Printing PCL or PostScript to PSF Destinations: Specifying Which Paper Bin to Use

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In general, when you submit a print job through a PCL or PostScript driver, you can use the printer options to specify which input paper bin you want the printer to use. For example, if you know that white 8.5 x 11 inch paper is always loaded in bin one and letterhead is always in bin two, you can select bin one when you want to print a draft and bin two when you're ready to print a real letter.

When you send PCL or PostScript print jobs to a PSF Destination in Infoprint Manager, the data stream is transformed into Advanced Function Presentation (AFP) before it is printed. By default, most PCL jobs that are transformed use paper bin one, regardless of the bin you specify. Transformed PostScript jobs default to letter-sized paper if no other options are specified, and look for a bin that contains that size paper; they either print on paper from the first bin that contains the right size or fail because they don't find the right paper.

If you want the transform program to check for your bin selection and include it in the AFP data that is sent to the printer, you must specify mappings between the PCL and PostScript bins and the AFP bins. The transform will use your mappings to convert the bin number it finds in the PCL or PostScript into an AFP bin number. You can configure Infoprint Manager so that you can specify up to 20 different input paper bins. For information about how to figure out which PCL and PostScript bins map to which AFP bins, refer to "Determining Bin Mappings".

After you have figured out the bin mappings, select the option below that most resembles your situation and follow the related procedure.

- If you only have one printer with multiple paper bins OR if you can use the same mappings for all of your printers, refer to "Editing Configuration Files" on page 7.
- If you have more than one printer with multiple paper bins AND you want to use different mappings for all of them, refer to "Creating a Transform with Bin Mappings" on page 8.

Be aware that you cannot specify bin mappings and finishing options (such as stapling) on the same job. In addition, you cannot specify bin mappings if you are printing booklets (with or without integrated covers) or side-by-side copies (multiple copies of the same page on one sheet of paper).

Determining Bin Mappings

PCL Printing

When you submit a print job through a PCL print driver and select a paper bin to print from, the driver generates a bin number and puts it into the data stream. Unfortunately, different drivers generate different bin numbers for the same bin. For example, one driver might make "Tray 1" equal to bin 4 and "Auxiliary tray" equal to bin 2, while another driver makes "Tray 1" equal to bin 1 and "Auxiliary

tray" equal to bin 8. To add more difficulty, the generated PCL bin numbers can range from 0 to 59. While most drivers use low numbers (0 through 10), keep in mind the other possibilities.

During the transformation from PCL to AFP, Infoprint Manager takes the bin number that the driver generated and compares it to the bin mappings you set. The pcl2afp transform inserts the AFP bin number that you assigned and sends the job to the destination you requested. The printer prints the job on paper from the bin you chose. As a result, it is essential that all of the users who submit jobs to a given Infoprint Manager printer use the same driver. If they do not, the mappings you set up will not work correctly for them.

The first challenge for you in setting up the mappings is determining what bin number the PCL driver places in the data stream. For various IBM printers, the drivers actually generate the same bin numbers. If you are using the PCL5e driver for an IBM Network Printer 12, Network Printer 17, Network Printer 24, Infoprint 20, Infoprint 21, Infoprint 32, or Infoprint 40, the numbers listed in Table 1 are placed in the data stream.

Table 1. IBM PCL5e Bin numbers

Tray (what you select in Device Settings)	PCL bin number (what the driver puts in data stream)
Automatically Select	0
Tray 1	1
Manual feed paper	2
Manual feed envelope	3
Auxiliary tray	4
Tray 2	5
Envelope feeder or Envelope tray	6
Tray 3	7
Tray 4	8
Tray 5 or 2000 sheet input tray	9

If you are using a different driver, the documentation that came with your printer may provide these numbers; look for a section on the PCL driver. Alternatively, if you are able to capture the PCL data that is sent to a specific bin in your printer, you can look for the bin number in the data stream. In some cases, however, it might be just as easy to use trial and error to determine the correct mappings. Again, keep in mind that PCL bin numbers can range from 0 to 59.

The second challenge is in determining the AFP bin numbers that correspond to your printer. AFP bin numbers range from 1 to 255, and are not standard from printer to printer. Some printers have hard-coded bin numbers; each bin on the printer actually has a number written on it. In other cases, the AFP bin numbers are more difficult to discover. In fact, the numbering scheme for some printers changes completely when you add one of the optional paper bins. Still other printers allow you to change the bin numbers yourself. As a result, it is difficult to predict exactly what the AFP bin numbers for your printers are. However, there are some guidelines that you can use.

- Most AFP paper bins use numbers 1 through 10, with 1 being the biggest, topmost, or bottommost bin.

- Envelope feeders/bins start at number 65 and can go up to 69.
- The manual feed tray is usually number 100.

If you are printing to IBM printers, the best place to find the default numbering schemes for each printer is the *IPDS and SCS Technical Reference* (S544-5312) and the *IPDS Handbook for printers that use the AFCCU* (G544-3895), both of which are available from the IBM Printing Systems website at http://www.ibm.com/printers. (Select **Support** on the left-hand navigation bar, then look under **Online Service and Support**, find the **Manuals and Publications link**. The *IPDS and SCS Technical Reference* (S544-5312) is located under **Distributed Printers- Network Printer Technical References**, and the *IPDS Handbook for printers that use the AFCCU* (G544-3895) is under **Print on Demand and Production Printers- IPDS Technical References**.

If you find the AFP bin numbers for your printer in this documentation, be aware that the number is written in hexadecimal notation. You must convert the number to decimal before you put it in the mapping file. In addition, the numbers that are listed are the machine numbers, not the numbers the software requires (they're the *IPDS* bin numbers, not the *AFP* bin numbers). After you convert the number to decimal, add 1 to it to get the number that you should put in the mapping file.

For example, if you have a printer with three paper bins and a manual feed bin, you could do the following.

1. On the system that your Infoprint Manager server runs on, install the PCL driver that you plan to use. The easiest way to install the driver is by using the Windows **Add printer** wizard to create a printer that uses that driver.
2. Using the Management Console, create a Windows gateway printer that uses the driver you just installed and has a PSF printer as its target destination.
3. Click the Windows **Start** button and select **Settings—>Printers** to open the **Printers** window.
4. Right-click the Windows gateway printer you just created and select **Properties** from the pop-up menu.
5. Click the **Device Settings** tab to show the printer options that are available for this driver. For example, some drivers show a list of "paper trays" and allow you to select a paper size for each one.
6. Make sure that all of the paper trays you plan to use are activated and have the correct size paper selected.
7. Click **OK** to close the dialog and make the settings take effect.
8. Determine which method you will be using to map bins:
   - If you only have one printer with multiple paper bins OR if you can use the same mappings for all of your printers, refer to "Editing Configuration Files" on page 7.
   - If you have more than one printer with multiple paper bins AND you want to use different mappings for all of them, refer to "Creating a Transform with Bin Mappings" on page 8.
9. Follow the appropriate procedure.

   When you have to enter PCL and AFP bin numbers, start with the guidelines above and create some logical mappings, such as the ones shown in table Table 2 on page 4 for an Infoprint 20.

Table 2. Sample mapping table for an Infoprint 20

Tray selection	PCL bin number	AFP bin number
Tray 1	1	1
Tray 2	5	2
Tray 3	7	3
Manual feed tray	2	100
Envelope tray 1	6	60
Envelope tray 2	4	61

Complete the procedure.

10. Load each paper bin (including the manual feed bin) with a different kind, color, or specially marked paper.

11. Submit a test job to each bin and see which paper it prints on. Keep track of your results and use them to change the mappings to meet your configuration.

12. Once you have the mappings worked out correctly, tell your users the following information:
    - How to create a connection to this Windows gateway printer from their workstations.
    - What options to set in the device settings.
    - What kind of paper is in each bin.
    - How to print to each bin.

PostScript printing

PostScript drivers use different methods to determine what paper bin to print a job on. Some drivers allow you to select which paper tray you want the paper to come from. When you submit a job, the driver sends a number to the printer to ask for the corresponding tray. Other drivers allow you to select different paper options (such as size, color, or weight). When you submit a print job, these options are sent with the print job and are used to determine which paper bin to use (paper size is the only option that you have to set for this function to work).

When you configure Infoprint Manager correctly, it will work with either type of driver. There are three steps involved in performing this configuration:

1. "Gathering paper tray information"
2. "Identifying paper trays to Infoprint Manager" on page 5
3. "Testing tray mappings" on page 6

Gathering paper tray information

The first step in configuring Infoprint Manager is to figure out :
- How many paper trays does your printer have?
- What is the AFP bin number for each tray?

  Guidelines for figuring out the bin numbers are provided below.
- What kind of paper will you be loading into each tray?

  At a minimum, you should know what size paper will go in each tray. If you need to, you can also specify a color or weight of the paper.

Use this chart to record your data.

Table 3.

AFP bin number (in decimal notation)	Paper tray on printer	Paper loaded
100	Manual feed tray	

There is trial and error work involved in figuring out the correct bin numbers. AFP bin numbers range from 1 to 255, and are not standard from printer to printer. Some printers have hard-coded bin numbers; each bin on the printer actually has a number written on it. In other cases, the AFP bin numbers are more difficult to discover. In fact, the numbering scheme for some printers changes completely when you add one of the optional paper bins. Still other printers allow you to change the bin numbers yourself. As a result, it is nearly impossible to predict exactly what the AFP bin numbers for your printers are. However, there are some guidelines that you can use.

- Most AFP paper bins use numbers 1 through 10, with 1 being the biggest, topmost, or bottommost bin.
- Envelope feeders/bins start at number 65 and can go up to 69.
- The manual feed tray is usually number 100.

If you are printing to IBM printers, the best place to find the default numbering schemes for each printer is the *IPDS and SCS Technical Reference* (S544-5312) and the *IPDS Handbook for printers that use the AFCCU* (G544-3895), both of which are available from the IBM Printing Systems website at http://www.ibm.com/printers. (Select **Support** on the left-hand navigation bar, then look under **Online Service and Support**, find the **Manuals and Publications link**. The *IPDS and SCS Technical Reference* (S544-5312) is located under **Distributed Printers- Network Printer Technical References**, and the *IPDS Handbook for printers that use the AFCCU* (G544-3895) is under **Print on Demand and Production Printers- IPDS Technical References**.

Important: If you find the AFP bin numbers for your printer in this documentation, be aware that the number is written in hexadecimal notation. You must convert the number to decimal before you put it in the mapping file. In addition, the numbers that are listed are the machine numbers, not the numbers the software requires (they're the *IPDS* bin numbers, not the *AFP* bin numbers). After you convert the number to decimal, add 1 to it to get the number that you should put in the mapping file.

Identifying paper trays to Infoprint Manager

Once you have the chart filled in with your first attempt at mappings, you can move to the second step: identifying all of the bins to Infoprint Manager.

By default, Infoprint Manager assumes that all PostScript printers have only one paper tray. When you identify the trays, you let Infoprint Manager know how many there really are. Then, when you submit a job, you can choose any one of them.

You identify the paper bins to Infoprint Manager either in the configuration file or in the transform you create. In this step, you will determine the syntax that you will be able to use in either place. The general syntax of the identification statement is:

```
inputX=(size,type=xxx,weight=xxx,color=xxx),inputX=(size,type=xxx,weight=xxx,color=xxx)
```

Where the following conditions apply:
- Each `inputX` corresponds to a different paper tray. You should have as many `inputX` entries as you have paper trays. Separate them with commas, no spaces.
- The `X` in each `inputX` is replaced with the **AFP bin number** from Table 3 on page 5 for each tray.
- Size is the only required paper attribute. Replace the word `size` with the size of the paper that will be in the tray, such as **letter**, **legal**, **8.5ix11i**, or **A4**.
- Other paper attributes can be specified or left out entirely.

All of the following are valid identification statements:

```
input1=(letter),input2=(legal),input100=(letter)
```

```
input1=(8.5ix11i,color=blue),input2=(8.5ix11i,color=yellow),input3=(11ix17i),input100=(8.5ix11i)
```

```
input1=(A4,color=white),input2=(A4,color=blue),input3=(A4,color=yellow),input65=(C5),input100=(A4,ty
```

Write out your identification statement before moving on to the next step.

Testing tray mappings

Once you have your identification statement created, you can test your mappings to make sure they are correct. The following procedure explains one way to verify the mappings.

1. On the system that your Infoprint Manager server runs on, install the PostScript driver that corresponds to your printer. The easiest way to install the driver is by using the Windows **Add printer** wizard to create a printer that uses that driver. After you create the printer, you can delete it; the driver will still be installed.
2. Using the Management Console, create a Windows gateway printer that uses the driver you just installed and has a PSF printer as its target destination.
3. Click the Windows **Start** button and select **Settings—>Printers** to open the **Printers** window.
4. Right-click the Windows gateway printer you just created and select **Properties** from the pop-up menu.
5. Click the **Device Settings** tab to show the trays and options that are available.
6. If your driver lists the paper trays that are available, activate them and select paper sizes for each one. Set the options to match your identification statement.
7. Click **OK** to close the dialog and make the settings take effect.
8. Determine which method you will be using to map bins:
   - If you only have one printer with multiple paper bins OR if you can use the same mappings for all of your printers, refer to "Editing Configuration Files" on page 7.

- If you have more than one printer with multiple paper bins AND you want to use different mappings for all of them, refer to "Creating a Transform with Bin Mappings" on page 8.

9. Follow the appropriate procedure.

   When you have to change the configuration file or enter the command that your transform will use, replace the `inputX=...` statement with your identification statement from "Identifying paper trays to Infoprint Manager" on page 5, and complete the procedure.

10. Load each paper bin (including the manual feed bin) with a different kind, color, or specially marked paper.

11. Test your settings by submitting print jobs to each bin of the Windows gateway printer and making sure that it prints on the correct paper. If a job does not print on the correct paper, adjust your AFP bin numbers and input numbers as necessary.

12. Tell your users the following information.

    - How to create a connection to this Windows gateway printer from their workstations.
    - What options to set in the device settings.
    - What kind of paper is in each bin.
    - How to print to each bin.

Editing Configuration Files

There are five configuration files that come with the Infoprint Manager PCL to AFP and PostScript to AFP transforms. For the PCL transform, they are: pcl2afp.cfg and pcl2afpd.cfg. For the PostScript transform they are: ps2afp.cfg, ps2afpd.cfg (used with Infoprint 3000 and Infoprint 4000 printers), and 3160d.cfg (used with all other IPDS printers). You only need to edit one of these files per data stream, depending on the printer you send your jobs to and the following considerations.

- Edit pcl2afpd.cfg, ps2afpd.cfg, or 3160d.cfg if you want everyone to use the same mappings. This method is recommended.
- Edit pcl2afp.cfg or ps2afp.cfg if different people have to use different mappings.

Follow these steps to edit the appropriate file.

1. On the system that your Infoprint Manager server is installed on, locate the file. It should be in the <install path>\pcl2afp or the <install path>\ps2afp directory.

2. Open the file in a text editor such as Notepad.

   At the bottom of the file, you will see blocks of instructions and sample commands.

3. Modify the file according to the instructions in the file.

   Choose one of the options and uncomment that line, then enter your mapping numbers. If you are using the ps2afp transform, replace the `inputX=...` portion of the `device_controls` line with your identification statement from "Identifying paper trays to Infoprint Manager" on page 5.

4. Save the file.

   Note: It is recommended that you save a copy of your changes in a directory outside of the Infoprint Manager install path so that you have a copy in case you ever have to re-install or apply service to Infoprint Manager.

5. Close the file.

6. Restart the computer to have the new settings take effect.

7. Tell your users what kind of paper is in each bin and how to print to each of them.

Creating a Transform with Bin Mappings

You can use the Infoprint Manager transforms to process print jobs with different options, including which paper bins to use. First, you create a transform using the Infoprint Manager Administration GUI, specifying an input data stream and an output datastream. Then, you associate it with one or more printers. When you send a print job to that printer, your transform checks to see if the file is the datastream that needs to be transformed. If it does, the transform converts the file as you specified; if it is not, the transform passes the file to the logical destination. As a result, if you don't want to use the same bin mappings for all of your printers, you can create several different transforms, all with different mappings. Then, associate each transform with whichever printer or printers you want.

Note: If you will be sending both PCL and PostScript jobs to the same printer, you can create two transform objects (one that accepts PCL and one that accepts PostScript) and associate them both with that printer.

Follow these steps to create a transform that maps PCL/PostScript bins to AFP bins.

1. In the Infoprint Manager Administration GUI, click the **Server** menu and select **Transform –> Create**.
2. In the **Create transform** dialog, fill in the fields:
   - **Name:** Type a name for the transform.
   - **Server:** Choose the correct Infoprint Manager server.
   - **Format of output file:** Select **MODCA-P**.
   - **Description:** Type a description that will help you remember which printer uses this transform.
   - **Transform options:** The command line that will execute when the transform runs.

     If this transform accepts PCL, type:

     ```
     pcl2afp  -o "%o" "%i" –device
     'plex,inputX=(pcl_bin=Z),inputX=(pcl_bin=Z)'
     ```

     Replacing the **X**s with the number of the AFP bin (on the printer) and **Z**s with the number of the PCL bin. You can specify up to 20 mappings.

     If this transform accepts PostScript, type:

     ```
     ps2afp  -o "%o" "%i" –device
     'plex,inputX=(size,type=xxx,color=xxx,weight=nnn),
     inputX=(size,type=xxx,color=xxx,weight=nnn)'
     ```

     Replace the inputX=... portion of the command with your identification statement from "Identifying paper trays to Infoprint Manager" on page 5.
   - Select **Transform and print**.
   - **Document formats allowed:** The data stream that your transform accepts. Select **PCL** or **PostScript** and add it to the allowed values.
   - Click **OK**.
3. Select the printer that you want to associate this transform with and open its properties notebook.
4. Click the **Configuration** tab.
5. Find the **Transforms to use** field.

6. Select the transform you just created in the **Possible values** box and add it to the **Values** box.
7. Click **Apply**.
8. Click the **Document** tab.
9. Find the **Formats allowed** section.and look in the **Values** box. Make sure that **modca-p** and either **pcl** or **PostScript** are listed.
10. Click **OK**.
11. Tell your users what kind of paper is in each bin and how to print to each of them.

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