

IBM Infoprint Manager for Windows NT and
Windows 2000



Configuration Guide

Version 1 Release 1

IBM Infoprint Manager for Windows NT and
Windows 2000



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Version 1 Release 1

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About This Publication

This publication helps you complete some of the more advanced configuration tasks for IBM Infoprint Manager for Windows NT and Windows 2000. It provides configuration information for both host and LAN printing, as well as other topics of interest.

Audience

This document is intended for the administrator who configures and manages the Infoprint Manager printing environment.

June 29, 2000

Part 1. Introduction

Chapter 1. Introduction

Assumptions

This book assumes that you have completed the following tasks before you begin any of the configuration procedures:

- Installed IBM Infoprint Manager for Windows NT and Windows 2000.
- Learned about Infoprint objects (including logical destinations, queues, and actual destinations) from the *IBM Infoprint Manager for Windows NT and Windows 2000: Planning Guide*.
- Decided what model (funnel, hourglass, one-to-one) your printing system will follow using the *IBM Infoprint Manager for Windows NT and Windows 2000: Planning Guide*.
- Determined whether you want to use PSF Direct or MVS Download for host printing using the *IBM Infoprint Manager for Windows NT and Windows 2000: Planning Guide*.
- Determined what kinds of actual destinations you need to create using the *IBM Infoprint Manager for Windows NT and Windows 2000: Getting Started*, though you may not have created them yet.
- Installed the IBM 4159 Model 001 S/390 Parallel Channel Emulator Card using the *IBM Infoprint Manager for Windows NT and Windows 2000: Getting Started*, if you will be printing to a channel-attached printer.

The book further assumes that you have some experience administering Windows systems.

Important Information for PSF for OS/2 Users

If you are replacing your PSF for OS/2 system with IBM Infoprint Manager for Windows NT and Windows 2000, you must be aware of the following differences between the two products.

- Infoprint Manager does not support SNA printers or IBM model 3820 printers.
- Infoprint Manager does not include the Distributed Print Function (DPF) that existed in PSF for OS/2, and there is no exact equivalent of that feature. Refer to the *IBM Infoprint Manager for Windows NT and Windows 2000: Planning Guide* for an overview of the host printing options that are available.
- If you currently use the Distributed Print Function (DPF) of PSF for OS/2, the resource files you use for printing are in Intelligent Printer Data Stream (IPDS) format. However, if you choose to replace DPF with MVS Download for your host printing, you will need to use the Advanced Function Presentation (AFP) versions of those files on the Windows NT/Windows 2000 system that Infoprint Manager is installed on. You can find the AFP versions on your host system.
- If you currently submit print jobs to PSF for OS/2 from a Netware server, you can submit them to Infoprint Manager as well. However, the netware.exe feature of Infoprint Manager can only accept jobs from a Netware server running version 4.1 or higher. If you currently use netware.cmd in PSF for OS/2, you already have the correct version of Netware. If you use nwqinfo.dll or nwpsf2.exe in PSF for OS/2, you will need to upgrade your Netware server.

June 29, 2000

Part 2. Setting Up Host Printing

Chapter 2. Collecting information from your PSF for OS/2 system

IBM Infoprint Manager for Windows NT and Windows 2000 is a functional replacement product for IBM Print Services Facility for OS/2 (PSF for OS/2). Most of the functionality that was available in PSF for OS/2 is also available in Infoprint Manager for Windows NT and Windows 2000. In addition, Infoprint Manager includes many features that were not available in PSF for OS/2, such as page-definition support and PostScript Level 3.

Like PSF for OS/2, Infoprint Manager for Windows NT and Windows 2000 supports integrated host and LAN printing. Host platforms that Infoprint Manager supports include: AS/400, VM, VSE, MVS, and OS/390.

Note: Support for the Upload-n-Print feature of PSF for OS/2 (the direct submission of print jobs from LAN applications to host-attached printers) is not available in IBM Infoprint Manager for Windows NT and Windows 2000.

If you are replacing your PSF for OS/2 system with Infoprint Manager, this chapter will help you collect the information you need to recreate your printing environment on a Windows NT/Windows 2000 system. It will also provide information about other tasks you will have to perform, such as moving your AFP resources and understanding the differences in printer definitions between PSF for OS/2 and Infoprint Manager.

Preparing your PSF for OS/2 System

Before you start to collect information and move resources to your Windows system, it is recommended that you apply the most recent CSD and the latest ALL20 (interim CSD) to your PSF for OS/2 system. Applying this service level makes your AFP resources more accessible, which help to make the process of changing over to Infoprint Manager for Windows NT and Windows 2000 easier. To download the latest service, go to

<ftp://ftp.software.ibm.com/printers/products/psfos2/service>

In the list that appears, find the most recent CSD and its readme file, and the latest ALL20. Apply these updates to all of your PSF for OS/2 systems.

Note: If you only use PSF Direct in PSF for OS/2, are planning to only use the PSF Direct function of Infoprint Manager, and you never used the OS/2 spools for printing, you do not need to apply these updates.

Moving AFP Resources

Any AFP resources that you used with PSF for OS/2 can be used with Infoprint Manager for Windows NT and Windows 2000. If you have AFP resources that you would like to continue to use in your Infoprint Manager environment, use this procedure to move those files.

1. Make a list of your AFP resource files and where they are stored.
 - a. Navigate to the **PSF2\SYSTEM** directory on your OS/2 system.
 - b. Find all of the files that end in .GRP.

These files are flat text files that list all of your resources and information about them. You can open these files in a text editor or print them to see the

contents. When you open or print any of the files, you will see six columns of data. From left to right, the columns list:

- Resource name
 - Group that the resource belongs to
 - Type of resource
 - Date of the resource
 - Time of the resource
 - Path and file name of the resource
- c. Print all of the files that end in .GRP so you can refer to them later.
You will need to move all of the resources that are listed to your Windows system.
2. If you have any resources defined outside of the resource library (for example, if any of your PSF for OS/2 device definitions include explicit paths to resources), add those resource files to your list. Follow these steps to find these resources:
- a. Open the PSF for OS/2 Control Panel.
 - b. Highlight a printer.
 - c. Select **Profile** → **Change** → **Default Options**.
 - d. Look at the entry in the **Default Search Order** field.
If there is a directory path listed, there are resources in that directory and they are all used. Make note of that directory path; you will need to move all of the resources in that directory to your Windows system.
 - e. Close the dialog.
 - f. Repeat this process for each of your printers.
3. On the Windows system that your Infoprint Manager server is installed on, create a directory to store your AFP resource files in.

Important: Do not create this directory as a subdirectory of your Infoprint Manager <install path> directory. If you place them in the <install path> directory and you ever have to uninstall Infoprint Manager, your resources may be removed during the uninstall process. It is safer to store your resources outside of the install path.

4. Copy all of the resource files that you found into the directory you just created on your Windows system.
You can move the files however you like, but the easiest way is to use the File Transfer Protocol (FTP).

Important: When you FTP your resources from your OS/2 system to your Windows system, be sure to send it as *binary* data, not as *ASCII* data.

5. Create a resource context object that points to this directory. For instructions on completing this task, refer to the Administration Procedure **Creating a New Resource-Context Object** on your Infoprint Manager Publication CD or on the IBM Printing Systems website at <http://www.ibm.com/printers>; click the Infoprint Manager for Windows NT and Windows 2000 link, then the IBM Infoprint Manager for Windows NT and Windows 2000 link. From there, click the **Reference Information** link in the navigation bar on the left side of the screen, and find **Administration Procedures**.
6. Once you have created Infoprint *actual destinations* to replace your PSF for OS/2 *printers*, start the Infoprint Manager Administration GUI and open the properties notebook for one of your actual destinations. Click the **PSF**

Resources tab and type the path to the directory you created in step 3 in the **Location of Resources** field. Click OK to close the properties notebook. Refer to the online help for additional information.

Mapping PSF for OS/2 Printer Definitions to Infoprint Manager Destination Types

When you created printer devices in PSF for OS/2, you chose from six attachment types: Communication, Parallel, TCP/IP, Channel, PSA, and None. In Infoprint Manager, some of these attachment types have equivalents and some do not. To recreate your print environment in Infoprint Manager, you will need to do two things:

1. Print the printer summary for each of your PSF for OS/2 printer devices so you can use that information when you create new destinations in Infoprint Manager.
2. Determine which Infoprint Manager destination types you want to replace your PSF for OS/2 printer devices with.

Once you have completed these steps, refer to the *IBM Infoprint Manager for Windows NT and Windows 2000: Planning Guide* and the *IBM Infoprint Manager for Windows NT and Windows 2000: Getting Started* for additional information about Infoprint Manager destination types and instructions for creating them.

Printing printer summaries

1. Open the PSF for OS/2 Control Panel.
2. Highlight a printer.
3. Select **Profile** → **Summary**.
4. In the dialog that opens, click **Print**.
5. Close the dialog.
6. Repeat this process for each of your printers.

Determining which Infoprint Manager Destination Types to Replace your PSF for OS/2 Printer Devices with

Descriptions of the six PSF for OS/2 printer device types are provided below. If there is an equivalent or near-equivalent destination type in Infoprint Manager, it is listed. If there is no equivalent, refer to the *IBM Infoprint Manager for Windows NT and Windows 2000: Planning Guide*, the *IBM Infoprint Manager for Windows NT and Windows 2000: Getting Started*, and the Administration Procedures to select a destination type that will fit your needs.

Communication

The communication attachment type allowed you to communicate with printers on a Synchronous Data Link Control (SDLC) or SNA 6.2 network using IBM Communications Manager for OS/2 or IBM Communications Server for OS/2. This attachment type has no equivalent in Infoprint Manager.

Parallel

The parallel attachment type allowed you to attach printers directly to a parallel or serial port on a PC. In Infoprint Manager, the closest equivalents are PSF command printers and PSF Other-driver printers.

TCP/IP

TCP/IP-attached printers in PSF for OS/2 received data over the TCP/IP network. You can replace them with TCP/IP-attached PSF printers in Infoprint Manager.

Note: There are two ways to create PSF TCP/IP printers in Infoprint Manager. If you will be using PSF Direct in your Infoprint environment, and you will **only** be using PSF Direct to submit jobs to a particular destination, use the Management Console to create a PSF Direct only (TCP/IP) destination. In any other case (for example, if the destination will be receiving jobs from both PSF Direct and your LAN), use the Infoprint Manager Administration GUI to create a PSF TCP/IP printer.

Channel

Channel-attached printers in PSF for OS/2 allowed you to send jobs to printers through the S/370 Channel Emulator/A adapter (a microchannel adapter). The server systems that Infoprint Manager for Windows NT and Windows 2000 runs on do not support this adapter card. However, Infoprint Manager does support channel-attached printing using the IBM 4159 Model 001 S/390 Parallel Channel Emulator Card (a PCI adapter). Contact your IBM customer service representative to obtain this card.

Once you have the card, you can find instructions for installing it in the *IBM Infoprint Manager for Windows NT and Windows 2000: Getting Started*. Then, you can create a channel-attached PSF printer in Infoprint Manager to replace your channel device.

Note: There are two ways to create PSF channel printers in Infoprint Manager. If you will be using PSF Direct in your Infoprint environment, and you will **only** be using PSF Direct to submit jobs to a particular destination, use the Management Console to create a PSF Direct only (channel) destination. In any other case (for example, if the destination will be receiving jobs from both PSF Direct and your LAN), use the Infoprint Manager Administration GUI to create a PSF channel printer.

PSA

The PSA attachment type in PSF for OS/2 could be used to attach a number of printers through an IBM Micro Channel Print Service Adapter. Because no support is currently available for this adapter under Windows, these printers must be attached to the Infoprint Manager server in a different way.

It is recommended that you change all of your PSA printers to be PSF TCP/IP attached printers in Infoprint Manager. To make this change, you must purchase an i-data 7913 IPDS Printer LAN Attachment, a device that is assigned a TCP/IP address on your network and is connected to the printer itself using a coaxial cable.

None

The None attachment type has no equivalent in Infoprint Manager. You can use the Configurable Transform Subsystem in Infoprint Manager to simulate many of the tasks that you used the None attachment type for, such as terminating transforms. Infoprint Manager does not, however, allow you to redirect IPDS output to fax software as you could using the AIN3DNOP secondary in PSF for OS/2.

Preparing for Host-to-Server Communication

If you are currently using PSF Direct for your host printing and plan to continue to use PSF Direct in Infoprint Manager, you will not need to change any of the configuration on your host system. You will, however, have to install IBM SecureWay Communications Server for Windows NT version 6.01 or higher and all of its APARs (JR13453, JR13599, and JR14098), and then configure it to match the IBM Communications Manager for OS/2 or IBM Communications Server for OS/2 on your existing PSF for OS/2 system.

Note: IBM SecureWay Communications Server for Windows NT version 6.01 does not run on Windows 2000. If you are running your Infoprint Manager server on a Windows 2000 system, IBM SecureWay Communications Server for Windows NT version 6.1 is recommended.

In addition, you will have to create new PSF Direct host receivers in Infoprint Manager that match the host receiver configurations on your existing PSF for OS/2 system. You can collect the information you need from the system that you have PSF for OS/2 installed on.

Collecting Communications Manager/Communications Server Configuration Information

When you created your PSF for OS/2 configuration on your OS/2 system, a file with the suffix .NDF was created and stored in the CMLIB subdirectory where Communications Manager/Communications Server was installed. This file contains the configuration information for Communications Manager/Communications Server. It is usually named BASIC.NDF, but the name may have been changed.

One .NDF file is created for each configuration; you are interested in the one that corresponds to the current active configuration. If you are not sure what your current active configuration is, follow these steps to find out:

1. Find the Communications Manager or Communications Server folder on your OS/2 system.
2. Double-click the Setup icon.
3. Make note of the configuration listed in the default file; it is the current active configuration.
4. Close Setup.

Once you know your current active configuration, find all of the files that end in .NDF in your CMLIB directory, and print the one that corresponds to the current active configuration.

The .NDF file is roughly equivalent to the .acg file that is created on your Windows NT/Windows 2000 system when you install and configure IBM SecureWay Communications Server for Windows NT. The .acg file is stored in <comm server install directory>\ibmcs\private on your Windows system, where <comm server install directory> is the directory that you installed SecureWay Communications Server in. Once you have installed SecureWay Communications Server, it is a good idea to locate the .acg file on your Windows system and compare it to the .NDF from your OS/2 system. If there are discrepancies, you can go back and fix the configuration.

Collecting PSF Direct Host Receiver Configuration Information

You will need to collect the following information about each of your PSF Direct host receivers:

- LU alias name
- Inactivity timer value
- Device busy timer value
- Device name

To find this information, follow these steps:

1. Open your PSF/2 folder.
2. Double-click the **PSF/2 PSF Direct** icon.

3. In the dialog that opens, highlight a receiver.
4. On the menu bar, select **Receiver—>Change**.
5. Make note of the configuration information listed in the dialog.
6. Repeat from step 3 for each receiver.

If you currently use DPF in PSF for OS/2 and plan to use the PSF Direct feature of Infoprint Manager, you must collect information about your DPF receivers as well. To find this information, follow these steps:

1. Open your PSF/2 folder.
2. Double-click the **PSF/2 DPF** icon.
3. In the dialog that opens, highlight a receiver.
4. On the menu bar, select **Receiver —> Setup**.
5. Make note of the **LU alias** and the value of the **Inactivity timer**.
6. Close the dialog.
7. With the same receiver highlighted, select **Spool —> Setup queue** on the menu bar.
8. Make note of the printer information in the dialog that opens.
9. Close the dialog.
10. Repeat this process for each DPF receiver.

Migrating Custom Transform Exit Programs

If you used the XFMFLTR feature of PSF for OS/2 to create custom transform exit programs, you will find a similar function in the Configurable Transform Subsystem of Infoprint Manager. You administer the Configurable Transform Subsystem from the Server menu of the Infoprint Manager Administration GUI. Refer to the online help for additional information.

For information on creating and customizing transforms, refer to “Chapter 7. Understanding Transforms and the Configurable Transform Subsystem” on page 43 and the Administration Procedures *Working with Infoprint Manager Transform Programs* and *Using Data Stream Transform Sequences* on your Infoprint Manager Publication CD or on the IBM Printing Systems website at <http://www.ibm.com/printers>; click the Infoprint Manager for Windows NT and Windows 2000 link, then the IBM Infoprint Manager for Windows NT and Windows 2000 link. From there, click the **Reference Information** link in the navigation bar on the left side of the screen, and find **Administration Procedures**.

Chapter 3. Setting up to use PSF Direct

If you are planning to use PSF Direct for your host printing, refer to the *IBM Infoprint Manager for Windows NT and Windows 2000: PSF Direct Network Configuration Guide* for information and instructions on:

- Configuring your host MVS, VSE, AS/400 or VM system
- Configuring IBM SecureWay Communications Server for Windows NT.

Note to PSF for OS/2 Users: Be sure you have completed all of the tasks outlined in “Chapter 2. Collecting information from your PSF for OS/2 system” on page 7 before you move on to the *PSF Direct Network Configuration Guide*.

Chapter 4. Setting up to use MVS Download

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 received 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 used the Distributed Print Function (DPF) feature of PSF for OS/2, your resources were managed automatically, so any changes you made to your resource files were automatically incorporated into your print jobs. MVS Download 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 MVS Download. You will need to copy the changed resource files to the computer that your Infoprint Manager server runs on.

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.

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 *IBM Infoprint Manager for Windows NT and Windows 2000: Getting Started* for information on creating destinations. Refer to "Making your AFP Resources Available to Infoprint Manager" on page 31 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 17 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. You will not submit AFPDS jobs with inline resources and request multiple copies.
 4. 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.
 5. You will not use MVS Exit 15.

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 will submit AFPDS jobs with inline resources and request multiple copies.
5. You see that some of the MVS to Infoprint mappings in the sample DCF are not what you want.
6. You want to identify MVS job defaults that are not communicated from MVS (for example PAGEDEF).
7. You want to identify Infoprint submission parameters to use on all jobs (for example, the font resource directory on your Windows system).
8. You use Host MVS Exit 15.

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 18
- "Understanding the MVS Download Exit Program" on page 28
- "Creating an MVS Download Receiver" on page 29

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 *IBM Infoprint Manager for Windows NT and Windows 2000: 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 MVS host Download FSA for this computer’s IP address.
 - **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.
 - **Exit Program Name:** 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).

For additional information, refer to the Operator Procedure *Deleting Orphan Files and Resubmitting Jobs to MVS Download* on your

Publication CD or on the IBM Printing Systems website at <http://www.ibm.com/printers>; click the Infoprint Manager for Windows NT and Windows 2000 link, then the IBM Infoprint Manager for Windows NT and Windows 2000 link. From there, click the **Reference Information** link in the navigation bar on the left side of the screen, and find **Operator Procedures**.

6. Click **OK**.
One or more pop-up informational messages may appear; read them and click **OK** to dismiss them.
7. 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 1.

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 1. Mappings in the Sample DCF

mvs_definition	Infoprint Attribute and Value
ACCOUNT	account-text
ADDRESS1	address1-text
ADDRESS2	address2-text
ADDRESS3	address3-text
ADDRESS4	address4-text
BUILDING	building-text
CC=NO	carriage-control-type=none
CC=YES	ignored
CCTYPE=ANSI	carriage-control-type=ansi-ebcdic
CCTYPE=MACHINE	carriage-control-type=machine
CCTYPE=ASCII	carriage-control-type=ansi-ascii
CHARS	chars

Table 1. Mappings in the Sample DCF (continued)

CLASS	printer-pass-through=-opa=class
COPIES	copy-count
DATACK=UNBLOCK	data-fidelity-problem-reported=all
DATACK=BLOCK	data-fidelity-problem-reported=none
DATACK=BLKPOS	data-fidelity-problem-reported=character
DATACK=BLKCHAR	data-fidelity-problem-reported=position
DATATYPE=LINE	document-format=line-data
DEPT	department-text
DEST	target-destination-name and printer-pass-through=-opa=destination
DUPLEX=NO	sides=1
DUPLEX=NO	plex=simplex
DUPLEX=NORMAL	sides=2
DUPLEX=NORMAL	plex=simplex
DUPLEX=TUMBLE	sides=2
DUPLEX=TUMBLE	plex=tumble
FCB	page-definition
FILEFORMAT=RECORD	new-line-option=counted-4-octet-aligned
FILEFORMAT=STREAM	new-line-option=lf
FORMDEF	form-definition
FORMS	printer-pass-through=-opa=forms
INTRAY	printer-pass-through=-obin
IPADDR	printer-pass-through=-opa=ipaddr
JOBID	printer-pass-through=-opa=jobid
JOBNAME	job-name and job-owner
NAME	name-text
NODEID	node-id-text
OFFSETXB	x-image-shift-back
OFFSETXF	x-image-shift
OFFSEYB	y-image-shift-back
OFFSEYF	y-image-shift
OUTBIN	output-bin
OVERLAYB	overlay-back
OVERLAYF	overlay-front
PAGEDEF	page-definition
PRMODE=SOSI1	shift-out-shift-in=one
PRMODE=SOSI2	shift-out-shift-in=two
PRMODE=SOSI3	shift-out-shift-in=three
PRMODE=[anything else]	ignored
PROGRAMMER	programmer-text

Table 1. Mappings in the Sample DCF (continued)

PRTQUEUE	printer-pss-through=-oprtqueue
RESFMT=P240	font-resolution=P240
RESFMT=P240	font-resolution=P300
ROOM	room-text
SEGMENTID	printer-pass-through=-opa=segmentid
SYSOUT	printer-pass-through=-opa=class
TITLE	title-text
TRC	table-characters-reference
UCS	chars
USERID	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 1 on page 18 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 2.

Table 2. 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
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 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 3 on page 26. 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 3 on page 26 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 OS/390: Download for OS/390, (S544-5624)*, which you can download from the IBM Printing Systems website at <http://www.ibm.com/printers>.

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 3. 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 3) to `class`. Since `class` does not begin with `-o`, the receiver assumes that `class` is a sub-keyword of the `-opa` keyword.

Table 3. MVS keyword internal conversions

mvs_keyword	MVS Values Passed to Infoprint
ACCOUNT	-AC
ADDRESS1	-oaddress1
ADDRESS2	-oaddress2
ADDRESS3	-oaddress3
ADDRESS4	-oaddress4
BUILDING	-obu
CC	-occ
CCTYPE	-occtype
CHARS	-ochars
CLASS	class
COPIES	-ocop
DATAACK	-odatac
DATATYPE	-odata
DEPT	-ode
DEST	destination
DUPLEX	-odu
FCB	-opagedef
FILEFORMAT	-ofileformat
FORMDEF	-of
FORMS	forms
INTRAY	-oin
IPADDR	-oipdest
JOBID	jobid
JOBNAME	-ojobn

Table 3. MVS keyword internal conversions (continued)

NAME	-ona
NODEID	-ono
OFFSETXB	-ooffxb
OFFSETXF	-ooffxf
OFFSETYB	-ooffyb
OFFSETYF	-ooffyf
OUTBIN	-ooutbin
OVERLAYB	-oovlyb
OVERLAYF	-oovlyf
PAGEDEF	-opagedef
PRMODE	-oprmode
PROGRAMMER	-opr
PRTQUEUE	-oprtqueue
RESFMT	-ore
ROOM	-oro
SEGMENTID	segmentid
SYSOUT	class
TITLE	-oti
TRC	-otrc
UCS	-ochars
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 OS/390: Download for OS/390, (S544-5624)*, which you can download from the IBM Printing Systems website at <http://www.ibm.com/printers>.

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: `mvsdsubm.dsp` (a project file), `mvsdsubm.dsw` (a workspace file), and `mvsdsubm.c` (a source file). The Visual Basic file set includes `mvsdsubm.vbp` (a project file), `mvsdsubm.vbw` (a workspace file), and `mvsdsubm.frm` (a source file). They are installed in the `<install path>\exits\mvsd` directory, where `<install path>` is the directory that you installed Infoprint Manager in.

Using the Sample MVS Download Exit Program

In the sample `mvsdsubm` files, the Exit performs the following operations using the five 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 #4).
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

Customizing the Sample Exit Program

You can customize either the `mvsdsubm.c` (written in Visual C++) or `mvsdsub.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 #4) and just processes 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\mvsd directory, where <install path> is the directory that you installed Infoprint Manager in, using Windows Explorer or the **My Computer** icon.

You will see six files. Three 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: mvsdsubm.dsp, mvsdsubm.dsw, and mvsdsubm.c
 - For the Visual Basic version, copy: mvsdsubm.vbp, mvsdsubm.vbw, and mvsdsubm.frm

Note: If you do not have the development software that you plan to use to modify the files (Microsoft Visual C++ Version 6.0 or Microsoft Visual Basic Version 6.0) installed on this system, you can copy these files onto a floppy disk instead to take them to the system that has that software installed. When you are finished making your changes, bring the compiled version of the new Exit back to this machine and place it in the directory you created in step two.

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.

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 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 MVS host Download FSA for this computer's IP address.
 - **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**.
- **Exit Program Name:** If you have not modified the exit program, do not change this path. If you have modified the exit program, click **Browse** and locate the exit program file that you modified and compiled. 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 the Operator Procedure *Deleting Orphan Files and Resubmitting Jobs to MVS Download* on your Publication CD or on the IBM Printing Systems website at <http://www.ibm.com/printers>; click the Infoprint Manager for Windows NT and Windows 2000 sitelet link and find **Operator Procedures**.

- 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.

4. Click **OK**.
One or more pop-up informational messages may appear; read them and click **OK** to dismiss them.
5. 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

The AFP resources you use for your printing jobs must be available to Infoprint Manager so the jobs process correctly. 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 instructions on creating a resource context object, refer to the Administration Procedure **Creating a New Resource-Context Object** on your Infoprint Manager Publication CD or on the IBM Printing Systems website at <http://www.ibm.com/printers>; click the Infoprint Manager for Windows NT and Windows 2000 link, then the IBM Infoprint Manager for Windows NT and Windows 2000 link. From there, click the **Reference Information** link in the navigation bar on the left side of the screen, and find **Administration Procedures**. 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 an 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 will have to do is resubmit a job for transmission to your Windowssystem. 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 because it sounds right.

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='COMYFNT.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.

Part 3. Setting up/Migrating LAN Printing

Chapter 5. 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 resolveable 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 6. Sending print jobs to IBM Infoprint Manager for Windows NT and Windows 2000 from an AIX system

You can submit print jobs to IBM Infoprint Manager for Windows NT and Windows 2000 from an AIX system by defining a Windows gateway printer on your Windows NT or Windows 2000 system, then using **lpr** to send jobs to it.

Notes:

1. This chapter assumes that you do not have IBM Infoprint Manager for AIX installed on your AIX system. If you do have IBM Infoprint Manager for AIX installed, you can still use this procedure to submit jobs to a Windows gateway printer, but you may want to consider setting up an interoperating environment so your Infoprint Manager servers can work together. Refer to the IBM Printing Systems website at <http://www.ibm.com/printers>; click the Infoprint Manager link and look in the IBM Infoprint Manager for AIX product library to find additional information on interoperability.
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**.

Once you have a Windows gateway printer defined in Infoprint Manager for Windows NT and Windows 2000, you must complete two tasks:

- Configure a print queue on your AIX system that will send jobs to the Windows gateway printer.
- Install and start the TCP/IP Printing service on your Windows system.

Configuring the Print Queue

This procedure assumes that you have already defined a Windows gateway printer on your Infoprint Manager for Windows NT and Windows 2000 system. Refer to the *IBM Infoprint Manager for Windows NT and Windows 2000: Getting Started* and the online help for the Infoprint Manager Management Console for instructions on creating a Windows gateway printer. Follow these steps to configure a print queue on your AIX system that sends jobs to the Windows gateway printer you defined.

Note: This example refers specifically to AIX version 4.2.

1. Open SMIT.
2. Select **Print spooling**.
3. Select **Add a print queue**.
4. Select **Attachment type = remote**.
5. Select **Standard processing**.
6. Enter the following values in the fields.
 - **Name of queue**- The name of this system; what you will **lpr** to on AIX.
 - **Hostname of remote server**- The host name or IP address of the Windows system that your Infoprint Manager server resides on, for example, `printserver.mycompany.com` or `9.99.9.9`.
 - **Name of queue on remote server**- The share name of the Windows gateway printer you created.
 - **Type of print spooler**- Select **BSD**.
 - **Description**- Type any descriptive information that you need.
7. Click **OK**.

Installing and Starting the TCP/IP Printing Service

For Windows NT Systems

Installing the TCP/IP Printing Service

1. Log on to the Windows NT system that your Infoprint Manager server is installed on.
2. Insert your Windows NT CD in the CD-ROM drive. If the Windows NT installer starts, exit the installer, but leave the CD in the drive.
3. Select **Start** → **Settings** → **Control Panel**.
4. In the **Control Panel** window, double-click the **Network** icon.
The **Network** dialog opens.
5. In the **Network** dialog, click the **Services** tab.
6. Click **Add**.
7. Find **Microsoft TCP/IP Printing** in the list of Network Services and select it.
8. Click **OK**.
A dialog opens that asks where the Setup program should look for the files it needs.
9. In that dialog, change the drive letter to the letter of your CD-ROM drive, and leave the rest of the path the same.
10. Click **Continue**.
The setup program runs. When it is complete, **Microsoft TCP/IP Printing** appears in the list of available Network services.

Note: You must reboot your system before the service will be available.

Starting the TCP/IP Printing Service

When you install the TCP/IP Printing service, it is not set to start automatically. Follow these steps to start the service and set it to start automatically when your system starts.

1. Select **Start** → **Settings** → **Control Panel**.
2. In the **Control Panel** window, double-click the **Services** icon.
The **Services** dialog opens.
3. Find **TCP/IP Print Server** in the list of services and select it.
4. Click **Startup**.
5. In the **Service** window, change the **Startup type** to **Automatic** and click **OK**.
6. In the **Services** dialog, click **Start** to start the **TCP/IP Print Server** service.
7. Close the **Services** dialog.

For Windows 2000 Systems

On Windows 2000 systems, the TCP/IP Printing Service is sometimes installed with the base product. If it is not installed, you will need your Windows 2000 CD to complete this procedure. Even if the service is installed, it may not be started. Follow these steps to verify or install the TCP/IP Printing Service and start it:

1. Log on to the Windows 2000 system that your Infoprint Manager server is installed on.
2. Select **Start** → **Settings** → **Control Panel**.
3. In the **Control Panel** window, double-click the **Add/Remove Programs** icon.

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4. In the **Add/Remove Programs** window, click the **Add/Remove Windows Components** button.
5. Find the **Other Network File and Print Services** box.
 - If it is selected, click **Cancel**, and continue with the next step.
 - If it is not selected, select it and click **Next**. Follow the instructions on the screen to complete the installation.
6. Close the **Add/Remove Programs** window.
7. In the **Control Panel** window, double-click the **Administrative Tools** icon.
8. Double-click the **Services** icon.
9. Find **TCP/IP Print Server** in the list of services and double-click it.
10. In the dialog that opens:
 - a. Change the **Startup type** to **Automatic** so it will start whenever you start this system
 - b. Click **Start** to start the service immediately
11. Click **OK**.
12. Close the remaining windows.

Chapter 7. Understanding Transforms and the Configurable Transform Subsystem

Transforms

Transforms are Infoprint objects (like queues and destinations) that you create and configure in Infoprint Manager. Transforms receive data in a particular format or formats, process the data in some way, and output the changed data. When you create a transform, you have complete control over what data format or formats it operates on and what type of processing it does. The processing that the transform performs can be anything from simply copying the data to a different place on disk, to filtering the data stream that the transform receives (for example, to remove a particular PostScript order), to transforming the data to a completely different format (for example, converting PCL to AFP).

When you create a transform, you specify several things, including:

- **Input data format**

The data stream that is sent to the transform. The input data format is what the transform uses to determine whether or not it has any work to do. If you send a PostScript job through a transform that has its input data stream set only to **PCL**, the job will bypass the transform without being changed at all. You can set the transform to accept multiple input data formats.

- **Transform options**

The program or command that actually does the work of the transform; what happens during the *processing* stage. The transform options can be system commands (such as **copy**), programs provided with Infoprint Manager (such as **ps2afp**), or your own custom transform programs (for example, **mypclfixup**).

When you create a transform, you specify the complete command line needed to invoke this program or command. Within this command line, you can also specify various *substitution variables*, place holders which Infoprint Manager replaces with a value when Infoprint Manager runs the transform. For example, if you include %i in the line, Infoprint Manager will replace it with the name of the file that the transform receives; if you include %o, it will be replaced with the name of the file that the transform puts 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 submit 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*.

Transform Sequences

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.

Note: If you include a terminating transform in a transform sequence, it must be the last transform in the sequence.

Transform Sequence Example

You want to define an actual destination that will copy AFP versions of all print jobs sent to it into a directory on your Infoprint Manager server system. This directory is used as an archive of AFP versions of print jobs that may need to be viewed later.

To accomplish this, you use the Infoprint Manager Administration GUI to create these three transforms:

1. **tranps**

You set the input data format to PostScript, the Transform options to use ps2afp, and the output data format to MODCA-P (Mixed Object Document Content Architecture).

2. **tranpcl**

You set the input data format to PCL, the Transform options to use pc12afp, 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.

For more details on transform objects and transform sequences, see the Administration Procedures **Working with Infoprint Manager Transform Programs** and **Using Data Stream Transform Sequences** on your Infoprint Manager Publication CD or on the IBM Printing Systems website at <http://www.ibm.com/printers>; click the Infoprint Manager for Windows NT and Windows 2000 link, then the IBM Infoprint Manager for Windows NT and Windows 2000 link. From there, click the **Reference Information** link in the navigation bar on the left side of the screen, and find **Administration Procedures**.

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 PSF for OS/2 users: Netware.exe provides the same function that was available through netware.cmd in PSF for OS/2.

Chapter 8. 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.

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. 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 1 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 1. 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 2 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 2. 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 3 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 3. 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 4 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 4. 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>\grid**
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>\grid** 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 IBM 6404 Line Matrix printer, the IBM 6408 Line Matrix printer, or the 6408 Line Matrix printer 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 52.

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.

```
COS0PR10 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 IBM 3835 Advanced Function Printer), IBM recommends that you map all the **CZnnnn** entries to raster font character-set names. If you do not create this mapping, Infoprint issues an error message and does not print the job.

For example, if you wanted to map the Times New Roman Latin 1 character set to the raster version, 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 *IBM Data Stream and Object Architectures Mixed Object Document Content Architecture Reference*.

Because the IBM 3835 Advanced Function Printer does not support any resident outline fonts, the **fgid.grd.sample** file maps the **FGID** and the **GCSGID** back to the C0N20000 character set. Then, Infoprint searches the resource library search path to locate the C0N20000 character for downloading with the job.

To modify the **cpgid** file so that the personal computer ASCII codepage for Iceland maps to the multilingual codepage for ASCII data as described in "Modifying the charset and codepage GRID Files" on page 51, perform the following 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 **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>\grd\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>\grd\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.

Chapter 9. Printing from ERP Applications

You can send PostScript or PCL output from your ERP software to Infoprint Manager to be printed. Regardless of whether your ERP software resides on a Windows system or an AIX system, you will submit these jobs through a Windows gateway printer.

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 your ERP software resides on an AIX system or any other non-Windows operating system, install and use the Generic / Text Only driver from your Windows CD.
 - 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 IBM Printing Systems 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 follow the instructions to create a printer that uses the FILE: port.
 - c. When the wizard gives you a list of drivers to choose from, select the one that you plan to use.
3. Create the Windows gateway printer using the Management Console.

In the **Target destination** field, select the destination that you created or chose in step 1. In the **Windows driver name** field, select the driver that you installed in step 2. Refer to the Management Console online help if you need additional information.

Submitting ERP Print Jobs from a Windows System

If your ERP software resides on a Windows system, you can add the Windows gateway printer to the desktop of the system that you want to print from and 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.
2. Once the connection to the Windows gateway printer is created, you can print to it just as you would to any other printer.

Submitting ERP Print Jobs from an AIX System

If your ERP software resides on an AIX system, you must configure a print queue that will submit jobs to the Windows gateway printer using **lpr** with the **-l** (lower case "L") option. You must also install and start the TCP/IP Printing service on your Windows system to allow it to receive the print jobs. Instructions for both of these processes follow.

Configuring the Print Queue

This procedure assumes that you have already defined a Windows gateway printer on your Infoprint Manager for Windows NT and Windows 2000 system. Refer to the *IBM Infoprint Manager for Windows NT and Windows 2000: Getting Started* and the online help for the Infoprint Manager Management Console for instructions on creating a Windows gateway printer. Follow these steps to configure a print queue on your AIX system that sends jobs to the Windows gateway printer you defined.

Note: This example refers specifically to AIX version 4.2.

1. Open SMIT.
2. Select **Print spooling**.
3. Select **Add a print queue**.
4. Select **Attachment type = remote**.
5. Select **Standard processing**.
6. Enter the following values in the fields.
 - **Name of queue**- The name of this system; what you will **lpr** to on AIX.
 - **Hostname of remote server**- The host name or IP address of the Windows system that your Infoprint Manager server resides on, for example, `printserver.mycompany.com` or `9.99.9.9`.
 - **Name of queue on remote server**- The share name of the Windows gateway printer you created.
 - **Type of print spooler**- Select **BSD**.
 - **Description**- Type any descriptive information that you need.
7. Click **OK**.

Installing and Starting the TCP/IP Printing Service

For Windows NT Systems

Installing the TCP/IP Printing Service:

1. Log on to the Windows NT system that your Infoprint Manager server is installed on.
2. Insert your Windows NT CD in the CD-ROM drive. If the Windows NT installer starts, exit the installer, but leave the CD in the drive.
3. Select **Start** → **Settings** → **Control Panel**.
4. In the **Control Panel** window, double-click the **Network** icon.
The **Network** dialog opens.
5. In the **Network** dialog, click the **Services** tab.
6. Click **Add**.
7. Find **Microsoft TCP/IP Printing** in the list of Network Services and select it.
8. Click **OK**.

A dialog opens that asks where the Setup program should look for the files it needs.

9. In that dialog, change the drive letter to the letter of your CD-ROM drive, and leave the rest of the path the same.
10. Click **Continue**.

The setup program runs. When it is complete, **Microsoft TCP/IP Printing** appears in the list of available Network services.

Note: You must reboot your system before the service will be available.

Starting the TCP/IP Printing Service: When you install the TCP/IP Printing service, it is not set to start automatically. Follow these steps to start the service and set it to start automatically when your system starts.

1. Select **Start** → **Settings** → **Control Panel**.
2. In the **Control Panel** window, double-click the **Services** icon.
The **Services** dialog opens.
3. Find **TCP/IP Print Server** in the list of services and select it.
4. Click **Startup**.
5. In the **Service** window, change the **Startup type** to **Automatic** and click **OK**.
6. In the **Services** dialog, click **Start** to start the **TCP/IP Print Server** service.
7. Close the **Services** dialog.

For Windows 2000 Systems

On Windows 2000 systems, the TCP/IP Printing Service is sometimes installed with the base product. If it is not installed, you will need your Windows 2000 CD to complete this procedure. Even if the service is installed, it may not be started. Follow these steps to verify or install the TCP/IP Printing Service and start it:

1. Log on to the Windows 2000 system that your Infoprint Manager server is installed on.
2. Select **Start** → **Settings** → **Control Panel**.
3. In the **Control Panel** window, double-click the **Add/Remove Programs** icon.
4. In the **Add/Remove Programs** window, click the **Add/Remove Windows Components** button.
5. Find the **Other Network File and Print Services** box.
 - If it is selected, click **Cancel**, and continue with the next step.
 - If it is not selected, select it and click **Next**. Follow the instructions on the screen to complete the installation.
6. Close the **Add/Remove Programs** window.
7. In the **Control Panel** window, double-click the **Administrative Tools** icon.
8. Double-click the **Services** icon.
9. Find **TCP/IP Print Server** in the list of services and double-click it.
10. In the dialog that opens:
 - a. Change the **Startup type** to **Automatic** so it will start whenever you start this system
 - b. Click **Start** to start the service immediately
11. Click **OK**.
12. Close the remaining windows.

June 29, 2000

Part 4. Additional Topics

Chapter 10. 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 NT, you must install Microsoft Windows NT Terminal Server as the operating system on the system that you install your Infoprint Manager server on.
- 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 Windows 95, Windows 98, Windows NT, and Windows 2000 systems, but the process is slightly different based on the system that your Infoprint Manager server is installed on (Windows NT Terminal Server or Windows 2000 Server). Use the following procedure to create Terminal Server Client installation disks and install the client.

Installing the Windows Terminal Server Client

To complete this procedure, you will need:

- One blank floppy disk if you are using Windows NT Terminal Server or
- Two blank floppy disks if you are using Windows 2000 Server.

1. Log on to the system that your Infoprint Manager server is installed on.
2. On Windows NT Terminal Server, click **Start**—> **Programs** —> **Administrative Tools** —> **Terminal Server Client Creator**.

On Windows 2000 Server, click **Start**—> **Programs** —> **Administrative Tools** —> **Terminal Services Client Creator**.

3. In the dialog that opens:
 - On Windows NT Terminal Server, select **Terminal Server Client for Windows 95/NT Intel** and check the **Format disk(s)** check box. Click **OK**.
 - On Windows 2000 Server, 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:
 - On Windows NT Terminal Server, select **Start —> Programs —> Terminal Services Client —> Terminal Server Client**.
 - On Windows 2000 Server, select **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 11. 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.

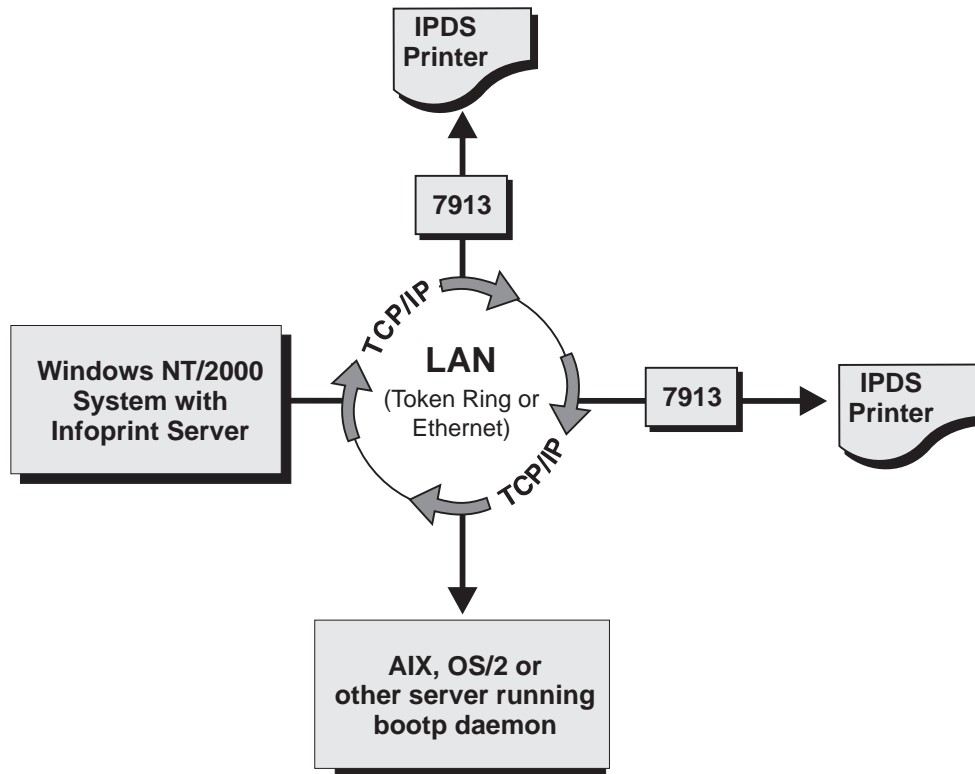


Figure 5. i-data 7913 IPDS Printer LAN Attachment in a TCP/IP LAN Environment

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

Use the configuration in Figure 6 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.

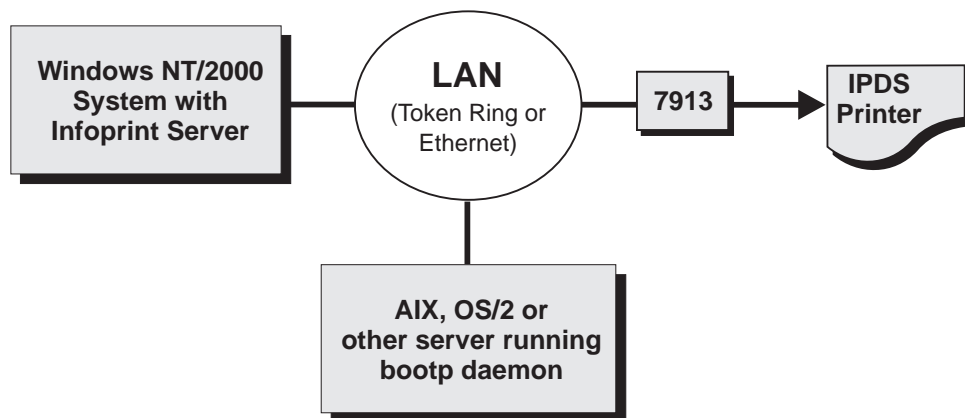


Figure 6. Network Configuration for Separate Internet Protocol Hosts

Prerequisite Tasks

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

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

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

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

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

- IBM 6412 Line Matrix Printer Model CTA

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

- ___ 2. You have installed IBM Infoprint Manager for Windows NT and Windows 2000, Version 1, Release 1 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

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

How the bootp Daemon Works

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

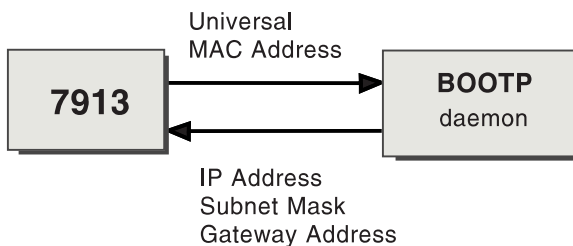


Figure 7. Data Flow between the i-data 7913 IPDS Printer LAN Attachment and the bootp Daemon

Figure 7 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 4. 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 4. *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 `/tcip/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 4 on page 66. You must have **Administrator** authority to edit the **bootp configuration** file.

Figure 8 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 8. A Simple `bootptab` File

The keywords and fields in Figure 8 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 9 on page 68 shows a more complex way to describe the same **bootp** configuration as in Figure 8. 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 9. A More Complex bootptab File

In addition to the keywords you saw in Figure 8 on page 67, Figure 9 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 you are satisfied that 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 10 shows the i-data 7913 IPDS Printer LAN Attachment Model 03 for IBM token-ring networks.

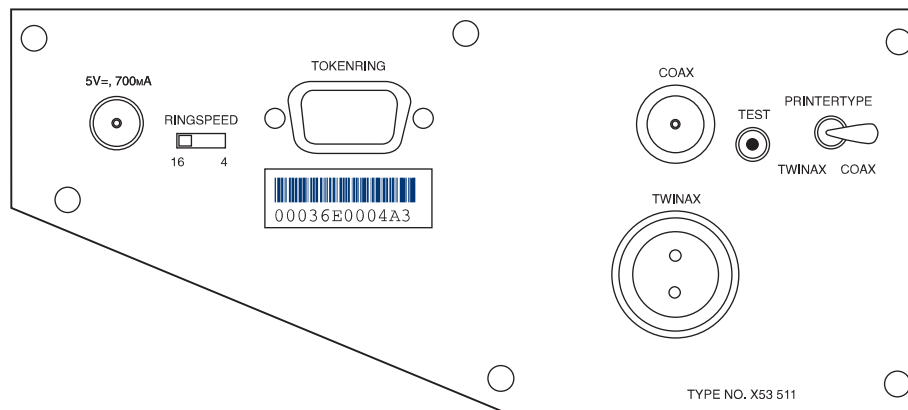


Figure 10. i-data 7913 IPDS Printer LAN Attachment Model 03 for IBM Token-Ring Networks

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

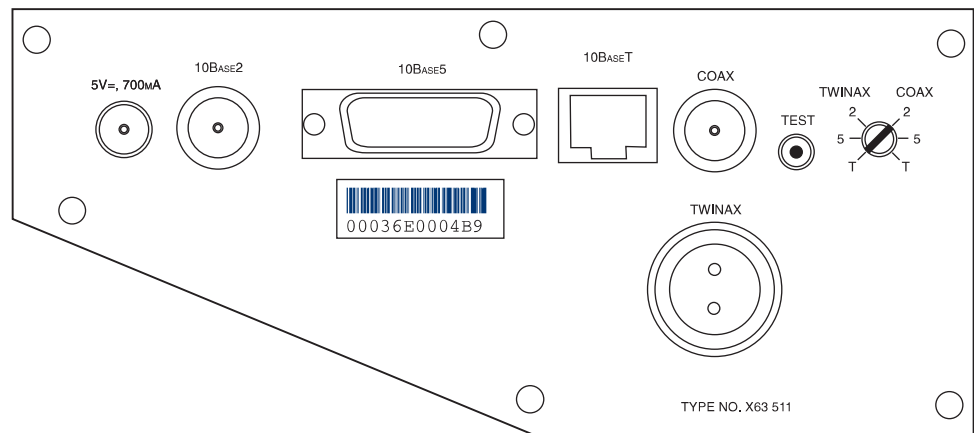


Figure 11. i-data 7913 IPDS Printer LAN Attachment Model 04 for Ethernet LANs

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.

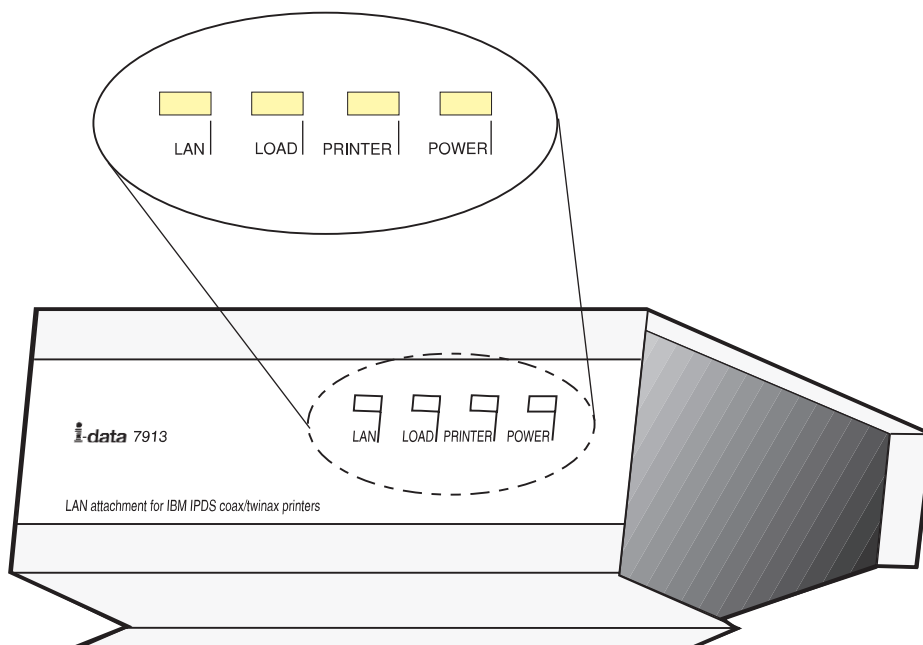


Figure 12. Status Indicators on the i-data 7913 IPDS Printer LAN Attachment

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 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**.
- 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 12. 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 IBM Infoprint Manager for Windows NT and Windows 2000, Version 1, Release 1, the maximum number of servers that you should set up to interoperate is three. Those three servers can all be installed on Windows NT systems, all on Windows 2000 systems, or on a combination of Windows NT and Windows 2000 systems. In addition, if you have IBM Infoprint Manager for AIX, it can be one of the three interoperating servers as well.

For information and instructions on setting up interoperating environments, refer to the Infoprint Manager Administration Procedures on your Publication CD or on the Printing Systems website at <http://www.ibm.com/printers>; click the Infoprint Manager link. From the Infoprint Manager Solutions page, you can either select the Infoprint Manager for Windows NT and Windows 2000 link, click **Product Library** and find **Administrator Procedures** or select the IBM Infoprint Manager for AIX link, click **3.2 Product Library**, and find **Infoprint Manager Interoperability**.

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.

Note: For information and specific instructions about setting up your Infoprint Manager servers so that they share one namespace, refer to the Administrative Procedures on your Infoprint Manager Publication CD or on the IBM Printing Systems website at <http://www.ibm.com/printers>; click the Infoprint Manager for Windows NT and Windows 2000 link, then the IBM Infoprint Manager for Windows NT and Windows 2000 link. From there, click the **Reference Information** link in the navigation bar on the left side of the screen, and find **Administration Procedures**.

- Install 2 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.

June 29, 2000

- **Printer drivers**

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

Chapter 13. Understanding Printer Drivers, Port Monitors, Windows Gateway Printers, and Passthrough Printers

To understand how Windows gateway printers and Passthrough printers work in Infoprint Manager, you must first understand the following terms.

Printer driver

Software that accepts Windows print API language and converts it into the data stream that is sent to the printer. The data stream that is created depends upon the driver.

Port monitor

Software that controls how the data stream that is generated by the printer driver gets sent to the printer.

Port A Windows entity that represents a particular output device or target. A port is always created and controlled with a specific port monitor.

Windows printer

An entity that represents the combination of a printer driver and a port. A Windows printer receives print data, processes it using the printer driver, and sends the resulting data to an output device or target using the port monitor that is associated with the port. You create a Windows printer using the Windows **Add printer** wizard.

Windows shared printer

A Windows shared printer is a Windows printer that is defined so that a remote Windows user can send print jobs to it. When a user on the network uses the Windows **Add printer** wizard to create a network printer on his or her desktop, a list of the Windows shared printers that are available is provided. In Infoprint Manager, a Windows gateway printer is a type of Windows shared printer.

Windows Gateway Printers

A Windows gateway printer is a Windows shared printer that users add to their desktops and submit jobs to. The gateway then submits the job to an Infoprint destination to be printed.

Important: Infoprint Manager manages this Windows shared printer for you; you should never modify the port monitor or port configuration of this printer by opening it from the **Start**→**Settings**→**Printers** window.

When you create a Windows gateway printer, you do several things:

- Specify a *share name* for the Windows gateway printer. The share name is the name that users will see in the **Add Printer** wizard when they look for the printer.
- Select the Infoprint destination that the gateway will send jobs to.
- Select the printer driver that corresponds to the destination or destinations that the jobs may be printed on.

You do not have to choose a port monitor; Infoprint Manager associates that driver with its own port monitor to create a Windows printer.

Passthrough Printers

When you want to create a Passthrough printer, you first use the Management Console to create a port that the Passthrough printer will use. When you create this port, you must select a port monitor that supports the attachment type for your printer. For example, if your printer is local- or parallel-attached, choose the Local Port; if your printer is TCP/IP attached, you can use the IBM TCP/IP Network Port Monitor, which you can download from the IBM Printing Systems website at: <http://www.ibm.com/printers/R5PSC.NSF/Web/npmondwn>.

Then you use the Infoprint Manager Administration GUI to create the Passthrough printer, specifying the port you just created. Infoprint Manager automatically creates a Windows printer (named **IPM-<actual destination name>**) that uses the port you specified in conjunction with the **Generic / Text Only** printer driver. The **Generic / Text Only** driver is considered a passthrough driver because it does not change the data stream it receives. If you send PostScript to it, it sends the same PostScript to the printer.

Important: Infoprint Manager manages this Windows printer for you; you should **never** modify it directly by opening it from the **Start—>Settings—>Printers** window.

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