-image-shift-back=***nnn.nnn*″	″**y-image-shift-back=***nnn.nnn*″
-ooffyf=*nnn.nnn*	″**y-image-shift=***nnn.nnn*″	″**y-image-shift=***nnn.nnn*″
-oovlyb=*overlay*	″**overlay-back=***overlay*″	″**overlay-back=***overlay*″
-oovlyf=*overlay*	″**overlay-front=***overlay*″	″**overlay-front=***overlay*″

-opa=
    class=*output_class*
    destination=*destination*
    forms=*form_name*
    segmentid=*nnn*
	″**printer-pass-through=**
	    ′-oclass=*output_class***′**
	    ′-odestination=*destination***′**
	    ′-oforms=*form_name***′**
	    ′-osegmentid=*nnn***′**″
		″**printer-pass-through=**
		    ′-oclass=*output_class***′**
		    ′-odestination=*destination***′**
		    ′-oforms=*form_name***′**
		    ′-osegmentid=*nnn***′**″

-opagecount=*nnnnnnnnn*	"**job-page-count=***nnnnnnnnn*"	"**job-page-count=***nnnnnnnnn*"
-opagedef=P1*pagedef*	″**page-definition=***P1pagedef*″	None (discarded)
-opr=*programmer_name*	″**programmer-text=***programmer_name*″	″**programmer-text=***programmer_name*″
-oprmode=SOSI1 **-oprmode=SOSI2**	″**shift-out-shift-in=one**″ ″**shift-out-shift-in=two**″	None (discarded)
-ore=P240 **-ore=P300**	″**font-resolution=240**″ ″**font-resolution=300**″	″**font-resolution=240**″ ″**font-resolution=300**″
-oro=*room*	″**room-text=***room*″	″**room-text=***room*″
-osheetcount=nnnnnnnnn	None (discarded)	None (discarded)
-oti=*title*	″**title-text=***title*″	″**title-text=***title*″
-otrc=no **-otrc=yes**	″**table-reference-characters=false**″ ″**table-reference-characters=true**″	None (discarded)
-ous=*userid*	″**user-id-text=***userid*″	″**user-id-text=***userid*″

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:

```
 if [ -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 multiple 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 multiple 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 multiple data set set jobs received from PSF/MVS on InfoPrint Manager for AIX.

Description of multiple 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 with Download for z/OS, you must:

- Install a special Download for z/OS user exit 15 program (**apsux15m**) on MVS
- Start the **mvsprsd** daemon with the *-n 1* option on AIX

To support the printing of multiple data sets in a job as a single unit with AFP Download Plus, you must:

- Install AFP Download Plus with APAR OA15317.
- Set the **dataset-grouping** parameter in the control statement data set to Yes.
- Start the **mvsprsd** daemon with the *-n 1* option on AIX

The sample user exit 15 program (**apsux15m**) provided with PSF for z/OS for Download for z/OS, adds a parameter that identifies data sets that belong to multiple data set jobs and indicates whether the data set is first, next, or last in a job.

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 multiple 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.

Note: If you enable multiple data set support using Download for z/OS and you need to configure multiple MVS Download FSA's, you must have one **mvsprsd** daemon for each Download FSA that is submitting jobs to the InfoPrint Manager server. If you don't do this and two Download for z/OS FSA systems send jobs at the same time, the job data sets can become intermingled and errors or incorrect output can result. This restriction does not apply to . Multiple AFP Download Plus FSAs can be enabled for multiple data set and use one **mvsprsd** daemon.

Procedure for installing multiple data set support with Download for z/OS

Use the following procedure to install the MVS Download multiple 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 can 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.

Procedure for installing multiple data set support with AFP Download Plus

Use the following procedure to install the AFP Download Plus multiple data set set support:

1. Install AFP Download Plus with APAR OA15317. To enable the multiple data set function, set the **dataset-grouping** parameter in the control statement data

set to **Yes**. For more information on installing AFP Download Plus, see Chapter 2, "Installing AFP Download Plus" in *Print Service Facility for z/OS: AFP Download Plus*, S550-0433. Using the Download for z/OS exit 15 program to enable multiple data set on AFP Download Plus is not supported.

2. 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
```

3. When the **mvsprsd** daemon is started, ensure that the **PATH** environment variable 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.

4. 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 can use the **resource-context** attribute instead of the **resource-context-page-definition** attribute.

5. 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 multiple data set support

This support has the following limitations:

1. This solution applies only to line mode, mixed mode, or MO:DCA-P data sets.

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 multiple 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)

5. You cannot have inline resources with the same name and different content in the same job, with the exception of page definitions and form definitions.

Technical description of multiple data set support

The following describes the sequence of the multiple data set support.

1. The MVS Download daemon receives a data set into a file.

2. The MVS Download daemon invokes the InfoPrint Manager script to spool the file. (You specified the script on the **-x** option when you started **mvsprsd**.)

3. If MVS user exit 15 or AFP Download Plus marked the file as part of a multiple data set job, the sample exit does not immediately spool the file. Instead, the sample exit calls a second program, which invokes ACIF to transform the file into MO:DCA-P if it is from Download for z/OS.

4. After the last file in a multiple data set job is received and transformed to MO:DCA-P for Download for z/OS, the sample exit invokes the **afpconcat** program to create one file with a comprehensive inline form definition and all the MO:DCA-P documents. The **afpconcat** program can combine the multiple MO:DCA-P files received from MVS Download into a single MO:DCA-P file. The comprehensive inline form definition contains medium maps (copy groups) from all of the form definitions associated with the individual data sets. The **formdef**s requested for each input file are merged into a single combined **formdef** that is placed inline in the output MO:DCA-P document.

5. If medium map names collide, the **afpconcat** program assigns unique names and updates references in the MO:DCA-P documents.

6. The **afpconcat** program merges the inline resource group, discarding page definitions and the original form definitions. Resources with matching resource names and types are compared to verify that they are identical.

7. The sample exit spools 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.hhmmsstABCD.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 384 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.

1. Go to the working directory where the failed job's JCL exists.

2. Run the `/usr/lpp/pd/bin/mvsprpsm.sh` command with the following parameters (or create a shell script to run the command):

> 1st parameter : PRD file (line data from host)
> 2nd parameter: Copy the content of JCL file

3rd paramete: Logical Dest name
4th parameter: none (blank)
5th parameter: none (blank)
6th parameter: MVSPRSD port number
7th parameter: none (blank)
8th parameter: 0 (zero)

For example:

```
#!/bin/ksh
      JOB00838.SRV1.YAMASAK1.STEP1.PERFAIX.2005105.23235906438.PRD
      '"-odatat=line -ofileformat=record -occ=yes -occtype=a
        -ochars=GT10 -opagedef=P1V04863 -of=F10101LA -ocop=007
        -odatac=unblock -ojobn=MYJOB -ous=MYNAME -oprmode=SOSI2
        -otrc=yes -ono=BLDPSRV1
        -opa=forms=PERFAIX,class=K,destination=LOCAL,jobid=JOBID,
         OUTGRP=ONLY "' local '' '' 6001 '' 0 >>$PPID 2>>$PPID
```

Note: Please note that multiple data set jobs cannot be resubmitted and must be resent from the host.

Chapter 32. Using AFP Upload

AFP Upload consists of an AIX client program (as part of InfoPrint Manager) and an MVS or host server program (available as a priced feature of PSF/MVS). The AIX client program accepts AFP files (or files it can convert to AFP) and sends them to the MVS server, which places them on the JES spool. The host server program ensures that the attributes passed by the AIX client (such as `class`, `destination`, and `forms`) are also communicated to the MVS system and recorded with the data sets on the JES spool. For more information on how to pass these values to an MVS system, see "Transmitting AFP file attributes to MVS."

To communicate between the MVS system and the AIX system, AFP Upload uses either TCP/IP or SNA LU 6.2 protocols. Depending upon the protocol used at your site, you should use one of the following publications to customize and use the AFP Upload feature of InfoPrint Manager:

- *AFP Upload Configuration Guide Using TCP/IP*
- *AFP Upload Configuration Guide Using SNA*

Both manuals are available from the InfoPrint Manager for AIX Version 4.2 Publications CD-ROM and the InforPrint Solutions Web site at **http://www.infoprint.com**.

In addition to the network configuration tasks described in these publications, you need to perform the following procedure before you can upload files to an MVS server from InfoPrint Manager.

Transmitting AFP file attributes to MVS

InfoPrint Manager allows you to specify values to MVS through two methods:

1. "Using specific InfoPrint Manager attributes"
2. "Using the destination-pass-through attribute" on page 396

Note that the CLASS, FORMS, and DESTINATION values allow you to specify values through either method. If you want to send these three values through AFP Upload and Print, as well as the BURST value, you must use the **destination-pass-through** attribute. If you specify the CLASS, FORMS, and DESTINATION attributes as specific attributes (**mvs-class**, **mvs-destination**, or **mvs-forms**) and then specify a BURST value on the same command or actual destination, InfoPrint Manager ignores the specific document attributes and only passes the BURST value onto the MVS host program. To pass BURST with the other three values, you must use the method described in "Using the destination-pass-through attribute" on page 396.

Using specific InfoPrint Manager attributes

You can specify a series of document attributes that map to MVS values by associating them with a job, specifying them on a **pdpr** print command, or setting them on an actual destination.

Table 35 on page 396 provides specific attributes that can be used to pass values to an MVS host system through AFP Upload and Print.

Table 35. Specific InfoPrint Manager attributes to pass values to an MVS host system

MVS Values	InfoPrint Manager Attribute(s)
ADDRESS	• **address1–text=** • **address2–text=** • **address3–text=** • **address4–text=**
BUILDING	**building–text=**
CLASS	• **mvs-class=** • **(destination-pass-through=)**
COPIES	**copy–count=**
DATACK	**data–fidelity-problem-report=**
DESTINATION	• **mvs-destination=** • **(destination-pass-through=)**
DEPARTMENT	**department-text=**
FORMDEF	**form-definition=**
FORMS	• **mvs-forms=** • **(destination-pass-through=)**
NAME	**name-text=**
ROOM	**room-text=**
TITLE	**title-text=**

For example, to pass a BUILDING value of 004 and a ROOM value of A5, you could use the **pdpr** print command to pass attributes for a single job with a **test1.tif** file:

```
pdpr -p nome-lp -x"building-text=004 room-text=A5" test1.tif
```

For specific syntax rules, refer to the latest draft of the *InfoPrint Manager Reference*, which is available on the InfoPrint Solutions Company Web site **http://www.infoprint.com**.

Using the destination-pass-through attribute

For a subset of MVS values that do not match specific InfoPrint Manager attributes, InfoPrint Manager allows you to specify values to MVS as **destination-pass-through** (also called **printer-pass-through**) attribute values. These values can be associated with a job, specified on a **pdpr** print command, or set on an actual destination. The MVS host server program associates attributes passed by the AIX client with the SYSOUT data set. These attributes are similar to JCL OUTPUT statement parameters.

They include
- BURST
- CLASS
- DESTINATION
- FORMS

The following procedures describe how you can pass these values to an MVS host server program using AFP Upload and Print, using the following syntax:

```
-x "destination-pass-through='PASSTHRU=MVS_PARM=value'"
```

where *MVS_PARM* can be BURST, CLASS, DESTINATION, and FORMS, either individually or in any combination. When more than one attribute is being passed, each value must be separated by a comma, as shown in the examples below.

The MVS value WRITER must be specified through the **destination-pass-through** attribute, but it does not conflict with specifying either **mvs-class**, **mvs-destination**, or **mvs-forms**. As you can see in the table below and the examples that follow, the syntax for passing the MVS WRITER value differs from that used for the other options.

The following table shows how you can use the **destination-pass-through** attribute to pass values to an MVS host system through AFP Upload and Print.

Table 36. Using the destination-pass-through attributes to pass values to an MVS host system

MVS Values	InfoPrint Manager Pass Through Syntax
BURST	destination-pass-through='PASSTHRU=BURST=xxx'
CLASS	destination-pass-through='PASSTHRU=CLASS=xxx'
DESTINATION	destination-pass-through='PASSTHRU=DESTINATION=xxx'
FORMS	destination-pass-through='PASSTHRU=FORMS=xxx'
WRITER	destination-pass-through='WRITER=xxx'

Examples: Using the destination-pass-through attribute

The first two-step example creates an initial value document and associates it with the default logical destination so that all jobs sent to this destination will pass the specified attributes.

1. Specify the following **pdcreate** command to create an initial value document named **upload1–dd** on the InfoPrint AIX server **nome**:

   ```
   pdcreate -c initial-value-document \
   -x"destination-pass-through='WRITER=WTR1 PASSTHRU=BURST=YES,CLASS=A'"\
   nome:upload1-dd
   ```

2. Specify the following pdset command to associate the initial value document named **upload1–dd** with the **nome-lp** logical destination:

   ```
   pdset -c destination\
   -x"destination-initial-value-document=upload1-dd"\
   nome:nome-lp
   ```

The second example uses the **pdpr** command to pass attributes for a class of A, a form of B, a job destination of B205, and a BURST value of YES on a single job with a **test2.tif** input file:

```
pdpr -p nome-lp\
-x"destination-pass-through='PASSTHRU=CLASS=A,FORMS=B,DESTINATION=B205,BURST=YES'"\
test2.tif
```

The third example uses the pdset command to specify a class of A, a form of B, a BURST value of YES, and a WRITER value of WTR1 on all jobs sent to the actual destination **nome-ad**.

```
pdset \
-x"destination-pass-through='WRITER=WTR1 PASSTHRU=CLASS=A,FORMS=B,BURST=YES'"\
```

Using InfoPrint Manager commands with AFP Upload

Because the AIX client program for AFP Upload operates as an InfoPrint Manager actual destination, you can control and monitor it through the commands used with other InfoPrint actual destinations:

- To shut down an AFP Upload actual destination, use the **pdshutdown** command that is documented in *InfoPrint Manager: Reference*.
- To find status about AFP Upload actual destinations, use the **psfstat** command.

Note that there are limitations to the tasks that you can perform with an AFP actual destination. You can neither forward space, back space, nor pause a job to an AFP Upload actual destination.

When the connection to the MVS host fails

If you experience connection problems with the MVS host after having submitted a job through AFP Upload and Print, how to ensure that the job prints depends upon whether or not InfoPrint Manager detected the loss of connectivity.

If InfoPrint Manager detected the lost connection, the AFP Upload logical destination becomes red and the job goes into the PENDING state. Once you have re-established connectivity to the MVS host program, re-enable the AFP Upload destination. Then InfoPrint Manager will restart the job and continue printing.

If InfoPrint Manager does not detect the lost connection, the job remains in the PENDING state, while the printer goes into a needs-key-operator state. To resolve this condition and print your job, you must regain connectivity to the MVS host program, cancel the job in the PENDING state, and then resubmit the job to the AFP Upload actual destination.

Chapter 33. Customizing error logs in the InfoPrint Manager AIX server

InfoPrint Manager provides three configuration files for various IPM servers and daemons:

1. **spl_error.cfg** for the InfoPrint Manager server error log.
2. **notifyd_error.cfg** for the Notification daemon error log.
3. **sap_error.cfg** for all the SAP daemons.

If you want to customize error logs for one of these servers or daemons to control their size, whether or not they wrap, the severity level of messages written to the logs, and the number of back-up logs that InfoPrint Manager saves, perform one of the following procedures.

Customizing an InfoPrint Manager server error log

By default, the InfoPrint Manager server error log starts when the InfoPrint Manager server starts. Use the following procedure to customize the InfoPrint Manager server error log(s). Any InfoPrint Manager server processes that are running on this AIX server are changed by this customization the next time they are started.

1. Find the **spl_error.cfg** file in the **/usr/lpp/pd/bin** directory and copy it into the **/var/pd** or **%PDBASE%** directory:

   ```
   cp /usr/lpp/pd/bin/spl_error.cfg /var/pd/spl_error.cfg
   ```

   Note: If you already customize your server error logs, remember to change the name or move the current **spl_error.cfg** file in **/var/pd** so that your customization values can be copied over into the newer version of the file.

2. Open the copy of the **spl_error.cfg** file that you created and specify the settings for the log attributes that you want (as shown in Figure 90).

   For example, you can modify the **log-backup-number** attribute, which allows you to specify the number of backup logs that InfoPrint saves, including the initial **error.log.BAK** file.

```
#
# ErrorLog Configuration File
#
# Log size (units = KBytes)
log-size = 1024
# Wrap On?
log-wrap = true
# Severity?
log-severity = debug
# Number of backup log files
log-backup-number = 10
```

Figure 90. Sample spl_error.cfg file provided by InfoPrint Manager

When you start the InfoPrint Manager server after a shutdown, it backs up the first error log by creating an **error.log.BAK** file. With each successive restart, it creates an additional **.BAK** file, adding a timestamp as a fourth qualifier. By

default, the **log-backup-number** attribute specifies a value of **10**, meaning that you can have nine back up files with timestamps and the initial **.BAK** file. You can reduce this number as low as 1 or increase it as high as 999.

For a complete list of the error log attributes that you can customize, see the *InfoPrint Manager: Reference* "Attributes for logs" topic in "Chapter 3. InfoPrint object attributes."

3. Once you have finished defining your options, save and close the **/var/pd/spl_error.cfg** file.

4. To shutdown the InfoPrint Manager server so that these customization changes can take effect, specify from the AIX command line:`pdshutdown -w now` *servername* .

   Note: If you do not need the customization change to take effect immediately, you can skip the final two steps and just wait until the next time the AIX system where the InfoPrint Manager server resides is restarted.

5. To restart the server, enter `start_server -F` *servername* where *servername* is the name of your InfoPrint Manager server.

Customizing a Notification daemon error log

By default, the Notification daemon error log starts when the Notification server starts. Use the following procedure to customize the InfoPrint Notification daemon error log.

1. Find the **notifyd_error.cfg** file from the **/usr/lpp/pd/bin** directory where the file is installed and copy it into the **/var/pd** directory:

   ```
   cp /usr/lpp/pd/bin/notifyd_error.cfg /var/pd/notifyd_error.cfg
   ```

   Note: If you already customize your Notification daemon error log, remember to change the name or move the current **notifyd_error.cfg** file in **/var/pd** so that your customization values can be copied over into the newer version of the file.

2. Open the copy of the **notifyd_error.cfg** file that you created and specify the settings for the log attributes that you want (as shown in Figure 91).

   For example, you can modify the **log-backup-number** attribute, which allows you to specify the number of backup logs that InfoPrint saves, including the initial **error.log.BAK** file.

```
#
#  Error Log Configuration File
#
log-size = 1024
log-wrap = true
log-severity = debug
log-backup-number = 10
```

Figure 91. Sample notifyd_error.cfg file provided by InfoPrint Manager

When you start the Notification daemon after a shutdown, it backs up the first error log by creating an **error.log.BAK** file. With each successive restart, it creates an additional **.BAK** file, adding a timestamp as a fourth qualifier. By default, the **log-backup-number** attribute specifies a value of **10**, meaning that you can have nine back up files with timestamps and the initial **.BAK** file. You can reduce this number as low as 1 or increase it as high as 999.

For a complete list of the error log attributes that you can customize, see the *InfoPrint Manager: Reference* "Attributes for logs" topic in "Chapter 3. InfoPrint object attributes."

3. Once you have finished defining your options, save and close the **/var/pd/notifyd_error.cfg** file.

   Note: If you do not need the customization change to take effect immediately, you can skip the final two steps and just wait until the next time the AIX system where the InfoPrint Manager server resides is restarted.

4. From an AIX command line, specify `stopnotd` to shut down the Notification daemon so that these customization changes can take effect.

5. Enter `startnotd` to restart the Notification daemon.

Part 3. Operator and user procedures

Chapter 34. Finishing options

Setting up finishing options for IPDS-only printers

Depending on the printer model, you can set up several finishing options. InfoPrint Manager can be set up to support many of these possibilities, including edge stitching (stapling one edge of the print job to create a booklet), saddle stitch (stapling in the middle of the page to create a folded booklet), and corner stapling. The following sections describe how to set up finishing options for IPDS printers, including the InfoPrint 45, InfoPrint 60, and InfoPrint 2000.

Telling InfoPrint Manager what options the finisher supports

The first step in enabling the finishing options is to let InfoPrint Manager know what options the finisher supports. Follow the steps below to set the appropriate values.

Note: If you will only be submitting print jobs that specify a form definition to this printer or if you will only be submitting jobs to this printer using PSF Direct, you do not have to complete this procedure. You can proceed to "Setting up InfoPrint Manager and clients to use finishing options" on page 413.

1. Start the InfoPrint Manager Administration GUI.
2. Find or create the PSF printer (actual destination) that sends jobs to the printer you are setting up.
3. Right-click the printer and select **Properties** from the pop-up menu.
4. In the Printer Properties notebook, click the **Job** tab.
5. Find the **Finishing options allowed** field.

   Note: If you don't see the **Finishing options allowed** field, click **Show More**.
6. Select all of the finishing options that your finisher supports in the **Possible values** list and add them to the **Values** list.
7. Click **OK**.

Setting up InfoPrint Manager and clients to use finishing options

How you set up to use finishing options varies depending upon what kind of print jobs you create and how you submit them. There are several categories; find the one below that most resembles your situation.

Using the pdpr command

When you submit print jobs from the command line with the **pdpr** command, you can use the **job-finishing** attribute on the **–x** flag to specify finishing options. For example:

```
pdpr -d printername -x"job-finishing=staple-top-left" printfilename
```

You can also use the **form-definition** attribute on the **–x** flag to specify finishing options. For example:

```
pdpr -d printername -x"form-definition=F1name" printfilename
```

For a list of allowed values, proper syntax, and usage guidelines for the **job-finishing** and **form-definition** attributes, refer to *InfoPrint Manager: Reference*.

Using a form definition

If you submit your print jobs using a form definition (either by specifying a certain one or by using a default form definition), you can identify the finishing options that you want to apply in the form definition. When you specify printing and finishing options this way, no InfoPrint finishing attributes are necessary to request the finishing options. The print job is sent to the printer and the options are read out of the formdef. If the finisher supports the options chosen, the job should print correctly without any more configuration on your part.

Note: InfoPrint Manager does not check the finishing options you specify in the formdef against the options you set in "Telling InfoPrint Manager what options the finisher supports" on page 412. As a result, if the finisher doesn't support the options, the job will fail.

Using PSF Direct

PSF Direct is a function of InfoPrint Manager for Windows and InfoPrint Manager for AIX. PSF Direct lets a PSF program (PSF for z/OS, PSF for OS/400®, PSF/VM, or PSF/VSE) print remotely, using SNA LU 6.2 protocol, on printers supported by InfoPrint Manager. The PSF program sends the print data stream directly to the InfoPrint Manager printer, bypassing the Windows or AIX spool.

When you submit a job using PSF Direct, all of the job options (including finishing options) are set on the host system. Use the method provided by your host system or document creation applications to request finishing.

When you use PSF Direct, you do not need to use the Infoprint Administration GUI to identify the finishing operations that the InfoPrint printer supports. When you send the print job to the printer, the printer uses the options you set on the host system. If the finisher supports the options specified, the job should print correctly; otherwise, if the finisher does not support the options, the job fails.

For more information about using PSF Direct, refer to the documentation for your specific type of connection.

Using InfoPrint Submit Express or InfoPrint Job Ticketer

When you submit a job using InfoPrint Submit Express or InfoPrint Job Ticketer, you can select a variety of options, including finishing. Build your job ticket as you usually would, and specify the finishing options that you want to use on the appropriate tab or page.

Using InfoPrint Select

The InfoPrint Select client allows you to specify job-finishing attribute values or a form definition when submitting a job to the server. For more information on using the job-finishing attribute, refer to the *InfoPrint Manager: Reference*. For instructions on setting attribute values within Select, consult the help system.

Using the InfoPrint AFP driver: If you are interested in using the powerful features of AFP in a wide range of environments, you may want to install and use the InfoPrint AFP driver with InfoPrint Select. To install and set up the InfoPrint AFP driver, see "Setting up the AFP driver" in *InfoPrint Manager for AIX: Planning and Installation Guide* . To specify the AFP driver for your printer, follow the directions in the *Infoprint Manager for AIX: Getting Started* guide, and specify one of the following drivers depending on your printer model:

1. For the Infoprint 45 printer, specify the **InfoPrint AFP 4345** driver.
2. For the Infoprint 60 printer, specify the **InfoPrint AFP 3160** driver.
3. For the Infoprint 2000 printer, specify the **InfoPrint AFP 2710** driver.

Once installed, you can click either the **Printing Preferences** button on Windows 2000/XP systems from the **Print** window, and then use the AFP driver to specify inline form definitions with finishing options, or make use of other AFP features.

PSF printer:

If you want to use InfoPrint Select to submit print jobs with finishing options to a PSF printer, you must create a Select printer that uses the specific printer driver for your printer shown here. The driver is installed on your system when you install InfoPrint Select. Use the procedure that is described in the *InfoPrint Manager for AIX: Getting Started* guide for creating a Select printer, modifying it as described below.

1. Follow the procedure through creating a port and selecting an InfoPrint destination.
2. When the **Add Printer** wizard asks you to choose a manufacturer and a printer model, don't select anything, just click **Have Disk**.
3. In the **Install from Disk** dialog, click **Browse** and navigate to the directory that you installed InfoPrint Select in. The default directory is c:\Infoprint.

   Note: Because this dialog assumes the the driver is actually on a floppy disk or CD-ROM, you may receive an error that the drive is not ready. In the error box, click **Cancel**. A Windows **Open** dialog should then open. Use that dialog to navigate to the correct directory.
4. Select the Ibmprint.inf file and click **Open**.
5. Select the appropriate driver based on your printer model and click **OK**.
   - For the InfoPrint 45 printer, specify the **IBM AFP 4345** driver.
   - For the InfoPrint 60 printer, specify the **IBM AFP 3160** driver.
   - For the InfoPrint 2000 printer, specify the **IBM AFP 2710** driver.
6. In the **Install from Disk** dialog, click **Next**.
7. Complete the wizard as usual.

When you submit jobs to this printer, you can choose the finishing option you want to use.

Note: The **IBM InfoPrint 60 with Finisher** driver only supports four finishing options: **top corner**, **bottom corner**, **2 edge stitch** (two staples in one side of the paper), and **3 edge stitch** (three staples on one side of the paper). If you need to use other finishing options, you have to use a different submission method.

Using MVS Download

MVS Download is an optional feature of PSF for z/OS that uses TCP/IP to automatically send data sets from the JES spool, without formatting them, directly to InfoPrint Manager for AIX or InfoPrint Manager for Windows. InfoPrint Manager receives the data sets into files, formats them, and sends them to the printer. When you submit a print job with MVS Download, do one of these:
- Specify a mapping from a JCL keyword to a finishing attribute in the AIX shell script. The selected JCL parameter you specify in z/OS maps to the InfoPrint Manager **pdpr** finishing attribute.

- Use the existing form definition JCL keyword to form definition attribute mapping. The JCL FORMDEF parameter you specify in z/OS maps to the InfoPrint Manager **pdpr** form definition attribute.
- Specify a default form definition or finishing attribute so all jobs have the same finishing option.

Using InfoPrint Manager hot folders

An InfoPrint Manager hot folder is a directory that is associated with a logical destination. When you copy or move a file to the hot folder, InfoPrint Manager automatically submits the file to that logical destination. The default job and document finishing attributes that are set for the logical destination are applied to jobs submitted through the hot folder. You can also specify other finishing attributes or use different values for existing attributes. For instructions on using hot folders refer to "Setting up hot folders to submit impositioning jobs" on page 358.

Using InfoPrint Manager LPD and an LPR client

The InfoPrint Manager Line Printer Daemon (LPD) is a utility that lets you submit print jobs from other operating systems using a Line Printer (LPR) client. To submit print jobs with finishing to the InfoPrint Manager LPD, you must use an LPR client, such as **lprafp**, that lets you use –o options to specify advanced printing options (for example, form definitions and page definitions) when you submit jobs to InfoPrint Manager. You can either specify finishing attributes on the submission command or use a default job.

Selecting the correct finishing options

In InfoPrint Manager, the finishing options have very descriptive names so that it is easy to choose the one you want for your job. However, the names of those options are based on print jobs that use the "portrait" orientation, and as a result are misleading for jobs that printed in the "landscape" orientation. In addition, some of the options are valid if the paper is fed through the printer long edge first (LEF) and not valid if the paper is fed short edge first (SEF), and vice versa. As a result, choosing the correct finishing option can be confusing. The following tables can help you determine which option to choose for the InfoPrint 45, InfoPrint 60, and InfoPrint 70, based on how you want your job to be finished.

Paper fed LEF

Table 37. Options to set for paper fed LEF on the InfoPrint 45

Desired output	Select this value for "portrait" jobs	Select this value for "landscape" jobs
One staple in the upper left corner	staple top left	staple bottom left
One staple in the upper right corner	Not supported	staple top left
One staple in the bottom left corner	staple bottom left	Not supported
More than one staple on the left edge of the paper	edge stitch, OR edge stitch left	Not supported
More than one staple on the top edge of the paper	Not supported	edge stitch OR edge stitch left

Table 38. Options to set for paper fed LEF on the InfoPrint 60

Desired output	Select this value for ″portrait″ jobs	Select this value for ″landscape″ jobs
One staple in the upper left corner	staple top left	staple bottom left
One staple in the upper right corner	staple top right	staple top left
One staple in the bottom left corner	staple bottom left	staple bottom right
One staple in the bottom right corner	staple bottom right	staple top right
More than one staple on the left edge of the paper (uses the default number of staples that is set for the finisher)	edge stitch OR edge stitch left	Not supported
Two staples on the left edge of the paper	edge stitch 2	Not supported
Three staples on the left edge of the paper	edge stitch 3	Not supported
More than one staple on the top edge of the paper (uses the default number of staples that is set for the finisher)	Not supported	edge stitch OR edge stitch left
Two staples on the top edge of the paper	Not supported	edge stitch 2
Three staples on the top edge of the paper	Not supported	edge stitch 3
More than one staple on the right edge of the paper	edge stitch right	Not supported
More than one staple on the bottom edge of the paper	Not supported	edge stitch right

Table 39. Options to set for paper fed LEF on the InfoPrint 2000

Desired output	Select this value for ″portrait″ jobs	Select this value for ″landscape″ jobs
One staple in the upper left corner	staple top left	staple bottom left
One staple in the upper right corner	staple top right	staple top left
One staple in the bottom left corner	staple bottom left	staple bottom right[1]
One staple in the bottom right corner	staple bottom right[1]	staple top right
Two staples on the left edge of the paper	edge stitch, edge stitch left, OR edge stitch 2	Not supported
Two staples on the top edge of the paper	Not supported	edge stitch, edge stitch left, OR edge stitch 2
Two staples on the right edge of the paper	edge stitch right	Not supported

Table 39. Options to set for paper fed LEF on the InfoPrint 2000 (continued)

Desired output	Select this value for "portrait" jobs	Select this value for "landscape" jobs
Two staples on the bottom edge of the paper	Not supported	edge stitch right

[1] Some printers support this option via 180-degree image rotation, some do not. See printer documentation for more details.

Note: For the InfoPrint 2000, paper must be pulled from the paper tray long-edge-first (LEF) for finishing options to be applied. Because ledger and A3 paper are both pulled from the paper tray short edge first (SEF), the InfoPrint 2000 does not support finishing options for those paper sizes.

Paper fed SEF

Table 40. Options to set for paper fed SEF on the InfoPrint 45

Desired output	Select this value for "portrait" jobs	Select this value for "landscape" jobs
One staple in the upper left corner	staple top left	Not supported
One staple in the upper right corner	staple top right	staple top left
One staple in the bottom right corner	Not supported	staple top right
More than one staple on the right edge of the paper	Not supported	edge stitch OR edge stitch top
More than one staple on the top edge of the paper	edge stitch OR edge stitch top	Not supported

Table 41. Options to set for paper fed SEF on the InfoPrint 60

Desired output	Select this value for "portrait" jobs	Select this value for "landscape" jobs
One staple in the upper left corner	staple top left	staple bottom left
One staple in the upper right corner	staple top right	staple top left
One staple in the bottom left corner	staple bottom left	staple bottom right
One staple in the bottom right corner	staple bottom right	staple top right
More than one staple on the top edge of the paper (uses the default number of staples that is set for the finisher)	edge stitch OR edge stitch top	Not supported
Two staples on the top edge of the paper	edge stitch 2	Not supported
Three staples on the top edge of the paper	edge stitch 3	Not supported

Desired output	Select this value for "portrait" jobs	Select this value for "landscape" jobs
More than one staple on the right edge of the paper (uses the default number of staples that is set for the finisher)	Not supported	edge stitch OR edge stitch top
Two staples on the right edge of the paper	Not supported	edge stitch 2
Three staples on the right edge of the paper	Not supported	edge stitch 3
More than one staple on the left edge of the paper	Not supported	edge stitch bottom
More than one staple on the bottom edge of the paper	edge stitch bottom	Not supported
Default number of staples in the center of the sheet	saddle stitch	saddle stitch

Staple positions for new InfoPrint printers

For more information about using this support, see the latest version of the *InfoPrint 2060ES/2075ES InfoPrint 2090ES/2105ES Finishing Guide* , (S544–5845).

Staple positions for InfoPrint 2060ES, InfoPrint 2075ES, and InfoPrint 2090ES

Table 42. Staple positions for InfoPrint 2060ES, InfoPrint 2075ES, and InfoPrint 2090ES mapped to InfoPrint Manager values

InfoPrint Manager value	Staple Position	
	Portrait	Landscape
staple-top-left	top left	top right
staple-bottom-left	bottom left	top left
staple-top-right	not supported	not supported
staple-bottom-right	not supported	not supported
edge-stitch	left edge	top edge
edge-stitch-2	not supported	not supported
edge-stitch-3	not supported	not supported
edge-stitch-left	left edge	top edge
edge-stitch-right	not supported	not supported
edge-stitch-top	not supported	not supported
edge-stitch-bottom	not supported	not supported
saddle-stitch	not supported	center

Note: The InfoPrint Manager value **saddle-stitch** means *staple down the center*. With the InfoPrint 2060ES, InfoPrint 2075ES, and InfoPrint 2090ES, printers, **saddle-stitch** is only supported for sheets in the landscape orientation, and if this is specified along with bin 3, the sheets are sent to the BookletMaker.

Staple positions for InfoPrint 2105ES

Table 43. Staple positions for InfoPrint 2105ES mapped to InfoPrint Manager values

InfoPrint Manager value	Staple Position	
	Portrait	Landscape
staple-top-left	top left	top right
staple-bottom-left	bottom left	top left
staple-top-right	not supported	not supported
staple-bottom-right	not supported	not supported
edge-stitch	left edge	top edge
edge-stitch-2	not supported	not supported
edge-stitch-3	not supported	not supported
edge-stitch-left	left edge	top edge
edge-stitch-right	not supported	not supported
edge-stitch-top	not supported	not supported
edge-stitch-bottom	not supported	not supported

Setting up finishing options for PS/PCL printers

Depending on the printer model, you can set up several finishing options.
InfoPrint Manager can be set up to support many of these possibilities, including
edge stitching (stapling one edge of the print job to create a booklet), saddle stitch
(stapling in the middle of the page to create a folded booklet), and corner stapling.
The following sections describe how to set up finishing options for printers that
can be sent PostScript and PCL, including the InfoPrint 70, InfoPrint 2085, and
InfoPrint 2105.

Telling InfoPrint Manager what options the finisher supports

The first step in enabling the finishing options is to let InfoPrint Manager know
what options the finisher supports. Follow the steps below to set the appropriate
values.

Notes:

1. For the InfoPrint 70, InfoPrint 2060ES, InfoPrint 2075ES, InfoPrint 2085,
   InfoPrint 2090ES, InfoPrint 2105, and InfoPrint 2105ES, the PSF DSS will set
   default values for the job-finishings-supported attribute, so you do not need to
   perform this setup process for the actual destination. These are the default
   settings:

   InfoPrint 70
   > staple-top-left, staple-bottom-left, staple-top-right, edge-stitch

   InfoPrint 2085, InfoPrint 2105
   > staple-top-left, staple-bottom-left, staple-top-right, edge-stitch,
   > edge-stitch-left

   InfoPrint 2060ES, InfoPrint 2075ES, and InfoPrint 2090ES
   > staple-top-left, staple-bottom-left, edge-stitch, edge-stitch-left,
   > saddle-stitch

   InfoPrint 2105ES
   > staple-top-left, staple-bottom-left, edge-stitch, edge-stitch-left

2. If you will be submitting only print jobs that specify a form definition to this printer or if you will only be submitting jobs to this printer using PSF Direct, you do not have to complete this procedure. You can proceed to "Setting up InfoPrint Manager and clients to use finishing options."

1. Start the InfoPrint Manager Administration GUI.

2. Find or create the PSF printer (actual destination) that sends jobs to the printer you are setting up.

3. Right-click the printer and select **Properties** from the pop-up menu.

4. In the Printer Properties notebook, click the **Job** tab.

5. Find the **Finishing options allowed** field.

   Note: If you don't see the **Finishing options allowed** field, click **Show More**.

6. Select all of the finishing options that your finisher supports in the **Possible values** list and add them to the **Values** list.

7. Click **OK**.

Setting up InfoPrint Manager and clients to use finishing options

How you set up to use finishing options varies depending upon what kind of print jobs you create and how you submit them. There are several categories; find the one below that most resembles your situation.

Using the pdpr command

When you submit print jobs from the command line with the **pdpr** command, you can use the **job-finishing** attribute on the **–x** flag to specify finishing options. For example:

```
pdpr -d printername -x"job-finishing=staple-top-left" printfilename
```

You can also use the **form-definition** attribute on the **–x** flag to specify finishing options. For example:

```
pdpr -d printername -x"form-definition=F1name" printfilename
```

For a list of allowed values, proper syntax, and usage guidelines for the **job-finishing** and **form-definition** attributes, refer to *InfoPrint Manager: Reference*.

Using a form definition

If you submit your print jobs using a form definition (either by specifying a certain one or by using a default form definition), you can identify the finishing options that you want to apply in the form definition. When you specify printing and finishing options this way, no InfoPrint finishing attributes are necessary to request the finishing options. The print job is sent to the printer and the options are read out of the formdef. If the finisher supports the options chosen, the job should print correctly without any more configuration on your part.

Note: InfoPrint Manager does not check the finishing options you specify in the formdef against the options you set in "Telling InfoPrint Manager what options the finisher supports" on page 412. As a result, if the finisher doesn't support the options, the job will fail.

Using PSF Direct

PSF Direct is a function of InfoPrint Manager for Windows and InfoPrint Manager for AIX. PSF Direct lets a PSF program (PSF for OS/390®, PSF for OS/400, PSF/VM, or PSF/VSE) print remotely, using SNA LU 6.2 protocol, on printers

supported by InfoPrint Manager. The PSF program sends the print data stream directly to the InfoPrint Manager printer, bypassing the Windows or AIX spool.

When you submit a job using PSF Direct, all of the job options (including finishing options) are set on the host system. Use the method provided by your host system or document creation applications to request finishing.

When you use PSF Direct, you do not need to use the InfoPrint Manager Administration GUI to identify the finishing operations that the InfoPrint printer supports. When you send the print job to the printer, the printer uses the options you set on the host system. If the finisher supports the options specified, the job should print correctly; otherwise, if the finisher does not support the options, the job fails.

For more information about using PSF Direct, refer to the documentation for your specific type of connection.

Using InfoPrint Submit or Submit Express

When you submit a job using InfoPrint Submit, you can select a variety of options, including finishing. Build your job ticket as you usually would, and specify the finishing options that you want to use in the **Finishing** field on the appropriate tab.

Using InfoPrint Select

If you apply InfoPrint Manager for AIX Program Temporary Fix (PTF) U483882(available in November 2002), your enhanced InfoPrint Select client allows you to specify job-finishing attribute values or a form definition when submitting a job to the server. For more information on using the job-finishing attribute, refer to the *InfoPrint Manager: Reference*. For instructions on setting attribute values within Select, consult the help system provided with the PTF U483882 level of InfoPrint Select.

The automatic data stream transforms that PSF printers use do not support finishing (stapling), so in general, if you plan to use InfoPrint Select to submit PCL or PostScript jobs to a PSF printer (destination), you may not specify finishing options when you submit a job, even if the print driver you use supports those options. However, there are other submission methods that will allow you to submit jobs with finishing options using Select.

Using the InfoPrint AFP driver: If you are interested in using the powerful features of AFP in a wide range of environments, you may want to install and use the InfoPrint AFP driver with InfoPrint Select. To install and set up the InfoPrint AFP driver, see "Setting up the AFP driver" in *InfoPrint Manager for AIX: Planning and Installation Guide* . To specify the AFP driver for your printer, follow the directions in "Installing and configuring the AFP driver" from the *InfoPrint Manager for AIX: Installation Instructions*, and specify one of the following printer drivers depending on your printer model:

1. For the InfoPrint 70 printer, specify the **InfoPrint AFP 2770** driver.
2. For the InfoPrint 2085 printer, specify the **InfoPrint AFP 2785** driver.
3. For the InfoPrint 2105 printer, specify the **InfoPrint AFP 2705** driver.

Once installed, you can click either the **Printing Preferences** button on Windows 2000 systems or the **Setup** button on Windows NT® systems from the **Print** window, and then use the AFP driver to specify inline form definitions with finishing options, or make use of other AFP features.

Using a PSF other-driver printer: You can use the **document-formats-ripped-at-destination** actual destination attribute to prevent the automatic data stream transform from occurring. Refer to the *InfoPrint Manager: Reference* for details.

Using an AIX printer: An AIX printer does not transform the data stream.This type of destination uses fewer processing resources but provides less functionality.

Any other destination type: If you want to use InfoPrint Select to submit print jobs to a different destination type (such as a BSD or IPP printer), the only way to request finishing options on PCL and PostScript jobs is to use default jobs. A *default job* is a list of attributes that is applied to every job that a particular logical destination receives. You can use the InfoPrint Manager Administration GUI to modify the default job for the logical destination that InfoPrint Select sends jobs to so that it requests the appropriate finishing options.

If you use default jobs, you will need a different logical destination for each finishing option. Every job that you send to a particular logical destination will be finished the same way. For example, if you set the **Finishing options** attribute of the default job to **staple-top-left**, every job that is submitted to that printer will have a staple in the top left corner. In addition, a logical destination can only have one default job, and a default job can only have one finishing option set.

Using MVS Download
MVS Download is an optional feature of PSF for OS/390 that uses TCP/IP to automatically send data sets from the JES spool, without formatting them, directly to InfoPrint Manager for AIX or InfoPrint Manager for Windows. InfoPrint Manager receives the data sets into files, formats them, and sends them to the printer. When you submit a print job with MVS Download, do one of these:

- Specify a mapping from a JCL keyword to a finishing attribute in the AIX shell script. The selected JCL parameter you specify in OS/390 maps to the InfoPrint Manager **pdpr** finishing attribute.
- Use the existing form definition JCL keyword to form definition attribute mapping. The JCL FORMDEF parameter you specify in OS/390 maps to the InfoPrint Manager **pdpr** form definition attribute.
- Specify a default form definition or finishing attribute so all jobs have the same finishing option.

Using InfoPrint Manager hot folders
An InfoPrint Manager hot folder is a directory that is associated with a logical destination. When you copy or move a file to the hot folder, InfoPrint Manager automatically submits the file to that logical destination. The default job and document finishing attributes that are set for the logical destination are applied to jobs submitted through the hot folder. You can also specify other finishing attributes or use different values for existing attributes. For instructions on using hot folders refer to "Setting up hot folders to submit jobs" in *InfoPrint Manager for AIX: Getting Started*.

Using InfoPrint Manager LPD and an LPR client
The InfoPrint Manager Line Printer Daemon (LPD) is a utility that lets you submit print jobs from other operating systems using a Line Printer (LPR) client. To submit print jobs with finishing to the InfoPrint Manager LPD, you must use an LPR client, such as **lprafp**, that lets you use –o options to specify advanced printing options (for example, form definitions and page definitions) when you submit jobs to InfoPrint Manager. You can either specify finishing attributes on the submission command or use a default job.

Selecting the correct finishing options

In InfoPrint Manager, the finishing options have very descriptive names so that it is easy to choose the one you want for your job. However, the names of those options are based on print jobs that use the "portrait" orientation, and as a result are misleading for jobs that printed in the "landscape" orientation. In addition, some of the options are valid if the paper is fed through the printer long edge first (LEF) and not valid if the paper is fed short edge first (SEF), and vice versa. As a result, choosing the correct finishing option can be confusing. The tables below can help you determine which option to choose based on how you want your job to be finished.

Paper fed LEF

Table 44. Options to set for paper fed LEF for the InfoPrint 70

Desired output	Select this value for "portrait" jobs	Select this value for "landscape" jobs
One staple in the upper left corner	staple top left	staple bottom left
One staple in the upper right corner	Not supported	staple top left
One staple in the bottom left corner	staple bottom left	Not supported
More than one staple on the left edge of the paper	edge stitch, OR edge stitch left	Not supported
More than one staple on the top edge of the paper	Not supported	edge stitch OR edge stitch left

Paper fed SEF

Table 45. Options to set for paper fed SEF for the InfoPrint 70

Desired output	Select this value for "portrait" jobs	Select this value for "landscape" jobs
One staple in the upper left corner	staple top left	Not supported
One staple in the upper right corner	staple top right	staple top left
One staple in the bottom right corner	Not supported	staple top right
More than one staple on the right edge of the paper	Not supported	edge stitch OR edge stitch top
More than one staple on the top edge of the paper	edge stitch OR edge stitch top	Not supported

Staple positions for InfoPrint 2085 and InfoPrint 2105

Table 46. Staple positions for InfoPrint 2085 and InfoPrint 2105 mapped to InfoPrint Manager values

InfoPrint Manager value	Staple Position	
	Portrait	Landscape
staple-top-left	top left	top right
staple-bottom-left	bottom left	top left
staple-top-right	not supported	not supported
staple-bottom-right	not supported	not supported
edge-stitch	left edge	top edge

edge-stitch-2	not supported	not supported
edge-stitch-3	not supported	not supported
edge-stitch-left	left edge	top edge
edge-stitch-right	not supported	not supported
edge-stitch-top	not supported	not supported
edge-stitch-bottom	not supported	not supported
saddle-stitch	not supported	not supported

Staple positions for InfoPrint 2060ES, InfoPrint 2075ES, and InfoPrint 2090ES

Table 47. Staple positions for InfoPrint 2060ES, InfoPrint 2075ES, and InfoPrint 2090ES mapped to InfoPrint Manager values

InfoPrint Manager value	Staple Position	
	Portrait	Landscape
staple-top-left	top left	top right
staple-bottom-left	bottom left	top left
staple-top-right	not supported	not supported
staple-bottom-right	not supported	not supported
edge-stitch	left edge	top edge
edge-stitch-2	not supported	not supported
edge-stitch-3	not supported	not supported
edge-stitch-left	left edge	top edge
edge-stitch-right	not supported	not supported
edge-stitch-top	not supported	not supported
edge-stitch-bottom	not supported	not supported
saddle-stitch	not supported	center

Note: The InfoPrint Manager value **saddle-stitch** means *staple down the center*. With the InfoPrint 2060ES, InfoPrint 2075ES, and InfoPrint 2090ES, printers, **saddle-stitch** is only supported for sheets in the landscape orientation, and if this is specified along with bin 3, the sheets are sent to the BookletMaker.

Staple positions for InfoPrint 2105ES

Table 48. Staple positions for InfoPrint 2105ES mapped to InfoPrint Manager values

InfoPrint Manager value	Staple Position	
	Portrait	Landscape
staple-top-left	top left	top right
staple-bottom-left	bottom left	top left
staple-top-right	not supported	not supported
staple-bottom-right	not supported	not supported
edge-stitch	left edge	top edge

Table 48. Staple positions for InfoPrint 2105ES mapped to InfoPrint Manager values (continued)

edge-stitch-2	not supported	not supported
edge-stitch-3	not supported	not supported
edge-stitch-left	left edge	top edge
edge-stitch-right	not supported	not supported
edge-stitch-top	not supported	not supported
edge-stitch-bottom	not supported	not supported
saddle-stitch	not supported	not supported

Chapter 35. Other procedures

Turning duplexing on and off for the InfoPrint 45 and InfoPrint 70

If your printer has the capability to duplex and has an option on the console to turn it on and off, you should understand the hierarchy of duplex processing options based on your selections.

The InfoPrint 45 and InfoPrint 70 can produce either simplex (single-sided) or duplex (double-sided) output. You can turn the duplex option **ON** or **OFF** at the printer console, depending upon what type of output you need. However, you can also turn duplexing on and off using the **sides** attribute in InfoPrint Manager. If you use InfoPrint Manager to turn duplexing on or off, the InfoPrint Manager setting will override the setting on the printer.

You can set the **sides** attribute on a document, default document, or an actual destination. You can also specify **duplex** or **simplex** in a form definition (formdef). If you set the attribute in a document, that setting overrides the value in the formdef. The formdef overrides the setting on the default document, which overrides the setting on the actual destination. All of these settings override the setting on the printer console.

Important: The default value of the **sides** attribute on all three objects (document, default document, and actual destination) is **Use default**. When InfoPrint Manager encounters that value, it considers the attribute "not set" and looks to the next item in the priority list to see if **sides** is set there. InfoPrint Manager keeps going down the list until it finds a value to use.

Some examples of this behavior include:

- You turn duplexing **OFF** at the console of your InfoPrint 45. Then, you submit a job to your InfoPrint 45 through InfoPrint Manager. The job uses a formdef that requests duplex printing. The **sides** attributes on the document, default document, and actual destination are set to **Use printer default**.

  InfoPrint Manager looks at the **sides** attribute on the document, and considers it "not set," so it looks at the formdef. The job prints duplex.

- You turn duplexing **OFF** at the console of your InfoPrint 70. Then, you use InfoPrint Submit Express to send a job with **Sides** set to duplex, and don't use a formdef. The **sides** attributes on the default document is set to **Use printer default** and on the actual destination is set to **1**.

  InfoPrint Manager looks at the **sides** attribute on the document, and sees that InfoPrint Submit Express sets it to **2**. InfoPrint Manager ignores all of the other values and the job prints duplex.

For additional information about the sides attribute, refer to the *InfoPrint Manager: Reference*, "Attributes for documents and default documents" in Chapter 3.

Submitting a job to a DocuTech Model 135 printer

To send jobs to your networked DocuTech system, you must first create a BSD destination on your AIX server. Once this is done, you can submit the job through InfoPrint Manager and release it for printing using your local DocuTech procedures.

Create a BSD destination for the DocuTech 135 printer

Using the InfoPrint basic administrator's GUI, do the following:

1. Drag the BSD template from the Types column in the template area, and drop it on the Actual Destinations pane. You will be prompted to select the server that will contain the actual destination.

2. Fill in the required information fields. Physical printer name is a name you determine, and the command will be as follows: **/usr/lpd/rembak -S docu1 -P docutech135** where **-S** is the name of the remote print server where the job will be sent, and where **-P** is the name of the queue on the remote print server where the job will be sent.

3. Select the **OK** button. InfoPrint creates a new actual destination using the information you supplied. It also creates a new logical destination and new default job. The new default job is associated with the new logical destination and requests the actual destination.

4. Enable the actual destination and logical printer.

Submit a job to the Docutech 135 printer

Use a familiar print submision mechanism such as InfoPrint Select or the **pdpr** command to submit the job to the logical destination you just created.

For example, **pdpr -pyuma-lp /bin/test.ps** could be used to route a test job to a logical printer named yuma-lp.

Note: The job will appear briefly in the jobs window and will be spooled to the Docutech server.

Release the job from the Docutech 135 server interface and printer console

1. Access the list of queued jobs, and the file you submitted should display in the refreshed list. From the server window, release the job for printing. Job status for each released job will display as the file is released.

2. Now on the DocuTech console, open the printer queue by clicking on its icon, and open the Job File list. The new job appears in the Job File list.

3. Click on the job and move or copy the file to the printer queue. Your InfoPrint manager job will then print on the DocuTech printer.

Supporting status information for InfoPrint Network and HP printers

Network printers

If you have InfoPrint network printers in your InfoPrint Manager environment, be sure to install the current version of the InfoPrint network printer drivers in order to take advantage of InfoPrint Manager's messaging support.

HP printers

If you have HP printers that you have already configured in InfoPrint Manager, you will need to change the **destination-command** attribute to use the **pioinfo** backend program rather than the **piojetd** backend program.

The necessary command is:

```
pdset -cde -x "destination command='/usr/lpd/pio/etc/pioinfo ipaddr'"
```

where *ipaddr* is the ip address or host name of the printer.

Stopping, restarting, or pausing a job that is currently printing

Use this procedure if you want to stop printing a job and start printing it again or if you want to stop printing a job, move it to a different printer, and start printing again. If you are printing an AFP print job, you can also use this procedure to stop printing a job and start it again from any page in the job, not just from the beginning.

This procedure does NOT stop the printer; it only stops the job you select.

Once the job is stopped, the next job in the queue will start to print. If you need to stop the printer (for example, to replace toner), use the procedure "Stopping a printer to perform scheduled maintenance" on page 428.

Note: Refer to the online help in the InfoPrint Manager GUI if you need instructions on completing any of these steps.

When you use the "Stopping the job" procedure, InfoPrint Manager considers the job cancelled and does not collect any checkpoint information about the job. Unless the operator changes the page range before releasing the job to print again, the job restarts printing at page 1. Be sure to remember any n-upping associated with the job when selecting the page range so that the pages are placed into the correct partition in relation to each other. You may want to use this procedure when you realize that a job has started to print on the wrong form.

Stopping the job

1. Open the InfoPrint Manager Operations GUI or the InfoPrint Manager Administration GUI.
2. In the GUI, find the job that you want to stop and select it.
3. Click **Job ➔ Hold**.

   Note: If the **Hold** item doesn't appear in the **Job** menu, use **Add/Remove Menu Items** to add it.
4. Click **OK**.

The job stops printing, the icon changes to black, and the job is listed in the job window of the main InfoPrint Manager GUI window.

Restarting the job

Use this procedure if you want to do one of the following:
- Print the entire job on the same printer it was printing on before.
- Print the entire job on a different printer.
- Print part of the job (such as page one to page fifty, or page twelve to the end).

  Important:
  - When you use **Job → Hold**, the job information resets to the beginning of the job. Checkpoint information is not stored.
  - You can only start printing in the middle of the job if the job is transformed into AFP before it gets printed. You cannot print part of an ASCII, KGL, metacode, or LCDS job; you have to print the whole job.
  - You can only start printing in the middle of the job if the job has only one printable document. If it has more than one printable document, you either have to print the whole job or use spacing to skip a section of the job. Refer to the "Moving backward or forward in a job that is currently printing" on page 426 for instructions on spacing.

    If you submitted this job using DPF from a host system, you can start printing from any page in the job, but InfoPrint Manager ignores any value you enter for the end page. You will always print to the end of the job.

    Note: Spacing will only work if you send the job to a PSF DSS printer.
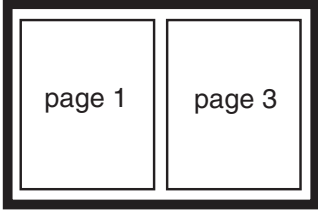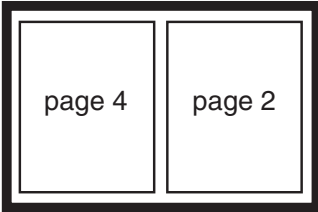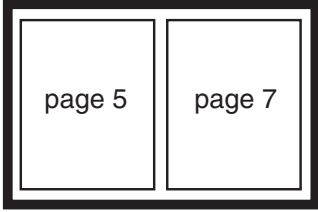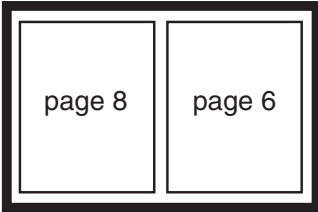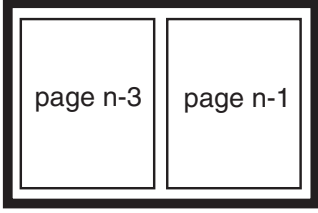
To restart the print job:
1. If you want to print the entire job on the same printer it was printing on before, select the job in the job window and click **Job → Release**. The job will start printing from the first page.
2. If you want to print the entire job on a different printer, skip to **Before you Continue** between steps 8 and 9 below.
3. If you only want to print part of the job, figure out what page you want to start printing from.

   Important: If you don't want to start printing from the first page of the job, be careful when you choose which page to start with. Duplex and n-up jobs can be confusing because you have to start printing with the **first** page on the **front** side of the sheet of paper. If you don't choose the correct start page, the job will print, but the sequence will probably be wrong.

   For example, if you are printing a 2–up duplex job, each sheet of paper actually has four pages printed on it, like this:

Table 49. 2–up duplex print job: front and back views

	Front of sheet	Back of sheet
Sheet one	page 1 page 3	page 4 page 2
Sheet two	page 5 page 7	page 8 page 6
Last sheet	page n-3 page n-1	page n page n-2

Since you have to start printing this job at the first page on the front side, you can choose page one or page five (or any other page that would fall in that position). If you choose a different page, the sequence of pages will be wrong, and the job won't print correctly.

4. Figure out what page you want to stop printing on (if you don't want to print all the way to the end of the job).

   You don't have to be as precise on the last page to print; the last page can be in any location on the sheet of paper.

5. Select the job you want to print.

6. With the job selected, click **Job → Change Page Range to Process**.

   If you don't see the **Change Page Range to Process** item in the **Job** menu, use **Add/Remove Menu Items** to add it.

7. In the **Change Page Range to Process** dialog, select **Range of Pages** and type the start page and end page you figured out above.

   Note: If you submitted this job using Distributed Print Facility (DPF), InfoPrint Manager ignores the end page that you specify. DPF jobs always print from the start page you specify to the end of the job.

8. Click **OK**.

   Before you continue:

   You should only move a job to an InfoPrint printer that uses the same destination support system (DSS) as the one the job was originally submitted to. If you move the job to a printer that uses a different DSS and the new printer doesn't support all of the attributes of the job, the job will fail to print. To check which DSS your InfoPrint printer uses, do the following.

   a. Select the printer in the tree view of the Main window of the InfoPrint Manager GUI.

b. See if the **Type** column appears in the details view. The **Type** column displays the DSS that the InfoPrint printer uses.

c. If you don't see the **Type** column, use **Add/Remove menu items** to add it.

Continue with step 9.

9. Select the job again and click **Job → Move job**.

10. In the **Move Jobs** dialog, select the printer that you want to print the job on. You can choose the same printer it was printing on before or a different one.

When you release the job in step 12 below, if the job is accepted it will go back into the queue and wait to be printed. Depending on how many jobs are ahead of it in the queue, it may take a while for the job to print. If you want the job to print right away, you can either move it to the top of the queue (so it prints next) or you can change its priority (so it prints sooner, but not necessarily next).

11. To move the job to the top of the queue, select the job in the InfoPrint Manager GUI and use the **Make Job First** task. To change the priority of the job, use the **Change Priority** task.

12. Select the job in the job window and click **Job → Release**.

   Note: If the task you want to use doesn't appear in the menu, use **Add/Remove menu items** to add it.

Pausing a job that's printing

1. Open the InfoPrint Manager Operations GUI or the InfoPrint Manager Administration GUI.

2. Find the job that you want to pause and select it.

3. Click either **Job → Pause → Now** or **Job → Pause → After current copy**.

   Note: If the **Pause** item doesn't appear in the **Job** menu, use **Add/Remove Menu Items** to add it.

4. Click **OK**.

   The job will stop printing, the icon will change to black, and the job will be listed in the job window of the main InfoPrint Manager GUI window.

5. To resume the printing of this job, click **Job → Resume**.

Pausing and restarting an actual destination

Use these procedures to pause and restart an actual destination. You may want to pause an actual destination when you are printing a long job, so that you can perform maintenance on the printer.

Pausing an actual destination

1. Open the InfoPrint Manager Operations GUI or the InfoPrint Manager Administration GUI.

2. In the GUI, find the actual destination you want to pause.

3. Right click on the actual destination, and select **Stop** or left click on the actual destination and then left click on the icon on the toolbar.

   Note: If the **Stop** action does not appear on the menu or toolbar, use the **Customize** dialog to add the action.

4. Choose from the following options:

- Select **Now** to pause the actual destination
- Select **After current copy** to pause the actual destination after the current copy has finished printing.
- Select **After current job** to pause the actual destination after the current job has finished printing.

5. Click **OK**.

The actual destination stops printing, and the jobs processing on the actual destination stay in the same state until the actual destination starts again..

Resuming the actual destination

To resume the actual destination:

- In the GUI, right-click on the actual destination and select the **Resume** action.

- Select the actual destination and left-click on the icon on the toolbar.

Interrupting and restarting a job that is currently printing on an InfoPrint 4000/4100

Use this procedure:

- If you want to interrupt the job that is currently printing and start printing it again
- If you want to interrupt the job that is currently printing, print another job, and then start the job that you interrupted.
- If you want to interrupt the job that is currently printing, move the job to a different printer, and start printing the job again.

This procedure does NOT stop the printer; it only stops the job that is currently printing. Other jobs continue to print on this printer.

Once the job is stopped, the next job in the queue will start to print. If you need to stop the printer (for example, to replace toner), use the procedure "Stopping a printer to perform scheduled maintenance" on page 428.

Note: Refer to the online help in the InfoPrint Manager GUI if you need instructions on completing any of these steps.

When you use the "Interrupting a job that is currently printing" procedure, the job fills a physical sheet, stops, and prints a message after the last page indicating the number of the last (AFP) page printed. The job shows on the GUI as **Paused**. When the job restarts, it starts on the **next** page of the job in the next logical partition. InfoPrint Manager prints a message at the end of the restarted section of the job indicating the page on which the printing started. You may want to use this procedure if you are printing a very long job, and you need to print another, more urgent job immediately.

Interrupting a job that is currently printing

1. Open the InfoPrint Manager Operations GUI or the InfoPrint Manager Administration GUI.
2. In the GUI, find the printer where the currently printing job is, and select it.

3. Right click on the printer, and select **Interrupt Printing Job** or left click on the printer and then left click on the icon on the toolbar.

   Note: If the **Interrupt Printing Job** action does not appear on the Printer menu or toolbar, use the **Customize** dialog to add the action.

4. Choose from the following options:
   - Select **Now** to interrupt the job as soon as possible
   - Select **After current copy** to interrupt the job after the current copy has finished printing.

5. Click **OK**.

   The job that is currently printing stops printing, its icon changes to black, and the job is listed in the job window of the main InfoPrint Manager GUI window. Other jobs continue to print on this printer.

Restarting the interrupted job

To restart the interrupted print job:
- In the GUI, right-click on the interrupted job and select the **Resume** action.
- Select the job and left-click on the

   icon on the toolbar.

Moving backward or forward in a job that is currently printing

In InfoPrint Manager, moving from page to page in a job is called *spacing the printer*:
- *Forward spacing* is moving to a point later in the job (such as skipping from page 10 to page 15).
- *Backspacing* is moving to a point earlier in the job (such as backing up from page 40 to page 20).

Spacing a printer

Things to remember:
- **You can only space a printer that uses the PSF Destination Support System (DSS) and one of the following attachment types:**
  - PSF TCP/IP
  - PSF BSD
  - PSF Other

  To see what DSS your printer uses, do the following:
  1. Select the printer in the tree view of the Main window of the InfoPrint Manager GUI.
  2. See if the **Type** column appears in the details view. The **Type** column displays the DSS that the InfoPrint printer uses.
  3. If you don't see the **Type** column, use **Add/Remove menu items** to add it.
- **You can only space a printer after a job has already started to print.**

If you only want to print a section of a job (such as page 11 to page 20) or if you want to start printing from a page other than the first page of the job, use the **Change Page Range to Process** task in the InfoPrint Manager GUI.

- **Spacing works better on high-speed printers than on low speed printers.**

  While spacing is supported on all printers that you print to using the PSF DSS, it is very difficult to space printers that print 40 pages per minute (ppm) or less. Spacing works adequately on printers that print between 60 and 100 ppm, and works very well with high-speed InfoPrint printers that are configured correctly.

- **The InfoPrint 2000, InfoPrint 3000, InfoPrint 4000, and InfoPrint 4100 printers require additional configuration for spacing to work efficiently.**

  Refer to the **Setting up high speed printers for spacing** topic for instructions on configuring your printer.

- **Page numbers refer to pages of the print job, not necessarily to any page numbers in your document.**

  For example, in a book, the first page of chapter one is usually "page 1." However, it might be page 15 of the print job, because of the title page, credits, and table of contents.

- **You cannot space to the back side of a sheet of paper.**

  If you are printing a duplex job, you will always print both the front and back sides of the sheet of paper that you space to.

To space a printer, do the following:

1. Start the InfoPrint Manager GUI.
2. In the GUI, find the InfoPrint printer that you need to space.
3. Select the InfoPrint printer by clicking on it, then click **Printer ➜ Stop**.

   Note: If you don't see **Stop** in the menu, use **Add/Remove menu items** to add it.

4. In the **Stop** *printer_name* dialog, select **Pause** and **Now**, and click **OK**.

   Even though you selected **Now**, the printer will keep printing for a while because it has to get to a point in the job where it can stop. For InfoPrint 2000, InfoPrint 3000, and InfoPrint 4000 printers that are configured correctly, you shouldn't have to wait more than 10 seconds. For other printers, you may have to wait longer.

5. Once the printer has stopped printing, look at the last sheet that printed. Write down the number of that sheet of the job.
6. Figure out what sheet of paper in the job you want to space to. Write down the number of that sheet of the job.
7. Figure out the number of sheets of paper you need to space.

   - To **forward space** the printer:

     Subtract the number of the sheet that printed last (from step 5) from the number of the sheet that you want to skip to (from step 6), and then subtract one. Like this:

     (number from step 6) – (number from step 5) – 1 = number of sheets to skip

   - To **backspace** the printer:

     Subtract the number of the sheet that you want to go back to (from step 6) from the page that printed last (from step 5), and add one (for the current page). Like this:

     (number from step 5) – (number from step 6) + 1 = number of sheets to back up

8. Determine the number of "sides" to space the printer.
   - If you are printing a simplex job, the number of sides is the same as the number of sheet from step 7 on page 427.
   - If you are printing a duplex job, multiply the number from step 7 on page 427 by two to get the number of sides. (number from step 7 on page 427 x 2 = number of sides)
9. In the InfoPrint Manager GUI, find the printer you want to space and select it.
10. With the printer selected, click **Printer → Space**.
11. In the **Space** *printer_name* dialog, select **Backspace** or **Forward space** and type the number of sides you found in step 8.
12. Click **OK**.
13. Make sure the printer is still selected and click **Printer → Resume** to start the printer again.

Stopping a printer to perform scheduled maintenance

Use this procedure to stop a printer so you can perform routine maintenance, such as updating the microcode, changing paper, or cleaning the printer. While you have the printer stopped, InfoPrint Manager will not be able to send or schedule jobs to it. This procedure will work for printers that use any DSS.

1. Open the InfoPrint Manager Operations GUI or the InfoPrint Manager Administration GUI.
2. In the GUI, find the printer that you want to stop and select it.
3. Use **Printer—>Disable** to disable the printer.

   The InfoPrint printer will stop accepting jobs, but the printer will not stop printing immediately. All of the jobs that were in the **processing** state before you disabled the printer will print before it stops.
4. After the printer stops printing, you can perform whatever maintenance you need to.
5. When you are finished and the printer is ready to receive jobs again, go back to the InfoPrint Manager GUI.
6. Find the printer in the GUI and select it.
7. Use the GUI to enable the printer again.

   The printer will be available to accept and print jobs again.

Fixing a printer problem and starting to print again

Use this procedure when the printer stops printing because of a paper jam, "out of paper" error, or for some other reason.
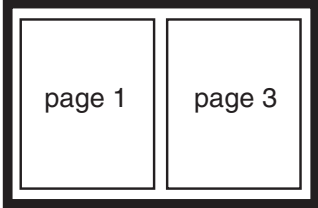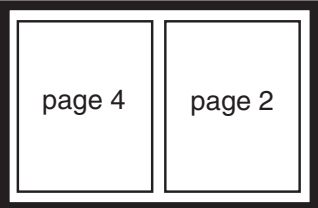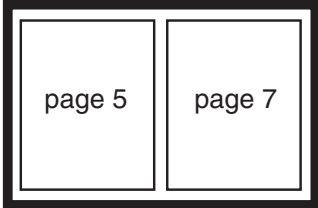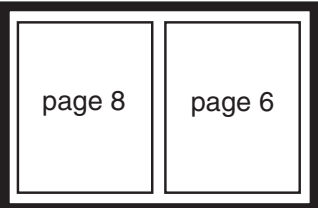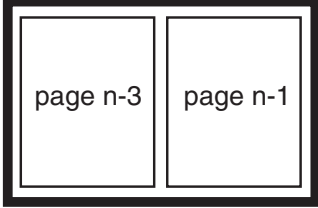
Note: Refer to the online help in the InfoPrint Manager GUI if you need instructions on completing any of these steps.

1. If you want to print the entire job on the same printer it was printing on before, select the job in the job window and click **Job → Release**. The job will start printing from the first page.
2. If you want to print the entire job on a different printer, skip to **Before you Continue** between steps 8 and 9 below.
3. If you only want to print part of the job, figure out what page you want to start printing from.

Important: If you don't want to start printing from the first page of the job, be careful when you choose which page to start with. Duplex and n-up jobs can be confusing because you have to start printing with the **first** page on the **front** side of the sheet of paper. If you don't choose the correct start page, the job will print, but the sequence will probably be wrong.

For example, if you are printing a 2–up duplex job, each sheet of paper actually has four pages printed on it, like this:

Table 50. 2–up duplex print job: front and back views

	Front of sheet	Back of sheet
Sheet one	page 1 page 3	page 4 page 2
Sheet two	page 5 page 7	page 8 page 6
Last sheet	page n-3 page n-1	page n page n-2

Since you have to start printing this job at the first page on the front side, you can choose page one or page five (or any other page that would fall in that position). If you choose a different page, the sequence of pages will be wrong, and the job won't print correctly.

4. Figure out what page you want to stop printing on (if you don't want to print all the way to the end of the job).

    You don't have to be as precise on the last page to print; the last page can be in any location on the sheet of paper.

5. Select the job you want to print.

6. With the job selected, click **Job → Change Page Range to Process**.

    If you don't see the **Change Page Range to Process** item in the **Job** menu, use **Add/Remove Menu Items** to add it.

7. In the **Change Page Range to Process** dialog, select **Range of Pages** and type the start page and end page you figured out above.

    Note: If you submitted this job using Distributed Print Facility (DPF), InfoPrint Managerignores the end page that you specify. DPF jobs always print from the start page you specify to the end of the job.

8. Click **OK**.

Before you continue:

You should only move a job to an InfoPrint printer that uses the same destination support system (DSS) as the one the job was originally submitted to. If you move the job to a printer that uses a different DSS and the new printer doesn't support all of the attributes of the job, the job will fail to print. To check which DSS your InfoPrint printer uses, do the following.

a. Select the printer in the tree view of the Main window of the InfoPrint Manager GUI.

b. See if the **Type** column appears in the details view. The **Type** column displays the DSS that the InfoPrint printer uses.

c. If you don't see the **Type** column, use **Add/Remove menu items** to add it.

Continue with step 9.

9. Select the job again and click **Job → Move job**.

10. In the **Move Jobs** dialog, select the printer that you want to print the job on. You can choose the same printer it was printing on before or a different one.

    When you release the job in step 12 below, if the job is accepted it will go back into the queue and wait to be printed. Depending on how many jobs are ahead of it in the queue, it may take a while for the job to print. If you want the job to print right away, you can either move it to the top of the queue (so it prints next) or you can change its priority (so it prints sooner, but not necessarily next).

11. To move the job to the top of the queue, select the job in the InfoPrint Manager GUI and use the **Make Job First** task. To change the priority of the job, use the **Change Priority** task.

12. Select the job in the job window and click **Job → Release**.

    Note: If the task you want to use doesn't appear in the menu, use **Add/Remove menu items** to add it.

Try this first

"Out of paper" errors and some paper jams are easy to recover from. Most of the time, you don't have to do anything to InfoPrint Manager to fix them; InfoPrint Manager just waits until the printer is ready to print again. While it is waiting, InfoPrint Manager continues to accept jobs and schedule them to the printer.

If the printer stops printing because of a problem, first try the following.

1. Check the printer.
   - If a lot of pages of the job are ruined and need to be reprinted, stop here. Don't finish this procedure. Use the "Fixing more complicated problems" on page 431 procedure below instead.
   - Otherwise, load paper if the bins are empty or clear paper jams as the printer console indicates. Once everything is clear, the printer should reset itself and continue sending jobs. InfoPrint Manager should pick up where it left off.

2. Find the printer in the InfoPrint Manager GUI. Make sure that its status is **ready**. If it is not, select the printer and use the GUI to enable it.

3. If just a few pages of the print job need to be printed again, the easiest thing to do is to resubmit the job and print just those pages. You can only print part of the job if you are using the PSF DSS and if the job will be transformed to AFP before it is printed.

Fixing more complicated problems

Use this procedure when the problem is more difficult to fix or if you have to reprint numerous pages of a job.

1. Open the InfoPrint Manager GUI.
2. Find the InfoPrint Manager printer (also called an actual destination) that sends jobs to that printer and select it.
3. Use the GUI to disable the printer.

   The printer won't be able to accept any print jobs until you enable it again.
4. If the printer stopped printing in the middle of a job, find that job in the GUI and select it.
5. With the job selected, click **Job → Hold**.

   Note: If the **Hold** item doesn't appear in the **Job** menu, use **Add/Remove Menu Items** to add it.
6. Click **OK**.

   The job will stop printing, the icon will change to black, and the job will be listed in the job window of the main InfoPrint Manager GUI window.
7. Decide what you want to do with any other jobs that are in the queue waiting for this printer. Some of the options are:
   - Leave them in the queue, so they print when you enable the printer again. If you can fix the problem quickly, this option is the easiest one. In addition, if your printers are pooled, the other printers will take care of all of the jobs until this one is ready.
   - Move them to a different printer so they can be scheduled to print while you are working on this one.
   - Delete them. You should only consider this option if it is easier to resubmit the jobs than to use other methods to recover them.
8. Fix the problem at the printer.

   Once the problem is fixed, the printer may start to print again, just to clear the pages that were in the buffer before you disabled it and deleted the job. If any other jobs were in **processing** state when you disabled the printer, they will print as well.
9. Go back to the InfoPrint Manager GUI, find the InfoPrint printer again, and select it.
10. Use the GUI to enable the printer.

    The printer will be available to accept jobs again. If you left jobs in the queue, the printer should start accepting and printing them.

Restarting the job that was printing when the problem occurred

You can either:
- Start the job from the beginning.
- Start the job from a point before the problem occurred (so the ruined pages get printed).

  Important:
  - You can only start printing in the middle of the job if the job is transformed into AFP before it gets printed. You cannot print part of an ASCII, KGL, metacode, or LCDS job; you have to print the whole job.

– You can only start printing in the middle of the job if the job has only one printable document. If it has more than one printable document, you either have to print the whole job or use spacing to skip a section of the job. Refer to the **Moving backward or forward in a print job that's already printing** topic for instructions on spacing.
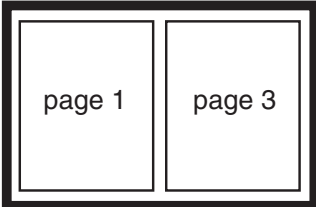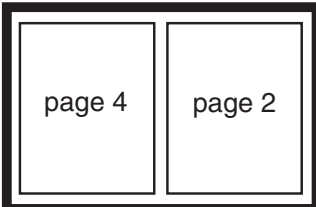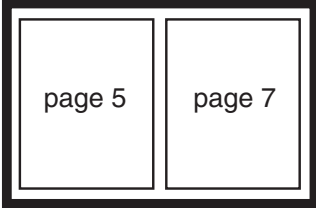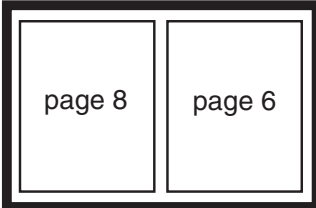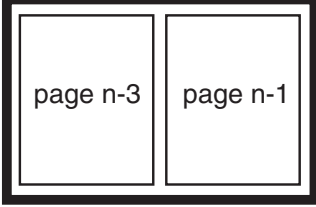
Note: Spacing will only work if you send the job to a PSF DSS printer.

1. If you want to print the entire job on the same printer it was printing on before, select the job in the job window and click **Job → Release**. The job will start printing from the first page.

2. If you want to print the entire job on a different printer, skip to **Before you Continue** between steps 8 and 9 below.

3. If you only want to print part of the job, figure out what page you want to start printing from.

Important: If you don't want to start printing from the first page of the job, be careful when you choose which page to start with. Duplex and n-up jobs can be confusing because you have to start printing with the **first** page on the **front** side of the sheet of paper. If you don't choose the correct start page, the job will print, but the sequence will probably be wrong.

For example, if you are printing a 2–up duplex job, each sheet of paper actually has four pages printed on it, like this:

Table 51. 2–up duplex print job: front and back views

	Front of sheet	Back of sheet
Sheet one	page 1 page 3	page 4 page 2
Sheet two	page 5 page 7	page 8 page 6
Last sheet	page n-3 page n-1	page n page n-2

Since you have to start printing this job at the first page on the front side, you can choose page one or page five (or any other page that would fall in that position). If you choose a different page, the sequence of pages will be wrong, and the job won't print correctly.

4. Figure out what page you want to stop printing on (if you don't want to print all the way to the end of the job).

   You don't have to be as precise on the last page to print; the last page can be in any location on the sheet of paper.

5. Select the job you want to print.

6. With the job selected, click **Job → Change Page Range to Process**.

   If you don't see the **Change Page Range to Process** item in the **Job** menu, use **Add/Remove Menu Items** to add it.

7. In the **Change Page Range to Process** dialog, select **Range of Pages** and type the start page and end page you figured out above.

   Note: If you submitted this job using Distributed Print Facility (DPF), InfoPrint Managerignores the end page that you specify. DPF jobs always print from the start page you specify to the end of the job.

8. Click **OK**.

   Before you continue:

   You should only move a job to an InfoPrint printer that uses the same destination support system (DSS) as the one the job was originally submitted to. If you move the job to a printer that uses a different DSS and the new printer doesn't support all of the attributes of the job, the job will fail to print. To check which DSS your InfoPrint printer uses, do the following.

   a. Select the printer in the tree view of the Main window of the InfoPrint Manager GUI.

   b. See if the **Type** column appears in the details view. The **Type** column displays the DSS that the InfoPrint printer uses.

   c. If you don't see the **Type** column, use **Add/Remove menu items** to add it.

   Continue with step 9.

9. Select the job again and click **Job → Move job**.

10. In the **Move Jobs** dialog, select the printer that you want to print the job on. You can choose the same printer it was printing on before or a different one.

    When you release the job in step 12 below, if the job is accepted it will go back into the queue and wait to be printed. Depending on how many jobs are ahead of it in the queue, it may take a while for the job to print. If you want the job to print right away, you can either move it to the top of the queue (so it prints next) or you can change its priority (so it prints sooner, but not necessarily next).

11. To move the job to the top of the queue, select the job in the InfoPrint Manager GUI and use the **Make Job First** task. To change the priority of the job, use the **Change Priority** task.

12. Select the job in the job window and click **Job → Release**.

    Note: If the task you want to use doesn't appear in the menu, use **Add/Remove menu items** to add it.

Part 4. Appendixes

Appendix A. IPDS print operator commands

InfoPrint Manager offers a comprehensive set of operator commands that can be used to manage printing on IPDS printers. These commands can be used to help manage printing priorities and also help by providing the operator with functions that are useful when dealing with problems that may occur in the printing system. This table describes several of the most commonly used operator tasks, and their corresponding commands. For more information, refer to the .

	Task	Description	InfoPrint Manager Command Syntax
1	Disable	Stop a printer from receiving new jobs.	*pddisable -cd dest* where *dest* specifies either a logical or an actual destination (printer) object.
2	Enable	Allow a printer to receive new jobs.	*pdenable -cd dest* where *dest* specifies either a logical or an actual destination (printer) object.
3	Query active job	Query which job is actively printing on a printer **Notes:** The query response is based on the last set of station counters obtained from the printer, which is printing pages continuously. To get an absolutely accurate query you must: • Pause the printer (7) • Issue the query • Resume the printer (11).	*pdls -f "destination-name-requested==ldest && current-job-state==printing" server:* where *server* specifies the InfoPrint AIX server to which the job was submitted, and *dest*specifies the actual destination (physical printer).
4	Query page number	Query the page number of the currently printing page. Refer to **Note** after (3).	*pdls -cj -r current-page-printing jobid* where *jobid* specifies the **job-identifier** attribute. we recommend using the global ID, which follows the convention *server*:0123456789 where *server* specifies the name of the InfoPrint AIX server to which this job was submitted and 0123456789 indicates a 10-digit numeric value assigned by the InfoPrint spooler. You can determine the **job-identifier** attribute value by specifying: *pdls -cj server:*
5	Query job details	Query the number of copies, sheets and pages stacked for a job. Refer to **Note** after (3).	*pdls -cj -r "job-copies-completed media-sheets-completed pages-completed" jobid* where *jobid* specifies the **job-identifier** attribute.
6	Clean	Remove all jobs from a printer.	*pdclean ldest* where *ldest* specifies the logical destination (logical printer).

	Task	Description	InfoPrint Manager Command Syntax
7	Pause printer	Pause a printer immediately.	*pdpause -cd dest* where *dest* specifies the actual destination (physical printer).
8	Pause printer	Pause a printer after the current copy completes.	*pdpause -cd -w after-current-copy dest* where *dest* specifies the actual destination (physical printer).
9	Pause printer	Pause a printer after the current job completes.	*pdpause -cd -w after-current-job dest* where *dest* specifies the actual destination (physical printer).
10	Resume printer	Resume a printer that had been paused.	*pdresume -cd dest* where *dest* specifies the actual destination (physical printer).
11	Cancel job	Cancel a specific job.	*pdrm jobid* where *jobid* specifies the **job-identifier** attribute.
12	Pause job	Pause a specific job after the current copy completes.	*pdpause -cj -w after-current-copy jobid* where *jobid* specifies the **job-identifier** attribute.
13	Pause job	Pause a specific job immediately.	*pdpause -cj jobid* where *jobid* specifies the **job-identifier** attribute.
14	Pause job	Pause the job that is currently printing immediately.	*pdpause -cd -j dest* where *dest* specifies the actual destination (physical printer).
15	Pause job	Pause the job that is currently printing after the current copy.	*pdpause -cd -j -w after-current-copy dest* where *dest* specifies the actual destination (physical printer).
16	Resume job	Resume a job that was paused.	*pdresume -cj jobid* where *jobid* specifies the **job-identifier** attribute.
17	Back space	Back space (reprint a specific number of sides) the job that is printing.	*pdspace -cd -b sidecount dest* where *dest* specifies the actual destination (physical printer).
18	Reprint	Reprint the job that is printing from the beginning.	*pdspace -cd -b -1 dest* where *dest* specifies the actual destination (physical printer).
19	Forward space	Forward space (skip a specific number of sides) the job that is printing.	*pdspace -cd -f sidecount dest* where *dest* specifies the actual destination (physical printer).

If one of these commands is received and it affects a job that has been sent or is in the process of being sent to the printer, InfoPrint Manager immediately stops sending data to the printer and sends the printer a command to stop printing (this applies to commands 7, 9, 10, 12-15).

For printers that support the SNMP Remote Operator interface, like the InfoPrint 4000, the printer will stop within a few seconds. For printers without this support, some pages will likely print before the printer stops.

The number of pages that print before the printer stops will vary depending on the number, size, and complexity of jobs that are in process as well as the speed and type of printer involved. Once the printer has stopped, InfoPrint Manager performs the steps necessary to execute the requested operator command.

Appendix B. IPDS error recovery

When driving an IPDS printer, InfoPrint Manager sends page and resource data to the printer. The printer reports status and errors back to InfoPrint Manager. The printer status information is in the form of station counters representing progress of pages sent to the device through the printer microcode and the physical printing mechanism. Station counters report the number of pages and the number of copies of pages proceeding through each point in the printer.

InfoPrint Manager requests printer status information (an acknowledgement request) after sending each job. The acknowledgement response contains the latest values of all the printer station counters. Once all pending jobs have been processed, InfoPrint Manager polls the printer periodically until all the pages of each job have been stacked.

The actual destination object **ack-interval** attribute is configurable and defines how often InfoPrint Manager requests updated station counters from the printer while processing a particular job. The value for this attribute is specified in terms of pages and can be from 1 to 9999; the default value is 100 pages. For a 360 page job, an **ack-interval** setting of 100 pages means that InfoPrint Manager will send an acknowledgement request to the printer after sending pages 100, 200, 300, and 360.

The printer responds to an acknowledgement request and returns station counters when all of the pages up to that point have been processed. This does not necessarily mean that all of those pages have printed or are stacked. The acknowledgement response from the printer after the 100th page will show that 100 pages have been processed (received). The printer may report, however, that only 10 pages have stacked.

The **ack-interval** value affects printing performance and the currency of job status information. A small **ack-interval** value causes increased communication and processing and can cause a reduction in printer throughput. A small **ack-interval** value will, however, increase the frequency that job attributes such as **current-page-printing**, **job-copies-completed**, **media-sheets-completed**, and **pages-completed** are updated. A small **ack-interval** value will also enable the InfoPrint Manager software to have more recent station counters than it would with a large **ack-interval** value.

Errors reported from the printer can be grouped into the following categories:
- "IPDS error recovery: Data stream errors"
- "IPDS error recovery: Insufficient memory in the printer" on page 443
- "IPDS error recovery: Intervention required conditions" on page 444
- "IPDS error recovery: Unrecoverable problems" on page 445

IPDS error recovery: Data stream errors

For data stream errors, the job may continue printing or the job may be terminated, depending on the severity of the error. There are hundreds of specific data stream errors. If one data stream error is defined for the error, InfoPrint Manager directs the printer to continue processing the page and take an alternate exception action.

When a data stream error occurs, messages are produced describing the problem and the recovery actions performed. The messages report details about the error and include the page number where the error occurred. After InfoPrint Manager receives a data stream error from the printer and produces a message, it uses station counters returned from the printer to continue printing without skipping or reprinting any pages.

Reporting of some data stream errors (for example, using undefined code points in a font or printing outside of the valid printable area) can be controlled with job attributes. This allows the job submitter to decide whether or not error messages or printer error marks should be generated when the following type of errors are encountered:

- "Data stream error example 1 (job continues printing):"
- "Data stream error example 2 (job is terminated, no pages print):"
- "Data stream error example 3 (job is terminated; some pages print):" on page 443

Interrupt Message Pages

If Interrupt Message Pages are activated, InfoPrint Manager will insert an IMP to mark the location of the error. See "Using Interrupt Message Pages" on page 109 for more information.

Data stream error example 1 (job continues printing):

If page 3 of a 10–page document attempts to print outside the valid printable area (an error) and the submitter specified (data-fidelity-problem-reported=all), the following occurs:

1. Pages 1-2 and 4-10 in the document print normally.
2. For page 3, the printer prints only the data that is inside the valid printable area. In addition, a printer error marker (PEM) is printed on the page where the print data extends outside the valid printable area.
3. After all 10 pages have printed, a set of messages is printed:

0420-094:	The following messages were generated for file /info/afp/baddata with Job ID 123. This file printed on the InfoPrint destination ip60, which is a 3160 destination.
0420-484:	The destination reported that an attempt was made to print outside of the valid printable area.
0420-249:	InfoPrint received IPDS exception X'08C1..00', action code X'01' from the destination.
0420-098:	The error occurred while printing page 3 of copy 1 of this print job.
0420-254:	The destination reported an error that caused InfoPrint to stop processing the page.

Data stream error example 2 (job is terminated, no pages print):

If a document is submitted and it requests a specific form definition which does not exist, the following occurs:

1. The document does not print. However, auxiliary sheets such as the start sheet (header) and end sheet (trailer) page, if requested, do print.

2. A message page will print with the following messages:

0420-094:	The following messages were generated for file /info/afp/testfdef with Job ID 456. This file printed on the InfoPrint destination ip60, which is a 3160 destination.
0420-128:	ERROR: InfoPrint cannot find or cannot access the FORMDEF resource named F1BAD.
0420-060:	The error occurred with the object type page with token name PAGE0001.
0420-060:	The error occurred with the object type document with token name ASCII.
0420-098:	The error occurred while printing page 1 of copy 1 of this print job.

Data stream error example 3 (job is terminated; some pages print):

If page 5 of a 10–page document requests a font (C0D0GT15) which cannot be located, the following occurs:

1. Pages one through four print; page five does not print. Printing of the document ends; pages 6 through 10 also do not print.
2. A message page will print with the following messages:

0420-094:	The following messages were generated for file /info/afp/long.list3820 with Job ID 167. This file printed on the InfoPrint destination psf4317, which is a 4317 destination.
0423-284:	InfoPrint mapped the FGID, GCSGID, width, vertical size combination: 230, 0, 96, 160 to the FCS name C0D0GT15. The FGID.GRD mapping file specified that this mapping be performed.
0423-291:	Map Coded Font (MCF) structured field could not be processed because InfoPrint could not locate the font character set C0D0GT15. Attempted resolution/type(s): 300-pel Font Fidelity for this job was CONTINUE. Destination supported resolution/type(s): 300-pel.
0420-060:	The error occurred with the object type Active Environment Group with token name 1.
0420-060:	The error occurred with the object type page with token name 1.
0420-060:	The error occurred with the object type document with token name LONG.
0420-098:	The error occurred while printing page 1 of copy 1 of this print job.
0423-302:	The font reference in the MCF1 structured field, repeating group number 1, with sequence number 1, at file offset 118, could not be processed successfully. Additional error and diagnostic messages follow.
0420-729:	The error occurred in file /info/afp/long.list3820. The structured field in error was structured field EAG with code X'D3A9C9' and sequence number 1 located at file offset 250.

IPDS error recovery: Insufficient memory in the printer

In some cases, a printer may not have sufficient storage to process the data or resources required for a page. When this occurs, InfoPrint Manager responds by deleting resources in the printer which are not required for the page and then tries to print the page again. Frequently, this recovery will allow the page to print successfully. If the printer still reports that there is insufficient storage to process

the page, the job is terminated and a message is produced indicating that the page and its associated resources are too complex.

Insufficient memory in the printer exmple:

A 30 page document is submitted. Each page of the document references several complex page segments.

1. InfoPrint Manager sends pages for the document to the printer.
   - Before each page is sent, InfoPrint Manager downloads page segments that are required by the page.
2. The printer reports an insufficient memory error to InfoPrint Manager (for page 23).
   - InfoPrint Manager deletes all the page segments (and any other resources) previously downloaded to the printer. All of the printer memory available for resources should now be free. InfoPrint Manager then attempts to load only the page segments required for page 23. Because unnecessary page segments have been removed from printer memory, all of the page segments for page 23 can be successfully downloaded into the printer. No messages are reported to the server and no message pages are printed.
3. All 30 pages of the job print successfully.

IPDS error recovery: Intervention required conditions

A printer may experience intervention required conditions that are not related to the data stream or complexity of the data. These conditions cause printing to stop. Some intervention required conditions are handled directly by some printers and are not reported back to InfoPrint Manager. In these cases, InfoPrint Manager continues to send data to the printer.

Example:

1. As soon as the paper jam occurs, printing stops and the destination (printer) object changes to red.
   - A message is sent to the operator:
     - `0420-466: The destination reported a paper jam; clear the jam.`
2. The actual destination (printer) object's destination-state changes to "needs key operator."
   - InfoPrint Manager waits until the paper jam has been cleared.
3. The operator then clears the paper jam, according to the printer jam recovery procedure. Some damaged pages are usually discarded as part of this procedure.
4. Once the printer jam is cleared, the destination (printer) object is no longer red. Using station counters from the printer, InfoPrint Manager repositions to the correct page and continues printing the document. If Interrupt Message Pages are activated, InfoPrint Manager will insert an IMP at this point to mark the location of the error. See "Using Interrupt Message Pages" on page 109 for more information.
5. At the end of the document, a message page is printed which contains the following:
   - 0420-094: The following messages were generated for file /info/paperjam with Job ID 787. This file printed on the InfoPrint destination ip32, which is a 4332 destination.

- 0420-467: A paper jam occurred in the destination while printing this job. Inspect the output to determine if it is complete and that all printed pages are acceptable.

IPDS error recovery: Unrecoverable problems

Unrecoverable problems cause the InfoPrint Manager software or printer software to stop functioning or prevent them from communicating with each other. Examples of unrecoverable errors include: server system crash, software core dump, printer abort, power failure, or severe network problems.

These errors prevent the InfoPrint Manager software from obtaining current station counter status information from the printer. In these cases, InfoPrint Manager cannot determine how many pages and which jobs printed since the last set of valid station counters were received. InfoPrint Manager considers a job complete only when all pages are reported by the printer as stacked. In most cases, some pages for one or more jobs will print between the time InfoPrint Manager last received a printer acknowledgment and the time the unrecoverable error occurs.

Those jobs, because they are considered incomplete, will normally start printing from the beginning when the problem is resolved and both the InfoPrint Manager software and the printer are operating and communicating again.

However, if the submitter or operator does not want the job to start printing from the beginning, there is a way to modify where printing starts for the documents in these jobs. The document object **page-select** attribute can be modified before the job is processed again. This attribute allows the submitter to specify a page range (first to last) for each document in a job. This way, the submitter or operator can control which pages are printed after the problem is resolved.

Depending on the type of error and the network configuration, some errors may not be reported to InfoPrint Manager immediately. In these cases, an operator can issue a **pdshutdown** command to the actual destination object. This command works without any attempts to communicate with the printer. InfoPrint Manager will checkpoint the job that was partially stacked at the printer and use the station counters from the last valid acknowledgment to determine which page of which job to checkpoint. A small **ack-interval** value will make it possible to checkpoint using a more recent set of station counters than would be available with a large **ack-interval** value. The job can be resumed later from that checkpoint.

Some unrecoverable errors are reported immediately to the InfoPrint Manager software and the actual destination object (printer) is disabled. When this occurs, the **pdshutdown** command cannot be issued and therefore no checkpoint can be taken. InfoPrint Manager does not perform automatic checkpointing.

Unrecoverable problem example:

1. The destination (printer) object becomes disabled and the icon changes to **black**.
2. The job object changes to the **pending** state.
3. Later, the printer power is restored.
4. The operator must enable the destination (printer) object.
5. Jobs start printing on the printer in the order they have been scheduled.

All 300 pages of the job that were printing during the power failure print again.

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- DB2
- DB2 Universal Database
- DFS
- DFSMSdfp
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- Definitions from *IBM Dictionary of Computing*.
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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)
> In computer security, a collection of all access rights for one object.
>
> 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)
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.

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 might 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
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.

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
The rendering of hard-edged objects so that they blend smoothly into the background. PhotoShop offers anti-aliasing when rasterizing an EPS file.

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 charactes and graphic characters.

asynchronous
Pertaining to two or more processes that do not depend upon the occurrence of specific events, such as common timing signals. (T)

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
A code representing characters by sets of parallel bars of varying thickness and separation that are read optically by transverse scanning.

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
The cover and materials that hold a book together. See *edition binding*, *perfect binding*, *spiral binding*, *wire-o binding*.

The process of applying the binding to a book.

In InfoPrint, assigning a job to an actual destination. See *early binding*, *late binding*.

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 In platemaking, an exposure. Burn is named because of the extremely bright ultraviolet lamps used to transfer images from film to plate.

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.

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.

CMY Cyan, magenta, yellow.

CMYK
Cyan, magenta, yellow, black.

collator
In some printers 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.

data stream

All information (data and control commands) sent over a data link.

A continuous stream of data that has a defined format.

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*, *Generalized Fax destination support system*, and *PSF 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
A printer device, attached to an RS/6000 through the network or through a serial or parallel port.

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.

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

Printing on both sides of the paper. Contrast with *simplex printing (1)*.

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.

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
A family of characters of a given size and style; for example, 9-point Helvetica.

One size and one typeface in a particular type family, including letters, numerals, punctuation marks, special characters, and ligatures.

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.

Generalized Fax destination support system
In InfoPrint, the destination support system that supports generalized fax destinations.

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 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.

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

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 imput. 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

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.

In InfoPrint software publications, InfoPrint Manager for AIX or any of its components.

InfoPrint Manager for AIX

The software component of InfoPrint. 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.

InfoPrint Manager for AIX is based on Palladium technology developed at MIT/Project Athena. It conforms to the ISO DPA and POSIX standards.

InfoPrint Network

The local area network running TCP/IP protocol that InfoPrint uses to communicate among servers, clients, and output devices.

InfoPrint Select

The component of InfoPrint Manager for AIX that allows users to submit jobs from an OS/2 or Windows workstation.

InfoPrint Submit Express

The component of InfoPrint Manager 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.

InfoPrint 60

A duplex, black and white, cut-sheet printer with 600-dpi resolution.

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.).

InfoPrint 4000

A duplex, black and white, continuous-forms printer with 600-dpi resolution.

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)

An all-points-addressable data stream that enables users to position text, images, and graphics at any defined point on a printed page.

Information that the host sends to IPDS printers. This information generally contains basic formatting, error recovery, and character data and enables the printers to make decisions.

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 can 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
A name or symbol that identifies a parameter.

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 InfoPrint 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   The human language and character set of information presented to a user.

In InfoPrint, the language InfoPrint uses when sending notification and error messages or displaying the InfoPrint graphical user interfaces.

log   A collection of messages or message segments added to a file for accounting or data collection purposes.

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
The act of reporting the occurrence of events.

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).

OpenType font (OTF)
An extension of the TrueType font format that adds:
- Support for PostScript outlines
- Better support for international character sets
- Broader support for advanced typographic control

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.

OTF   OpenType font.

P

PAC   Privilege Attribute Certificate.

page definition
A resource that contains the formatting controls for line data.

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 Manager Administration 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.

pdcrcds
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   Portable Document Format.

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*.

piobe   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 might or might 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   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.

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 can change based on other activity.

ready   A state in which an object is ready and able to perform tasks.

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

The accuracy of printing on paper relative to the edges of the paper.

The accuracy of printing a single color (cyan, magenta, or yellow) relative to black.

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 Raster image processor.

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 can be printed on one or both sides of the paper. Contrast with *tumble*; see also *simplex printing* and *duplex printing*.

simplex printing
Printing on only one side of the paper. Contrast with *duplex printing (1)*.

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
Any group of nodes that have a set of common characteristics, such as the same network ID.

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
A printer device attached to an RS/6000 through telecommunication lines using the TCP/IP protocol.

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 Manager Administration 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.

TrueType font (TTF)
A font format based on scalable outline technology with flexible hinting. Glyph shapes are based on quadratic curves. The font is described with a set of tables contained in a TrueType Font File.

TTF TrueType font.

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 Manager Administration 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)
An IBM licensed product that manages the resources of a single computer so that multiple computing systems appear to exist.

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 Manager Administration 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.

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