

# InfoPrint Manager for Windows: Procedures



# InfoPrint Manager for Windows: Procedures

**Note:**

Before using this information and the product it supports, read the information in "Notices" on page 409.

| This edition applies to InfoPrint Manager for Windows, Version 2 Release 2 Modification 0, with PTF UO00688 (March 2008), and to all subsequent releases and modifications until otherwise indicated in new editions.

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## **Part 1. Introduction**





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## Chapter 1. About this publication

This publication helps you with advanced configuration and daily administration/operations for InfoPrint® Manager for the Windows® Operating System, hereafter called InfoPrint Manager for Windows.

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### Who should read this publication

This publication is for the administrator who configures and manages an InfoPrint Manager environment. You should have already performed the basic installation of InfoPrint Manager by performing the steps described in the book *InfoPrint Manager for Windows: Getting Started*, G550–1072.

---

### Most recent information

For the most recent information about InfoPrint Manager, go to the InfoPrint Solutions Company Web site at <http://www.infoprint.com>.



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## Chapter 2. The InfoPrint publication library

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

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### 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.

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### 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.

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## 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.



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## **Part 2. Administrative Procedures: Configuring InfoPrint Manager**





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## Chapter 3. Using Multiple Network Adapter Cards

If you are concerned that your local area network (LAN) may not have enough bandwidth to handle the additional traffic that installing additional printers can create, you can create a secondary network that is essentially dedicated to driving printers. To set up this configuration, the system that your InfoPrint Manager server resides on will have to have two network adapter cards installed in it, one for each network. Print data comes into the InfoPrint Manager server over the LAN and is transferred to the secondary network to be printed.

When you set up the secondary network, keep the following points in mind:

- In the system that your InfoPrint Manager server resides on, the primary network adapter card should be the one that connects to your existing network.
- In the system that your InfoPrint Manager server resides on, the secondary network adapter card connects to a network that contains **only** printers. This network is isolated; no IP forwarding is recommended.
- The IP addresses for printers on the secondary network must not be resolvable on the primary network.

It is recommended that you use private IP addresses for your secondary network card and your printers, for example, addresses that follow either of these formats:

- Class A IP address: 10.xx.xxx.xxx
- Class B IP address: 192.168.xxx.xxx
- In the properties for the secondary network adapter card, you should not set a Default Gateway, DNS, or WINS. If these fields are filled in when you configure the card, clear the default values.
- On the printers that you connect to the secondary network, do not specify a Default Gateway. If you must specify a Default Gateway, enter the IP address of the secondary network adapter card.



---

## Chapter 4. Setting up and using the i-data 7913 IPDS Printer LAN Attachment

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 and 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, and you must install and configure each unit separately.

In order to use the 7913, you must also configure and start a bootp daemon on a system somewhere in your TCP/IP network. The bootp daemon initializes the i-data 7913 IPDS Printer LAN Attachment with the TCP/IP address information that it uses to communicate over the network. bootp daemons are available for most operating systems; AIX and OS/2 provide bootp daemons in their base TCP/IP packages. If you have an AIX or OS/2 system that can run the bootp daemon on your network, you can use it. Instructions for configuring and starting the bootp daemon on both of those systems are provided in this chapter. The base Windows TCP/IP does not include a bootp daemon, but versions are available from Microsoft® and other vendors as extensions to the base TCP/IP package. You can install one of those products using the documentation provided by the other vendors.

Once you have installed and tested the i-data 7913 IPDS Printer LAN Attachment and the bootp daemon, you can define it to InfoPrint Manager as a PSF TCP/IP-attached printer. Create this actual destination using the InfoPrint Manager Administration GUI.

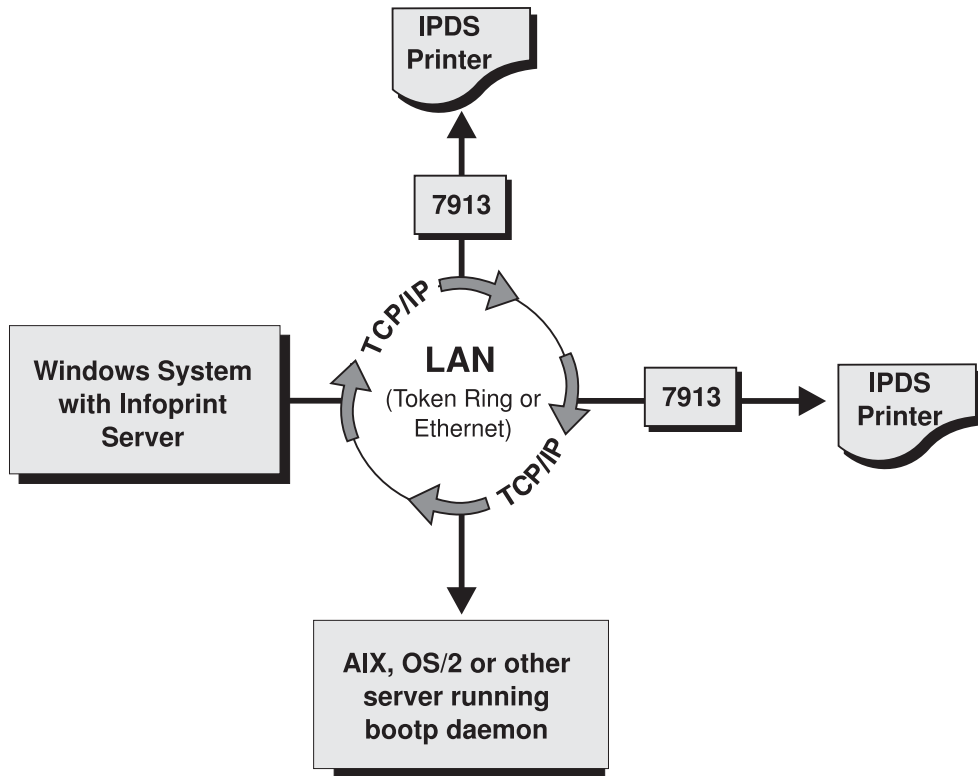


Figure 1. i-data 7913 IPDS Printer LAN Attachment in a TCP/IP LAN Environment

## How the i-data 7913 IPDS Printer LAN Attachment fits into network configurations

Use the configuration in Figure 2 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.

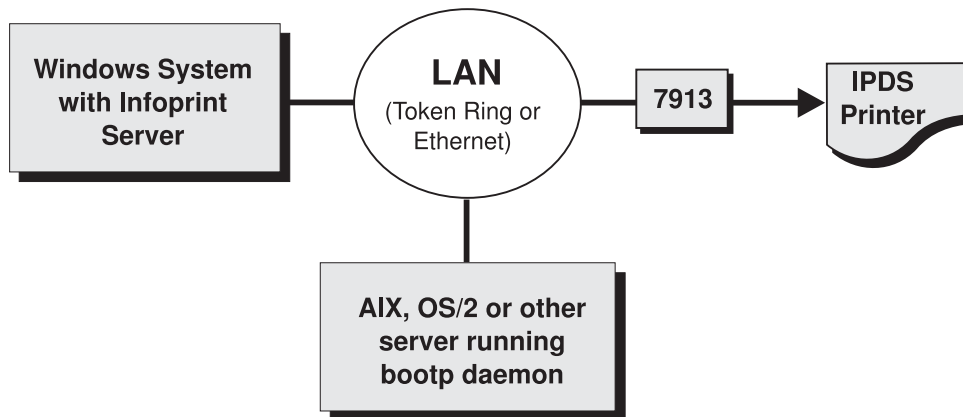


Figure 2. Network Configuration for Separate Internet Protocol Hosts

---

## 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 coaxial or twinaxial printer that you plan to install. You can order the 7913 unit 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
- 3112 Page Printer Model 001
- 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 Manager does not support twinaxial connections for this printer device.

- 6412 Line Matrix Printer Model CTA

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

2. You have installed InfoPrint Manager for Windows, Version 2, Release 2 or higher.
3. You have either an IBM token-ring network or an Ethernet LAN installed and operating.
4. 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

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.

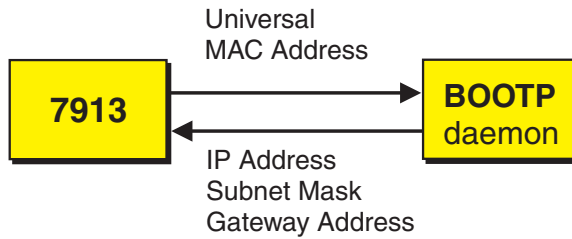


Figure 3. Data Flow between the i-data 7913 IPDS Printer LAN Attachment and the bootp Daemon

Figure 3 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 1. 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	

Table 1. bootp Configuration Worksheet (continued)

Parameter	Where to Find the Value	Value
Printer type (twinaxial or coaxial)	Printer documentation	

## Editing the bootp configuration file

bootp daemons use a text configuration file, usually named `bootptab`. On AIX, this file resides in the `/etc` filesystem. On OS/2, the file is placed in the `/etc` subdirectory under the install path for the TCP/IP product (usually in `/tcpip/etc`). Existence and location of the configuration file on Windows system depend upon the TCP/IP extension that you selected.

The **bootp configuration** 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 1 on page 16. You must have **Administrator** authority to edit the **bootp configuration** file.

Figure 4 shows an example of a simple **bootp configuration** 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 4. A Simple bootptab File

The keywords and fields in Figure 4 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 5 on page 18 shows a more complex way to describe the same **bootp** configuration as in Figure 4. 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 5. A More Complex bootptab File*

In addition to the keywords you saw in Figure 4 on page 17, Figure 5 contains the following keywords:

**tc=template**

A pointer to another entry that contains addressing information.

**#** Comment character

## Running the bootp daemon

Once the bootptab configuration file has been edited to include the TCP/IP network information for each of your i-data 7913 IPDS Printer LAN Attachment, follow instructions specific to your operating system to start the bootp daemon. The daemon can be configured to be controlled by the inet superdaemon by adding the bootp daemon to the list of services that the inet daemon controls. The bootp daemon may also be started manually from a command line at boot time if you want to maintain control over the daemon.

If you do not want to maintain an active bootp daemon on your network, the i-data 7913 IPDS Printer LAN Attachment allows you to load default network information into the device; the 7913 automatically uses this information if no bootp daemon responds to the address request within the timeout period (usually about two minutes). Follow the detailed instructions provided with your 7913 to modify your bootptab configuration file to force the network information into the device. You will still have to temporarily start a bootp daemon to initially load the network information into each 7913, but once the information is loaded, the bootp daemon will only be required if you want to change network information for a specific i-data 7913 IPDS Printer LAN Attachment, if you wanted to add an additional 7913 to your network, or if you needed to load updated microcode into existing i-data 7913 IPDS Printer LAN Attachments.

Instructions for setting up the bootp daemon on AIX and OS/2 systems follow.

### Setting up the bootp daemon on AIX

After you have configured the **bootp configuration** 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.

## Setting up the BOOTP daemon under OS/2

To use the BOOTP daemon under OS/2, the SERVICES file in the ETC directory (**/tcpip/etc/services**) must contain the following entries:

```
sbootp 67/udp # bootp server
cbootp 68/udp # bootp client
```

To test the BOOTPD command, enter the following from an OS/2 command line:

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

where:

- **-d** displays debugging information, such as hardware address. Each additional **-d** increases the amount of debugging information displayed. You can specify **-d** up to five times.

When the BOOTPD command is working correctly, you can add the command to your startup procedure.

Add the BOOTPD command to the **/tcpip/bin/tcpstart.cmd** file (assuming that TCP/IP was installed in the **tcpip** subdirectory). If the BOOTPD and the 7913 are on the same LAN segment (no bridges), enter the following:

```
start BOOTPD
```

If the BOOTP daemon and the 7913 are on different LAN segments (bridges required), enter the following:

```
start BOOTPD -b
```

---

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

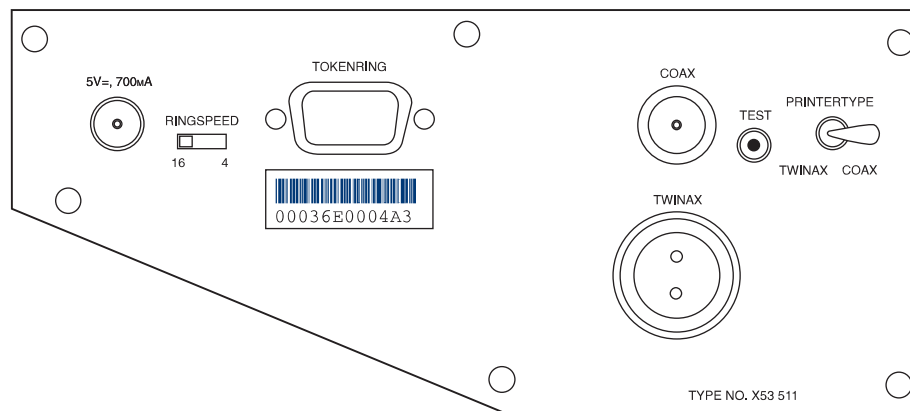


Figure 6. i-data 7913 IPDS Printer LAN Attachment Model 03 for IBM Token-Ring Networks

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

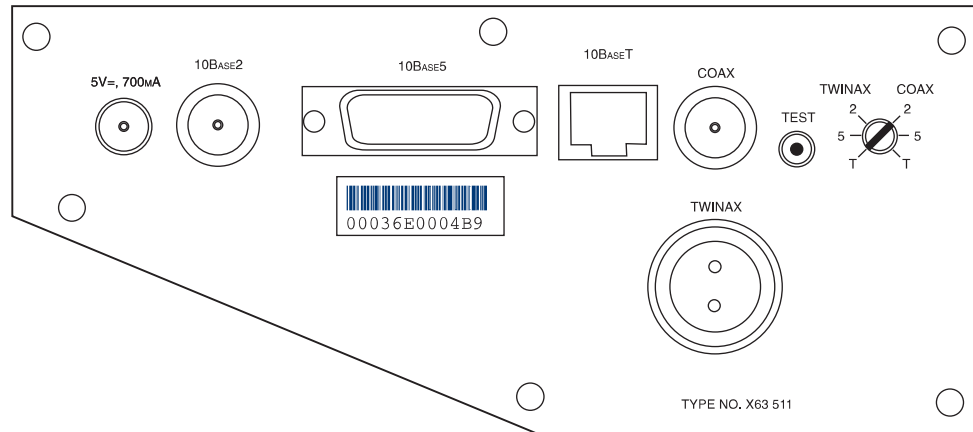


Figure 7. i-data 7913 IPDS Printer LAN Attachment Model 04 for Ethernet LANs

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 Manager.

1. Unplug the i-data 7913 IPDS Printer LAN Attachment.
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.

**Note:** If no bootp daemon responds within the timeout limit, the i-data 7913 IPDS Printer LAN Attachment uses default network information that it has stored internally, if it is available. If no default information has been stored, the 7913 device will remain unavailable to your network.

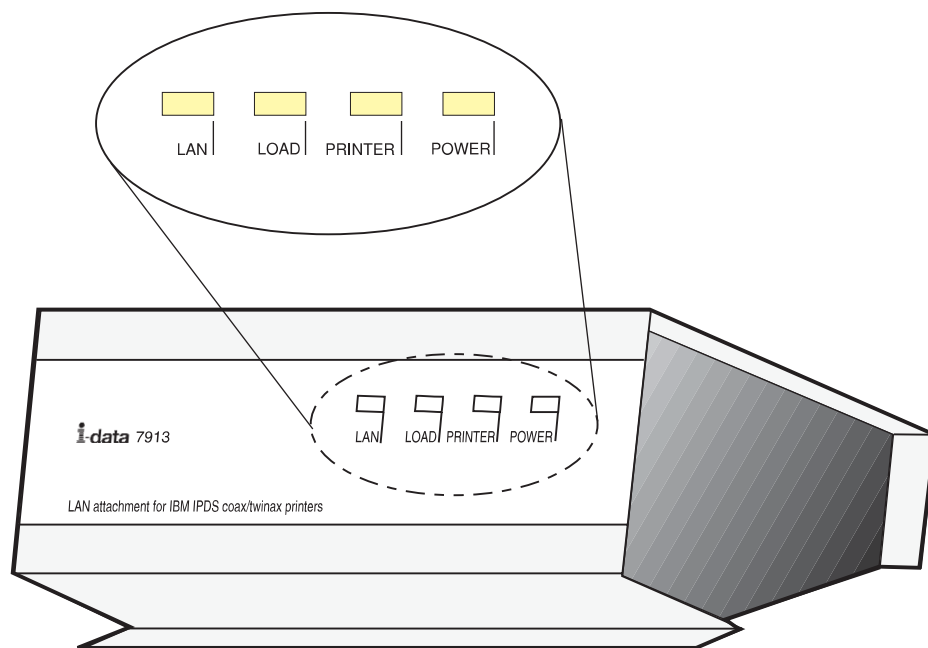


Figure 8. Status Indicators on the i-data 7913 IPDS Printer LAN Attachment

---

## 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 Manager and the i-data 7913 IPDS Printer LAN Attachment and causes the printer to print a test page.
2. From any system on your LAN, ping the i-data 7913 IPDS Printer LAN Attachment to test both the physical LAN connection and the IP network connection.
  - a. Open a DOS window. On Windows 2000 systems, click the Windows Start button and select **Program** —> **Accessories** —> **Command Prompt**.
  - b. Type **ping** 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 with 32 bytes of data
Reply from 9.99.12.73: bytes = 32 time<10ms ttl=128
Reply from 9.99.12.73: bytes = 32 time<10ms ttl=128
Reply from 9.99.12.73: bytes = 32 time<10ms ttl=128
Reply from 9.99.12.73: bytes = 32 time<10ms ttl=128
```

---

## 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, you should treat it as you would any other physical destination. Issue a shutdown command to break the connection to InfoPrint Manager, then unplug the device to ensure that the connection will not be inadvertently restored.



## Chapter 5. Selecting a type of actual destination

Once you have decided how many logical destinations, queues, and actual destinations you want to use and how to configure them, you need to determine which kind of actual destinations to create. In InfoPrint Manager for Windows, there are four basic types of actual destinations: PSF printers (including PSF Direct only destinations), Passthrough printers, BSD printers, and IPP printers. The names of the destination types refer to the destination support systems (DSSs) that process the print data and send it to the printer.

Consult the tables below to help you determine what kind of destinations to create based on where your print jobs are coming from:

- PC-based applications or a host system using IP Printway
- Host system using PSF Direct
- Both PC-based applications and host systems (using PSF Direct or MVS Download)

### PC-based applications or a host system using IP Printway

Use this table to see which type of destination fits your needs.

*Table 2. PC-based applications or a host system using IP Printway*

<b>If the data stream that your applications send to InfoPrint Manager is:</b>	PostScript, PCL or any non-IPDS data stream			
<b>and the data stream that you send to this printer is:</b>	the same that the application sends to InfoPrint Manager			PCL, PPDS <sup>1</sup> , IPDS
<b>and your jobs are going to be sent to a printer:</b>	through a Windows defined port	using a command such as lpr	that is IPP enabled	that is attached to your InfoPrint Manager system in any of the ways listed in the PSF Attachment Types table
<b>Create this kind of actual destination:</b>	Passthrough <sup>2</sup>	BSD	IPP	PSF
<b>Note:</b>				
1. You can only print PPDS on a non-Windows system, for example, by sending the PPDS data stream to an AIX system.				
2. If you are printing PCL data to an Windows-defined printer, and have therefore chosen to create a Passthrough destination, you may want to consider creating a "PSF attachment types" on page 27 destination instead. A Passthrough destination uses fewer processing resources, but a PSF destination provides much more functionality, such as accounting and automatic datastream transforms.				

For example, an advertising firm is installing InfoPrint Manager for Windows to manage printing for its 1,200 employees. The company has 450 PCL and PostScript® printers that are between one and seven years old, and about 20 printers that are more than seven years old. They have recently purchased 5 PCL printers that are also enabled to use the Internet Printing Protocol (IPP). Most of the print jobs that users generate are from word processing, graphics, or desktop publishing programs. These applications create mostly PCL and PostScript print jobs, which don't need to be transformed to another data stream to be printed on the existing printers.

The print administrator decides to create three kinds of actual destinations.

- Passthrough printers will send jobs to the PostScript and PCL printers.
- IPP printers will send jobs to the new IPP-enabled printers.
- BSD printers will send jobs to the oldest of the printers (the ones that still receive jobs using the lpr command).

---

## Host system using PSF Direct

If you send print jobs to your printers from a host system using PSF Direct and you don't plan to allow job submission to those destinations through any other paths (such as the IPP gateway or a Windows gateway printer), use this table to see which type of destination fits your needs. This table assumes that a host PSF is being used to send IPDS data to InfoPrint Manager. Use the Management Console to create these destinations.

*Table 3. Host system using PSF Direct*

<b>If the data stream that you send to your printer is:</b>	IPDS	PCL or PPDS <sup>1</sup>
<b>Create this type of actual destination:</b>	PSF Direct only (TCP/IP or channel)	PSF Direct only (non-IPDS) <b>Note:</b> This destination type is equivalent to a PSF command destination
<b>Note::</b>		
1. You can only print PPDS on a non-Windows system, for example, by sending the PPDS data stream to an AIX system.		

For example, a mail order clothing company stores all of its customer order information in a database on a mainframe. On the host system, the information is extracted and customer order sheets and shipping labels are generated. The order sheets and labels are then printed on a high-speed IPDS printer that is dedicated to these jobs. Because the print administrator wants to manage his print jobs and resources on the host system, he has chosen to use PSF Direct instead of MVS Download to submit jobs. PSF/MVS converts these jobs to IPDS and sends them to InfoPrint Manager. Also, the printer is an older model and it is only set up to support channel attachment, so the administrator attaches it to the system using a parallel channel emulator card.

The print administrator uses the Management Console to create a PSF Direct only (channel) destination.



## MVS Download, DPF, or a combination of PC-based applications and host systems

If you will be sending jobs to this destination from both PC-based applications and host systems (using PSF Direct, DPF, or MVS Download), use this table to see which type of destination fits your needs.

Table 4. MVS Download, DPF, or a combination of PC-based applications and host systems

<b>If the data stream that your host system and applications send to InfoPrint Manager is:</b>	AFP, ASCII, DBCS ASCII, line data, PCL, PostScript, PDF, IPDS (via PSF Direct or DPF) <sup>1</sup>		PCL only	PS only
<b>and the data stream that you send to this printer is:</b>	IPDS	PCL or PPDS <sup>2</sup>	PCL	PS
<b>Create this type of actual destination:</b>	PSF (TCP/IP or channel)	PSF (other driver or command)	PSF (other driver or command) <b>OR</b> any of the destination types listed under PC-based applications	One of the destination types listed under PC-based applications
<b>Note:</b>				
1. PSF Direct and DPF can only submit jobs to PSF printers. MVS Download can submit jobs to any of the printer types listed.				
2. You can only print PPDS on a non-Windows system, for example, by sending the PPDS data stream to an AIX system				

For example, a film studio uses the same printers for all of their print jobs. During the day, employees in their business offices print reports, letters, and advertising materials. At night, they print royalty checks for their actors from information stored on their AS/400<sup>®</sup> host operating system using the PSF Direct function. By creating their print destination through the InfoPrint Manager Administration GUI rather than the Management Console, the print administrator can ensure that the same destination can print jobs from both the LAN and the host.

## PSF attachment types

PSF destinations are further divided by attachment type. Refer to the table below for information on choosing an attachment type.

Table 5. PSF attachment types

<b>If you are sending this data stream to the printer:</b>	IPDS	IPDS	PCL or PPDS	PCL or PPDS
--	------	------	-------------	-------------

Table 5. PSF attachment types (continued)

<p><b>and you are going to attach the printer to the system the InfoPrint Manager is running on this way:</b></p>	<p>over the TCP/IP network</p>	<p>using the IBM 4159 Parallel Channel Emulator Card</p>	<p>over the TCP/IP network <b>OR</b> directly attaching it through a parallel or serial port</p>	<p>over the TCP/IP network using a command such as lpr to submit jobs to it</p>
<p><b>Select this attachment type:</b></p>	<p>TCP/IP</p>	<p>Channel</p>	<p>Other driver</p>	<p>Command</p>

---

## Chapter 6. Using the Internet Printing Protocol (IPP) with InfoPrint Manager

The Internet Printing Protocol (IPP) is an application protocol that uses the Hypertext Transfer Protocol (HTTP) to allow you to print your documents to any IPP-enabled printer whose web address (or Uniform Resource Identifier-URI) you know. You can use IPP to send print data over both LANs and the Internet so users who are directly connected to your LAN as well as those who work remotely have access to the same printers. InfoPrint Manager for Windows provides two ways to configure your system to print using IPP.

---

### Printing to an IPP-enabled printer

If you have an IPP-enabled printer, you can create an IPP printer just as you would any other actual destination using the Create IPP Printer Wizard in the InfoPrint Administration GUI. To print to the new destination, you can submit jobs using a print command such as `pdpr`, or you can install InfoPrint Select on your workstation and create a Select printer that uses that destination or any other job submission method.

---

### Printing through the IPP Gateway

The IPP gateway is a service in InfoPrint Manager that allows you to print using IPP even if you don't have an IPP-enabled printer, as long as you (and your users) have IPP client software installed on your workstation.

**Note:** Windows 2000/2003 systems come with IPP client software built in. Users on other Windows platforms can download IPP client software. The Printer Working Group, the organization that is leading the development of IPP, provides a list of IPP client software that you can use to find an appropriate client at: <http://www.pwg.org/ipp/IPP-Products.html>

Once you have an IPP client installed, follow these steps to set up the gateway.

1. Enable the IPP Gateway using the InfoPrint Manager Management Console. Refer to the Management Console online help for more information on completing this task.
  - a. The IPP Gateway runs as a Windows service called InfoPrint Manager IPP Gateway. On Windows 2000/2003 systems, the IPP Gateway is not set to start automatically by default. Refer to the Management Console online help for information on changing the default settings.

**Note:** Selecting this box does not start the IPP Gateway Service immediately. You must either restart the system that the InfoPrint Manager server is installed on or start the service from the Windows Control Panel.

- b. To start the IPP Gateway service from the Windows Control Panel:
  - 1) Navigate to the Control Panel and select **Administrative Tools**.
  - 2) In Administrative Tools, click on **Services**.
  - 3) In Services, highlight **Infoprint Manager IPP Gateway**, and then select **Action → Start**.

2. Verify that the gateway is working. Open your Internet browser and enter the following web address, replacing *serverhostname* with the DNS hostname of the system that InfoPrint Manager is installed on:

`http://serverhostname:631/printers`

**Note:** If you don't have a DNS name server running on your network, replace *serverhostname* with the dotted-decimal IP address of the system that InfoPrint Manager is installed on instead.

If the gateway is working correctly, you will see a list of the printers that are available through the gateway. All of your InfoPrint destinations should be listed. Find the address (URI) of the destination you want your users to print to.

3. Refer your users to "Adding an Internet Printing Protocol (IPP) gateway printer to your desktop" on page 372. This step varies depending on which IPP client you are using; follow the instructions for adding a printer as provided by the IPP client. For the printer address, have your users enter the address that you found in step 2.

---

## Chapter 7. 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 that 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 32 for more information.

#### Delivery method

How the messages are delivered. See “Delivery method and delivery address” on page 32 for more information.

#### Delivery address

Where the messages are sent. See “Delivery method and delivery address” on page 32 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.

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 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 36 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 6 on page 33 lists the delivery methods, along with descriptions and how to set the delivery address for each type.<sup>1</sup>

---

1. Two other delivery methods, **sapcb** and **sapconnect** exist, but they are only used internally in conjunction with the InfoPrint Manager SAP Print Feature. You should never use either of those values in a notification profile entry.

Table 6. InfoPrint notification delivery method characteristics

Delivery Method	Description	Delivery address
<p><b>message</b></p> <p>Message is the default delivery method for all objects.</p>	<p>Sends a message to the InfoPrint Manager notification server, where it waits for an InfoPrint Manager Notifications client to pick it up. Once a message is picked up, it is deleted from the notification server; there are no further records of that message.</p>	<p>The delivery address listed in the notification profile can be whatever you want it to be— a user id, office number, IP address, driver’s license number— as long as it is unique. In order to receive messages sent to that address, you must set the delivery address listed in the <b>Settings</b> dialog in the InfoPrint Manager Notification client to the same value. The InfoPrint Manager Notifications client will only pick up messages that specify an identical delivery address.</p>
<p><b>electronic-mail</b> (synonyms: <b>e-mail</b>, <b>email</b>)</p>	<p>Sends an e-mail to the address listed in the delivery address.</p> <p>To use the e-mail delivery method, you must also set the <b>smtp-server-host</b> attribute on your InfoPrint Manager server to the IP address or DNS hostname of the system that your SMTP mail server runs on.</p>	<p>The e-mail address that you want notification messages to be sent to. For example, <b>kjones@printerco.com</b>.</p>
<p><b>exit</b></p>	<p>Doesn’t actually send a message. Instead, when the event specified in the event identifier occurs, InfoPrint Manager runs an exit program or script. Refer to “Using the ‘exit’ delivery method” on page 36 for more information.</p>	<p>The full path to the notification exit program or script (with hard-coded arguments, if any).</p>
<p><b>wireless</b></p>	<p>Sends notifications to wireless devices, such as pagers, cellular phones, palm pilots, and laptop computers.</p>	<p>Because wireless notifications are delivered as e-mails, you must set both the <b>smtp-server-host</b> and the <b>smtp-server-port</b> server attributes on this InfoPrint server.</p> <p>If your InfoPrint server resides behind a firewall, you may have to configure your SMTP server.</p>
<p><b>file</b></p>	<p>Writes the message in the file you specify in the delivery address. If the file doesn’t exist, InfoPrint Manager will create it. If the file does exist, InfoPrint Manager will overwrite it the first time it writes a message. After that, messages are added to the end of the file.</p>	<p>The directory path and name of the file that you want to write your notification messages in. This file must reside on the same system as your InfoPrint Manager server.</p>

Table 6. InfoPrint notification delivery method characteristics (continued)

Delivery Method	Description	Delivery address
<b>file-add-to</b>	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.
<b>job-log</b> Valid only for jobs.	Writes messages into the <b>job-log</b> attribute of the job. If the job is deleted, the job log is also deleted. To see the messages, issue the <code>pdl</code> s command for the job-log attribute on the job you want to know about; or, on the InfoPrint Manager Administration Interface, go to <b>Job → View Log</b> .	No value needed.
<b>none</b>	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 do not 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.

- **Windows Vista**

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 system settings** 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 `c:\InfoPrint\exits\myscript`, when a job finishes printing, InfoPrint Manager will generate and execute a command line similar to this one:

```
c:\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.

**Note:** The program run by a notification profile with the "exit" delivery method runs under InfoPrint Manager, which is running as a Windows service and does not have access to the desktop. Because of this, the notification method of "exit" does not allow a delivery address that requires a windowed program to be used, such as `notepad.exe`.

---

## 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 7. Default notification profile settings*

Object	Events
Actual destination	<ul style="list-style-type: none"> <li>• destination-needs-administrator</li> <li>• destination-needs-attention</li> <li>• destination-needs-operator</li> <li>• destination-timed-out</li> <li>• object-cleaned</li> <li>• object-deleted</li> </ul>
Default Job	No defaults set. Refer to “Using notification profiles with default jobs” on page 38 for more information.
Job	<ul style="list-style-type: none"> <li>• destination-needs-attention</li> <li>• destination-needs-operator</li> <li>• destinations-not-ready-for-job</li> <li>• document-aborted-by-destination</li> <li>• document-aborted-by-server</li> <li>• document-cancelled-at-destination</li> <li>• job-aborted-by-server</li> <li>• job-cancelled-by-operator</li> <li>• job-cannot-be-scheduled</li> <li>• job-completed</li> <li>• past-discard-time</li> </ul>
Logical destination	<ul style="list-style-type: none"> <li>• object-cleaned</li> <li>• object-deleted</li> </ul>
Queue	<ul style="list-style-type: none"> <li>• object-cleaned</li> <li>• object-deleted</li> <li>• queue-backlogged</li> </ul>
Server	<ul style="list-style-type: none"> <li>• internal-server-error</li> <li>• low-on-memory</li> <li>• memory-exhausted</li> <li>• object-cleaned</li> <li>• object-deleted</li> <li>• out-of-disk-space</li> <li>• out-of-dpf-haids</li> <li>• out-of-dpf-job-numbers</li> <li>• out-of-dpf-raids</li> <li>• sapcbd-down</li> <li>• sapconnect-down</li> <li>• server-shutdown-complete</li> </ul>

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 7 on page 37. (If you submit jobs using InfoPrint Select, the default notification profile is different. Refer to "Working with Select notifications" on page 34 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 34 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.

## Viewing an existing notification profile

If you want to see what values are set for a notification profile, follow these steps.

1. Open a DOS window on the computer that your InfoPrint Manager server is installed on. On Windows NT® systems, click the Windows **Start** button and select **Programs** → **Command Prompt**. On Windows 2000 systems, click the Windows **Start** button and select **Programs** → **Accessories** → **Command Prompt**.
2. Type the following command. Fill in the values for the italicized items as defined below.

```
pdls -c Type of Infoprint object -r notification-profile Objectname
```

### Type of Infoprint object

What type of object you want to perform this command on, not the specific object. For example, type **destination** not **printer1-ld**.

### Objectname

The name of the destination or queue that this notification profile refers to.

3. Press **Enter**.

The notification profile will be displayed.

**Note:** If you have messages about a particular object sent to more than one person, the notification profile will display multiple entries, one for each person.

## Adding or modifying events or users in a notification profile

Follow these steps to add or remove events in the notification profile for a particular delivery address, or to add another entry to the notification profile, so that messages will be sent to another address as well.

1. Open a DOS window on the computer that your InfoPrint Manager server is installed on. On Windows NT systems, click the Windows **Start** button and select **Program** → **Command Prompt**. On Windows 2000 systems, click the Windows **Start** button and select **Program** → **Accessories** → **Command Prompt**.
2. Type the following command. Fill in the values for the italicized items as defined below.

```
pdset -c Type of Infoprint object-x "notification-profile+={event-  
identifiers= event(s) delivery-method= method delivery-  
address="address"}" Objectname
```

### Type of Infoprint object

What type of object you want to perform this command on, not the specific object. Type **destination**, **queue**, **job**, or **server**.

### event-identifiers

The events that cause InfoPrint Manager to send a message. You can have messages sent for any of the events that are listed in the events-supported attribute for the server. Refer to the *InfoPrint Manager: Reference, InfoPrint object attributes* chapter, section *Attributes for Servers: events-supported*, for a list of these values. Not all events support all objects. Refer to *Notification events and event classes* chapter in the *InfoPrint Manager: Reference* for lists of what objects each event supports.

**Note:** You must type all of the events for this object that you want the user you specify in the delivery address to receive, even if they already

appear in the notification profile. Any events that you do not type will not be listed in the notification profile.

**delivery-method**

How you want messages to be sent. Refer to Table 6 on page 33 for information about the various delivery methods.

**delivery-address**

Where you want to have messages sent. Refer to Table 6 on page 33 for information about what kinds of delivery address value to use with each delivery method. Enclose the value in double quotes.

**Note:** You cannot specify more than one delivery address here. If you want another user to receive messages about the same (or different) events, finish this procedure, then enter the command again with that user's delivery address.

**Objectname**

The name of the destination or queue that this notification profile refers to.

3. Press **Enter**.
4. Repeat the process for other users and objects.

## Example

The default notification profile for queues is set to send you messages when the **queue-backlogged**, **object-cleaned**, and **object-deleted** events occur. You need to change the notification profile for the print queue **printer1-q** so that you receive messages when the **queue-no-longer-backlogged** and **queue-state-changed** events occur as well. Your backup person does not currently receive any messages about queues, but needs to receive all of the same messages you do.

Issue this command to change your notification profile. Remember to list the event-identifiers for **all** of the events that you want this user to receive notifications about. This list of event-identifiers replaces the existing list entirely.

```
pdset -c queue -x "notification-profile+={event-identifiers=object-cleaned
object-deleted queue-backlogged queue-no-longer-backlogged
queue-state-changed delivery-address="administrator@mydesk.office.com"}"
printer1-q
```

Then, issue this command to have the **same** queue messages sent to your backup person.

```
pdset -c queue -x "notification-profile+={event-identifiers=object-cleaned
object-deleted queue-backlogged queue-no-longer-backlogged
queue-state-changed delivery-address="backup@hisdesk.office.com"}"
printer1-q
```

Use the "Viewing an existing notification profile" on page 39 procedure to make sure the changes took effect.

## Removing users from a notification profile

Follow these steps to remove an entire entry from a notification profile.

1. Open a DOS window on the computer that your InfoPrint Manager server is installed on. On Windows NT systems, click the Windows **Start** button and

select **Program** —> **Command Prompt**. On Windows 2000 systems, click the Windows **Start** button and select **Program** —> **Accessories** —> **Command Prompt**.

2. Use the “Viewing an existing notification profile” on page 39 procedure to find the entry you want to remove.
3. Type the following command. Type the correct **delivery-method** and the **delivery-address** exactly as it is displayed for the entry that you want to remove.

```
pdset -c Type of Infoprint object -x "notification-profile-={delivery-method=electronic-mail or message delivery-address="address"}"Objectname
```

4. Press **Enter**.
5. Use the “Viewing an existing notification profile” on page 39 procedure to verify that the entry has been removed.
6. Repeat the process for other entries.

### Example

You and two other people currently receive messages about the logical destination **printer1-ld**. You don't want to receive them any longer. You view the notification profile, and see these three entries:

```
printer1-ld: notification-profile=
```

```
{event-identifiers = object-cleaned object-deleted delivery-method = message  
delivery-address = "admin@desk1.office.com" locale = en_US}
```

```
{event-identifiers = object-cleaned object-deleted delivery-method = message  
delivery-address = "helpdesk@desk2.office.com" locale = en_US}
```

```
{event-identifiers = object-cleaned object-deleted delivery-method = message  
delivery-address = "backup@desk3.office.com" locale = en_US}
```

Issue this command to remove your entry from the notification profile.

```
pdset -c destination -x "notification-profile-={delivery-method=message  
delivery-address = "admin@desk1.office.com"}" printer1-ld
```

**Note:** If you display the notification profile to verify that the entry has been removed and find that it has not been removed, issue the command again, but this time instead of only specifying the **delivery-address**, type the entire notification profile exactly as it appears.

## Changing the delivery method

You can choose to receive your notification messages in a variety of ways, as listed in Table 6 on page 33. Follow these steps to change the delivery method from the default to some other value.

1. Open a DOS window on the computer that your InfoPrint Manager server is installed on. On Windows NT systems, click the Windows **Start** button and select **Program** —> **Command Prompt**. On Windows 2000 systems, click the Windows **Start** button and select **Program** —> **Accessories** —> **Command Prompt**.
2. Use the “Viewing an existing notification profile” on page 39 procedure to find the entry you want to change.



3. Type the following command. Fill in the values for the italicized items exactly as they appear in the entry you want to change. Replace the **delivery-method** and **delivery-address** values as specified in Table 6 on page 33.

```
pdset -c Type of Infoprint object -x "notification-profile+={event-  
identifiers=event(s) delivery-method=method delivery-address="address"  
locale=yourlocale}"Objectname
```

4. Press **Enter**.
5. Use the "Viewing an existing notification profile" on page 39 procedure to verify that the entry was added.
6. Follow the procedure for removing a user to remove the old entry.

### Example

You want to receive your messages about **printer1-q** in your E-mail instead of through InfoPrint Manager Notifications. You view the notification profile, and see this entry:

```
printer1-q: notification-profile={event-identifiers = object-cleaned  
object-deleted queue-backlogged delivery-method = message delivery-address  
= "admin@desk1.office.com" locale = en_US}
```

Issue this command to add another entry to the notification profile with a different delivery method and delivery address.

```
pdset -c queue -x "notification-profile+={event-identifiers=object-cleaned  
object-deleted queue-backlogged delivery-method=electronic-mail  
delivery-address="admin@mycompany.com" locale=en_US}" printer1-q
```

Then view the notification profile again and see two entries:

```
printer1-q: notification-profile= {event-identifiers = object-cleaned  
object-deleted queue-backlogged delivery-method = message delivery-address  
= "admin@desk1.office.com" locale = en_US} {event-identifiers =  
object-cleaned object-deleted queue-backlogged delivery-method =  
electronic-mail delivery-address = "admin@mycompany.com" locale = en_US}
```

Follow the procedure for removing a user to delete the entry that would send messages to InfoPrint Manager Notifications.

---

## 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, open the Management Console and select **Help** → **Message Help**. Type the message code in the fields at the top of the Message Help dialog, and click **OK**.



---

## 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 6 on page 33 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 8. Managing security

InfoPrint Manager security (sometimes called *non-DCE security*) is a feature that you administer through the InfoPrint Manager Management Console. It 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.

**Important:** InfoPrint Manager Security references the login ID of the current user to determine who is attempting to perform an action. Otherwise, the InfoPrint Manager security system is entirely separate from any Windows security you have set. For example, you cannot use groups that you create with the Windows User Manager in InfoPrint Manager Security- you must create security groups using the InfoPrint Manager Management Console.

If you do not want to use InfoPrint Manager Security, you can turn it off using the server properties notebook in the InfoPrint Manager Administration GUI by setting the **Security level** for your server to **none**.

---

### 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 modify attributes.
- **Delete-** For all objects, the user can delete the object.

**Note:** The levels of permission are not cumulative. If you give a user **delete** permission only, he will **not** automatically have **read** and **write** permissions. Be sure to mark all of the levels of permission that the user needs.

If you place user A 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 user A 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 subsets of objects by using object-level ACLs.

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, user B 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 user B **read** permission for the operation **Reorder Job** to allow him to do his job. On the other hand, user C 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 (for example, a job or a printer).

- If the object is not protected, any user with **read** permission on an operation can perform that operation.
- If the object is protected, the permission needed depends on the operation. For example: **List** requires **read** permission on the object, **Set** requires **write** permission, and **Delete** requires **delete** permission.

By default, InfoPrint objects (destinations, queues, servers) are not protected, members of the **admin** group have read permission on all operations, members of the **oper** group have read permission on most operations, and **all** users have read permission on five operations. Those five operations are:

- **List/Query** (all objects)
- **Print**
- **Modify job**
- **Query job**
- **Remove job** (delete job)

However, users who are not members of the **admin** and **oper** groups can only modify and remove jobs that they submitted. In addition, if the ACL for the **Reorder job** action is changed so that everyone can use it, users who are not members of the **admin** and **oper** groups will only be able to reorder jobs that they submitted. By default, members of the **admin** and **oper** groups can perform all six of those operations on all jobs.

**Note:** If you decide to protect your queues, all users will still be able to perform the tasks listed above on their own jobs. Users who are on the ACL for a queue will be able to perform those tasks on all jobs in that queue.

---

## 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 of your help desk operators to be able to perform the same operations, create a group and name it **helpdesk**. Then, add **helpdesk** to the appropriate ACLs.

**Important:** User IDs and group names are case sensitive.

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 (for example, **myuserid@\***).
- **admin**- Users who have administrator authority. The default members are **Administrator@\*** and the user who was logged on when InfoPrint Manager was installed (for example, **myuserid@\***).
- **oper**- Users who have operator authority. The default member is **Administrator@\***.

**Note:**

1. If you have installed InfoPrint Job Ticketer as part of the Print-on-Demand feature, the **Job Ticketer** group is created. 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 the help desk operators to the default **oper** group and modified any permissions that weren't set to the level that you wanted them.
3. The default group members contain the wildcard character (\*) for greater flexibility. See below for more information on wildcarding. If you don't want the Administrator user on other systems to be able to administer InfoPrint Manager, replace the \* with the explicit address of the system that the InfoPrint Manager server is installed on, for example **Administrator@serversystem.company.com**.

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.

**Note:** The *computername* that you specify must be the fully-qualified name of the workstation, for example: *joescomputer.infoprint.com*

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 **\*@computer1**, any user who logs on to computer1 can perform the actions that the ACL member has permission for.

---

## Working with ACLs and groups

Use the InfoPrint Manager Management Console to manage the security of your print system. Open the **Security** folder in the left pane of the Management Console to display the Access Control Lists folder and Groups object. Open the Access Control Lists folder to see the types of ACLs that exist. Click on the type of ACL (**Operations**, **Destinations**, **Servers**, or **Queues**) to display the ACLs that exist. Click on **Groups** to see the groups that currently exist and their members.

For more detailed information on using the Management Console to work with groups and ACLs, refer to the online help (in the Management Console, click **Help** -> **Contents**, and look on the **Contents** tab under **Managing Security**).

---

## Chapter 9. Customizing error logs in the InfoPrint Manager Windows server

InfoPrint Manager provides three configuration files for various IPM servers and processes:

1. **spl\_error.cfg** for the InfoPrint Manager server error log.
2. **notifyd\_error.cfg** for the Notification server error log.
3. **sap\_error.cfg** for all the SAP Callback processes.

If you want to customize error logs for one of these servers or processes 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, you must 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.

1. Find the **spl\_error.cfg** file in the **bin** directory that resides under the directory where InfoPrint Manager is installed (the default is C:\Program Files\IBM\Infoprint Manager).

2. Copy the **spl\_error.cfg** file into the *workspace\_path* directory.

The *workspace\_path* is specified on the **Workspace path** field. From the **Infoprint Manager Management Console**, click on the **Edit** → **Service Configuration** path to verify the setting of the **Workspace path** field. For the following examples, *workspace\_path* signifies the fully-qualified path where the error log resides, such as C:\Program Files\IBM\Infoprint Manager\var\pd.

**Note:** If you already customize your server error logs, remember to change the name or move the current **spl\_error.cfg** file in *workspace\_path* so that your customization values can be copied over into the newer version of the file.

3. Open a copy of the **spl\_error.cfg** file in the *workspace\_path* directory and edit it to specify the settings for the log attributes that you want (as shown in Figure 9 on page 50).

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. Before this attribute was added to the product, an unlimited number of logs were saved.



```

#
# 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 9. 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."

4. Once you have finished defining your options, save and close the 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 InfoPrint Manager server is restarted.

5. To shut down the server from the Management Console, specify **File** → **Stop server**.
6. To restart the server from the Management Console, specify **File** → **Start server**.

---

## Customizing a Notification server error log

By default, the Notification server error log starts when the Notification server starts. Use the following procedure to customize the InfoPrint Notification server error log.

1. Find the **notifyd\_error.cfg** file in the **bin** directory that resides under the directory where the file is installed.
2. Copy it to the *workspace\_path* directory.

The *workspace\_path* is specified on the **Workspace path** field. From the **Infoprint Manager Management Console**, click on the **Edit** → **Service Configuration** path to verify the setting of the **Workspace path** field. For the following examples, *workspace\_path* signifies the fully-qualified path where the error log resides, such as `C:\Program Files\IBM\Infoprint Manager\var\pd`.

**Note:** If you already customize your Notification server error log, remember to change the name or move the current **notifyd\_error.cfg** file in *workspace\_path* so that your customization values can be copied over into the newer version of the file.

3. From the *workspace\_path* directory, edit the **notifyd\_error.cfg** file to specify the settings for the log attributes that you want (as shown in Figure 10 on page 51). 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. Before the **log-backup-number** attribute was added, InfoPrint Manager for Windows only saved one backup error log.

```
#  
# Error Log Configuration File  
#  
log-size = 1024  
log-wrap = true  
log-severity = debug  
log-backup-number = 10
```

Figure 10. Sample `notifyd_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."

4. Once you have finished defining your options, save and close the 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 InfoPrint Manager server is restarted.

5. To stop the Notification server on an InfoPrint Windows server:
  - a. Click **Start** → **Settings** → **Control Panel** → **Services**.
  - b. Highlight **Infoprint Manager Notification** and click **Stop**.
6. To restart the Notification server on an InfoPrint Windows server:
  - a. Click **Start** → **Settings** → **Control Panel** → **Services**.
  - b. Highlight **Infoprint Manager Notification** and click **Start**.



---

## Chapter 10. Monitoring disk use

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

Here is the polling schedule:

80% Every 8 minutes  
90% Every 4 minutes  
95% Every 2 minutes  
97.5% Every minute

If the usage for a disk goes above the InfoPrint Manager pre-defined threshold of 80%, InfoPrint Manager logs a message and generates a **disk-space-low** event. As usage increases above the 80% threshold, more messages and **disk-space-low** events are logged and generated.

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. Figure 11 illustrates the algorithm used to monitor disk usage.

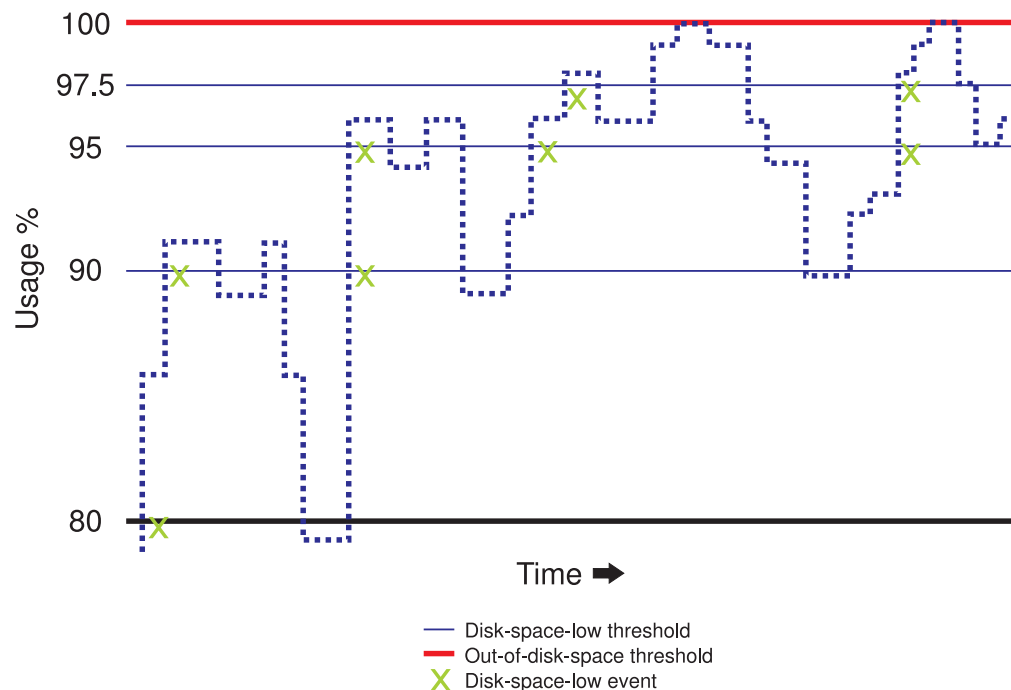


Figure 11. Disk usage algorithm

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

---

## Adjusting your server notification profile for disk usage

The InfoPrint Manager server notification profile uses the **out-of-disk-space** event as the default, so that when your disk 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 disk usage monitoring are always logged; regardless of the events in the server notification profile. It is recommended that you include both the **disk-space-low** and **out-of-disk-space** events in your notification profiles.

---

## Disks monitored by InfoPrint Manager

InfoPrint Manager for Windows monitors these paths (as shown in the **Management Console** → **Service Configuration**) that point to subdirectories where InfoPrint Manager is installed:

- **Install path**
- **Base namespace path**
- **Workspace path**
- **AFP support workspace path**

---

## Chapter 11. Administering your InfoPrint Manager server using a Windows Terminal Server client

While you can perform most administrative tasks using the InfoPrint Manager Administration GUI, there are a few that you must perform using the Management Console. However, since the Management Console must reside on the system that your InfoPrint Manager server is installed on, performing those tasks can be inconvenient. The only way to perform administrative tasks on the Management Console on a different system is to use a Windows Terminal Server. If you use Windows 2000, Terminal Server capabilities are included in Windows 2000 Server. Therefore, you must install your InfoPrint Manager server on a Windows 2000 Server system, not a Windows 2000 Professional system.

Once you have InfoPrint Manager installed on the correct version of Windows, you need to install the Terminal Server Client on any other systems that you want to be able to access the Management Console from. You can install the client on one of the following systems:

- Windows 2000 Server SP4
- Windows Server 2003 Standard Edition
- Windows Server 2003 R2 Standard Edition SP2
- Windows Server 2003 Enterprise Edition SP2
- Windows Server 2003 R2 Enterprise Edition SP2

Use the “Installing the Windows Terminal Server client” procedure to create installation disks and install the client.

---

### Installing the Windows Terminal Server client

To complete this procedure, you need two blank floppy disks.

#### For Windows 2000/2003 Server:

1. Log on to the system that your InfoPrint Manager server is installed on.
2. On Windows Server, click **Start** → **Programs** → **Administrative Tools** → **Terminal Services Client Creator**.
3. Select **Terminal Services for 32-bit x86 Windows** and check the **Format disk(s)** check box. Click **OK**.
4. Follow the instructions in the pop-up dialogs to create your Terminal Services Client installation disks.

**Note:** Save these disks. You will need them if you ever need to uninstall the client.

5. Close the dialog once the disks are created.
6. Log on to the machine that you want to install the Terminal Services Client on.
7. Insert the first Terminal Services Client installation disk in the drive.
8. Navigate to that disk drive and double click the **Setup.exe** icon to start the **Terminal Server/Services Client Setup** wizard.
9. Follow the instructions in the wizard to install the client.

When you finish the wizard, Terminal Server/Services Client will be added to your **Start** menu.

10. Start the client by selecting **Start → Programs → Terminal Services Client → Terminal Services Client**.
11. Find the name of the server that your InfoPrint Manager server is installed on and connect to it.

Once you are connected, you can open the Management Console and use it just as you would on the server system itself.

---

## Chapter 12. Changing the server hostname and IP address

Use this procedure to change the hostname of the system that your InfoPrint Manager server runs on.

**Note:**

1. If you have changed the hostname/IP address on the system and already restarted the system, the InfoPrint Manager service will not be able to start and your InfoPrint GUIs will not function properly. Complete the “Changing the server hostname and IP address” task to correct the problem.
2. If the system that your InfoPrint Manager server runs on is part of a domain, remove it from the domain before you perform this procedure. Complete the “Changing the server hostname and IP address” task before you add the system to the domain again.
3. **For multi-server environments:**
  - If you are changing the hostname/IP address on the namespace system, you must stop all of the non-namespace servers and un-map the network drives all of the network drives that you have mapped to the namespace system before you start the procedure below. After you complete the procedure below, re-map the network drives. Then, use the Management Console (**Edit** → **Service Configuration**) on each of the non-namespace servers to change the **Base namespace path** and **Remote namespace folder** to the new hostname and restart the non-namespace servers.
  - If you are changing the hostname of a InfoPrint Manager non-namespace server (running on Windows 2000 or 2003) that shares a namespace with InfoPrint Manager for AIX (with the namespace on an AIX system), follow the “Changing the hostname of a non-namespace server” on page 58 procedure below.

---

### Changing the server hostname and IP address

1. If your InfoPrint Manager server is running, stop it by selecting **File** → **Stop Server** in the Management Console.

**Notes:** If you changed the hostname on the system and already restarted the system, your InfoPrint Manager server will already be stopped.

2. If you use InfoPrint Manager Security and have changed the member names of the **acl\_admin** group so they include the hostname, follow these steps:
  - In the left pane of the Management Console, open the **Security** folder and click the **Groups** item.
  - In the right pane, check to see if any of the member names in the **acl\_admin** group include the hostname.
  - Edit any user IDs in the **acl\_admin** group that contain the old hostname by replacing the hostname with the wildcard character (\*), so you will still be able to administer InfoPrint Manager Security after the hostname is changed.
  - Make note of the members that you change so you can replace the wildcard with the new hostname once it is set.
3. Change the hostname/IP address using Windows interfaces. When the system asks, choose **not** to restart the system.

**Note:** If you have already changed the hostname/IP address of your system, you do not have to change them again. Continue with step 4.

4. In the Management Console, select **Edit → Changed Hostname**.
5. In the **Changed Hostname** dialog, enter the new hostname. Names are case sensitive. Make sure the new hostname that you type exactly matches the one on your Windows system and click **OK**.
6. When the system asks, restart the system so the changes take effect.
7. Update all of the client systems that communicated with the server using the old hostname/IP address to use the new one, including:
  - InfoPrint Select clients
  - InfoPrint Manager Administration GUI
  - InfoPrint Manager Operations GUI
  - Windows gateway printers
  - IPP Gateway clients
  - InfoPrint Manager Notifications clients
8. Update any InfoPrint Manager Security ACLs or groups that reference IDs using the old hostname. In addition, if you changed any members of the **acl\_admin** group in step 2, change the wildcard character to the new hostname.

---

## Changing the hostname of a non-namespace server

Follow this procedure only if you are running both InfoPrint Manager for AIX and InfoPrint Manager for Windows as interoperating print servers and need to change the hostname of the system that InfoPrint Manager for Windows is running on.

1. Complete “Changing the server hostname and IP address” on page 57 on the non-namespace server. At the end of the procedure, the InfoPrint Manager for Windows server should be stopped and can no longer access the namespace on the AIX machine.
2. On the system that InfoPrint Manager for Windows runs on, disconnect the network drive that was mapped to the namespace on the AIX machine.
3. Log on to AIX server machine as **root**.
4. Follow this path: **Smitty → Infoprint Printing System → Infoprint Utilities → Configure Secondary Servers (NFS) → Link from Primary Server to Secondary Server**
5. In the dialog that appears:
  - a. Type the new hostname in the **Secondary Server Host Name** field.
  - b. Type the new server IP address in the **Secondary Server IP Address** field.
  - c. For **Is /ipdata used for job ticketing?** answer:
    - **Yes** if you use /ipdata with InfoPrint Submit.
    - **No** if you do not.
  - d. For **Retain secondary servers previously defined?** answer **Yes**.
6. On the Windows server machine, remap the network drive to the `\\aixserver\var\pddir\default_cell` filesystem using the same drive letter that you used for the network drive that you disconnected in step 2. Map the drive using the same user id and password that you used during the initial multiserver environment setup.
7. Log on to the AIX server machine as **root**.
8. Stop the InfoPrint Manager for AIX server.



9. Clear the namespace by issuing the `clrfstns /var/pddir/default_cell` command.
10. Create the shared namespace by issuing the `crtfstns /var/pddir/default_cell` command.
11. Start the InfoPrint Manager for AIX server.
12. Start the InfoPrint Manager for Windows non-namespace server.

---

## Changing only the server IP address

If you are only changing the IP address and you have updated your system name resolution so that the old name resolves to the new IP address, InfoPrint Manager will be reset to use the new IP address with the old hostname when you restart the system. If any of your InfoPrint clients refer to InfoPrint Manager using the IP address, you must update them so they use the new IP address.



---

## Chapter 13. Setting up your InfoPrint Manager server to use resources on a different Windows system

Sometimes, users choose to store printing resources (such as pagedefs, formdefs, and fonts) on systems other than the one that their InfoPrint Manager server runs on. If you choose that setup, you must first make sure that InfoPrint Manager has access to the resources, then tell InfoPrint Manager where the resources are located. Use the following procedures to complete these tasks.

1. "Giving InfoPrint Manager access to remote resources"
2. "Telling InfoPrint Manager where your remote resources are located" on page 77

---

### Giving InfoPrint Manager access to remote resources

Follow "Using Windows 2000/2003" to set up access to remote resources.

**Note:** Both of your systems must be running on the same operating system. You cannot mix Windows operating systems in this environment. The systems should also operate in the same domain.

#### Using Windows 2000/2003

1. *Set up a domain user account that your InfoPrint Manager server will run under.*
  - a. Log on to the domain that your InfoPrint Manager servers operate in as a domain administrator.
  - b. Click the Windows **Start** button and select **Programs** → **Administrative Tools** → **Active Directory Users and Computers**.
  - c. In the left pane of the Active Directory Users and Computers window, find the Users directory.
  - d. Right-click the Users directory and select **New** → **User** from the pop-up menu.



Figure 12. Windows 2000/2003 — Active Directory Users and Computers: New User

- e. In the first dialog of the New Object – User wizard, type a name for this user in the **Full name** and the **User logon name** fields.

**Note:** You do not have to fill in the other name fields.

**New Object - User**

Create in: ipm.penn.boulder.ibm.com/Users

First name:  Initials:

Last name:

Full name:

User logon name:  @ipm.penn.boulder.ibm.com

User logon name (pre-Windows 2000):

< Back   **Next >**   Cancel

Figure 13. Windows 2000/2003 — Active Directory Users and Computers: New Object- User

- f. Click **Next**.
- g. In the second dialog of the New Object – User wizard, enter a password for this user. Clear all of the check boxes, then select **Password never expires** (so you don't have to change the password and update all of your servers on a regular basis).

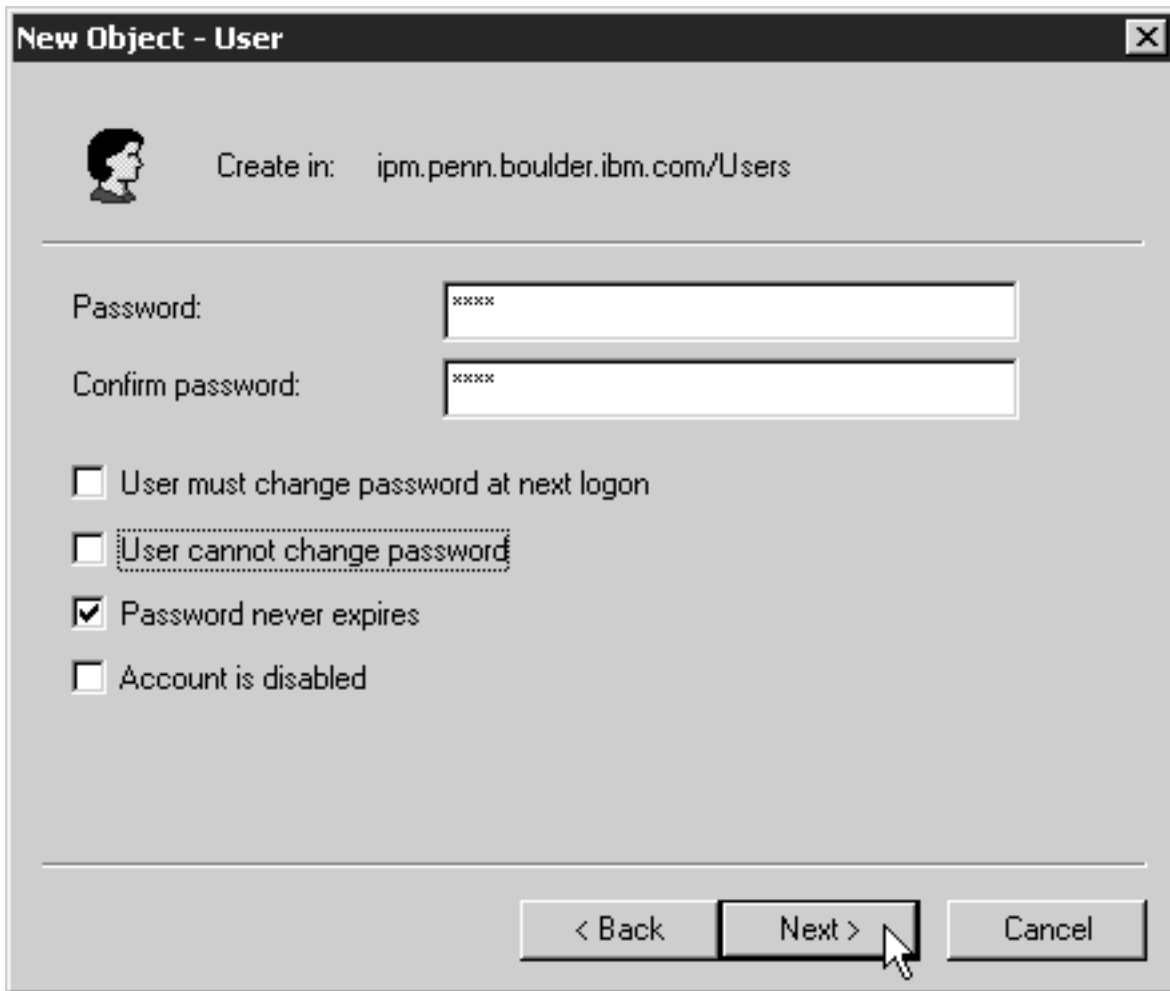


Figure 14. Windows 2000/2003 — Active Directory Users and Computers: New Object— User 2

- h. Click **Next** to verify the settings for the user and complete the wizard.
- i. Once you have created the user, right-click the user in the right pane of the **Active Directory Users and Computers** window and select **Add members to a group** from the pop-up menu.

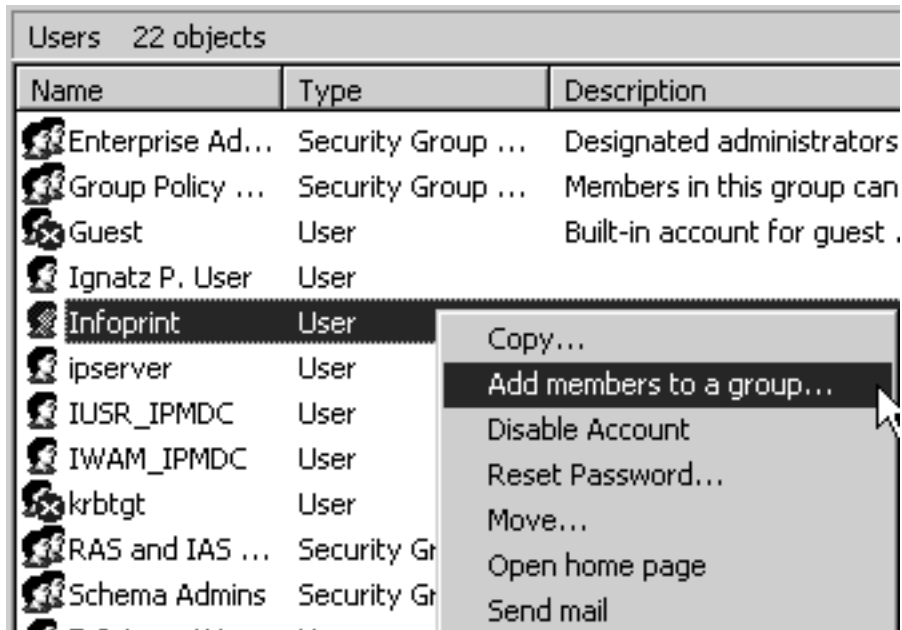


Figure 15. Windows 2000/2003 — Active Directory Users and Computers: Add Members to Group

- j. In the **Select Group** dialog, find and select the **Domain Administrators** (or **Domain Admins**) group. Click **OK** to add your user to the group.

**Note:** You can leave the **Name** field blank.

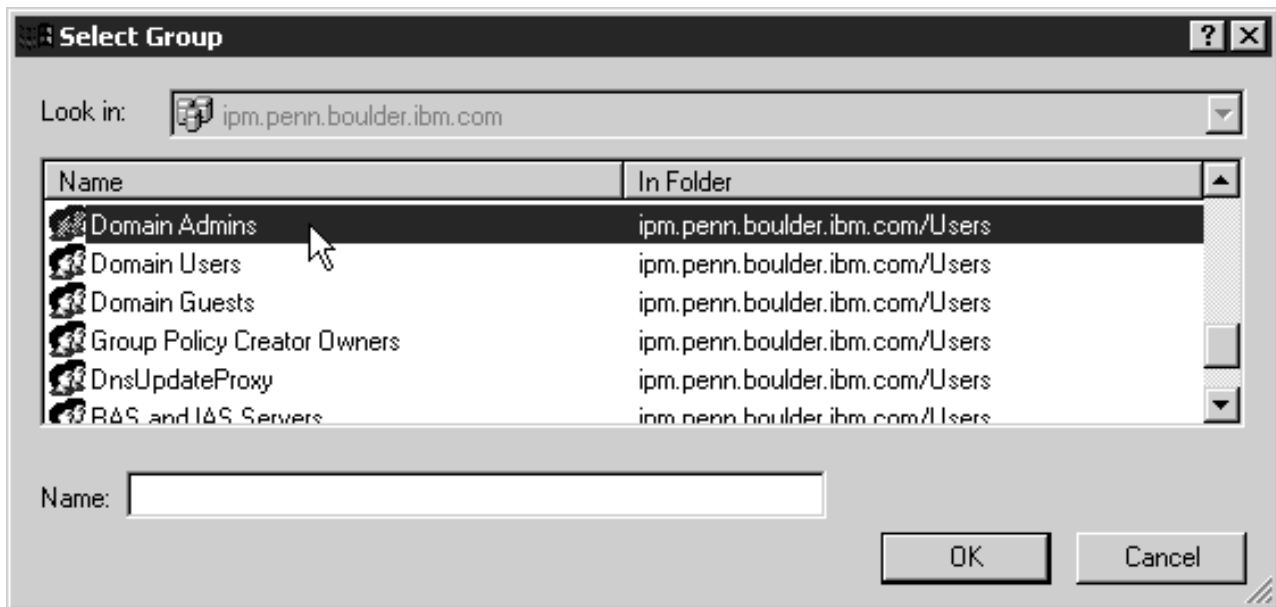


Figure 16. Windows 2000/2003 — Active Directory Users and Computers: Select Group

2. *Grant the appropriate user rights to the new domain user on the system that your InfoPrint Manager server runs on.*
  - a. Log on to the system as a user who is a member of the Domain Administrators group.
  - b. Click the Windows **Start** button and select **Settings** → **Control Panel**.

- c. In the Control Panel window, double-click the **Administrative Tools** icon.
- d. In the Administrative Tools window, double-click the **Local Security Policy** icon.
- e. In the right pane of the Local Security Settings window, double-click **Local policies**.

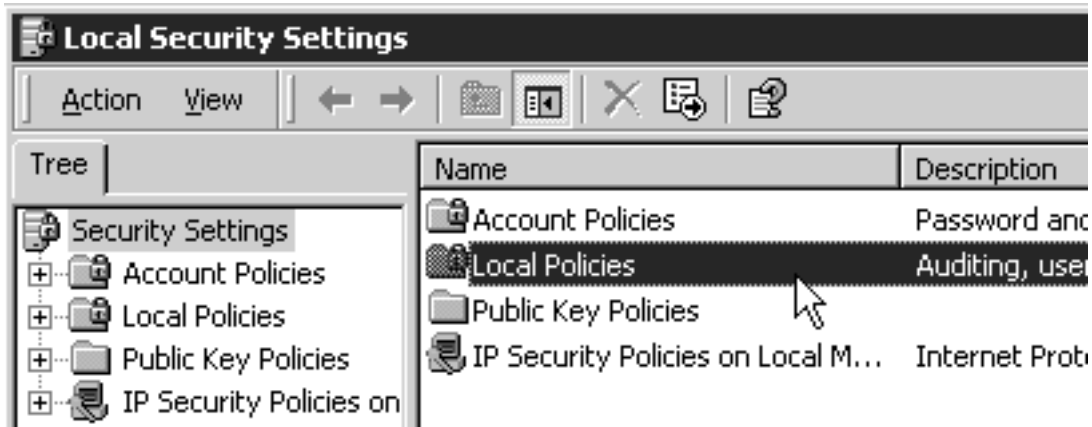


Figure 17. Windows 2000/2003 — Local Security Policy: Local Security Settings

- f. Double-click **User Rights Assignment** in the right pane.



Figure 18. Windows 2000/2003 — Local Security Policy: User Rights Assignment

- g. In the list of user rights, select **Act as part of the operating system** and double click it.



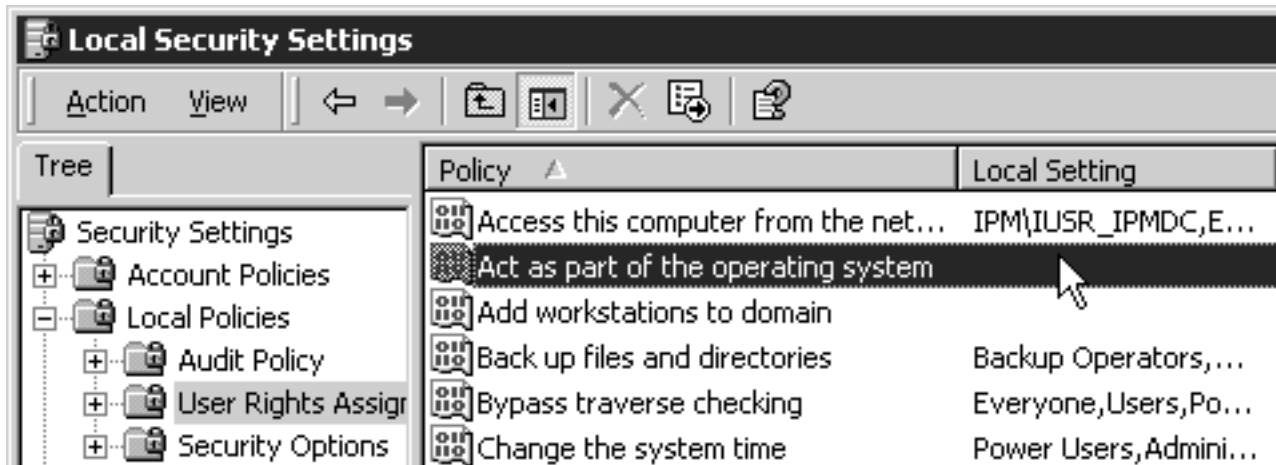


Figure 19. Windows 2000/2003 — User Rights Assignment: Act as part of the operating system

- h. In the **Local Security Policy Setting** dialog, click **Add**.

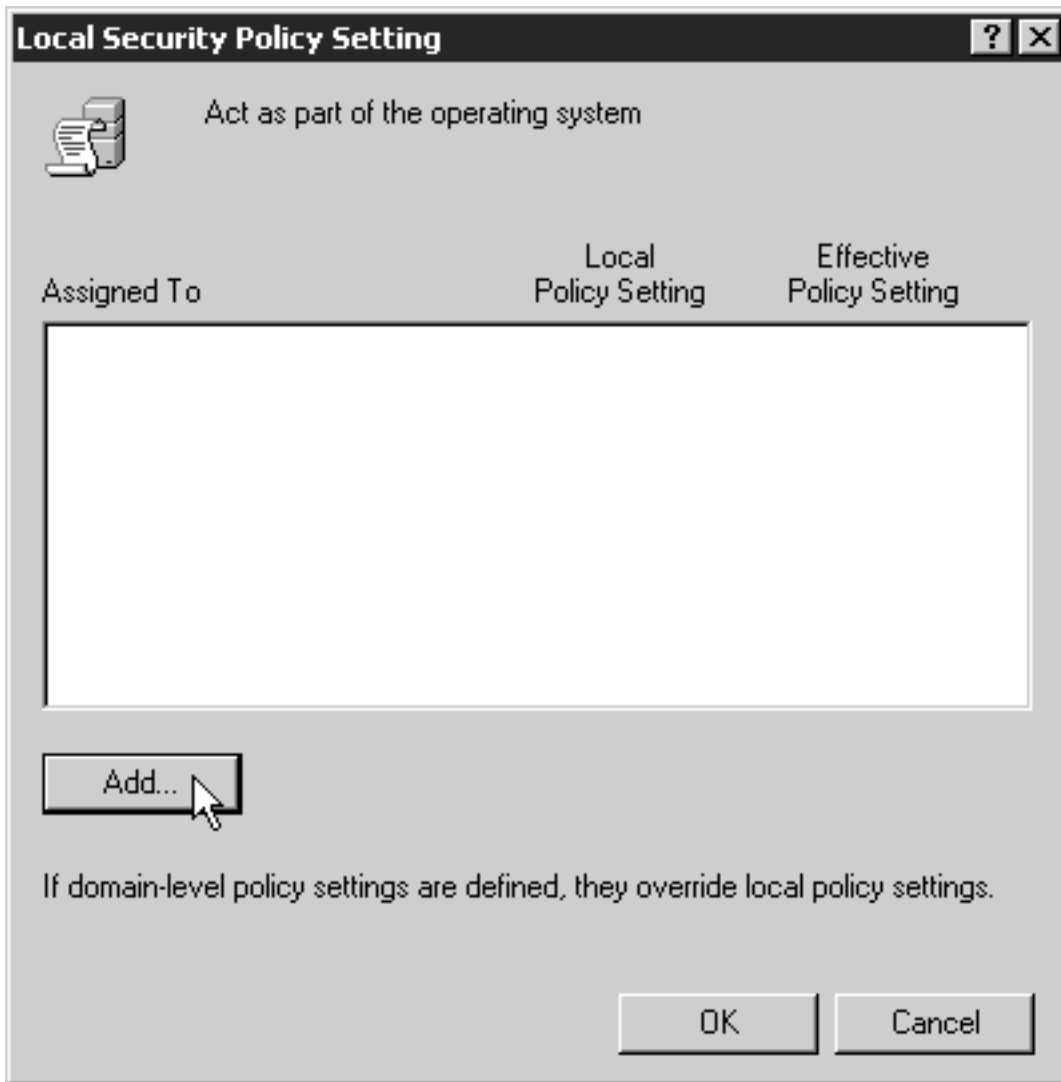


Figure 20. Windows 2000/2003 — Local Security Policy Setting

- i. 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.

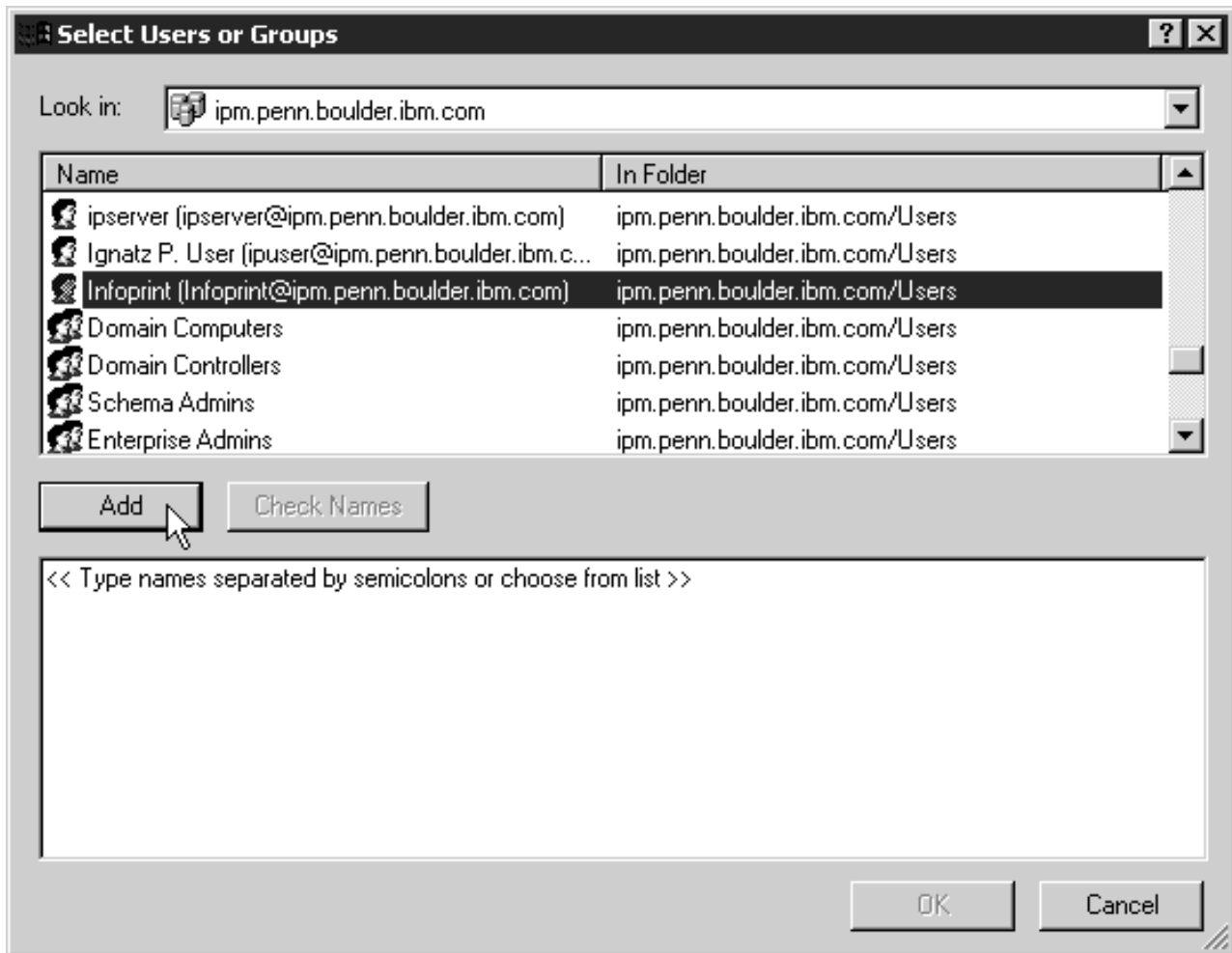


Figure 21. Windows 2000/2003 — Local Security Policy Setting: Select Users or Groups

- j. Find and select the domain user you created and click **Add**.
- k. Click **OK** in the **Select Users or Groups** dialog.
- l. Click **OK** in the **Local Security Policy Setting** dialog.
- m. Repeat from step 2g on page 66 for two other user rights: **Create permanent shared objects** and **Log on as a service**.
3. *Set up the InfoPrint Manager server to use the new user account.*
  - a. Click the Windows **Start** button and select **Programs → IBM InfoPrint Manager → Management Console**.
  - b. Stop the InfoPrint Manager server by selecting **File → Stop Server**.

**Note:** If you are not able to stop the server because you are not authorized for that action, check the InfoPrint Manager Access Control List (ACL) for the **Shutdown** operation. Log off and log back on as a user who is on the access control list.

- c. Select **Edit → Service Account/Domain**.

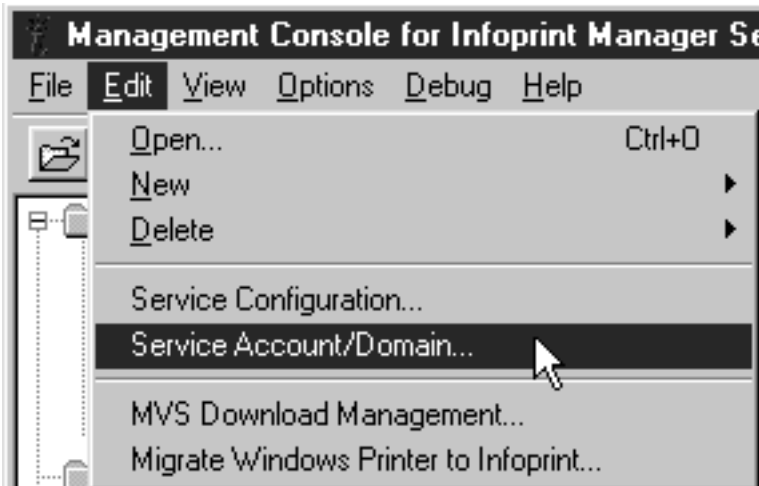


Figure 22. Windows 2000/2003 — Management Console: Edit → Service Account/Domain

- d. Enter the name of the domain that the InfoPrint Manager server is installed in and the user name and password from step 1 on page 61

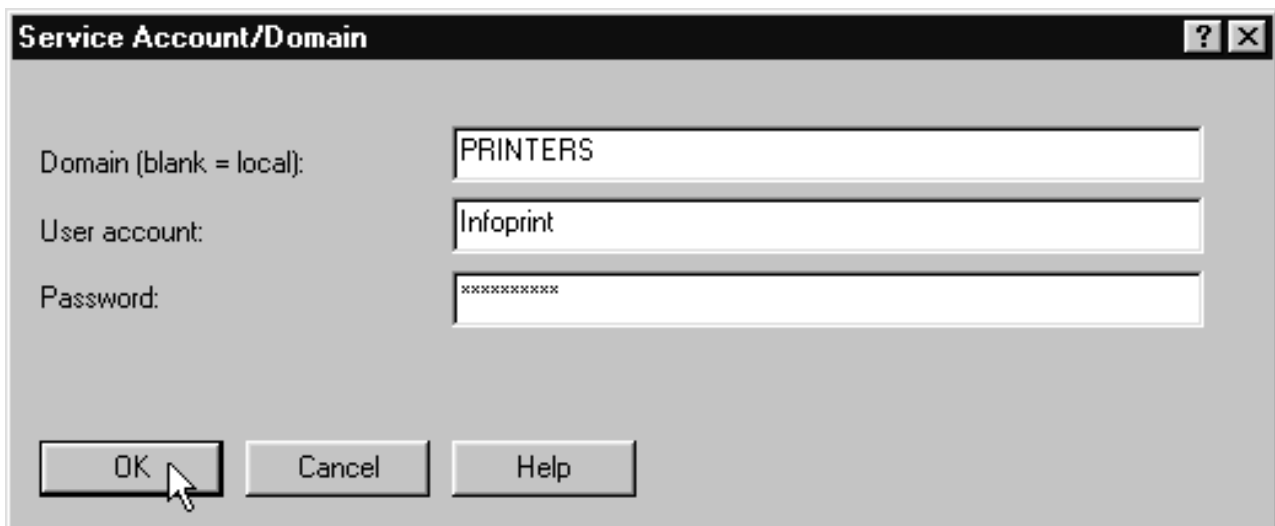


Figure 23. Windows 2000/2003 — Management Console: Service Account/Domain dialog

- e. Click **OK**.
4. *On the machine where the AFP resources reside, share the directory that the resources reside in so the domain user has access to it.*
  - a. Log on to the system that your resources reside on as a user who is a member of the Administrators group.
  - b. Open **Windows Explorer** and navigate to the directory that your resources are stored in.
  - c. Right-click the folder and select **Properties** from the pop-up menu.

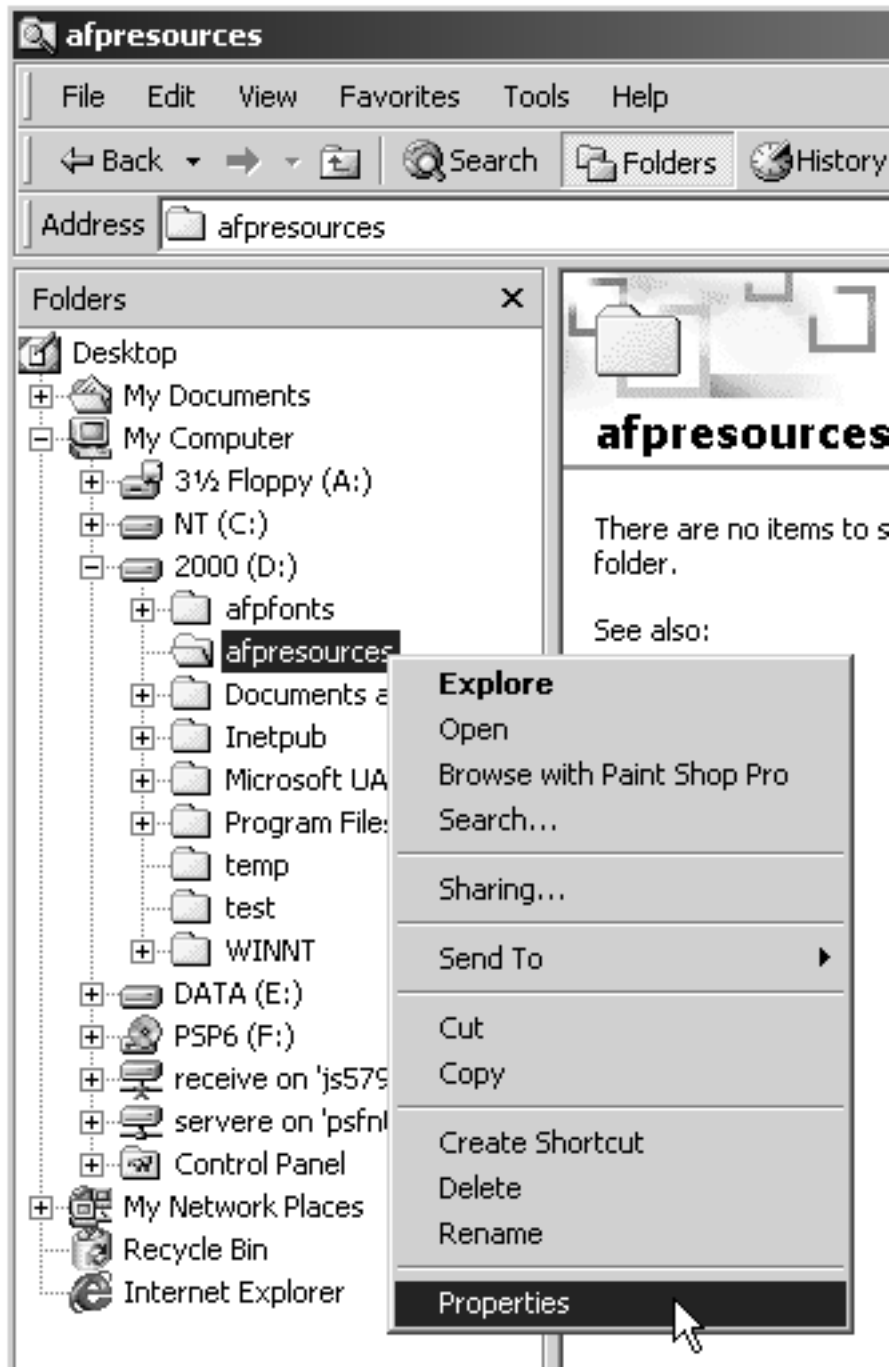


Figure 24. Windows 2000/2003 — Explorer folder right-click menu

- d. In the **Properties** dialog, click the **Security** tab.

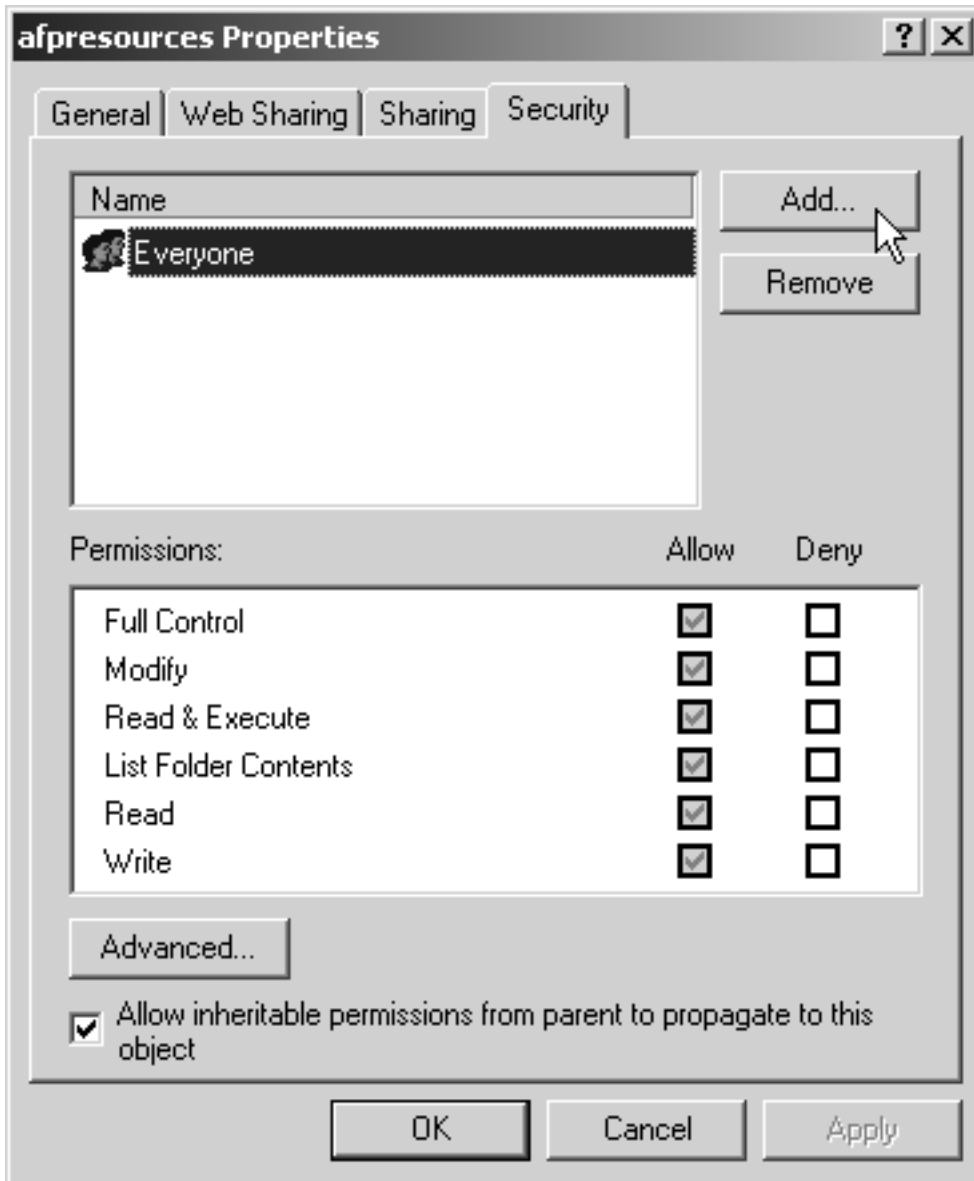


Figure 25. Windows 2000/2003 — Properties dialog: Security tab

- e. If **Domain Admins** is not in the **Name** list, click **Add**.
- f. In the **Select Users, Computers, or Groups** dialog, choose the correct domain from the **Look in** drop-down list.
- g. Select **Domain Admins** in the **Name** list and click **Add**. You might also want to add the local administrators group as well.

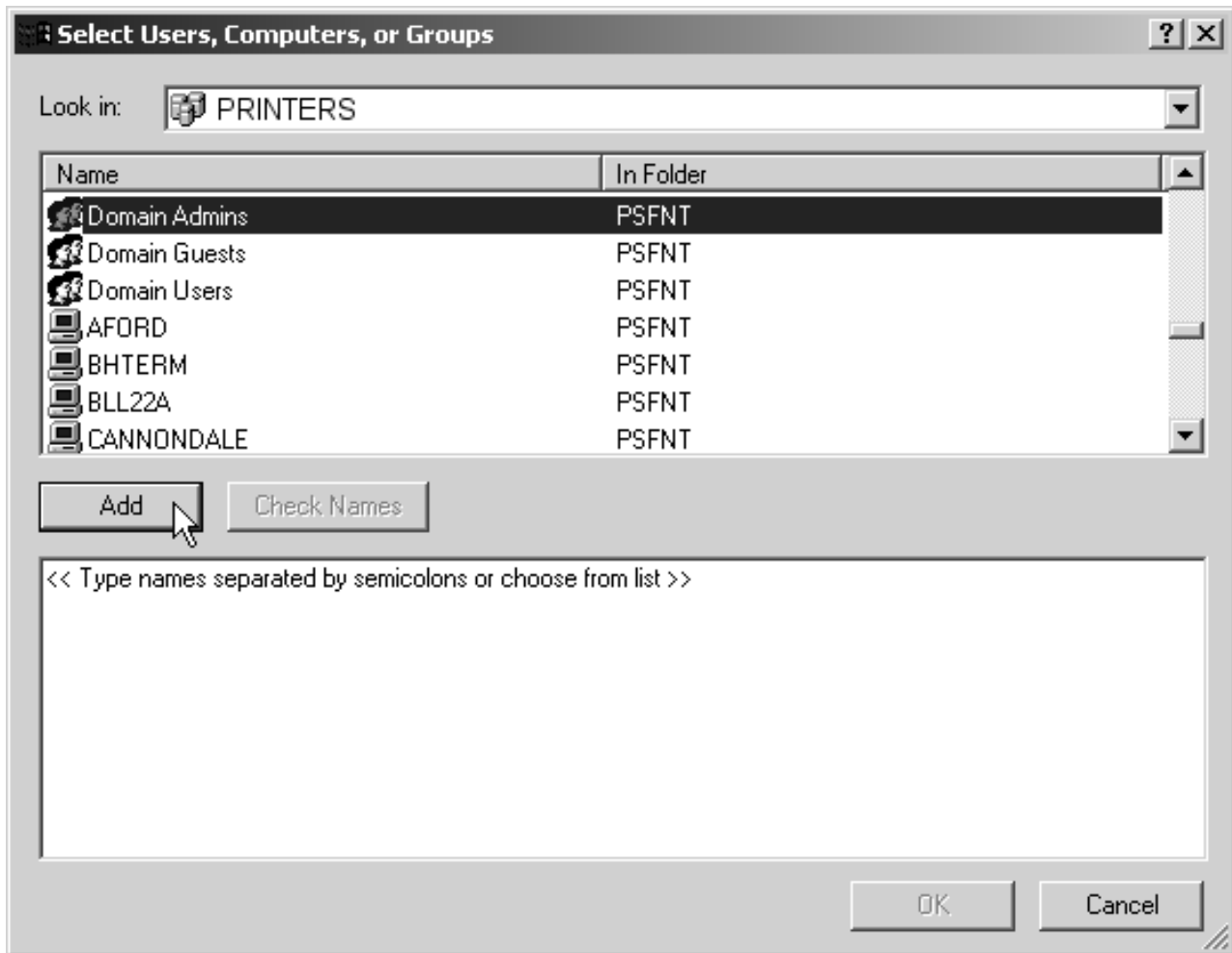


Figure 26. Windows 2000/2003 — Add Domain Admins group to list

- h. Click **OK**.
- i. In the **Properties** dialog, make sure that **Full Control** is allowed for **Domain Admins** in the **Permissions** box.

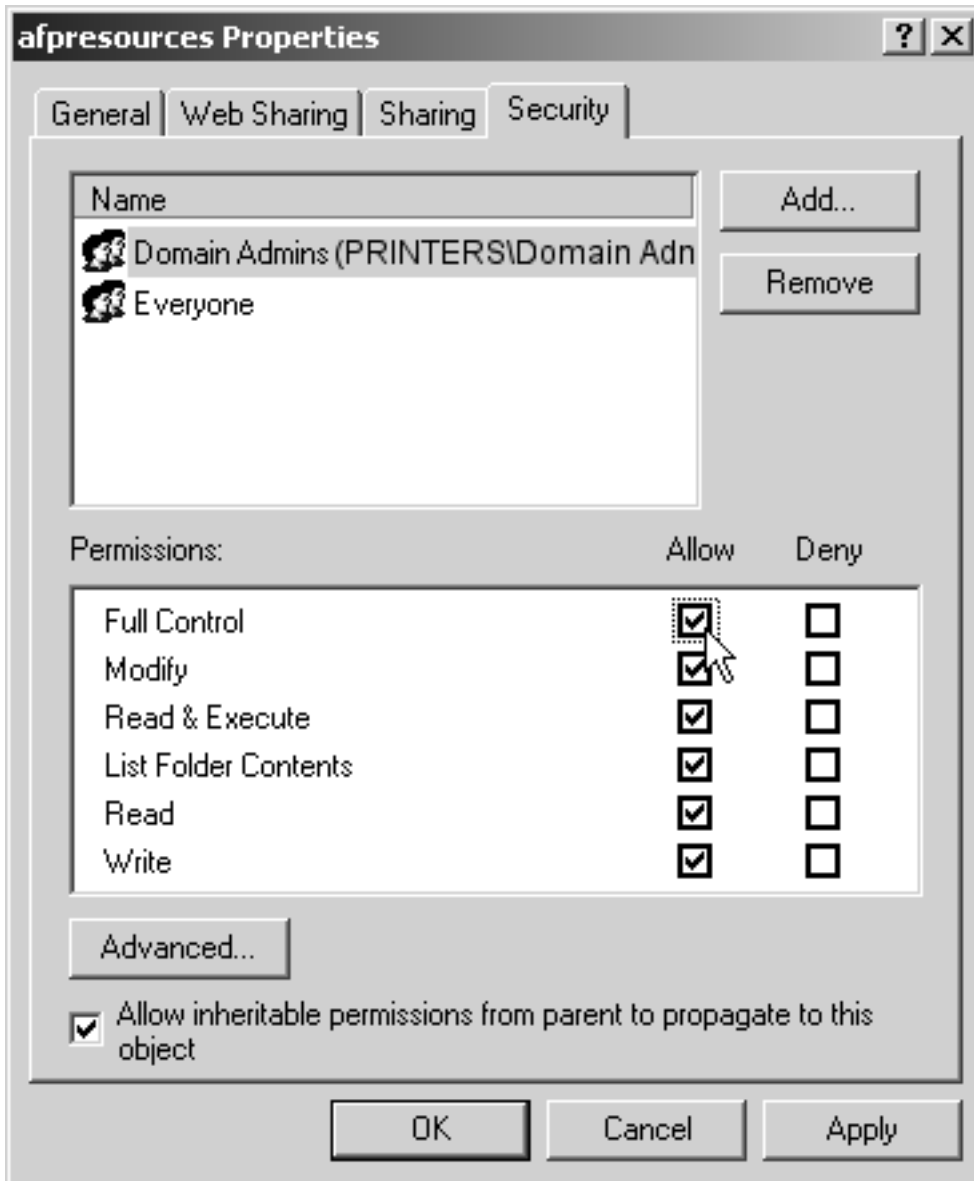


Figure 27. Windows 2000/2003 — Properties dialog: Give Domain Admins Full Control

- Note:** You may want change the access level for the **Everyone** group as well.
- j. Click the **Sharing** tab.
  - k. Select **Share this folder**. Verify the name of the folder in the **Share name** field and type a descriptive comment in the **Comment** field.



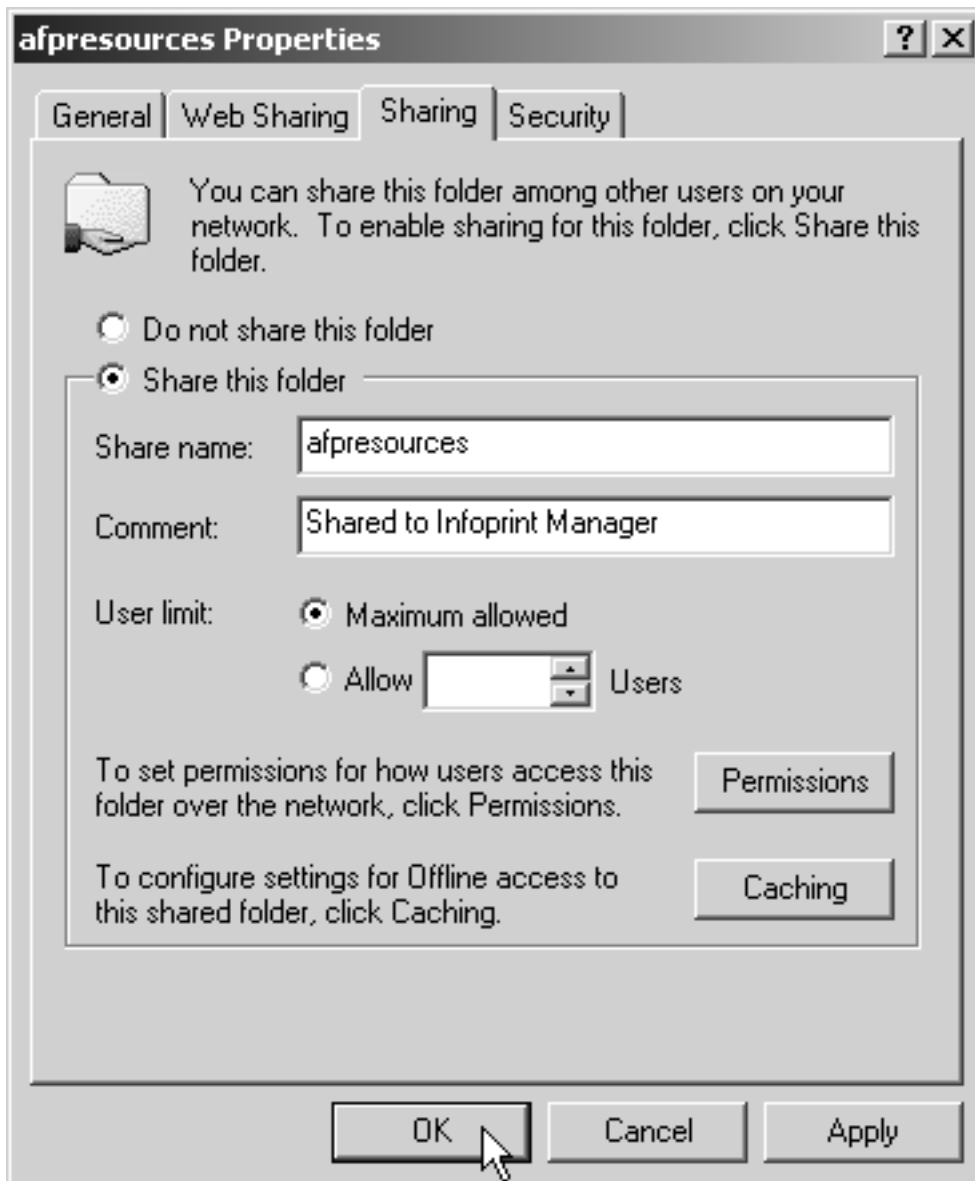


Figure 28. Windows 2000/2003 — Properties dialog: Sharing tab

- l. Click **OK**.
- m. Return to the Management Console on the system that InfoPrint Manager is installed on and select **File** → **Start Server** to restart the InfoPrint Manager server.

## Preparing for shared resources with MVS Download

If you are running InfoPrint Manager on Windows 2000, 2003, or XP and will be using MVS Download multiple data set support, you must perform an additional task to share resources on a network drive:

1. Click the Windows **Start** button and select **Settings** → **Control Panel** → **Administrative Tools** → **Services**.
2. Select **Infoprint Manager MVS Download**.

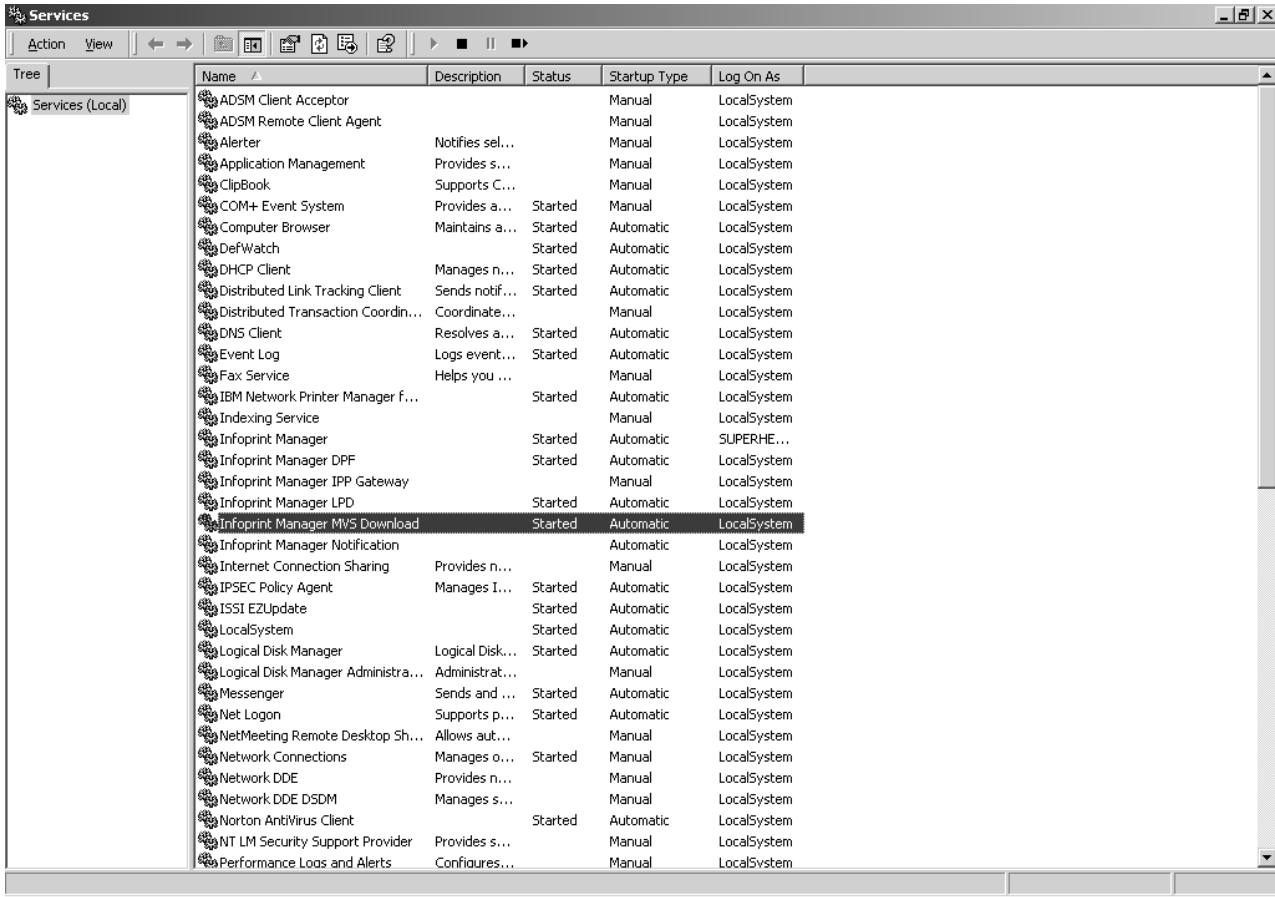


Figure 29. Services dialog: InfoPrint Manager MVS Download

3. On the **Infoprint Manager MVS Download Properties (Local Computer)** dialog, click the **Log On** tab, and click the **This account** radio button.

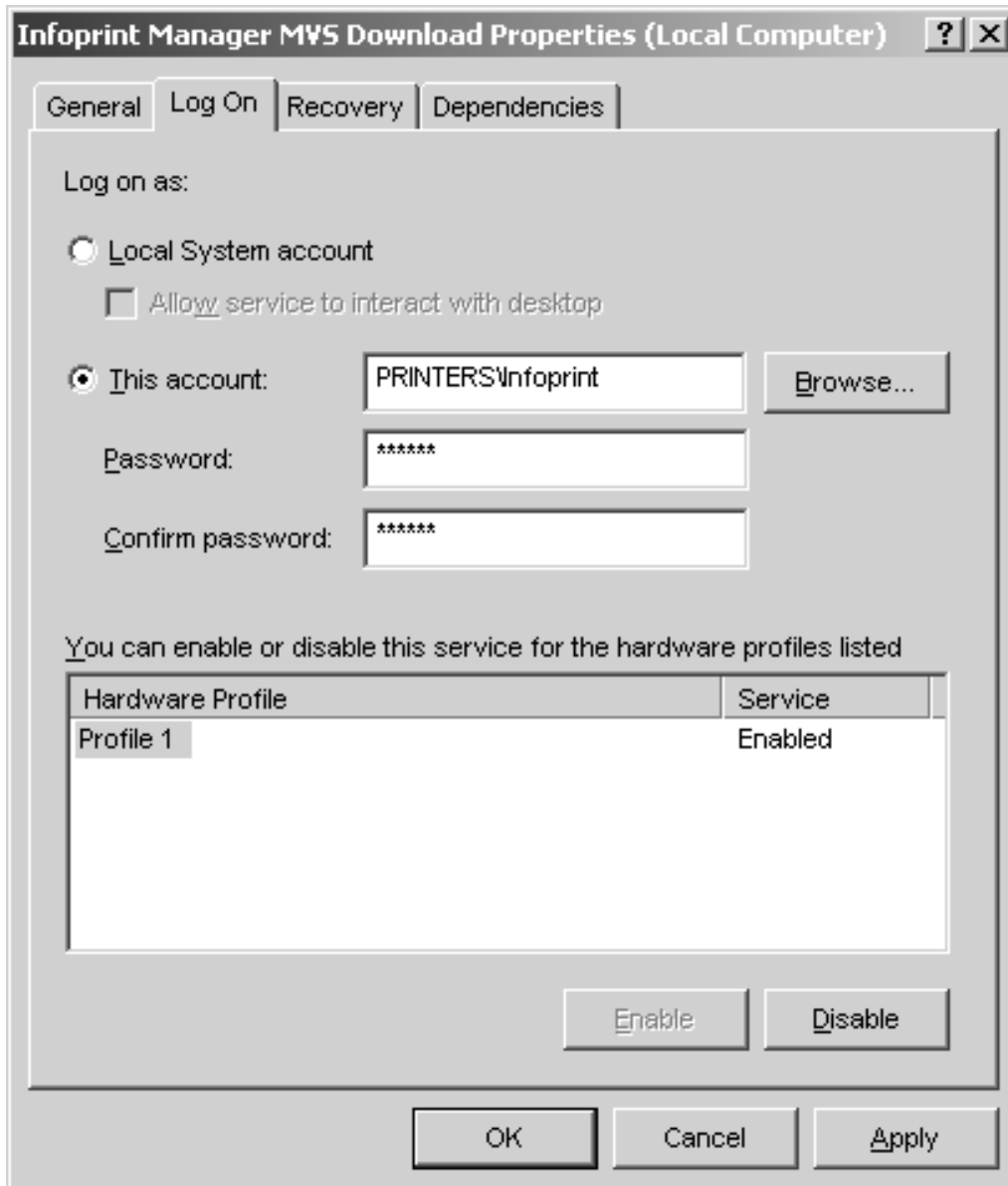


Figure 30. InfoPrint Manager MVS Download Properties (Local Computer)

4. Enter the account information for the same user you authorized in step 1 on page 61.
5. Click OK.

**Note:** This procedure uses screen captures from Windows 2000. The screens are very similar to this on Windows 2003 and XP.

## Telling InfoPrint Manager where your remote resources are located

Once you have made the resources available, you have to make sure the InfoPrint Manager destinations that will be using them know where they are. Follow the steps below to complete this configuration.

1. On the system that InfoPrint Manager runs on, map a network drive to the directory that your resources reside in.

- a. Open Windows Explorer.
- b. Select **Tools** → **Map Network Drive**.

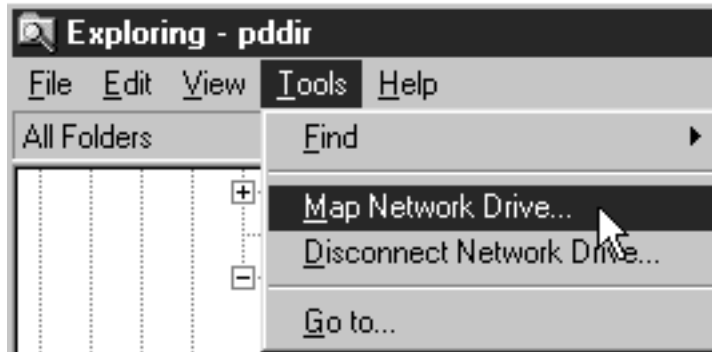


Figure 31. Map network drive

- c. Specify the user and password to use.
  - Windows 2000**
  - 1) In the **Map Network Drive** dialog, select a drive letter that you are not currently using from the drop-down menu in the **Drive** field.



Figure 32. Map Network Drive

- 2) In the **Folder** field, type the Universal Naming Convention (UNC) name of the directory you shared on the system that your resources are stored on server in this format: `\\resourcesystem\sharename`.

- 3) Select **Reconnect at logon**.
- 4) Click the **Connect using a different user name** link.
- 5) In the **Connect As** dialog, type the user name and password that you created in step 1 on page 61.

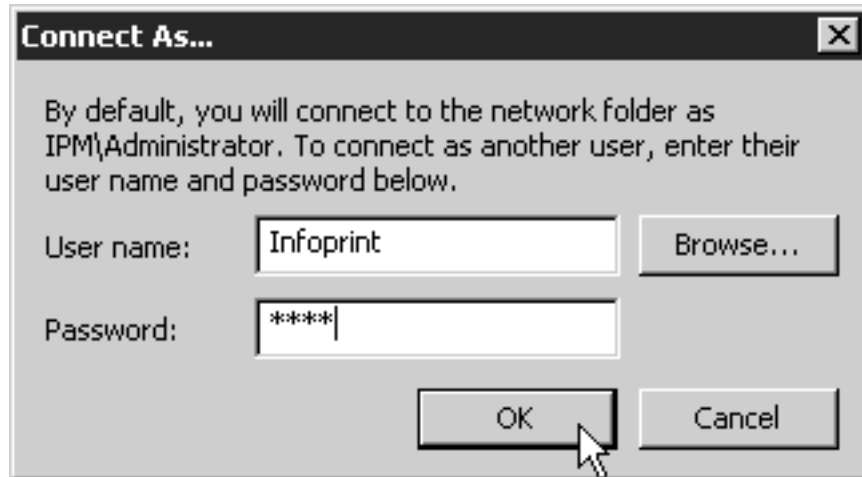


Figure 33. Connect As...

- 6) Click **OK** in the **Connect As** dialog.
  - 7) Click **Finish** in the **Map Network Drive** dialog.
2. Start the InfoPrint Administration GUI.
  3. Select one of the printers that needs to access these resources and right-click it.

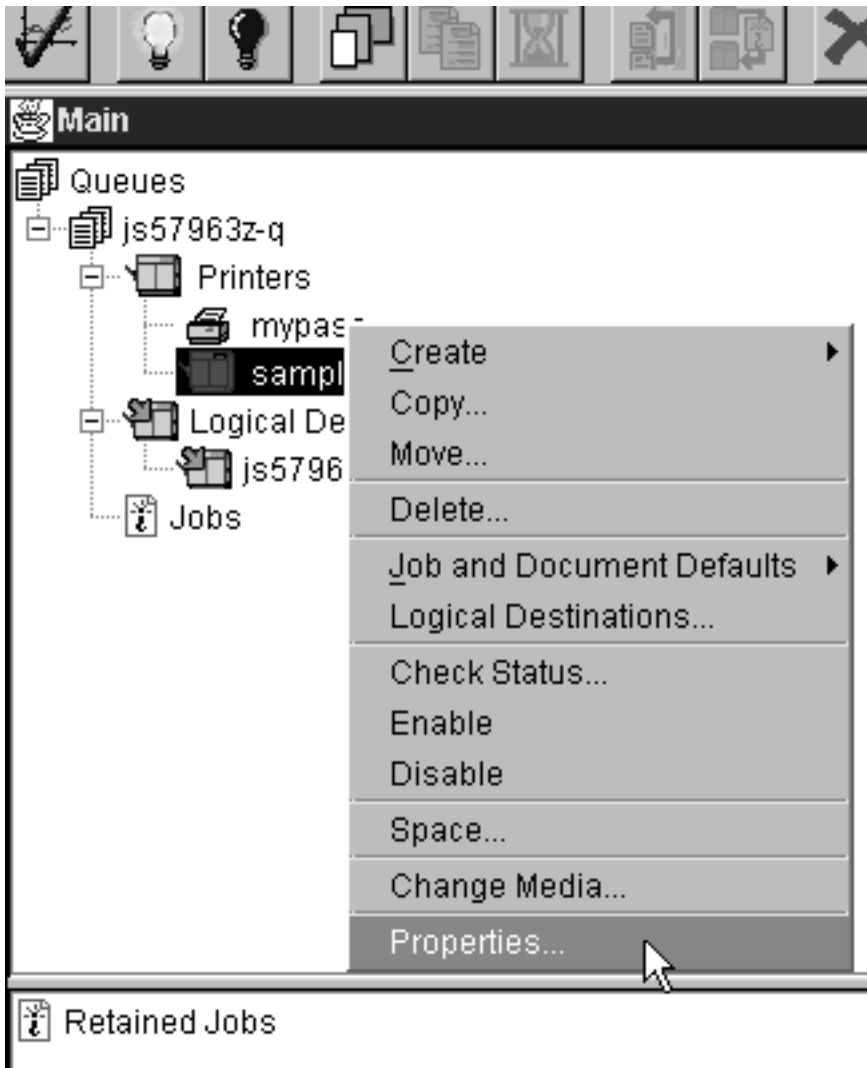


Figure 34. Administration GUI: Printer right-click menu

4. Select **Properties** from the pop-up menu.
5. In the Properties notebook for this printer, click the **AFP Resources** tab.

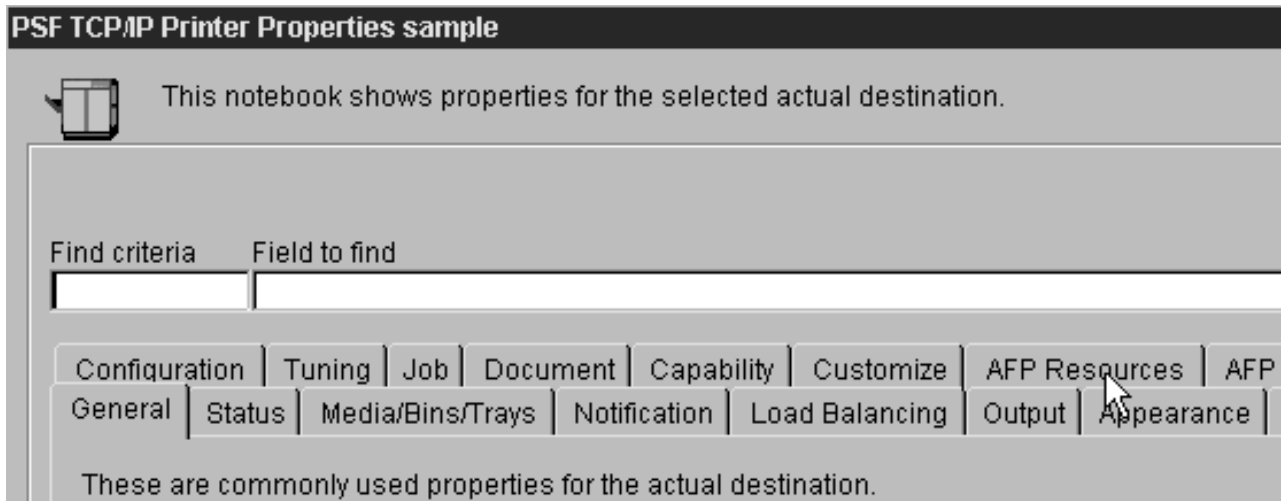


Figure 35. Administration GUI: Printer Properties Notebook

6. Find the correct field for your situation. For example, if your directory only holds fonts, find the **Location of fonts** field; if it holds only overlays, find the **Location of overlays** field. However, if the directory holds a variety of resources, find the **Location of resources** field.

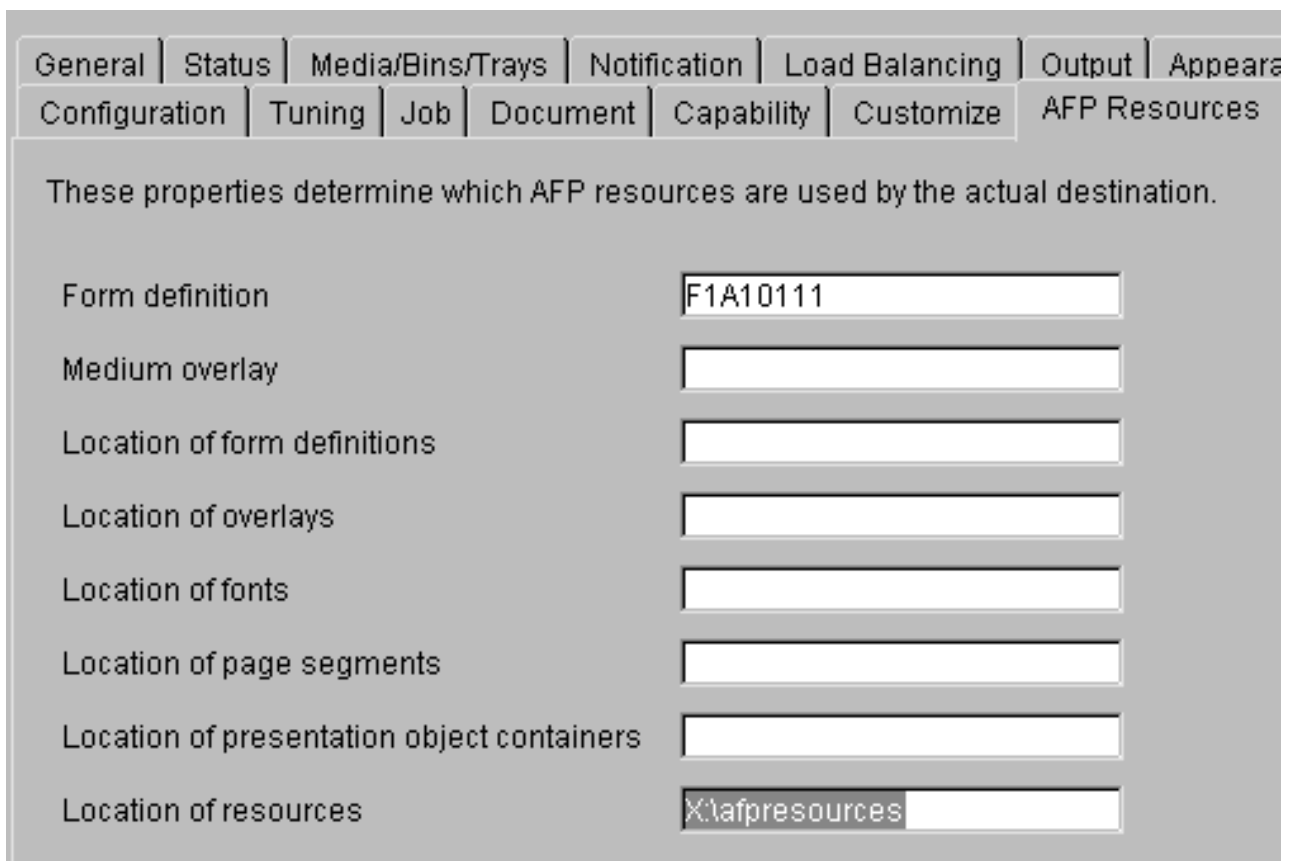


Figure 36. Administration GUI: Printer Properties notebook- AFP Resources tab

7. In the correct field, type the letter of the drive you mapped in step 1c on page 78 and the share name of the directory that contains the resources. For example: x:\afpresources.
8. Click **OK** to close the properties notebook and make the settings take effect.



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## Chapter 14. Working with SNMP printers

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### 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**

### Note:

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 **snmp-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 attributes 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*.

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## 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 87 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*.

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## 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 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 **pdlis** 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.





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## Chapter 15. 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 293.

### 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 COH20000 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\COH20000.300`
2. `x:\myfonts\COH20000.FONT300`
3. `x:\myfonts\COH20000`
4. `x:\all_resources\COH20000.300`
5. `x:\all_resources\COH20000.FONT300`
6. `x:\all_resources\COH20000`
7. With InfoPrint Manager for Windows:
  - a. `c:install_path\reslib\COH20000.300`
  - b. `c:install_path\reslib\COH20000.FONT300`
  - c. `c:install_path\reslib\COH20000`

- d. `c:\font_install_path\afpfonts\C0H20000.300`
- e. `c:\font_install_path\afpfonts\C0H20000.FONT300`
- f. `c:\font_install_path\afpfonts\C0H20000`
- g. `c:\font_install_path\psf\fontlib\C0H20000.300`
- h. `c:\font_install_path\psf\fontlib\C0H20000.FONT300`
- i. `c:\font_install_path\psf\fontlib\C0H20000`

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 Windows, `$$ENV_PDRESLIB`

#### 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 Windows, `$$ENV_PDRESLIB`

**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.

<i>Type of Resource</i>	<i>File Extensions Searched (see note)</i>
BCOCA (bar code) objects	No file extension

<i>Type of Resource</i>	<i>File Extensions Searched (see note)</i>
Code pages	<ol style="list-style-type: none"> <li>1. No file extension</li> <li>2. <b>FONT3820</b></li> <li>3. <b>FONT38PP</b></li> <li>4. <b>CDP</b></li> <li>5. <b>FONT300</b></li> </ol>
Coded fonts	<ol style="list-style-type: none"> <li>1. No file extension</li> <li>2. <b>FONT3820</b></li> <li>3. <b>FONT38PP</b></li> <li>4. <b>CFT</b></li> <li>5. <b>FONT300</b></li> </ol>
Font character sets, 240-pel resolution	<ol style="list-style-type: none"> <li>1. No file extension</li> <li>2. <b>240</b></li> <li>3. <b>FONT3820</b></li> <li>4. <b>FONT38PP</b></li> <li>5. <b>CFT</b></li> <li>6. <b>CDP</b></li> </ol>
Font character sets, 300-pel resolution	<ol style="list-style-type: none"> <li>1. No file extension</li> <li>2. <b>300</b></li> <li>3. <b>FONT300</b></li> <li>4. <b>CFT</b></li> <li>5. <b>CDP</b></li> </ol>
Outline fonts	<ol style="list-style-type: none"> <li>1. No file extension</li> <li>2. <b>OLN</b></li> <li>3. <b>FONTOLN</b></li> <li>4. <b>CFT</b></li> <li>5. <b>CDP</b></li> </ol>
TrueType and OpenType fonts, CMRs, and data object resources	Entire file name, including extension; comes from the Resources Access Tables (RATs) created 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	<ol style="list-style-type: none"> <li>1. No file extension</li> <li>2. <b>FDEF3820</b></li> <li>3. <b>FDEF38PP</b></li> <li>4. <b>FDE</b></li> <li>5. <b>FIL</b></li> </ol>
BCOCA (bar code) objects	<ol style="list-style-type: none"> <li>1. No file extension</li> <li>2. <b>OBJ</b></li> <li>3. <b>OBJECT</b></li> </ol>
GOCA (graphics) objects	<ol style="list-style-type: none"> <li>1. No file extension</li> <li>2. <b>OBJ</b></li> <li>3. <b>OBJECT</b></li> </ol>

<i>Type of Resource</i>	<i>File Extensions Searched (see note)</i>
IOCA (IO image) objects	<ol style="list-style-type: none"> <li>1. No file extension</li> <li>2. <b>OBJ</b></li> <li>3. <b>OBJECT</b></li> </ol>
MO:DCA™ Objects	<ol style="list-style-type: none"> <li>1. No file extension</li> <li>2. <b>OBJ</b></li> <li>3. <b>OBJECT</b></li> </ol>
Overlays	<ol style="list-style-type: none"> <li>1. No file extension</li> <li>2. <b>OVLY3820</b></li> <li>3. <b>OVLY38PP</b></li> <li>4. <b>OVL</b></li> <li>5. <b>OLY</b></li> <li>6. <b>OVR</b></li> </ol>
Page definitions	<ol style="list-style-type: none"> <li>1. No file extension</li> <li>2. <b>PDEF3820</b></li> <li>3. <b>PDEF38PP</b></li> <li>4. <b>PDE</b></li> </ol>
Page segments	<ol style="list-style-type: none"> <li>1. No file extension</li> <li>2. <b>PSEG3820</b></li> <li>3. <b>PSEG38PP</b></li> <li>4. <b>PSG</b></li> <li>5. <b>PSE</b></li> </ol>
Color mapping table	<ol style="list-style-type: none"> <li>1. No file extension</li> <li>2. <b>SETUP</b></li> <li>3. <b>SET</b></li> </ol>
Presentation object container For data object resources not installed in a Resource Access Table (RAT).	<ol style="list-style-type: none"> <li>1. No file extension</li> <li>2. <b>DOR</b></li> </ol>
Setup data	<ol style="list-style-type: none"> <li>1. No file extension</li> <li>2. <b>SETUP</b></li> <li>3. <b>SET</b></li> <li>4. <b>COMSETUP</b></li> </ol>
<b>Note:</b> 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
<b>FONTPATH</b>	TrueType and OpenType fonts
<b>OBJCONDDDD, RESLIB, and USERLIB</b>	Object containers (including data objects) and CMRs
<b>USERPATH</b>	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.

---

## Creating a new resource-context object

You create resource-context objects from the **Command prompt** window; 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=x:\resource\fonts\group1"  
Server1:Resfont1
```

### Notes:

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 x:\resource\fonts\group2 as the directory containing AFP font resources, enter the command:

```
pdset -c resource-context -x "context-address=x:\resource\fonts\group2"  
Server1:Resfont1
```



---

## Chapter 16. Using PSF DSS user-exit programs

This topic describes the sample PSF DSS user-exit programs supplied with InfoPrint Manager and shows how you can create your own PSF DSS user-exit programs. These user-exit programs apply to printers connected to InfoPrint Manager through the PSF device support subsystem (DSS).

This chapter contains the following topics:

- “Supported types of PSF DSS user-exits”
- “Sample PSF DSS user-exit programs” on page 102
- “Creating and using your own PSF DSS user-exit programs” on page 104
- “Compiling and installing the user-exit program” on page 104
- “The header page and trailer page user-exit programs” on page 109
- “Accounting, post-print accounting, and audit user-exit program inputs and outputs” on page 110
- “Input data user-exit program inputs and outputs” on page 113
- “Output data user-exit program inputs and outputs” on page 115
- “Structure of a user-exit program” on page 116
- “User-exit programs for the line data transform” on page 116
- “Attributes of the line data input file” on page 123
- “Using the uconv command to convert coded character sets” on page 124

---

### Supported types of PSF DSS user-exits

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

InfoPrint Manager allows eight different types of PSF DSS user exits. InfoPrint Manager calls the 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

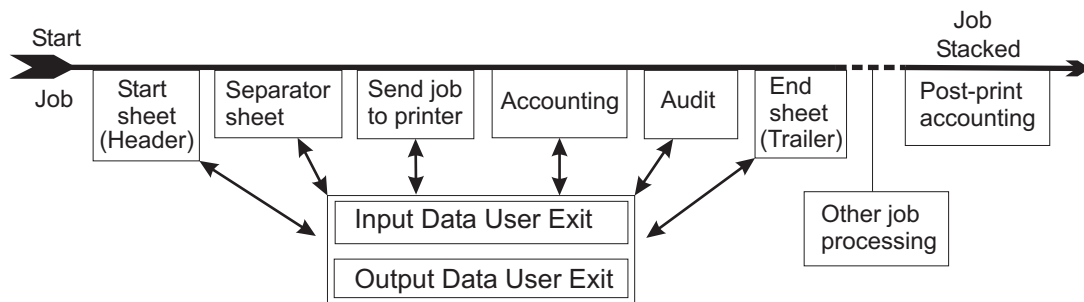


Figure 37. InfoPrint Manager user-exit program order at the printer

## Sample PSF DSS user-exit programs

InfoPrint Manager supplies sample PSF DSS 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 `install_path\exits\psf` directory. The `install_path` is the directory that InfoPrint Manager is installed in. If you don't know the install path, you can find it in the **Management Console**. Open the Management Console, click **Edit → Change Service Configuration** and find the **Install path** field.

Table 1 lists the sample user exit programs supplied with InfoPrint Manager.

Table 8. 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.

Table 8. Sample user-exit programs (continued)

Type of user exit	File Name	Description
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
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.

**Note:** Refer to "User-exit programs for the line data transform" on page 116 for sample user-exit programs used with the line data transform.

---

## Creating and using your own PSF DSS user-exit programs

You can create your own PSF DSS user-exit program at any time; however, you must perform additional tasks to produce a PSF DSS user-exit executable program. You must have the Microsoft Visual C++ Program, Version 5.0 or higher, installed on your InfoPrint Windows server in order to compile and build user-exit programs. Be sure to apply the latest service available.

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 the Microsoft Visual C++ Program.
- Write your own user-exit program. You can include the variable data shown in the following sections, for example, USERID; but InfoPrint cannot process variable data that is not shown in this topic.

### 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.

---

## Compiling and installing the user-exit program

You can only specify one user-exit program for each function name provided by InfoPrint per actual destination.

The function name of the user exit must be one of the following (in uppercase), because that is the entry point in the module:

- ACCOUNTING
- AUDIT
- JOBCOMPLETION
- HEADER
- SEPARATOR
- TRAILER
- INDATA
- OUTDATA

## Activating the user-exit program

Before you can use the new user-exit program, you must activate the program.

To perform this task from the command line, click the Windows **Start** button and select **Programs** → **Command Prompt** and complete the following steps:

1. Enter the following command: `pdls -c aux -r all 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 -c aux -r all servername:accounting-log`

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

From the **Infoprint Manager Administration GUI**, 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 GUI**.

To perform this task from the command line, complete the following steps.

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

```
pdcreate -c aux-sh -x psf-exit-prog-name=fullpath\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=fullpath\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
```

---

## 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 *install\_path\psf\exits\ainuexit.h* file
- The *install\_path\psf\exits\ainurpt.h* file

The **ainuexit.h** file contains definitions for the header, trailer, separator, accounting, audit, and post-print accounting exits, while the **ainurpt.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 *install\_path\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

### UserID

Identifies the system user ID of the person who submitted the job.

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

### NodeID

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

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

### Jobname or Name

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** or **name=name** when they submit a job. If the job name is not specified for files defined as PCL, PostScript, line data, unformatted ASCII, double-byte character set (DBCS) ASCII, or PDF, when the job is submitted, InfoPrint creates a temporary file for the transform output. InfoPrint uses the temporary file name for the job name.

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

### 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.

**Date** Identifies the date the job is printed in MM/DD/YY format.

**Time** Identifies the time the job is printed in HH:MM:SS format.

### Distribution

Identifies the distribution information provided when the job is submitted.



**PagePointer**

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

**PageSize**

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

**PageType**

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

- 0      AFP data stream
- 1      ASCII data

**Job Completion**

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

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

**Account**

Identifies the account information provided when the job is submitted. The **Account** field value can be any null-terminated (X'00') character string. You should limit the string to 20 characters or less. Job submitters can specify this same information through the **account-text** document attribute.

**Address1**

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

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

**Address2**

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

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

**Address3**

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

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

**Address4**

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

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

#### **Account**

Identifies the account information provided when the job is submitted.

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

#### **Building**

Identifies the building information provided when the job is submitted.

The **Building** field value can be any null-terminated (X'00') character string. You should limit the string to 24 or less characters. You can specify this same information through the **building-text** document attribute.

#### **Department**

Identifies the department information provided when the job is submitted.

The **Department** field value can be any null-terminated (X'00') character string. You should limit the string to 24 or less characters. You can specify this same information through the **department-text** document attribute.

#### **Passthru**

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

The following **Passthru** flags are supported:

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

#### **destination**

Identifies the one-to eight-character destination attribute.

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

#### **segmentid**

Identifies the one-to ten-character segmentation identifier.

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

#### **Programmer**

Identifies the programmer information provided when the job is submitted.

The **Programmer** field value can be any null-terminated (X'00') character string. You should limit the string to 24 or less characters. You can specify this same information through the **programmer-text** document attribute.

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

The **Room** field value can be any null-terminated (X'00') character string. You should limit the string to 24 or less characters. You can specify this same information through the **room-text** InfoPrint document attribute.

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

The **Title** field value can be any null-terminated (X'00') character string. You should limit the string to 24 or less characters. You can specify this same information through the **title-text** document attribute.

#### **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 102 are located in the *install\_path\exits\psf* 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 *install\_path\exits\psf\ainuexit.h* file. The code for these structures is shown in “User-exit program structures” on page 105.

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 106 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 104).

---

## 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. This exit is also called before the error messages and the trailer page ( Figure 37 on page 102).

The source code (in the C programming language) for the sample separator page user-exit programs listed on page 102 are located in the *install\_path\exits\psf* 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 *install\_path\exits\psf\ainuexit.h* file. The code for these structures is shown in “User-exit program structures” on page 105.

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 106 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 104).

---

## Accounting, post-print accounting, and audit user-exit program inputs and outputs

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 separator page user-exit programs listed in “Supported types of PSF DSS user-exits” on page 101 are located in the *install\_path*\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 *install\_path\exits\psf* directory.

These executable reporting utilities are located in the *install\_path\bin* folder. By specifying these executable reporting utilities at the DOS 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 104.

The data structures for the accounting, audit, and post-print accounting user-exit programs are included with the source code in the *install\_path\exits\psf\ainuexit.h* and *install\_path\exits\paf\ainurpt.h* files. The code for these structures is shown in “Structure of a user-exit program” on page 116.

The declarations of these exits are:

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

The **ACCOUNTING\_EXITDATA**, **AUDIT\_EXITDATA**, and **JOBCOMPLETION\_EXITDATA** input and output parameters contain all the input and output data needed to communicate between InfoPrint and the user-exit programs.

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

To build the executable program, you must use the Microsoft Visual C++ Program, Version 5.0 pull-down menu.

## **Fields that provide information for accounting, audit, and post-print accounting user-exit programs**

The following fields 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 all pages sent are 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 all pages sent are printed and stacked.

**DORU**

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

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

---

## Input data user-exit program inputs and outputs

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 37 on page 102).

**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 “Sample PSF DSS user-exit programs” on page 102 is in the `install_path\exits\psf\ainuxind.c`. 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 `install_path\exits\psf` directory.

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 `INDATA_EXITDATA` structure includes the following fields. The following fields provide input information:

**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).

**Note:** 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 *install\_path\exits\psf*.

**Note:** The input information fields used by some of the sample programs are available through the alternate sample user exits. InfoPrint Manager does not provide an alternate Input Data User Exit.

## Ouput data user-exit program inputs and outputs

The InfoPrint output data user-exit program is used to monitor the outgoing print data stream from InfoPrint. This exit is called at the end of the job before the error messages and the trailer page. The input and output data exits are one-directional, that is, it can read the data but cannot alter it.

The source code (in the C programming language) for the sample input data user-exit program listed in “Supported types of PSF DSS user-exits” on page 101 is in the *install\_path\exits\psf\ainuxout.c* file. This sample program consists of a return code and performs no function.

The data structures for the output data user-exit program are included with the source code in the *install\_path\exits\psf\ainuexit.h* file. The code for these structures is shown in "Structure of a user-exit program."

The declaration of this exit is: `void OUTDATA (OUTDATA_EXITDATA \exitdata)`

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

To build the executable program, you must use the Microsoft Visual C++ Program, Version 5.0 pull-down menu.

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.

---

## Structure of a user-exit program

All input and output variables used in InfoPrint user exits are defined through either of the following two files:

- *install\_path\exits\psf\ainuexit.h* or
- *install\_path\exits\psf\ainurpt.h*

The *ainuexit.h* file contains definitions for the header, trailer, separator, accounting, audit, and post-print accounting exits, while the *ainurpt.h* file formats data for the following executable reporting utilities:

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

---

## User-exit programs for the line data transform

InfoPrint provides several sample user-exit programs for the line-data transform. Use of the user exits is optional. You specify the names of the exit programs with the **inpexit**, **indxexit**, **outexit**, and **resexit** keywords.

InfoPrint provides the following sample programs:

*install\_path\exits\acif\apkinp.c*  
Input-record user exit

*install\_path\exits\acif\apkout.c*  
Output-record user exit

*install\_path\exits\acif\apkres.c*  
Resource exit

In addition, InfoPrint provides the following input-record user exits programs to translate input data streams:

- apka2e
- asciinp
- asciiupe

## apka2e

*install\_path\exits\acif\apka2e.c*

Converts ASCII stream data to EBCDIC stream data.

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=install_path\bin\apka2e.dll  
cc=yes  
cctype=z
```

## asciinp.c

*install\_path\exits\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.

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=install_path\bin\asciinp.dll  
cc=yes  
cctype=z
```

## asciiupe.c

*install\_path\exits\acif\asciiupe.c*

Converts unformatted ASCII data into a record format just as **asciinp.c** does, and then converts the ASCII stream data to EBCDIC stream data.

The **asciinpe** input-record exit program combines both of the user input-record exits described above. To execute, specify `inpxit=install_path\bin\asciinpe.dll` as the exit program in the keyword file and follow the directions specified for both **apka2e** and **asciinp**.

The **asciinpe.c** 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')

In addition to the information above, refer to the prolog of the **asciinp.c** source file that is provided with InfoPrint Manager in the `install_path\exits\acif` directory for more information on using and modifying these programs.

The C language header file for all ACIF exit programs is provided in `install_path\exits\acif\apkexits.h` along with the build rules for the ACIF user exits in `install_path\exits\acif\Makefile`.

To build the executable program, you must use the Microsoft Visual C++ Program, Version 6.0 SP5 and above, pull-down menu.

## Input record exit

The line-data transform provides an exit that enables you to add, delete, or modify records in the line-data input file. The program invoked at this exit is defined by the value of the **inpxit** keyword of the **line2afp** command.

This exit is called after each record is read from the input file. The exit can request that the record be discarded, processed, or processed with control returned to the exit for the next input record. The largest record that InfoPrint Manager can process is 32756 bytes. This exit is not called when the line-data transform is processing resources from directories.

The following example provides a sample C language header that describes the control block that is passed to the exit program:

```

/*****
/* INPEXIT STRUCTURE
/*****
typedef struct _INPEXIT_PARAMS /* 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 @006a*/
    unsigned short out_CCSID;    /* output CCSID for translating @006a*/
    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;

```

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. Refer to “Attributes of the line data input file” on page 123 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.

**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.

## **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.

The following example 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 written         */
    unsigned short recordln;     /* Length of the output record             */
    char          request;       /* Delete or process the record            */
    char          eof;          /* Last call indicator                     */
}OUTEXIT_PARMS;
```

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. Refer to “Attributes of the line data input file” on page 123 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 not process 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 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).



The following example contains a sample C language header that describes the control block passed to the exit program:

```
/* RESEXIT STRUCTURE */
/* RESEXIT STRUCTURE */
typedef struct _RESEXIT_PARMS /* Parameters for resource record exit */
{
    char          *work;      /* Address of 16-byte static work area */
    PFATTR        *pattr;    /* 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 resname1; /* Length of resource name @05A*/
    char          pad1[3];    /* padding byte @05A*/
    char          resnamf[250]; /* Rsrc name if more than 8 bytes@05A*/
} RESEXIT_PARMS;
```

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. Refer to “Attributes of the line data input file” on page 123 for more information on the format of this data structure and the information presented.

#### **resname (Bytes 9–16)**

Specifies the name of the requested resource. The exit program cannot modify or change this value.

#### **restype (Byte 17)**

Specifies the type of resource the name refers to. This is a one-byte hexadecimal value where:

- X'03' Specifies a GOCA (graphics) object.
- X'05' Specifies a BCOCA (barcode) object.
- X'06' Specifies an IOCA (IO image) object.
- X'40' Specifies a font character set.
- X'41' Specifies a code page.
- X'FB' Specifies a page segment.
- X'FC' Specifies an overlay.

The line-data transform does not call this exit for the following resource types:

#### **Page definition**

The page definition (**pagedef** keyword) is a required resource for transforming a line-data file.

#### **Form definition**

The form definition (**formdef** keyword) is a required resource for printing a transformed line-data file.



### Coded fonts

The line-data transform must process coded fonts to determine the names of the code pages and font character sets they reference. This is necessary in creating Map Coded Font-2 (MCF-2) structured fields.

### request (Byte 18)

Specifies how the line-data transform processes the resource. On entry to the exit program, this parameter is X'00'. When the exit program returns control to the line-data transform, this parameter must have the value X'00' or X'01' where:

X'00' Specifies that the line-data transform should process the resource.

X'01' Specifies that the line-data transform should ignore the resource.

A value of X'00' on entry to the exit program specifies that the resource be processed. If you want to ignore the resource, change the request byte value to X'01'. Any value greater than X'01' is interpreted as X'00' and the resource is processed.

### eof (Byte 19)

An end-of-file (**eof**) indicator. This indicator is a one-byte character code that signals when the line-data transform has written the last record.

When **eof** is signaled (eof value = 'Y'), the last record has already been presented to the resource exit. The pointer **record** is no longer valid. Records may not be inserted after **eof** is signaled. The following are the only valid values for this parameter:

Y Specifies that the last record has been written.

N Specifies that the last record has not been written.

This end-of-file flag, used as a last-call indicator, returns control to the line-data transform. The exit program cannot change this parameter.

### resnamel

The length of the meaningful characters in field resnamf. In **resnamel**, the last character is the letter l.

**pad1** A padding byte to place resnamf on a word boundary.

### resnamf

An actual name of the resource if it is greater than 8 characters in length. If the name is 8 characters or less, it is stored in field resname instead.

## 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. The following example 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;

```

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 are 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.

---

## Using the **uconv** command to convert coded character sets

InfoPrint Manager for Windows, Version 2, Release 2, replaces **iconv** with **uconv** for translating text strings. **uconv** also lets you use UTF16 characters for translation.

**iconv:**

If you have written any line-data user-exit programs that use **iconv**, you need to alter them to use **uconv** instead.

From a Command Prompt window, you can invoke the **uconv** command to convert the encoding of characters read from either standard input or the specified file from one code character set (CCSID) to another and then write the results to standard output (for example to convert ASCII to EBCDIC). This command is useful when the line data coded character sets must be changed so they match the coded character sets for the available font resources for a job. These are often applied for job resources (such as page definitions and form definitions) that have been created on either an AIX or an z/OS operating system and sent to Windows.

For more information about the **uconv** command, see *InfoPrint Manager: Reference*.



---

## Chapter 17. Creating and managing auxiliary sheets and PSF DSS user-exit programs

Besides logical destinations, queues, and actual destinations, the InfoPrint Windows server also controls auxiliary-sheet objects. This section contains information and procedures for creating and configuring these objects.

This section contains the following topics:

- “Preparing to work with auxiliary sheets”
- “Creating and configuring auxiliary sheet objects” on page 135
- “Using Interrupt Message Pages” on page 137

---

### Preparing to work with auxiliary sheets

The following topics describe auxiliary-sheet terms, default auxiliary sheets, and PSF DSS user-exit programs supplied by InfoPrint Manager, and provides examples of printed auxiliary sheets:

- “Terms relating to auxiliary sheets”
- “InfoPrint default auxiliary-sheet objects” on page 128
- “Sequence of user-exit programs” on page 133
- “Directory locations of user-exit programs supplied with InfoPrint Manager” on page 133

### Terms relating to auxiliary sheets

To understand auxiliary sheets and how InfoPrint Manager 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 copies of a job, or follow a job. PSF printers print auxiliary sheets. Both Internet Print Protocol (IPP) and Passthrough printers also print auxiliary sheets, but they do not use auxiliary sheet objects to activate this support.

#### Auxiliary-sheet object

Represents a single user-exit program that you can specify for InfoPrint PSF printers. 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 (PSF printer) and the auxiliary-sheet objects must reside in the same InfoPrint server.

Some auxiliary sheet objects supplied with InfoPrint Manager generate a file that you can use with an executable reporting utility to view job statistics. Refer to Chapter 18, “Gathering accounting and audit data about print jobs,” on page 141 for more information on viewing statistics.

#### Auxiliary-sheet object name

Identifies the auxiliary sheet object. 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 print processing when you can tell InfoPrint Manager to

run a user-exit program, then return control of processing to InfoPrint Manager after the user-exit program ends. InfoPrint Manager provides data at each exit point that can serve as input to the user-exit program. InfoPrint Manager can use the output from the user-exit program for InfoPrint Manager processing; for example, a user-exit program can pass instructions about how to format a start sheet to InfoPrint Manager. InfoPrint Manager provides user exits for the following types of auxiliary sheets:

- 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)

#### **User-exit program**

Defines the data that prints and creates the format of the auxiliary sheet style. InfoPrint Manager extends its function by providing user-exit programs that you can use to format start, end, or separator sheets for the job. Also, InfoPrint Manager user-exit programs allow you to track accounting and audit information, as well as extract information about the incoming and outgoing job data streams.

#### **Form definition**

Defines the characteristics of the form or printed media, which include: overlays used, the paper source (for cut-sheet printers), duplex printing, text suppression, and the position of composed-text data on the form.

For more information about both form definitions, refer to the *InfoPrint Manager: Reference*.

#### **Edge marks**

Marks that print at the edges of auxiliary sheets and help to identify job boundaries in printed output.

#### **Interrupt Message Pages**

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 137 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 9 on page 129.

Table 9. Default auxiliary sheet objects

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

Table 9. Default auxiliary sheet objects (continued)

Auxiliary sheet object	Form definition	Description	User exit program	Additional Information
64xx	F1A10110	Start sheet	ainuxhdrx	
		Separator sheet	ainuxsep	
		End sheet	ainuxtlx	

You can create your own auxiliary-sheet objects using the InfoPrint **pdcreate** command from a Command Prompt window. Refer to “Creating new auxiliary-sheet objects using the pdcreate command” on page 135.

### 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 38, 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.

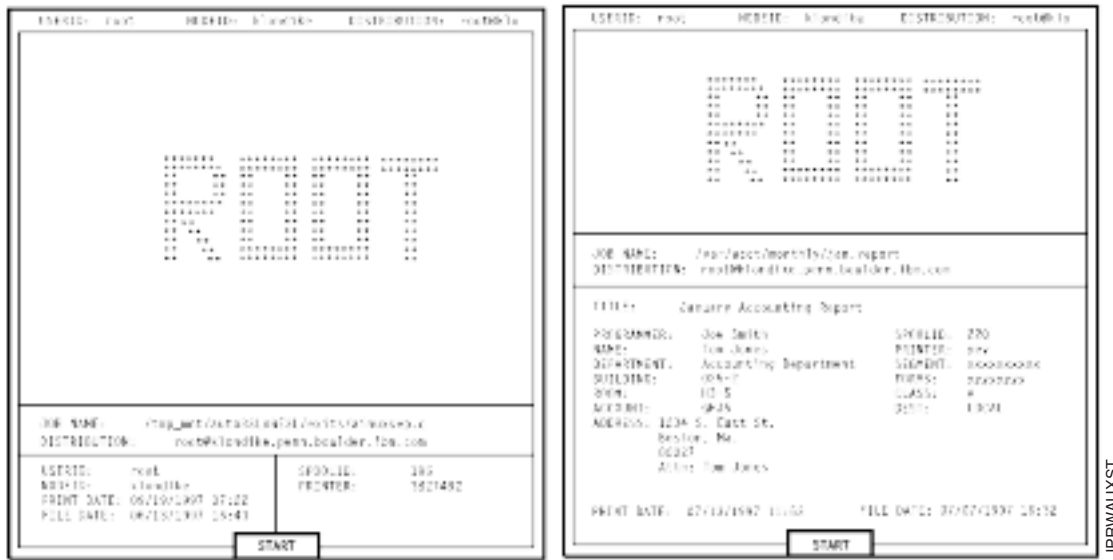


Figure 38. Brief and Full Styles of Start Sheets

**Separator Sheet Examples:** In Figure 39 on page 131, 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.



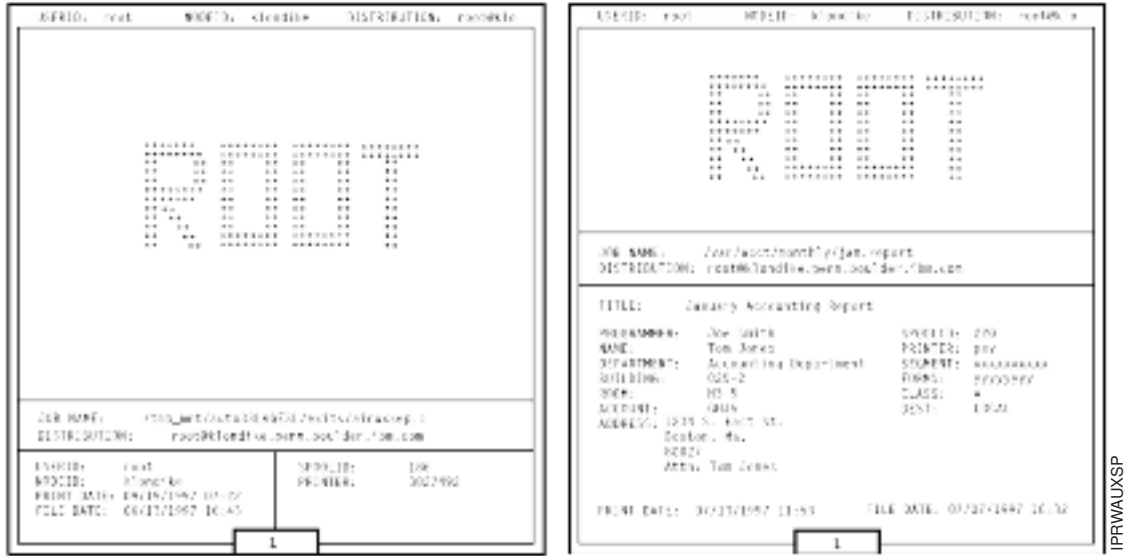


Figure 39. Brief and Full Styles of Separator Sheets

**End Sheet Examples:** In Figure 40, 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.

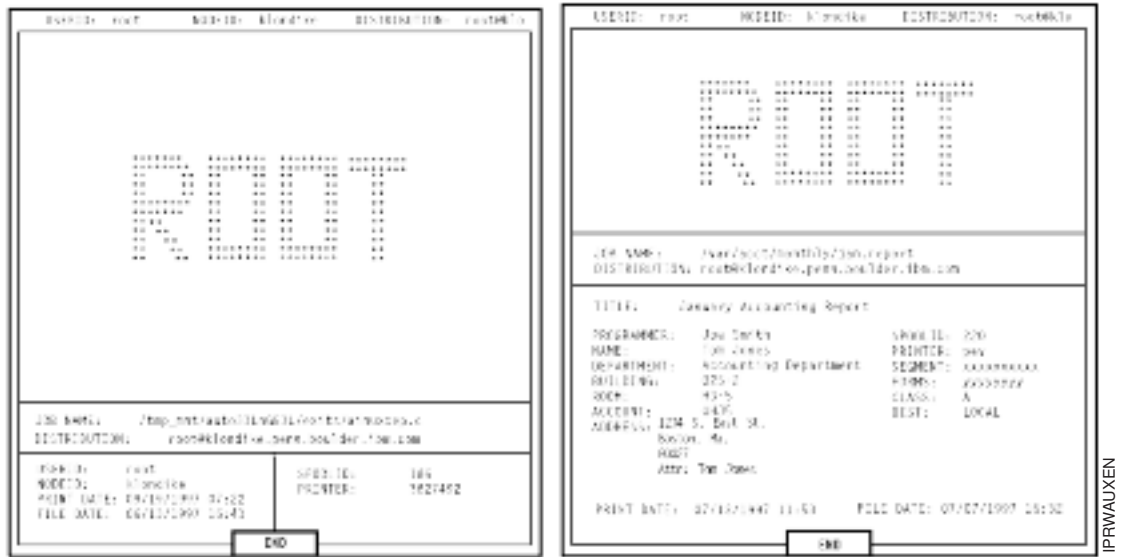


Figure 40. Brief and Full Styles of End Sheets

**Accounting Sheet Examples:** In Figure 41 on page 132, 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:
UserID=root
NodeID=starwars
JobName=/info/afp/twopage.afp
SpoolID=1366
PrinterName=psf4317
PagesPrinted=3
BinOneSheets=3
BinTwoSheets=0
FontsUsed=2
ResidentFontsUsed=0
OverlaysUsed=0
HardSegmentsUsed=0
SoftSegmentsUsed=0
DataObjectResourcesUsed=0
StartDate=11/01/2000
StartTime=14:50:14
EndDate=11/01/2000
EndTime=14:50:15
FileDate=05/05/2000
FileTime=07:59:13
ExtendedSpoolID=

```

```

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

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

```

IPRWAUXAU

Figure 41. Brief and Full Styles of Accounting-Log Sheets

**Audit Sheet Examples:** In Figure 42 on page 133, 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.



Figure 42. Brief and Full Styles of Audit Sheets

## Sequence of user-exit programs

The following figure shows the order in which InfoPrint calls the user-exit programs during job processing on a printer. You cannot change this order.

**Note:** Separator sheets are printed only between copies of a job, not between documents within a job.

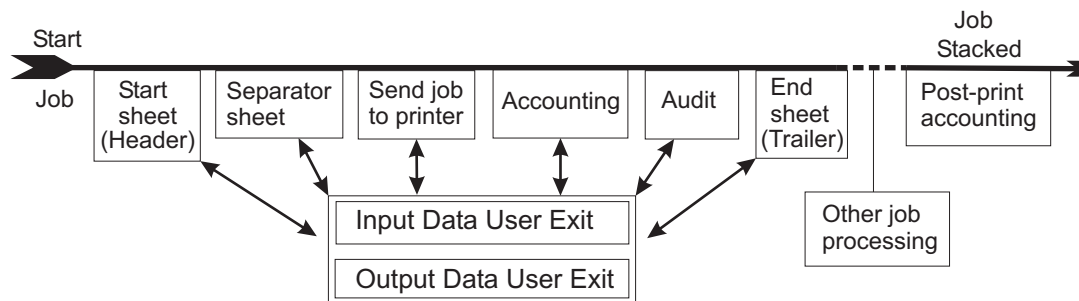


Figure 43. InfoPrint Manager user-exit program order at the printer

## Directory locations of user-exit programs supplied with InfoPrint Manager

When you create the auxiliary-sheet object, you specify the name of the user-exit program and other options, such as the form definition and whether the program

produces printed output. You identify which auxiliary-sheet objects you want associated with each actual destination using the GUI attributes notebook for each actual destination. InfoPrint Manager runs the referenced user-exit programs when you submit a job to that printer.

Table 10. Locations of InfoPrint Manager user exits

Program	Description
<i>Start Sheets</i>	
<i>install_path\bin\pduxblkh.dll</i>	Prints a blank start sheet.
<i>install_path\bin\ainuxhdr.dll</i>	Prints a brief-style start sheet.
<i>install_path\bin\ainuxhdr2.dll</i>	Prints a full-style start sheet.
<i>install_path\bin\ainuxhdrp.dll</i>	Prints job ticket information on the start sheet.
<i>install_path\lpp\psf\bin\ainuxhdrx.dll</i>	Prints a start sheet without vertical lines for InfoPrint 6400 and 6500 model printers.
<i>Separator Sheets</i>	
<i>install_path\bin\pduxblks.dll</i>	Prints a blank separator sheet.
<i>install_path\bin\ainuxsep.dll</i>	Prints a brief-style separator sheet.
<i>install_path\bin\ainuxsep2.dll</i>	Prints a full-style separator sheet.
<i>install_path\bin\ainuxsepp.dll</i>	Prints job ticket information on the separator sheet.
<i>install_path\lpp\psf\bin\ainuxsepx.dll</i>	Prints a separator sheet without vertical lines for InfoPrint 6400 and 6500 model printers.
<i>End Sheets</i>	
<i>install_path\bin\pduxblks.dll</i>	Prints a blank end sheet.
<i>install_path\bin\ainuxtlr.dll</i>	Prints a brief-style end sheet.
<i>install_path\bin\ainuxtlr2.dll</i>	Prints a full-style end sheet.
<i>install_path\bin\ainuxtlrp.dll</i>	Prints job ticket information on the end sheet.
<i>install_path\lpp\psf\bin\ainuxtlrx.dll</i>	Prints an end sheet without vertical lines for InfoPrint 6400 and 6500 model printers.
<i>Accounting</i>	
<i>install_path\bin\ainuxacc.dll</i>	Prints a brief-style accounting sheet.
<i>install_path\bin\ainuxacc2.dll</i>	Prints a full-style accounting sheet.
<i>install_path\bin\ainuxaccp.dll</i>	Writes accounting information to <i>install_path\var\psf\podaccount.log</i> .
<i>install_path\bin\ainacclog.dll</i>	Writes accounting information to <i>install_path\var\psf\accounting.log</i> .
<i>Post-print Accounting</i>	
<i>install_path\bin\ainuxjobcompletion.dll</i>	Writes accounting information to <i>install_path\var\psf\jobcompletion.log</i>
<i>Audit</i>	
<i>install_path\bin\ainuxaud.dll</i>	Prints a brief-style audit sheet.
<i>install_path\bin\ainuxaud2.dll</i>	Prints a full-style audit sheet.
<i>install_path\bin\ainuxaudp.dll</i>	Prints job ticket information on the audit sheet.

Table 10. Locations of InfoPrint Manager user exits (continued)

Program	Description
<i>install_path\bin\ainaudlog.dll</i>	Writes audit information to <i>install_path\var\psf\audit.log</i> .
<i>Input Data</i>	
<i>install_path\bin\ainuxind.dll</i>	Performs no tasks; use it as a model for writing your own user-exit program.
<i>Output Data</i>	
<i>install_path\bin\ainuxout.dll</i>	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 Manager provides the source code for all of these exits in the *install\_path\exits\psf* directory.

---

## Creating and configuring auxiliary sheet objects

When you first create a server, InfoPrint creates the default auxiliary-sheet objects described in “InfoPrint default auxiliary-sheet objects” on page 128.

The following topics describe how you can create and configure auxiliary-sheet objects:

- “Creating new auxiliary-sheet objects using the `pdcreate` command”
- “Associating auxiliary-sheet objects with PSF printers” on page 136
- “Activating auxiliary sheets for accounting or audit information” on page 136
- “Associating the post-print accounting user-exit program with an actual destination” on page 136
- “Associating an input data user-exit program with an actual destination” on page 137
- “Associating an output data user-exit program with an actual destination” on page 137

### Creating new auxiliary-sheet objects using the `pdcreate` command

You create auxiliary-sheet objects from the **Command Prompt** window; you cannot create them through the InfoPrint administrator’s GUI. Use the `pdcreate` command with the `-c auxiliary-sheet` flag 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. Different servers can contain a auxiliary-sheet objects 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
```

## Associating auxiliary-sheet objects with PSF printers

Use the **Infoprint Manager Administration GUI** to associate auxiliary sheet objects with PSF printers. Start the GUI 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 GUI**, starting with the topic *Using auxiliary-sheet objects*.

## Activating auxiliary sheets for accounting or audit information

You can use the **Infoprint Manager Administration GUI** 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 GUI 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 GUI**, 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 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 the post-print accounting user-exit program with an actual destination

Use the **Infoprint Manager Administration GUI** to specify auxiliary sheets to collect post-print accounting information about jobs processed by a selected PSF printer. Start the GUI 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 GUI**, 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 104.

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 GUI**. Start the GUI 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 GUI**, 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 GUI**. Start the GUI 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 GUI**, 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 allows 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 and PSF Channel 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 PSF Direct.

IMPs and finishing processes are incompatible and we do not recommend combining these functions.

Scenario/Condition	Produce interrupt message page?
Pause job	Yes
Resume job	Yes
Pause printer	No
Resume printer	No
AD shutdown - <i>Synchronous</i> (same as pause job)	Yes
AD shutdown - <i>Now</i> (stop as soon as possible)	No
NACKs <sup>1</sup>	On an action code basis

Scenario/Condition	Produce interrupt message page?
<u>Forward Spacing</u>	Yes
- Normal in-job forward space	No
- before NPRO <sup>2</sup>	Yes
- after NPRO	No
- Forward space with no pages committed	Yes
- Forward past the end of the job	No
- before NPRO	Yes
- after NPRO	
<u>Back Spacing</u>	Yes
- Normal in job back space	No
- before NPRO	Yes
- after NPRO	No
- Back space with no pages committed	Yes
- Back space to the beginning	No
- before NPRO	Yes
- after NPRO	
Print a page range	No
Cancel job	Yes
- pdrm/pddelete	Covered under NACK
- cancel button on printer	
Communication lost	No
Stop button on the printer	No - on <b>ready/not ready</b> (other conditions fall under NACKs)
Add new IMP messages to the final message page	Yes
Add messages to the IMP	Yes
Print messages in currently supported NLS language	Yes
1 negative acknowledgement2 non-process run out	

## 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 mark form**. The **Interrupt message page mark form** 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 InfoPrint Page Printer Formatting Aid (PPFA) feature. See the *InfoPrint Page Printer Formatting Aid: User's Guide*, S544–5284, and the *InfoPrint Page Printer Formatting Aid: Command Quick Reference*, G544–3701, 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.



---

## Chapter 18. Gathering accounting and audit data about print jobs

InfoPrint Manager for Windows allows you to gather accounting information about print jobs from two sources:

- The InfoPrint Manager server (applies to all destination support systems (DSSs)). For more information, see Working with InfoPrint Manager Accounting Information below.

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 audit, accounting, and post-print accounting user-exit programs (applies only to the PSF DSSs). For more information, see Working with PSF Accounting and Audit User-Exit Programs.

You should use information from these PSF audit 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 Manager server accounting information

While all DSSs can store accounting information about the jobs processed, the information from some DSSs is more accurate than the information from 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 through your editor of choice (such as Notepad) from the command-line or by specifying the **pdaccount** command. The **pdaccount** command allows you to obtain 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 (information for all print jobs) for a specified time period, instead of the summary data.

### How does the **pdaccount** command collect InfoPrint Manager accounting information?

To activate InfoPrint Manager 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 **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. If you have not set an actual destination, 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. If an actual destination hasn't specified this attribute, the server's **log-accounting-data** attribute is used.

You may change the **log-accounting-data** attribute with either a **pdset** command or the InfoPrint Manager Administration GUI. For more information on the InfoPrint Manager Administration GUI, see the Chapter 6: "Using the InfoPrint Interfaces" in *InfoPrint Manager for Windows: Getting Started*.

The **pdaccount** command obtains the following accounting information from one or more InfoPrint Manager 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 grouped by destinations on an InfoPrint Manager server named Server1 from 8 AM 9/20/99 to 8 AM 9/27/99, specify the following from either the Windows **Command prompt** or **MS-DOS prompt** window:

```
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 start and end times (in this example, one week).

For more information about using the **pdaccount** command, see *InfoPrint Manager: Reference*.

## How do you manage the InfoPrint Manager accounting logs?

Once you specify `log-accounting-data=true` on either an InfoPrint Manager server or an actual destination, these accounting logs start growing without bound. As part of your scheduled system maintenance, the accounting logs should be managed carefully to avoid potential performance problems. Periodically, the log files must be either deleted or moved to a different folder. If you do not perform either of these tasks, your server will run out of space on the disk drive, preventing you from printing any more jobs.

The Windows accounting logs reside in a subfolder of the server's folder. The following describes the subdirectory where the files reside:

```
install_path\var\pd\accounting.logs
```

InfoPrint Manager for Windows 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.

To save a record of InfoPrint Manager server accounting data, you need to move the existing log files to a new drive. Be sure that these logs are not being written to, then use the following procedure:

1. Create a new directory in the location where you want to archive the existing (**prt1.accounting.log.v1**) log file by moving to that location on your system (from the command line prompt, specify E:, then `cd \ntserver`).

To create the new directory, type: `mkdir 3qrt2001logs`

2. Go back to your C drive to the folder where the log file resides. Then access that location, for example **prt1.accounting.log.v1** on server1, by specifying:

```
cd install_path\var\pd\accounting.logs
```

3. Copy the **prt1.accounting.log.v1** file to a new directory on a different drive (E for this example) named **3qrt2001** by specifying:

```
copy prt1.accounting.log.v1 E:\ntserver\3qrt2001logs\
```

This command copies the existing file to the new directory.

4. Remove the original **prt1.accounting.log.v1** file from the *install\_path*\var\pd\**accounting.logs** folder:

```
del prt1.accounting.log.v1
```

When the next job is processed on **prt1**, InfoPrint creates a new **prt1.accounting.log.v1** file.

We recommend that you move the data to another disk drive 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 **prt1.accounting.log.v1** file,

1. Specify `cd install_path\var\pd\accounting.logs`

This command moves you into the correct path.

2. Enter

```
del prt1.accounting.log.v1
```

When the MS-DOS command-line prompt returns, you know that the **prt1.accounting.log.v1** file has been deleted from the system.

3. Enter

```
dir
```

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 to that actual destination, 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 log files in the original location. 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 but are put back into the queue because the printer is shutdown when a printer problem is encountered.

### 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, separator 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).
  - The number of Intelligent Printer Data Stream™ (IPDS) pages printed is based upon the number of **begin-page** and **end-page** structured

field pairs in the data. As a result, a **2-up** document printed duplex could provide a page count of four for a single sheet of paper.

#### **PSF DSS with Other-Driver attachment type**

- If you are using the IBM TCP/IP Port Monitor 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. A duplexed four-page job with a header sheet provides a page count of four, because the auxiliary sheets are not included in the count, but both sides of each page are counted.
- If you are not using the IBM TCP/IP Port Monitor, 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, including start pages, separator pages, and end pages.
- If you have set the **document-formats-ripped-at-destination** actual destination attribute for a PSF DSS with Other-Driver attachment type actual destination, the accounting is handled as if it had been submitted to a Passthrough DSS actual destination.
- **Limitations:** The page count and octet count reported in the accounting log for cancelled and paused jobs is not accurate.

#### **PSF DSS with Command attachment type**

The page count recorded in the accounting log for destinations using the command is the number of pages PSF generates and sends to the printer. It is not based on the number of pages received or printed by the printer. The page count does include start pages, separator pages, and end pages.

#### **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.

#### **Internet Printing Protocol (IPP) DSS**

The page count recorded in the accounting log for destinations using the IPP DSS is based on the following criteria:

- Depending upon the capabilities of the your particular IPP printer, if the printer reports pages completed information through the Internet Printing Protocol and the job completes successfully, that information is used. The auxiliary sheet is not added to the count.
- 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. The auxiliary sheet is not added to the count.
- If the user has not specified **job-page-count** or **page-count**, and the data being printed is PCL or PostScript, InfoPrint Manager retrieves the page

count from the printer, if the particular printer supports that function. The auxiliary sheet is not included in the count.

- **Limitations:** Because all information is obtained through the Internet Printer Protocol, the attributes required for **pages-completed** might not be supported by a particular printer model.
- **Note:** For accurate results with this DSS, ensure that you set the sides default (whether simplex or duplex) in the printer to match the value on the **sides** actual destination attribute.

### Passthrough DSS

The page count recorded in the accounting log for destinations using the Windows DSS is based on the following criteria:

- If you are using the IBM TCP/IP Port Monitor 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. Auxiliary sheets are not included in the count.
- If you are using the IBM TCP/IP Port Monitor and the job does not complete successfully, or if you are not using the IBM TCP/IP Port Monitor and 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.

A duplexed four-page job with a header sheet provides a page count of four, because neither the auxiliary sheets nor the back sides of each page are included in the count.

- 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. The auxiliary sheet is not included in the count.

**Note:** For accurate results with this DSS, ensure that you set the sides default (whether simplex or duplex) in the printer to match the value on the **sides** actual destination attribute.

---

## Working with PSF accounting, post-print accounting, and audit data about the job

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

This section contains the following topics:

- "What do the accounting, post-print accounting, and audit PSF DSS user exits provide?" on page 147
- "How do you format accounting, post-print accounting, and audit data for viewing?" on page 148
- "How do you manage the contents of the data files?" on page 149



## What do the accounting, post-print accounting, and audit PSF DSS user exits provide?

The accounting and audit PSF DSS user-exit programs record statistical data on jobs processed by InfoPrint Manager actual destinations. The following table shows the most common accounting and audit user-exit programs, the files where they record data, and the types of data that they record.

Program	Log File	Records
<i>install_path</i> \ bin\ainuxaccp	<i>install_path</i> \var\psf\ <b>podaccount.log</b>	Job submitter, job ID, actual destination, submission machine (nodeid), pages processed (projected), sheets from bin 1, sheets from bin 2, end time, start date, start time, copies per job
<i>install_path</i> \ bin\ainacclog	<i>install_path</i> \var\psf\ <b>accounting.log</b>	Job submitter, job name, actual destination, submission machine (nodeid), pages processed (projected), sheets from bin 1, sheets from bin 2, end time, start date, start time, fonts, resident fonts, overlays
<i>install_path</i> \ bin\ <b>ainuxjobcompletion</b>	<i>install_path</i> \var\psf\ <b>jobcompletion.log</b>	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
<i>install_path</i> \ bin\ainaudlog	<i>install_path</i> \var\psf\ <b>audit.log</b>	Job submitter, job name, actual destination, pages per job, pages per actual destination, jobs per output bin, start date, start time, fonts, resident fonts, overlays

Both *install\_path*\ bin\ainacclog and *install\_path*\ 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/cancelled 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-print 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 InfoPrint Manager Version, such as 1.1, to InfoPrint Manager V2.2 will continue to find the previous accounting exit interface intact. Accounting programs that count on the previous accounting interface, which includes the IBM supplied samples, will function without modification.

Customers installing a InfoPrint Manager V2.2 server for the first time will see the post-print accounting exit activated and the accounting data will be written to *install\_path\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 V2.2 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 IBM supplied 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 IBM 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 accounting, post-print accounting, and audit data for viewing?

To view this data, you can use one of the following executable reporting utilities that are provided with InfoPrint Manager. These reporting utilities only work if

you open a **Command Prompt** window, navigate to the *install\_path\bin* directory, and run the program from the command line.

- Accounting utilities

**ainupod1**

Reports accounting data stored in **podaccount.log** in a summary format (one line per user), sorted by customer ID.

**ainupod2**

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

**ainupod3**

Reports detailed entries of times and pages printed for each job by the customer ID from **podaccount.log**.

**ainurpt1**

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

**ainurpt2**

Reports summary accounting data (one line per job submitted) stored in **accounting.log**, sorted by job submitter.

**ainurpt3**

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

- Audit utilities

**ainurpt4**

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

**ainurpt5**

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

**ainurpt6**

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

- Post-print accounting utilities

**ainurpt7**

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

**ainurpt8**

Reports summary post-print 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**.

## How do you manage the contents of the data files?

An installation with a regular schedule of printing jobs will accumulate accounting, post-print 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 folder. If you do not perform either of these tasks, your installation may 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.

We recommend that you move the data to another file system rather than deleting it from the system. That way, you can store accounting data and delete it from the system when you no longer need to refer to it. The following procedure describes one way to copy the data to a new location.

1. On your InfoPrint Manager server system, open the Management Console and select **Edit → Service Configuration**.
2. Make note of the directory that is listed in the **Install path** field.
3. Open Windows Explorer and navigate to the *install path*\bin directory.
4. In that directory, find the log file that you need to move, for example, **jobcompletion.log** and select it.
5. With the file selected, click **Edit → Copy**.
6. Navigate to the directory that you want to archive the log file in and select the directory.

**Note:** This directory may be on a different Windows system than the one you are currently working on.

7. With the directory selected, click **Edit → Paste**.
8. Verify that the log file appears in the new directory.
9. Navigate back to the *install path*\bin directory.
10. In that directory, find the log file that you need to move, for example, **jobcompletion.log** and select it.
11. With the file selected, click **File → Delete**.

If you want to delete the **jobcompletion.log** file without storing the data in another folder, use the procedure above, skipping steps five through ten.

When the next job is submitted for printing, InfoPrint creates a new **jobcompletion.log** file and writes the data into that file.

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## Chapter 19. Using the InfoPrint Manager line printer daemon (LPD)

The InfoPrint Manager Line Printer Daemon (LPD) is a utility that allows you to submit print jobs from other operating systems using a Line Printer (LPR) client. The InfoPrint Manager LPD replaces the LPD that is supplied with the Windows operating system (TCP/IP Print Services); however, it submits the files it receives directly to an InfoPrint destination, not to a Windows printer. It also supports the -o options that are available with some LPR clients (-o options allow you to specify advanced InfoPrint print options, such as formdefs and pagedefs).

Only one LPD can run on your InfoPrint Manager server system at a time. If you have TCP/IP Print Services installed, InfoPrint Manager will disable it and enable the InfoPrint Manager LPD. If you would prefer to use TCP/IP Print Services, use the Management Console to change the service configuration. Refer to the Management Console help for further instructions.

**Important:** If you have a different LPD installed, InfoPrint Manager will **not** disable it, but will install and start the InfoPrint Manager LPD. You must stop one of the LPDs before you try to submit a print job using an LPR client.

To submit print jobs to the InfoPrint Manager LPD, you can use any LPR client. However, if you want to be able to specify advanced InfoPrint options on the -o flag, you should use the **lprafp** sample code package. **lprafp** is an LPR client that is available as a free download from the InfoPrint Solutions Company Web site. The package includes executable forms of the **lprafp** client for the Windows and AIX (version 4.3.3 and above) platforms. You can compile this code to use it on other platforms as well. InfoPrint Solutions Company does not provide support for the package.

Refer to “Submitting print jobs through the InfoPrint Manager LPD” on page 374 for information about downloading, configuring, and using the **lprafp** sample code package.



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## Chapter 20. Setting up interoperating environments

This topic describes this interoperating information:

- “Understanding interoperating environments”
- “Setting up a print environment with multiple Windows servers” on page 155
- “Configuring for interoperability between an InfoPrint AIX server and an InfoPrint Windows server” on page 166

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### Understanding interoperating environments

When you install an InfoPrint Manager server, 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. On a Windows system, the namespace is located by default at <install path>\var\pddir, where <install path> is the directory that you installed InfoPrint Manager in.

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 on one of the servers and the other servers are granted permissions that allow them to use that directory.

In InfoPrint Manager for Windows, Version 2, Release 2, you should only set up two or three servers to interoperate (not four or more). Those servers can all be installed on Windows 2000 systems, on Windows 2003 systems, on Windows XP systems, or on a combination of Windows systems. In addition, if you have InfoPrint Manager for AIX, it can be one of the three interoperating servers as well.

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 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.

## 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.

- **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 is the most available (always running) and most reliable (doesn't have to be rebooted often).

- **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.

- **Printer drivers**

If you are setting up an interoperating environment with mixed operating systems (for example, two Windows 2000 systems and one Windows 2003 system), make sure that the printer drivers you choose work correctly in both environments.

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## Setting up a print environment with multiple Windows servers

Some print environments require more than one InfoPrint Manager server to handle their print management. If you are installing and configuring more than one InfoPrint Manager for Windows server in your print environment, this topic will tell you what you need to do to make those servers work together.

When you install InfoPrint Manager, 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. On a Windows system, the namespace is located by default at <install path>\var\pddir, where <install path> is the directory that you installed InfoPrint Manager in.

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 on one of the servers (the *namespace server*) and the other servers (the *non-namespace servers*) are granted permissions that allow them to use that directory.

With InfoPrint Manager for Windows, Version 2, Release 2, you should only set up two or three servers to interoperate (not four or more). Those two or three servers can all be installed on Windows systems, or on a combination of Windows systems. In addition, if you have InfoPrint Manager for AIX, it can be one of the three interoperating servers as well.

If you want InfoPrint Manager for Windows and InfoPrint Manager for AIX servers to work together, refer to “Configuring for interoperability between an InfoPrint AIX server and an InfoPrint Windows server” on page 166.

**Notes:**

1. You can only install one InfoPrint Manager server on a given Windows workstation or server.
2. For your InfoPrint Manager servers to work together, they must all operate in the same domain.
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 multi-server system running, if the system that one of your non-namespace servers is installed on shuts down or is restarted, that InfoPrint Manager server will not restart automatically when the system

restarts, even if you have that option selected in the Management Console. You must open the Management Console for that server and start it manually.

5. You must set up each of your InfoPrint Manager servers so that all of the other InfoPrint Manager servers can access them using the same IP address. For example, Ipserv1 sometimes uses the IP address 9.99.155.122 and other times uses 9.89.214.162, depending upon the machine that is trying to connect to it. Ipserv2 and Ipserv3 must be able to access Ipserv1 through the same one of those addresses; if Ipserv2 uses 9.99.155.122 to access Ipserv1, Ipserv3 must use 9.99.155.122 as well.
6. If you have more than one network adapter card in the system that InfoPrint Manager runs on, the other InfoPrint Manager systems must be able to access the system through the IP address that corresponds to the first (or primary) network card in the system.

## Configuration example

The recommended way to set up interoperating Windows servers is to create one domain user account and let all of the InfoPrint Manager services use it as their login account. The steps below describes how to set up this type of configuration.

**Note:** It is possible to configure your system so that each InfoPrint Manager service has its own domain user account. If you want set up this alternate configuration, you can follow the same basic instructions. However, in step 4 on page 157, you would create a domain user for each server. Then, when you assign user rights and set up sharing in subsequent steps, you must make sure you use the same user and password consistently on each system.

Follow these steps to have your InfoPrint Manager services share a namespace and a log in account.

1. ***Install all of your InfoPrint Manager servers.***

Follow the installation instructions in *InfoPrint Manager for Windows: Getting Started*. When you are finished, your servers will be operating independently.

2. ***Stop all of your InfoPrint Manager servers.***

On each system that an InfoPrint Manager server runs on, open the InfoPrint Manager Management Console and select **File → Stop Server**.

**Note:** If you are using the SAP Print Feature with an OMS configuration, you must stop the SAP Service from the Control Panel. Click the Windows Start button and select **Settings → Control Panel**. Go to SAP Service Properties and select to stop the service. For more details on this and other considerations for SAP systems, refer to the *SAP R/3 Configuration and Printing Guide* available on the InfoPrint Solutions Company Web site.

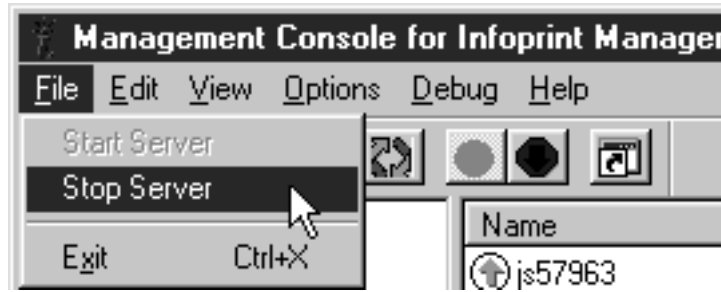


Figure 44. Management Console: Stop InfoPrint Manager server

3. *Decide which server you want to use as the namespace server.*

It is highly recommended that you choose your most reliable server to be the namespace server since any disruption of service in the namespace server has an impact on all of the servers in the configuration.

4. *Set up the common domain user account that the servers will run under.*

**Windows 2000/2003**

- a. Log on to the domain that your InfoPrint Manager servers operate in as a domain administrator.
- b. Click the Windows **Start** button and select **Programs → Administrative Tools → Active Directory Users and Computers**.
- c. In the left pane of the **Active Directory Users and Computers** window, find the **Users** item.
- d. Right-click the **Users** directory and select **New → User** from the pop-up menu.



Figure 45. Directory Users and Computers: New User

- e. In the first dialog of the **New Object – User** wizard, type a name for this user in the **Full name** and the **User logon name** fields.

**Note:** You do not have to fill in the other name fields.

**New Object - User**

Create in: ipm.penn.boulder.ibm.com/Users

First name:  Initials:

Last name:

Full name:

User logon name:  @ipm.penn.boulder.ibm.com

User logon name (pre-Windows 2000):

< Back   **Next >**   Cancel

Figure 46. New Object: User

- f. Click **Next**.
- g. In the second dialog of the **New Object – User** wizard, enter a password for this user. It is recommended that you select the **Password never expires** check box so you do not have to change the password and update all of your servers on a regular basis, and clear all of the others.



Figure 47. New Object: User 2

- h. Click **Next** to verify the settings for the user and complete the wizard.
- i. Once you have created the user, right-click the user in the right pane of the **Active Directory Users and Computers** window and select **Add members to a group** from the pop-up menu.

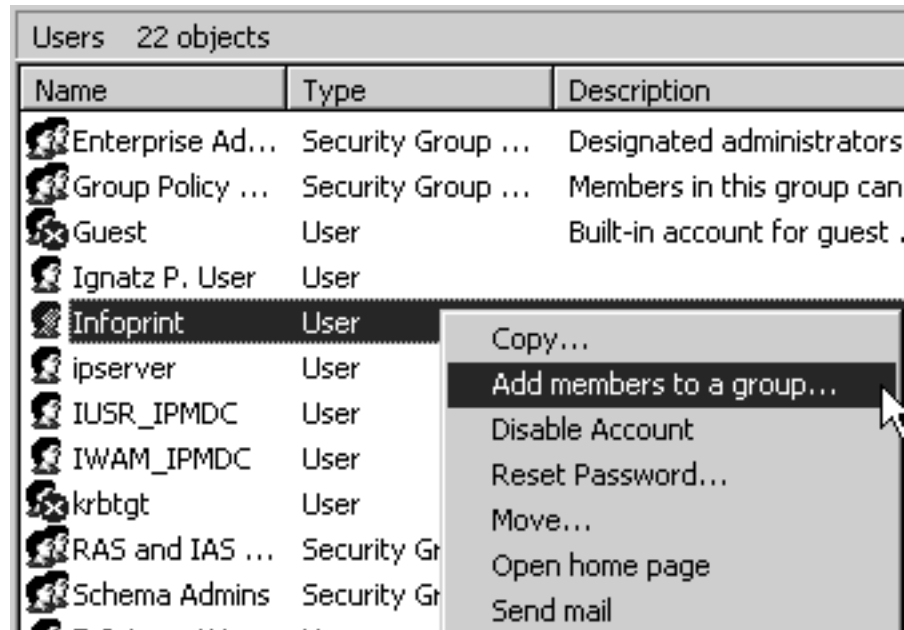


Figure 48. Add Members to a Group

- j. In the **Select Group** dialog, find and select the Domain Administrators (or Domain Admins) group. Click **OK** to add your user to the group.

**Note:** You can leave the **Name** field blank.

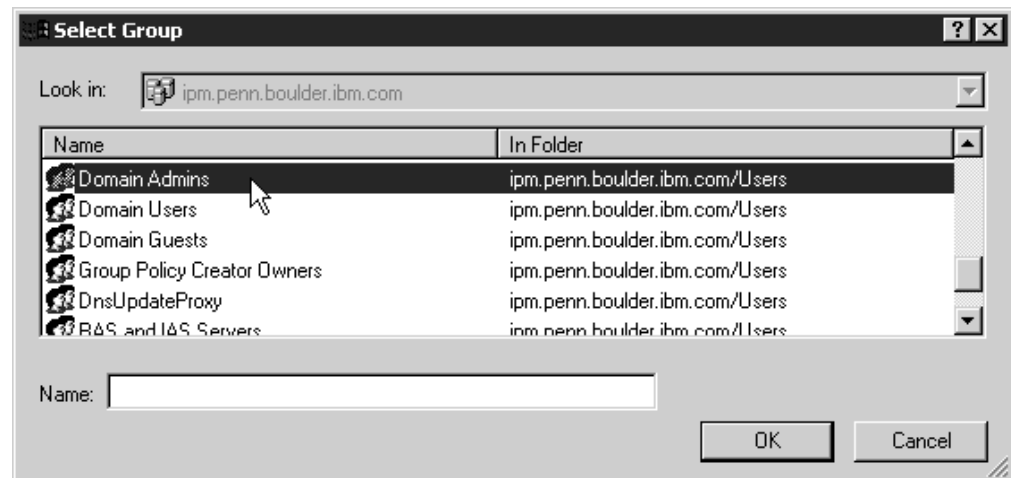


Figure 49. Select Group

5. *Grant the appropriate user rights to the new domain user on all of the systems that InfoPrint Manager is installed on.*

**Windows 2000**

- a. Log on to one of the systems as a user who is a member of the Domain Administrators group.
- b. Click the Windows **Start** button and select **Settings** → **Control Panel**.
- c. In the **Control Panel** window, double-click the **Administrative Tools** icon.
- d. In the **Administrative Tools** window, double-click the **Local Security Policy** icon.

- e. In the right pane of the **Local Security Settings** Window, double-click **Local policies**.



Figure 50. Local Policies

- f. Double-click **User Rights Assignment** in the right pane.



Figure 51. User Rights Assignment

- g. In the list of user rights, select **Act as part of the operating system** and double click it.
- h. In the **Local Security Policy Setting** dialog, click **Add**.



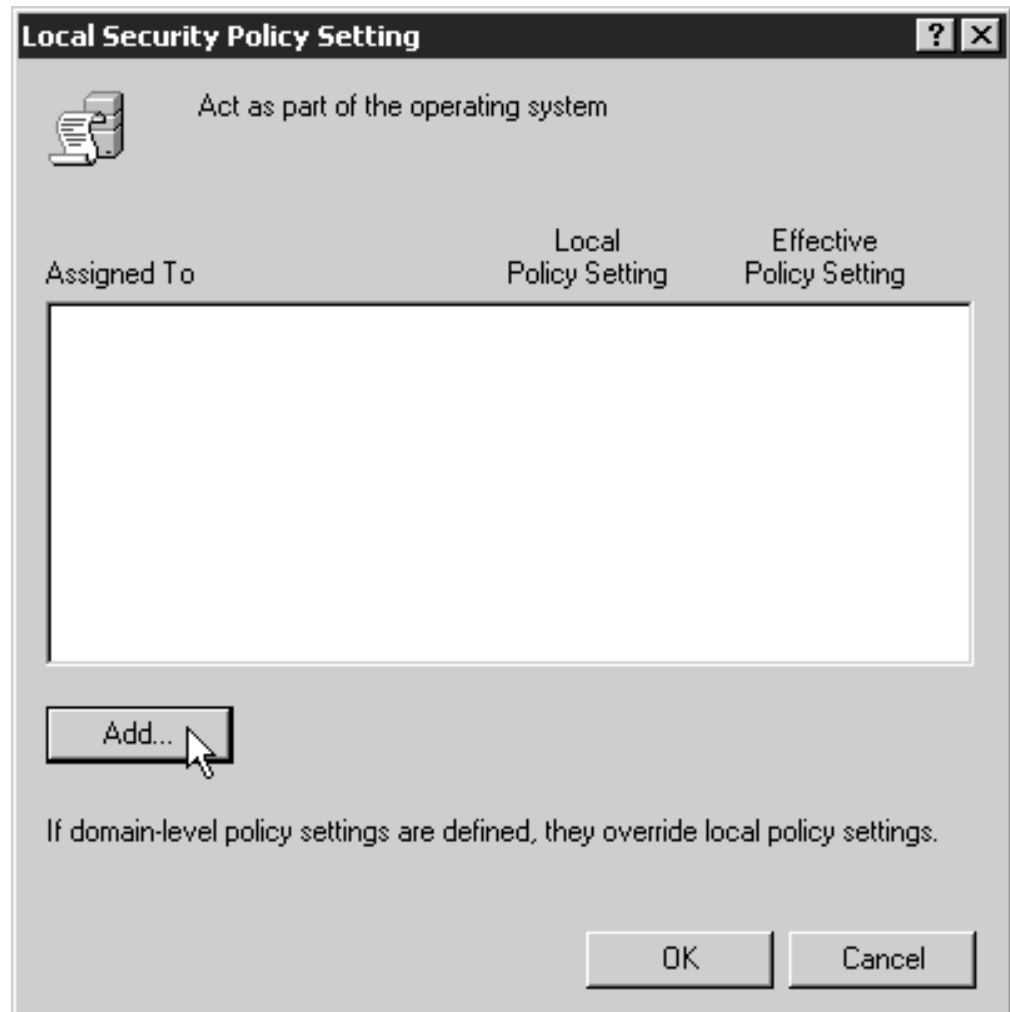


Figure 52. Local Security Policy Setting

- i. 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.

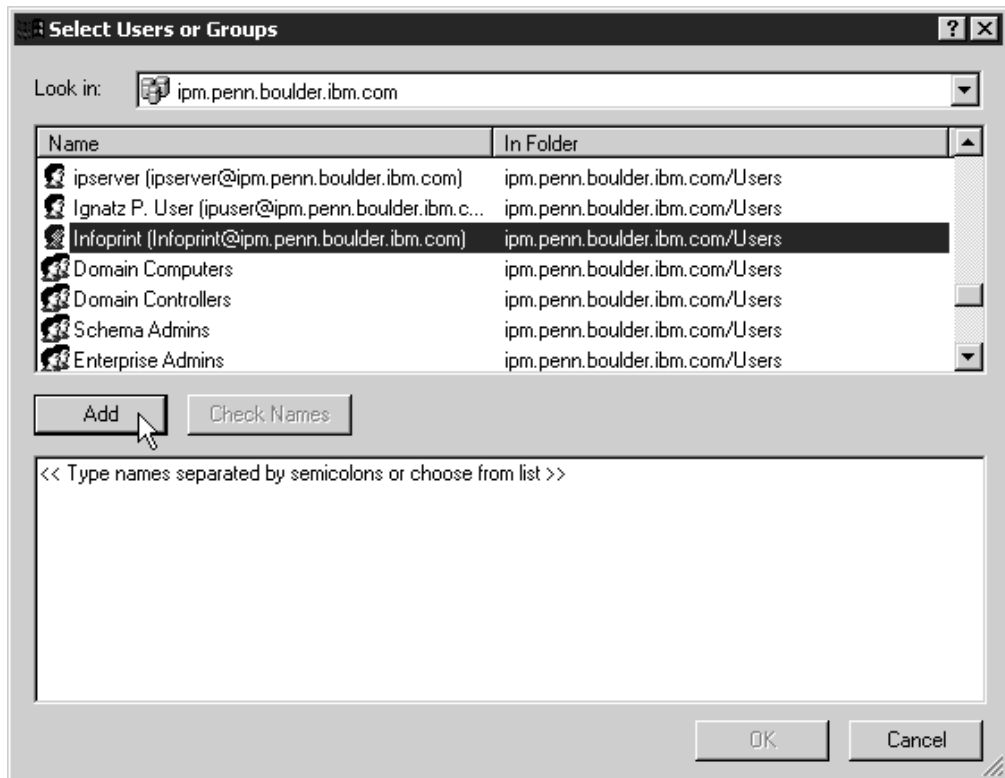


Figure 53. Select Users or Groups

- j. Find and select the domain user you created, and click **Add**.
- k. Click **OK** in the **Select Users or Groups** dialog.
- l. Click **OK** in the **Local Security Policy Setting** dialog.
- m. Repeat from step 5g on page 162 for two other user rights: **Create permanent shared objects** and **Log on as a service**.
6. *Set up sharing for the namespace directory on the namespace server.*
  - a. Log on to the namespace server.
  - b. Open the InfoPrint Manager Management Console and select **Edit → Service Configuration**.

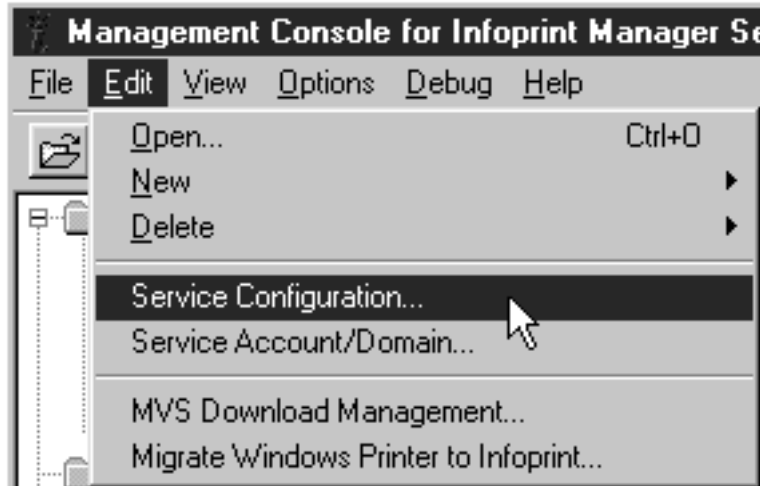


Figure 54. Management Console: Edit menu

- c. Make note of the directory listed in the **Base namespace path** field. The path will be <install path>\var\pddir.

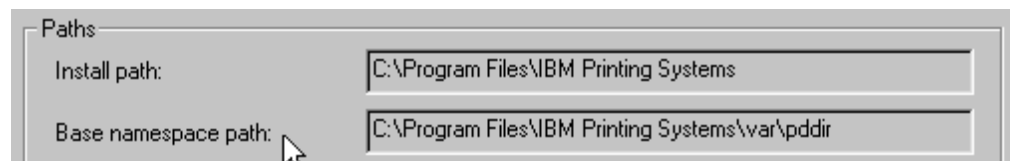


Figure 55. Management Console: Service Configuration- Base namespace path

- d. Open Windows Explorer and navigate to that directory.
- e. Right-click the folder for that directory and select **Sharing...** from the pop-up menu.

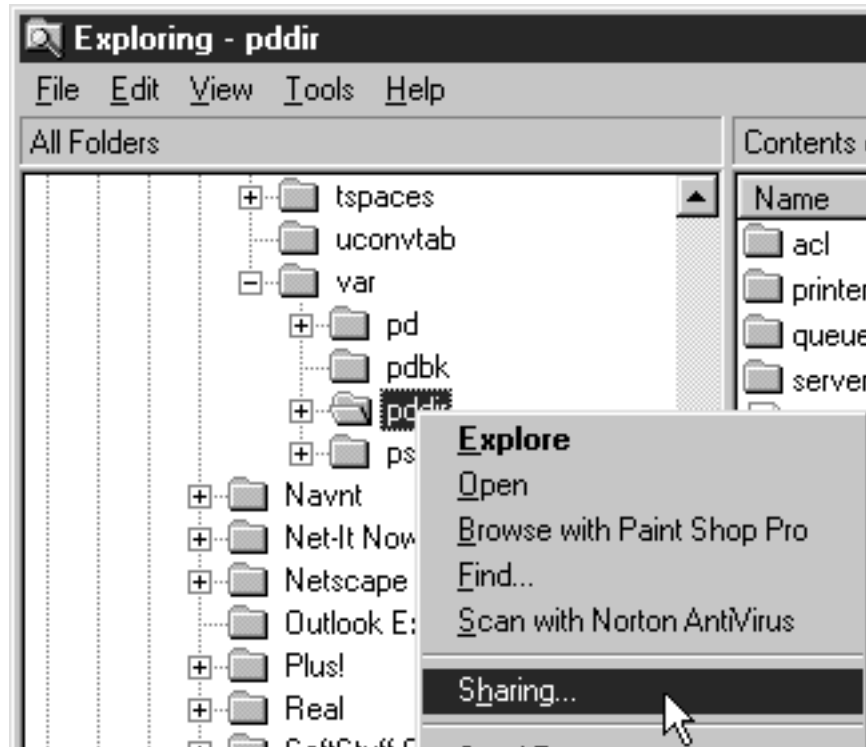


Figure 56. Sharing item

## Configuring for interoperability between an InfoPrint AIX server and an InfoPrint Windows server

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.

**Note:** If you are interested in configuring two or more InfoPrint AIX servers for interoperability, refer to "Installing secondary InfoPrint servers" in *InfoPrint Manager for AIX: Getting Started*.

When configuring InfoPrint Manager 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.

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 Version 4 Release 2 on your AIX server and have logged onto the server as **root**.

### Starting NFS and connecting the AIX secondary server

1. Open a dterm window and type: `/etc/rc.nfs` to either start the NFS daemon or ensure that it has been started.
2. Open a dterm window, type `smi`. The following screen displays.

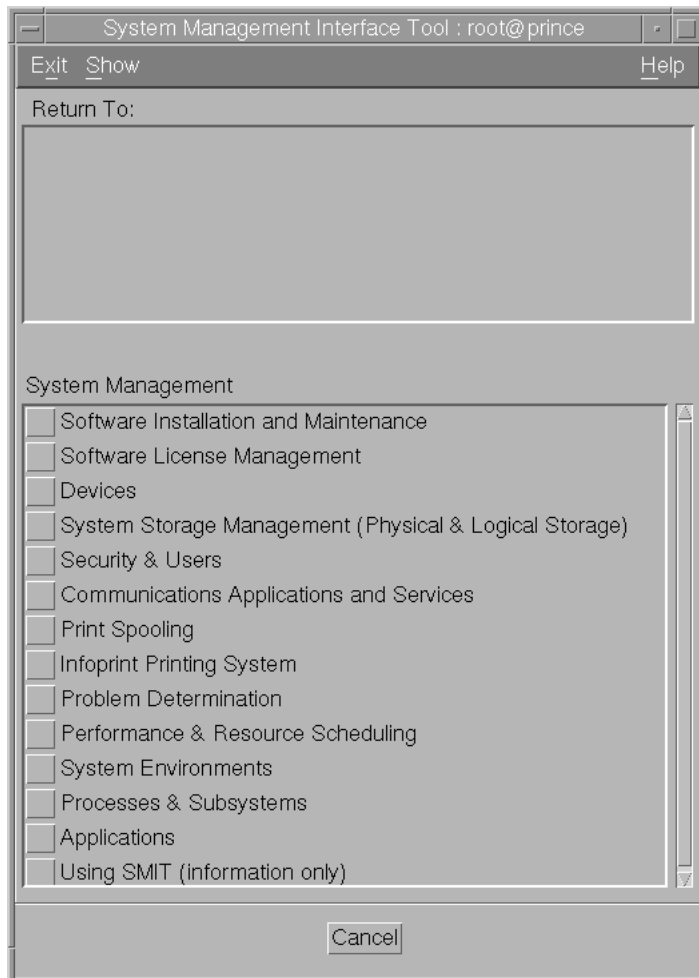


Figure 57. Main SMIT Panel

3. From this panel, specify the **Infoprint Printing System** → **Infoprint Utilities** → **Configure Secondary Servers (NFS)** → **Link from Primary Server to Secondary Server** path.

- 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:

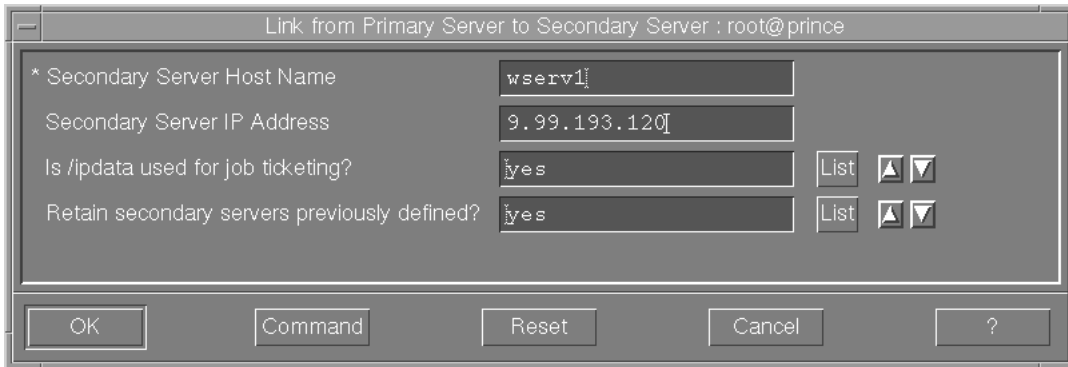


Figure 58. Link from Primary to Secondary Server Panel

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 Express Windows client for preflighting jobs and saving RIPPed 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.

- Once verified, click **OK**, and then click **Done**.
- Return to the first SMIT panel displayed in step 2 on page 167.

### Adding users to and modifying permissions for FST security groups

- 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**.
- 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.
- 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 migrating from an InfoPrint Manager 3.1 system or earlier. If you have installed InfoPrint Manager 4.1 on a "clean" machine, the **admin** group will have read authority for all **pd** commands by default.

- Once complete, return to the first SMIT panel displayed in step 2 on page 167.

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 167.

Now you can proceed to “Setting up the `ipwinadmin` id on a Windows 2000/2003 domain controller.”

### Setting up the `ipwinadmin` id on a Windows 2000/2003 domain controller

On the Windows 2000/2003 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

This 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. Specify SMIT and take the **Security & Users** → **Users** → **Add a User** path.

2. On the Add a User panel, specify `ntuser` as the **User NAME** field value, specify `printq` for the **Primary GROUP** field, `printq,system` as the **Group SET** field, and `/home/ntuser` for the **HOME directory** field.

Change the **File Creation UMASK** field value to `003`

Ensure the **Login AUTHENTICATING Grammar** field is either blank or specifies `compat` (if SMIT will not process the command without an entry in this field).

Ensure the **Password REGISTRY** field value specifies `files` and take the default for all other fields.

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 for other procedures.

### 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 AIX Version 4.2 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 multi-server system running, if one of your Windows servers shuts down or is restarted, 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. Using the CD-ROM, install Microsoft Windows Services for UNIX<sup>®</sup> from the "Add-on Pack for MicroSoft Windows Workstation and Server 4.0" at Version 1.0 or higher.
2. Reboot each InfoPrint Windows server.

### Setting up the common account for InfoPrint Windows servers on a 2000/2003 domain controller

On the Windows 2000/2003 domain controller server for the domain where your servers reside, you must create the domain account that all the InfoPrint Windows servers will run under. 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 **ntuser**. In the **Password** and **Confirm Password** fields, type the **ntuser** password from step 5 on page 170.  
We recommend that you select **Password never expires** so you do not 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 **ntuser** 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.

### Grant appropriate user rights to the domain user on all InfoPrint Manager Windows 2000/2003 servers

To ensure that the Windows 2000/2003 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 2000/2003 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.

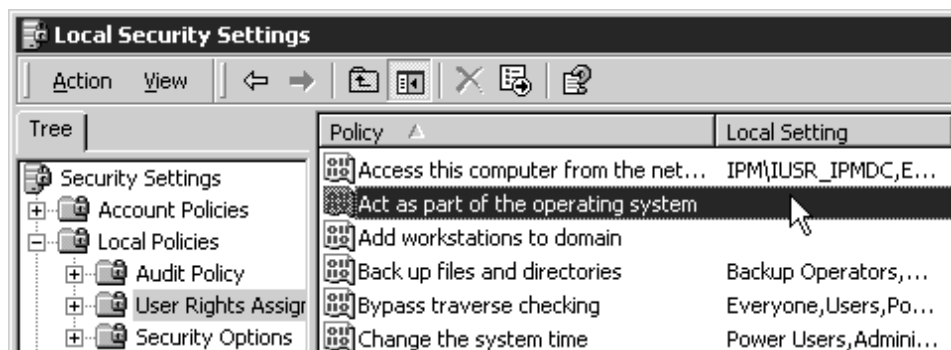
- In the **Administrative Tools** window, double-click the **Local Security Policy** icon.
- In the right pane of the **Local Security Settings** Window, double-click **Local policies**.



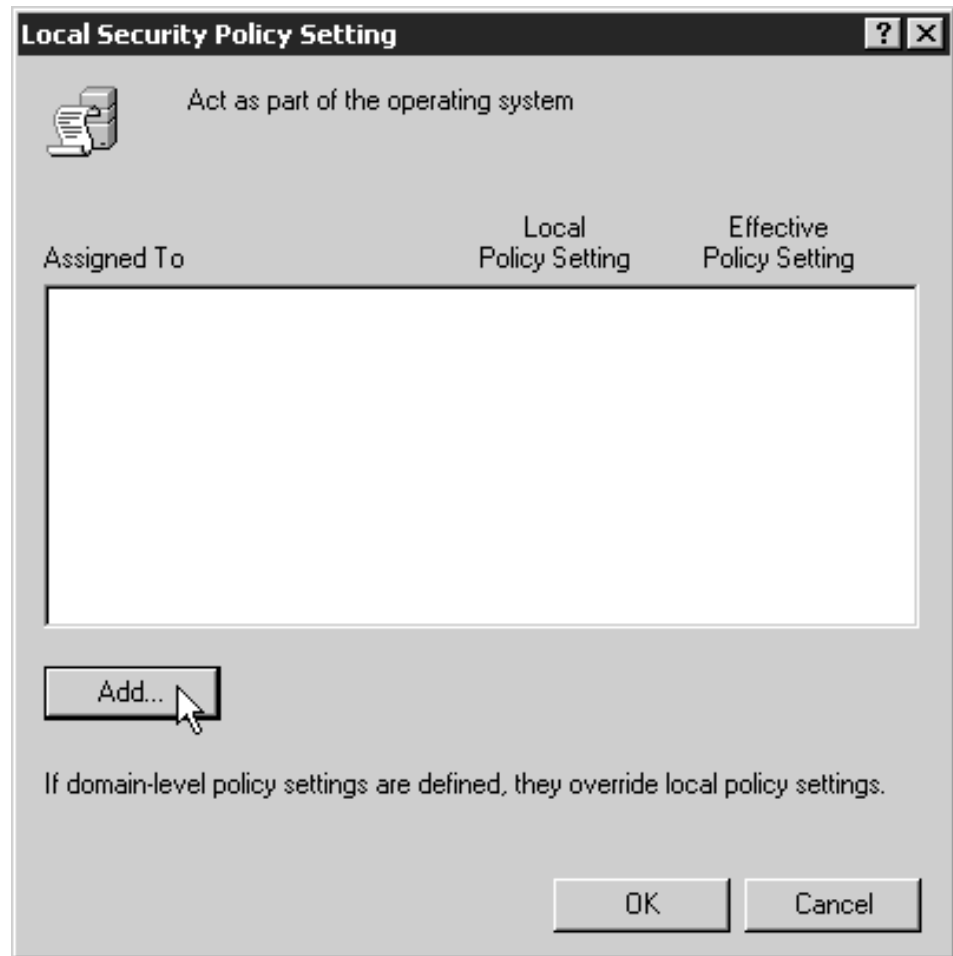
- Double-click **User Rights Assignment** in the right pane.



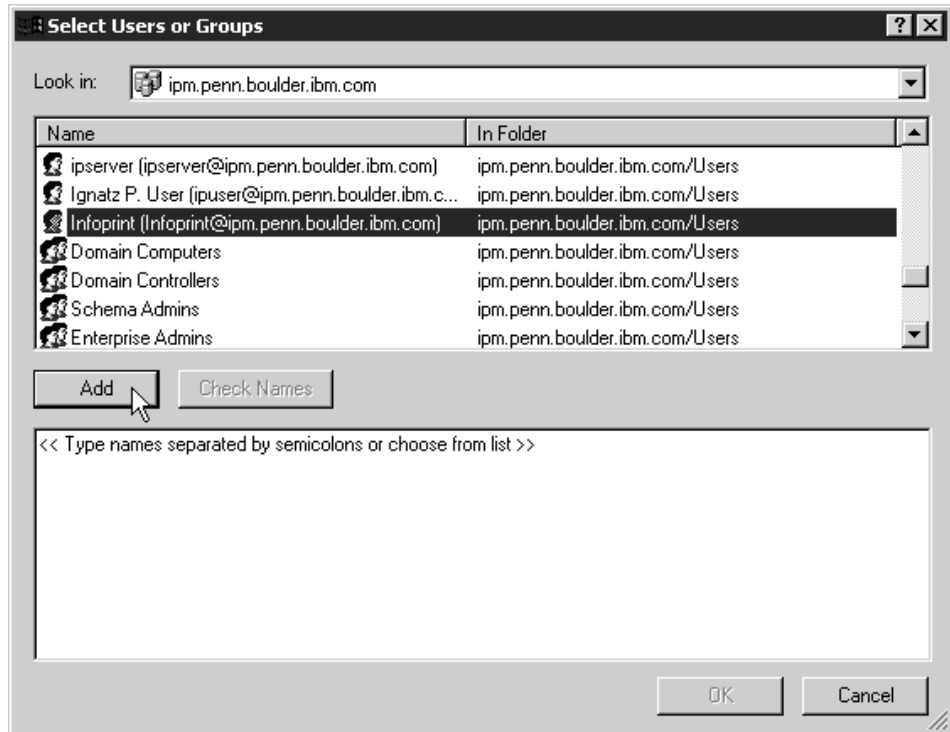
- In the list of user rights, select **Act as part of the operating system** and double click it.



- 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 172 for two other user rights: **Create permanent shared objects** and **Log on as a service**.

## Configuring the NFS client to access the namespace

The following NFS client configuration will need to be performed on each InfoPrint Manager for Windows server that will access the namespace on the AIX InfoPrint Manager server machine.

1. Log on to the Windows InfoPrint Manager server as the domain user `ntuser` who was created in the Setting Up the Common Account for InfoPrint Windows Servers on the Domain Controller procedure above.
2. From the **Start** menu, access the **Settings → Control Panel** path, and double-click **Client for NFS** to configure the NFS client to access the namespace.
3. Click the **Authentication** tab:
  - a. Enter `ntuser` in the **User Name** field.
  - b. Enter the InfoPrint AIX password for `ntuser` from step 5 on page 170) in the **Password** field.
  - c. Click the **PCNFSD Server** radio button and type in the name of an InfoPrint Manager AIX server.
4. Click the **Filenames** tab and set values as follows:

<b>Preserve Case (no conversion)</b>	check
<b>Generate Unique Names for Existing Files with Mixed Case Filenames</b>	unchecked
<b>Match Filenames Exactly</b>	check

**Match Filenames Ignoring Case**

unchecked

5. Click **OK**.
6. When you receive the pop-up dialog box that says NFS Login Successful, click **YES**.  
If you do not receive this message, go back to the **Authentication** tab and make sure that the ID and password match those set up in step 5 on page 170.
7. Log off the Windows InfoPrint Manager server as the domain user ntuser and log on to the Windows InfoPrint Manager server as the ipwinadmin user.
8. Repeat steps 2 through 6 from above.

### **Verifying access to the AIX namespace that allows interoperability on Windows 2000/2003**

From each InfoPrint Windows 2000/2003 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 170) from the Windows 2000/2003 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 170 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 during step 4 on page 171 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 in step 4 on page 171.
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 175.
2. Ensure that you created a user named ipwinadmin in the domain in “Setting up the ipwinadmin id on a Windows 2000/2003 domain controller” on page 169.
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.





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## **Part 3. Administrative Procedures: Configuring for Host Printing**



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## Chapter 21. Setting up to use MVS Download

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### Important information for PSF for OS/2 users

If you have decided to use the MVS Download function of InfoPrint Manager to replace your PSF for OS/2 system, you should be aware of these differences between the two products:

- PSF for OS/2 uses SNA to send data from the host to the server; MVS Download uses TCP/IP.
- To use PSF for OS/2, you had to install and configure IBM Communications Manager for OS/2 or IBM Communications Server for OS/2; you do not need to install the equivalent product on your Windows system to use MVS Download.
- The Distributed Print Function (DPF) feature of PSF for OS/2 receives IPDS data from the host system. MVS Download receives AFPDS and line data, as well as PCL or PostScript and passes it to InfoPrint Manager to be transformed before it is printed.
- In PSF for OS/2, AFP resources are sent from the host system to the print server along with the job. In MVS Download, AFP resources are not sent with the job; they must either be sent inline in the data stream or they must be resident on your InfoPrint Manager server before any print jobs that use them are sent.
- If you use the Distributed Print Function (DPF) feature of PSF for OS/2, your resources are managed automatically, so any changes you made to your resource files were automatically incorporated into your print jobs. Download for z/OS does not have an automatic resource management feature. If you make changes to your resource files, those changes will not be automatically incorporated into print jobs you submit through Download for z/OS. You will need to copy the changed resource files to the computer that your InfoPrint Manager server runs on. AFP Download Plus does have an automatic resource management function.

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### Configuring MVS Download

The MVS Download feature of InfoPrint Manager uses a *Destination Control File (DCF)* to map Job Control Language (JCL) parameters to InfoPrint Manager submission parameters. A default DCF called `mvsdmap.txt` is provided with InfoPrint Manager; it is installed in the `<install path>\var\pd\mvsd` directory, where `<install path>` is the directory that you installed InfoPrint Manager in. MVS Download receives JCL parameters from the host system, applies the DCF to it, and generates a corresponding list of InfoPrint parameters. The list of InfoPrint parameters is then passed to the MVS Download Exit Program (or *Exit*) so InfoPrint Manager can process the job.

The MVS Download feature of InfoPrint Manager also invokes an Exit for every file received. This Exit is responsible for performing some action on the received file. Two sample Exits are provided with InfoPrint Manager: one written in Microsoft Visual C++ Version 6.0 and one written in Microsoft Visual Basic Version 6.0. Both samples perform the same action: submit the file to InfoPrint Manager using `pdpr` and log any errors. The exit also stop the MVS Download receiver if the `pdpr` fails. The C sample also supports AFP Download Plus and multiple data set functions. The Visual Basic sample supports neither of these.

There are essentially five tasks that you must perform to be able to print using the MVS Download feature of InfoPrint Manager:

1. Create the InfoPrint destination or destinations that you want to submit your print jobs to.
2. Make the AFP resources that you need to use for your print jobs available to InfoPrint Manager.
3. **[Optional]**Modify the DCF.
4. **[Optional]**Modify the Exit Program.
5. Create an MVS Download receiver that will accept print jobs from the host and tie all of the other elements together.

All printing configurations must complete steps one, two, and five. Refer to the *InfoPrint Manager for Windows: Getting Started* for information on creating destinations. Refer to “Making your AFP resources available to InfoPrint Manager” on page 199 for information about completing step 2. If you can use the sample DCF and Exit that are provided with InfoPrint Manager (the default configuration), you do not have to perform steps three and four. Refer to “Setting up a default MVS Download configuration” on page 183 for instructions on completing step five for the default configuration. You can use the default configuration if all of the following conditions apply:

1. On jobs that are sent to this MVS Download receiver, the DEST listed on the job when it is received from the host (converted to lower case) identifies the InfoPrint actual or logical destination that the job should be submitted to

**OR**

Jobs with no DEST specified will be submitted to the InfoPrint actual or logical destination that you set as the default for this receiver.

2. You do not use InfoPrint job scheduling functions based on media type.
3. When submission of a print job fails (for example, because the server is stopped or because the DEST requested does not exist), you will accept the default action that the receiver automatically stops.
4. You will not use the multiple data set function of MVS Download.

If you do not meet all of the criteria, you will need to modify the DCF, the Exit, or both. Some of the reasons that you would need to modify the DCF are:

1. You want to use alternate attributes or no attributes for some mvs\_keywords.
2. You do not want the DCF to change the DEST value it receives to lower case.
3. You want to use InfoPrint job scheduling based on media type.
4. You see that some of the MVS to InfoPrint mappings in the sample DCF are not what you want.
5. You want to identify MVS job defaults that are not communicated from MVS (for example PAGEDEF).
6. You want to identify InfoPrint submission parameters to use on all jobs (for example, the font resource directory on your Windows system).
7. You use the multiple data set function of MVS Download.

Refer to the following sections for instructions on modifying your DCF and Exit, and creating an MVS Download receiver:

- “Understanding and using the MVS Download destination control file” on page 184
- “Understanding the MVS Download Exit Program” on page 194
- “Creating an MVS Download Receiver” on page 196

## Setting up a default MVS Download configuration

Once you have made your resources available, the only tasks you need to perform on your Windows system to set up a Default configuration are:

- Create an InfoPrint destination.  
Refer to the *InfoPrint Manager for Windows: Getting Started* for information on creating destinations.
- Create and configure an MVS Download receiver that uses the default DCF and Exit to send print jobs to that destination.  
Refer to “Creating an MVS Download Receiver for a default configuration” for instructions.

### Creating an MVS Download Receiver for a default configuration

Before you can begin sending jobs from the MVS JES spool to InfoPrint Manager through the MVS Download feature, follow this procedure to set up an MVS Download Receiver:

1. Open the InfoPrint Manager Management Console.
2. Left click the **MVS Download Receiver** item in the left pane to select it.
3. Right click the **MVS Download Receiver** item in the left pane to open a pop-up menu.
4. In the menu that pops up, select **New**.  
The **Add MVS Receiver** dialog opens.
5. Fill in the fields according to the following specifications. Refer to the Management Console online help for more information about the dialog and the fields it contains.
  - **Port Number:** Enter the port number that you want this receiver to use when it communicates with the host system. This number must match the port number that is specified in the Routing Control File used by the Download for z/OS FSA for this computer’s IP address or the PORTNO in the PRINTDEV for the AFP Download Plus FSA.
  - **Target Destination:** Select the default InfoPrint destination that you want this receiver to submit jobs to from the drop-down list. InfoPrint Manager will only submit a job to this destination if the jobs does not have a DEST specified when it comes from the host system.
  - **Destination Control File:** Do not change this path.
  - In the **Processing Options** group box, both options are selected by default and can be left that way.

**Note:** When the **Retain command files** check box is selected, InfoPrint Manager saves the control files for any MVS Download print jobs that failed in print submission. Therefore, when you want to resubmit those jobs, you do not have to download them from the host system again; the files are still on your InfoPrint server. You can deselect this box, but any jobs that fail in processing will need to be resubmitted from the host to be printed.

Operators should evaluate any processing failures, correct the problems that caused the failures, and resubmit the jobs either from the host system (if this box is deselected) or from the receiver (if this box is selected).

Refer to "Deleting Orphan Files and Resubmitting Jobs to MVS Download" in the *InfoPrint Manager for Windows: User's and Operator's Guide* in the InfoPrint Solutions Company Information Center for more information.

6. In the **Error Processing Options** group box, neither option is selected by default and can be left that way.
7. In the **Mapping Options** group box, none of the options are selected by default and can be left that way.
8. Click **OK**.  
One or more pop-up informational messages may appear; read them and click **OK** to dismiss them.
9. Select the **MVS Download Receivers** item in the left pane of the Management Console.  
You should see the receiver you just created in the right pane. The receiver status may be **STOPPED**, but it should start momentarily. Click the **Refresh View** button on the toolbar until the status changes to **RUNNING**.

Once the receiver is running, it is ready to receive print jobs from the host system.

## Understanding and using the MVS Download destination control file

The MVS Download Destination Control File (DCF) is a flat text file that consists of Control Statements, blank lines, and comments. Each line has a maximum length of 1023 bytes. Tabs are treated as blank spaces.

**Note:** If you change the DCF, the changes will not become active until you stop and restart the receivers that use that DCF.

The DCF maps the MVS keywords and parameters it receives from the host to the pdpr `-x` and `-p` attributes and parameters. The supplied MVS Download Exit uses pdpr to submit jobs to the target destination. To modify any of the other pdpr options, you must change the Exit Routine.

The sample DCF that comes with InfoPrint Manager is set to perform the mappings listed in Table 11.

**Note:** This table only lists the Mapping statements in the sample DCF. It does not reflect the Default statements and Global statements that are set.

Table 11. Mappings in the Sample DCF

mvs_definition	InfoPrint Attribute and Value for Download for z/OS	InfoPrint Attribute and Value for AFP Download Plus
ACCOUNT	account-text	account-text
ADDRESS1	address1-text	address1-text
ADDRESS2	address2-text	address2-text
ADDRESS3	address3-text	address3-text
ADDRESS4	address4-text	address4-text
BUILDING	building-text	building-text
CC=NO	carriage-control-type=none	ignored
CC=YES	ignored	ignored
CCTYPE=ANSI	carriage-control-type=ansi-ebcdic	ignored

Table 11. Mappings in the Sample DCF (continued)

CCTYPE=MACHINE	carriage-control-type=machine	ignored
CCTYPE=ASCII	carriage-control-type=ansi-ascii	ignored
CHARS	chars	ignored
CLASS	printer-pass-through=-opa=class	printer-pass-through=-opa=class
COPIES	copy-count	results-profile
DATAACK=UNBLOCK	data-fidelity-problem-reported=all	data-fidelity-problem-reported=all
DATAACK=BLOCK	data-fidelity-problem-reported=none	data-fidelity-problem-reported=none
DATAACK=BLKPOS	data-fidelity-problem-reported=character	data-fidelity-problem-reported=character
DATAACK=BLKCHAR	data-fidelity-problem-reported=position	data-fidelity-problem-reported=position
DATATYPE=AFP	Not applicable	document-format=modca-p
DATATYPE=LINE	document-format=line-data	Not applicable
DEPT	department-text	department-text
DEST	target-destination-name and printer-pass-through=-opa=destination	target-destination-name and printer-pass-through=-opa=destination
DUPLEX=NO	sides=1	sides=1
DUPLEX=NO	plex=simplex	plex=simplex
DUPLEX=NORMAL	sides=2	sides=2
DUPLEX=NORMAL	plex=simplex	plex=simplex
DUPLEX=TUMBLE	sides=2	sides=2
DUPLEX=TUMBLE	plex=tumble	plex=tumble
FCB	page-definition	ignored
FILEFORMAT=RECORD	new-line-option=counted-4-octet-aligned	ignored
FILEFORMAT=STREAM	new-line-option=lf or cr-and-lf	ignored
FILETYPE	ignored	ignored
FORMDEF	form-definition	form-definition
FORMLENGTH	form-length=nnnn.nnn	form-length=nnnn.nnn
FORMS	printer-pass-through=-opa=forms	printer-pass-through=-opa=forms
INTRAY	printer-pass-through=-obin	printer-pass-through=-obin
IPADDR	printer-pass-through=-opa=ipaddr	printer-pass-through=-opa=ipaddr
JOBID	printer-pass-through=-opa=jobid	printer-pass-through=-opa=jobid
JOBNAME	job-name and job-owner	job-name and job-owner
NAME	name-text	name-text
NODEID	node-id-text	node-id-text
OFFSETXB	x-image-shift-back	x-image-shift-back
OFFSETXF	x-image-shift	x-image-shift
OFFSETYB	y-image-shift-back	y-image-shift-back
OFFSETYF	y-image-shift	y-image-shift

Table 11. Mappings in the Sample DCF (continued)

OUTBIN	output-bin	output-bin
OVERLAYB	overlay-back	overlay-back
OVERLAYF	overlay-front	overlay-front
PAGECNT	job-page-count	job-page-count
PAGEDEF	page-definition	ignored
PRMODE=SOSI1	shift-out-shift-in=one	ignored
PRMODE=SOSI2	shift-out-shift-in=two	ignored
PRMODE=SOSI3	shift-out-shift-in=three	ignored
PRMODE=[anything else]	ignored	ignored
PROGRAMMER	programmer-text	programmer-text
PRTQUEUE	printer-pss-through=-oprtqueue	printer-pss-through=-oprtqueue
RESFMT=P240	font-resolution=P240	font-resolution=P240
RESFMT=P300	font-resolution=P300	font-resolution=P300
ROOM	room-text	room-text
SEGMENTID	printer-pass-through=-opa=segmentid	printer-pass-through=-opa=segmentid
SHEETCNT	ignored	ignored
SYSOUT	printer-pass-through=-opa=class	printer-pass-through=-opa=class
TITLE	title-text	title-text
TRC	table-characters-reference	ignored
UCS	chars	ignored
USERID	user-id-text	user-id-text

## Types of control statements

There are three kinds of Control Statements in a DCF:

1. **Default statements** identify a default parameter for an `mvs_keyword` when one is not received from MVS. They consist of only an `mvs_definition`.

**Note:** If you include multiple Default statements that use the same `mvs_keyword`, InfoPrint only uses the last one.

2. **Global statements** identify an InfoPrint parameter that should be used on all data set submissions. This statement uses `GLOBAL` as the `mvs_definition` value.

**Note:** If you include multiple Global statements that use the same `infoprint_attribute`, InfoPrint only uses the last one.

3. **Mapping statements** match `mvs_keyword` with their InfoPrint equivalents. These statements must contain both an `mvs_keyword` and a control. If there is no Mapping statement listed in the DCF for one or more of the `mvs_keywords` and parameters that are received, InfoPrint adds those `mvs_keywords` and parameters as unchanged printer-pass-through attributes.

### Notes:

- a. If you include multiple Mapping statements that use the same `mvs_definition` but map to different `infoprint_attributes`, all of them will be honored.



- b. If you include multiple Mapping statements that use the same `mvs_keyword` and map to the same `infoprint_attribute`, the last one mapped will be used.
- c. If you define a Mapping statement that maps to an `infoprint_attribute` that is also used in a Global statement, and the Mapping statement is used due to the MVS keywords in a received file, the Mapping statement will override the Global statement.
- d. If no matching Mapping statement is found for a received `mvs_keyword` and parameter, it will automatically be added to the printer-pass-through parameter. A null Mapping statement can be used to throw the `mvs_keyword` away entirely. A null Mapping statement contains an `mvs_definition` and a control, but no `infoprint_definition`.

## Syntax of control statements

Each Control Statement consists of three parts as described below. The entire statement must reside on a single line (it can't contain a carriage return until it is complete) and it must follow this syntax:

```
mvs_definition [control [infoprint_definition]]
```

**mvs\_definition:** The `mvs_definition` identifies a keyword that is generated by the host and, for Default and some Mapping statements, its associated parameter. It follows this format:

```
mvs_keyword[=mvs_parameter]
```

**Note:** In Control Statements, `mvs_definitions`, `controls`, and `infoprint_definitions` themselves cannot contain any white space (spaces or tabs). The first occurrence of white space separates the `mvs_definition` from the control and the second separates the control from the `infoprint_definition`. As a result, if the elements contain white spaces, the DCF will not complete the mapping correctly.

These values are described below.

*mvs\_keyword:* The `mvs_keyword` represents the string that InfoPrint Manager receives from an MVS system. It is what the MVS system uses to refer to information about a print job (for example, whether or not it should be duplexed or what overlay it uses, if any). The keywords identified in Table 11 on page 184 are the standard set of `mvs_keywords` that are available for you to use. The keywords that MVS uses to refer to these job characteristics are not the same as the InfoPrint attribute names that do the same things.

*mvs\_parameter:* The optional `mvs_parameter` is a case-sensitive free-format field. The purpose of an `mvs_parameter` depends upon what type of Control Statement it is used with.

- **Default Statement**

The `mvs_parameter` value is required. This value identifies the default value of the `mvs_keyword` when the `mvs_keyword` has not been sent by the host system with a job. For example, in the Defaults section of the `mvsdmap.txt` file, `CHARS=GT13` is identified. Therefore, `GT13` is the `mvs_parameter` default font value, and will be used whenever InfoPrint Manager does not receive a font value from the host system.

- **Global Statement**

The `mvs_parameter` value is ignored.

- **Mapping Statement**

The `mvs_parameter` value is optional. If an `mvs_parameter` value is specified for an `mvs_keyword` on a Mapping statement, the `mvs_keyword` is not always mapped to the `infoprint_definition` specified. The `mvs_keyword` is only mapped to the `infoprint_definition` when the `mvs_keyword` and the `mvs_parameter` combination that comes from the host system matches the `mvs_keyword` and `mvs_parameter` combination specified on the Mapping statement.

For example, these four lines appear in the Mapping section of the `mvsdmap.txt` file:

```
CCTYPE :: carriage-control-type=none
CCTYPE=ANSI :: carriage-control-type=ansi-ebcdic
CCTYPE=MACHINE :: carriage-control-type=machine
CCTYPE=ASCII :: carriage-control-type=ansi-ascii
```

If InfoPrint Manager receives a job from the host system with the `mvs_keyword` `CCTYPE=ANSI` specified, InfoPrint Manager will map that keyword to the InfoPrint attribute `carriage-control-type` and set its parameter to `ansi-ebcdic`. If the next job comes with the `mvs_keyword` `CCTYPE=MACHINE` specified, InfoPrint Manager will map that keyword to the InfoPrint attribute `carriage-control-type` and set its parameter to `machine` instead. But, if InfoPrint Manager receives a job with the `mvs_keyword` `CCTYPE` set to anything besides `ANSI`, `MACHINE`, or `ASCII`, it will map that keyword to the InfoPrint attribute `carriage-control-type` and set its parameter to `none`.

For certain `mvs_keywords`, special `mvs_parameters` are recognized. These keywords are listed in Table 12.

Table 12. Special `mvs_parameters`

<code>mvs_keyword</code>	<code>mvs_parameters</code>
CC	YES NO
CCTYPE	ANSI MACHINE ASCII
DATAACK	BLOCK UNBLOCK BLKPOS BLKCHAR
DATATYPE	LINE AFP
DUPLEX	NO NORMAL TUMBLE
FILEFORMAT	RECORD STREAM
RESFMT	P240 P300
TRC	YES NO

**control:** A *control* is a symbol that is used for delineation and which can also tell the MVS Download receiver what it has to do to the `mvs_keyword` if it converts the `mvs_keyword` to an InfoPrint keyword. Every Mapping statement contains a control. Some of the controls listed below are used in the `mvsdmap.txt` file.

- :: Don't do any special processing. (Standard delineation)
- :+ Change all of the characters in the `mvs_parameter` into upper case when converting it to an `infoprint_parameter`.
- :- Change all of the characters in the `mvs_parameter` into lower case when converting it to an `infoprint_parameter`.
- !: Do not convert this `mvs_parameter` into an `infoprint_parameter`. This control is only necessary if no `infoprint_parameter` is specified on this statement.

**Note:** In Control Statements, *mvs\_definitions*, *controls*, and *infoprint\_definitions* themselves cannot contain any white space (spaces or tabs). The first occurrence of white space separates the *mvs\_definition* from the control and the second separates the control from the *infoprint\_definition*. As a result, if the elements contain white spaces, the DCF will not complete the mapping correctly.

Controls behave differently in the different types of Control statements.

- In **Default** statements, you cannot specify a control.
- In **Global** statements, you must specify a control, but the operator is only recognized as a delineator; no matter what operator you use, it acts like the `::` control.
- In **Mapping** statements, you must specify a control.

**infoprint\_definition:** The *infoprint\_definition* identifies the attribute and parameter that will be specified on the **pdpr** command when InfoPrint Manager sends the job to the printer. The *infoprint\_definition* identifies an InfoPrint attribute and (optionally) the value that it should be set to. *infoprint\_definitions* follow this syntax:

```
infoprint_attribute[=infoprint_parameter]
```

**Note:** In Control Statements, *mvs\_definitions*, *controls*, and *infoprint\_definitions* themselves cannot contain any white space (spaces or tabs). The first occurrence of white space separates the *mvs\_definition* from the control and the second separates the control from the *infoprint\_definition*. As a result, if the elements contain white spaces, the DCF will not complete the mapping correctly.

The *infoprint\_attribute* is the InfoPrint attribute name as it is listed in the *InfoPrint Manager: Reference* under `-x` options, plus the specially recognized *target-destination-name*, which is used to identify the `-p` option of the **pdpr** command. The *infoprint\_parameter* is the value that is assigned to that attribute.

*infoprint\_definitions* work differently in each kind of control statement.

- In **Default statements**, you cannot specify an *infoprint\_definition*.
- In **Global statements**, you must specify an *infoprint\_definition*.
- In **Mapping statements**, you should specify an *infoprint\_definition* to map the *mvs\_definition* to. However, if you specify an *infoprint\_attribute*, you do not have to specify an *infoprint\_parameter* with it. If you only list an *infoprint\_attribute*, the *mvs\_parameter* value from the *mvs\_keyword* becomes the *infoprint\_attribute* value.

**Notes:**

1. If you do not provide an *infoprint\_definition* in a Mapping statement, the information contained in that **mvs\_keyword** will be discarded.
  2. If you provide multiple Mapping statements that lead to the same attribute only one will be used, but it is impossible to predict which one that will be.
- To identify an *infoprint\_attribute* that you want to use on the `-x` option of the **pdpr** command, omit the `-x`, for example: `media-id`.
  - To identify an *infoprint\_attribute* that you want to use on the `printer-pass-through` attribute of the **pdpr** command, prefix the *infoprint\_attribute* with an `-o` flag for example, `-ojobid`. All generated `-o` attributes will be collected and added to a single `printer-pass-through` attribute.

- To identify an infoprint\_attribute that you want to use on the **-opa** option of the printer-pass-through attribute of the pdpr command, prefix the infoprint\_attribute with an -opa, for example, -opa:class. All generated-opa attributes will be collected and added to a single -opa keyword on the printer-pass-through attribute.
- To identify that the mvs\_definition is to map to the name of the target destination for submission, specify target-destination-name, which is a specially-recognized infoprint\_attribute that overrides the third parameter that is passed to the sample MVS Download Exit.
- To handle complex, multi-valued infoprint\_attributes, begin the infoprint\_parameter with as many colons (:) as necessary to move the parameter into the correct position. For example, the results-profile attribute follows this syntax:

```
-x "results-profile=name@node:method:number:'message text':bin"
```

In use, the attribute would look like this:

```
-x "results-profile=nr645@b1d25:pickup:2:'Please read this'"
```

So, if you wanted to map the COPIES value to the 'number' parameter of results-profile, you would enter two colons (::) in the mapping statement. The two colons indicate that the program should skip over the first two parameters in the results-profile (name@node and method), and insert the value in the third position (number). The mapping statement would look like this:

```
COPIES :: results-profile=::
```

You can include a hard-coded infoprint\_parameter in the statement, but you do not have to. If you do not include one, the normal rules for determining the resulting infoprint\_parameter apply.

## Changing the sample DCF

### Copying the sample DCF:

Follow these steps to create a copy of the sample DCF provided with InfoPrint Manager.

1. Open the file <install path>\var\pd\mvsdmap.txt, (where <install path> is the directory where InfoPrint Manager is installed) in a text editor such as Notepad.
2. Select **File** → **Save as**, and save the file into a directory outside of the <install path> directory. Make note of the directory and file name for reference later.

#### Notes:

- a. You can change the file name if you like, but do not need to.
- b. If you do not save the file to another directory outside the <install path> directory, it could be overwritten or deleted if you ever need to reinstall, apply service, or upgrade InfoPrint Manager.
- c. This step creates a copy of the sample/default file and leaves the original, unedited version in the directory listed above so you can use it to create another customized DCF later if you need to.

### Editing the DCF:

Refer to this section to edit either the sample DCF provided with InfoPrint Manager or an existing DCF.

1. Open the file you want to edit in a text editor.

Notice that most of the lines begin with a \*. Every line that begins with a \* is a line that is *commented out*, so InfoPrint Manager ignores it during processing. When you need to comment out a line, insert a \* at the beginning of the line; to uncomment a line, delete the \* at the beginning of the line.

2. Read the notes and instructions in the file before you make any changes to it.
3. Change the Control Statements as you need to.
  - In the **Defaults** section, you can set the defaults as you need them to be.
  - In the **Globals** section, the only value that is set is carriage-control-type attribute value.

The statements that are commented out are examples of how to specify alternate resource search orders.

- The first example specifies a location that InfoPrint Manager will search for all fonts (resource-context-font=C:\fonts\reslib).
- The second example specifies a location and search order for page definitions (resource-context-pagedef=C:\joeski\pagedefs;c:\bills\pdefs).

You should put any other pdpr parameters to be specified on the -x option on all jobs here.

- In the **Mapping** section, there are two sections: *Commonly changed mappings* and *Less commonly changed mappings*. Follow the instructions provided in the text file to make your changes, keeping these additional considerations in mind:
  - If you plan to send print jobs to different logical destinations based upon the media type of the job, you should uncomment the FORMS :: default-medium mapping.
  - The default mapping uses the MVS JCL keyword DEST to specify the target destination (printer) that the downloaded jobs are sent to. If you comment out this mapping or remove the target-destination-name from the right side, all jobs are submitted to the target destination that you specify in the **Target destination** field when you set up your MVS Download Receiver.
  - If your host MVS system uses the newer PRTQUEUE JCL keyword to identify the target-destination, comment out the DEST :: target-destination-name mapping and uncomment the lines:

```
PRTQUEUE :: target-destination-name
DEST      ::
```

### Debugging your changed DCF:

The sample DCF contains a DEBUG statement that is commented out. Follow these steps to use this statement to check your DCF.

1. Uncomment the DEBUG statement in the DCF that you changed.
2. Save the file.
3. Stop the MVS Download receiver that uses this DCF.
4. Restart the MVS Download receiver that uses this DCF.
5. Submit a job from MVS that runs through this MVS Download receiver.

Information will be written into the server log. You can view the server log by clicking the **Server Log** item in the left pane of the Management Console.

6. Once you are satisfied with the results, open the DCF and comment the DEBUG statement out again.
7. Save the file.

8. Stop the MVS Download receiver that uses this DCF.
9. Restart the MVS Download receiver that uses this DCF.

### Changing the sample DCF advanced information

If you use MVS Exit 15, understand that the predefined *mvs\_keywords* are internally converted using Table 13. If you need to add lines to the DCF you will need to be aware of these internal mappings and what additional information your lines need to contain.

For example, the sample DCF contains the line:

```
DATAACK=BLKPOS    :: data-fidelity-problem-reported=character
```

But, because in Table 13 DATAACK maps to -odatac, the following line would produce the same results:

```
-odatac=blkpos   :: data-fidelity-problem-reported=character
```

When the MVS host actually sends -odatac=blkpos, this mapping statement is used. For information on the actual keywords that the MVS host sends, refer to the publication *Print Services Facility for z/OS; Download for z/OS, (S544-5624)*, which you can download from the InfoPrint Solutions Company Web site at <http://www.infoprint.com>.

**Note:** The *mvs\_definition* (all of the information to the left of the control) is case-sensitive and must exactly match the information that comes from the host system for the mapping to be made.

Some parameter information is received from the MVS host as -o keywords and other information is received as sub-keywords of the -opa keyword. For example, CLASS information is received as -opa=class=xxx.

When the DCF is processed by an MVS Download receiver, the receiver looks at each *mvs\_keyword* to determine if it will be received from MVS as a keyword or as a sub-keyword of the -opa keyword. The receiver tries to convert the specified *mvs\_keyword* according to Table 13. If the receiver doesn't find a mapping conversion for the specified *mvs\_keyword*, the *mvs\_keyword* is left unchanged. If the result of the conversion begins with -o, the receiver assumes that the *mvs\_keyword* will be received as a keyword. If the result of the conversion does not begin with -o, the receiver assumes that the *mvs\_keyword* will be received as a sub-keyword of the -opa keyword.

For example, the *mvs\_keyword* SYSOUT is internally converted (according to Table 13) to class. Since class does not begin with -o, the receiver assumes that class is a sub-keyword of the -opa keyword.

Table 13. MVS keyword internal conversions

<i>mvs_keyword</i>	MVS Values Passed to InfoPrint
ACCOUNT	-AC
ADDRESS1	-oaddress1
ADDRESS2	-oaddress2
ADDRESS3	-oaddress3
ADDRESS4	-oaddress4
BUILDING	-obu
CC	-occ

Table 13. MVS keyword internal conversions (continued)

CCTYPE	-occtype
CHARS	-ochars
CLASS	class
COPIES	-ocop
DATAACK	-odatac
DATATYPE	-odatat
DEPT	-ode
DEST	destination
DUPLEX	-odu
FCB	-opagedef
FILEFORMAT	-ofileformat
FILETYPE	-ofiletype
FORMDEF	-of
FORMLEN	-oformlength
FORMS	forms
INTRAY	-oin
IPADDR	-oipdest
JOBID	jobid
JOBNAME	-ojobn
NAME	-ona
NODEID	-ono
OFFSETXB	-ooffxb
OFFSETXF	-ooffxf
OFFSEYB	-ooffyb
OFFSEYF	-ooffyf
OUTBIN	-ooutbin
OVERLAYB	-oovlyb
OVERLAYF	-oovlyf
PAGECNT	-opagecount
PAGEDEF	-opagedef
PRMODE	-oprmode
PROGRAMMER	-opr
PRTQUEUE	-oprqueue
RESFMT	-ore
ROOM	-oro
SEGMENTID	segmentid
SHEETCNT	-osheetcount
SYSOUT	class
TITLE	-oti
TRC	-otrc
UCS	-ochars



Table 13. MVS keyword internal conversions (continued)

USERID	-ous
--------	------

MVS Exit 15 allows users to add sub-keywords to the -opa keyword only. The `mvs_keyword` that would be used in the DCF is the (case-sensitive) sub-keyword only. For example, if an MVS Exit 15 added `OUTGRP=n`, where *n* was the number of the dataset in the job, and you wanted to map this value to the `printer-pass-through=-opa=segmentid` parameter (instead of the supplied mapping), you would replace the existing DCF mapping statement of:

```
SEGMENTID      :: -opa:segmentid
```

with

```
OUTGRP         :: -opa:segmentid
```

If you wish to add multiple sub-keywords to the -opa keyword using MVS Exit 15, each keyword/parameter pair must be delineated with a comma. It is highly recommended that you not use any blank spaces or tabs around the comma or around the "=" sign that you place between your generated sub-keyword and the parameter.

For more information, refer to the publication *Print Services Facility for z/OS: Download for z/OS*, or *Print Services Facility for z/OS: AFP Download Plus*, which you can download from the InfoPrint Solutions Company Web site at <http://www.infoprint.com>.

## Understanding the MVS Download Exit Program

The MVS Download Exit Program (or *Exit*) takes the InfoPrint Manager submission parameters generated by the DCF and uses them to process the print job appropriately. The Exit is invoked once per file received from MVS.

Two sample exit routines are provided with InfoPrint Manager: one written in Microsoft Visual C++ Version 6.0 and one written in Microsoft Visual Basic Version 6.0. The Visual C++ file set includes: `mvdsdsubm.dsp` and `mvdsdsubm.opt` (project files), `mvdsdsubm.dsw` (a workspace file), and `mvdsdsubm.c` (a source file). The Visual Basic file set includes `mvdsdsubm.vbp` (a project file), `mvdsdsubm.vbw` (a workspace file), and `mvdsdsubm.frm` (a source file). They are installed in the `<install path>\exits\mvdsd` directory, where `<install path>` is the directory that you installed InfoPrint Manager in.

### Using the sample MVS Download exit program

In the sample `mvdsdsubm` files, the Exit performs the following operations using the eight parameters that are passed to it. Both of the sample Exits perform the same functions.

1. Issues a **pdpr** print command to submit the file (parameter #1) to the specified target destination (parameter #3), with the indicated InfoPrint print parameters (parameter #5).
2. If the job prints successfully, the Exit will erase the print job file (parameter #1).
3. If the job does not print, the Exit will log an error in the MVS Download error file and terminate the receiver.

Parameters	Definition
#1	The name of the file that contains data received from the MVS JES spool



#2	MVS JES destination control parameters
#3	InfoPrint target destination (printer) where the job is submitted
#4	MVS Download receiver name
#5	InfoPrint print parameters
#6	The port number used by this receiver
#7	Additional exit parameter specified when the receiver was created
#8	Indicator that indicates whether trace is on. A value of zero indicates trace is off. Any other value indicates trace is on.

In addition, the Visual C++ version of the exit has support for the multiple data set function in Download for z/OS and AFP Download Plus. The Visual Basic version does not contain this support.

### Customizing the sample exit program

You can customize either the `mvdsdsubm.c` (written in Visual C++) or `mvdsdsubm.frm` (written in Visual Basic) to allow the Exit to perform differently. For example, you might want to modify the Exit so that it ignores the InfoPrint Manager print parameters (parameter #5) and processes only the MVS JES destination control parameters themselves (parameter #2). Or, you could remove the `pdpr` call and change it to any applicable program or OS command call. For instance, you could have the Exit copy or archive the data file (parameter #1).

**Note:** If you specify a DCF that contains no statements, InfoPrint will pass parameter #5 as a null string.

#### Copying the sample exit:

If you want to customize the sample Exit, you should not change the sample itself, because if you ever need to reinstall InfoPrint Manager, all of your changes will be lost. Instead, copy the fileset that you want to use (either the Visual C++ version or the Visual Basic version) into a directory outside of the directory the you have InfoPrint Manager installed in and make your changes to that version.

**Note:** You must have access to either Microsoft Visual C++ Version 6.0 or Microsoft Visual Basic Version 6.0 to customize the Exit.

You can follow these steps to complete the process:

1. Log on to the system that your InfoPrint Manager server is installed on.
2. Decide which directory you would like to store your new exit in or create a new one for it.
3. Navigate to the `<install path>\exits\mvdsd` directory, where `<install path>` is the directory that you installed InfoPrint Manager in, using Windows Explorer or the **My Computer** icon.  
You will see seven files. Four of them are the Visual C++ fileset and the other three are the Visual Basic fileset.
4. Copy the files for the version of the Exit you want to modify into the directory you selected or created in step two.
  - For the Visual C++ version, copy: `mvdsdsubm.dsp`, `mvdsdsubm.opt`, `mvdsdsubm.dsw`, and `mvdsdsubm.c`
  - For the Visual Basic version, copy: `mvdsdsubm.vbp`, `mvdsdsubm.vbw`, and `mvdsdsubm.frm`

5. Open the copy of the project and make your changes.
6. Save and compile the Exit.

**Note:** By default, the sample Visual C++ Exit builds a **Debug** compile version of the Exit. The pre-installed executable version of the sample (mvsdsubm.exe) is a **Release** version. You can change the Active Configuration of the **mvsdsubm** project to build the Release version of the Exit.

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 any of the Error Processing Options

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.

## Creating an MVS Download Receiver

Before you can begin sending jobs from the MVS JES spool to InfoPrint Manager through MVS Download, follow this procedure to set up an MVS Download Receiver.

1. Open the InfoPrint Manager Management Console.
2. On the menu bar, select **Edit** → **New** → **MVS Download Receiver**.  
The **Add MVS Download Receiver** dialog opens.
3. Fill in the fields according to the following specifications. Refer to the Management Console online help for more information about the dialog and the fields it contains.
  - **Port Number:** Enter the port number that you want this receiver to use when it communicates with the host system. This number must match the port number that is specified in the Routing Control File used by the Download for z/OS FSA for this computer's IP address or the PORTNO in the PRINTDEV for the AFP Download Plus FSA.
  - **Target Destination:** Select the InfoPrint destination that you want this receiver to submit jobs to from the drop-down list. InfoPrint Manager will only submit a job to this destination when the job does not have a target-destination-name value assigned to it after its mvs\_keywords have been processed against the DCF.
  - **Destination Control File:** Click **Browse** and locate the destination control file that you want to use with this receiver. Select the file and click **Save**.
  - In the **Processing Options** group box, both of the options are selected by default.
    - When the **Retain command files** check box is selected, InfoPrint Manager saves all of the files that pertain to MVS Download jobs that fail in processing. When MVS Download print jobs are processed successfully, these files are cleaned up regardless of what you select here. If you need

to resubmit failed jobs, you do not have to download them from the host system again; the files are still on your InfoPrint server. If you deselect this box, you will have to download any jobs that fail in processing from the host again to print them.

**Note:** You can diagnose errors by clicking the **Server Log** item in the left pane of the Management Console.

Operators should evaluate any processing failures, correct the problems that caused the failures, and resubmit the jobs.

Refer to "Deleting Orphan Files and Resubmitting Jobs to MVS Download" in the *InfoPrint Manager for Windows: User's and Operator's Guide* in the InfoPrint Solutions Company Information Center for more information.

- When the **Enable parallel processing** check box is selected, this MVS receiver will process multiple jobs simultaneously. When it is cleared, the receiver will wait until the Exit for one print job completes before it starts to process the next job.

This option is normally left selected unless a custom Exit has been written that requires only one instance of the exit to run at a time and in the order the files are received.

This option must be unchecked if the multiple data set function of Download for z/OS or AFP Download Plus is used.

- In the **Error Processing Options** group box, neither of the options are selected by default:
  - When the **Provide Extended Error Information to AFP Download Plus** check box is selected, internal errors or exit errors are reported to the host for assistance in problem determination if requested by AFP Download Plus. When the check box is cleared, neither internal errors nor exit errors are reported to the host for assistance in problem determination. To report internal error messages, you must check this box to report internal error messages. In addition, you must also check the **Provide Exit Program Errors to z/OS** check box to report exit messages. For all new and existing view receivers, the default status of the box is cleared.
  - When the **Provide Exit Program Errors to z/OS** check box is selected, the success of the exit is monitored by the receiver. A zero return code from the exit causes the receiver to indicate success to the mainframe. A non-zero return code from the exit causes the receiver to indicate failure to the mainframe. When this check box is selected and the exit reports an error on a file in an multiple data set job, the mainframe might retry the file. In addition, any error messages generated by the exit are provided to the mainframe when you check this box if the **Provide Exit Program Errors to z/OS** check box is also checked. When you do not check this box, the success of the exit is not monitored by the receiver. For all new and existing view receivers, the default status of the box is cleared.
- In the **Mapping Options** group box, neither of the options are selected by default:
  - Select the **Basic** check box, if you want to use a limited hard-coded conversion table.
  - Select the **Custom** check box, if you want to specify the **Host Code Page** and, optionally, the **Local Code Page** for conversion.
    - **Host Code Page:** Enter the name of the code page from where your JCL is submitted.

- (Optional)**Local Code Page:** Enter the name of the local code page that you want to use. If this field is left empty, the receiver queries the system code page and uses it instead.
4. (Optional) Click **Advanced** to open the **Add MVS Download Receiver Advanced** dialog. In this dialog, you can specify the following options. Refer to the Management Console online help for more information about the dialog and the fields it contains.

- Select the **Standard Exit Program Options** check box, if you want to specify the **Print AFP Download Plus Jobs with Errors on z/OS**, the **Server Submission Retry Count**, and the **Server Submission Retry Interval**.

**Note:** The following options are only functional if you are using the new InfoPrint Manager provided exit. If you are using an older InfoPrint Manager provided exit, these options will be ignored. If you are using a custom exit, consult the writer of the exit.

- If you select the **Print AFP Download Plus Jobs with Errors on z/OS** check box, and AFP Download Plus detects an error in any file in the job, the job is printed including the error messages provided by AFP Download Plus. The error messages provided by AFP Download Plus are printed where the file would normally be printed in the job. If you clear this check box and AFP Download Plus detects an error in any file in the job, the entire job is discarded. For all new and existing view receivers, the default status of the box is cleared.
  - **Server Submission Retry Count:** Enter the number of times the **pdpr** should be tried. If no value, or a value of 0 is entered, the **pdpr** is retried.
  - **Server Submission Retry Interval:** Enter the time interval in seconds between the **pdpr** retries. The value entered must be a integer from 0 to 32767. If no value or a value of 0 is entered, the **pdpr** is retried immediately.
- Select the **Custom Exit Program Options** check box, if you are using custom exits. Consult with the person responsible for the custom exits to determine whether this box should be selected.
    - **Exit Program Name:** Enter the path and filename of the custom Exit Program that you want this receiver to use. Consult with the person responsible for the custom exit program to determine the name of the exit.
    - **Additional Exit Program Parameters:** Consult with the person responsible for the custom exit program to determine the Additional Exit Parameters.
  - Click **OK** to close the **Add MVS Download Receiver Advanced** dialog.
5. On the **Add MVS Download Receiver** dialog, click **OK**.  
One or more pop-up informational messages may appear; read them and click **OK** to dismiss them.
6. Select the **MVS Download Receivers** item in the left pane of the Management Console.  
You should see the receiver you just created in the right pane. The receiver status may be **STOPPED** but it should start momentarily. Click the **Refresh View** button on the toolbar until the status changes to **RUNNING**.  
If the receiver does not start within a few minutes, select **Edit → MVS Download Manager** and manually start the receiver by selecting it and clicking **Start**.

**Note:** Receivers that will not start more than likely have destination control file errors. You can diagnose errors by clicking the **Server Log** item in the left pane of the Management Console.

## Making your AFP resources available to InfoPrint Manager

When the Download for z/OS feature of PSF for z/OS is used with MVS Download, the AFP resources you use for your printing jobs must be available to InfoPrint Manager, so the jobs can process correctly. When the AFP Download Plus feature of PSF for z/OS is used with MVS Download, the resources are usually sent with the print jobs and the AFP resources do not need to be available to InfoPrint Manager, and this section can be skipped. However, AFP Download Plus can be configured to not send all AFP resource types to InfoPrint Manager. If this configuration is used, the resource types not sent must be made available to InfoPrint Manager as described in this section. This section assumes that these resources currently reside on your host system in AFP format, and that you (or someone) can locate them.

**Note:** If you currently use the Distributed Print Function (DPF) of PSF for OS/2, the resource files you use are in Intelligent Printer Data Stream (IPDS) format. However, the Advanced Function Presentation (AFP) versions of those files exist on your host system as well. Make sure that you use the AFP versions with MVS Download.

There are several ways that you can make your resources available to InfoPrint Manager; three of them are described below. Read through the options and decide which is best for your configuration.

### Manually transfer the resources from the host to your Windows system

You can move your resources directly from your host system using any method you like, though the most common is ftp. If you decide to ftp your files, make sure that you transfer the files as *binary* data, not as *text*. In general, the steps you should follow are:

1. Create a directory on your Windows system that will receive your resources.
2. ftp your resources to that directory as binary data.
3. Identify that directory to InfoPrint Manager.

You can either identify the directory using a resource context object or by changing the default resource search path in the Management Console. For information on changing the default resource search path, consult the online help for the Management Console under **Service Configuration**.

This method is effective and relatively easy to implement. However, every time you change your AFP resources, you will have to ftp them to the correct directory on your Windows system. If you do not change your resources often, this method may work well for you. If you change your AFP resources often, you may want to consider a different option.

### Store your resources in a central location

Another option is to store your AFP resources on any machine in your network (including the host system that they currently reside on), and NFS mount a directory on the Windows system that your InfoPrint Manager server is installed on to that machine. Then, identify that directory to InfoPrint Manager just as in the option above (either by using a resource context object or by changing the default

resource search path). To implement this option, you will need to install NFS server and client software, which is available from a variety of vendors.

The main drawback to this solution is that it generates a significant amount of network traffic as the system retrieves the resources. The increase in traffic and time needed to retrieve the resources when needed could cause printer clutching.

### **Move the resources using MVS Download**

A third option is to move your AFP resources using the MVS Download feature of InfoPrint Manager itself. You can achieve this by setting up a MVS Download receiver that receives jobs and copies them into a particular directory without printing them. You would only use this receiver to move your resources. Setting up this configuration is different depending on your environment. Each time you modify a resource, you submit a job that sends the modified resource to each system that you are running an InfoPrint Manager server on. To accomplish this task, you may need to customize the JES inish deck, the Host MVS Download routing control data set, the Destination Control File (DCF), and the Exit Program. The modifications needed will depend on your existing MVS Download configuration used for sending jobs, although the process of getting the AFP resources to the InfoPrint Manager computer is the same in all cases:

1. Place the resource on the spool for MVS Download to process with identification that it is an AFP resource, the resource name, and the desired target path. (Target path is optional)
2. Set up the routing control data set to send the AFP resources to unique MVS Download receivers on the InfoPrint Manager system. (Optional)
3. Set up the routing control data set to not prefix each record with a record length field for AFP resources.
4. Set up the DCF to map the desired resource path/name to the target-destination-name. (Optional)
5. Modify the supplied Exit to copy the received AFP resource into the proper resource directory with the provided resource name. The full functionality of this Exit would depend on the options chosen above. For example:
  - a. If the target path was not supplied, the Exit would either need to have it hardcoded or determine it using other means.
  - b. If both AFP resources and print jobs are being sent to the same receiver, the exit would need to distinguish between the two by some mechanism and take the proper action for each.
  - c. If the DCF does not map the resource path/name to the target-destination-name, it will either need to parse it from the other parameters or determine it using other means.

This option is more difficult to set up than the other two, but is less time consuming once you have it implemented, because every time you change your AFP resources all you have to do is resubmit a job for transmission to your Windows systems. If you have multiple Windows systems to update or can further automate this process, this method may work well for you. One possible configuration example follows.

**Example:** Assume that JES is configured to schedule all jobs with DEST=NTPRT1 to an MVS Download FSA that downloads them to an InfoPrint Manager system that then uses the default supplied DCF and Exit to submit the jobs to an IPDS printer, **ntprt1**. The MVS Download FSA uses a routing control data set that contains the following statement:



```
DEST=NTPRT1
IPADDR=dept01.myststem
PORTNUM=5002
RETRYNUM=3
RETRYINTV=60
```

We have decided the following about the configuration:

- Leave the existing MVS Download receiver (on our Windows system) alone.
- Create a new receiver to processes the AFP resources, but continue using the existing MVS Download FSA.
- Pass only the AFP resource name, not the directory path for it to be stored in.
- Use the FORMS keyword to identify the job as an AFP resource since the Routing Control Statements can use FORMS to direct files to different receivers.
- Use the NAME JCL keyword to identify the AFP resource name.

In the JCL job for putting modified AFP resources on the spool, we have an OUTPUT statement with the following:

```
OUTPUT      DEST=NTPRT1,FORMS=AFPRES,NAME='COMFYNT.300',....
```

No changes to the JES inish deck are required since the MVS Download FSA already receives jobs with DEST=NTPRT1.

We change the routing control file as follows to send this job to a separate receiver and to prefix these resources with no length field. Jobs that do not have FORMS=AFPRES would continue to be sent to the existing receiver.

```
DEST=NTPRT1
FORMS=AFPRES
IPADDR=dept01.mysystem
PORTNUM=5003
SEND_REC_LENGTH=NO
RETRYNUM=3
RETRYINTV=60
DEST=NTPRT1
IPADDR=dept01.myststem
PORTNUM=5002
RETRYNUM=3
RETRYINTV=60
```

Now we need to define a new receiver on the dept01.mysystem machine. The new receiver will use port number 5003 (as identified in the routing control statement), a modified DCF, and a user-written Exit.

We make a copy of the supplied DCF and modify it to change the mapping of the NAME keyword from MVS. The existing statement:

```
NAME      :: name-text
```

would be changed to:

```
NAME      :: target-destination-name
```

Also, the existing statement that maps DEST to target-destination-name would be commented out as follows:

```
* DEST    :: target-destination-name
```

Due to this change in the DCF, the Exit will now receive the AFP resource name as the third passed parameter.

Next, we make a copy of the supplied Exit (either the Visual Basic or Visual C++ version). We modify the Exit so it copies the received file instead of submitting it to InfoPrint Manager using pdpr. The Exit must use the first passed parameter as the name of the resource file and the third passed parameter to derive the target resource file name, because the DCF mapped it that way. Since we did not pass the desired resource directory name in the JCL, the Exit needs to determine the drive and directory and pre-pend it to the target resource file name. Since this Exit will only be used on a receiver that receives AFP resources, it doesn't need to identify the file as an AFP resource and have a paths for both copying resources and submitting non-resources to InfoPrint Manager to be printed. The Exit can also be coded to detect and react to error situations as appropriate.

Lastly, we use the Management Console to create the receiver that will use the DCF and Exit that we created. In this example, the **Target Destination** that we specify when we create the receiver is irrelevant and will only be passed to the Exit if no NAME is specified in the JCL that submitted the resource.

## Submitting multiple data set jobs

Download for z/OS and AFP Download Plus send each JES SYSOUT data set separately to the MVS Download receiver on Windows. By default, the receiver spools each data set as a separate file. On MVS, a job can contain multiple data sets. Use the following procedure to customize your installation for MVS Download multiple data set job support, so that the data sets in a job sent to InfoPrint Manager through MVS Download 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.

Use the following procedures to install and configure MVS Download support for printing multiple data set jobs.

- “Requirements to use multiple data set support”
- “Installing multiple data set support with MVS Download” on page 203
- “Limitations of multiple data set support” on page 204
- “Technical description of multiple data set support” on page 205

### Requirements to use multiple data set support

To support the printing of multiple data sets in a job as a single unit using Download for z/OS, you must:

- Install a special Download for z/OS user exit 15 program on MVS.
- Create a MVS Download Receiver on your InfoPrint Manager system with parallel processing turned off.

To support the printing of multiple data sets in a job as a single unit using 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.



- Create an MVS Download Receiver on your InfoPrint Manager system with parallel processing turned off.

The sample user exit 15 program (**apsux15m**) provided with 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.

Turning off parallel processing ensures that the MVS Download receiver receives the data sets in the correct sequence by creating only one child process. If parallel processing is turned on, MVS Download can create more than one child process, and thus can receive more than one data set from a multiple data set job at the same time. Data sets could be received out of order and may not print correctly.

**Note:** Make sure you have set up your shared resources so that MVS Download can find them.

## Installing multiple data set support with MVS Download

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. Ensure that ACIF can locate your resources. It looks in the directories specified in the **Service Configuration** dialog of the Management Console. If you specify resource directories using any of the following attributes, you must specify those same directories in the **Default resource search path** field in the **Service Configuration** dialog of the Management Console:
  - **resource-context**
  - **resource-context-font**
  - **resource-context-overlay**
  - **resource-context-page-segment**
  - **resource-context-page-definition**
  - **resource-context-form-definition**

You must delimit each directory using a semicolon (;), not a colon (:).
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 may use the **resource-context** attribute instead of the **resource-context-page-definition** attribute.
5. Make sure that all of the receivers you plan to use have parallel processing turned off. If parallel processing is enabled, you cannot use those receivers with multiple data set jobs. To see the status of parallel processing, do the following:
  - a. Open the Management Console and click the MVS Download Receivers item in the left pane.
 

A list of receivers appears in the right pane.

- b. Double-click each receiver to open the **Viewing** dialog.
- c. In the **Processing Options** box, see if **Parallel Processing** is enabled. If it is enabled, you cannot use that receiver with multiple data set jobs.

## Installing multiple data set support with AFP Download Plus

Use the following procedure to install the AFP Download Plus multiple data 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 the "Installing AFP Download Plus" chapter 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. 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.
3. Make sure that all of the MVS Download receivers that you plan to use have parallel processing turned off. If parallel processing is enabled, you cannot use those receivers with multiple data set jobs. To see the status of parallel processing, do the following:
  - a. Open the Management Console and click the **MVS Download Receivers** item in the left pane. A list of receivers appears in the right pane.
  - b. Double-click each receiver to open the **Viewing** dialog.
  - c. In the **Processing Options** box, see if **Parallel Processing** is enabled. If it is enabled, you cannot use that receiver with multiple data sets.

## Limitations of multiple data set support

This support has the following limitations.

1. You cannot use custom MVS Download exits on Windows with this function—you must use the sample exit that comes with InfoPrint Manager.
2. This solution applies only to line mode, mixed mode, or MO:DCA-P data sets.
3. 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.
4. You must disable parallel processing when you create the MVS Download Receiver, so that it only receives one data set at a time. You cannot change processing options on existing receivers. As a result, you will have to delete and re-create any receivers that have parallel processing enabled.
5. You must have enough disk space on the Windows 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.
6. 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)

**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 receiver 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 AFP Download Plus. Multiple AFP Download Plus FSAs can be enabled for multiple data set and use one receiver.

### Technical description of multiple data set support

The following describes the sequence of the multiple data set support.

1. The MVS Download receiver receives a data set into a file.
2. The MVS Download receiver invokes the InfoPrint Manager sample exit to spool the file. (You associated the sample exit with this receiver when you created it.)
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 **formdefs** 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.

## Displaying the page count for your MVS Download jobs

If you want to be able to see the page count for your Download for z/OS jobs listed in the InfoPrint Manager GUI, you must install the multiple data set support as described in "Submitting multiple data set jobs" on page 202. All of the requirements and limitations apply, even if you do not plan to use multiple data set support.

If you want to be able to see the page count for your AFP Download Plus jobs listed in the InfoPrint Manager GUI, you can either turn on multiple data set support, or you can turn on page-accounting-support in AFP Download Plus.



---

## Chapter 22. Using PSF Direct

Refer to the following sources for information on using PSF Direct to manage and control printing from the host console:

- "Planning to print from host systems" in the *InfoPrint Manager for Windows: Introduction and Planning Guide*.
- "Preparing InfoPrint Manager to connect to your host system" in *InfoPrint Manager for Windows: Getting Started*.
- The following documents describing how to configure PSF Direct, located at the InfoPrint Solutions Company Web site at <http://www.infoprint.com>:
  - Configuring PSF Direct for an iSeries® System
  - Configuring PSF Direct for the 3174 Communications Controller
  - Configuring PSF Direct for the 3172 Communications Controller
  - Configuring PSF Direct for the 37xx Communications Controller



---

## Chapter 23. Using the Distributed Print Facility (DPF)

Refer to the following sources for information on using DPF to manage and control printing from the host console:

- "Planning to print from host systems" in the *InfoPrint Manager for Windows: Introduction and Planning Guide*.
- "Preparing InfoPrint Manager to connect to your host system" in *InfoPrint Manager for Windows: Getting Started*.
- "Create/change/view DPF Host Receiver" topic in the online Help for the InfoPrint Manager Management Console.





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## **Part 4. Administrative Procedures: Customizing for Special Jobs**



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## Chapter 24. Working with transforms

InfoPrint Manager provides transform programs for the following data streams:

- Printer control language (PCL)
- PostScript
- Portable document format (PDF)
- Tag image file format (TIFF)
- Joint photographic experts group (JPEG)
- Graphic interchange format (GIF)
- Line (ASCII, both formatted and unformatted)
- Double Byte text stream
- Personalized Print Markup Language (PPML)
- Extensible Markup Language (XML)

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 printer, InfoPrint Manager automatically invokes the appropriate transform. You can also run the transforms from the **Command Prompt** window without printing the generated output. You may find this useful if you intend to print the job later. You can also use these transforms in transform objects and transform-sequences associated with actual destinations. For more information on this function, see “Configuring transforms” on page 244. 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 the *InfoPrint Manager: Reference*. Configuration files, environment variables, and user-exit programs allow you to specify processing information for InfoPrint Manager to use when it invokes the transform automatically. You can also use configuration files and environment variables instead of typing flags on the command line whenever you run a transform.

This topic consists of these procedures:

- “Customizing the PCL, PostScript, and PDF transforms” on page 214
- “Customizing the img2afp transform” on page 220
- “Customizing the TIFF, JPEG, and GIF transforms” on page 223
- “Working with the transform for line data” on page 224
- “Working with the transform for double byte text streams” on page 229

**Note:** For information about the fonts used with the double-byte (**db2afp**) transform, refer to Chapter 27, “Working with fonts,” on page 291.

- “Working with the InfoPrint PPML transform program” on page 231
- “Working with the XML transforms” on page 233

## 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 14 shows the default configuration files that InfoPrint Manager provides.

In the table, *install\_path* is the directory that InfoPrint Manager is installed in. If you don't know the install path, you can find it in the **Management Console**. Open the Management Console, click **Edit -> Change Service Configuration** and find the **Install path** field.

You can either modify these files or create your own.

Table 14. InfoPrint Manager transforms and configuration files

Data Stream	Transform	Configuration File	Daemon Configuration File
PCL	pcl2afp	<i>install_path</i> \pcl2afp\pcl2afp.cfg	<i>install_path</i> \pcl2afp\ pcl2afpd.cfg
PostScript	ps2afp	<i>install_path</i> \ps2afp\ps2afp.cfg	<i>install_path</i> \ps2afp\ps2afpd.cfg
PDF	pdf2afp	<i>install_path</i> \ps2afp\ps2afp.cfg	<i>install_path</i> \ ps2afp\ps2afpd.cfg

The PostScript and PDF transforms use the same default configuration files.

## Sample configuration file

The following is an example of a configuration file for the PostScript and PDF transforms. The configuration file for the PCL transform is similar.

```
# ps2afp configuration file
# KEYWORD          ps2afp FLAG      PURPOSE
#####            #####
port = 8251         # -P          which TCP\IP port to use
server = 127.0.0.1 # -S          server to connect with
ps_job_timeout = 20 # -j          maximum number of minutes
                  #                    to process PostScript job
ps_server_timeout = 20 # -s          maximum number of minutes
                  #                    server waits between jobs
ps_width = 8.5i    # -w          width of generated image
ps_length = 11i   # -l          length of generated image
ps_x_offset = 0i  # -x          left and right margins
ps_y_offset = 0i  # -y          top and bottom margins
ps_resolution = 600 # -r          resolution of printer
ps_output_type = I01_G4 # -a          type of AFP image to
                  #                    generate
```

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 the *InfoPrint Manager: Reference* for the daemon keywords.

## Hierarchy of transform options

InfoPrint Manager 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 Manager 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 Manager uses the last occurrence of the flag to determine the value to use. For example, if you issue the following command:

```
ps2afp -Cconfig.file -r240 -r300 myfile.ps
```

the **ps2afp** command transforms the file using 300-pel resolution. InfoPrint Manager ignores the resolution value specified in the configuration file `config.file` as well as 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 Manager 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 "Sample configuration file" on page 214.
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 "Sample configuration file" on page 214.
7. Default values that are built into InfoPrint Manager. 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. To use this support, 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 59 on page 217.
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 217 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. You can specify these InfoPrint printers as either TCP/IP or Channel DSSs:

- 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 either the **/usr/lpp/psf/ps2afp/** directory on an AIX server or the *install\_path*\ps2afp folder on a Windows server.
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 59. 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 15 on page 218 and Table 16 on page 218. 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 16.

The << /Punch 4 information below is a particular example drawn from Table 17 on page 219, Table 18 on page 219, and Table 19 on page 220. 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 19 on page 220.

**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 18 on page 219.

Table 15. Default staple locations

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

Table 16. Additional PostScript staple details

Staple details	Key name	PostScript staple details
Do not staple	None	<b>Portrait:</b> /Position 0 <b>Landscape:</b> /Position 0
Single left diagonal	LeftDiagonal	<b>Portrait:</b> /Position 1 <b>Landscape:</b> /Position 5
Single left horizontal	LeftHorizontal	<b>Portrait:</b> /Position 3 <b>Landscape:</b> /Position 7



Table 16. Additional PostScript staple details (continued)

Single left vertical	LeftVertical	<b>Portrait:</b> /Position 2 <b>Landscape:</b> /Position 6
Single right diagonal	RightDiagonal	<b>Portrait:</b> /Position 9 <b>Landscape:</b> /Position 13
Single right horizontal	RightHorizontal	<b>Portrait:</b> /Position 11 <b>Landscape:</b> /Position 15
Single right vertical	RightVertical	<b>Portrait:</b> /Position 10 <b>Landscape:</b> /Position 14
Double left	DoubleLeft	<b>Portrait:</b> /Position 4 <b>Landscape:</b> /Position 8
Double right	DoubleRight	<b>Portrait:</b> /Position 12 <b>Landscape:</b> /Position 16
Double top	DoubleTop	<b>Portrait:</b> /Position 17 <b>Landscape:</b> /Position 18
Booklet	Booklet	<b>Portrait:</b> /Position 20 <b>Landscape:</b> /Position 20

Table 17. Default punch locations

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

Table 18. Additional PostScript punch details

Punch details	Key name	PostScript punch details
Do not punch	None	<b>Portrait:</b> /Position 0 <b>Landscape:</b> /Position 0
Left	PunchLeft	<b>Portrait:</b> /Position 1 <b>Landscape:</b> /Position 5

Table 18. Additional PostScript punch details (continued)

Top	PunchTop	<b>Portrait:</b> /Position 3 <b>Landscape:</b> /Position 7
Right	PunchRight	<b>Portrait:</b> /Position 2 <b>Landscape:</b> /Position 6
Bottom	PunchBottom	<b>Portrait:</b> /Position 4 <b>Landscape:</b> /Position 8

Table 19. 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 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 *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.ibm1061pi.ta.ps
gcorr=4000-708.ibm1061pi.tf.dt.ps
pagetype=page
v=yes
r=600
```

On an InfoPrint Manager for Windows server, the **respath** value should be set to the path where the **img2afp** configuration files reside: *install\_path*\config

where *install\_path* is the fully-qualified path where InfoPrint Manager for Windows is installed on your system.

Within each device-specific configuration file, only the **thresh** and **gcorr** values change

**img2afp.cfg** files observe the following basic rules:

**Note:**

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 a Windows server an InfoPrint HD1-HD2, HD3-HD4, HD5-HD6, HS1, HS3, MD1-MD2, MS1, PS-1, or PD1-PD2 4100 printer provides the following:

- /usr/lpp/psf/config/4100.ibm71lpi.ta.ps
- /usr/lpp/psf/config/4100.ibm71lpirot90.ta.ps
- /usr/lpp/psf/config/4100.ibm85lpi.ta.ps
- /usr/lpp/psf/config/4100.ibm85lpirot90.ta.ps
- /usr/lpp/psf/config/4100.ibm106lpi.ta.ps
- /usr/lpp/psf/config/4100.ibm106lpirot90.ta.ps
- /usr/lpp/psf/config/4100.ibm141lpi.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 a Windows 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.ibm851pi.tf.ls.ps for accutone halftones
- /usr/lpp/psf/config/4100.ibm851pi.tf.oc.ps for dark2 halftones
- /usr/lpp/psf/config/4100.ibm1061pi.tf.ap.ps for dark halftones
- /usr/lpp/psf/config/4100.ibm1061pi.tf.dt.ps for midtone halftones
- /usr/lpp/psf/config/4100.ibm1061pi.tf.lr.ps for standard halftones
- /usr/lpp/psf/config/4100.ibm1061pi.tf.ls.ps for accutone halftones
- /usr/lpp/psf/config/4100.ibm1061pi.tf.oc.ps for dark2 halftones
- /usr/lpp/psf/config/4100.ibm1411pi.tf.ap.ps for dark halftones
- /usr/lpp/psf/config/4100.ibm1411pi.tf.dt.ps for midtone halftones
- /usr/lpp/psf/config/4100.ibm1411pi.tf.lr.ps for standard halftones
- /usr/lpp/psf/config/4100.ibm1411pi.tf.ls.ps for accutone halftones
- /usr/lpp/psf/config/4100.ibm1411pi.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.ibm1061pi.ta.ps -gcorr 4322.ibm1061pi.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.ibm1061pi.ta.ps -gcorr 4100-HD3-HD4.ibm1061pi.tf.lr.ps \
DSC011FS45.afp -o DSC011FS10.afp
```

To print the resulting FS10 image (DSC011FS10.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 ip40001-1d DSC015FS10.afp
```

---

## 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. Table 20 shows the default configuration files that InfoPrint Manager provides. You can either modify these files or create your own.

*Table 20. Default TIFF, JPEG, and GIF Transform Configuration Files*

Data Stream	Transform	Configuration Files
TIFF	tiff2afp	<i>install_path</i> \tiff2afp\tiff2afp.cfg <i>install_path</i> \tiff2afp\tiff2afp.3160cfg <i>install_path</i> \tiff2afp\tiff2afp.3900cfg
JPEG	jpeg2afp	<i>install_path</i> \jpeg2afp\jpeg2afp.cfg <i>install_path</i> \jpeg2afp\jpeg2afp.3160cfg <i>install_path</i> \jpeg2afp\jpeg2afp.3900cfg
GIF	gif2afp	<i>install_path</i> \gif2afp\gif2afp.cfg <i>install_path</i> \gif2afp\gif2afp.3160cfg <i>install_path</i> \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

The following is 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
```

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 the *InfoPrint Manager: Reference* for the options and values that you can specify in the configuration file.

## Hierarchy of transform options

InfoPrint Manager 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 Manager commands process options from left to right. If you enter the same option more than once, InfoPrint Manager 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 Manager 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 20 on page 223.
3. Default values that are built into InfoPrint Manager. These are the same as the transform defaults.

---

## Working with the transform for line data

InfoPrint Manager includes a line-data transform program that transforms line data into the Advanced Function Presentation (AFP) data stream. Converting the line data allows you to print it on high-speed AFP printer devices.

The **line2afp** command and its keywords are a subset of the AFP Conversion and Indexing Facility (ACIF) **acif** command. When you use this transform and if errors occur, you may receive some error messages that make references to ACIF.

This section describes the following:

- “What is line data?”
- “What are ANSI and machine carriage controls?” on page 225
- “What are variable-length and fixed-length files?” on page 226
- “How does the imageout keyword affect processing?” on page 228
- “Customizing the line data transform” on page 228

## What is line data?

Line data is simply unformatted data; data with few or no embedded control characters to create font changes, page breaks, and so on. The term line data can cover a variety of data streams, such as:

- Traditional line printer format, also called *1403 format*
- Unformatted ASCII files without escape sequences
- DBCS (double-byte character set) ASCII files generated for an IBM 5577 or 5587.

**Notes:**

1. The **line2afp** transform does not handle DBCS ASCII files. For this type of input, use the **db2afp** transform.
2. ACIF accepts EBCDIC DBCS line data files that use SOSI (shift-out/shift-in) characters. ACIF must be coded with the **PRMODE** control statement set to SOSI1, SOSI2 or SOSI3, as documented in the *ACIF User's Guide*.

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

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. For more information about the page definitions and form definitions available to you, refer to the *InfoPrint Manager: Reference*. For more information about associating page definitions and form definitions with jobs, refer to the online help in the InfoPrint Manager Administration GUI.

#### 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 Manager also lets you transform and print DBCS ASCII data and DBCS EUC data without a page definition. For more information, see the **db2afp** command in the *InfoPrint Manager: Reference*.

## What are 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 listed in Table 21.

Table 21. ANSI carriage controls

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 line and print.
1-9	Skip to a vertical position on the page as defined by a vertical tab record (which is either printer- or system-dependent) or by a Page Definition.
A,B,C	Skip to a vertical position on the page as defined by a vertical tab record (which is either printer- or system-dependent) or by a Page Definition.

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 printers, and are often used on other systems. Machine controls are binary values, not symbols. They are not represented as characters in any encoding and, therefore, machine controls cannot be translated. Some typical machine controls are listed in Table 22.

Table 22. Machine carriage control characters

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)
X'8B'	Skip to channel 1 immediately (do not print)

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 if you want to use carriage controls at all, every record in the file must contain a carriage control. 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.

## What are 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.

MO:DCA structured fields are treated as a special case. All such structured fields are self-identifying and contain their own length. They do not need to contain a length prefix to be correctly interpreted, but are also processed correctly if the length prefix is present.

### Variable-length and fixed-length files

Variable-length files may use a length prefix, which means they contain a prefix that identifies the length of the record in the file. Each record contains a field that gives the length of the record. If the record contains a length, that length must be a prefix for each record and it must be a 16-bit binary number that includes the length of the 2-byte length prefix. Use the **fileformat=record** keyword and value to identify files with length prefixes.

Variable-length files may use either a separator or a 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 compatibility with other systems, the default record separator for the **line2afp** command is X'0A'.

InfoPrint Manager 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, the line-data transform program assumes that the file uses the ASCII **newline** character, X'0A'. Otherwise, the transform assumes the file uses the EBCDIC **newline** character, X'25'. Because an input file can misguide the line-data transform, a set of rules has been established to determine how the transform processes the file.

Data Type	Newline Character
All EBCDIC	EBCDIC X'25'
All EBCDIC	ASCII X'0D0A' or X'0A' <sup>1</sup>
All ASCII	EBCDIC X'25' <sup>1</sup>
All ASCII	ASCII X'0D0A' or X'0A'
<p><b>1:</b> These combinations are possible only if a file contains a prefix with a string that indicates a different code set than actually exists.</p> <ul style="list-style-type: none"> <li>• For EBCDIC data with ASCII newlines, use X'0320202020200A' as the first seven bytes of the file.</li> <li>• For ASCII data with EBCDIC newlines, use X'03404040404025' as the first seven bytes of the file.</li> </ul>	

### Fixed-length files

Fixed-length files contain records that are all the same length. No other separators or 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 does the imageout keyword affect 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.

If you are using non-InfoPrint products, you may want to specify **imageout=asis**.

## Customizing the line data transform

InfoPrint Manager provides several sample programming exits to assist you in customizing the line-data transform. Use of the programming exits is optional. You specify the names of the exit programs with the **inpxit**, **outexit**, and **resexit** keywords. Each of these keywords is described in the *InfoPrint Manager: Reference*.

InfoPrint Manager provides the following sample exits:

*install\_path*\exits\acif\apkinp.c  
Input record exit

*install\_path*\exits\acif\apkout.c  
Output record exit

*install\_path*\exits\acif\apkres.c  
Resource exit

In addition, InfoPrint Manager provides the following user input record exits to translate line-data data streams:

*install\_path*\exits\acif\apka2e.c  
Converts the ASCII stream data into the EBCDIC<sup>2</sup> stream data.

*install\_path*\exits\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.

*install\_path*\exits\acif\asciinpe.c  
Converts unformatted ASCII data into a record format as does *asciinp.c*, and then converts the ASCII stream data into EBCDIC<sup>2</sup> stream data.

*install\_path*\exits\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 EBCDIC).
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

---

2. The default conversion is from code page 850 to code page 037. You can override the defaults with the **inpcsid** and **outccsid** parameters.

input data is EBCDIC, and that the output data is also EBCDIC. 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 provided in the *install\_path\exits\acif\apkexits.h* directory, and the build rules for the line-data transform user exits reside in *install\_path\exits\acif\exit\_program*.

The source code for the sample exits is provided in *install\_path\exits\acif*. You can modify these source files or create your own. You must have the Microsoft Visual C++ Program, Version 5.0, or higher, installed on your InfoPrint Windows server in order to compile and build user-exit programs. Be sure to apply the latest service available. Sample project files for Microsoft Visual for each exit program are also installed in the same directory.

For more information about compiling user exit programs, refer to “Configuring transforms” on page 244.

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## Working with the transform for double byte text streams

InfoPrint Manager includes the **db2afp** transform, a program that transforms both double-byte character set (DBCS) ASCII and Extended UNIX Code (EUC) files into the Advanced Function Presentation (AFP) data stream.

This section describes the following:

- “What are DBCS ASCII and EUC?”
- “What font resources are needed to print DBCS ASCII and EUC?” on page 230
- “Determining what code page your print jobs use and setting the correct environment variable” on page 230

### What are DBCS ASCII and EUC?

In ideographic languages like Japanese, Chinese, and Korean, there are thousands of characters. All of these characters cannot be represented with a single byte of information because a single byte only accommodates 256 characters. Therefore, at least one more byte of information is required.

In DBCS ASCII files, each ideographic character is exactly two bytes. In 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 and EUC characters.

InfoPrint Manager for Windows supports printing DBCS ASCII files in the Japanese and Traditional Chinese languages, which can contain formatting controls for the IBM 5577 or 5587 printers. InfoPrint Manager for Windows also supports

printing EUC files in the Japanese, Traditional Chinese, and Korean languages, but you must submit those jobs from a UNIX or AIX workstation. EUC files cannot contain any formatting control characters.

## What font resources are needed to print DBCS ASCII and EUC?

You can use the **db2afp** command to transform DBCS ASCII and EUC files that use the following code pages:

- 932 (Japanese PC)
- 950 (Traditional Chinese PC)
- 33722 or eucJP (Japanese EUC)
- 964 or eucTW (Traditional Chinese EUC)
- 970 or eucKR (Traditional Korean EUC)

**Note:** Code page 938 (Traditional Chinese PC) is not supported on Windows 2000. If your files use code page 938, you cannot use InfoPrint Manager for Windows on a Windows 2000 operating system to print them.

Your InfoPrint Manager server must be able to access the appropriate DBCS fonts when you print the transformed files. DBCS fonts are available for the MVS, VM, Windows 2000, and AIX operating systems as separately orderable licensed programs. To make the fonts available on your InfoPrint Windows 2000 system, you must ensure that you have installed the fonts on your system and then make the double-byte fonts known to InfoPrint Manager for Windows.

For more information on setting up font resources to print DBCS fonts, refer to "Fonts for printing DBCS ASCII and EUC" on page 297.

## Determining what code page your print jobs use and setting the correct environment variable

Before you transform a print job, you need to determine what code page it uses, then set the PSFDBLANG environment variable to that code page. If the job was created on an AIX or a Windows workstation, you can determine the code page that the job uses by finding out what code page is active on that system. On the system that the job was created on, open a **Command Prompt** window and type:

```
chcp
```

then press **Enter**. The system responds with

```
Active code page: xxx
```

where *xxx* represents a three- to five-digit number. Use this number to set the PSFDBLANG environment variable by following the steps below.

1. On your InfoPrint Manager server system, click the Windows **Start** button and select **Settings ->Control Panel**.

**Note:** If you have more than one InfoPrint Manager server system, you need to set this environment variable on all of the servers that contain actual destinations that will use the **db2afp** transform.

2. In the Control Panel window, double-click the **System** icon.
3. In the **System Properties** dialog, click the **Environment** tab.
4. In the **Variable** field, type PSFDBLANG.

5. In Table 23, locate the **Code Page Value** that you got from your system above.

Table 23. Code pages and their associated PSFDBLANG values

Code Page Value	PSFDBLANG Value	Language
932	J	Japanese PC
950	T	Traditional Chinese PC
33722 or eucJP	JE	Japanese EUC
964 or eucTW	CE	Traditional Chinese EUC
970 or eucKR	KE	Traditional Korean EUC

6. Find the **PSFDBLANG Value** that corresponds to that code page and type it in the **Value** field of the **System Properties** dialog.

**Note:** The PSFDBLANG Value is case sensitive. Be sure to type it in all caps.

7. Click **OK**.

The **db2afp** command assumes that all jobs use this code page as long as you do not specify either the **-i** flag or the **-e** flag when running the command from a **Command Prompt** window.

---

## Working with the InfoPrint PPML transform program

InfoPrint Manager for Windows Version 2.2 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 Windows 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 *install\_path\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 Windows command line.

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 physical printer, InfoPrint automatically invokes the transform. You can also run the transforms from the 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 the *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 24 the default configuration files that InfoPrint provides. You can either modify these files or create your own.

Table 24. Default PPML transform configuration file

Data Stream	Transform	Configuration File
PPML	ppml2afp	install_path\ppml2afp\ppml2afp.cfg

### Sample PPML configuration file

Figure 60 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 = AFP_Support_Path\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 = ipm_server

# 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 I01_G4(monochrome)
ppml_outdatatype = FS45

# page height (measurement units: i (inches), c (centimeters), m (millimeters))
page_height = 11i

# page width (measurement units: i (inches), c (centimeters), m (millimeters))
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 60. 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 `install_path\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 InfoPrint 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 61 shows what you can do with XML data when you use the XML transforms.

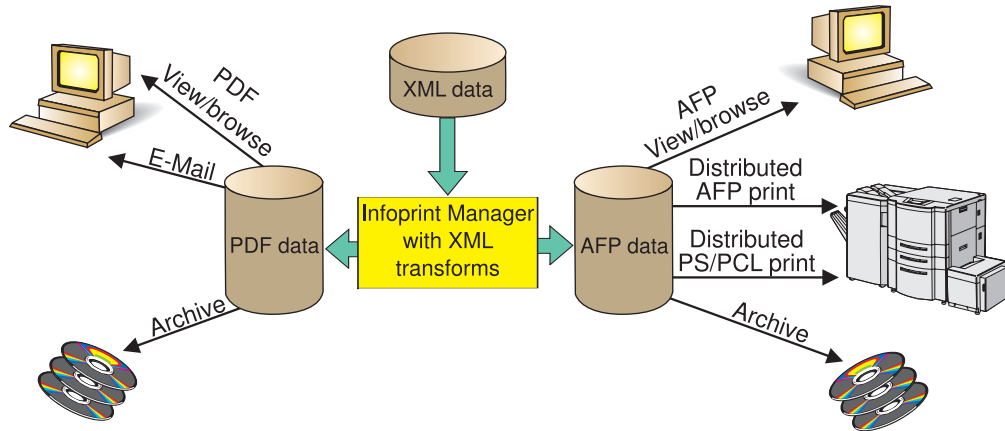


Figure 61. Scenarios for using XML data that has been transformed to AFP or PDF

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 62 shows how the XML transforms process data from XML to AFP or PDF data.

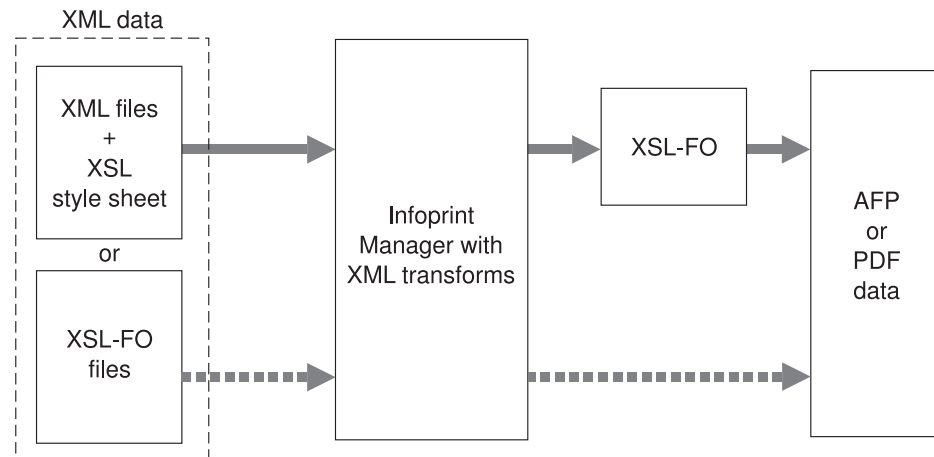


Figure 62. Process for transforming XML data to AFP or PDF

## 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/>). See Appendix C, “Supported formatting objects,” on page 401 for the formatting objects that the supports.

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*.

To use the **xml2afp** transform, you must install the appropriate font features for either Infoprint Fonts, Version 1.1.0, or AFP Font Collection, Version 2.1.0.

## 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.

## Customizing 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, we recommend you to 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/xmltransform/xml2afp.cfg` on AIX and `install_path\xmltransform\xml2afp.cfg` on Windows. 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 Windows, copy the sample configuration file, **install\_path\xmltransform\xml2afp.cfg**, to a temporary location.

**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**.

3. Add `-C xml2afp.cfg` to **other-transform-options** for your XML transform. You can also add `-C xml2afp.cfg` to the IVD to apply the **xml2afp** transform to all the jobs on the associated logical destination.

*Customizing the font index file for xml2afp:* The sample font index file for **xml2afp** is provided in `/usr/lpp/psf/xmltransform` on AIX and `install_path\xmltransform` on Windows. 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 **default**.

**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<sup>®</sup>, 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 C0420070
  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/xmltransform/xml2pdf.cfg` on AIX and `install_path\xmltransform\xml2pdf.cfg` on Windows. 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:
  - Use Windows commands to copy the sample configuration file, *install\_path\xmltransform\samples\xml2pdf.cfg*, to *install\_path\xmltransform\xml2pdf.cfg*:  

```
copy install_path\xml2afp\samples\xml2pdf.cfg install_path\xml2afp\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.

---

## Chapter 25. Understanding transforms and the configurable transform subsystem

*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 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. **transps**

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 `pc12afp`. 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 **Infoprint 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 **transps**, **transpcl**, and **saveafp** transforms in sequence as described above. To accomplish this task, the **Values** field would contain the following:

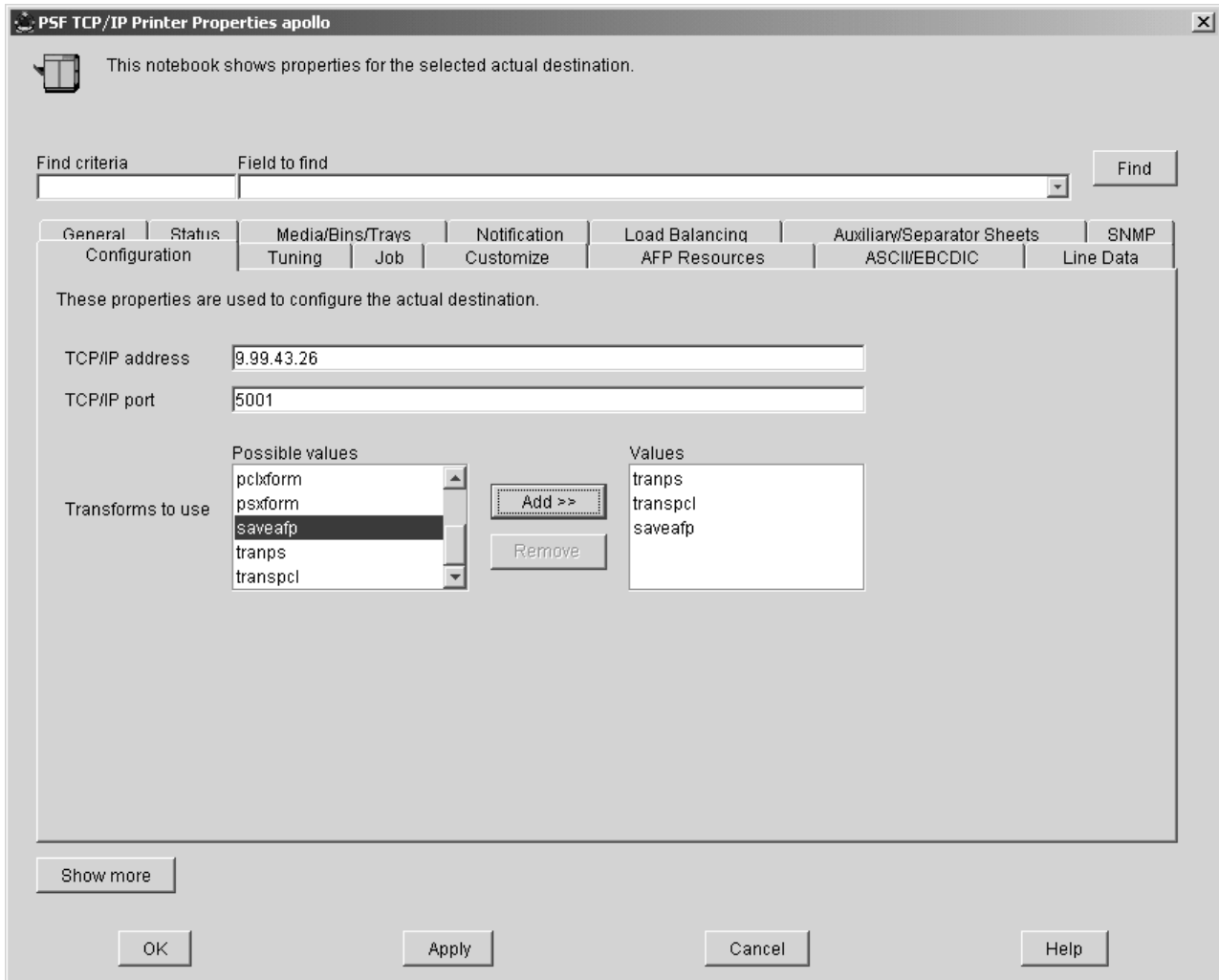


Figure 63. Printer Properties notebook: Transforms to use

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 248.

### 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 64. 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 multiple 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 25. 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 25. 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. <b>Note:</b> If this is a non-terminating transform, data must be stored in the file named by %o.

Table 25. Transform substitution variables (continued)

Transform options substitution variables	Meaning
%e	<p>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.</p> <p><b>Note:</b></p> <ol style="list-style-type: none"> <li>1. If the transform exits with an exit code of 0 or the value set in the <b>Conditional terminating return code</b> field, the error messages from the transform are logged as <b>debug</b> severity.</li> <li>2. If the transform exits with a non-zero return code, but not with the value set in the <b>Conditional terminating return code</b> field transform attribute, the error messages from the transform are logged as <b>error</b> severity.</li> <li>3. InfoPrint Manager writes transform error messages to either the file specified through this substitution variable, or to standard error (<b>stderr</b>). You should not mix output to <b>%e</b> and <b>stderr</b> within a single run of the exit program. You should use either one or the other in any given run.</li> </ol>
%u	<p>The name of the file for updating the <b>pages-completed</b> and <b>job-page-count</b> job attributes.</p> <p><b>Note:</b> This file should only be accessed through the <b>transform_update</b> utility.</p>
%j	<p>The name of the original print file, minus the path (from the <b>document-file-name</b> attribute).</p> <p><b>Note:</b> This should only be used to construct another name, such as a temporary file.</p>
%n	<p>The name of the original print file, minus the path and minus the extension (from the <b>document-file-name</b> attribute).</p> <p><b>Note:</b> This should only be used to construct another name, such as a temporary file.</p>
%d	<p>A text string that represents the document format of the input file. This value may be:</p> <ul style="list-style-type: none"> <li>• <b>ASCII</b> for ASCII line data.</li> <li>• <b>AFPDS</b> for Advanced Function Presentation data</li> <li>• <b>PCL</b> for Printer Control Language data</li> <li>• <b>PS</b> for PostScript data</li> </ul> <p><b>Note:</b> You can also acquire document format through the <b>%%Ddocument-format</b> substitution value.</p>
%p	<p>The value of the document's <b>destination-pass-through</b> attribute.</p> <p><b>Note:</b> This value is passed to all subsequent transforms and the actual destination.</p>

Table 25. Transform substitution variables (continued)

Transform options substitution variables	Meaning
%q	The actual destination that is processing the job.
%s	The <b>document-sequence-number</b> for the document.
%t	The value of the document's <b>other-transform-options</b> attribute. <b>Note:</b> 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).
%%Aad_attribute%%	The value of the InfoPrint Manager actual destination attribute specified. For example, if %%Aresource-context%%, InfoPrint Manager passes the actual destination's <b>resource-context</b> attribute value. <b>Note:</b> See the "Considerations when using the %%Nattributename substitution control sequences" topic under the "Usage guidelines" for the <b>other-transform-options</b> attribute in the <i>InfoPrint Manager: Reference</i> before using this substitution variable.
%%Ddoc_attribute%%	The value of the InfoPrint Manager document attribute specified. For example, if you use %%Ddepartment-text%%, InfoPrint Manager passes the document's <b>department-text</b> attribute value. <b>Note:</b> See the "Considerations when using the %%Nattributename substitution control sequences" topic under the "Usage guidelines" for the <b>other-transform-options</b> attribute in the <i>InfoPrint Manager: Reference</i> before using this substitution variable.
%%Jjob_attribute%%	The value of the InfoPrint Manager job attribute specified. For example, if you use %%Jjob-owner%%, InfoPrint Manager passes the <b>job-owner</b> attribute value of the job that owns the document being transformed. <b>Note:</b> See the "Considerations when using the %%Nattributename substitution control sequences" topic under the "Usage guidelines" for the <b>other-transform-options</b> attribute in the <i>InfoPrint Manager: Reference</i> 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 242.

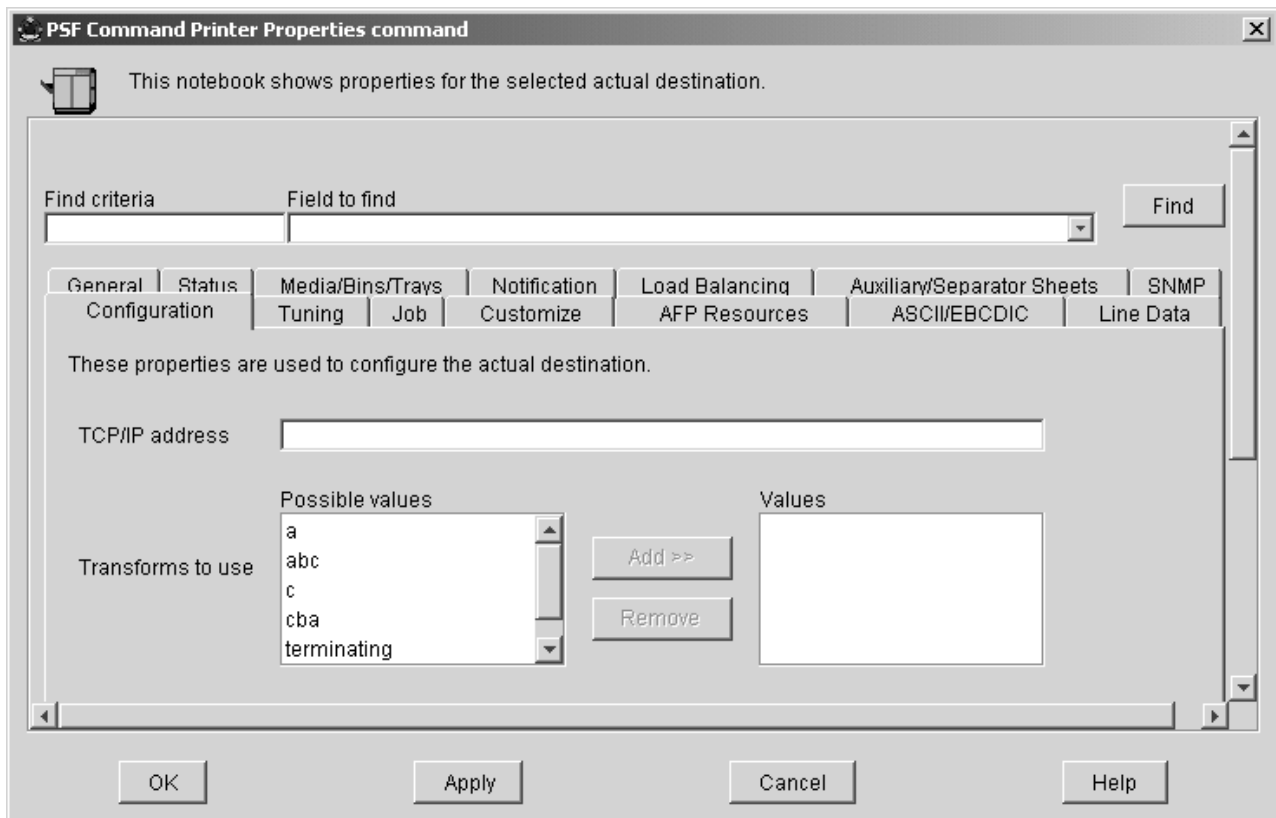


Figure 65. Printer Properties notebook: Transforms to use

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**

- **pdl**s

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 66 on page 251 or Figure 67 on page 252, 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.



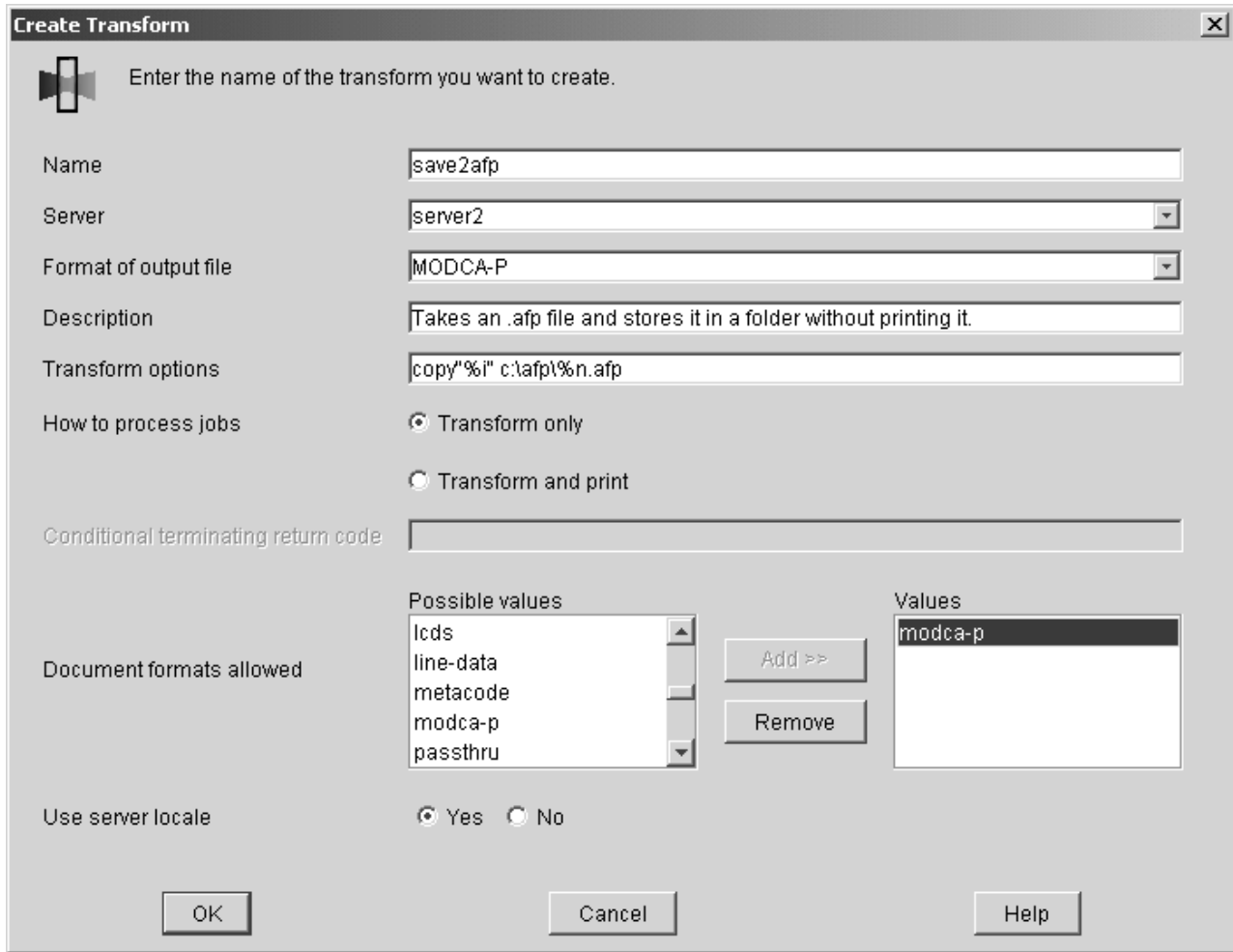


Figure 66. Create Transform dialog: Define a transform that copies an AFP file to a folder without printing on Windows

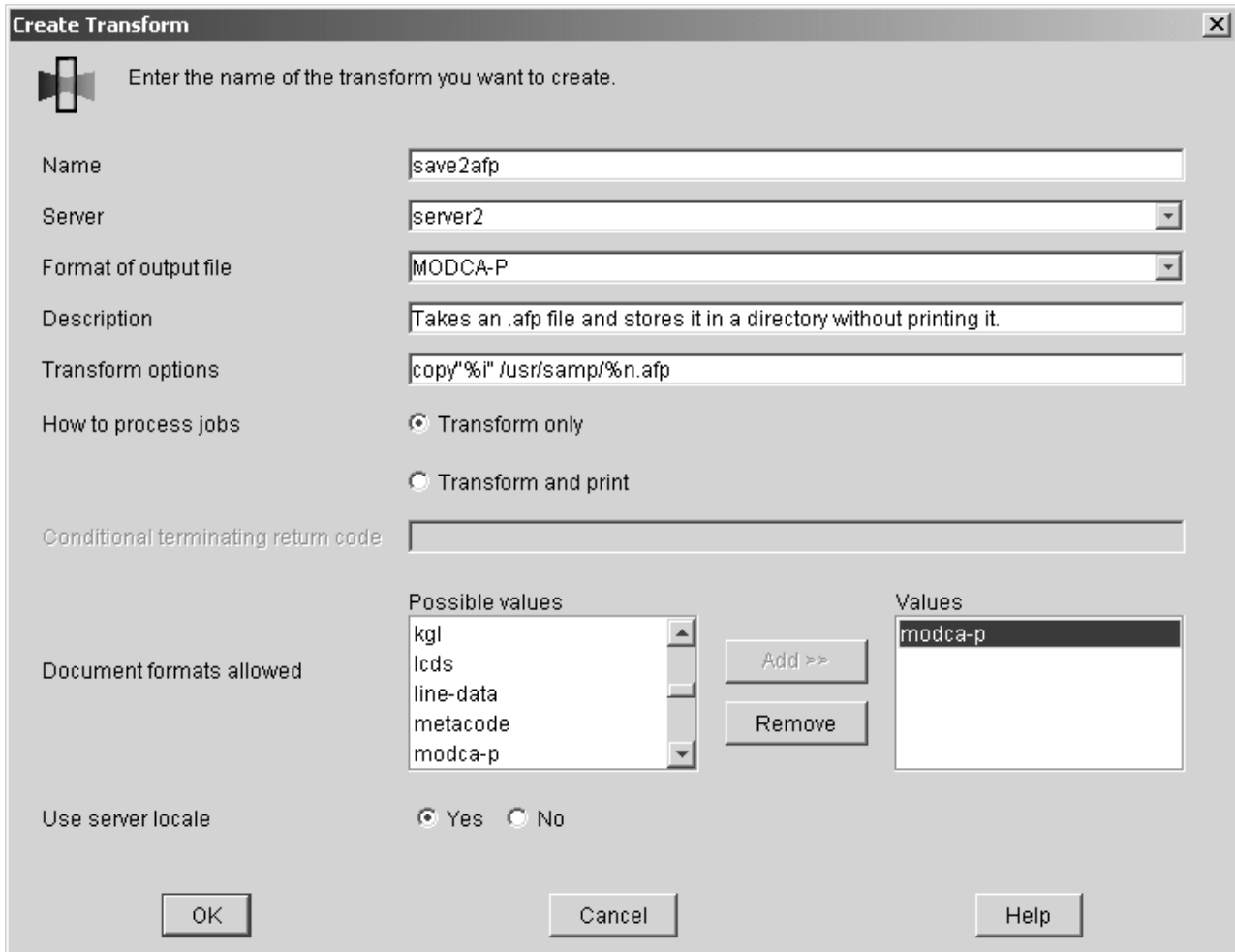


Figure 67. Create Transform dialog: Define a transform that copies an AFP file to a directory without printing on AIX

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 68. 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.

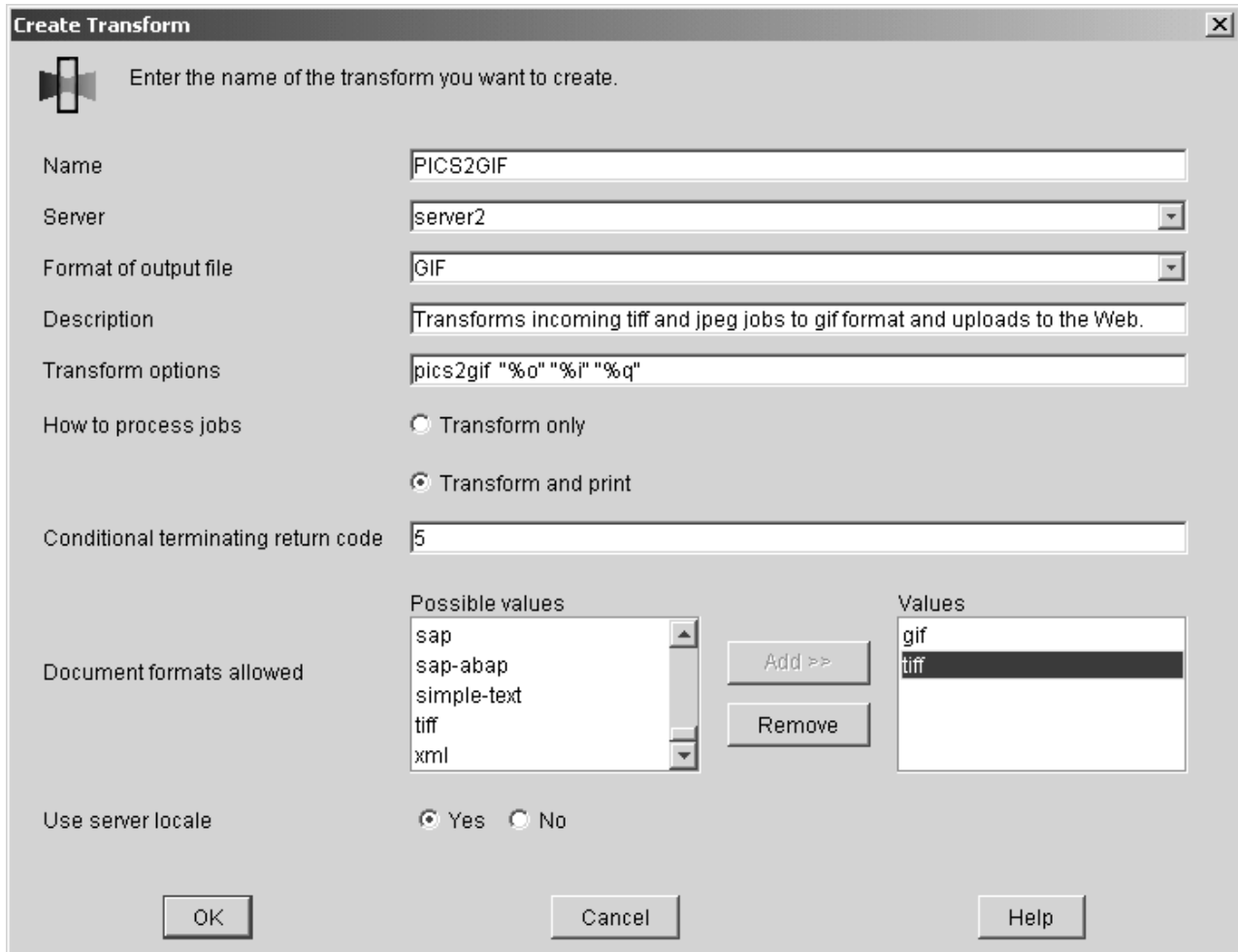


Figure 68. Create Transform dialog: Define a conditionally terminating transform

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 255.

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 69 on page 255.

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.

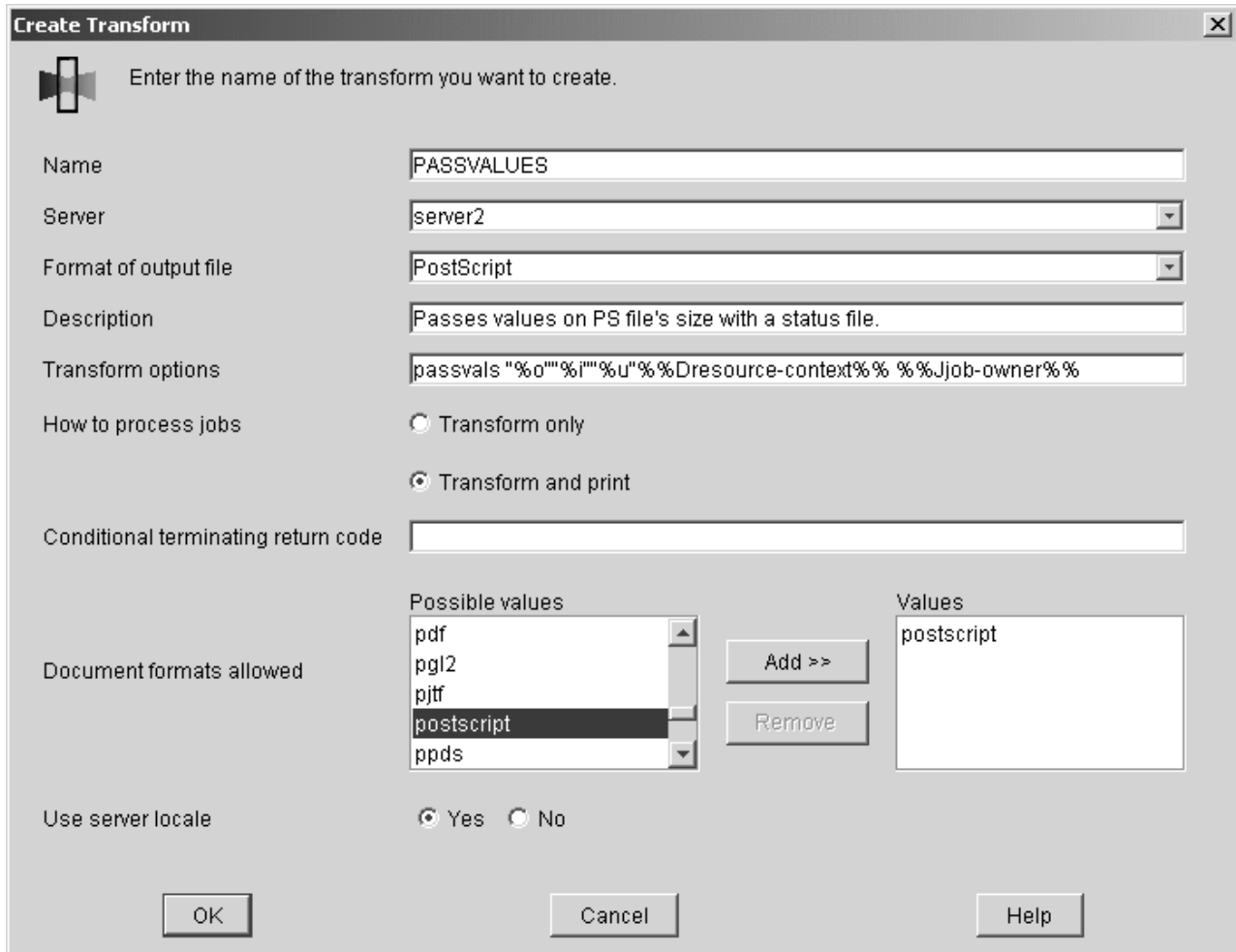


Figure 69. Create Transform dialog: Define a transform to pass job attributes

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 Manager 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.

## Netware.exe

Netware.exe is one of the transform programs that is included with InfoPrint Manager. This program extracts the user ID and job information from the header of PostScript print jobs that are submitted from a Netware server, then strips that header off the job and creates a new header that prints correctly from InfoPrint Manager. **Netware.exe** is a terminating transform, but not because it stores its output in another file. It is a terminating transform because the last step of the program is to issue a **pdpr** command, which submits the job to a logical destination to be printed.

**Note to users:** `Netware.exe` provides the same function that was available through `netware.cmd` in PSF for OS/2.

## Using the Netware print program

From a **Command Prompt** window on an InfoPrint Manager server, you can submit Netware Version 4 Release 1 jobs to an InfoPrint Manager printer. The command removes the Netware-generated Postscript header and submits the job for printing by using the **JobName** and **JobOwner** parameter values from the original header.

To submit a Netware-generated job, type the following in a Command Prompt window, substituting the italicized terms with the appropriate values as described below.

```
netware input_name output_file_name log_dest_name
```

*input\_file*

The fully-qualified name of the file from Netware 4.1 with a Postscript header.

*output\_file*

The fully-qualified name of the file from Netware 4.1 without the Postscript header (after the transform has run).

*log\_dest\_name*

The name of the InfoPrint Manager logical destination that the job is submitted to after the Postscript header has been removed.

The following example submits a PostScript file from Netware (%i) to be transformed into file without the PostScript header (%o), which is then submitted to a logical destination called **happyprinter1**.

```
netware %i %o happyprinter1
```





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## Chapter 26. 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.

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### 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 260
- “Grayscale printing concepts” on page 264

#### 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 265
- “Tips for images” on page 276
- Scenario describing a possible implementation:
  - “Eliminating physical inserts” on page 287

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 264
  - “Color management” on page 265
- “AFP color management” on page 267
- “InfoPrint AFP color and grayscale products” on page 277
- “AFP color solution scenarios” on page 282
- “Related publications” on page 288
- Scenario describing a possible implementation:
  - “Replacing pre-printed forms” on page 284

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## 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.

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## 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

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## 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

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## 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 processing 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.

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## **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.

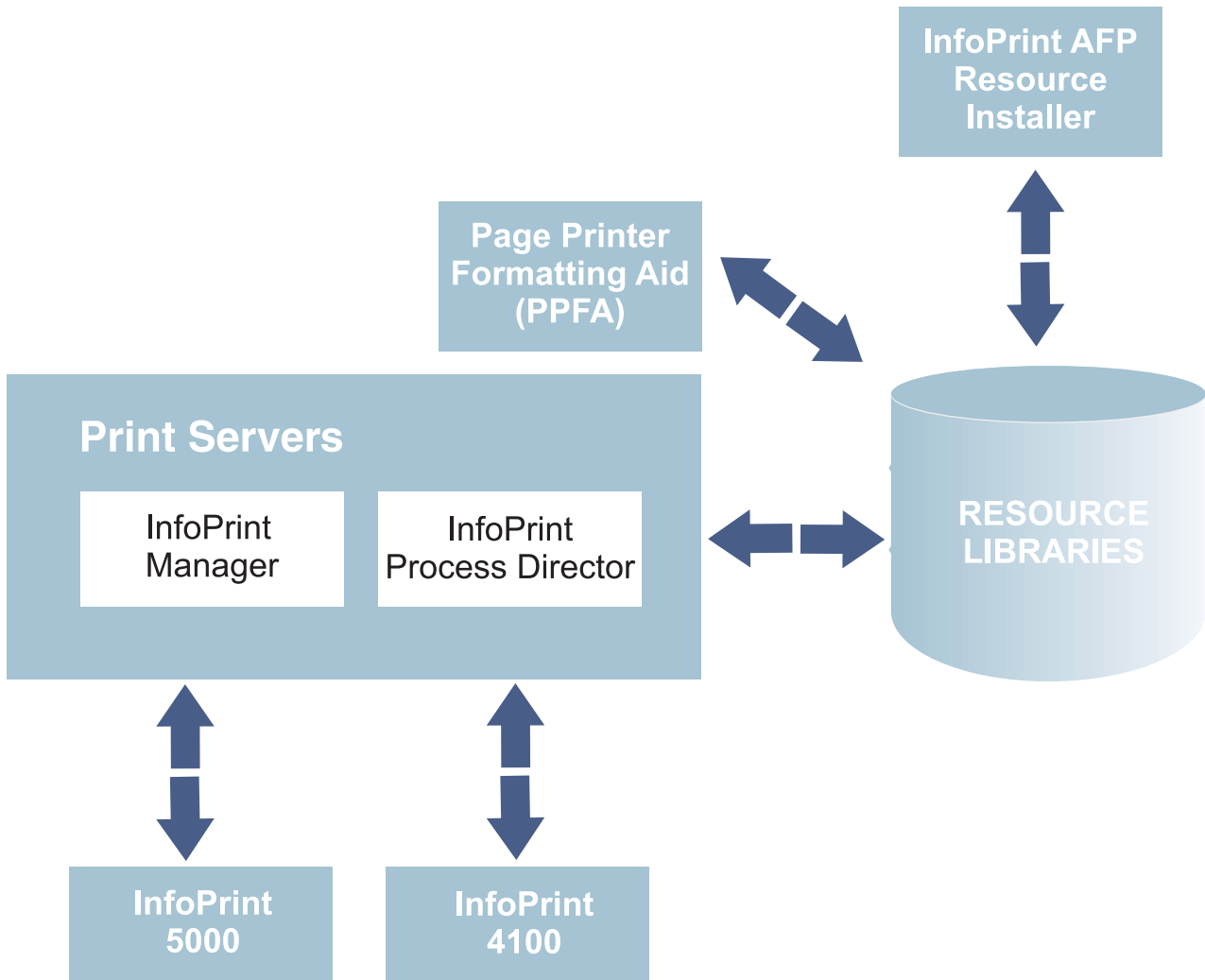


Figure 70. The InfoPrint products that support AFP color management

## 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.

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## 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

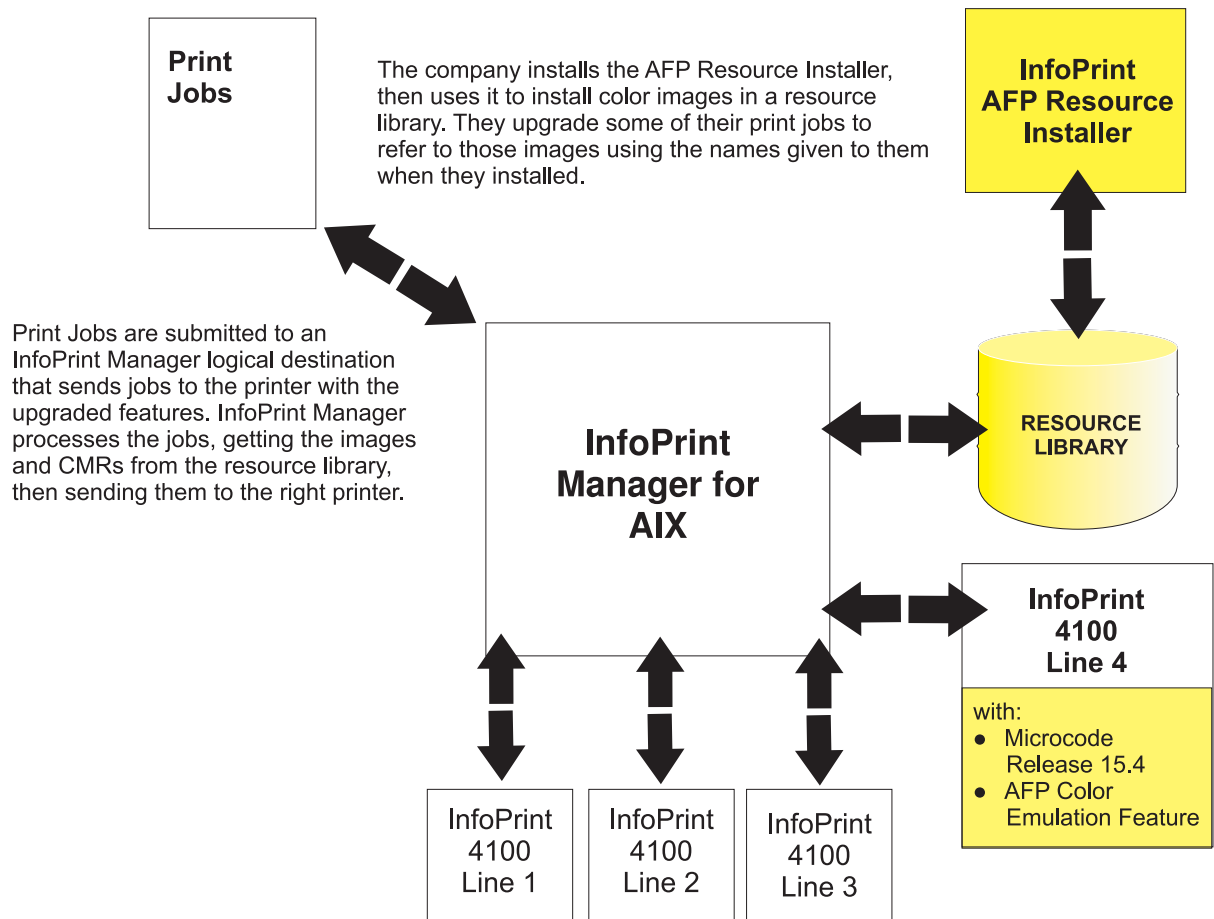


Figure 71. Solution diagram for adding AFP Resource Installer and a resource library, and updating one InfoPrint 4100 printer line to use microcode release 15.4 and the AFP Color Emulation Feature.

## 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.

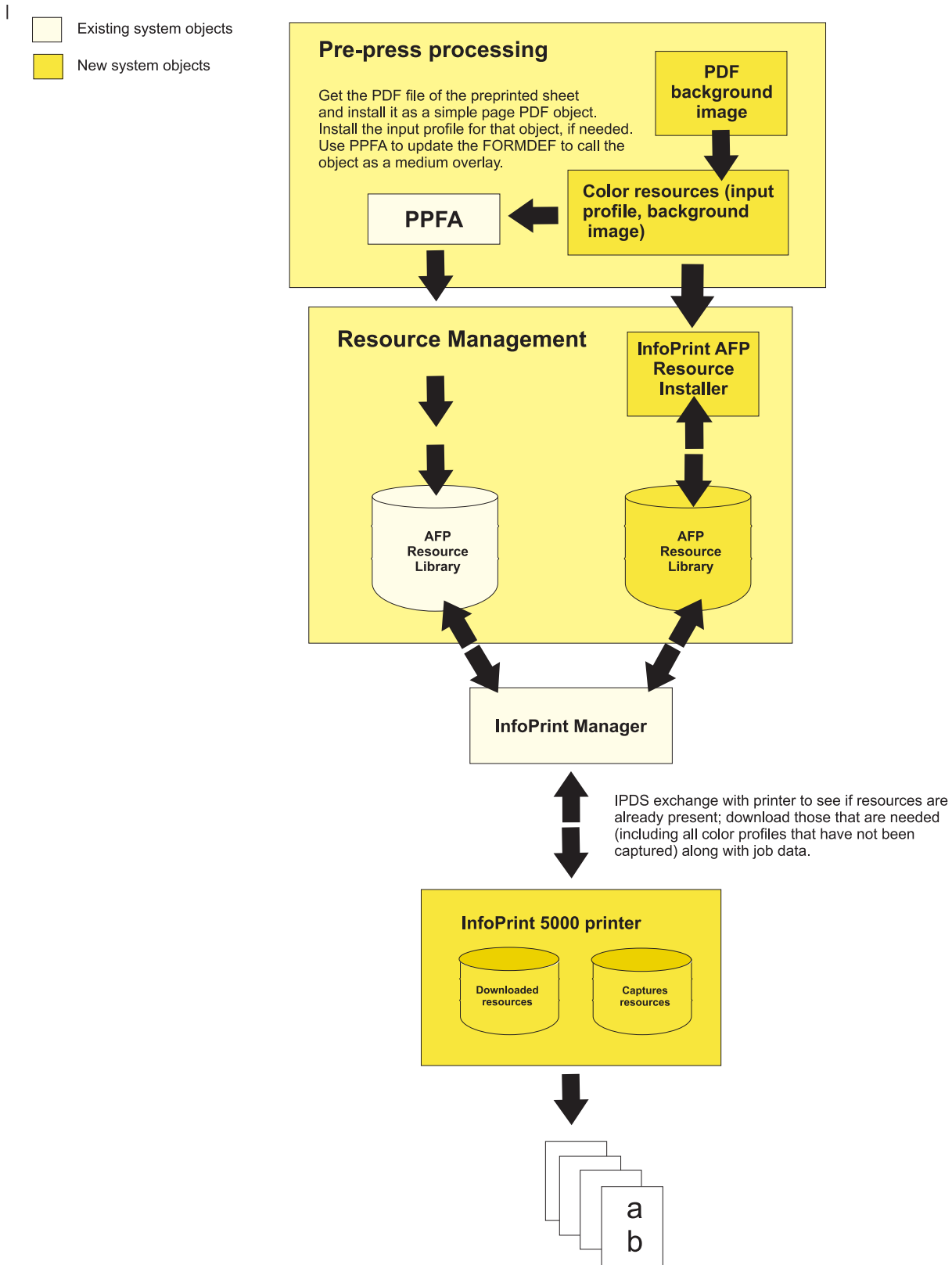


Figure 72. Solution diagram for adding InfoPrint AFP Resource Installer and an InfoPrint 5000 printer

## 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 a 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.

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## 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 Presentation: 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>





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## Chapter 27. Working with fonts

This topic describes the fonts required for printing different data formats. It also describes what you must do so that InfoPrint can use them. This material covers the following font topics:

- “Fonts for printing transformed PostScript and PDF data”
- “Fonts for printing DBCS ASCII and EUC” on page 297
- “Fonts for printing line data” on page 299

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### 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 Type 1 outline fonts and these fonts are installed in the *install\_path* \ps\fonts path during installation. If you have other Type 1 outline fonts, you can also use them with the transform program.

*install\_path* indicates the path where you have installed InfoPrint Manager. You can view that path from the **Management Console for InfoPrint Manager Server** by clicking on the **Edit** → **Service Configuration** path and checking the **Install path** field.

**Note:** When InfoPrint runs the PostScript transform program during job submission, it can search other directories for fonts.

The following section contains the following topics:

- “Font mapping files”
- “Specifying font substitution through initialization files” on page 293

### Font mapping files

A font-mapping file identifies the file names of the Type 1 outline fonts on the Windows operating system. The InfoPrint PostScript transform program requires at least one font-mapping file. InfoPrint installs the default font-mapping file, **fonts.map** in the *install\_path*\ps path 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.

#### Creating a PostScript font mapping file

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.

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 **pdf2afp** command

By default, InfoPrint uses the **fonts.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** command, you must do 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, which is named **ps2afpd.cfg** and located in the *install\_path*\ps2afp\ folder. 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=c:\path\font1.map; c:\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:

```
ps2afp -F c:\path\font.map -F C:\path2\font2.map
```

This method can also result in degraded performance.

- If the path to the font mapping file contains blanks, you must surround the qualified pathname in double-quotes:

```
ps2afp -F"D:\Program Files\ps\fonts.map"
```

Do not enclose a path that contains spaces in quotes(""); the transform will fail with invalid font mapping file errors.

- If you want to specify two mapping files in a command, you must ensure that each file's full pathname is specified, as in the following examples:

```
ps2afp -F"D:\Program Files\ps\font1.map; D:\Program Files\ps\font2.map"
```

```
ps2afp -F"D:\Program Files\ps\font1.map" -F"D:\Program Files\ps\font2.map"
```

- If you do not specify a drive letter, but expect the transform to find a mapping file using a relative path, the default drive is based on the *install\_path* because that is where the **ps2afp** executables reside.

If your file is on the **D:** drive, the command line is on the **C:** drive, and the product is installed on the **E:** drive, InfoPrint attempts to use the **E:\samp1.map** font mapping file:

```
C:\> ps2afp -oout.afp -F\samp1.map d:\incoming.ps
```

However, if you specify the following command, InfoPrint attempts to use the **C:\ps\files\samp1.map** font mapping file:

```
C:\ps\files> ps2afp -oout.afp -F\samp1.map d:\incoming.ps
```

If you create your own font mapping file -- either by using the **mkfntmap** command or manually -- and the path to the fonts contains blanks, the font

mapping file needs to double-quote the paths as well. For example, if your fonts reside in `E:\Program Files\ps\fonts`, the font-mapping file could have any of the following variations:

**PATH:**

```
"E:\Program Files\ps\fonts"
```

**FONT:**

```
AvantGarde-Book AvantGarde-Book
```

**FONT**

```
AvantGarde-Book "E:\Program Files\ps\fonts\AvantGarde-Book"
```

**Note:** You can use either 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. If the value from those three sources 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 for that one job. However, restarting the PostScript interpreter decreases performance, because the interpreter is restarted again with the font-mapping file in the configuration file for the very next PostScript job.

## Specifying font substitution through initialization files

You can issue specific PostScript commands to specify whether printers substitute fonts for those defined in job tickets that are neither inline with the job nor resident on the printer. To perform this task, modify the `UserInit` file that is located in the `install_path\ps` file system.

To ensure that fonts not inline with the job or resident on your printer substitute Courier fonts to allow the job to print, specify the following in the `UserInit` file:

```
%!
```

```
turnFontSubstitutionOn
```

To ensure that fonts not inline with the job or resident on your printer do not print, specify the following in the `UserInit` file:

```
%!
```

```
turnFontSubstitutionOff
```

---

## 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 92.

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 Manager Windows server

To update the global search path on an InfoPrint Manager Windows server, follow these steps.

**Note:** If you do not update the global search path, you must update each actual destination that you use to print OpenType fonts.

1. To start the InfoPrint Manager Management Console, click the Windows **Start** button and select **Programs** → **IBM Infoprint Manager** → **Management Console**.
2. Stop the InfoPrint Manager server by selecting **File** → **Stop Server**.

**Note:** If you are not able to stop the server because you are not authorized for that action, check the InfoPrint Manager Access Control List (ACL) for the **Shutdown** operation. Log off and log back on as a user who is on the access control list.

3. Select **Edit** → **Service Configuration**.
4. Update both the **Default Font Search Path** field and the **Default Resources Search Path** fields with the directory where the OpenType fonts reside.

## 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 Manager Windows server”) 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 DBCS ASCII and EUC

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 either one byte or two bytes for each character. 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 InfoPrint 5577 or 5587 printers.
- EUC files in the Japanese, Traditional Chinese, and Korean languages. EUC files cannot contain any formatting control characters.

The following section contains the following topics on printing with DBCS Fonts::

- Fonts required to print a double-byte transformed file
- Installing DBCS fonts on Windows 2000
- Setting up font resources for DBCS ASCII and EUC printing
- Printing Japanese DBCS messages at the end of a job

### 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-950)
- Traditional Chinese EUC (code page IBM-eucTW)
- Korean EUC (code page IBM-eucKR)

The transformed files contain font references to the double-byte character set. You set the character set and code page you want by either setting the **PSFDBLANG** environment variable or using the **default-character-mapping** default document attribute defined in the *InfoPrint Manager: Reference*. When using the **default-character-mapping** default document attribute, you must also specify `document-format=debs-ascii` for each applicable document or default document.

To set the **PSFDBLANG** environment variable, refer to the **Determining what code page your print jobs use and setting the correct environment variable** section in Chapter 24, “Working with transforms,” on page 213.

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 available with *Infoprint Fonts*, which is a separately orderable feature of InfoPrint Manager.

## Installing DBCS fonts on Windows

To make the fonts available to InfoPrint on your system once you have the licensed programs, you can use the Windows licensed programs to install the fonts, or copy the fonts to a particular directory on your Windows 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 destination. Using this method makes the fonts known to InfoPrint for any job submitted to the logical destination associated with the default-document object.
- Add the drives and specific folders to the search path for actual destinations using the following procedure from the **InfoPrint Administration GUI**:
  1. From the **InfoPrint Administration GUI** main window, highlight the actual destination.
  2. From the main menu, select the **Printer → Properties** path to open the selected printers’ **Printer Properties** window.
  3. From the **Printer Properties** window, select the **AFP Resources** tab.
  4. From the **AFP Resources** tab, you can specify the fully-qualified path where the double-byte fonts reside in the **Location of Resources** field.

This makes the fonts known to InfoPrint for any job processed by this actual destination.

## Printing Japanese DBCS fonts at the end of a job

You can have DBCS messages print in Japanese at the end of each DBCS print job. As with printing any DBCS jobs, you must have already installed the appropriate DBCS fonts on your system, and your printer must be DBCS-enabled. Also, you



must have installed the font from the *AFP Font Collection – Japanese Fonts* CD-ROM to support printing the Japanese DBCS message page. If you have installed this prerequisite and can print DBCS output in Japanese, this support is enabled and messages print in Japanese automatically.

Please note that if you do not install the appropriate fonts, InfoPrint Manager defaults to printing the appropriate message in English.

---

## Fonts for printing line data

When you specify a coded font name with the **chars** keyword of the **line2afp** command or with the **chars** document attribute, the font name is limited to four characters, excluding the two-character prefix.

The following table provides a list of the IBM Expanded Core Fonts for use with unformatted ASCII input data. InfoPrint stores these coded fonts in the *install\_path\fontlib* path. There are copies of the eight-character names that correspond to the six-character names that reside in the same location.

For the names of other coded fonts, refer to *IBM AFP Fonts: Font Summary*.

Table 26. IBM Expanded Core Fonts

Type Family	Point Size	Coded Font Name	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	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	X0N230J2	X0N2J2
Helvetica	24	X0N230N2	X0N2N2
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

Table 26. IBM Expanded Core Fonts (continued)

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 UO00352 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.

---

## Chapter 28. Working with global resource identifiers

InfoPrint can identify the fonts required for a job, access AFP font files that are installed on or NFS-mounted to your Windows system, and download the appropriate fonts to an InfoPrint-managed printer device. However, some InfoPrint printers can use fonts that are resident in the printer, which saves the time it takes to download these fonts. Because the font files on the Windows system do not share the same names as the printer-resident fonts, InfoPrint uses global resource identifiers (GRIDs) to map the system-resident fonts to the printer-resident fonts.

---

### Uses of GRID files

GRID files contain preassigned mappings that you can modify to map system-resident font file names to printer-resident font identifiers. These preassigned 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.

GRID files also 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 datastream 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 datastream must specify a specific width value

---

### GRID files that come with InfoPrint Manager

InfoPrint Manager provides four GRID files that you can customize to use with the types of printer devices that you have 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 `<install path>\grid` 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 **.grid** file changes are applied.

Descriptions of each file are provided below.

#### **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 73 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 73. 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 74 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 74. 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 75 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 75. 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 76 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 76. Sample File for a Code Page Identifier

For a detailed explanation of how the different types of identifiers combine to produce fonts, see *AFP Fonts: Font Summary*.

If you have a job that specifies a font that is not resident on your printer, you can use the GRID files to map the missing font to one with the same point size that does reside on your printer. To understand what resident fonts your printer device has, consult both your printer documentation and *Advanced Function Presentation: Printer Information*.

---

## InfoPrint search order 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. **<install path>\grd**
3. **<install path>\var\psf\printername**, where *PrinterName* is the name of a valid InfoPrint actual destination.

**Note:** When the same mapping is found in one of these files, InfoPrint uses the last one.

When you install InfoPrint Manager, sample GRID files are installed in the **<install path>\grd** directory. You can maintain a central location for new or modified GRID files for specific printers by storing files in the **<install path>\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 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 that apply to all types of GRID files

GRID files are simple ASCII text files that you can modify using any standard text editor. The following rules apply to all of the GRID files.

- No line in the file can contain more than 255 characters
- Fields within a line must be separated with one or more delimiters (spaces)
- The pound sign (#) indicates the start of a comment, which causes InfoPrint to ignore the remainder of that line
- A dash (-), indicates the absence of a particular value, for which InfoPrint substitutes a zero (0)
- An asterisk (\*) indicates that a wildcard value (any numeric decimal) is accepted.

- InfoPrint ignores blank lines and extraneous fields

## Allowable values for the `charset.grd` file

You can specify the following values for fields in the GRID file for a character set for a font:

*fgid*

Identifies the character set identifier for the font. Specify a numeric value from 1 to 65534 or enter a dash, `-`, if you want to disable the mapping of this character set to GRID values.

*gcsgid*

Identifies a global identifier for the font. Specify a numeric value from 0 to 65534 or enter a dash (`-`) to specify no **gcsgid**. If you specify an asterisk (`*`), InfoPrint issues an error message.

*width*

Identifies the width specified in the character set. Specify a numeric value from 0 to 65534 or enter a dash (`-`) to specify no width. If you specify an asterisk (`*`), InfoPrint issues an error message.

*vertical\_size*

Identifies the vertical size specified in the character set. Specify a numeric value from 0 to 65534 or enter a dash (`-`) to specify no vertical size. If you specify an asterisk (`*`), InfoPrint issues an error message.

*attribute\_field*

Indicates the attributes of the character set. Specify a lowercase `b` (bold), `i` (italic), `d` (doublewide), or enter a dash (`-`) to specify no attribute.

## Allowable values for the `codepage.grd` file

You can specify the following values for fields in the GRID file for a code page for a font:

*cpgid*

Identifies the code page identifier for the font. Specify a numeric value from 1 to 65534 or enter a dash (`-`) if you want to disable the mapping of this character set to GRID values.

*gcsgid*

Identifies a global identifier for the code page. Specify a numeric value from 0 to 65534 or enter a dash (`-`) to specify no **gcsgid**. If you specify an asterisk (`*`), InfoPrint issues an error message.

## Allowable values for the `fgid.grd` file

You can specify the following values for fields in the GRID file for a font global identifier:

*fgid*

Identifies the global identifier for the font. Specify a numeric value from 1 to 65534 or enter an asterisk (`*`) to indicate a wildcard value. If you specify a dash (`-`), InfoPrint issues an error message.

*gcsgid*

Identifies the global identifier for the font. Specify a numeric value from 0 to 65534 or enter an asterisk (`*`) to indicate a wildcard value. If you specify a dash (`-`), InfoPrint issues an error message.

*width*

Identifies the number of characters per horizontal inch. Specify a numeric value from 1 to 65534 or enter an asterisk (\*) to indicate a wildcard value. If you specify a dash (-), InfoPrint issues an error message.

*vertical\_size*

Identifies the vertical size of the font. Specify a numeric value from 1 to 65534 or enter an asterisk (\*) to indicate a wildcard value. If you specify a dash (-), InfoPrint issues an error message.

## Allowable values for the `cpgid.grd` file

You can specify the following values for fields in the GRID file for a code page global identifier:

*cpgid*

Identifies code page identifier for the font. Specify a numeric value from 1 to 65534.

*gcsgid*

Identifies the global identifier for the font. Specify a numeric value from 0 to 65534 or enter an asterisk (\*) to indicate a wildcard value. If you specify a dash (-), InfoPrint issues an error message.

---

## Modifying GRID files

The following section describes the two ways you can modify GRID files to support the printer devices and types of jobs in your production printing environment.

**Note:** If you are using InfoPrint Manager to print from either the 6400 and 6500 series in both native and 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 306.

## Modifying the charset and codepage GRID files

You can avoid having InfoPrint download fonts by adding font entries that map the font character set or code page that is most referenced in jobs to a global identifier for a resident font.

For example, if many of your jobs specify the Prestige 10 point font, which is character set C0S0PR10, and that font is not resident on your IBM 3812 printer diskette, you can map the Prestige 10 point font to a similar font that does reside on your IBM 3812 printer diskette. In the following procedure, you map the Gothic 10 point font, character set C0D0GT10, that is a printer-resident font to the Prestige 10 point font.

Perform the following steps:

1. Open the file `<install path>\grd\charset.grd.sample` in a text editor such as Notepad.
2. Select **File** → **Save as**. Rename the file `charset.grd` and save it into the `<install path>\var\psf\PrinterName` directory, where *PrinterName* is the name of the InfoPrint actual destination representing the 3812 printer device.
3. Edit the `charset.grd` file you just created. 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 COS0PR10 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. Open the file `<install path>\grd\codepage.grd.sample` in a text editor such as Notepad.
2. Select **File** → **Save as**. Rename the file **codepage.grd** and save it into the `<install path>\var\psf\PrinterName` directory, where *PrinterName* is the name of the InfoPrint actual destination representing the 3812 printer device.
3. 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 *CZnnnn* entries to raster font character-set names. If you do not create this mapping, InfoPrint issues an error message and does not print the job.

For example, if you wanted to map the Times New Roman Latin 1 character set to the raster version, follow these steps.

1. Open the file `<install path>\grd\fgid.grd.sample` in a text editor such as Notepad.
2. Select **File** → **Save as**. Rename the file **fgid.grd** and save it into the `<install path>\var\psf\PrinterName` directory, where *PrinterName* is the name of the InfoPrint actual destination representing the printer device.



3. 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 CON20000 character set. Then, InfoPrint searches the resource library search path to locate the CON20000 character for downloading with the job.

To modify the **cpgid** file so that the personal computer ASCII codepage for Iceland maps to the multilingual codepage for ASCII data as described in "Modifying the charset and codepage GRID files" on page 305, perform the following steps:

1. Open the file `<install path>\grid\fgid.grd.sample` in a text editor such as Notepad.
2. Select **File** → **Save as**. Rename the file **cpgid.grd** and save it into the `<install path>\var\psf\PrinterName` directory, where *PrinterName* is the name of the InfoPrint actual destination representing the printer device.
3. 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 GRID files that fail. For information on what files, lines, or fields are in error, you must access the GRID **error.log** file for the physical printer, which is located in `<install path>\var\psf\PrinterName`.

---

## Preventing InfoPrint from using GRID files

If you have a 300-pel printer but you 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, which in turn keeps InfoPrint from using printer-resident fonts.

1. Rename your customized GRID files. For example, open Windows Explorer and navigate to the `<install path>\var\psf\PrinterName` directory, where `PrinterName` is the InfoPrint actual destination that you don't want to use GRID files with. Find the `charset.grd` file and right-click it. From the pop-up menu, select **Rename** and change the name to `charset.grd.bak`.
2. Open the file `<install path>\grid\charset.grd.sample` in a text editor such as Notepad.
3. Select **File** → **Save as**. Rename the file `charset.grd` and save it into the same `<install path>\var\psf\PrinterName` directory that you were working with in step 1.
4. Edit the `charset.grd` file and place a dash (-) in the `fgid` column.
5. Save your changes and close the file.
6. Open the file `<install path>\grid\codepage.grd.sample` in a text editor such as Notepad.
7. Select **File** → **Save as**. Rename the file `codepage.grd` and save it into the same `<install path>\var\psf\PrinterName` directory that you were working with in step 1.
8. Edit the copied `codepage.grd` file and place a dash (-) in the `cpgid` column.
9. Save your changes and close the file.

## 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 a DOS prompt:  

```
cd <install path>\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:  

```
copy <install path>\lpp\psf\grid\charset.grd.nores charset.grd
```
3. Create the `codepage.grd` file from the `codepage.grd.nores` file:  

```
copy <install path>\lpp\psf\grid\codepage.grd.nores codepage.grd
```

---

## Chapter 29. 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 highlight color attachments to 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 or the InfoPrint 4100 when printing with highlight colors. To apply color to black and white documents, you must use the following procedure to create Color Mapping Table Source (.src) and Output Files. Refer to "InfoPrint administrative utilities" in "Chapter 2. InfoPrint Manager Tools" of the *InfoPrint Manager: Reference* for information about the **cmt** utility. 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.

The sample configuration file named **cmt.cfg** file should be available in the *install\_path*\config directory and the **cmt** utility should be available in the *install\_path*\bin directory on your Infoprint Server. Using the AFP architectural reference, you can apply color to existing black and white documents.

**Note:** A MOD:CA sample color mapping table produces from the sample **cmt.cfg** file is provided in *install\_path*\config\cmtsampl.

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 Highlight Color Model HC2 Post-Processor (HCPP). For more information on the HCPP, see the InfoPrint Hi-Lite Color Printer: Library Catalog at the URL <http://www.infoprint.com>.

---

### 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 that 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 that 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 that 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 Solutions Company 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 reviewing 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 these tasks from the Windows command line:

1. From the **install\_path\config** directory, specify:  
copy cmt.cfg piel.cfg

This copies the Color Mapping Table configuration file into a file you can customize for your own purposes (in this case, piel.cfg)

2. Specify notepad piel.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 |
# GOCADData | BCOCADData | A11OCA | Page | Overlay |
# ObjsAll
# default= ObjsAll
# -----
ObjectType: GOCADData
# -----
# PercentShading:
# Optional, only valid for SourceColorSpace: 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 (MOD:CA) 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.out
```

This command produces a `pie1.out` output file.

## 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 Windows 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
<code>pdpr -d prt1</code>	Print Command with logical destination name.
<code>-x job-name=gocajob</code>	Name of the AFP file you submit for printing.
<code>-x resource-context=/usr/lpp/psf/cmt/</code>	Explicit path name for the Color Mapping Table object files.
<code>-x color-mapping-table=pie1.out</code>	Color Mapping Table that you created in "Creating a color mapping table" on page 311 for printing this file.
<code>install_path\psf\cmt\goca.afp</code>	Explicit pathname where the print file resides.

## Configuring an actual destination with the InfoPrint Manager Administration GUI

Follow 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**.

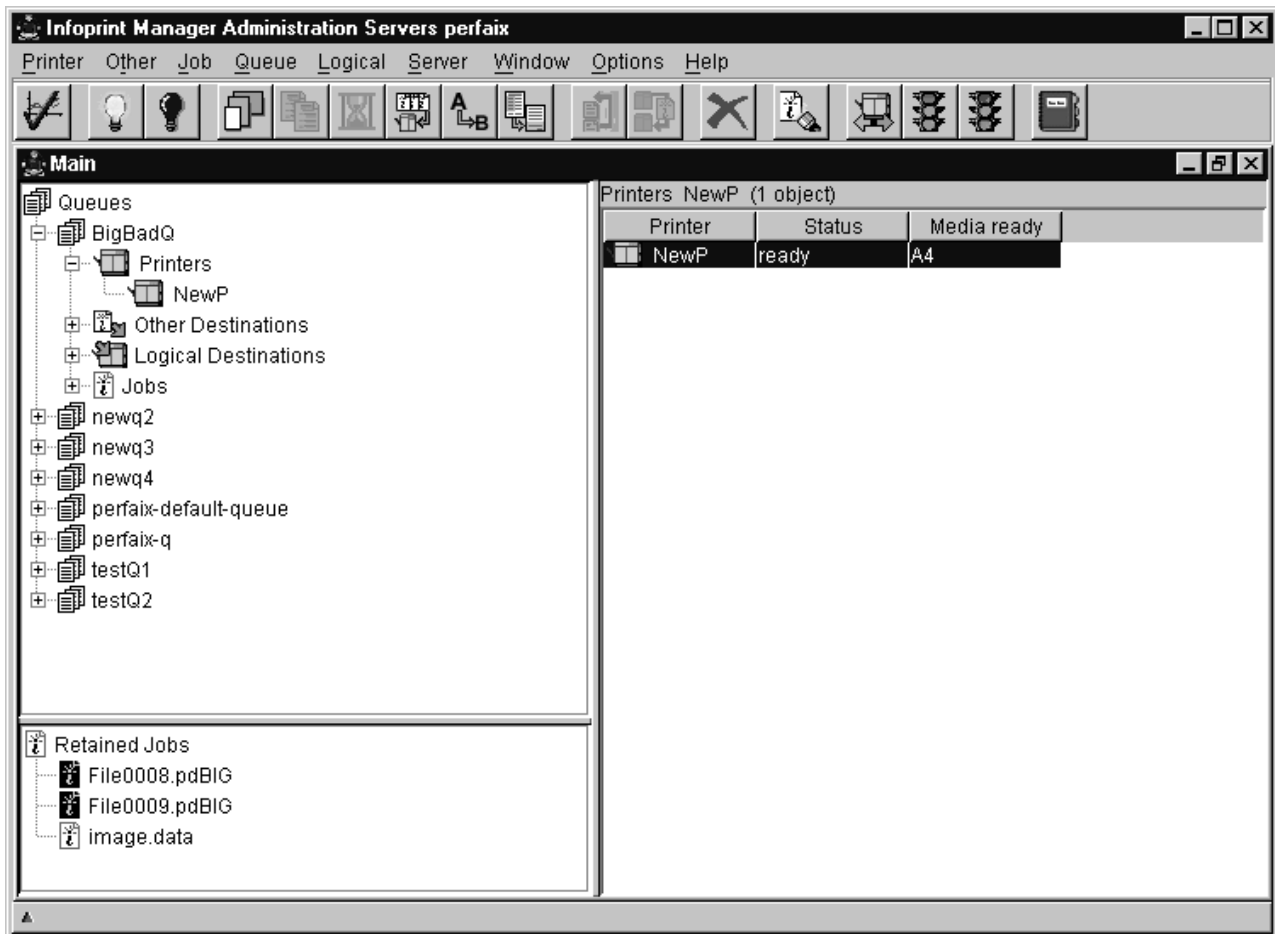


Figure 77. InfoPrint Administration Servers main window

2. Ensure that the **Color mapping table** (pie1.out) has been specified on the AFP Color tab of the Printer Properties notebook and that the **Location of resources** (*install\_path*\config) has been specified on the AFP Resources tab:



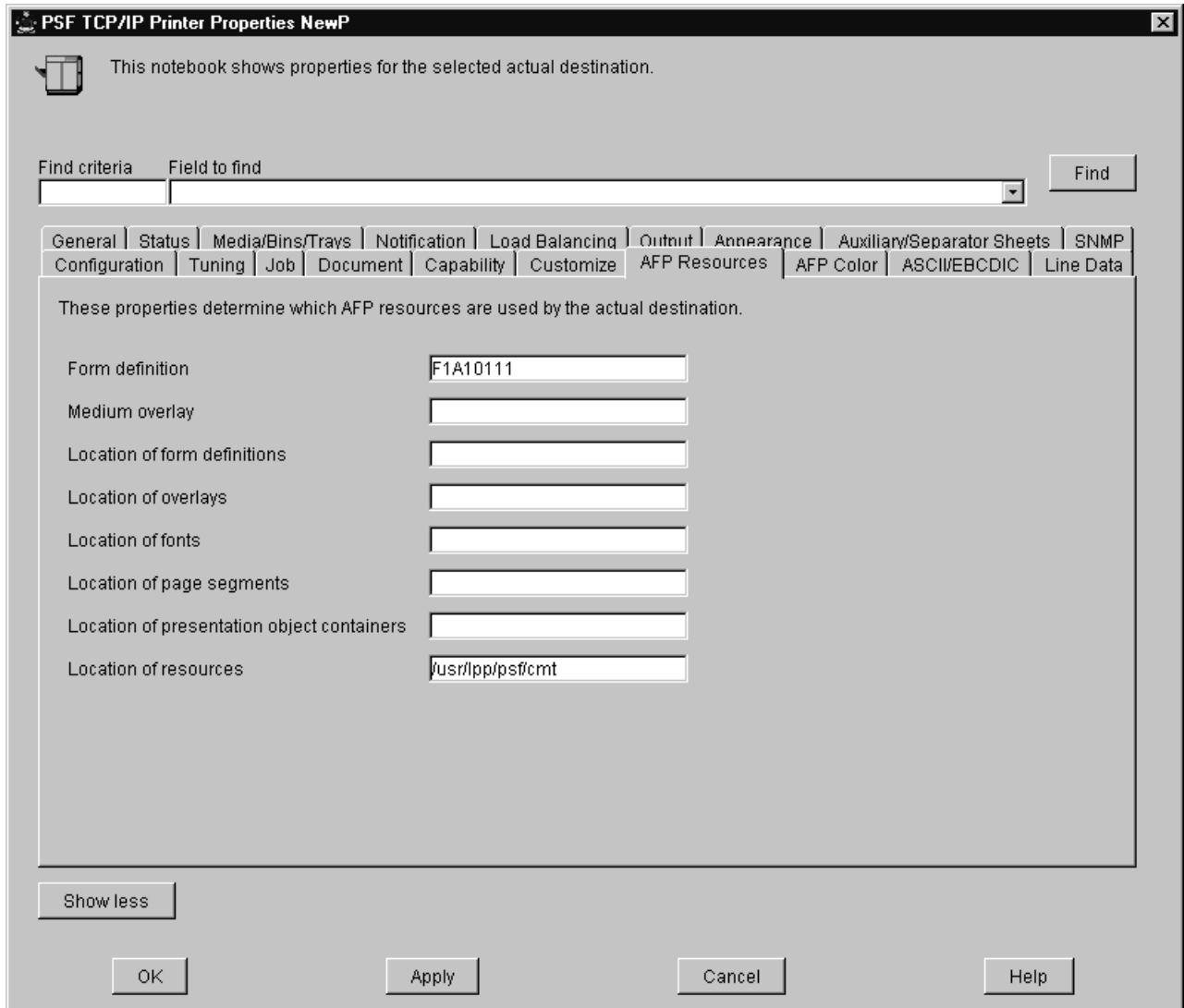


Figure 78. Printer Properties notebook

3. Submit your job to InfoPrint Manager, using either the command line or the InfoPrint Select client.

### Using the InfoPrint Select client with Color Mapping Tables

In InfoPrint Select, specify the name of the Color Mapping Table as the job or document default as appropriate.



---

## Chapter 30. 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/ipca1/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" on page 319
2. "Calibrating a densitometer" on page 319

---

### 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 Windows bat file from the command line.

**Notes:**

- When you apply InfoPrint Manager PTFs, the appropriate Windows bat file 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 a Windows bat file provided.

The bat files are installed in **install\_path\config**

- IP4000-ID5-6.Std.bat
- IP4000-ID5-6.V2toner.bat
- IP4000-ID5-6.V3toner.bat
- IP4000-IR1-2.Std.bat
- IP4000-IR1-2.V2toner.bat
- IP4000-IR1-2.V3toner.bat
- IP4000-IR3-4.Std.bat
- IP4000-IR3-4.V2toner.bat
- IP4000-IR3-4.V3toner.bat
- IP4100-HD3-HD4.RTtoner.bat
- IP4100-HD3-HD4.Stdtoner.bat
- IP4100-HD3-HD4.V3toner.bat
- IP4100-HD3-HD4.V5toner.bat
- IP4100-MD1-2.Stdtoner.bat
- IP4100-MD1-2.V2toner.bat
- IP4100-MD1-2.V2\_PQItoner.bat
- IP4100-PD1-2.Std.bat
- IP4100-PD1-2V3toner.bat

Each bat 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 27, Table 28 on page 319, and Table 29 on page 319.

*Table 27. Screen Frequencies for InfoPrint 4000 IR3/IR4 and ID5/ID6 and InfoPrint 4100 HD3/HD4 and HS2 printers with Version 3 Toner*

<b>Submit Screen Frequency (LPI)</b>	71	85	106	141
<b>Actual screen frequency (LPI)</b>	74	85	96	117
<b>Actual Screen Angle (Default ° Set)</b>	35.5°	45°	51.3 °	59°

Table 27. Screen Frequencies for InfoPrint 4000 IR3/IR4 and ID5/ID6 and InfoPrint 4100 HD3/HD4 and HS2 printers with Version 3 Toner (continued)

Actual Screen Angle (90° Set)	54.5°	45°	38.7°	31°
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Table 28. 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 29. 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

The Halftone Management System that is included with the InfoPrint Manager POD feature is not started with an icon or shortcut on InfoPrint Manager for Windows.

Use these steps to start the Halftone Management System:

1. Go to the **Start** menu.
2. Go to **Programs**.
3. Go to **Infoprint Manager**.
4. Select **Start Halftone Management Server**.
5. Repeat steps 1 through 3, and then select **Start Halftone Management Client**.

If the InfoPrint Manager Server has already been defined in the Halftone Management System and the Halftone Management System client is started when the Halftone Management System Server is not running, InfoPrint Manager issues this message: **Error in connecting to host *yourhostname* - Connection refused**. When this happens, start the Halftone Management System server.

---

## 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 Greyttag Macbeth model D19C has a polarizing filter and should not be used. Densitometers which are appropriate to use include the X-Rite Model 504, 508, or 400B.

The densitometer should be used in Absolute Density mode for measurements. The following procedure describes how to calibrate the X-RITE 400B (1060)

densitometer, using the Reflection Reference Card (part number 400-62). Since the X-RITE 400B is now obsolete, the following information is provided as reference.

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

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

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

To find out how you can calibrate and set output appearances, see "Calibrating a printer using the Halftone Management System" on page 321.

---

## Calibrating a printer using the Halftone Management System

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

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

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

### Defining InfoPrint servers to the Halftone Management System client

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

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

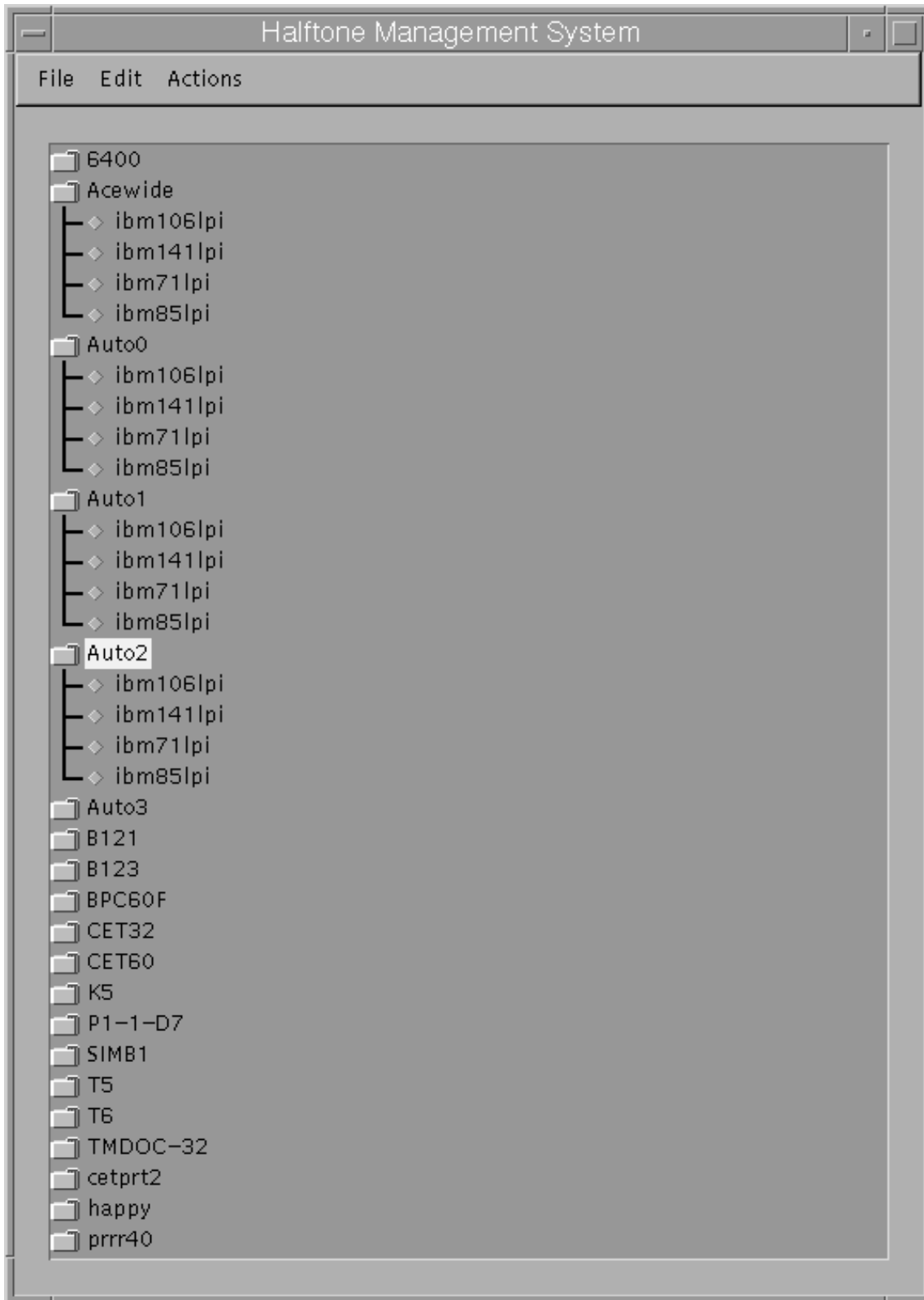


Figure 79. HalfTone Management System Main window



## 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.

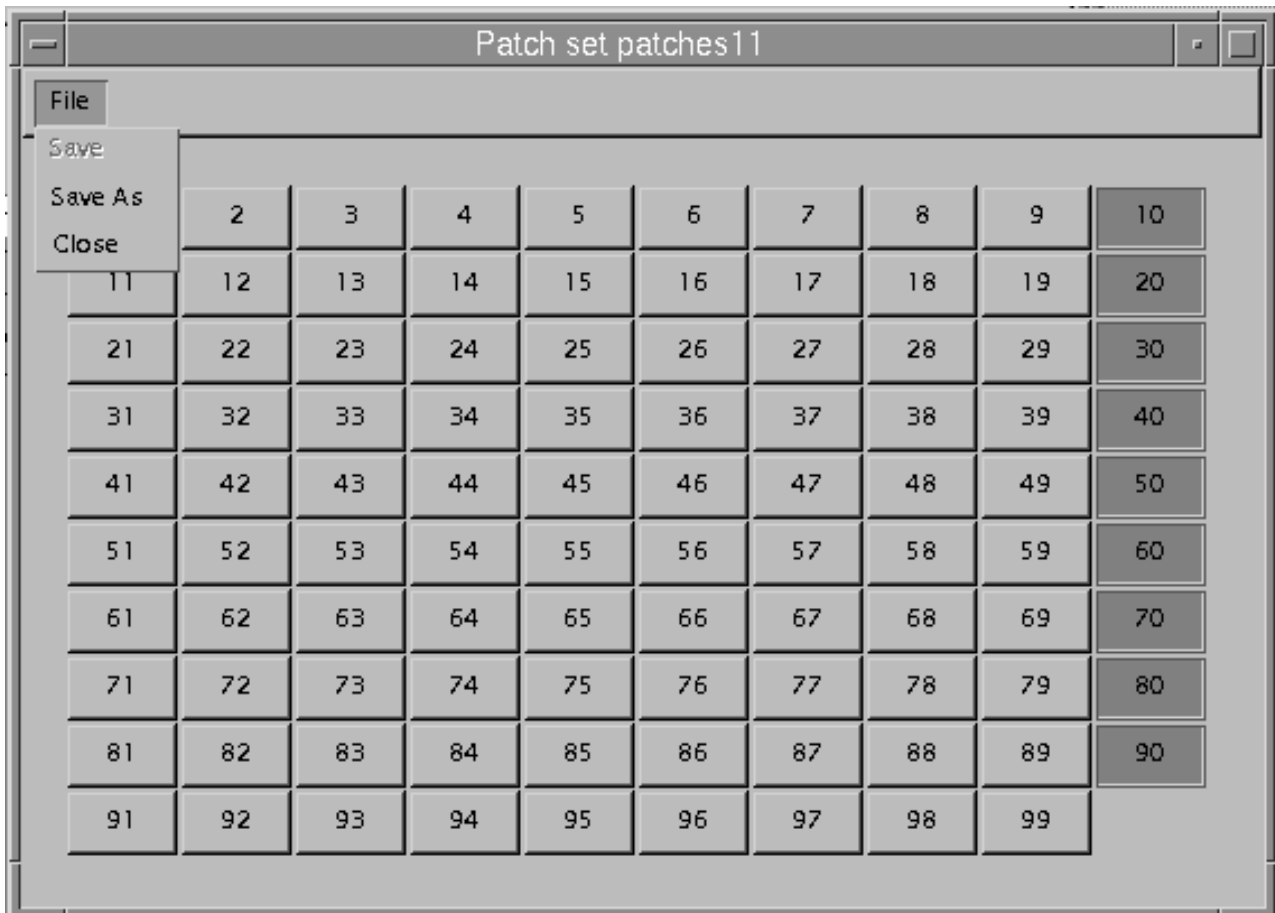


Figure 80. Patch set name window

## Calibrating a halftone

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

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

Use the following procedure to accomplish these tasks:

1. If desired, define a custom patch set to print from the Halftone Management System window from the menu bar by selecting **EDIT → PATCH SETS**, then selecting the patch from the list and **ACTIONS → SELECT AS CURRENT, FILE → CLOSE**.
2. From the **Halftone Management System** window, select a printer and a halftone screen supported by that printer.
3. From the **Halftone Management System** window, select the **Actions → Print Patches** option.

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

Enter calibration values

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

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

Figure 81. 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.

The screenshot shows a dialog box titled "Enter calibration values". It contains the following information:

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

Below this information is a table with the following columns: % gray, Entry, Average, Min, Max, # entries, and a Clear button for each row.

% 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

At the bottom of the dialog box are two buttons: "Do" and "Cancel".

Figure 82. 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=ibm1061pi: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 (ibm1061pi: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`.





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## Chapter 31. Submitting specialized print jobs

This topic describes these specialized print job:

- “Submitting PSF printer input to a PCL or PPDS printer”
- “Printing PCL or PostScript to PSF destinations: specifying which paper bin to use” on page 333
- “Sending print jobs to InfoPrint Manager for Windows from an AIX system” on page 341
- “Printing from ERP applications” on page 343

---

### 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.

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 30 on page 332 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 30. 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 334. 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.

---

## 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 x 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.”

After you have figured out the bin mappings, select the option below that most resembles your situation and follow the related procedure.

- If you only have one printer with multiple paper bins OR if you can use the same mappings for all of your printers, refer to “Editing configuration files” on page 340.
- If you have more than one printer with multiple paper bins AND you want to use different mappings for all of them, refer to “Creating a transform with bin mappings” on page 340.

You cannot specify bin mappings if you are printing booklets (with or without integrated covers) or side-by-side copies (multiple copies of the same page on one sheet of paper).

## 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 IBM Network Printer 12, Network Printer 17, Network Printer 24, InfoPrint 20, InfoPrint 21, InfoPrint 32, or InfoPrint 40, the numbers listed in Table 31 are placed in the data stream.

*Table 31. IBM PCL5e Bin numbers*

Tray (what you select in Device Settings)	PCL bin number (what the driver puts in data stream)
Automatically Select	0

Table 31. IBM PCL5e Bin numbers (continued)

Tray (what you select in Device Settings)	PCL bin number (what the driver puts in data stream)
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. 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 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 are 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.

For example, if you have a printer with three paper bins and a manual feed bin, you could do the following.

1. On the system that your InfoPrint Manager server runs on, install the PCL driver that you plan to use. The easiest way to install the driver is by using the Windows **Add printer** wizard to create a printer that uses that driver.
2. Using the Management Console, create a Windows gateway 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 Windows gateway 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 that 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. Determine which method you will be using to map bins:
  - If you only have one printer with multiple paper bins OR if you can use the same mappings for all of your printers, refer to "Editing configuration files" on page 340.
  - If you have more than one printer with multiple paper bins AND you want to use different mappings for all of them, refer to "Creating a transform with bin mappings" on page 340.
9. Follow the appropriate procedure.

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 32 for an InfoPrint 20.

Table 32. 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.

10. Load each paper bin (including the manual feed bin) with a different kind, color, or specially marked paper.
11. Submit a test job to each bin and see which paper it prints on. Keep track of your results and use them to change the mappings to meet your configuration.
12. Once you have the mappings worked out correctly, tell your users the following information:
  - How to create a connection to this Windows gateway printer from their workstations.
  - 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 338
3. "Testing tray mappings" on page 339

**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 33. Paper bin information*

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 are 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:

```
inputX=(size,type=xxx,weight=xxx,color=xxx),inputX=(size,
type=xxx,weight=xxx,color=xxx)
```

Where the following conditions apply:

- Each `inputX` corresponds to a different paper tray. You should have as many `inputX` entries as you have paper trays. Separate them with commas, no spaces.
- The `X` in each `inputX` is replaced with the **AFP bin number** from Table 33 on page 337 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**, **8.5x11i**, 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=(8.5x11i,color=blue),input2=(8.5x11i,color=yellow),
input3=(11x17i),input100=(8.5x11i)
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 the system that your InfoPrint Manager server runs on, install the PostScript driver that corresponds to your printer. The easiest way to install the driver is by using the Windows **Add printer** wizard to create a printer that uses that driver. After you create the printer, you can delete it; the driver will still be installed.
2. Using the Management Console, create a Windows gateway 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 Windows gateway 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. Determine which method you will be using to map bins:
  - If you only have one printer with multiple paper bins OR if you can use the same mappings for all of your printers, refer to “Editing configuration files” on page 340.
  - If you have more than one printer with multiple paper bins AND you want to use different mappings for all of them, refer to “Creating a transform with bin mappings” on page 340.
9. Follow the appropriate procedure.

When you have to change the configuration file or enter the command that your transform will use, replace the `inputX=...` statement with your identification statement from “Identifying paper trays to InfoPrint Manager” on page 338, and complete the procedure. When you have to enter PostScript options and AFP bin numbers, select an input bin number and enter the options that you want to assign to that bin. For example, if you want AFP bin 1 (on the printer) to hold letter-sized paper, AFP bin 2 to hold legal paper, and the manual feed tray to hold 11x17 inch paper, the mapping portion of your command would read:

```
input1=(letter),input2=(legal),input100=(11x17i)
```

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. Tell your users the following information.
  - How to create a connection to this Windows gateway printer from their workstations.
  - 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 only need to edit one of these files per data stream, depending on the printer you send your jobs to and 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 `inputX=...` portion of the `device_controls` line with your identification statement from “Identifying paper trays to InfoPrint Manager” on page 338.
4. Save the file.

**Note:** It is recommended that you save a copy of your changes in a directory outside of the InfoPrint Manager install 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/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)'
```

Replacing the Xs with the number of the AFP bin (on the printer) and Zs 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 `inputX=...` portion of the command with your identification statement from "Identifying paper trays to InfoPrint Manager" on page 338.

- 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.

---

## Sending print jobs to InfoPrint Manager for Windows from an AIX system

To send print jobs from an AIX system to InfoPrint Manager for Windows, you need to set up an appropriate Line Printer client (LPR) on the AIX system and an appropriate Line Printer Daemon (LPD) on the Windows system. If you want to use the advanced printing options (such as `formdef` and `pagedefs`) that InfoPrint Manager provides, you must use `lprafp` on your AIX system and the InfoPrint Manager LPD on your Windows system.

**lprafp** is a version of LPR that allows you to use `-o` options to specify advanced print options when you submit jobs to InfoPrint Manager. You can download an **lprafp** sample code package (including a compiled version of the code that can be used on AIX version 4.3.3 and higher) from the InfoPrint Solutions Company Web site at <http://www.infoprint.com/>. InfoPrint Solutions Company does not provide support for the package.

The InfoPrint Manager LPD is installed and activated with your InfoPrint Manager for Windows server. It is the only LPD that properly processes the `-o` options that **lprafp** submits. If you use a different LPD (such as *TCP/IP Print Services*, the LPD that is shipped with the Windows operating system), the `-o` options that you send will be lost.

**Note:** The LPD supplied with the Windows operating system (TCP/IP Print Services) does support a `-o` option, but it is not the same. This `-o` option specifies the binary option.

If you use the InfoPrint Manager LPD, you will only be able to LPR print jobs to InfoPrint Manager destinations, not to Windows printers. If you use a different LPD, you will only be able to LPR to Windows printers. To submit a job to InfoPrint Manager, you will have to set up a Windows gateway printer.

If you cannot use **lprafp** and/or the InfoPrint Manager LPD, you can use the standard LPR and a different LPD to submit jobs from an AIX system to your InfoPrint Manager for Windows system. However, you will not be able to use advanced print options.

**Important:**

1. Do not use this procedure if you have InfoPrint Manager for AIX installed on your AIX system. If you have InfoPrint Manager for AIX installed, you should use the InfoPrint Manager AIX Client to submit print jobs from AIX systems to your InfoPrint Manager servers. In addition, you should consider setting up an interoperating environment so your InfoPrint Manager servers can work together.

For additional information on interoperability, refer to “Configuring for interoperability between an InfoPrint AIX server and an InfoPrint Windows server” on page 166.

2. 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`.

To submit jobs from an AIX system to your InfoPrint Manager for Windows system, you must complete two tasks:

- “Verify that the InfoPrint Manager LPD is running”
- “Install and configure **lprafp**” on page 343

## Verify that the InfoPrint Manager LPD is running

1. On the system that your InfoPrint Manager server runs on, open the InfoPrint Manager Management Console.
2. Select **Edit** → **Service Configuration**.
3. In the **Service Configuration** dialog, find **Run Infoprint Manager LPD service** check box.

- If the box is checked, the InfoPrint Manager LPD is already running. Click **Cancel** to dismiss the dialog.
  - If the box is not checked, click **Cancel** and continue with step 4.
4. In the Management Console, select **File → Stop Server**.
  5. After the InfoPrint Manager server has stopped, click **Edit → Service Configuration** again.
  6. Click the **Run Infoprint Manager LPD service** check box to select it.
  7. Click **OK**.
  8. Select **File → Start Server** to restart the InfoPrint Manager server.

## Install and configure lprafp

The lprafp sample code package is available for free download from the InfoPrint Solutions Company Web site at <http://www.infoprint.com/>. Use this procedure to locate and install the package.

**Note:** The compiled version of lprafp for AIX will only run on AIX 4.3.3 and above. If you have a lower version, you must use a different LPR client and will not be able to use advanced printing options.

1. Navigate to <http://www.infoprint.com/> in your web browser.
2. Under **Resources for**, click **InfoPrint Manager**.
3. On the InfoPrint Manager Family Home Page, click **InfoPrint Manager for Windows**.
4. On the InfoPrint Manager for Windows home page, select **Downloads** from the list under **Product Resources**.
5. On the Downloads page, find **lprafp** and click to download.
6. Use a zip utility to unzip the package.
7. Open the README file and follow the instructions for installing the package on a UNIX system. Skip steps 4 & 5 of the instructions, because you will be using the already compiled version of lprafp.

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## Printing from ERP applications

For information on the use of SAP R/3 with InfoPrint Manager, refer to the *InfoPrint Manager: SAP R/3 Configuration and Printing Tasks* publication, which can be found on the Internet in the manual and publication page for InfoPrint Manager for Windows or InfoPrint Manager for AIX at <http://www.infoprint.com>.

You can send PostScript or PCL output from your ERP software to InfoPrint Manager to be printed. If your ERP software resides on a Windows system, you should submit the jobs through a Windows gateway printer. If your ERP software resides on an AIX system and you do not have InfoPrint Manager for AIX installed, you should use the lprafp Line Printer Client (LPR) and the InfoPrint Manager Line Printer Daemon (LPD).

## Submitting ERP print jobs from a Windows system

### Defining the Windows gateway printer

Your ERP print jobs will be submitted to a Windows gateway printer that is associated with the appropriate PostScript or PCL driver for your printer. Follow these steps to define your Windows gateway printer:

1. Create or select an InfoPrint actual destination that will accept the data stream that you will be sending to the printer (PostScript, PCL, or AFP).

This actual destination can be almost any type of InfoPrint printer (Passthrough, BSD, IPP, PSF) that you can create using the InfoPrint Manager Administration GUI. If you don't want to use the default queue and logical destination, create them and associate the actual destination with them.

2. Install the appropriate PostScript or PCL printer driver on the system that your InfoPrint Manager server resides on.
  - If you will be sending PostScript data to an AFP printer, you can use the IBM Network Printer 17 driver, which you can download from the InfoPrint Solutions Company website.
  - Otherwise, you can install and use the driver that came with your printer.

Follow these steps to install the driver on your system.

- a. Insert the CD or disk containing the driver into the correct drive.
- b. Start the Windows **Add Printer** wizard and create a local printer. When you have to select a port, select FILE:.
- c. When the wizard gives you a list of manufacturers and printers, select either the IBM Network Printer 17 or the driver that came with your printer.
- d. Finish the wizard without printing a test page or making this printer the default.

Once you finish the wizard, you can delete this printer; the driver will still be installed.

3. Open the Management Console and create a Windows gateway printer.

In the **Target destination** field, select the destination that you created or chose in 1. In the **Windows driver name** field, select the driver that you installed in 2. Remember the **Share name** that you choose; you will need it later. Refer to the Management Console online help for additional information.

### **Adding the Windows gateway printer to the system you want to print from**

Once the Windows gateway printer is created, you can add it to the desktop of the system that you want to print from. Then you will be able to submit your print jobs directly to it. Follow this procedure to add the Windows gateway printer to the desktop.

1. Use the **Add Printer** wizard to add the Windows gateway printer to your desktop as a network printer. When you are prompted for the name of the printer to connect to, find or enter the **Share name** of the Windows gateway printer you created. Finish the wizard.
2. Once the connection to the Windows gateway printer is created, you can print to it just as you would to any other printer.



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## Chapter 32. Configuring InfoPrint Manager for Windows 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 Windows 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 for InfoPrint 5000" on page 347 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 34 on page 346 for sample names.

Table 34. 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 letter	5K-PDF1	5k-pdf1-ld-letter	PDF letter
PDF tabloid	5K-PDF2	5k-pdf2-ld-tabloid	PDF tabloid
PostScript letter size	5K-PS1	5k-ps1-ld-letter	PS letter
PostScript tabloid size	5K-PS2	5k-ps2-ld-tabloid	PS tabloid
PostScript ABC Statement size	5K-PS3	5k-ps3-ld-abc	PS ABC Statement

See “Running scripts” on page 347 for detailed instructions.

4. InfoPrint Manager for Windows uses a default user name called **LocalSystem** for its activities. **LocalSystem** does not have the ability to write to a network drive, even if the Administrator on the workstation can write to that same network drive:
  - a. You must add the user name and password provided to access shared network drives on the InfoPrint 5000 printer to the InfoPrint Manager for Windows server by using **Control Panel→Users and Passwords**. The user must be a member of the Administrator’s group. You must also set the password to never expire.
  - b. Give the user access to these Administrative Tool policies:
    - 1) Go to **Control Panel→Administrative Tools→Local Security Policy**. You see the **Local Security Settings** window.
    - 2) From the **Local Security Settings** window on the left pane, open the **Local Policies** folder and then open the **User Rights Assignment** folder, and then select these assignments on the right pane:
      - **Act as part of the operating system**
      - **Create permanent shared objects**
      - **Log on as a service**
  - c. Open the InfoPrint Manager for Windows Management Console. Stop the InfoPrint Manager for Windows server. Use **Edit→Service Account/Domain** and replace **LocalSystem** with the InfoPrint 5000 user name and password that you received from the System Services Representative.
5. Restart the InfoPrint Manager for Windows server.
6. 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.

**Notes:**

1. 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.
2. If you use interoperating InfoPrint Manager for Windows servers in your environment, make sure that the hot folder share userid is the same as the domain account userid that was used for the interoperating systems.



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## Mapping the Hot Folder for InfoPrint 5000

You should map or mount the Hot Folder provided by the InfoPrint 5000 printer onto your local system.

To do this mapping in the Windows operating system, follow these steps:

1. On the desktop, right-click **My Computer** or **My Network Places** icon. Then a pop-up menu displays.
2. From the pop-up menu, select **Map Network Drive...** You see the **Map Network Drive** window.
3. On the **Map Network Drive** window:
  - a. In the **Drive** combination box, click the local drive letter that you want the remote folder to be mapped to.
  - b. In the **Folder** combination box, type the path to the remote folder (such as `\\IPC01\SV-110 Hotfolder` or the IP address) or press the **Browse** button to select the remote folder from the Local Area Network.
  - c. Click on **Connect using a different user name**.
  - d. You see the **Connect As...** window. Enter the supplied userid and password from your System Services Representative.
4. Click the **Finish** button. Now you have successfully mapped the Hot Folder onto your local system.

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## 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 execute a Window command `run_customization_1.cmd`, with administrative rights both on the Windows system and on the InfoPrint Manager server.

The `run_customization_1.cmd` command syntax:

```
run_customization_1.cmd nameOfServer nameOfAD nameOfQueue nameOfLD nameOfSharedIP5000NetworkDrive
```

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.

*nameOfSharedIP5000NetworkDrive*

Specify the path to the Hot Folder provided by the InfoPrint 5000 printer.

For example:

```
run_customization_1.cmd ipmwin 5K-PS1 color-q 5k-ps1-1d-1edger "\\ipc01\SV-110 Hotfolder\PS Letter"
```

**Note:** After running the **run\_customization\_1.cmd** script, check the results that the command returns and make sure that a new actual destination and logical destination were created. You can specify an existing queue in the script's parameters, so this might be reflected in the results that the command returns. Specify the path to the Hot Folder provided by the InfoPrint 5000 printer.

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## 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. Any attributes relevant to PS and PDF input files are not supported, because these files will be simply passed through.
10. InfoPrint Manager submission clients Submit Express and InfoPrint JobTICKETER are not supported.
11. 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.

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## **Part 5. Operator and User Procedures**



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## Chapter 33. Setting up finishing options for specific printers

This topic describes finishing options for these printers:

- “Setting up finishing options for IPDS-only printers”
- “Setting up finishing options for PS/PCL printers” on page 359

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### 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 360.

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 359. 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 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

When you submit a job using InfoPrint Submit Express, 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

The 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.

**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 Windows: Getting Started*. To specify the AFP driver for your printer, follow the directions in "Creating InfoPrint Select printers" in the *InfoPrint Manager for Windows: Getting Started*, 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 the **Printing Preferences** button on Windows 2000 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 Windows: Getting Started* 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 **InfoPrint AFP 4345** driver.
  - For the InfoPrint 60 printer, specify the **InfoPrint AFP 3160** driver.
  - For the InfoPrint 2000 printer, specify the **InfoPrint 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 **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 a Windows gateway printer or the IPP gateway**

You cannot select finishing options when you submit a print job using any of these methods, therefore it is recommended that you choose a different submission method if you want to specify finishing options.

If you cannot use a different submission method, the only way to submit print jobs through one of these methods and request finishing options 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, even if the job is only one page long. 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 Windows destination control file. 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 “Submitting jobs through InfoPrint Manager hot folders” on page 372.

### 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.

On a Windows server, the InfoPrint Manager LPD is the only LPD that properly processes the **-o** options that **lprafp** submits. If you use a different LPD (such as TCP/IP Print Services, the LPD supplied with the Windows operating system), the **-o** options that you send will be lost. You can download an **lprafp** sample code package from the InfoPrint Solutions Company Web site at <http://www.infoprint.com>. The package includes executable forms of the **lprafp** client for



the Windows and AIX (Version 4.3.3 Build Level 9 and above) platforms. You can also compile this code to use it on other platforms. InfoPrint Solutions Company does not provide support for the package.

## 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 35. 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 36. 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

Table 36. Options to set for paper fed LEF on the InfoPrint 60 (continued)

Desired output	Select this value for "portrait" jobs	Select this value for "landscape" jobs
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 37. 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 <sup>1</sup>
One staple in the bottom right corner	staple bottom right <sup>1</sup>	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
Two staples on the bottom edge of the paper	Not supported	edge stitch right

<sup>1</sup> 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 38. 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

Table 38. Options to set for paper fed SEF on the InfoPrint 45 (continued)

Desired output	Select this value for "portrait" jobs	Select this value for "landscape" jobs
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 39. 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
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 InfoPrint 2060ES, InfoPrint 2075ES, InfoPrint 2090ES, InfoPrint 2190, InfoPrint 2210, and InfoPrint 2235

Table 40. 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 41. 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

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## 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-finishing-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” on page 360.
  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 359. 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 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

When you submit a job using InfoPrint Submit Express, 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

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 provided with 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 Windows: Getting Started*. To specify the AFP driver for your printer, follow the directions in "Creating InfoPrint Select printers" in *InfoPrint Manager for Windows: Getting Started* 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 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 a Passthrough printer:** A Passthrough printer allows InfoPrint Manager for Windows to bridge to the Windows print-spooling subsystem, and it 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 a Windows gateway printer or the IPP gateway

You cannot select finishing options when you submit a print job using any of these methods, therefore it is recommended that you choose a different submission method if you want to specify finishing options.

If you cannot use a different submission method, the only way to submit print jobs through one of these methods and request finishing options 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 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 Windows destination control file. 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 “Submitting jobs through InfoPrint Manager hot folders” on page 372.

### 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.

On a Windows server, the InfoPrint Manager LPD is the only LPD that properly processes the `-o` options that **lprafp** submits. If you use a different LPD (such as TCP/IP Print Services, the LPD supplied with the Windows operating system), the `-o` options that you send will be lost. You can download an **lprafp** sample code package from the InfoPrint Solutions Company Web site at <http://www.infoprint.com>. The package includes executable forms of the **lprafp** client for the Windows and AIX (Version 4.3.3 Build Level 9 and above) platforms. You can also compile this code to use it on other platforms. InfoPrint Solutions Company does not provide support for the package.

## 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 42. 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 43. 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 44. 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 45. 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 46. 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
saddle-stitch	not supported	not supported



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## Chapter 34. 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.

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### 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.

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## 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.

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## Chapter 35. General Operator and User Procedures

This topic describes these procedures:

- “Turning duplexing on and off for the InfoPrint 45 and InfoPrint 70”
- “Deleting orphan files and resubmitting jobs to MVS Download” on page 370
- “Using a Windows gateway printer” on page 371
- “Adding an Internet Printing Protocol (IPP) gateway printer to your desktop” on page 372
- “Submitting jobs through InfoPrint Manager hot folders” on page 372
- “Submitting print jobs through the InfoPrint Manager LPD” on page 374
- “Checking job status” on page 376
- “Interrupting and restarting a job that is currently printing on an InfoPrint 4000/4100” on page 376
- “Stopping, restarting, or pausing a job that is currently printing” on page 378
- “Pausing a job that’s printing” on page 380
- “Moving backward or forward in a job that is currently printing” on page 382
- “Stopping a printer to perform scheduled maintenance” on page 384
- “Fixing a printer problem and starting to print again” on page 384

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### 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.

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## Deleting orphan files and resubmitting jobs to MVS Download

Orphaned files are old files left in the Windows file system because you specified the **Keep CMD file for Resubmitting Jobs** check box when you started the MVS Download receiver to submit the jobs, and errors prevented InfoPrint from processing these print jobs. Their file names follow the MVS Download Destination Control file naming format:

`MVS_system_name.job_name.dataset_name.forms_name.yyddd.hhmmsstABCD.PRD`

Because orphan files can cause performance problems, you should either correct the problem that prevented the job from processing and then resubmit the job to MVS Download, or delete the orphan files from the system.

### Deleting orphaned files from the system

Orphan files should only occur when there's an error. If you do not want to identify and correct errors, delete all files that are older than some site-determined period, such as three days.

To manually delete individual files, you can do the following:

1. In the **Management Console**, double-click the MVS Download receiver that you want to clean out.
2. In the **Viewing: Receiver xxx** dialog, find the **View Job Data** field and click **Browse**. The orphan and **.CMD** files that remain on the InfoPrint Manager server are listed in the **MVS Download Receiver Data** dialog that opens.
3. Highlight the job to be deleted and right-click it, then select **Delete** from the menu that appears.

### Resubmitting jobs

Use the following procedure to resubmit jobs through MVS Download:

1. In the **Management Console**, double-click the MVS Download receiver that received the failed print job.
2. In the **Viewing: Receiver xxx** dialog, find the **View Job Data** field and click **Browse**. The orphan and **.CMD** files that remain on the InfoPrint Manager server are listed in the **MVS Download Receiver Data** dialog that opens.
3. Right-click the **.CMD** file that failed.
4. Select **Edit** from the menu that appears to open the **.CMD** file as a text file.



5. Edit the file as you need to and save it.
6. Close the text editor.
7. Back in the **MVS Download Receiver Data** dialog, select and right-click the **.CMD** file again.
8. Select **Open** from the menu that appears to run the file.
9. In the **MVS Download Receiver Data** dialog, click **Cancel**.
10. In the **Viewing: Receiver xxx** dialog, click **Cancel**.

If you identify and correct print errors, re-submission of the file to MVS Download should delete the file once it is successful.

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## Using a Windows gateway printer

A Windows gateway printer is a Windows shared printer that you create on your InfoPrint Manager server system. This allows users anywhere in the network to submit print jobs through InfoPrint Manager. InfoPrint Manager organizes everyone's print jobs by putting them in a print queue in the order that it receives them, then sends them all to the correct printers. In addition, if you have InfoPrint Manager notifications running on your workstation, InfoPrint manager sends you messages about the status of your print job.

Users must follow the instructions in "Adding a Windows gateway printer to a workstation" to add the Windows gateway printer to their desktops. Administrator's can use the Management Console to create and administer a Windows gateway printer. The Management Console help includes instructions.

**Note:** When InfoPrint Manager is uninstalled, all Windows Gateway printers are deleted. Therefore, you must have your users manually delete the Windows Gateway printer from their desktops after the uninstall.

## Adding a Windows gateway printer to a workstation

To add a Windows gateway printer to a workstation, instruct your users to follow the steps below. This procedure assumes that you have already created the Windows gateway printer on the InfoPrint Manager server system.

1. Locate the share name of the Windows gateway printer.
2. Follow the standard procedure for adding a network printer to your desktop. This procedure depends on the operating system that you use. For example, on Windows systems, use the **Add Printer Wizard** to create a printer that will be managed by network print server. When you are prompted for the name of the printer to connect to, enter the share name of the Windows gateway printer.
3. Once the connection to the Windows gateway printer is created, you can print to it just as you would print to any other printer.

### Notes:

1. When the InfoPrint Manager server is uninstalled, any Windows gateway printers that exist on the server are deleted. However, connections to those Windows gateway printers that have been added to workstations are still present; they are still displayed in the Printers window, and you can still try to print to them from applications. Because the Windows gateway printer on the InfoPrint Manager server no longer exists, those print jobs will fail. If you try to print to one of these Windows gateway printer, you will get an application-dependent message that does not identify this problem. To resolve

this problem, delete the Windows gateway printer from your desktop and create a new one once your print system administrator has created a new one.

2. In certain situations, the system may attempt to use drivers that you have not intended to be used.

To avoid this situation, load print drivers for each client OS on the InfoPrint Manager server system so that they can be automatically installed onto client machines over the network (if they are not already on the client system).

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## Adding an Internet Printing Protocol (IPP) gateway printer to your desktop

The Internet Printing Protocol (IPP) is a data transport protocol that allows you to print your documents to any IPP-enabled printer whose IP address you know. You can use IPP to send print data over both LANs and the Internet, so you can send print jobs to a network printer from your desk, your home office, or anywhere that you find an Internet connection. Not all printers are currently enabled to work with IPP. However, InfoPrint Manager provides an IPP gateway (a mechanism that allows you to use IPP) even if your printers are not IPP-enabled.

**Note:** You must work with your InfoPrint Manager Administrator to have the IPP gateway enabled through the Management Console.

An **Internet Printing Protocol (IPP) gateway printer** is a printer that you create on a client workstation using IPP client software, such as the Windows 2000 IPP client. Users submit print jobs to that printer, and they are sent to InfoPrint Manager through the InfoPrint IPP gateway. The IPP gateway can then send the job on to any InfoPrint printer, even those that are not IPP-enabled.

To be able to print through an IPP gateway, you must first have IPP client software installed on your workstation or laptop. IPP client software is available from various printer vendors; check with your printing system administrator to see which IPP client your company is using. Once you have the IPP client software installed, follow these steps to set up to print through the IPP gateway.

1. Ask your printing system administrator for the address of the printer that you want to print to.
2. Follow the instructions provided with your IPP client software for adding a printer to your desktop. When you are asked for the address of the printer, enter the address that you got in step 1.
3. Once the printer is added, you can print to it just as you would any other printer.

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## Submitting jobs through InfoPrint Manager hot folders

### Mapping a network drive

On the end user system, use the standard Windows method to map a network drive (available in Windows Explorer) to the InfoPrint Manager hot folder. If there are multiple hot folders within the same directory, you only have to map one network drive to the parent directory; you will be able to access all of the subdirectories through it.

## Submitting jobs through a hot folder

To submit a job through a hot folder, simply copy or move the print file to the hot folder.

**Note:** If you experience problems with hot folders submitting incomplete jobs to the InfoPrint Manager server, use the method described in “Staging jobs.”

**Attention:** If you want to save the file, copy it. Files are deleted from the hot folder after submission.

### Specifying job attributes

By default, jobs submitted through a hot folder use the attribute values in the default document and default job associated with the logical destination; and also by default, hot folder jobs are submitted to InfoPrint Manager with job notifications turned off. If you want to receive notifications about jobs that you submit through hot folders, you must specify a **notification-profile** with an explicit **delivery-address** in the .att file. If you want to specify other attributes or use different values for existing attributes, complete these steps.

1. Either on your system or in the hot folder itself, create a text file to use as your attributes file. Name the attributes file *filename.att*, where *filename* is the same as the file name of the print file. For example, if the print file is *report.pdf*, the attributes file is *report.pdf.att*.
2. In the attributes file, specify the InfoPrint attributes and values that you want to use for this job. For example, if you want to print three single-sided copies of *report.pdf*, *report.pdf.att* looks like this:

```
copy-count = 3
sides = 1
```

**Note:** The attributes file is in the same format as a `-X` file passed to a `pdpr` command.

For information about job and document attributes, refer to *InfoPrint Manager: Reference*.

3. If you created the attributes file on your system, copy or move the file to the hot folder. The InfoPrint Manager logical destination recognizes the .att file extension as an attributes file and knows not to try to print it.
4. Copy or move the print file to the hot folder. The InfoPrint Manager logical destination sees the print file and looks for an attributes file with the same file name. Both of the files are taken and your attributes are used.

### Staging jobs

You can stage jobs to InfoPrint Manager with this procedure:

1. Make a copy of the print file on your local system.  
You will end up with 2 files: **report.pdf** and **copy of report.pdf**.
2. Rename the copy of the print file so that it has the same name as the original print file and the extension .stg.  
Rename **copy of report.pdf** to **report.pdf.stg**.
3. Copy the new file to the hot folder.  
Copy **report.pdf.stg** and paste it in the hot folder.

**Note:** The InfoPrint Manager logical destination ignores files with the .stg extension.

4. Change the extension back to the original extension when you want the job to print.  
Rename **report.pdf.stg** back to **report.pdf**. InfoPrint Manager will pick up the renamed file and send it to print.

### Submitting multiple-document jobs

You can use staging to print jobs that contain multiple documents. In this case, you stage an entire directory. The InfoPrint Manager logical destination prints the documents as one job, in the order that you copied the files into the directory.

1. Navigate to the hot folder (using Windows Explorer, for example).
2. In the hot folder directory, create a new folder named *jobname.stg*, where *jobname* is any name you choose.

**Note:** The InfoPrint Manager logical destination ignores directories with the .stg extension.

3. Copy the documents you want to print into the subdirectory in the **same** order that you want to print them.

**Note:** If you copy multiple files in a single operation, they may not be copied in the same order that you selected them. If the print order matters, copy the files one at a time.

4. If you want to override the default attributes, create an attributes file called *jobname.att*, where *jobname* is the same as the subdirectory name, and copy it into the hot folder.
5. Rename the subdirectory from *jobname.stg* to *jobname*. The InfoPrint Manager logical destination then accepts all of the files in the subdirectory as a single job.

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## Submitting print jobs through the InfoPrint Manager LPD

The InfoPrint Manager Line Printer Daemon (LPD) is a utility that allows you to submit print jobs from other operating systems using a Line Printer (LPR) client. The InfoPrint Manager LPD replaces the LPD that is supplied with the Windows operating system (TCP/IP Print Services), however, it submits the files it receives directly to an InfoPrint destination, not to a Windows printer. It also supports the -o options that are available with some LPR clients (-o options allow you to specify advanced InfoPrint print options such as formdefs and pagedefs).

Only one LPD can run on your InfoPrint Manager server system at a time. If you have TCP/IP Print Services installed, InfoPrint Manager disables it and enables the InfoPrint Manager LPD. If you would prefer to use TCP/IP Print Services, use the Management Console to change the service configuration. Refer to the Management Console help for further instructions.

**Important:** If you have a different LPD installed, InfoPrint Manager does **not** disable it, but installs and starts the InfoPrint Manager LPD. You must stop one of the LPDs before you try to submit a print job using an LPR client.

To submit print jobs to the InfoPrint Manager LPD, you can use any LPR client. However, if you want to be able to specify advanced InfoPrint options on the -o flag, you should use the **lprafp** sample code package. **lprafp** is an LPR client that is available as a free download from the InfoPrint Solutions Company website. The package includes executable forms of the **lprafp** client for the Windows and AIX

(version 5.1 and above) platforms. You can compile this code to use it on other platforms as well. InfoPrint Solutions Company does not provide support for the package.

**Note:** The Microsoft LPR client supports a `-o` flag, but it is not the same as the InfoPrint `-o`. Any values you pass to InfoPrint Manager using the Microsoft `-o` flag will be lost. In addition, some LPR clients provide print control functions, such as landscape print. The InfoPrint Manager LPD does not support these options.

## 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>. Use this procedure to locate and install the package:

1. Navigate to <http://www.infoprint.com> in your Web browser.
2. Click **Support and maintenance**.
3. Select **InfoPrint Manager for Windows** in the **Software Support** list.
4. On the InfoPrint Manager for Windows Home page, click **Downloads**.
5. On the Downloads page, click **InfoPrint Manager for Windows NT and Windows 2000 downloads**.
6. Choose **lprafp - LPR sample code package** and click **FTP**.
7. Save the `lprafp.zip` file to your machine.
8. Use a zip utility to unzip the package.
9. Open the `readme.txt` file and follow the instructions for installing the package on a Windows system.

## Preparing to submit print jobs

When you submit jobs to the InfoPrint Manager LPD, it uses a mapping file to match the keywords you specify on the `-o` option with InfoPrint attributes. A sample mapping file comes with InfoPrint Manager for Windows; before you submit any print jobs to the InfoPrint Manager LPD, you should modify this file to meet your needs.

To modify the mapping file do the following.

1. Open the file `<install path>\var\pd\lpd\lpdmap.txt` (where `<install path>` is the directory where InfoPrint Manager is installed) in a text editor such as Notepad.
2. Read all of the instructions in the mapping file before you make any changes.
3. Edit the mappings as necessary and save the file using the same name.

Because all LPR clients use different keywords, it is impossible to list them all. The mappings listed are "best guess" mappings and may not generate the results you need. The best way to see what values you need to add or change is to uncomment the line that reads:

```
* DEBUG
```

and save the file. (To uncomment the line, delete the `*`.) Submit a print job through the LPD and check the output. If the job fails or if it prints incorrectly, check the error messages in the server log in the Management Console. Use them to help

determine which keywords are missing or mapped incorrectly. When you are finished, be sure to open the mapping file and comment the DEBUG line out again.

## Submitting print jobs

When you submit print jobs using the LPR client, all you need to specify is the InfoPrint Manager server and the name of an InfoPrint destination (logical or actual). The InfoPrint Manager LPD submits the job to the InfoPrint print spool.

---

## Checking job status

This section describes some ways you can find out the status of print jobs that you submit through InfoPrint Manager.

### Checking status using notifications

The easiest way to find out the status of print jobs that you submit is to have InfoPrint Manager send you messages about them. You can use the InfoPrint Manager Notifications client, or if you submitted the job using Select, you can use Select notifications. Installing and setting up the Notifications client is described in the *InfoPrint Manager for Windows: Planning and Installation Guide* book. In addition, see Chapter 7, “Using InfoPrint Manager notifications,” on page 31 and “Working with Select notifications” on page 34 for more detailed instructions about using the Notifications client and Select notifications.

### Checking status from the Printers window

If you cannot or choose not to use InfoPrint Manager notifications, you may be able to check the status of your jobs manually. If you submit jobs to a Windows gateway printer or to a Select printer, follow these steps:

1. Click the Windows **Start** button, and select **Settings** → **Printers** to open the Printers window.
2. In the Printers window, double-click the printer that you sent your job to. The job window for that printer will open.
3. Find your job in the list of documents. If the job isn't in the list, it may be finished printing.

**Note:** For Windows gateway printers, print jobs will appear in this list only if the gateway was configured to report accurate job status back to workstations.

---

## 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 384.

**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.



---

## 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 384.

**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 382 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 47. 2-up duplex print job: front and back views

	Front of sheet	Back of sheet
Sheet one		
Sheet two		
Last sheet		

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 a job that's printing

When you use the use this procedure, InfoPrint Manager stops the job, checks to see if the paused job is indeed the job currently printing, and collects checkpoint information about the job if it is. The job shows on the GUI as **Paused**. Assuming that the operator does not take actions that invalidate the checkpoint information when the job is resumed, it should restart at the checkpoint boundary. If the checkpoint information is invalidated, the job restarts at page 1 unless the operator changes the page range before resuming the job. Changing the job attributes so that the job would have to be re-ripped before printed is an example of an action that would invalidate the checkpoint information.

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.

---

## 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:

$$(\text{number from step 6}) - (\text{number from step 5}) - 1 = \text{number of sheets to skip}$$

- 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:

$$(\text{number from step 5}) - (\text{number from step 6}) + 1 = \text{number of sheets to back up}$$

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.
  - If you are printing a duplex job, multiply the number from step 7 by two to get the number of sides. (number from step 7 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.

### 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 385 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 48. 2-up duplex print job: front and back views

	Front of sheet	Back of sheet
Sheet one		
Sheet two		
Last sheet		

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.



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## **Part 6. 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.	<i>pddisable -cd dest</i> where <i>dest</i> specifies either a logical or an actual destination (printer) object.
2	Enable	Allow a printer to receive new jobs.	<i>pdenable -cd dest</i> where <i>dest</i> specifies either a logical or an actual destination (printer) object.
3	Query active job	Query which job is actively printing on a printer <b>Note:</b> 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: <ul style="list-style-type: none"> <li>• Pause the printer (7)</li> <li>• Issue the query</li> <li>• Resume the printer (11).</li> </ul>	<i>pdlc -f "destination-name-requested==ldest &amp;&amp; current-job-state==printing" server:</i> where <i>server</i> specifies the InfoPrint AIX server to which the job was submitted, and <i>dest</i> specifies the actual destination (physical printer).
4	Query page number	Query the page number of the currently printing page. Refer to <b>Note</b> after (3).	<i>pdlc -cj -r current-page-printing jobid</i> where <i>jobid</i> specifies the <b>job-identifier</b> attribute. We recommend using the global ID, which follows the convention <i>server:0123456789</i> where <i>server</i> 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 <b>job-identifier</b> attribute value by specifying: <i>pdlc -cj server:</i>
5	Query job details	Query the number of copies, sheets and pages stacked for a job. Refer to <b>Note</b> after (3).	<i>pdlc -cj -r "job-copies-completed media-sheets-completed pages-completed" jobid</i> where <i>jobid</i> specifies the <b>job-identifier</b> attribute.
6	Clean	Remove all jobs from a printer.	<i>pdcclean ldest</i> where <i>ldest</i> specifies the logical destination (logical printer).

	Task	Description	InfoPrint Manager Command Syntax
7	Pause printer	Pause a printer immediately.	<i>pdpause -cd dest</i> where <i>dest</i> specifies the actual destination (physical printer).
8	Pause printer	Pause a printer after the current copy completes.	<i>pdpause -cd -w after-current-copy dest</i> where <i>dest</i> specifies the actual destination (physical printer).
9	Pause printer	Pause a printer after the current job completes.	<i>pdpause -cd -w after-current-job dest</i> where <i>dest</i> specifies the actual destination (physical printer).
10	Resume printer	Resume a printer that had been paused.	<i>pdresume -cd dest</i> where <i>dest</i> specifies the actual destination (physical printer).
11	Cancel job	Cancel a specific job.	<i>pdrm jobid</i> where <i>jobid</i> specifies the <b>job-identifier</b> attribute.
12	Pause job	Pause a specific job after the current copy completes.	<i>pdpause -cj -w after-current-copy jobid</i> where <i>jobid</i> specifies the <b>job-identifier</b> attribute.
13	Pause job	Pause a specific job immediately.	<i>pdpause -cj jobid</i> where <i>jobid</i> specifies the <b>job-identifier</b> attribute.
14	Pause job	Pause the job that is currently printing immediately.	<i>pdpause -cd -j dest</i> where <i>dest</i> specifies the actual destination (physical printer).
15	Pause job	Pause the job that is currently printing after the current copy.	<i>pdpause -cd -j -w after-current-copy dest</i> where <i>dest</i> specifies the actual destination (physical printer).
16	Resume job	Resume a job that was paused.	<i>pdresume -cj jobid</i> where <i>jobid</i> specifies the <b>job-identifier</b> attribute.
17	Back space	Back space (reprint a specific number of sides) the job that is printing.	<i>pdspace -cd -b sidecount dest</i> where <i>dest</i> specifies the actual destination (physical printer).
18	Reprint	Reprint the job that is printing from the beginning.	<i>pdspace -cd -b -1 dest</i> where <i>dest</i> specifies the actual destination (physical printer).
19	Forward space	Forward space (skip a specific number of sides) the job that is printing.	<i>pdspace -cd -f sidecount dest</i> where <i>dest</i> 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 , 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.





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## 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 397
- “IPDS error recovery: Intervention required conditions” on page 398
- “IPDS error recovery: Unrecoverable problems” on page 399

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### 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 (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 397

### 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.

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### 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 example:

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.
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.

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## 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.



## Appendix C. Supported formatting objects

Table 49 lists the XSL formatting objects (XSL-FO) and properties that XML Extender supports. For more information about XSL formatting objects and XSL style sheets, refer to <http://www.w3.org/TR/XSL/> and <http://www.w3.org/Style/XSL/>.

**Attention:**

- The XML transforms do not support XSL shorthand properties and XSL functions.
- For the common properties listed in the table, most of their properties are supported.

*Table 49. Supported XSL formatting objects.* The order of the formatting objects is based on the order listed in the XSL Standard on W3C.

Formatting object	Category	Property
root	declaration-pagination-layout	
page-sequence	declaration-pagination-layout	initial-page-number
		master-reference
page-sequence-master	declaration-pagination-layout	master-name
single-page-master-reference	declaration-pagination-layout	master-reference
repeatable-page-master-reference	declaration-pagination-layout	master-reference
		maximum-repeats
repeatable-page-master-alternatives	declaration-pagination-layout	maximum-repeats
layout-master-set	declaration-pagination-layout	
simple-page-master	declaration-pagination-layout	Common Margin Properties-Block
		master-name
		page-height
		page-width
region-body	declaration-pagination-layout	Common Border, Padding, and Background Properties
		Common Margin Properties-Block
		clip
		region-name
		reference-orientation
region-before	declaration-pagination-layout	Common Border, Padding, and Background Properties
		extent
		precedence
		region-name
		reference-orientation

Table 49. Supported XSL formatting objects (continued). The order of the formatting objects is based on the order listed in the XSL Standard on W3C.

Formatting object	Category	Property
region-after	declaration-pagination-layout	Common Border, Padding, and Background Properties
		extent
		precedence
		region-name
		reference-orientation
region-start	declaration-pagination-layout	Common Border, Padding, and Background Properties
		extent
		region-name
		reference-orientation
region-end	declaration-pagination-layout	Common Border, Padding, and Background Properties
		extent
		region-name
		reference-orientation
flow	declaration-pagination-layout	flow-name
static-content	declaration-pagination-layout	flow-name
block	block	Common Border, Padding, and Background Properties
		Common Font Properties
		Common Margin Properties-Block
		absolute-position
		color
		linefeed-treatment
		line-stacking-strategy
		text-align
		visibility
		text-indent
		white-space-collapse
		white-space-treatment
		wrap-option
block-container	block	Common Border, Padding, and Background Properties
		Common Margin Properties-Block
		block-progression-dimension
		height
		inline-progression-dimension
		reference-orientation
		width



Table 49. Supported XSL formatting objects (continued). The order of the formatting objects is based on the order listed in the XSL Standard on W3C.

Formatting object	Category	Property
character	inline	Common Border, Padding, and Background Properties
		Common Font Properties
		Common Margin Properties–Inline
		character
		color
initial-property-set	inline	Common Border, Padding, and Background Properties
		Common Font Properties
		color
external-graphic	inline	Common Border, Padding, and Background Properties
		Common Margin Properties–Inline
		block-progression-dimension
		content-height
		content-width
		inline-progression-dimension
		src
		text-align
inline	inline	Common Border, Padding, and Background Properties
		Common Font Properties
		Common Margin Properties–Inline
		block-progression-dimension
		color
		height
		inline-progression-dimension
		width
		wrap-option
inline-container	inline	Common Border, Padding, and Background Properties
		Common Margin Properties–Inline
		block-progression-dimension
		height
		inline-progression-dimension
		reference-orientation
		width

Table 49. Supported XSL formatting objects (continued). The order of the formatting objects is based on the order listed in the XSL Standard on W3C.

Formatting object	Category	Property
page-number	inline	Common Border, Padding, and Background Properties
		Common Font Properties
		Common Margin Properties–Inline
		wrap-option
table-and-caption	table	Common Border, Padding, and Background Properties
		Common Margin Properties–Block
		caption-side
		text-align
table	table	Common Border, Padding, and Background Properties
		Common Margin Properties–Block
		block-progression-dimension
		inline-progression-dimension
		height
		table-layout
		width
table-column	table	column-width
		number-columns-spanned
table-caption	table	Common Border, Padding, and Background Properties
		block-progression-dimension
		height
		inline-progression-dimension
		width
table-header	table	Common Border, Padding, and Background Properties
table-footer	table	Common Border, Padding, and Background Properties
table-body	table	Common Border, Padding, and Background Properties
table-row	table	Common Border, Padding, and Background Properties
		height

Table 49. Supported XSL formatting objects (continued). The order of the formatting objects is based on the order listed in the XSL Standard on W3C.

Formatting object	Category	Property
table-cell	table	Common Border, Padding, and Background Properties
		block-progression-dimension
		empty-cells
		ends-row
		height
		inline-progression-dimension
		number-columns-spanned
		number-rows-spanned
		starts-row
		width
list-block	list	Common Border, Padding, and Background Properties
list-item	list	Common Border, Padding, and Background Properties
list-item-body	list	
list-item-label	list	



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## Appendix D. Accessibility

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, use software products successfully. The major accessibility features in the InfoPrint Manager for Windows let users:

- Use assistive technologies such as screen-readers and screen magnifier software.
- Operate specific or equivalent features using only the keyboard.
- Customize display attributes such as color, contrast, and font size.

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### Using assistive technologies

Assistive technology products, such as screen-readers, function with the user interfaces found in the InfoPrint Manager for Windows. Consult the assistive technology documentation for specific information when using it to access the InfoPrint Manager for Windows.

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### Keyboard navigation of the user interface

The InfoPrint Manager for Windows user interface complies with the accessibility guidelines for HTML. Users can use keyboard shortcuts or function keys (PF keys) to access the InfoPrint Manager for Windows user interface. For example, Alt+Shift+F2 lets you skip to the main content. Refer to your browser documentation for keyboard shortcuts and default settings for the PF keys and for explanations about how to modify their functions.



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## Glossary

This glossary provides definitions of specialized terms used by InfoPrint. This glossary does not define terms that are defined in non-technical dictionaries or that have no special meaning in information processing.

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## Sources and References

This glossary includes definitions from the following sources:

- Definitions reprinted from a published section of the International Organization for Standardization's (ISO) *Vocabulary—Information Processing* or from a published section of the *ISO Vocabulary—Office Machines* are identified by the symbol (I) following the definition.
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- Definitions reprinted from *Introduction to OSF DCE*, by Open Systems Foundation, published by Prentice-Hall, are identified by (OSF).
- Definitions from *Portable Operating System Interface (POSIX) System Administration Interface/Printing Standards Project* are identified by (P).
- Definitions from *Information technology—Document printing application (DPA)—Part 1: Abstract-service definition and procedures* are identified by (D).
- Definitions from *AIX Version 4.1 Topic Index and Glossary* are identified by (X).
- Definitions from *IBM Dictionary of Computing*.
- Definitions that are specific to certain products are so labeled, for example, "In InfoPrint", or "In DCE".

This glossary uses the following cross-references:

### Contrast with

This refers to a term that has an opposed or substantively different meaning.

### Synonym for

This indicates that the term has the same

meaning as a preferred term, which is defined in its proper place in the glossary.

### Synonymous with

This is a backward reference from a defined term to all other terms that have the same meaning.

**See** This refers you to multiple-word terms that have the same last word.

### See also

This refers you to terms that have a related, but not synonymous, meaning.

## Special Characters

### .Guidefaults file

A file created by InfoPrint in the home directory of a person using the InfoPrint GUI. InfoPrint uses this file to save and reference information about the servers you are monitoring and the windows you are working in.

## A

### Access Control List (ACL)

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 (**pio**be), 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 characters 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 input. Imagesetting is the step before Cromalin proofing and platemaking.

**imposition**

The process of arranging pages on a press sheet to ensure the correct order during final cutting, folding, and binding.



Electronic imposition builds press sheets automatically during the RIP and outputs film formatted for immediate use in platemaking.

**InfoPrint**

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.

**pdcrdcs**

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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