

IBM



# Infoprint Transforms to AFP for z/OS

*Version 2 Release 2*



IBM



# Infoprint Transforms to AFP for z/OS

*Version 2 Release 2*

**Note:**

Before using this information and the product it supports, read the information in "Notices" on page 135.

This edition applies to Version 2 Release 2 of IBM Infoprint Transforms to AFP for z/OS (program number 5655-N60) and to all subsequent releases and modifications until otherwise indicated in new editions.

This edition replaces G550-0443-03.

**Internet**

Visit our home page: <http://www.ibm.com>

You can send comments by e-mail to [printpub@infoprint.com](mailto:printpub@infoprint.com) or by mail to:

IBM Corporation  
6300 Diagonal Hwy 002J  
Boulder, CO 80301-9270  
U.S.A.

© Copyright International Business Machines Corporation 2005, 2010.

US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

# Contents

**Figures . . . . . v**

**Tables . . . . . vii**

**About this publication . . . . . ix**

Who should read this publication . . . . . ix

How this publication is organized . . . . . ix

How to read syntax diagrams . . . . . ix

Where to find more information . . . . . x

    Web sites . . . . . x

    Preventive Service Planning information . . . . . xi

    Publications and other information . . . . . xi

**How to send your comments to IBM . . . xv**

If you have a technical problem . . . . . xv

**Summary of changes . . . . . xvii**

**Chapter 1. Introduction . . . . . 1**

What is different in Version 2 Release 2 . . . . . 1

What is different in Version 2 Release 1 . . . . . 2

Transform names and levels . . . . . 2

Using transforms with Infoprint Server . . . . . 2

    Printing Web documents on AFP printers . . . . . 2

    Printing PDF documents on AFP printers . . . . . 3

    Printing SAP R/3 documents on AFP printers . . . . . 4

Methods for transforming documents . . . . . 5

Specifying transform options . . . . . 6

Software requirements . . . . . 6

Performance considerations . . . . . 7

PCL to AFP transform . . . . . 7

    Supported fonts . . . . . 7

    PCL to AFP transform limitations . . . . . 8

PDF to AFP transform . . . . . 8

    Supported fonts . . . . . 8

    PDF to AFP transform limitations . . . . . 9

PostScript to AFP transform . . . . . 9

    Supported fonts . . . . . 9

    PostScript to AFP transform limitations . . . . . 10

SAP to AFP transform . . . . . 10

    Supported input code pages . . . . . 11

    OTF BX command support . . . . . 12

    SAP to AFP transform limitations . . . . . 12

**Chapter 2. Using transforms . . . . . 13**

pcl2afp—Transform PCL data to AFP data . . . . . 13

    Format . . . . . 13

    Description . . . . . 13

    Options. . . . . 13

    Operand . . . . . 19

    Usage notes . . . . . 20

    Examples -- pcl2afp. . . . . 20

    Environment variables. . . . . 21

    Files . . . . . 21

    Exit values . . . . . 21

pdf2afp—Transform PDF data to AFP data . . . . . 22

    Format . . . . . 22

    Description . . . . . 22

    Options. . . . . 22

    Operand . . . . . 28

    Usage notes . . . . . 28

    Examples -- pdf2afp . . . . . 28

    Environment variables. . . . . 29

    Files . . . . . 29

    Exit values . . . . . 29

ps2afp—Transform PostScript data to AFP data . . . . . 30

    Format . . . . . 30

    Description . . . . . 30

    Options. . . . . 30

    Operand . . . . . 36

    Usage notes . . . . . 36

    Examples -- ps2afp . . . . . 36

    Environment variables. . . . . 37

    Files . . . . . 37

    Exit values . . . . . 37

sap2afp—Transform SAP OTF or ABAP data to AFP

data . . . . . 38

    Format . . . . . 38

    Description . . . . . 38

    Options. . . . . 38

    Operand . . . . . 40

    Examples -- sap2afp . . . . . 40

    Environment variables. . . . . 41

    Files . . . . . 41

    Exit values . . . . . 41

Transforming data with the AOPBATCH program . . . . . 42

    AOPBATCH parameters . . . . . 42

    AOPBATCH DD statements . . . . . 43

    AOPBATCH examples. . . . . 44

    AOPBATCH exit values . . . . . 46

Using the Print Interface subsystem . . . . . 46

Using the lprafp command . . . . . 47

Calculating the size of the AFP data stream. . . . . 47

l AOP\_MVS\_RETURN\_CODES environment variable . . . . . 48

**Chapter 3. Customizing transforms . . . . . 51**

Customizing the PCL to AFP transform . . . . . 51

    Creating an entry in the Infoprint Server

    transform configuration file . . . . . 51

Customizing the PDF to AFP and PostScript to AFP

transforms. . . . . 59

    Creating an entry in the transform configuration

    file . . . . . 59

    Starting Infoprint Server with sufficient memory . . . . . 67

    Setting up security . . . . . 67

    Adding fonts . . . . . 69

Customizing the SAP to AFP transform . . . . . 71

    Creating an entry in the transform configuration

    file . . . . . 71

Customizing SAP to AFP configuration files . . . . .	76	Removing the SAP to AFP V2.1 default resource directory . . . . .	119
Customizing multibyte conversion tables . . . . .	90	Removing the -p option from the sap2afp transform command and filter . . . . .	119
<b>Chapter 4. Administering transforms . . . . .</b>	<b>93</b>	Replacing the -t option on the sap2afp transform command and filter . . . . .	119
Requesting the PCL to AFP transform . . . . .	93	Migrating from V1.1 to V2.2 . . . . .	120
PCL to AFP transform filter . . . . .	93	Setting up security for the PDF to AFP and PostScript to AFP transform . . . . .	120
Steps for editing printer definitions for the PCL to AFP transform . . . . .	94	Removing the PCL to AFP, PDF to AFP, and PostScript to AFP V1.1 resource directories . . . . .	121
Example -- ISPF Processing panel for the PCL to AFP transform . . . . .	95	Transforming selected pages . . . . .	121
Requesting the PDF to AFP transform . . . . .	96	Adding fonts to the PDF to AFP and PostScript to AFP transform . . . . .	122
PDF to AFP transform filter . . . . .	96	Removing environment variables for the PDF to AFP transform . . . . .	122
Steps for editing printer definitions for the PDF to AFP transform . . . . .	97	Creating full-page AFP images . . . . .	123
Example -- ISPF Processing panel for the PDF to AFP transform . . . . .	98	Using new functions introduced in V2.2 . . . . .	123
Requesting the PostScript to AFP transform . . . . .	99	Creating AFP records larger than 8K in the SAP to AFP transform . . . . .	124
PostScript to AFP transform filter . . . . .	99	Stopping the transform . . . . .	124
Steps for editing printer definitions for the PostScript to AFP transform . . . . .	100	Suppressing messages on the trailer error page . . . . .	125
Example -- ISPF Processing panel for the PostScript to AFP transform . . . . .	101	Using MVS return codes . . . . .	125
Requesting the SAP to AFP transform . . . . .	102	Transforming SAP R/3 files with non-Latin or Unicode character sets . . . . .	126
SAP to AFP transform filter . . . . .	102	Resizing fonts for printing on InfoPrint 6400 printers . . . . .	126
Steps for editing printer definitions for the SAP to AFP transform . . . . .	102	Using new functions introduced in V2.1 . . . . .	126
Example -- ISPF Processing panel for the SAP to AFP transform . . . . .	104	Creating AFP records larger than 8K in the PCL to AFP, PDF to AFP and PostScript to AFP transforms . . . . .	126
<b>Chapter 5. Diagnosing errors . . . . .</b>	<b>107</b>	Tracing transforms . . . . .	127
Submitting APARs. . . . .	107	Stopping processing on error . . . . .	127
Using error messages. . . . .	107	Disabling font-substitution messages . . . . .	127
Finding the transform stderr file . . . . .	107	<b>Appendix A. Accessibility . . . . .</b>	<b>129</b>
Running traces . . . . .	108	Using assistive technologies . . . . .	129
Tracing the transforms . . . . .	108	Keyboard navigation of the user interface . . . . .	129
<b>Chapter 6. Messages . . . . .</b>	<b>111</b>	z/OS information . . . . .	129
Message format. . . . .	111	<b>Appendix B. Environment variables . . . . .</b>	<b>131</b>
Messages . . . . .	111	<b>Appendix C. Fonts . . . . .</b>	<b>133</b>
<b>Chapter 7. Migrating to Infoprint Transforms to AFP V2.2 . . . . .</b>	<b>115</b>	PCL to AFP transform fonts . . . . .	133
Migrating from V2.1 to V2.2 . . . . .	115	PDF to AFP and PostScript to AFP transform fonts . . . . .	133
Removing the PCL to AFP, PDF to AFP, and PostScript to AFP V2.1 resource directories . . . . .	116	<b>Notices . . . . .</b>	<b>135</b>
Changing the SAPGOF_E output device type . . . . .	116	Policy for unsupported hardware. . . . .	136
Configuring Infoprint Server for the SAP to AFP transform. . . . .	117	Trademarks . . . . .	137
Customizing SAP to AFP transform configuration files . . . . .	117	<b>Index . . . . .</b>	<b>139</b>
Customizing multibyte conversion tables for the SAP to AFP transform . . . . .	118		

---

## Figures

1. Printing Web documents on AFP printers 3
2. Printing PDF documents on AFP printers 4
3. Printing SAP R/3 documents on AFP printers 5
4. Default **barcode.tab** configuration file . . . . 80
5. Default **defcp.tab** configuration file . . . . 81
6. Courier portion of default **fonts.tab** configuration file. . . . . 84
7. Heisei Gothic portion of default **fonts.tab** configuration file. . . . . 84
8. Default **image.tab** configuration file . . . . 85
9. Default **pagedef.tab** configuration file. . . . 87
10. Default **80000000.tab** configuration file . . . . 88



---

## Tables

1.	PSP upgrade IDs and subsets . . . . .	xi	14.	Tasks for migrating from Infoprint Transforms V2.1 to V2.2 . . . . .	115
2.	Publications for Infoprint Server and other IBM transform products . . . . .	xi	15.	PCL, PDF, and PostScript transform resource directories in V2.1 and V2.2 . . . . .	116
3.	Publications for Infoprint Transforms V2 . . . . .	xii	16.	Changes to V2.1 SAP to AFP configuration files in V2.2 . . . . .	117
4.	Licensed program specifications for Infoprint Transforms V2 . . . . .	xii	17.	SAP transform resource directories in V2.1 and V2.2 . . . . .	119
5.	Program directories for Infoprint Transforms V2 . . . . .	xiii	18.	Tasks for migrating from Infoprint Server Transforms to AFP V1.1 . . . . .	120
6.	SAP transform configuration files . . . . .	11	19.	PCL, PDF, and PostScript transform resource directories in V1.1 and V2.2 . . . . .	121
7.	Transform exit values with AOP_FAIL_ON_ERROR and AOP_MVS_RETURN_CODES environment variables . . . . .	49	20.	Tasks required to use new functions in V2.2 . . . . .	123
8.	SAP to AFP transform configuration files . . . . .	76	21.	Tasks required to use new functions in V2.1 . . . . .	126
9.	SAP code page configuration files . . . . .	88	22.	Environment variables the transforms support . . . . .	131
10.	PCL to AFP filter name and filter options . . . . .	93	23.	PCL to AFP transform built-in fonts . . . . .	133
11.	PDF to AFP filter name and filter options . . . . .	96	24.	PDF to AFP and PostScript to AFP transform fonts . . . . .	133
12.	PostScript to AFP filter name and filter options . . . . .	99			
13.	SAP to AFP filter name and filter options . . . . .	102			



---

## About this publication

This publication describes Version 2 Release 2 (V2.2) of IBM® Infoprint® Transforms to AFP™ for z/OS® (program number 5655-N60).

With this product, you can transform documents to Advanced Function Presentation™ (AFP) format from:

- HP Printer Control Language (PCL)
- Adobe® Portable Document Format (PDF)
- Adobe PostScript®
- SAP R/3 System Generic Output Format (SAPGOF)

The transforms require Infoprint Server, which is a separately priced feature of z/OS. The transforms run on all supported releases of z/OS.

---

## Who should read this publication

This publication is for anyone who needs to transform documents to AFP, system programmers who customize the transform products, administrators responsible for maintaining the Infoprint Server Printer Inventory, and diagnosticians who must diagnose transform errors.

Readers should be familiar with Infoprint Server, AFP, z/OS UNIX® System Services, and z/OS job control language (JCL).

---

## How this publication is organized

This publication is divided into these chapters:

- Introduction
- Using transforms
- Customizing transforms
- Administering transforms
- Diagnosing errors
- Messages
- Migrating to Infoprint Server Transforms V2.2

---

## How to read syntax diagrams

This section explains the general notations that this publication uses in syntax diagrams. For ease of reading, this publication breaks some examples into several lines. However, when you enter a command, enter it all on one line. Do not press Enter until you have typed the entire command.

This notation:	Means:	You enter:	For example:	
			This publication shows:	You enter:
Apostrophes	String	As shown	SEND '123'	SEND '123'
Bold	Keyword	As shown	<b>CLASS</b>	CLASS

This notation:	Means:	You enter:	For example:	
			This publication shows:	You enter:
Braces	List of items	The braces and one or more items from the list	{GT10 GT12}	{GT10 GT12}
Brackets	Optional item	One item or no items	aopstop [now]	aopstop
Comma	Separator	As shown	DISPLAY C,K	DISPLAY C,K
Ellipsis	Repeatable item	One or more items	<i>filename ...</i>	file1 file2
Lowercase	Item the system defines	As shown, in lowercase	lp	lp
Lowercase italics	Variable item	A value for the item	MOUNT <i>devnum</i>	MOUNT A30
Parentheses	List of items	The parentheses and one or more items from the list	(GT10,GT12)	(GT10,GT12)
Special characters	Various symbols	As shown	%filter-options	%filter-options
Underline	Default	The item, or you can omit it	K T <u>REF</u>	K T
Uppercase	Item the system defines	As shown, in uppercase	PRMODE	PRMODE
Vertical bar	UNIX pipe (the output of the first is input to the second)	As shown	ls   lp	ls   lp
Vertical bar in braces	Required choice	One item	{NOW FOREVER}	FOREVER
Vertical bar in brackets	Optional choice	One item or no items	[PORTNO PRTQUEUE]	PORTNO

## Where to find more information

This section describes where to find related information.

### Web sites

These Web sites contain related information:

This site:	Contains:
<a href="http://www.ibm.com">http://www.ibm.com</a>	Downloads, including: <ul style="list-style-type: none"> <li>• Infoprint Port Monitor</li> <li>• AFP Viewer plug-in</li> <li>• AFP Printer Driver</li> <li>• <b>lprafp</b> command</li> </ul>
<a href="http://www.ibm.com/systems/z/os/zos/">http://www.ibm.com/systems/z/os/zos/</a>	Information about z/OS

<b>This site:</b>	<b>Contains:</b>
<a href="http://www.ibm.com/systems/z/os/zos/bkserv/">http://www.ibm.com/systems/z/os/zos/bkserv/</a>	z/OS documentation, including: <ul style="list-style-type: none"> <li>• All z/OS publications</li> <li>• Updates from APARs and PTFs</li> </ul>
<a href="http://www.ibm.com/redbooks">http://www.ibm.com/redbooks</a>	IBM redbooks, including a publication for Infoprint Server
<a href="http://www.ibm.com/systems/z/os/zos/features/unix/">http://www.ibm.com/systems/z/os/zos/features/unix/</a>	Information about z/OS UNIX System Services

## Preventive Service Planning information

Before installing Infoprint transforms, you should review the current Preventive Service Planning (PSP) information, also called the *PSP bucket*. You should also periodically review the current PSP information.

The PSP upgrade IDs and subsets are:

*Table 1. PSP upgrade IDs and subsets*

Transform	Upgrade ID	Subset
IBM Infoprint Transforms to AFP	5655N60	HXFR2B0

To obtain the current PSP bucket, contact the IBM Support Center or use z/OS SoftwareXcel (IBMLink™). If you obtained z/OS as part of a CBPDO, HOLDDATA and PSP information is included on the CBPDO tape. However, this information might not be current if the CBPDO tape was shipped several weeks prior to installation.

## Publications and other information

This section lists related publications and other information that can help you use Infoprint Server, Infoprint Transforms V2, and other IBM transform products. For publications for all z/OS products, see *z/OS Information Roadmap*.

*Table 2. Publications for Infoprint Server and other IBM transform products*

Publication	Form number
<i>z/OS Infoprint Server Introduction</i>	S544-5742
Introduces Infoprint Server. This publication contains printing scenarios that show how you can use Infoprint Server in your installation.	
<i>z/OS Infoprint Server Customization</i>	S544-5744
Describes customization tasks for Infoprint Server. This publication describes Infoprint Server environment variables, configuration files, startup procedures, how to write exit routines and filter programs, and how to use the Infoprint Server API.	
<i>z/OS Infoprint Server Operation and Administration</i>	S544-5745
Describes operator procedures and administrative tasks for Infoprint Server. This publication describes how to start and stop Infoprint Server and how operators can use Infoprint Central. It describes how administrators can create entries in the Printer Inventory using either ISPF panels or the Printer Inventory Definition Utility (PIDU) program and define NetSpool™ printer LUs to VTAM®.	

Table 2. Publications for Infoprint Server and other IBM transform products (continued)

Publication	Form number
<p><i>z/OS Infoprint Server User's Guide</i></p> <p>Describes user tasks for Infoprint Server. This publication describes how to submit print jobs from remote systems (including Windows® systems), the local z/OS system, and Virtual Telecommunications Access Method (VTAM) applications. It describes z/OS UNIX commands; the AOPPRINT JCL procedure; the AOPBATCH program; DD and OUTPUT JCL parameters that Infoprint Server supports; and how to download and install the Infoprint Port Monitor for Windows.</p>	S544-5746
<p><i>z/OS Infoprint Server Messages and Diagnosis</i></p> <p>Describes messages from Infoprint Server. This publication also describes how to use Infoprint Server tracing facilities to diagnose and report errors.</p>	G544-5747
<p><i>Infoprint XML Extender for z/OS</i></p> <p>Describes how to plan for, configure, and submit jobs with Infoprint XML Extender for z/OS.</p>	S544-5855
<p><i>Infoprint XT Extender for z/OS: Customization and Usage</i></p> <p>Describes how to customize and use Infoprint XT™ Extender for z/OS.</p>	S544-5879

Table 3. Publications for Infoprint Transforms V2

Publication	Form number
<p><i>Infoprint Transforms to AFP for z/OS</i></p> <p>Describes IBM Infoprint Transforms to AFP V2.2 for z/OS. This publication describes using transforms, customizing transforms, administering transforms, diagnosing errors, messages, and migrating from Infoprint Server Transforms V1.1 and V2.1.</p>	G550-0443
<p><i>Infoprint Transforms from AFP for z/OS</i></p> <p>Describes V2.1 of these IBM products:</p> <ul style="list-style-type: none"> <li>• Infoprint Transform for AFP to HP PCL for z/OS</li> <li>• Infoprint Transform for AFP to Adobe PDF for z/OS</li> <li>• Infoprint Transform for AFP to Adobe PostScript for z/OS</li> </ul> <p>This publication describes using transforms, customizing transforms, administering transforms, diagnosing errors, messages, and migrating from Infoprint Server Transforms V1.1.</p>	G550-0444

Table 4. Licensed program specifications for Infoprint Transforms V2

Licensed program specification	Form number
IBM Infoprint Transforms to AFP for z/OS	G550-0445
IBM Infoprint Transform for AFP to HP PCL for z/OS	G550-0446
IBM Infoprint Transform for AFP to Adobe PDF for z/OS	G550-0492
IBM Infoprint Transform for AFP to Adobe PostScript for z/OS	G550-0493
IBM Infoprint Coaxial Printer Support for z/OS	G550-0447

*Table 5. Program directories for Infoprint Transforms V2*

<b>Program directory</b>	<b>Form number</b>
IBM Infoprint Transforms to AFP for z/OS	GI11-4317
IBM Infoprint Transform for AFP to HP PCL for z/OS	GI10-0277
IBM Infoprint Transform for AFP to Adobe PDF for z/OS	GI10-0279
IBM Infoprint Transform for AFP to Adobe PostScript for z/OS	GI10-0280
IBM Infoprint Coaxial Printer Support for z/OS	GI10-0278



---

## How to send your comments to IBM

We appreciate your input on this publication. Feel free to comment on the clarity, accuracy, and completeness of the information or give us any other feedback that you might have.

Use one of the following methods to send us your comments:

1. Send an e-mail to [printpub@infoprint.com](mailto:printpub@infoprint.com)
2. Visit the Contact z/OS Web page at <http://www.ibm.com/servers/eserver/zseries/zos/webqs.html>
3. Mail the comments to the following address:  
IBM Corporation  
6300 Diagonal Hwy 002J  
Boulder, CO 80301-9270  
U.S.A.

Include the following information:

- Your name and address
- Your e-mail address
- Your telephone or fax number
- The publication title and order number:  
Infoprint Transforms to AFP V2.2 for z/OS  
G550-0443-04
- The topic and page number related to your comment
- The text of your comment.

When you send comments to IBM, you grant IBM a nonexclusive right to use or distribute your comments in any way it believes appropriate without incurring any obligation to you.

IBM or any other organizations will only use the personal information that you supply to contact you about the issues that you submit.

---

## If you have a technical problem

Do not use the feedback methods listed above. Instead, do one of the following:

- Contact your IBM service representative
- Call IBM technical support
- Visit the IBM zSeries support Web page at <http://www.ibm.com/servers/eserver/support/zseries/>.



---

## Summary of changes

### Summary of changes for G550-0443-04

This publication contains information previously presented in G550-0443-03. It contains information about functions that have been added in Version 2 Release 2 in these APARs/PTFs:

- APAR OA30983/PTF UA52362
- APAR OA32105/PTF UA54506
- APAR OA32228/PTF UA54346

### New information

- Information about the new functions has been added. See “What is different in Version 2 Release 2” on page 1.
- The required Infoprint Server APARs have been added to the software requirements. See “Software requirements” on page 6.
- A limitation has been added for the **sap2afp** command. See “SAP to AFP transform limitations” on page 12.
- Information about the new AOP\_MVS\_RETURN\_CODES environment variable and how to specify it on the command line and in the AOPBATCH JCL procedure has been added:
  - “AOP\_MVS\_RETURN\_CODES environment variable” on page 48
  - “Examples -- pcl2afp” on page 20
  - “Examples -- pdf2afp” on page 28
  - “Examples -- ps2afp” on page 36
  - “Examples -- sap2afp” on page 40
  - “AOPBATCH examples” on page 44
- Information about the new WARNING value for the AOP\_FAIL\_ON\_ERROR environment variable has been added:
  - “Environment variables for the PCL to AFP transform” on page 53
  - “Environment variables for the PDF to AFP and PostScript to AFP transforms” on page 62
  - “Environment variables for the SAP to AFP transform” on page 73
- Information about the new AOP\_TRAILER\_ERROR\_PAGE environment variable has been added:
  - “Environment variables for the PCL to AFP transform” on page 53
  - “Environment variables for the PDF to AFP and PostScript to AFP transforms” on page 62
  - “Environment variables for the SAP to AFP transform” on page 73
- Information about how to customize the SAP to AFP transform configuration file **userenv** to enable non-Latin and Unicode character sets has been added. See “userenv configuration file” on page 90.
- Information about the new **Fail on error** and **Trailer error page** fields in the printer definition has been added:
  - “Steps for editing printer definitions for the PCL to AFP transform” on page 94

- “Example -- ISPF Processing panel for the PCL to AFP transform” on page 95
- “Steps for editing printer definitions for the PDF to AFP transform” on page 97
- “Example -- ISPF Processing panel for the PDF to AFP transform” on page 98
- “Steps for editing printer definitions for the PostScript to AFP transform” on page 100
- “Example -- ISPF Processing panel for the PostScript to AFP transform” on page 101
- “Steps for editing printer definitions for the SAP to AFP transform” on page 102
- “Example -- ISPF Processing panel for the SAP to AFP transform” on page 104
- Information about the Infoprint Server common message log has been added. See “Using error messages” on page 107.
- Information about how to use the new functions has been added. See:
  - “Stopping the transform” on page 124
  - “Suppressing messages on the trailer error page” on page 125
  - “Using MVS return codes” on page 125

#### Changed information

- Information about how to enable non-Latin and Unicode character sets has been changed. See “userenv configuration file” on page 90.

#### Deleted information

- The limitation that the SAP to AFP transform cannot transform SAP ABAP files that contain Unicode has been removed.

You may notice changes in the style and structure of some content in this document—for example, headings that use uppercase for the first letter of initial words only, and procedures that have a different look and format. The changes are ongoing improvements to the consistency and retrievability of information in our documents.

This document contains terminology, maintenance, and editorial changes. Technical changes or additions to the text and illustrations are indicated by a vertical line to the left of the change.

#### Summary of changes for G550-0443-03

This publication contains information previously presented in G550-0443-02. It contains information about functions that have been added in Version 2 Release 2.

#### New information

- Information about the new functions and limitations in Version 2 Release 2 has been added. See “What is different in Version 2 Release 2” on page 1.
- Information about these new options on the **pcl2afp** command has been added: **-l**, **-r**, **-w**, **-x**, and **-y**. See “pcl2afp—Transform PCL data to AFP data” on page 13.
- Information about these new options on the **sap2afp** command has been added: **-c** and **-T**. See “sap2afp—Transform SAP OTF or ABAP data to AFP data” on page 38.

- Information about how to configure the Infoprint Server transform configuration file for the SAP to AFP transform has been added. See “Creating an entry in the transform configuration file” on page 71.
- Information about these new SAP to AFP transform environment variables has been added: AOP\_FAIL\_ON\_ERROR, AOP\_RECLLEN, and AOP\_SAP2AFP\_ICU. Also, information about these Infoprint Server environment variables that now apply to the SAP to AFP transform has been added: AOPTRACEDIR and AOPTRACEON. See “Environment variables for the SAP to AFP transform” on page 73.
- Information about how to change the Language Environment® run-time options for the SAP to AFP transform has been added. See “Changing Language Environment run-time options” on page 75.
- Information about these new code page conversion tables for the SAP to AFP transforms has been added: 83000000.tab, 84000000.tab, 85000000.tab, 86000000.tab, and 15000000.tab. See “xxxx0000.tab configuration file” on page 88.
- Information about how to resize fonts for printing on InfoPrint® 6400 printers with the SAP to AFP transform has been added. See “6400fonts.tab configuration file” on page 88.
- Information about how to enable non-Latin character sets for the SAP to AFP transform has been added. See “userenv configuration file” on page 90.
- Information about how to enable Unicode character sets for the SAP to AFP transform has been added.
- Message AOP2061E for the SAP to AFP transform has been added. See Chapter 6, “Messages,” on page 111.
- Information about how to migrate from V2.1 to V2.2 of the transforms has been added. See Chapter 7, “Migrating to Infoprint Transforms to AFP V2.2,” on page 115.

### Changed information

- The default resource directory for the PCL to AFP transform has been changed. See the description of the AOP\_RESOURCE\_PATH environment variable in “Environment variables for the PCL to AFP transform” on page 53.
- The default maximum memory size for the PDF to AFP and PostScript to AFP transforms has been changed. See “Format of a PDF to AFP and PostScript to AFP transform entry” on page 60.
- The default resource directory for the PDF to AFP and PostScript to AFP transforms has been changed. See the description of the AOP\_RESOURCE\_PATH environment variable in “Environment variables for the PDF to AFP and PostScript to AFP transforms” on page 62.
- The default resource directory for the SAP to AFP transform has been changed. See the description of the AOP\_SAP2AFP\_RESOURCES environment variable in “Environment variables for the SAP to AFP transform” on page 73.
- The steps for customizing the SAP to AFP transform configuration files have been changed. See “Steps for customizing SAP to AFP transform configuration files” on page 77.
- The contents of the default SAP to AFP transform **barcode.tab** file have been changed. See “barcode.tab configuration file” on page 78.
- The contents of the default SAP to AFP transform **defcp.tab** file have been changed. See “defcp.tab configuration file” on page 81.
- The contents of the default SAP to AFP transform **fonts.tab** file have been changed. See “fonts.tab configuration file” on page 81.

- The steps for customizing the SAP to AFP transform multibyte conversion tables have been changed. See “Customizing multibyte conversion tables” on page 90.
- Information about where to find SAP to AFP transform messages has been changed. See “Using error messages” on page 107.
- Information about how to trace the SAP to AFP transform has been changed. See “Tracing the transforms” on page 108.
- The list of PCL built-in fonts has changed. See “PCL to AFP transform fonts” on page 133.
- The fonts that the PostScript to PSF transform supports have changed. See “PDF to AFP and PostScript to AFP transform fonts” on page 133.

#### Deleted information

- Information about the supported z/OS releases has been removed. The transforms run on all supported releases of z/OS.
- The **sap2afp -p** and **-t** options have been removed because the SAP to AFP transform no longer supports them.
- These messages have been removed because the SAP to AFP transform no longer issues them:
  - AOP2001E
  - AOP2005E
  - AOP2006E
  - AOP2007E
  - AOP2008E
  - AOP2009E
  - AOP2010E
  - AOP2011E
  - AOP2012E
  - AOP2013E
  - AOP2014E
  - AOP2015W
  - AOP2016E
  - AOP2018E
  - AOP2020E
  - AOP2022E
  - AOP2023E
  - AOP2024E
  - AOP2026W
  - AOP2027E
  - AOP2060E
- Information about how to specify a PostScript initialization file in the **ps2afp -i** option has been removed because the PostScript to AFP transform does not support the **-i** option.
- Information about how to specify the maximum amount of memory the PCL to AFP transform can use in the **-m** option in the transform configuration file has been removed because the PCL to AFP transform does not support the **-m** option.

The “Readers’ Comments - We’d Like to Hear from You” section at the back of this publication has been replaced with a new section “How to send your comments to IBM” on page xv. The hardcopy mail-in form has been replaced with a page that provides information appropriate for submitting readers comments to IBM.

Technical changes or additions to the text and illustrations are indicated by a vertical line to the left of the change.

## Summary of changes for G550-0443-02

This publication contains information previously presented in G550-0443-01. It contains information about functions that have been added in these APARs/PTFs:

- APAR OA21263/PTF UA37332
- APAR OA21390/PTF UA35787
- APAR OA23320/PTF UA41456
- APAR OA24581/PTF UA41402
- APAR OA24261/PTF OA24261

## New information

- The limitation in the PDF to AFP and PostScript to AFP transforms that you cannot transform concatenated PDF or PostScript files has been added. See “PDF to AFP transform limitations” on page 9 and “PostScript to AFP transform limitations” on page 10. In addition, an example has been added to show how to use AOPBATCH to transform multiple files in separate steps. See “AOPBATCH examples” on page 44.
- The **-T** option has been added to the **pcl2afp**, **pdf2afp**, and **ps2afp** transform commands. See Chapter 2, “Using transforms,” on page 13 and “Running traces” on page 108.
- Environment variable AOP\_FAIL\_ON\_ERROR has been added for the PCL to AFP transform. See “Environment variables for the PCL to AFP transform” on page 53.
- Environment variable AOP\_TRIM has been added for the PCL to AFP, PostScript to AFP, and PDF to AFP transforms. See “Environment variables for the PCL to AFP transform” on page 53 and “Environment variables for the PDF to AFP and PostScript to AFP transforms” on page 62.
- These messages have been added: AOP2505E, AOP2506W. See “Messages” on page 111.

## Changed information

- The transforms are no longer supported on z/OS V1R4, z/OS V1R5, and z/OS V1R6 because z/OS no longer supports these releases.
- The description of the **-t** option of the PCL to AFP transform has been changed to say that it creates an overlay or page segment only for the first page. See “pcl2afp—Transform PCL data to AFP data” on page 13.
- The PCL to AFP transform does not support the AOP\_FONT\_SUBSTITUTION\_MESSAGES environment variable. The previous edition incorrectly indicated that the PCL to AFP transform supported this environment variable.

## Summary of changes for G550-0443-01

This publication contains information previously presented in G550-0443-00. It contains information about functions that have been added in these PTFs:

- UA27523
- UA29461
- UA29296
- UA32863

### **New information**

- Information about font-substitution messages has been added. See Chapter 1, “Introduction,” on page 1 and “Using new functions introduced in V2.1” on page 126.
- Information about how to continue parameter fields in JCL has been added, and the AOPBATCH examples now show how to specify job attributes in the PARM parameter. See “AOPBATCH examples” on page 44.
- Information about how to calculate the size of the AFP data stream has been added. See “Calculating the size of the AFP data stream” on page 47.
- Environment variable AOP\_FONT\_SUBSTITUTION\_MESSAGES has been added. See “Environment variables for the PDF to AFP and PostScript to AFP transforms” on page 62.
- Information has been added about the Language Environment (LE) run-time options that the PCL to AFP, PDF to AFP, and PostScript to AFP transforms set. See “Changing Language Environment run-time options” on page 58 and “Changing Language Environment run-time options” on page 65.
- Environment variables \_CEE\_DMPTARG and AOP\_FAIL\_ON\_ERROR have been added. See “Environment variables for the PDF to AFP and PostScript to AFP transforms” on page 62.
- These messages have been added: AOP2500W, AOP2501E, AOP2502I, AOP2503I, AOP2504E. See “Messages” on page 111.

### **Changed information**

- The transforms to AFP can now transform data streams in PDF 1.6 and earlier levels.
- The description of the AOP\_RECLEN environment variable has been changed. See “Environment variables for the PCL to AFP transform” on page 53 and “Environment variables for the PDF to AFP and PostScript to AFP transforms” on page 62.
- Message AOP2026E has been changed to AOP2026W. The text and description of the message have been modified. See “Messages” on page 111.

This publication contains terminology, maintenance, and editorial changes, including changes to improve consistency and retrievability.

---

## Chapter 1. Introduction

This chapter introduces Version 2 Release 2 (V2.2) of IBM Infoprint Transforms to AFP for z/OS (program number 5655-N60).

This product provides data-stream transforms that let you transform documents to Advanced Function Presentation (AFP) format from other data stream formats. These transforms let you print non-AFP data on AFP printers, also known as Intelligent Printer Data Stream™ (IPDS™) printers. You can transform documents to AFP format from:

- Hewlett-Packard (HP) Printer Control Language (PCL)
- Adobe Portable Document Format (PDF)
- Adobe PostScript
- SAP R/3 System Generic Output Format (SAPGOF)

---

### What is different in Version 2 Release 2

The **pcl2afp** command now supports the **-l length**, **-r resolution**, **-w width**, **-x xmargin**, and **-y ymargin** options.

The **sap2afp** command now supports the **-c transformclass** and **-T** options. (The **-T** option replaces the **-t** option.)

| The transform commands can now return MVS return codes (0, 4, 8) instead of  
| UNIX exit values (0, 1). MVS return codes indicate whether a warning or data  
| stream error occurred during the transform. To request MVS return codes, you use  
| the new AOP\_MVS\_RETURN\_CODES environment variable.

| The transforms can now suppress messages on the trailer error page, a page at the  
| end of the AFP output. To suppress messages, you use the new  
| **trailer-transform-error-page** job attribute, **Trailer error page** field in a printer  
| definition, and AOP\_TRAILER\_ERROR\_PAGE environment variable.

| The transforms can now fail when a warning or data stream error occurs. To  
| request that the transforms fail on a warning or error, you use the new  
| **fail-on-transform-error** job attribute, **Fail on error** field in a printer definition, and  
| AOP\_FAIL\_ON\_ERROR environment variable.

The SAP to AFP transform can now transform SAP R/3 files that contain:

- Cyrillic, Korean, Simplified Chinese, Traditional Chinese, and Thai character sets
- Unicode character sets in either SAP R/3 Output Text Format (OTF) or Advanced Business Application Programming (ABAP) format
- Color Box (CB), Color Text (CT) commands
- SAP R/3 Smart Forms (the successor to SAPscript)

| The SAP to AFP transform can now automatically detect Unicode data so that you  
| can convert SAP Unicode data and non-Unicode data streams without changing  
| the transform configuration.

The SAP to AFP transform now lets you resize fonts for printing SAP R/3 OTF files on InfoPrint 6400 printers.

Infoprint Server now manages the SAP to AFP transform. Infoprint Server Transform Manager:

- Starts and stops the transform using configuration information the administrator specifies in the Infoprint Server transform configuration file
- Traces the transform using the Infoprint Server AOPTRACEON and AOPTRACEDIR environment variables
- Writes transform error messages to the Infoprint Server common message log, in the transform's **stderr** file, and on a page after the output

The SAP to AFP transform has these new limitations:

- The transform can no longer transform SAP R/3 EBCDIC data. It can only transform ASCII data.
- The **sap2afp** command no longer supports the **-p pagerange** option.

---

## What is different in Version 2 Release 1

Version 2 Release 1 (V2.1) is a newer version of IBM z/OS Infoprint Server Transforms Version 1 Release 1. It replaces the PCL to AFP, PDF to AFP, PostScript to AFP, and SAP to AFP features.

The main new things that you can do in V2.1 of the transforms to AFP are:

- Transform documents from a newer level of PCL
- Transform documents from a newer level of PDF
- Obtain traces that help IBM diagnose transform problems

---

## Transform names and levels

The names of the transforms to AFP and the levels of data streams that they transform are:

<b>This transform:</b>	<b>Transforms to AFP from these levels:</b>
PCL to AFP	PCL 6 (XL, 5, 5e, 5c)
PDF to AFP	PDF 1.6 and earlier levels
PostScript to AFP	PostScript Language Level 3
SAP to AFP	SAP R/3 SAPGOF Release 4.6C

**Note:** The SAP to AFP transform also supports most functions in SAP R/3 Release 6.10.

---

## Using transforms with Infoprint Server

This section describes how you can use the transforms together with Infoprint Server to meet your printing needs. It describes these scenarios:

- Printing Web documents on AFP printers
- Printing PDF documents on AFP printers
- Printing SAP R/3 documents on AFP printers

### Printing Web documents on AFP printers

A company wants to print Web-based documents on an AFP printer. Here is how the company can use the PCL to AFP transform, Infoprint Server, and Print Services Facility™ (PSF) to meet its requirement:

1. The user installs the Infoprint Port Monitor on her Windows system and configures it to print on the AFP printer. The user associates a PCL driver with the Infoprint port.
2. The user views the Web-based document using a browser, such as Microsoft® Internet Explorer. The user prints the document using the standard print-submission method that the browser provides, selecting the printer configured at the Infoprint port.

As an option, the user specifies Infoprint Server job attributes in the Infoprint Port Monitor window. For example, the user might specify distribution information for PSF to print on the printer's separator page and the name of a form definition for PSF to use when it prints the document.

3. The PCL driver associated with the Windows printer creates a document in PCL format.
4. The Infoprint Port Monitor sends the PCL document and job attributes over the TCP/IP network to Infoprint Server.
5. Infoprint Server determines that it needs to call the PCL to AFP transform. The transform converts the PCL document to AFP format.
6. Infoprint Server writes the AFP document to an output data set on the JES spool.

Infoprint Server also specifies JES output parameters that route the output data set to the PSF-controlled AFP printer and tell PSF how to process the document. For example, Infoprint Server specifies distribution information and the name of the form definition in JES output parameters.

7. PSF selects the output data set from the JES spool. It uses the form definition to process the AFP document and sends it to the AFP printer.

Figure 1 shows how to print a Web document on an AFP printer.

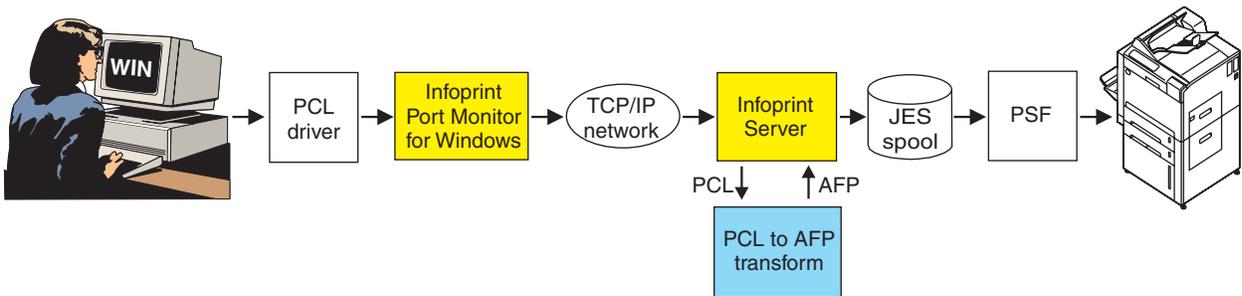


Figure 1. Printing Web documents on AFP printers

## Printing PDF documents on AFP printers

A company wants to print PDF documents on a high-speed AFP printer. Here is how the company can use the PDF to AFP transform, Infoprint Server, and PSF to meet its requirement:

1. The user installs the **lprafp** command on his Windows system. Using the command, the user submits the PDF document to Infoprint Server and specifies the name of the AFP printer on the command.

As an option, the user specifies Infoprint Server job attributes on the **lprafp** command. For example, the user might specify the number of copies and the name of a form definition for PSF to use when it prints the document.

2. The **lprafp** command sends the PDF document and job attributes over the TCP/IP network to Infoprint Server.

3. Infoprint Server determines that it needs to call the PDF to AFP transform. The transform converts the PDF document to AFP format.
4. Infoprint Server writes the AFP document to an output data set on the JES spool.
 

Infoprint Server also specifies JES output parameters that route the output data set to the PSF-controlled AFP printer and tell PSF how to process the document. For example, Infoprint Server specifies the number of copies and the name of the form definition in JES output parameters.
5. PSF selects the output data set from the JES spool. It uses the form definition to process the AFP document and sends it to the AFP printer.

Figure 2 shows how to print a PDF document on an AFP printer.

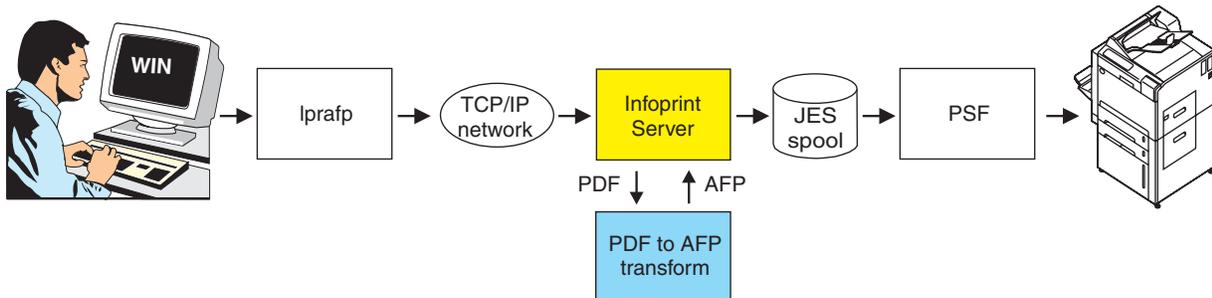


Figure 2. Printing PDF documents on AFP printers

## Printing SAP R/3 documents on AFP printers

A company wants to print purchase orders created by SAP R/3 applications on a high-speed AFP printer. Here is how the company can use the SAP to AFP transform, Infoprint Server, the SAP R/3 Application Server for z/OS, and PSF to meet its requirement:

1. Using the SAP R/3 GUI, a user submits an SAP SAPGOF (ABAP or SAP OTF format) document for printing on an SAP R/3 output device that the SAP R/3 administrator has associated with a printer defined to Infoprint Server.
 

The SAP R/3 application server sends the document over the TCP/IP network to the spool work process of the SAP R/3 Application Server for z/OS. (The spool work process must run on the same system as Infoprint Server.)
2. The SAP R/3 Application Server's spool work process submits the print request to the Infoprint Server SAP Output Management System (OMS).
3. Infoprint Server determines that it needs to call the SAP to AFP transform.
4. The SAP to AFP transform converts the SAP R/3 OTF data to AFP format and ABAP data to line data format. The transform selects appropriate AFP resources, such as a form definition, for PSF to use when it prints the document.
5. Infoprint Server writes the AFP document to an output data set on the JES spool.
 

Infoprint Server also specifies JES output parameters that route the output data set to the AFP printer and tell PSF how to process the document. For example, the transform specifies the name of the form definition in a JES output parameter.
6. PSF selects the output data set from the JES spool. It uses the form definition to process the AFP document and sends it to the AFP printer.

7. When the data set finishes printing or is deleted from the JES spool, Infoprint Server sends notification back to the SAP application server that submitted the print request. The notification indicates whether the data set printed successfully.

Figure 3 shows how to print an SAP R/3 document on an AFP printer.

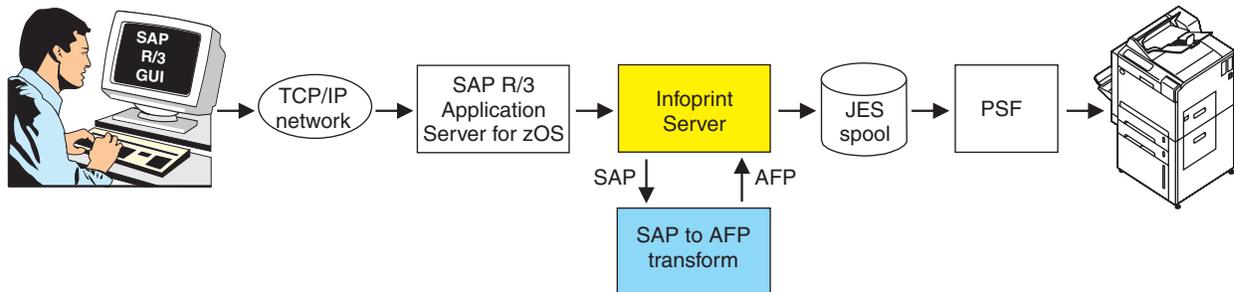


Figure 3. Printing SAP R/3 documents on AFP printers

## Methods for transforming documents

You can use either of these methods to transform documents to AFP:

### z/OS UNIX transform commands

z/OS UNIX System Services users can use transform commands to convert documents to AFP format from another format without printing the documents. You can run the transform commands from the z/OS UNIX command line, or you can use the Infoprint Server AOPBATCH program to run them.

You might want to transform documents without printing them if you intend to print a document many times. In this case, it is more efficient to transform the document once and print the output than to transform the document every time you print it.

You can use these transform commands:

<b>pcl2afp</b>	For PCL to AFP
<b>pdf2afp</b>	For PDF to AFP
<b>ps2afp</b>	For PostScript to AFP
<b>sap2afp</b>	For SAP to AFP

The input document and the output AFP document can be in an MVS™ data set or in a z/OS UNIX file.

For example, to transform the PostScript document `myfile.ps` to an AFP document named `myfile.afp`, enter:

```
ps2afp -o myfile.afp myfile.ps
```

### Printer definitions

The administrator can specify transform filters in printer definitions in the Infoprint Server Printer Inventory. When you do this, Infoprint Server automatically calls the appropriate transform filter before it prints the document or sends it to an e-mail destination. You use this method when you want to transform and print AFP documents but not save the transformed output.

For example, suppose that the administrator has configured a printer definition named “myprinter” to use the PDF to AFP transform filter:

- You can use the z/OS UNIX **lp** command to transform and print a PDF document using this printer definition. For example, to transform and print a PDF document in file `myfile.pdf`, enter this z/OS UNIX command:

```
lp -d myprinter myfile.pdf
```

- You can transform and print the PDF output of a batch job using the Print Interface subsystem and this printer definition. For example, to transform and print a PDF document created by a batch program using the subsystem named AOP1, submit this JCL:

```
//MYJOB JOB ...  
//STEP1 EXEC PGM=USERA  
//DD1 DD SUBSYS=(AOP1,'myprinter')
```

---

## Specifying transform options

You can use transform options to tell the transforms how you want the data to be transformed to AFP. You can use these methods to specify transform options:

### Transform configuration file

The administrator can specify some transform options in the transform configuration file **aopxfd.conf**. For example, you can tell the PCL to AFP transform the resolution of the printer in the AOP\_RESOLUTION environment variable in the transform configuration file.

The administrator can create separate classes of a transform with different transform options in each class. For example, the administrator could create a transform class for AFP printers with a resolution of 300 pels, and a class for printers with a resolution of 600 pels. The administrator names and defines the transform classes in the transform configuration file. To use a transform class that the administrator has defined:

- The administrator can specify the name of the transform class in the **-c** transform option in the printer definition.
- The job submitter can specify the name of the transform class in the **-c** transform command option.

### Transform command options

You can specify some transform options on the transform commands. For example, when you enter the **pdf2afp** command, you can specify option **-c transformclass** to tell the transform the name of a transform class to use.

When you transform and print documents, you can specify transform command options in the **filter-options** job attribute. For example, when you enter the **lp** command, you can specify the **-c** option in the **filter-options** job attribute.

---

## Software requirements

The transforms to AFP run on all supported releases of z/OS.

This additional IBM software beyond the z/OS base elements is required:

- z/OS Infoprint Server
- Infoprint Transforms to AFP APARs/PTFs:
  - APAR OA30983/PTF UA52362
  - APAR OA32105/PTF UA54506

- z/OS Infoprint Server APARs/PTFs:
  - APAR OA30236/PTF UA50439
  - APAR OA32228/PTF UA54346
- Print Services Facility (PSF) V4R1 for z/OS or later (5655–M32) to print on AFP printers, including those offered by InfoPrint Solutions Company.

---

## Performance considerations

Transforming documents from the document format in which they were created to another document format uses more system resources than printing the documents on printers that support the original document format.

The impact on system and network resources varies depending on items such as:

- Print volume
- Content of documents being transformed
- Current utilization of the system and network resources

The throughput of the transform varies depending on items such as:

- Document format created
- Size, density, and complexity of the documents to be transformed
- Resolution of the output documents

In addition, transformed documents are usually larger than the original documents.

---

## PCL to AFP transform

The PCL to AFP transform converts documents in Printer Control Language (PCL) 6 (XL, 5, 5e, 5c) format to AFP format. The transform can accept PCL documents in color. However, it always creates a monochrome AFP image.

The transform creates an AFP Image Object Content Architecture (IOCA) image for each page in the PCL document. The image can be a compressed IOCA image (recommended for faster printing) or an uncompressed image. The transform can produce a complete printable AFP document, or it can create an AFP overlay or page segment of a single page that you can print as part of other documents.

You can specify the type of IOCA image and type of document the transform creates in options on the transform command and in options in the printer definition. The administrator can specify the height and width of the output page and the resolution of the IOCA image in environment variables in the transform configuration file.

## Supported fonts

The PCL to AFP transform contains a set of single-byte built-in fonts, which it uses to create a rasterized image of the data. For a list of the fonts that are built in, see Table 23 on page 133. DBCS fonts are not built in to the transform, but the transform can process DBCS fonts that are embedded in the PCL document.

If a PCL document specifies a font that is not built in and is not embedded in the PCL document, the transform substitutes another font that is the best match for the specified font. You cannot customize the way the transform performs font substitution, and the transform does not write any message when it substitutes fonts.

The administrator cannot add fonts to the transform. However, you can embed fonts in the PCL document.

## PCL to AFP transform limitations

These limitations apply to the PCL to AFP transform:

- The transform does not produce color output. It produces monochrome output only.
- DBCS fonts are not built in to the transform, but the transform can process DBCS fonts that are embedded in the PCL document.
- The transform cannot create FS45 image objects, which some color printers require.
- PCL data can contain device commands (for example, to begin or end duplexing or to change the input bin). Because the AFP architecture defines those device functions in an AFP form definition, the transform ignores the device commands in the PCL data stream. To obtain these device functions, you must specify them in the form definition or Infoprint Server job attributes.
- Resolution conversion algorithms might produce a degraded appearance when used to reduce the resolution of a data stream. For this reason, the transform might degrade the appearance of higher-resolution data streams when used with 240-pel printers. You should verify that print fidelity is satisfactory.
- Subtle differences exist between PCL4 and PCL5e related to handling fonts. While many PCL4 files work with the transform, some might not produce the expected output.

---

## PDF to AFP transform

The PDF to AFP transform converts documents in PDF 1.6 or earlier levels of PDF format to AFP format. The transform can accept PDF documents in color. However, it always creates a monochrome AFP image.

The transform creates an AFP Image Object Content Architecture (IOCA) image for each page in the PDF document. The image can be a compressed IOCA image (recommended for faster printing) or an uncompressed image. The transform can produce a printable AFP document, or an AFP overlay or page segment that you can print as part of other documents.

You can specify the type and resolution of the IOCA image, the height and width of the output page, and the type of document the transform creates in options on the transform command and in options in the printer definition.

## Supported fonts

The PDF to AFP transform provides a set of fonts, which it uses to create a rasterized image of the data. For a list of the fonts that are provided with the transform, see Table 24 on page 133.

If a PDF document specifies a font that is not embedded in the PDF document and is not provided with the transform, the transform substitutes another font that is the best match for the specified font. You cannot customize the way the transform performs font substitution.

The administrator can add single-byte ASCII fonts to the transform. For information, see “Adding fonts” on page 69.

The transform writes a message when it substitutes fonts in a document. The transform writes the font-substitution message to the transform's `stderr` file so that the administrator can see which fonts the transform has substituted.

## PDF to AFP transform limitations

These limitations apply to the PDF to AFP transform:

- The transform does not produce color output. It produces monochrome output only.
- The transform cannot process DBCS fonts.
- The PDF to AFP transform might not be able to transform very large PDF documents that contain non-balanced page trees. For information about page trees, see the Adobe PDF Reference, which is available on the Adobe Web site ([www.adobe.com](http://www.adobe.com)).

**Tip:** Applications that create PDF documents by combining a large number of separate PDF documents sometimes create PDF documents with non-balanced tree structures.

- Resolution conversion algorithms might produce a degraded appearance when used to reduce the resolution of images imbedded in a data stream. For this reason, the transform might degrade the appearance of higher-resolution images when used with 240-pel printers. You should verify that print fidelity is satisfactory.
- This transform cannot create AFP FS45 image objects, which some color printers require. However, the PDF to AFP transform that InfoPrint Manager for AIX<sup>®</sup> and Windows provides can create FS45 images. If your installation has installed InfoPrint Manager for AIX or Windows, the administrator can set up the printer definitions for the color printers to run the transform remotely using InfoPrint Manager. For information, see “Transforming data remotely with InfoPrint Manager for AIX or Windows” in *z/OS Infoprint Server Operation and Administration*.
- The transform cannot transform PDF files that are concatenated. If you use the AOPBATCH program to run the transform, you must transform each PDF file in a separate step.

---

## PostScript to AFP transform

The PostScript to AFP transform converts documents in PostScript Language Level 3 format to AFP format. The transform can accept PostScript documents in color. However, it always creates a monochrome AFP image.

The transform creates an AFP Image Object Content Architecture (IOCA) image for each page in the PostScript document. The image can be a compressed IOCA image (recommended for faster printing) or an uncompressed image. The transform can produce a printable AFP document, or an AFP overlay or page segment that you can print as part of other documents.

You can specify the type, height, width, and resolution of the IOCA image, and the type of document the transform creates in options on the transform command and in options in the printer definition.

## Supported fonts

The PostScript to AFP transform provides a set of fonts, which it uses to create a rasterized image of the data. For a list of the fonts that are provided with the transform, see Table 24 on page 133.

If a PostScript document specifies a font that is not embedded in the PostScript document and is not provided with the transform, the transform substitutes another font that is the best match for the specified font. You cannot customize the way the transform performs font substitution.

The administrator can add single-byte ASCII fonts to the transform. For information, see “Adding fonts” on page 69.

The transform writes a message when it substitutes fonts in a document. The transform writes the font-substitution message to the transform’s `stderr` file so that the administrator can see which fonts the transform has substituted.

## PostScript to AFP transform limitations

These limitations apply to the PostScript to AFP transform:

- The transform does not produce color output. It produces monochrome output only.
- The transform cannot process DBCS fonts.
- PostScript data can contain device commands (for example, to begin or end duplexing or to change the input bin). Because the AFP architecture defines those device functions in a form definition resource, the transform command ignores the device commands in the print data. To access those device functions, you must specify them in the form definition or attributes file, or on a print command, when you print the job.
- Resolution conversion algorithms might produce a degraded appearance when used to reduce the resolution of images imbedded in a data stream. For this reason, the transform might degrade the appearance of higher-resolution images when used with 240-pel printers. You should verify that print fidelity is satisfactory.
- This transform cannot create AFP FS45 image objects, which some color printers require. However, the PostScript to AFP transform that InfoPrint Manager for AIX and Windows provides can create FS45 images. If your installation has installed InfoPrint Manager for AIX or Windows, the administrator can set up the printer definitions for the color printers to run the transform remotely using InfoPrint Manager. For information about how to set up printer definitions to run transform remotely, see *z/OS Infoprint Server Operation and Administration*.
- The transform cannot transform PostScript files that are concatenated. If you use the AOPBATCH program to run the transform, you must transform each PostScript file in a separate step.

---

## SAP to AFP transform

The SAP to AFP transform converts SAP R/3 Release 4.6C Output Text Format (OTF) and Advanced Business Application Programming (ABAP) documents to AFP format:

- SAP R/3 OTF data streams are converted into AFP Presentation Text Object Content Architecture (PTOCA) data streams.
- SAP R/3 ABAP data streams are converted into line data.

The SAP R/3 OTF and ABAP data streams must be in ASCII representation.

The transform selects the appropriate AFP resources (form definition, page definition, and font) to use when PSF prints the document. The transform selects the resources based on the value of the PJFORM keyword in the header of the SAP data stream.

Table 6 shows the configuration files that you can customize. For information about how to customize these files, see “Customizing SAP to AFP configuration files” on page 76.

*Table 6. SAP transform configuration files*

Configuration file	Purpose	SAP data stream
barcode.tab	Maps SAP OTF bar code names to Bar Code Object Content Architecture™ (BCOCA™) bar codes.	OTF data only
defcp.tab	Maps single-byte ASCII code points to EBCDIC code points.	ABAP data only
fonts.tab	Maps the fonts used in the OTF data stream to AFP fonts.	OTF data only
image.tab	Defines values used to print image data.	OTF data only
pagedef.tab	For SAP R/3 Format names, specifies the page definition, form definition, and ABAP coded fonts.	ABAP and OTF data
xxx0000.tab	Maps SAP code pages to AFP code pages.	OTF data only
6400fonts.tab	Lists raster fonts that apply exclusively to the InfoPrint 6400 printer with the appropriate character set and code page.	OTF data only
userenv	Defines the input character set.	ABAP and OTF data

## Supported input code pages

The SAP to AFP transform supports these input code pages:

- 0000 ASCII ISO-1 (Latin 1)
- 1100 ASCII ISO 8859/1 (Latin 1)
- 4001 OCR-A (ASCII)
- 4004 OCR-B (ASCII)
- 8000 Japanese ISO Shift-JIS
- 8300 Chinese (traditional) ISO Big5
- 8400 Chinese (simplified) ISO GB2312
- 8500 Korean ISO KSC 5601
- 8600 Thai ISO TIS620-2529
- 1500 Cyrillic ISO 8859/5

For information about the 4-byte codes (such as 1100), see the SAP R/3 4.6C specifications.

## OTF BX command support

The SAP to AFP transform supports the OTF BX command. The BX command lets you print boxes that are either clear, solid, or contain four different levels of shading. The levels of shading are a percentage between 0 and 100, with 0 indicating a clear box and 100 a solid box. If the SAP to AFP transform recognizes a BX command, it creates Graphics Object Content Architecture (GOCA) output. GOCA is an AFP data architecture used to represent pictures generated by computer.

If your applications do not require GOCA support features such as box shading, you might want to improve performance by suppressing GOCA support. To suppress GOCA support, specify the **-s** option on the **sap2afp** command or on the transform filter in the printer definition.

## SAP to AFP transform limitations

These limitations apply to the SAP to AFP transform:

- The transform cannot transform SAP R/3 EBCDIC data. It can only transform ASCII data.
- The transform cannot create FS45 image objects, which some color printers require.
- If you use the **sap2afp** command to transform ABAP data to line data, the output file must be an MVS data set, not a UNIX file.

---

## Chapter 2. Using transforms

This chapter describes the z/OS UNIX transform commands that you can use. It also describes how to use the Infoprint Server subsystem and the **lprafp** command to transform and print documents.

The transform commands let you convert files to an AFP data stream without printing. The transform commands can write the output AFP data stream to a UNIX file or to an MVS data set.

For the levels of the data stream files that the transform commands transform, see “Transform names and levels” on page 2.

The sections in this chapter are:

- “pcl2afp—Transform PCL data to AFP data” on page 13
- “pdf2afp—Transform PDF data to AFP data” on page 22
- “ps2afp—Transform PostScript data to AFP data” on page 30
- “sap2afp—Transform SAP OTF or ABAP data to AFP data” on page 38
- “Transforming data with the AOPBATCH program” on page 42
- “Using the Print Interface subsystem” on page 46
- “Using the lprafp command” on page 47
- “Calculating the size of the AFP data stream” on page 47

---

### pcl2afp—Transform PCL data to AFP data

#### Format

```
pcl2afp [-a imagetype] [-c transformclass] [jobattributes] [-l length] [-o outputfile]  
  
[-p pagerange] [-r resolution] [-t outputtype] [-w width]  
  
[-x xmargin] [-y ymargin] [-T] [inputfile...]
```

#### Description

The **pcl2afp** command converts a Printer Control Language (PCL) data file into an Advanced Function Presentation (AFP) data stream file.

If you specify the same option multiple times, the command uses only the last option.

You can specify one or more input files to be transformed. If you do not specify an input file name, or if you specify a dash (-) as the file name, **pcl2afp** uses standard input. The output file name is also optional. If you do not specify one, the **pcl2afp** command writes the results to standard output.

#### Options

**Note:** All options and values are case-sensitive, except as noted.

**-a** *imagetype*

Determines the type of AFP data stream image to generate for each page in the PCL file.

Values are:

**io1-g4** Compressed Image Object Content Architecture (IOCA) image in Modified Telecommunication Standardization Sector (TSS) T.6 G4 Facsimile Coding Scheme (G4 MMR) format. This is the recommended output type because the AFP output data stream is smaller and it prints faster.

**Tips:**

1. Some older AFP printers do not support printing with an image type of **io1-g4**. For these printers, specify an image type of **io1-mm**r because it is the compressed image type that they support. This image type results in faster printing than uncompressed image types.
2. TSS was formerly the International Telegraph and Telephone Consultative Committee (CCITT).

**im1** IM1 image. This type of image is not compressed. Specify it only if you know that your printer does not support compressed images.

**Note:** Do not create IM1 images at a resolution that the printer does not support because Print Services Facility (PSF) converts the IM1 images to uncompressed IOCA images at the resolution the printer requires. This conversion can cause PSF to use very large amounts of CPU time.

**io1** IOCA image. This type of image is not compressed. Specify it only if you know that your printer does not support compressed images.

**io1-mm**r

Compressed IOCA image in Modified Modified Read (MMR) format.

**-c** *transformclass*

Specifies the name of a transform class that your administrator has defined. The transform class determines these options:

- The length and width of the generated image
- The page margins
- The resolution of the output image
- The amount of memory that the transform allocates

Ask your administrator for the name of a transform class suitable for the printer and the type of job.

**Tip:** If the transform class specifies a resolution that the printer does not support, PSF prints the image under most conditions, but with degraded results.

**-l** *length*

Specifies the length of the generated image. In general, specify the length of the physical page. For more information about this option, see "Usage notes" on page 20. Specify a number followed by one of these units:

**in** Inches

**mm** Millimeters  
**pel** Pels, the default unit

Values are:

<b>0.1334in to 53in</b>	Inch values for 240-pel printers
<b>0.1067in to 53in</b>	Inch values for 300-pel printers
<b>0.0667in to 53in</b>	Inch values for 480-pel printers
<b>0.0534in to 53in</b>	Inch values for 600-pel printers
<b>3.3867mm to 1346.2mm</b>	Millimeter values for 240-pel printers
<b>2.7094mm to 1346.2mm</b>	Millimeter values for 300-pel printers
<b>1.6934mm to 1346.2mm</b>	Millimeter values for 480-pel printers
<b>1.3547mm to 1346.2mm</b>	Millimeter values for 600-pel printers
<b>32pel to 12720pel</b>	Pel values for 240-pel printers
<b>32pel to 15900pel</b>	Pel values for 300-pel printers
<b>32pel to 25440pel</b>	Pel values for 480-pel printers
<b>32pel to 31800pel</b>	Pel values for 600-pel printers

**Examples:**

```
-l 40mm  
-l 200.5mm  
-l 13in  
-l 5280  
-l 5280pel
```

**Default:** The value specified in the AOP\_PAGE\_LENGTH environment variable. If the environment variable is not specified, the default value is 11 inches.

**Tips:**

1. If a text margin is already set in the file, try **-l 11in** to set the length to 11 inches.
2. Inch values and millimeter values can contain a decimal point. Pel values cannot.
3. You can specify the unit using lowercase or uppercase letters (for example, in or IN).

**-o outputfile**

Specifies the output path and file into which the transform output (that is, AFP data) is written. The transform overwrites any existing data in the output file. If you specify more than one output file, the last path and file name are used. If you do not specify an output file, the result is written to standard output (STDOUT).

To specify an MVS data set, such as a sequential or partitioned data set, precede the data set name with //. When you specify a fully qualified name, two sets of quotation marks are required. For example, `///hlq.PDS(MYDOC)'` or `///hlq.SEQDS'`. When you specify a partially qualified name, you only need one set of quotation marks. For example, `///PDS(MYDOC)'` or `///SEQDS'`.

If you specify an MVS data set, you must allocate and catalog the data set before you run this command. Allocate the output data set with these characteristics:

- Record format: VBM
- Record length: 8K (8192) bytes or larger

Allocate an MVS data set that is large enough to hold the AFP data stream. The size of the AFP data stream depends on the size and complexity of the document, the type of image compression you select in the **-a** option, and the resolution specified in the **-r** option or in the AOP\_RESOLUTION environment variable. Typically, an output AFP data stream is several times as large as the input data stream. For information about the size of the AFP data stream, see “Calculating the size of the AFP data stream” on page 47.

**Note:** If the specified MVS output data set does not exist, the transform creates the data set; however, the data set does not have the correct record format and record length. If you attempt to print the data set, PSF for z/OS writes message APS114I.

**-p** *pagerange*

Specifies that the output should contain only selected pages.

The **-p** option counts pages by their actual sequence in the document, not by page number. For example, to write only the last page of a document whose pages are numbered i, ii, 1, 2, 3, 4, specify **-p 6**.

Examples of values include:

- p 1-10** Write the first through tenth pages.
- p 10-** Write pages from the tenth page until the end of the file.

**-r** *resolution*

Specifies the resolution used to print image data in the job. Select the correct resolution for the printer on which you intend to print the job.

Values are:

- 240** 240 pels per inch (for example, IBM 3812, 3825, 3827, 3835, and 3900 printers)
- 300** 300 pels per inch (for example, IBM 3112, 3116, 4019, 4028, 4029, and 4039 printers and Hewlett-Packard printers)
- 480** 480 pels per inch
- 600** 600 pels per inch (for example, the InfoPrint 60 and InfoPrint 4000 printers)

**Default:** The resolution specified in the AOP\_RESOLUTION environment variable. If not specified, the default is 240 pels.

**Tips:**

1. If you specify a resolution that the printer does not support, PSF prints the image under most conditions, but sometimes with degraded results.
2. A resolution of 300 pels typically produces good quality output on 300 or 600 pel printers. 300 pel output requires one-fourth the space and transmission time.

**-t** *outputtype*

Determines the type of output to create.

Values are:

- document**  
Printable document.

**overlay**

Graphic image that can be printed on each page of a printable document.

**pagesegment**

Graphic image that can be embedded in a printable document.

**Tip:** When you create overlays or page segments from multiple-page documents, use the **-p** option to select a single page. If you do not select a page, the output will contain an overlay or page segment only for the first page because the AFP architecture does not allow multiple, concatenated overlays or page segments.

**-w width**

Specifies the maximum width of the generated image. In general, specify the width of the physical page. For more information about this option, see "Usage notes" on page 20. Specify a number followed by one of these units:

**in** Inches  
**mm** Millimeters  
**pel** Pels, the default unit

Values are:

<b>0.1334in to 25.5in</b>	Inch values for 240-pel printers
<b>0.1067in to 25.5in</b>	Inch values for 300-pel printers
<b>0.0667in to 25.5in</b>	Inch values for 480-pel printers
<b>0.0534in to 25.5in</b>	Inch values for 600-pel printers
<b>3.3867mm to 647.7mm</b>	Millimeter values for 240-pel printers
<b>2.7094mm to 647.7mm</b>	Millimeter values for 300-pel printers
<b>1.6934mm to 647.7mm</b>	Millimeter values for 480-pel printers
<b>1.3547mm to 647.7mm</b>	Millimeter values for 600-pel printers
<b>32pel to 6120pel</b>	Pel values for 240-pel printers
<b>32pel to 7650pel</b>	Pel values for 300-pel printers
<b>32pel to 12240pel</b>	Pel values for 480-pel printers
<b>32pel to 15300pel</b>	Pel values for 600-pel printers

**Examples:**

```
-w 40mm
-w 200.5mm
-w 13in
-w 4000
-w 4000pel
```

**Default:** The value specified in the AOP\_PAGE\_WIDTH environment variable. If the environment variable is not specified, the default value is 8.5 inches.

**Tips:**

1. If a text margin is already set in the file, try **-w 8.5in** to set the width to 8.5 inches

2. Inch values and millimeter values can contain a decimal point. Pel values cannot.
3. You can specify the unit using lowercase or uppercase letters (for example, in or IN).

**-x *xmargin***

Specifies a horizontal margin or border around the generated image to avoid the non-printable areas of some printers. For more information about this option, see "Usage notes" on page 20. Specify a number followed by one of these units:

- in** Inches
- mm** Millimeters
- pel** Pels, the default unit

Values are:

**0in to 12.75in** Inch values for all printers

**0mm to 323.85mm**  
Millimeter values for all printers

**0pel to 3060pel**  
Pel values for 240-pel printers

**0pel to 3825pel**  
Pel values for 300-pel printers

**0pel to 6120pel**  
Pel values for 480-pel printers

**0pel to 7650pel**  
Pel values for 600-pel printers

**Default:** 0.167 inches

**Tips:**

1. If the value is less than 1, include a leading zero. For example, specify:  
0.5in  
0.8mm
2. Because the X value specifies margins on *both* the left and right sides of the page, the X value can be no more than half of the width (-w) of the generated image. For example, if you specify a width of 8 inches, the X value can be no larger than 4 inches. If you specify an X value of 5 inches, a blank page is printed because the sum of the left and right margins exceeds the width of the paper.
3. The X value does not shift the image on the page. The image is cropped if it is defined to print in the left or right margin.
4. Inch values and millimeter values can contain a decimal point. Pel values cannot.
5. You can specify the unit using lowercase or uppercase letters (for example, in or IN).

**-y *ymargin***

Specifies a vertical margin or border around the generated image to avoid the non-printable areas of some printers. For more information about this option, see "Usage notes" on page 20. Specify a number followed by one of these units:

- in** Inches

**mm** Millimeters

**pel** Pels, the default unit

Values are:

**0in to 26.5in** Inch values for all printers

**0mm to 673.1mm**  
Millimeter values for all printers

**0pel to 6360pel**  
Pel values for 240-pel printers

**0pel to 7950pel**  
Pel values for 300-pel printers

**0pel to 12720pel**  
Pel values for 480-pel printers

**0pel to 15900pel**  
Pel values for 600-pel printers

**Default:** 0.167 inches

**Tips:**

1. If the value is less than 1, include a leading zero. For example, specify:  
0.5in  
0.8mm
2. Because the Y value specifies margins on *both* the top and bottom of the page, the Y value can be no more than half of the length (-1) of the generated image. For example, if you specify a length of 12 inches, the Y value can be no larger than 6 inches. If you specify a Y value of 7 inches, a blank page is printed because the sum of the top and bottom margins exceeds the length of the paper.
3. The Y value does not shift the image on the page. The image is cropped if it is defined to print in the top or bottom margin.
4. Inch values and millimeter values can contain a decimal point. Pel values cannot.
5. You can specify the unit using lowercase or uppercase letters (for example, in or IN).

**Tip:** You can use the **filter-options** job attribute with, for example, the **lp** command to pass any of these options except **-o** *outputfile* to the transform. For information about the **filter-options** job attribute, see *z/OS Infoprint Server User's Guide*.

## Operand

*inputfile*

Specifies an input file to be transformed. If you specify more than one input file name, the **pcl2afp** command transforms each file to AFP format and writes the results to a single output file (if one is specified) or to standard output.

If you do not specify an input file, or if you specify a dash (-) as the file name, **pcl2afp** uses standard input.

**-T** Requests a trace. Specify this option only if instructed by IBM service personnel. For more information, see Chapter 5, "Diagnosing errors," on page 107.

## Usage notes

In general, to position data on the page:

- Use **-l** and **-w** to set the physical page dimensions.
- Use **-x** and **-y** to set the amount of white space between the physical page dimensions and the image.

These options do not shift or scale the image on the page. If the image is defined to print in the unprintable areas, it is cropped.

For example, to create a 6.5 x 9 inch image that is centered on an 8.5 x 11 inch page, enter:

```
-l 11in -w 8.5in -x 1in -y 1in
```

- Use a form definition that specifies zero vertical offset and zero horizontal offset, or specify X and Y offsets of 0 when you submit the print job.

## Examples -- pcl2afp

### Transform a file, specifying transform class

To transform the PCL file `myfile.pcl` into an AFP data stream, using the `a4_300` transform class, and write the result to a file called `myfile.afp`, enter:

```
pcl2afp -c a4_300 -o myfile.afp myfile.pcl
```

### Transform and print a file, specifying image type

To transform the PCL file `myfile.pcl` into an AFP data stream as an IO1-MMR image, and send the result to the default printer with the `lp` command, enter:

```
pcl2afp -a iol-mmr myfile.pcl | lp
```

### Transform a file using redirection

To transform the PCL file `input.pcl` into the AFP output file called `output.afp`, enter:

```
pcl2afp < input.pcl > output.afp
```

**Note:** You can use redirection operators only with UNIX files.

### Transform multiple files

To transform the PCL files `input.01.pcl`, `input.02.pcl`, ... `input.xx.pcl` and write the results to one AFP output file called `output.afp`, enter:

```
pcl2afp -o output.afp input.01.pcl input.02.pcl ... input.xx.pcl
```

### Transform a UNIX file to an MVS data set

To transform file `input.pcl` into an existing, cataloged MVS output data set called `hlq.OUTPUT.AFP(member)`, where `hlq` is your user ID, enter:

```
pcl2afp -o "'/hlq.OUTPUT.AFP(member)'" input.pcl
```

### Transform an MVS data set, writing the output to a UNIX file

To transform the MVS data set `hlq.INPUT.PCL(member)`, where `hlq` is your user ID, into an output file called `output.afp`, enter:

```
pcl2afp -o output.afp "'/hlq.INPUT.PCL(member)'"
```

### Transform a file and receive MVS return codes

To transform the PCL file `myfile.pcl` into an AFP data stream and write the result to a file called `myfile.afp` and receive MVS return codes (0, 4, 8), enter:

```
AOP_MVS_RETURN_CODES=YES pcl2afp -o myfile.afp myfile.pcl
```

MVS return codes indicate whether the transform was successful (0), a transform warning occurred (4), or a transform error occurred (8).

## Environment variables

The **pcl2afp** command uses these environment variables:

**AOPCONF** Names the Infoprint Server configuration file. This variable takes precedence over the user-specific configuration file (**\$HOME/.aopconf**) and the system default configuration file (**/etc/Printsrv/aopd.conf**). For more information about the configuration file, see *z/OS Infoprint Server Customization*.

### AOP\_MVS\_RETURN\_CODES

Specifies whether the command returns MVS return codes (0, 4, 8) or UNIX exit values (0, 1). The default is UNIX exit values.

**LIBPATH** The path used to locate dynamic link libraries (DLLs).

**NLSPATH** Names the directory paths that the **pcl2afp** command searches for message catalogs.

For information about setting and using environment variables, see *z/OS UNIX System Services User's Guide*.

The PCL to AFP transform uses environment variables specified in the Infoprint Server transform configuration file. For information, see “Environment variables for the PCL to AFP transform” on page 53.

## Files

### **\$HOME/.aopconf**

Contains the user-specific Infoprint Server configuration file. This file takes precedence over **/etc/Printsrv/aopd.conf**.

### **/etc/Printsrv/aopd.conf**

Contains the system default Infoprint Server configuration file.

For the format of the configuration files, see *z/OS Infoprint Server Customization*.

## Exit values

MVS return codes:

**0** Successful.

**4** A warning occurred during the transform.

**8** The command was not accepted, a data stream error occurred during the transform, or the transform failed.

UNIX exit values (default):

**0** Successful. However, a warning or data stream error might have occurred during the transform.

**1** The command was not accepted, or the transform failed.

### Notes:

1. The **AOP\_MVS\_RETURN\_CODES** environment variable determines the type of exit values.

2. The **AOP\_FAIL\_ON\_ERROR** environment variable controls whether the transform fails when it detects a data stream warning or error.

---

## pdf2afp—Transform PDF data to AFP data

### Format

```
pdf2afp [-a imagetype] [-c transformclass] [[-l length] [-o outputfile]  
[-p pagerange] [-r resolution] [-t outputtype] [-w width]  
[-x xmargin] [-y ymargin] [-T] [inputfile...]
```

### Description

The **pdf2afp** command converts a Portable Document Format (PDF) data file into an Advanced Function Presentation (AFP) data stream file.

If you specify the same option multiple times, the command uses only the last option.

You can specify one or more input files to be transformed. If you do not specify an input file name, or if you specify a dash (-) as the file name, **pdf2afp** uses standard input. The output file name is also optional. If you do not specify one, the **pdf2afp** command writes the results to standard output.

### Options

**Note:** All options and values are case-sensitive, except as noted.

**-a** *imagetype*

Determines the type of AFP data stream image to generate for each page in the PDF file.

Values are:

**io1-g4** Compressed Image Object Content Architecture (IOCA) image in Modified Telecommunication Standardization Sector (TSS) T.6 G4 Facsimile Coding Scheme (G4 MMR) format. This is the recommended output type because the AFP output data stream is smaller and it prints faster.

**Tips:**

1. Some older AFP printers do not support printing with an image type of **io1-g4**. For these printers, specify an image type of **io1-mm** because it is the compressed image type that they support. This image type results in faster printing than uncompressed image types.
2. TSS was formerly the International Telegraph and Telephone Consultative Committee (CCITT).

**im1** IM1 image. This type of image is not compressed. Specify it only if you know that your printer does not support compressed images.

**Note:** Do not create IM1 images at a resolution that the printer does not support because Print Services Facility (PSF) converts the IM1 images to uncompressed IOCA images at the resolution the printer requires. This conversion can cause PSF to use very large amounts of CPU time.

**io1** IOCA image. This type of image is not compressed. Specify it only if you know that your printer does not support compressed images.

**io1-mmr**  
Compressed IOCA image in Modified Modified Read (MMR) format.

**-c transformclass**  
Specifies the name of a transform class defined in the transform configuration file. The transform class determines these options:

- The initial transform configuration
- The fonts used in the transformed files

Ask the administrator for the name of a transform class suitable for the type of job.

**-l length**  
Specifies the length of the generated image. In general, specify the length of the physical page. For more information about this option, see “Usage notes” on page 28. Specify a number followed by one of these units:

**in** Inches  
**mm** Millimeters  
**pel** Pels, the default unit

Values are:

<b>0.1334in to 53in</b>	Inch values for 240-pel printers
<b>0.1067in to 53in</b>	Inch values for 300-pel printers
<b>0.0667in to 53in</b>	Inch values for 480-pel printers
<b>0.0534in to 53in</b>	Inch values for 600-pel printers
<b>3.3867mm to 1346.2mm</b>	Millimeter values for 240-pel printers
<b>2.7094mm to 1346.2mm</b>	Millimeter values for 300-pel printers
<b>1.6934mm to 1346.2mm</b>	Millimeter values for 480-pel printers
<b>1.3547mm to 1346.2mm</b>	Millimeter values for 600-pel printers
<b>32pel to 12720pel</b>	Pel values for 240-pel printers
<b>32pel to 15900pel</b>	Pel values for 300-pel printers
<b>32pel to 25440pel</b>	Pel values for 480-pel printers
<b>32pel to 31800pel</b>	Pel values for 600-pel printers

**Examples:**

```
-l 40mm  
-l 200.5mm  
-l 13in  
-l 5280  
-l 5280pel
```

**Default:** The length value set in the file is used. If none is set, the default is 11 inches.

**Tips:**

1. If a text margin is already built into the file, try **-l 11in** to set the length to 11 inches.

2. Inch values and millimeter values can contain a decimal point. Pel values cannot.
3. You can specify the unit using lowercase or uppercase letters (for example, in or IN).

**-o** *outputfile*

Specifies the output path and file into which the transform output (that is, AFP data) is written. The transform overwrites any existing data in the output file. If you specify more than one output file, the last path and file name are used. If you do not specify an output file, the result is written to standard output (STDOUT).

To specify an MVS data set, such as a sequential or partitioned data set, precede the data set name with // . When you specify a fully qualified name, two sets of quotation marks are required. For example, `///'hlq.PDS(MYDOC)'` or `///'hlq.SEQDS'` . When you specify a partially qualified name, you only need one set of quotation marks. For example, `///PDS(MYDOC)` or `///SEQDS` .

If you specify an MVS data set, you must allocate and catalog the data set before you run this command. Allocate the output data set with these characteristics:

- Record format: VBM
- Record length: 8K (8192) bytes or larger

Allocate an MVS data set that is large enough to hold the AFP data stream. The size of the AFP data stream depends on the size and complexity of the document, the type of image compression (**-a** option), and the resolution of the image (**-r** option). Typically, an output AFP data stream is several times as large as the input data stream. For information about the size of the AFP data stream, see “Calculating the size of the AFP data stream” on page 47.

**Note:** If the specified MVS output data set does not exist, the transform creates the data set; however, the data set does not have the correct record format and record length. If you attempt to print the data set, PSF for z/OS writes message APS114I.

**-p** *pagerange*

Specifies that the output should contain only selected pages.

Examples of values include:

- p 1-10            Write the first through tenth pages.
- p 10-            Write pages from the tenth page until the end of the job.

**-r** *resolution*

Specifies the resolution of the output image. Select the correct resolution for the printer on which you intend to print the image.

Values are:

- 240**    240 pels per inch (for example, IBM 3812, 3825, 3827, 3835, and 3900 printers)
- 300**    300 pels per inch (for example, IBM 4019, 4028, 4029, and 4039 printers and some Hewlett-Packard printers)
- 480**    480 pels per inch
- 600**    600 pels per inch (for example, InfoPrint 60 and InfoPrint 4000 printers)

**Default:** 600 pels

**Tips:**

1. If you specify a resolution that the printer does not support, PSF prints the image under most conditions, but sometimes with degraded results.
2. A resolution of 300 pels typically produces good quality output on 300 or 600 pel printers. 300 pel output requires one-fourth the space and transmission time.

**-t** *outputtype*

Determines the type of output to create.

Values are:

**document**

Printable document.

**overlay**

Graphic image that can be printed on each page of a printable document.

**pagesegment**

Graphic image that can be embedded in a printable document.

**Tip:** When you create an overlay or page segment from a multiple-page input file, use the **-p** option to select a single page. If you do not select a page, the output will contain multiple, concatenated overlays or page segments. The AFP architecture does not allow multiple, concatenated overlays or page segments.

**-w** *width*

Specifies the maximum width of the generated image. In general, specify the width of the physical page. For more information about this option, see "Usage notes" on page 28. Specify a number followed by one of these units:

**in** Inches

**mm** Millimeters

**pel** Pels, the default unit

Values are:

**0.1334in to 25.5in** Inch values for 240-pel printers

**0.1067in to 25.5in** Inch values for 300-pel printers

**0.0667in to 25.5in** Inch values for 480-pel printers

**0.0534in to 25.5in** Inch values for 600-pel printers

**3.3867mm to 647.7mm** Millimeter values for 240-pel printers

**2.7094mm to 647.7mm** Millimeter values for 300-pel printers

**1.6934mm to 647.7mm** Millimeter values for 480-pel printers

**1.3547mm to 647.7mm** Millimeter values for 600-pel printers

**32pel to 6120pel** Pel values for 240-pel printers

**32pel to 7650pel** Pel values for 300-pel printers

**32pel to 12240pel** Pel values for 480-pel printers

**32pel to 15300pel** Pel values for 600-pel printers

### Examples:

-w 40mm  
-w 200.5mm  
-w 13in  
-w 4000  
-w 4000pel

**Default:** The width set in the file is used. If none is set, the default is 8.5 inches.

### Tips:

1. If a text margin is already built into the file, try **-w 8.5in** to set the width to 8.5 inches.
2. Inch values and millimeter values can contain a decimal point. Pel values cannot.
3. You can specify the unit using lowercase or uppercase letters (for example, in or IN).

### -x *xmargin*

Specifies a horizontal margin or border around the generated image to avoid the non-printable areas of some printers. For more information about this option, see "Usage notes" on page 28. Specify a number followed by one of these units:

**in** Inches  
**mm** Millimeters  
**pel** Pels, the default unit

Values are:

**0** Zero  
**0in to 12.75in** Inch values for all printers  
**0mm to 323.85mm** Millimeter values for all printers  
**0pel to 3060pel** Pel values for 240-pel printers  
**0pel to 3825pel** Pel values for 300-pel printers  
**0pel to 6120pel** Pel values for 480-pel printers  
**0pel to 7650pel** Pel values for 600-pel printers

**Default:** 0

### Tips:

1. If the value is less than 1, include a leading zero. For example, specify:  
0.5in  
0.8mm
2. Because the X value specifies margins on *both* the left and right sides of the page, the X value can be no more than half of the width (-w) of the generated image. For example, if you specify a width of 8 inches, the X value can be no larger than 4 inches. If you specify an X value of 5 inches, a blank page is printed because the sum of the left and right margins exceeds the width of the paper.

3. The X value does not shift the image on the page. The image is cropped if it is defined to print in the left or right margin.
4. Inch values and millimeter values can contain a decimal point. Pel values cannot.
5. You can specify the unit using lowercase or uppercase letters (for example, in or IN).

**-y *ymargin***

Specifies a vertical margin or border around the generated image to avoid the non-printable areas of some printers. For more information about this option, see "Usage notes" on page 28. Specify a number followed by one of these units:

**in** Inches

**mm** Millimeters

**pel** Pels, the default unit

Values are:

**0** Zero

**0in to 26.5in** Inch values for all printers

**0mm to 673.1mm**  
Millimeter values for all printers

**0pel to 6360pel**  
Pel values for 240-pel printers

**0pel to 7950pel**  
Pel values for 300-pel printers

**0pel to 12720pel**  
Pel values for 480-pel printers

**0pel to 15900pel**  
Pel values for 600-pel printers

**Default:** 0

**Tips:**

1. If the value is less than 1, include a leading zero. For example, specify:  
0.5in  
0.8mm
2. Because the Y value specifies margins on *both* the top and bottom of the page, the Y value can be no more than half of the length (-1) of the generated image. For example, if you specify a length of 12 inches, the Y value can be no larger than 6 inches. If you specify a Y value of 7 inches, a blank page is printed because the sum of the top and bottom margins exceeds the length of the paper.
3. The Y value does not shift the image on the page. The image is cropped if it is defined to print in the top or bottom margin.
4. Inch values and millimeter values can contain a decimal point. Pel values cannot.
5. You can specify the unit using lowercase or uppercase letters (for example, in or IN).

**-T** Requests a trace. Specify this option only if instructed by IBM service personnel. For more information, see Chapter 5, "Diagnosing errors," on page 107.

**Tip:** You can use the **filter-options** job attribute with, for example, the **lp** command to pass any of these options except **-o outputfile** to the transform. For information about the **filter-options** job attribute, see *z/OS Infoprint Server User's Guide*.

## Operand

*inputfile*

Specifies an input file to be transformed. If you specify more than one input file name, the **pdf2afp** command transforms each file to AFP format and writes the results to a single output file (if one is specified) or to standard output.

If you do not specify an input file, or if you specify a dash (-) as the file name, **pdf2afp** uses standard input.

## Usage notes

In general, to position data on the page:

- Use **-l** and **-w** to set the physical page dimensions.
- Use **-x** and **-y** to set the amount of white space between the physical page dimensions and the image.

These options do not shift or scale the image on the page. If the image is defined to print in the unprintable areas, it is cropped.

For example, to create a 6.5 x 9 inch image that is centered on an 8.5 x 11 inch page, enter:

```
-l 11in -w 8.5in -x 1in -y 1in
```

- Use a form definition that specifies zero vertical offset and zero horizontal offset, or specify X and Y offsets of 0 when you submit the print job.

## Examples -- pdf2afp

### Transform and print a file, specifying image type

To transform the PDF `myfile1.pdf` file into an AFP data stream as an IO1-MMR image, and send the result to the default printer with the **lp** command, enter:

```
pdf2afp -a iol-mmr myfile1.pdf | lp
```

### Transform and print a file, specifying resolution

To transform the PDF file `myfile1.pdf` into an AFP data stream, and then submit it to the 4019 printer called `robin`, enter:

```
pdf2afp -r 300 myfile1.pdf | lp -d robin
```

**Tip:** You need to specify a resolution of 300 pels (`-r 300`) because the 4019 is a 300-pel resolution printer. The default resolution for the **pdf2afp** command is 600 pels.

### Transform and print a file, specifying image type and resolution

To transform the PDF `myfile1.pdf` file into an AFP data stream in 300-pel resolution, as an IO1-MMR image, and send the result to the default printer with the **lp** command, enter:

```
pdf2afp -a iol-mmr -r 300 myfile1.pdf | lp
```

### Transform a UNIX file to an MVS data set

To transform file `input.pdf` into an existing, cataloged MVS output data set called `hlq.OUTPUT.AFP(member)`, where `hlq` is your user ID, enter:

```
pdf2afp -o "'h1q.OUTPUT.AFP(member)'" input.pdf
```

**Transform a file and receive MVS return codes:** To transform the PDF file `myfile.pdf` into an AFP data stream and write the result to a file called `myfile.afp` and receive MVS return codes (0, 4, 8), enter:

```
AOP_MVS_RETURN_CODES=YES pdf2afp -o myfile.afp myfile.pdf
```

MVS return codes indicate whether the transform was successful (0), a transform warning occurred (4), or a transform error occurred (8).

## Environment variables

The `pdf2afp` command uses these environment variables:

**AOPCONF** Names the Infoprint Server configuration file. This variable takes precedence over the user-specific configuration file (`$HOME/.aopconf`) and the system default configuration file (`/etc/Printsrv/aopd.conf`). For more information about the configuration file, see *z/OS Infoprint Server Customization*.

**AOP\_MVS\_RETURN\_CODES** Specifies whether the command returns MVS return codes (0, 4, 8) or UNIX (0, 1) exit values. The default is UNIX exit values.

**LIBPATH** The path used to locate dynamic link libraries (DLLs).

**NLSPATH** Names the directory paths that the `pdf2afp` command searches for message catalogs.

For information about setting and using environment variables, see *z/OS UNIX System Services User's Guide*.

The PDF to AFP transform uses environment variables specified in the Infoprint Server transform configuration file. For information, see "Environment variables for the PDF to AFP and PostScript to AFP transforms" on page 62.

## Files

### `$HOME/.aopconf`

Contains the user-specific Infoprint Server configuration file. This file takes precedence over `/etc/Printsrv/aopd.conf`.

### `/etc/Printsrv/aopd.conf`

Contains the system default Infoprint Server configuration file.

For the format of the configuration files, see *z/OS Infoprint Server Customization*.

## Exit values

### Exit values

MVS return codes:

**0** Successful.

**4** A warning occurred during the transform.

**8** The command was not accepted, a data stream error occurred during the transform, or the transform failed.

UNIX exit values (default):

**0** Successful. However, a warning or data stream error might have occurred during the transform.

- 1 The command was not accepted, or the transform failed.

**Notes:**

1. The AOP\_MVS\_RETURN\_CODES environment variable determines the type of exit values.
2. The AOP\_FAIL\_ON\_ERROR transform environment variable controls whether the transform fails when it detects a data stream warning or error.

---

## ps2afp—Transform PostScript data to AFP data

### Format

```
ps2afp [-a imagetype] [-c transformclass] [-l length]  
  
[-o outputfile] [-r resolution] [-t outputtype] [-w width]  
  
[-x xmargin] [-y ymargin] [-T] [inputfile...]
```

### Description

The **ps2afp** command converts a PostScript data file into an Advanced Function Presentation (AFP) data stream file.

If you specify the same option multiple times, the command uses only the last option. You can specify one or more input files to be transformed. If you do not specify an input file name, or if you specify a dash (-) as the file name, **ps2afp** uses standard input. The output file name is also optional. If you do not specify one, the **ps2afp** command writes the results to standard output.

### Options

**Note:** All options and values are case-sensitive, except as noted.

**-a** *imagetype*

Determines the type of AFP data stream image to generate for each page in the PostScript file.

Values are:

**io1-g4** Compressed Image Object Content Architecture (IOCA) image in Modified Telecommunication Standardization Sector (TSS) T.6 G4 Facsimile Coding Scheme (G4 MMR) format. This is the recommended output type because the AFP output data stream is smaller and it prints faster.

**Tips:**

1. Some older AFP printers do not support printing with an image type of **io1-g4**. For these printers, specify an image type of **io1-mm1** because it is the compressed image type that they support. This image type results in faster printing than uncompressed image types.
2. TSS was formerly the International Telegraph and Telephone Consultative Committee (CCITT).

**im1** IM1 image. This type of image is not compressed. Specify it only if you know that your printer does not support compressed images.

**Note:** Do not create IM1 images at a resolution that the printer does not support because Print Services Facility (PSF) converts the IM1 images to uncompressed IOCA images at the resolution the printer requires. This conversion can cause PSF to use very large amounts of CPU time.

**io1** IOCA image. This type of image is not compressed. Specify it only if you know that your printer does not support compressed images.

**io1-mm**  
Compressed IOCA image in Modified Modified Read (MMR) format.

**Default:** io1-g4

**-c transformclass**

Specifies the name of a transform class that your administrator has defined. The transform class determines these options:

- The initial transform configuration
- The fonts used in the transformed files

Ask your administrator for the name of a transform class suitable for the type of job.

**-l length**

Specifies the length of the generated image. In general, specify the length of the physical page. For more information about this option, see “Usage notes” on page 36. Specify a number followed by one of these units:

**in** Inches  
**mm** Millimeters  
**pel** Pels, the default unit

Values are:

<b>0.1334in to 53in</b>	Inch values for 240-pel printers
<b>0.1067in to 53in</b>	Inch values for 300-pel printers
<b>0.0667in to 53in</b>	Inch values for 480-pel printers
<b>0.0534in to 53in</b>	Inch values for 600-pel printers
<b>3.3867mm to 1346.2mm</b>	Millimeter values for 240-pel printers
<b>2.7094mm to 1346.2mm</b>	Millimeter values for 300-pel printers
<b>1.6934mm to 1346.2mm</b>	Millimeter values for 480-pel printers
<b>1.3547mm to 1346.2mm</b>	Millimeter values for 600-pel printers
<b>32pel to 12720pel</b>	Pel values for 240-pel printers
<b>32pel to 15900pel</b>	Pel values for 300-pel printers
<b>32pel to 25440pel</b>	Pel values for 480-pel printers
<b>32pel to 31800pel</b>	Pel values for 600-pel printers

**Examples:**

-l 40mm  
-l 200.5mm  
-l 13in  
-l 5280  
-l 5280pel

**Default:** The length value set in the file is used. If none is set, the default is 11 inches.

**Tips:**

1. If a text margin is already built into the file, try **-l 11in** to set the length to 11 inches.
2. Inch values and millimeter values can contain a decimal point. Pel values cannot.
3. You can specify the unit using lowercase or uppercase letters (for example, in or IN).

**-o outputfile**

Specifies the output path and file into which the transform output (that is, AFP data) is written. The transform overwrites any existing data in the output file. If you specify more than one output file, the last path and file name are used. If you do not specify an output file, the result is written to standard output (STDOUT).

To specify an MVS data set, such as a sequential or partitioned data set, precede the data set name with // . When you specify a fully qualified name, two sets of quotation marks are required. For example, `///hlq.PDS(MYDOC)''` or `///hlq.SEQDS''`. When you specify a partially qualified name, you only need one set of quotation marks. For example, `///PDS(MYDOC)"` or `///SEQDS"`.

If you specify an MVS data set, you must allocate and catalog the data set before you run this command. Allocate the output data set with these characteristics:

- Record format: VBM
- Record length: 8K (8192) bytes or larger

Allocate an MVS data set that is large enough to hold the AFP data stream. The size of the AFP data stream depends on the size and complexity of the document, the type of image compression (**-a** option), and the resolution of the image (**-r** option). Typically, an output AFP data stream is several times as large as the input data stream. For information about the size of the AFP data stream, see “Calculating the size of the AFP data stream” on page 47.

**Note:** If the specified MVS output data set does not exist, the transform creates the data set; however, the data set does not have the correct record format and record length. If you attempt to print the data set, PSF for z/OS writes message APS114I.

**-r resolution**

Specifies the resolution of the output image. Select the correct resolution for the printer on which you intend to print the image.

Values are:

- |            |  |
|------------|--|
| <b>240</b> | 240 pels per inch (for example, IBM 3812, 3825, 3827, 3835, and 3900 printers)                             |
| <b>300</b> | 300 pels per inch (for example, IBM 4019, 4028, 4029, and 4039 printers and some Hewlett-Packard printers) |

**480** 480 pels per inch

**600** 600 pels per inch (for example, InfoPrint 60 and InfoPrint 4000 printers)

**Default:** 600 pels

**Tips:**

1. If you specify a resolution that the printer does not support, PSF prints the image under most conditions, but sometimes with degraded results.
2. A resolution of 300 pels typically produces good quality output on 300 or 600 pel printers. 300 pel output requires one-fourth the space and transmission time.

**-t** *outputtype*

Determines the type of output to create.

Values are:

**document**

Printable document.

**overlay**

Graphic image that can be printed on each page of a printable document.

**pagesegment**

Graphic image that can be embedded in a printable document.

**Default:** document

**Tip:** When you create an overlay or page segment from a multiple-page input file, use the **-p** option to select a single page. If you do not select a page, the output will contain multiple, concatenated overlays or page segments. The AFP architecture does not allow multiple, concatenated overlays or page segments.

**-w** *width*

Specifies the maximum width of the generated image. In general, specify the width of the physical page. For more information about this option, see "Usage notes" on page 36. Specify a number followed by one of these units:

**in** Inches

**mm** Millimeters

**pel** Pels, the default unit

Values are:

**0.1334in to 25.5in** Inch values for 240-pel printers

**0.1067in to 25.5in** Inch values for 300-pel printers

**0.0667in to 25.5in** Inch values for 480-pel printers

**0.0534in to 25.5in** Inch values for 600-pel printers

**3.3867mm to 647.7mm** Millimeter values for 240-pel printers

**2.7094mm to 647.7mm** Millimeter values for 300-pel printers

**1.6934mm to 647.7mm** Millimeter values for 480-pel printers

<b>1.3547mm to 647.7mm</b>	Millimeter values for 600-pel printers
<b>32pel to 6120pel</b>	Pel values for 240-pel printers
<b>32pel to 7650pel</b>	Pel values for 300-pel printers
<b>32pel to 12240pel</b>	Pel values for 480-pel printers
<b>32pel to 15300pel</b>	Pel values for 600-pel printers

**Examples:**

-w 40mm  
 -w 200.5mm  
 -w 13in  
 -w 4000  
 -w 4000pel

**Default:** The width set in the file is used. If none is set, the default is 8.5 inches.

**Tips:**

1. If a text margin is already built into the file, try **-w 8.5in** to set the width to 8.5 inches.
2. Inch values and millimeter values can contain a decimal point. Pel values cannot.
3. You can specify the unit using lowercase or uppercase letters (for example, in or IN).

**-x *xmargin***

Specifies a horizontal margin or border around the generated image to avoid the non-printable areas of some printers. For more information about this option, see "Usage notes" on page 36. Specify a number followed by one of these units:

**in** Inches  
**mm** Millimeters  
**pel** Pels, the default unit

Values are:

**0in to 12.75in** Inch values for all printers  
**0mm to 323.85mm** Millimeter values for all printers  
**0pel to 3060pel** Pel values for 240-pel printers  
**0pel to 3825pel** Pel values for 300-pel printers  
**0pel to 6120pel** Pel values for 480-pel printers  
**0pel to 7650pel** Pel values for 600-pel printers

**Default:** 0

**Tips:**

1. If the value is less than 1, include a leading zero. For example, specify:  
 0.5in  
 0.8mm

2. Because the X value specifies margins on *both* the left and right sides of the page, the X value can be no more than half of the width (-w) of the generated image. For example, if you specify a width of 8 inches, the X value can be no larger than 4 inches. If you specify an X value of 5 inches, a blank page is printed because the sum of the left and right margins exceeds the width of the paper.
3. The X value does not shift the image on the page. The image is cropped if it is defined to print in the left or right margin.
4. Inch values and millimeter values can contain a decimal point. Pel values cannot.
5. You can specify the unit using lowercase or uppercase letters (for example, in or IN).

**-y ymargin**

Specifies a vertical margin or border around the generated image to avoid the non-printable areas of some printers. For more information about this option, see “Usage notes” on page 36. Specify a number followed by one of these units:

- in** Inches
- mm** Millimeters
- pel** Pels, the default unit

Values are:

**0in to 26.5in** Inch values for all printers

**0mm to 673.1mm**  
Millimeter values for all printers

**0pel to 6360pel**  
Pel values for 240-pel printers

**0pel to 7950pel**  
Pel values for 300-pel printers

**0pel to 12720pel**  
Pel values for 480-pel printers

**0pel to 15900pel**  
Pel values for 600-pel printers

**Default:** 0

**Tips:**

1. If the value is less than 1, include a leading zero. For example, specify:  
0.5in  
0.8mm
2. Because the Y value specifies margins on *both* the top and bottom of the page, the Y value can be no more than half of the length (-l) of the generated image. For example, if you specify a length of 12 inches, the Y value can be no larger than 6 inches. If you specify a Y value of 7 inches, a blank page is printed because the sum of the top and bottom margins exceeds the length of the paper.
3. The Y value does not shift the image on the page. The image is cropped if it is defined to print in the top or bottom margin.
4. Inch values and millimeter values can contain a decimal point. Pel values cannot.

5. You can specify the unit using lowercase or uppercase letters (for example, in or IN).

**-T** Requests a trace. Specify this option only if instructed by IBM service personnel. For more information, see Chapter 5, “Diagnosing errors,” on page 107.

**Tip:** You can use the **filter-options** job attribute with, for example, the **lp** command to pass any of these options except **-o outputfile** to the transform. For information about the **filter-options** job attribute, see *z/OS Infoprint Server User's Guide*.

## Operand

*inputfile*

Specifies an input file to be transformed. If you specify more than one input file name, the **ps2afp** command transforms each file to AFP format and writes the results to a single output file (if one is specified) or to standard output.

If you do not specify an input file, or if you specify a dash (-) as the file name, **ps2afp** uses standard input.

## Usage notes

In general, to position data on the page:

- Use **-l** and **-w** to set the physical page dimensions.
- Use **-x** and **-y** to set the amount of white space between the physical page dimensions and the image.

These options do not shift or scale the image on the page. If the image is defined to print in the unprintable areas, it is cropped.

For example, to create a 6.5 x 9 inch image that is centered on an 8.5 x 11 inch page, enter:

```
-l 11in -w 8.5in -x 1in -y 1in
```

- Use a form definition that specifies zero vertical offset and zero horizontal offset, or specify X and Y offsets of 0 when you submit the print job.

## Examples -- ps2afp

### Transform a file, specifying transform class

To transform the PostScript file `myfile.ps` into an AFP data stream, using the `bigjob` transform class, and write the result to a file called `myfile.afp`, enter:

```
ps2afp -c bigjob -o myfile.afp myfile.ps
```

### Transform a file, specifying image size

To transform the PostScript file `myfile2.ps` into an AFP data stream, with an image that is 8 inches high and 5 inches wide, and write the result to a file called `myfile2.afp`, enter:

```
ps2afp -l 8in -w 5in -o myfile2.afp myfile2.ps
```

### Transform a file, using redirection

To transform the PostScript file `input.ps` into the AFP output file called `output.afp`, enter:

```
ps2afp < input.ps > output.afp
```

**Note:** You can only use redirection operators with z/OS UNIX files.

## Transform multiple files

To transform the PostScript files `input.01.ps`, `input.02.ps`, ... `input.xx.ps` and write the results to one AFP output file called `output.afp`, enter:

```
ps2afp -o output.afp input.01.ps input.02.ps ... input.xx.ps
```

## Transform a UNIX file to an MVS data set

To transform file `input.ps` into an existing, cataloged MVS output data set called `hlq.OUTPUT.AFP(member)`, where `hlq` is your user ID, enter:

```
ps2afp -o "'/hlq.OUTPUT.AFP(member)'" input.ps
```

## Transform a file and receive MVS return codes

To transform the PostScript file `myfile.ps` into an AFP data stream and write the result to a file called `myfile.afp` and receive MVS return codes (0, 4, 8), enter:

```
AOP_MVS_RETURN_CODES=YES ps2afp -o myfile.afp myfile.ps
```

MVS return codes indicate whether the transform was successful (0), a transform warning occurred (4), or a transform error occurred (8).

## Environment variables

The `ps2afp` command uses these environment variables:

**AOPCONF** Names the Infoprint Server configuration file. This variable takes precedence over the user-specific configuration file (`$HOME/.aopconf`) and the system default configuration file (`/etc/Printsrv/aopd.conf`). For more information about the configuration file, see *z/OS Infoprint Server Customization*.

### AOP\_MVS\_RETURN\_CODES

Specifies whether the command returns MVS return codes (0, 4, 8) or UNIX exit values (0, 1). The default is UNIX exit values.

**LIBPATH** The path used to locate dynamic link libraries (DLLs).

**NLSPATH** Names the directory paths that the `ps2afp` command searches for message catalogs.

For information about setting and using environment variables, see *z/OS UNIX System Services User's Guide*.

The PostScript to AFP transform uses environment variables specified in the Infoprint Server transform configuration file. For information, see "Environment variables for the PDF to AFP and PostScript to AFP transforms" on page 62.

## Files

### `$HOME/.aopconf`

Contains the user-specific Infoprint Server configuration file. This file takes precedence over `/etc/Printsrv/aopd.conf`.

### `/etc/Printsrv/aopd.conf`

Contains the system default Infoprint Server configuration file.

For the format of the configuration files, see *z/OS Infoprint Server Customization*.

## Exit values

MVS return codes:

0 Successful.

- | 4 A warning occurred during the transform.  
 | 8 The command was not accepted, a data stream error occurred during the  
 | transform, or the transform failed.
- | UNIX exit values (default):  
 | 0 Successful. However, a warning or data stream error might have occurred  
 | during the transform.  
 | 1 The command was not accepted, or the transform failed.
- | **Notes:**  
 | 1. The AOP\_MVS\_RETURN\_CODES environment variable determines the type of  
 | exit values.  
 | 2. The AOP\_FAIL\_ON\_ERROR transform environment variable controls whether  
 | the transform fails when it detects a data stream warning or error.

---

## sap2afp—Transform SAP OTF or ABAP data to AFP data

### Format

**sap2afp** [-c *transformclass*] [-o *outputfile*] [-r *resolution*] [-s] [-T] [*inputfile ...*]

### Description

The **sap2afp** command converts System Generic Output Format (SAPGOF) Output Text Format (OTF) and Advanced Business Application Programming (ABAP) data files:

- SAP OTF data files are converted into Advanced Function Presentation (AFP) Presentation Text Object Content Architecture (PTOCA) data streams.
- SAP ABAP data files are converted into line data streams.

The SAP OTF and ABAP data streams must be in ASCII representation.

If you specify the same option multiple times, the command uses only the last option.

You can specify one or more input files to be transformed. If you specify more than one input file, the command concatenates the files, and the job attributes are determined by the first file transformed. If you do not specify an input file name, or if you specify a dash (-) as the file name, **sap2afp** uses standard input.

The output file name is also optional. If you do not specify one, the **sap2afp** command writes the results to standard output.

### Options

**Note:** All options and values are case-sensitive.

**-c** *transformclass*

Specifies the name of a transform class that is defined in the transform configuration file. Ask your administrator for the name of a transform class suitable for the type of job.

**-o** *outputfile*

Specifies the output path and file into which the transform output (that is, AFP or line data) is written. The transform overwrites any existing data in the output file. If you specify more than one output file, the last specified

path and file name are used. If you do not specify an output file, the result is written to standard output (STDOUT).

For SAP R/3 OTF data, you can specify either an MVS data set (such as a sequential or partitioned data set) or a UNIX file. However, for SAP ABAP data, you must specify an MVS data set.

If you specify an MVS data set, precede the data set name with // . When you specify a fully qualified name, two sets of quotation marks are required. For example, "'/'hlq.PDS(MYDOC)'" or "'/'hlq.SEQDS'". When you specify a partially qualified name, you only need one set of quotation marks. For example, "'/PDS(MYDOC)'" or "'/SEQDS'".

If you specify an MVS data set, you must allocate and catalog the data set before you run this command. Allocate the output data set with these characteristics:

- Record format: VBM
- Record length: 8K (8192) bytes or larger

Allocate an MVS data set that is large enough to hold the AFP data stream. Typically, the output AFP data stream is the same size as the input data stream.

**Note:** If the specified MVS output data set does not exist, the transform creates the data set; however, the data set does not have the correct record format and record length. If you attempt to print the data set, PSF for z/OS writes message APS114I.

#### **-r** resolution

Specifies the resolution used to print image data in the job. Select the correct resolution for the printer on which you intend to print the job.

Values are:

- |            |   |
|------------|---|
| <b>240</b> | 240 pels per inch (for example, IBM 3812, 3825, 3827, 3835, and 3900 printers)                                    |
| <b>300</b> | 300 pels per inch (for example, IBM 3112, 3116, 4019, 4028, 4029, and 4039 printers and Hewlett-Packard printers) |
| <b>480</b> | 480 pels per inch   |
| <b>600</b> | 600 pels per inch (for example, the InfoPrint 60 and InfoPrint 4000 printers)                                     |

**Default:** The resolution specified in the **image.tab** configuration file.

#### **Tips:**

1. If you specify a resolution that the printer does not support, PSF prints the image under most conditions, but sometimes with degraded results.
2. A resolution of 300 pels typically produces good quality output on 300 or 600 pel printers. 300 pel output requires one-fourth the space and transmission time.

**-s** Suppresses Graphic Object Content Architecture (GOCA) boxes. Some older printers do not print these boxes.

**-T** Requests a trace. Specify this option only if instructed by IBM service personnel. For more information, see Chapter 5, "Diagnosing errors," on page 107.

**Tip:** You can use the **filter-options** job attribute with, for example, the **lp** command to pass any of these options except **-o outputfile** to the transform. For information about the **filter-options** job attribute, see *z/OS Infoprint Server User's Guide*.

## Operand

### *inputfile*

Specifies an input file to be transformed. If you specify more than one input file name, the **sap2afp** command concatenates the files. The results are written to a single output file (if one is specified) or to standard output.

The data in the file must be in stream mode. That is, it must not contain any record data.

If you do not specify an input file, or if you specify a dash (-) as the file name, **sap2afp** uses standard input.

## Examples -- sap2afp

### **Transform a file, specifying resolution**

To transform the SAP OTF file `myfile.otf` for printing on a 600-pel AFP printer, and write the result to a UNIX file called `myfile.afp`, enter:

```
sap2afp -r 600 -o myfile.afp myfile.otf
```

### **Transform and print a file**

To transform the SAP OTF file `myfile.otf` into an AFP data stream, and send the result to the default printer with the **lp** command, enter:

```
sap2afp myfile.otf | lp
```

### **Transform a file using redirection**

To transform the SAP OTF file `input.otf` into a UNIX output file called `output.afp`, enter:

```
sap2afp < input.otf > output.afp
```

**Note:** You can use redirection operators only with UNIX files.

### **Transform multiple files and concatenate the output**

To transform the SAP OTF files `input.01.otf`, `input.02.otf`, ... `input.xx.otf` into one UNIX output file called `output.afp`, enter:

```
sap2afp -o output.afp input.01.otf input.02.otf ... input.xx.otf
```

### **Transform a UNIX file to an MVS data set**

To transform file `input.sap` into an existing, cataloged MVS output data set called `hlq.OUTPUT.AFP(member)`, where `hlq` is your user ID, enter:

```
sap2afp -o "'hlq.OUTPUT.AFP(member)'" input.sap
```

### **Transform an MVS data set, writing the output to a UNIX file**

To transform the MVS data set `hlq.INPUT.OTF(member)`, where `hlq` is your user ID, into an output file called `output.afp`, enter:

```
sap2afp -o output.afp "'hlq.INPUT.OTF(member)'"
```

### **Transform a file and receive MVS return codes**

To transform the SAP file `myfile.sap` into an AFP data stream and write the result to an existing, cataloged MVS output data set called `hlq.OUTPUT.AFP(member)` and receive MVS return codes (0, 4, 8), enter on the same command line:

```
AOP_MVS_RETURN_CODES=YES sap2afp -o "'h1q.OUTPUT.AFP(member)'" myfile.sap
```

MVS return codes indicate whether the transform was successful (0), a transform warning occurred (4), or a transform error occurred (8).

## Environment variables

The **sap2afp** command uses these environment variables:

**AOPCONF** Names the Infoprint Server configuration file. This variable takes precedence over the user-specific configuration file (**\$HOME/.aopconf**) and the system default configuration file (**/etc/Printsrv/aopd.conf**). For more information about the configuration file, see *z/OS Infoprint Server Customization*.

**AOP\_MVS\_RETURN\_CODES** Specifies whether the command returns MVS return codes (0, 4, 8) or UNIX exit values (0, 1). The default is UNIX exit values.

**LIBPATH** The path used to locate dynamic link libraries (DLLs).

**NLSPATH** Names the directory paths that the **sap2afp** command searches for message catalogs.

For information about setting and using environment variables, see *z/OS UNIX System Services User's Guide*.

The SAP to AFP transform uses environment variables specified in the Infoprint Server transform configuration file. For information, see "Environment variables for the SAP to AFP transform" on page 73.

## Files

### **\$HOME/.aopconf**

Contains the user-specific Infoprint Server configuration file. This file takes precedence over **/etc/Printsrv/aopd.conf**.

### **/etc/Printsrv/aopd.conf**

Contains the system default Infoprint Server configuration file.

## Exit values

MVS return codes:

**0** Successful.

**4** A warning occurred during the transform.

**8** The command was not accepted, a data stream error occurred during the transform, or the transform failed.

UNIX exit values (default):

**0** Successful. However, a warning or data stream error might have occurred during the transform.

**1** The command was not accepted, or the transform failed.

### Notes:

1. The **AOP\_MVS\_RETURN\_CODES** environment variable determines the type of exit values.

2. The **AOP\_FAIL\_ON\_ERROR** transform environment variable controls whether the transform fails when it detects a data stream warning or error.

---

## Transforming data with the AOPBATCH program

This section describes how to use the Infoprint Server AOPBATCH program to run the transform commands. The AOPBATCH program lets you submit a batch job to transform data to AFP. Infoprint Server provides the AOPBATCH program in SYS1.LINKLIB.

### AOPBATCH parameters

The AOPBATCH parameters are the name of the transform command, followed by transform options and arguments, in this format:

```
EXEC PGM=AOPBATCH,PARM='/transform_name transform_options'
```

/ The optional slash indicates that the PARM data that follows is input to AOPBATCH. If you omit the initial slash, your PARM data might be interpreted as C++ run-time options. You *must* include the initial slash if any of the PARM data itself includes a slash. For example, if the transform name is /mylib/ps2afp, specify: PARM='/mylib/ps2afp ...'.

#### *transform\_name*

The name of an executable transform program that resides in a z/OS UNIX file. The name of the transform program is case-sensitive. You can specify one of these command names: **pcl2afp**, **pdf2afp**, **ps2afp**, **sap2afp**.

If the transform program does not reside in one of the directories specified in the PATH environment variable, also specify the pathname. You can use the STDENV DD statement to set the PATH environment variable if the default value set by AOPBATCH is not suitable. For information about the defaults set for environment variables, see “AOPBATCH DD statements” on page 43.

#### *transform\_options*

Options and arguments accepted by the transform. For a description of each, see “pcl2afp—Transform PCL data to AFP data” on page 13, “pdf2afp—Transform PDF data to AFP data” on page 22, “ps2afp—Transform PostScript data to AFP data” on page 30, or “sap2afp—Transform SAP OTF or ABAP data to AFP data” on page 38.

You must specify the transform input data set or file as a transform argument, and you must specify the **-o** transform option to identify where you want the transform to write its output. (This is because the transform cannot write its output to standard output and cannot read input from standard input.) To identify the transform input and output data set or file, you can specify either a DD statement name or a data set or file name. You must specify a DD statement name if you want to write the transform output to an MVS data set that does not already exist.

Specify the names of DD statements to the transform in this format:

```
//DD:DDname
```

The name of the DD statement is *DDname*.

When you specify an MVS data set name in the **-o** option, code two slashes before the data set name and enclose the data set name in two sets of single quotation marks if you specify a fully qualified data set name. If you do *not* enclose the data set name in quotation marks, a high-level qualifier is added to the name you specify:

- If you are running under TSO (batch or interactive), the TSO user prefix is appended.

- If you are running under MVS batch or IMS™ (batch or online), the RACF® user ID is appended.
- If your system does not use RACF, a high-level qualifier is not added.

For examples of different ways to specify transform input and output data sets and files, see “AOPBATCH examples” on page 44.

**Note:** A maximum region size of 6M should be sufficient.

## AOPBATCH DD statements

The AOPBATCH JCL procedure accepts these standard DD statements:

### STDENV

Specifies environment variables that the transform command uses. You can specify the environment variables in-stream in the JCL, in an MVS data set, or in a UNIX file. Specify the environment variables in the format *variable=value*, with one environment variable per line or record. Sequence numbers in columns 73 - 80 in data specified with the STDENV DD statement are ignored and *not* treated as part of the data.

If you omit the STDENV DD statement or do not specify one of these environment variables, AOPBATCH sets these default values, which are suitable for running Infoprint Server programs if your installation installed Infoprint Server files in the default directories:

```
PATH=/usr/lpp/Printsrv/bin:/bin:/usr/bin
LIBPATH=/usr/lpp/Printsrv/lib:/lib:/usr/lib
NLSPATH=/usr/lpp/Printsrv/%L/%N:/usr/lpp/Printsrv/En_US/%N:/usr/lib/nls/msg/%L/%N
```

#### Notes:

1. To obtain MVS return codes (0, 4, 8) instead of the default UNIX exit values (0, 1), set the AOP\_MVS\_RETURN\_CODES=yes environment variable. For information, see “AOP\_MVS\_RETURN\_CODES environment variable” on page 48.
2. AOPBATCH sets the HOME environment variable to the user’s home directory and sets the LOGIN variable to the user ID.
3. Do not specify the \_BPX\_SHAREAS environment variable. AOPBATCH sets it appropriately.

### STDERR

Specifies the system output data set where error messages are to be written. The data set can be an MVS data set or a UNIX file. The transforms do not write messages related to errors in the input data stream in this data set. Instead, the transforms write these messages at the end of the output document.

### STDOUT

Specifies the system output data set where informational messages are to be written. The data set can be an MVS data set or a UNIX file.

You can also include DD statements to specify MVS data sets that contain input data to be transformed, the transformed output, or job attributes that are input to the transform.

### Rules

- Do *not* use DD names STDIN, STDOUT, or STDERR to specify the transform input and output data sets. Instead, use other DD names, such as INPUT and OUTPUT, which are used in the examples.

- If you have not added the Language Environment run-time library (CEE.SCEERUN) or the C++ run-time library (CBC.SCLBDLL) to the system LNKLST, specify these data sets in a STEPLIB DD statement.
- The PDF to AFP and the PostScript to AFP transforms cannot transform concatenated input files. If you want to transform more than one PDF or PostScript file in the same job, create a separate step to transform each file. (The PCL to AFP transform can transform concatenated input files.) See “AOPBATCH examples” for an example of how to transform and print multiple PDF files in the same job.
- If you want to write the AFP data stream to an MVS data set, you must allocate and catalog the MVS data set before you run AOPBATCH or include a DD statement in the AOPBATCH job to allocate the data set. Allocate a data set with these characteristics:
  - Record format: VBM.
  - Record length: 8192 (8K) or larger.
  - Disposition: SHR or OLD overwrites any existing data in the data set; MOD appends the output to any existing data. MOD is the default.

Allocate an MVS data set that is large enough to hold the AFP data stream. The size of the AFP data stream depends on the size and complexity of the document, the type of image compression, and the resolution of the image. Typically, the PCL to AFP, PDF to AFP, and PostScript to AFP transforms create an output AFP data stream that is several times as large as the input data stream. For more information about the size of the AFP data stream, see “Calculating the size of the AFP data stream” on page 47.

**Note:** If you specify an MVS output data set that does not exist, the transform creates the data set; however, the data set does not have the correct record format and record length. If you attempt to print the data set, PSF for z/OS writes message APS114I.

## AOPBATCH examples

These examples show how to use the AOPBATCH procedure to transform data. For additional AOPBATCH examples, see *z/OS Infoprint Server User's Guide*.

### Specify transform input and output in MVS data sets, and specify environment variables

This example shows how to transform data when the transform input is in an MVS data set and transform output is written to an MVS data set. The PostScript to AFP transform reads PostScript input from data set HLQ.INPUT.PS and writes AFP output to data set HLQ.OUTPUT.AFP. HLQ represents the high-level qualifier.

This example also shows how to specify environment variables in-stream in the STDENV DD statement. If you installed Infoprint Server and created Infoprint Server configuration files in default directories, you do not need to specify the PATH, LIBPATH, NLSPATH, and AOPCONF environment variables.

```
//AOPBATCH JOB ...
//TRANSFRM EXEC PGM=AOPBATCH,PARM='/ps2afp -c letter -r 300 -o //DD:OUT
//          PUT DD:INPUT'
//INPUT    DD  DSN=HLQ.INPUT.PS,DISP=SHR
//OUTPUT   DD  DSN=HLQ.OUTPUT.AFP,DISP=(NEW,CATLG,DELETE),
// DCB=(RECFM=VBM,LRECL=32756,BLKSIZE=32760),SPACE=(CYL,(1,1))
//STDOUT   DD  SYSOUT=*
//STDERR   DD  SYSOUT=*
//STDENV   DD  *
AOP_MVS_RETURN_CODES=YES
PATH=/usr/lpp/Printsrv/bin:/bin:/usr/bin
```

```
LIBPATH=/usr/lpp/Printsrv/lib:/lib:/usr/lib
NLSPATH=/usr/lpp/Printsrv/En_US/%N:/usr/lib/nls/msg/En_US/%N
AOPCONF=/etc/Printsrv/aopd.conf
/*
```

## Specify transform input in a UNIX file and output in an MVS data set

This example shows how to transform data when the transform input is in a UNIX file and transform output is written to an MVS data set. The PDF to AFP transform reads the PDF input from file `/tmp/input.pdf` and writes AFP output to `HLQ.OUTPUT.AFP`.

```
//AOPBATCH JOB ...
//TRANSFRM EXEC PGM=AOPBATCH,PARM='/pdf2afp -c letter_300 -o //DD:OUTPU
//          T /tmp/input.pdf'
//OUTPUT DD DSN=HLQ.OUTPUT.AFP,DISP=(NEW,CATLG,DELETE),
// DCB=(RECFM=VBM,LRECL=32756,BLKSIZE=32760),SPACE=(CYL,(1,1))
//STDOUT DD SYSOUT=*
//STDERR DD SYSOUT=*
```

## Transform and print data sets

This example shows how to transform data and print the output from the transform in a subsequent step.

In the first step, the PostScript to AFP transform reads PostScript input from data set `HLQ.INPUT.PS` and writes AFP output to data set `HLQ.OUTPUT.AFP`, where `HLQ` represents the high-level qualifier.

In the second step, the `AOPPRINT` JCL procedure prints the AFP output to the printer named `mypsfpriener`, which is defined in the Printer Inventory.

For information about `AOPPRINT`, see *z/OS Infoprint Server User's Guide*.

```
//AOPBATCH JOB ...
//TRANSFRM EXEC PGM=AOPBATCH,PARM='/ps2afp -o //DD:OUTPUT //DD:INPUT'
//INPUT DD DSN=HLQ.INPUT.PS,DISP=SHR
//OUTPUT DD DSN=HLQ.OUTPUT.AFP,DISP=(NEW,CATLG,DELETE),
// DCB=(RECFM=VBM,LRECL=32756,BLKSIZE=32760),SPACE=(CYL,(1,1))
//STDOUT DD SYSOUT=*
//STDERR DD SYSOUT=*
//PRINT EXEC AOPPRINT,PRINTER='mypsfpriener'
//SYSIN DD DSN=HLQ.OUTPUT.AFP,DISP=SHR
```

## Transform and print data sets only if the transform is successful

This example shows how to transform data and print the output from the transform in a subsequent step only if no warnings or errors occur during the transform.

In the first step, the PostScript to AFP transform reads PostScript input from data set `HLQ.INPUT.PS` and writes AFP output to data set `HLQ.OUTPUT.AFP`, where `HLQ` represents the high-level qualifier.

The `STDENV` data set specifies the `AOP_MVS_RETURN_CODES` environment variable. Because this variable is set to `YES`, the transform returns MVS return codes: 0 (successful), 4 (warning), 8 (failure).

In the second step, the `AOPPRINT` JCL procedure prints the AFP output to the printer named `mypsfpriener`, which is defined in the Printer Inventory. This step runs only if the return code from the transform step is less than 4.

For information about `AOPPRINT`, see *z/OS Infoprint Server User's Guide*.

```

//AOPBATCH JOB ...
//TRANSFORM EXEC PGM=AOPBATCH,PARM='/ps2afp -o //DD:OUTPUT //DD:INPUT'
//INPUT DD DSN=HLQ.INPUT.PS,DISP=SHR
//OUTPUT DD DSN=HLQ.OUTPUT.AFP,DISP=(NEW,CATLG,DELETE),
// DCB=(RECFM=VBM,LRECL=32756,BLKSIZE=32760),SPACE=(CYL,(1,1))
//STDOUT DD SYSOUT=*
//STDERR DD SYSOUT=*
//STDENV DD *
AOP_MVS_RETURN_CODES=YES
/*
//PRINT EXEC AOPPRINT,PRINTER='myspfprinter',
// COND=(4,LT,TRANSFORM)
//SYSIN DD DSN=HLQ.OUTPUT.AFP,DISP=SHR

```

## Continuing parameter fields in JCL

To continue a parameter field:

1. Interrupt the field after a complete parameter or subparameter, including the comma that follows it, at or before column 71.
2. Code // in columns 1 and 2 of the following statement.
3. Code a blank character in column 3 of the following statement.
4. Continue the interrupted parameter or field beginning in any column from 4 through 16.

To continue a parameter that is enclosed in apostrophes:

1. Extend the parameter to column 71. Do not code an apostrophe in column 71.
2. Code // in columns 1 and 2 of the following statement.
3. Continue the parameter in column 16 of the following statement even if this splits the parameter.

## AOPBATCH exit values

AOPBATCH returns one of these values:

Value	Meaning
1	An error occurred while AOPBATCH was trying to write to the STDOUT DD.
2	An error occurred while AOPBATCH was trying to write to the STDERR DD.
4	AOPBATCH could not spawn the process.
<i>nn</i>	The exit value from the transform command.

The transforms return either MVS return codes (0, 4, 8) or UNIX exit values (0, 1) depending on the value of the AOP\_MVS\_RETURN\_CODES environment variable. If the environment variable is not set, the transforms return UNIX exit values.

---

## Using the Print Interface subsystem

You can use the Print Interface subsystem (provided with Infoprint Server) to transform data created by a batch application to AFP format so that it can be printed on an AFP printer. The Print Interface subsystem writes the AFP output from the transform to an output data set on the JES spool. PSF can then print the output data set on an AFP printer.

For information about the Print Interface subsystem, see “Transforming data using the Print Interface subsystem” in *z/OS Infoprint Server User’s Guide*.

**Example:** This example shows how to print a PDF document created by a batch application on an AFP printer using form definition F1MYDEF, which is in library USERA.MYLIB, to format the AFP data. It assumes that:

- The Print Interface subsystem named AOP1 has been started.
- Printer definition myafpprinter exists in the Infoprint Server Printer Inventory with these characteristics:
  - The PDF to AFP transform is specified.
  - The class and destination name for the PSF-controlled AFP printer are specified. (CLASS and DEST are JES work-selection parameters that can direct output from the JES spool to a PSF-controlled printer.)

```
//SUBSYS JOB ...
//STEP1 EXEC PGM=USERA
//OUTDS1 OUTPUT FORMDEF=MYDEF,USERLIB=USERA.MYLIB
//DD1 DD SUBSYS=(AOP1,'myafpprinter'),OUTPUT=*.OUTDS1
```

---

## Using the `lprafp` command

The `lprafp` command lets you print documents from Windows systems and UNIX systems (such as HP-UX and SunOS) and specify Infoprint Server job attributes. For example, when you use the `lprafp` command, you can specify the name of a form definition in the **form-definition** attribute and the number of copies in the **copies** attribute.

You might want to use the `lprafp` command to print PDF or PostScript documents that are on your Windows or UNIX systems.

You can download the `lprafp` command at <http://www.ibm.com>. (Search for “lprafp”.) On this Web site, you can also find information about how to use the command.

**Example:** This example shows how to print two copies of a PDF document named `myfile.pdf` on an AFP printer named `myafpprinter` using form definition `F1FORM` to format the AFP data. It assumes that:

- The host name of the z/OS system where Infoprint Server is running is `systema`.
- Printer definition `myafpprinter` exists in the Infoprint Server Printer Inventory with these characteristics:
  - The PDF to AFP transform is specified.
  - The class and destination name for the PSF-controlled AFP printer are specified. (CLASS and DEST are JES work-selection parameters that can direct output from the JES spool to a PSF-controlled printer.)

```
lprafp -o"XAOP form-definition=f1form copies = 2" -p myafpprinter -s systema myfile.pdf
```

---

## Calculating the size of the AFP data stream

If a transform command writes the AFP data stream to an MVS data set, you must allocate an MVS data set that is large enough to hold the AFP data stream. Typically, the AFP data stream is several times as large as the input data stream.

The size of the AFP data stream depends on the size and complexity of the document, whether the AFP images are compressed, and the resolution of the images. You specify the type of image compression in the `-a` option of the transform command. You can specify the resolution in the `-r` option of the transform command, in the `AOP_RESOLUTION` environment variable (PCL to AFP transform), and in the **image.tab** configuration file (SAP to AFP transform).

### Steps for calculating the size of the AFP data stream:

1. Use these formulas to calculate the number of bytes per page:

page width \* resolution \* page height \* resolution = bits per page  
bits per page / 8 = bytes per page

The page width, page height, and resolution must be in the same units.

For example, for an 8.5 x 11 inch page at 600 pels (bits) per inch resolution:

$(8.5 * 600 * 11.0 * 600) / 8 = 4,207,500$  bytes per page

**Note:** If the pages contain blank areas, which is typical of most text pages, the number of bytes per page can be substantially smaller.

2. If the transform creates a compressed IOCA image (G4 MMR or MMR format), multiply the bytes per page by 50%. For example:

$4,207,500 * 0.5 = 2,103,750$  bytes per page

3. Multiply the number of bytes per page by the number of pages in the document. For example, for 100 pages:

$2,103,750 * 100 = 210,375,000$  bytes in AFP data stream

**Note:** The SAP to AFP transform does not produce full-page AFP images. This transform creates an AFP data stream that is approximately the same size as the input data stream.

**Tip:** To reduce the size of the AFP data stream:

- Specify the lowest resolution that produces good quality output. A resolution of 300 pels typically produces good quality output on 300 or 600 pel printers. 300 pel output requires one-fourth the space and transmission time than 600 pel output. (The default resolution for the PDF to AFP, PostScript to AFP, and SAP to AFP transforms is 600 pels. The default resolution for the PCL to AFP transform is 240 pels.)
- Specify compressed IOCA images (**-a io1-g4** or **-a io1-mmr**). Specify uncompressed IOCA or IM1 images only if you know that your printer does not support compressed images. Most newer printers support compressed IOCA images.
- Do not specify IM1 images at a resolution that the printer does not support because Print Services Facility (PSF) converts the IM1 images to uncompressed IOCA images at the resolution the printer requires. This conversion can cause PSF to use very large amounts of CPU time.

---

## AOP\_MVS\_RETURN\_CODES environment variable

The AOP\_MVS\_RETURN\_CODES environment variable determines whether the transform command returns MVS return codes (0, 4, 8) instead of UNIX exit values (0, 1). MVS return codes let you determine whether a warning or error occurred during the transform.

MVS return codes are useful when you use the AOPBATCH JCL procedure to run a transform and want a subsequent step in the job to run only if the transform step was successful. For an example of using MVS return codes with AOPBATCH, see "AOPBATCH examples" on page 44.

### AOP\_MVS\_RETURN\_CODES

Specifies whether the **lp**, **pcl2afp**, **pdf2afp**, **ps2afp**, and **sap2afp** commands return MVS return codes or UNIX exit values:

Value	Meaning
<b>YES</b>	MVS return codes: <b>0</b> Successful. <b>4</b> A warning occurred during the transform. <b>8</b> The command was not accepted, a data stream error occurred during the transform, or the transform failed.
<b>NO</b>	UNIX exit values: <b>0</b> Successful. However, a warning or data stream error might have occurred during the transform. <b>1</b> The command was not accepted, or the transform failed.

**Notes:**

- Specify this environment variable before the command on the z/OS UNIX command line. You can also specify this variable in the **\$HOME/.profile** file (if you use the /bin/sh shell) or the **\$HOME/.tcshrc** file (if you use the /bin/tcsh shell).
- If you use the AOPPRINT JCL procedure, specify this environment variable in the STDENV data set of the procedure. AOPPRINT runs the **lp** command and returns the code from the **lp** command.
- If you use the AOPBATCH JCL procedure to run a transform command or the **lp** command, specify this environment variable in the STDENV data set of the procedure. AOPBATCH returns the code from the transform command or the **lp** command.
- Do not specify this environment variable in the transform entry in the Infoprint Server transform configuration file, **aopxfd.conf**.
- You can specify the value using lowercase or uppercase letters (for example, no or NO).

**Default:** NO

**Example:** AOP\_MVS\_RETURN\_CODES=YES

Table 7 shows the transform exit values when the AOP\_FAIL\_ON\_ERROR and AOP\_MVS\_RETURN\_CODES environment variables are set and the transform is successful, a warning occurs, or a data stream error occurs. (The **Fail on error** field in the printer definition and the **fail-on-transform-error** job attribute provide equivalent function to the AOP\_FAIL\_ON\_ERROR environment variable.)

*Table 7. Transform exit values with AOP\_FAIL\_ON\_ERROR and AOP\_MVS\_RETURN\_CODES environment variables*

AOP_FAIL_ON_ERROR	AOP_MVS_RETURN_CODES=YES	AOP_MVS_RETURN_CODES=NO
NO	<b>Successful:</b> 0	<b>Successful:</b> 0
	<b>Warning:</b> 4	<b>Warning:</b> 0
	<b>Error:</b> 8	<b>Error:</b> 0
ERROR	<b>Successful:</b> 0	<b>Successful:</b> 0
	<b>Warning:</b> 4	<b>Warning:</b> 0
	<b>Error:</b> 8	<b>Error:</b> 1

| *Table 7. Transform exit values with AOP\_FAIL\_ON\_ERROR and AOP\_MVS\_RETURN\_CODES environment variables (continued)*

AOP_FAIL_ON_ERROR	AOP_MVS_RETURN_CODES=YES	AOP_MVS_RETURN_CODES=NO
WARNING	<b>Successful:</b> 0 <b>Warning:</b> 8 <b>Error:</b> 8	<b>Successful:</b> 0 <b>Warning:</b> 1 <b>Error:</b> 1

---

## Chapter 3. Customizing transforms

This chapter describes how to customize the transforms:

Task	See page
Customizing the PCL to AFP transform	51
Customizing the PDF to AFP and PostScript to AFP transforms	59
Customizing the SAP to AFP transform	71

---

### Customizing the PCL to AFP transform

To customize the PCL to AFP transform, do the tasks listed in this table. Required tasks are required by all installations. Optional tasks are required only if the listed condition applies to your installation.

Task	Condition	See page
Creating an entry in the Infoprint Server transform configuration file	Required	51

#### Creating an entry in the Infoprint Server transform configuration file

You must create at least one transform entry in the Infoprint Server transform configuration file (**aopxfd.conf**) for the PCL to AFP transform. In the transform entry, you specify:

- Environment variables that control the transform
- Attributes that control how the Infoprint Server Transform Manager manages the transform

For information about how to create and edit the Infoprint Server transform configuration file, see “Creating the transform configuration file (aopxfd.conf)” in *z/OS Infoprint Server Customization*. After you update the transform configuration file, you must restart the Infoprint Server Transform Manager.

**Tip:** After you restart the Transform Manager, check for error messages in the transform’s **stderr** file. If you find any error messages, fix the errors and restart the Transform Manager. For more information about how to find the transform message logs, see “Finding the transform stderr file” on page 107.

#### Transform classes

If you want to specify different transform options for different printers, you can create different classes of the transform. For example, you could create classes for printers that print on different paper sizes.

For each transform class, you must create a separate transform entry. You select a name for the transform class in the transform entry (see the **transform** attribute).

To use a transform class, job submitters must specify the class name in the **-c** option on the **pcl2afp** transform command or in the **filter-options** job attribute,

and administrators must specify the class name in the **-c** filter option in the printer definition. For example, these z/OS UNIX commands use the "letter\_300" transform class:

```
pcl2afp -c letter_300 -o myfile.afp myfile.pcl
lp -d myprinter -o "filter-options='-c letter_300'" myfile.pcl
```

**Tip:** The sample transform configuration file, **/usr/lpp/Printsrv/samples/aopxfd.conf**, shows examples of transform entries with different transform classes. Also, see "Examples -- Transform configuration file entries for the PCL to AFP transform" on page 57.

## Format of a PCL to AFP transform entry

The format of a PCL to AFP transform entry in the transform configuration file (**aopxfd.conf**) is:

```
transform pcl2afp[_transformclass]
  start-command = pcl2afpd
  [ environment = {name -> value [ name -> value]... } ]
  [ maximum-active = number ]
  [ maximum-idle-time = seconds ]
  [ minimum-active = number ]
  ;
```

**transform pcl2afp[\_transformclass]**

This statement indicates the beginning of a transform entry.

### **pcl2afp**

The name of the transform.

### *transformclass*

The name of an optional transform class. Specify from 1 to 63 characters, including letters, numbers, or special characters. The name of the transform class is case-sensitive.

**Default:** No transform class.

**Example:** transform pcl2afp\_letter\_300

**start-command = pcl2afpd**

This attribute names the transform daemon and option. Enclose the value in single or double quotation marks if you specify the option.

### **pcl2afpd**

The name of the transform daemon. If the transform daemon is not in a directory identified in the PATH environment variable in the **aopstart** EXEC, specify the full directory path name of the daemon. (The **pcl2afpd** daemon is installed in **/usr/lpp/Printsrv/bin.**) This attribute is required.

**environment = {name -> value [name -> value]... }**

Environment variables that specify transform options. Enclose the entire set of environment variables in braces. The values in these environment variables override environment variables with the same name that are set in the **aopstart** EXEC. If a value contains special characters or spaces, enclose the value in single or double quotation marks.

For information about the environment variables you can specify, see "Environment variables for the PCL to AFP transform" on page 53.

**Rule:** Environment variable names must be upper-case. Environment variable values are case-insensitive.

**Default:** None.

**Example:**

```
environment = {AOP_RESOLUTION -> 240}
```

**maximum-active = number**

The maximum number of transform daemons that the Transform Manager activates concurrently. Specify a number greater than 0 and greater than or equal to the number specified in the **minimum-active** attribute. For more information, see “Format of a transform entry” in *z/OS Infoprint Server Customization*.

**Default:** No maximum number. Transform daemons are started when needed.

**maximum-idle-time = seconds**

The number of seconds before the Transform Manager shuts down an idle transform daemon and system resources are freed. Specify a number greater than 0. For more information, see “Format of a transform entry” in *z/OS Infoprint Server Customization*.

**Default:** Idle transform daemons are not shut down.

**minimum-active = number**

The minimum number of transform daemons that the Transform Manager activates concurrently. Specify a number less than or equal to the number specified in the **maximum-active** attribute. For more information, see “Format of a transform entry” in *z/OS Infoprint Server Customization*.

**Default:** minimum-active = 0

## Environment variables for the PCL to AFP transform

Environment variables let you specify:

- Height and width of the page
- Margins of the page
- Resolution of the printer
- Record length of AFP images
- Tracing options
- Whether the transform fails when warnings or data stream errors occur
- Whether the transform writes messages to a trailer error page

You specify environment variables in the format:

The name of the environment variable

ou can specify these environment variables. All environment variables are optional.

### **\_BPX\_JOBNAME**

The job name for this transform. When you assign a different job name to each class of transform, the operator can manage the transform daemons more effectively. Specify a job name of 1 to 8 alphanumeric characters. Incorrect job names are ignored. For more information about the `_BPX_JOBNAME` variable, see *z/OS UNIX System Services Planning*.

**Default:** The job name is AOPXFD.

**Example:** environment = {`_BPX_JOBNAME -> PCL2AFPD`}

## AOP\_FAIL\_ON\_ERROR

Specifies whether the transform stops processing when a warning or data stream error occurs during the transform. Warnings can indicate degraded output.

Valid values are:

**error** The transform fails when a data stream error occurs and does not create an output document. However, the transform continues if warnings occur.

**no** The transform continues processing when a warning or data stream error occurs and creates an output document. This is the default.

### **warning**

The transform fails when a warning or data stream error occurs and does not create an output document.

### **Tips:**

- For backward compatibility, value **yes** is allowed and is equivalent to **error**.
- The **fail-on-transform-error** job attribute and the **Fail on error** field in the printer definition override this value.
- You can specify the value using lowercase or uppercase letters (for example, no or NO).

**Default:** AOP\_FAIL\_ON\_ERROR -> no

**Example:** environment = {AOP\_FAIL\_ON\_ERROR -> error}

## AOP\_HORIZONTAL\_MARGINS

The left and right margins of the page. Specify a number followed by one of these units:

**in** Inches

**mm** Millimeters

**pel** Pels, the default unit

### **Tips:**

- Inch values and millimeter values can contain a decimal point. Pel values cannot.
- You can specify the unit using lowercase or uppercase letters (for example, in or IN).
- The **-x** option of the **pcl2afp** command and transform filter overrides this value.

**Default:** AOP\_HORIZONTAL\_MARGINS -> 0.167in

## AOP\_PAGE\_HEIGHT

The height of the page. Specify a number followed by one of these units:

**in** Inches

**mm** Millimeters

**pel** Pels, the default unit

### **Tips:**

- Inch values and millimeter values can contain a decimal point. Pel values cannot.
- You can specify the unit using lowercase or uppercase letters (for example, in or IN).

- The **-l** option of the **pcl2afp** command and transform filter overrides this value.

**Default:** AOP\_PAGE\_HEIGHT -> 11in

#### **AOP\_PAGE\_WIDTH**

The width of the page. Specify a number followed by one of these units:

- in** Inches
- mm** Millimeters
- pel** Pels, the default unit

#### **Tips:**

- Inch values and millimeter values can contain a decimal point. Pel values cannot.
- You can specify the unit using lowercase or uppercase letters (for example, in or IN).
- The **-w** option of the **pcl2afp** command and transform filter overrides this value.

**Default:** AOP\_PAGE\_WIDTH -> 8.5in

#### **AOP\_RECLEN**

The length of the AFP images the transform creates. Each output record contains an AFP image and an additional 17 bytes of information (for example, header information). For example, if you specify a value of 8 (8,000 bytes) for the AFP image in this environment variable, the length of each output record is 8,017 bytes.

Valid values are from 8 to 32, in units of 1,000 bytes. For example, 8 = 8,000.

**Tip:** The default value is suitable for most installations. However, a larger record length might improve performance.

**Default:** AOP\_RECLEN -> 8

**Example:** environment = {AOP\_RECLEN -> 16}

#### **AOP\_RESOLUTION**

The resolution in pels per inch of the printer. The transform creates the AFP images with this resolution. Valid values: 240, 300, 480, and 600.

**Default:** AOP\_RESOLUTION -> 240

**Example:** environment = {AOP\_RESOLUTION -> 300}

#### **Tips:**

- If you specify a resolution that the printer does not support, PSF prints the image under most conditions, but sometimes with degraded results.
- A resolution of 300 pels typically produces good quality output on 300 or 600 pel printers. 300 pel output requires one-fourth the space and transmission time.
- The **-r** option of the **pcl2afp** command and transform filter overrides this value.

#### **AOP\_RESOURCE\_PATH**

The directory that contains the fonts that are provided with the transform. If you installed the fonts in the default directory, **/usr/lpp/Printsrv/pcl2afpv2.2/fonts**, you do not need to specify this environment variable. The transform always looks for fonts in the default font directory last.

**Default:** AOP\_RESOURCE\_PATH -> /usr/lpp/Printsrv/pcl2afpv2.2/fonts

**Example:**

```
environment = {AOP_RESOURCE_PATH -> /etc/Printsrv/pcl2afpv2.2/fonts}
```

**AOP\_TRAILER\_ERROR\_PAGE**

Specifies whether the transform writes messages for transform warnings and data stream errors to a trailer error page. The trailer error page is the last page in the output document. Warnings can indicate degraded output.

Valid values are:

**error** The transform writes error messages, but not warning messages, to a trailer error page. This option does not apply when AOP\_FAIL\_ON\_ERROR-> error or AOP\_FAIL\_ON\_ERROR->warning because no output document is created when an error occurs.

**no** The transform does not write messages to a trailer error page.

**warning**

The transform writes warning and error messages to a trailer error page. This option does not apply when AOP\_FAIL\_ON\_ERROR->warning because no output document is created when an error or warning occurs. This is the default.

**Tips:**

- The **trailer-transform-error-page** job attribute and the **Trailer error page** field in the printer definition override this value.
- You can specify the value using lowercase or uppercase letters (for example, no or NO).

**Default:** AOP\_TRAILER\_ERROR\_PAGE -> warning

**Example:** environment = {AOP\_TRAILER\_ERROR\_PAGE -> error}

**AOP\_VERTICAL\_MARGINS**

The top and bottom margins of the page. Specify a number followed by one of these units:

**in** Inches

**mm** Millimeters

**pel** Pels, the default unit

**Tips:**

- Inch values and millimeter values can contain a decimal point. Pel values cannot.
- You can specify the unit using lowercase or uppercase letters (for example, in or IN).
- The **-y** option of the **pcl2afp** command and transform filter overrides this value.

**Default:** AOP\_VERTICAL\_MARGINS -> 0.167in

**AOPTRACEDIR**

The full path name of the directory where the transform writes trace information. You can specify the same directory for different transform classes. The name of the trace file identifies the transform and transform class, and contains a timestamp.

This directory must already exist. If the directory does not exist, the transform writes trace information to the transform's **stderr** file. For information about how to find the **stderr** file, see "Finding the transform stderr file" on page 107.

**Default:** AOPTRACEDIR -> /var/Printsrv/trace

**Examples:**

```
environment = {AOPTRACEDIR -> /var/Printsrv/xfd}
environment = {AOPTRACEDIR -> .}
```

### AOPTRACEON

Turns tracing on. The transform traces all transform requests that use this transform class. Any value turns tracing on. To turn tracing off, do not specify this environment variable. Specify this environment variable only if IBM directs you to do so. Tracing can adversely affect performance.

**Default:** Tracing is turned off.

**Example:** environment = {AOPTRACEON -> 1}

### AOP\_TRIM

Indicates whether the transform creates trimmed AFP images or full-page AFP images. Trimmed AFP images are smaller than full-page AFP images. Therefore, AFP output files that contain trimmed AFP images are smaller and can be transmitted more quickly over a network.

In contrast to full-page AFP images, trimmed AFP images do not include any white space that surrounds the data on the page. The transform positions trimmed AFP images on the page so that the data prints in the correct position on the page. For example, if a page is 8 1/2 by 11 inches and has a 1 inch margin on all sides:

- A trimmed AFP image is 6 1/2 x 9 inches. It is positioned at offset 1 inch (x), 1 inch (y) on the page.
- A full-page AFP image is 8 1/2 by 11 inches. It is positioned at offset 0 (x), 0 (y) on the page.

AFP documents print the same whether you specify AOP\_TRIM = yes or AOP\_TRIM = no. However, AFP overlays and AFP page segments typically print differently because trimmed AFP images are smaller than full-page AFP images. A page segment that contains a trimmed AFP image typically prints higher and to the left on a page. (The **-t** transform option determines the type of output. For example, **-t** pagesegment creates a page segment.)

Values are:

**yes** The transform creates trimmed AFP images (default).

**no** The transform creates full-page AFP images.

The V1 transforms always create full-page AFP images. To create full-page AFP images in V2, you must specify the AOP\_TRIM=no environment variable.

**Tip:** In addition to the environment variables listed in this section, you can specify other environment variables. For example, you can specify the **\_CEE\_RUNOPTS** environment variable. For information, see "Changing Language Environment run-time options" on page 58.

### Examples -- Transform configuration file entries for the PCL to AFP transform

This section shows sample transform entries in the Infoprint Server transform configuration file (**aopxfd.conf**) for the PCL to AFP transform.

**Print on letter size paper on 300-pel printers:** This transform entry can be used for printers that print on letter size paper (8.5 inches wide, 11 inches high) and that have a resolution of 300 pels per inch. This transform entry creates transform class "letter\_300". To use this transform class, specify the class in the **-c** transform option as shown in these two examples:

```
pcl2afp -c letter_300 -o myfile.afp myfile.pcl
lp -o "filter-options='-c letter_300'" -d myprinter myfile.pcl
```

```
transform pcl2afp_letter_300
  start-command = pcl2afpd
  maximum-active = 2
  maximum-idle-time = 300 # 5 minutes
  minimum-active = 1
  environment = {
    _BPX_JOBNAME -> PCL2AFPD
    AOP_PAGE_HEIGHT -> 11in
    AOP_PAGE_WIDTH -> 8.5in
    AOP_HORIZONTAL_MARGINS -> 0.167in
    AOP_VERTICAL_MARGINS -> 0.167in
    AOP_RESOLUTION -> 300
  }
;
```

**Print on A4 paper on 300-pel printers:** This transform entry can be used for printers that print on A4 paper (210 millimeters wide, 297 millimeters high). This transform entry creates transform class "a4\_300". To use this transform class, specify the class in the **-c** transform option as shown in these two examples:

```
pcl2afp -c a4_300 -o myfile.afp myfile.pcl
lp -o "filter-options='-c a4_300'" -d myprinter myfile.pcl
```

```
transform pcl2afp_a4_300
  start-command = pcl2afpd
  maximum-active = 2
  maximum-idle-time = 300 # 5 minutes
  minimum-active = 1
  environment = {
    _BPX_JOBNAME -> PCL2AFPD
    AOP_PAGE_HEIGHT -> 297mm
    AOP_PAGE_WIDTH -> 210mm
    AOP_HORIZONTAL_MARGINS -> 4.242mm
    AOP_VERTICAL_MARGINS -> 4.242mm
    AOP_RESOLUTION -> 300
  }
;
```

## Changing Language Environment run-time options

The transform sets these run-time options for the Language Environment (LE):

- ALL31(ON)
- ANYHEAP(16K,8K,ANYWHERE,FREE)
- BELOWHEAP(8K,4K,FREE)
- DEPTHCONDLMT(10)
- ERRCOUNT(0)
- HEAP(512K,512K,ANYWHERE,FREE)
- LIBSTACK(8K,4K,FREE)
- STACK(128K,128K,ANYWHERE,KEEP,512K,128K)
- STORAGE(NONE,NONE,NONE,8K)
- TERMTHDACT(DUMP)
- THREADHEAP(8K,8K,ANYWHERE,KEEP)
- THREADSTACK(OFF)

- TRAP(ON,SPIE)

If you need to change any of these options, you can specify a new value by setting the `_CEE_RUNOPTS` environment variable in the transform configuration file, `aopxfd.conf`.

For example, to change the `ERRCOUNT` value, specify this environment variable:  
`_CEE_RUNOPTS -> 'ERRCOUNT(4)'`

**Guideline:** Do not specify smaller initial allocation sizes in the `ANYHEAP`, `HEAP`, `STACK`, and `THREADSTACK` options. Setting smaller values can cause severe performance degradation.

For more information, see *z/OS XL C/C++ Programming Guide*

---

## Customizing the PDF to AFP and PostScript to AFP transforms

To customize the PDF to AFP and PostScript to AFP transform, do the tasks listed in this table. Required tasks are required by all installations. The customization tasks are the same for both transforms. Optional tasks are required only if the listed condition applies to your installation.

**Tip:** The same transform daemon (`ps2afpd`) transforms both PDF and PostScript data streams. Therefore, the customization tasks for the PDF to AFP transform and the PostScript to AFP transform are the same.

Task	Condition	See page
Creating an entry in the transform configuration file	Required	59
Starting Infoprint Server with sufficient memory	Required	67
Setting up security	Required	67
Adding fonts	Optional: To add custom fonts	69

### Creating an entry in the transform configuration file

You must create at least one transform entry in the Infoprint Server transform configuration file (`aopxfd.conf`) for the PDF to AFP and PostScript to AFP transform. In the transform entry, you specify:

- Environment variables that control the transform
- Attributes that control how the Infoprint Server Transform Manager manages the transform

For information about how to create and edit the Infoprint Server transform configuration file, see “Creating the transform configuration file (`aopxfd.conf`)” in *z/OS Infoprint Server Customization*. After you update the transform configuration file, you must restart the Infoprint Server Transform Manager.

**Tip:** After you restart the Transform Manager, check for error messages in the transform’s `stderr` file. If you find any error messages, fix the errors and restart the Transform Manager. For more information about how to find the transform message logs, see “Finding the transform `stderr` file” on page 107.

## Transform classes

If you want to specify different transform options for different transform situations, you can create different classes of the transform. For example, you could create a separate class that turns tracing on. You could use this transform class if IBM directs you to trace the transform.

For each transform class, you must create a separate transform entry. You select a name for the transform class in the transform entry (see the **transform** attribute).

To use a transform class, job submitters must specify the class name in the **-c** option on the **pdf2afp** or **ps2afp** transform command or in the **filter-options** job attribute, and administrators must specify the class name in the **-c** filter option in the printer definition. For example, these z/OS UNIX commands use the “trace” transform class:

```
pdf2afp -c trace -o myfile.afp myfile.pdf
lp -d myprinter -o "filter-options='-c trace'" myfile.pdf
```

**Tip:** The sample transform configuration file, */usr/lpp/Printsrv/samples/aopxfd.conf*, shows examples of transform entries with different transform classes. Also, see “Examples -- Transform configuration file entries for the PDF to AFP and PostScript to AFP transforms” on page 66.

## Format of a PDF to AFP and PostScript to AFP transform entry

The format of a PDF to AFP and PostScript to AFP transform entry in the transform configuration file (**aopxfd.conf**) is:

```
transform ps2afp[_transformclass]
  start-command = "ps2afpd [-m nnnnn[K|M]]"
  [ environment = {name -> value [ name -> value]... } ]
  [ maximum-active = number ]
  [ maximum-idle-time = seconds ]
  [ minimum-active = number ]
;
```

**transform ps2afp[\_transformclass]**

This statement indicates the beginning of a transform entry.

### **ps2afp**

The name of the PDF and PostScript to AFP transform.

### *transformclass*

The name of an optional transform class. Specify from 1 to 63 characters, including letters, numbers, or special characters. The name of the transform class is case-sensitive.

**Default:** No transform class.

**Example:** transform ps2afp\_trace

**start-command = "ps2afpd [-m nnnnn[K|M]]"**

This attribute names the transform daemon and option. Enclose the value in single or double quotation marks if you specify the option.

### **ps2afpd**

The name of the transform daemon. If the transform daemon is not in a directory identified in the PATH environment variable in the **aopstart** EXEC, specify the full directory path name of the daemon. (The **ps2afpd** daemon is installed in */usr/lpp/Printsrv/bin*.) This attribute is required.

**-m** *nnnnnn*[K|M]

The maximum number of bytes of memory the transform daemon uses to do transforms. Specify the number of bytes in either kilobytes (K) or megabytes (M).

Suggested values are:

15M to 1024M  
15360K to 1048576K

The amount of memory the transform requires depends on the complexity of the documents to be transformed. If you specify too low a value, the transform of complex PDF or PostScript documents might fail with undefined PostScript errors. If this occurs, try increasing the value in this option.

You must specify a maximum region size that is at least 10M greater than the value you specify in this option. For example, if you use the default value (246M), set the region size to at least 256M (246M + 10M). For information about how to specify the region size, see "Starting Infoprint Server with sufficient memory" on page 67.

**Note:** IBM recommends a region size of at least 256M. If the region size is too low, the transform fails due to lack of memory.

**Default:** 246M

**Example:** start-command = "ps2afpd -m 512M"

**environment** = {*name* -> *value* [*name* -> *value*]... }

Environment variables that specify transform options. Enclose the entire set of environment variables in braces. The values in these environment variables override environment variables with the same name that are set in the **aopstart** EXEC. If a value contains special characters or spaces, enclose the value in single or double quotation marks.

For information about the environment variables you can specify, see "Environment variables for the PDF to AFP and PostScript to AFP transforms" on page 62.

**Default:** None

**Example:**

environment = {AOP\_RESOURCE\_PATH -> /etc/Printsrv/ps2afpv2.2/fonts}

**maximum-active** = *number*

The maximum number of transform daemons that the Transform Manager activates concurrently. Specify a number greater than 0 and greater than or equal to the number specified in the **minimum-active** attribute. For more information, see "Format of a transform entry" in *z/OS Infoprint Server Customization*.

**Default:** No maximum number. Transform daemons are started when needed.

**maximum-idle-time** = *seconds*

The number of seconds before the Transform Manager shuts down an idle transform daemon and system resources are freed. Specify a number greater than 0. For more information, see "Format of a transform entry" in *z/OS Infoprint Server Customization*.

**Default:** Idle transform daemons are not shut down.

**minimum-active** = *number*

The minimum number of transform daemons that the Transform Manager activates concurrently. Specify a number less than or equal to the number specified in the **maximum-active** attribute. For more information, see “Format of a transform entry” in *z/OS Infoprint Server Customization*.

**Default:** minimum-active = 0

## Environment variables for the PDF to AFP and PostScript to AFP transforms

Environment variables let you specify:

- Directory that contains transform resources
- Record length of AFP images
- Tracing options
- Whether the transform fails when warnings or data stream errors occur
- Whether the transform writes messages to a trailer error page

You can specify these environment variables. All environment variables are optional.

### **\_BPX\_JOBNAME**

The job name for this transform. When you assign a different job name to each class of transform, the operator can manage the transform daemons more effectively. Specify a job name of 1 to 8 alphanumeric characters. Incorrect job names are ignored. For more information about the `_BPX_JOBNAME` variable, see *z/OS UNIX System Services Planning*.

**Default:** The job name is AOPXFD.

**Example:** environment = {`_BPX_JOBNAME` -> PS2AFPD}

### **\_CEE\_DMPTARG**

The directory where Language Environment (LE) writes a CEEDUMP. You can specify a period (.) to write the CEEDUMP to the transform’s current working directory. IBM customer service expects to find CEEDUMPs in the transform’s current working directory.

The transform’s current working directory is: *base-directory*/xfd/ps2afp.#.d. *base-directory* is the base directory specified in the Infoprint Server configuration file, **aopd.conf**. An example of the transform’s current working directory is:

```
/var/Printsrv/xfd/ps2afp.0.d
```

If you specify a directory other than the transform’s current working directory, make sure that the user ID that owns the **ps2afpd** file has write access to the directory. For example, if user PS2AFPD owns transform file **ps2afpd**, user PS2AFPD must have write access to the directory.

**Default:** LE writes the dump to the directory specified in the `TMPDIR` environment variable. If the `TMPDIR` environment variable is not specified, LE writes the dump to the **/tmp** directory.

**Example:** environment = {`_CEE_DMPTARG` -> .}

**Note:** For other transforms, such as the PCL to AFP transform, LE writes the CEEDUMP to the transform’s current working directory by default. This is because the owners of the other transforms have write access to the Infoprint Server base directory. Therefore, you do not need to specify the

`_CEE_DMPTARG` environment variable for other transforms. For more information about how LE determines where to write the CEEDUMP, see *z/OS Language Environment Debugging Guide*.

### AOP\_FAIL\_ON\_ERROR

Specifies whether the transform stops processing when a warning or data stream error occurs during the transform. Warnings can indicate degraded output.

Valid values are:

**error** The transform fails when a data stream error occurs and does not create an output document. However, the transform continues if warnings occur.

**no** The transform continues processing when a warning or data stream error occurs and creates an output document. This is the default.

#### **warning**

The transform fails when a warning or data stream error occurs and does not create an output document.

#### **Tips:**

- For backward compatibility, value **yes** is allowed and is equivalent to **error**.
- The **fail-on-transform-error** job attribute and the **Fail on error** field in the printer definition override this value.
- You can specify the value using lowercase or uppercase letters (for example, **no** or **NO**).

**Default:** `AOP_FAIL_ON_ERROR -> no`

**Example:** `environment = {AOP_FAIL_ON_ERROR -> error}`

### AOP\_FONT\_SUBSTITUTION\_MESSAGES

Indicates whether the transform writes a message (AOP2500W) when it substitutes fonts in a document. However, if another warning or an error occurs during the transform, the transform writes the font-substitution message regardless of the setting of this environment variable because the font-substitution message might help you diagnose problems.

Font-substitution messages let you determine if the transform has used substitute fonts. If a substitute font is not acceptable, you might be able to add the original font to the transform. For information, see “Adding fonts” on page 69.

Valid values are:

**yes** The transform writes messages about font substitution.

**no** The transform does not write messages about font substitution.

**Tip:** If the `AOP_TRAILER_ERROR_PAGE -> error` or `AOP_TRAILER_ERROR_PAGE -> no` environment variable is set, the transform does not write the font-substitution message to a trailer error page regardless of the setting of the `AOP_FONT_SUBSTITUTION_MESSAGES` environment variable.

**Default:** `AOP_FONT_SUBSTITUTION_MESSAGES -> yes`

**Example:** `environment = {AOP_FONT_SUBSTITUTION_MESSAGES -> no}`

### AOP\_RECLLEN

The length of the AFP images the transform creates. Each output record contains an AFP image and an additional 17 bytes of information (for example,

header information). For example, if you specify a value of 8 (8,000 bytes) for the AFP image in this environment variable, the length of each output record is 8,017 bytes.

Valid values are from 8 to 32, in units of 1,000 bytes. For example, 8 = 8,000.

**Tip:** The default value is suitable for most installations. However, a larger record length might improve performance.

**Default:** AOP\_RECLEN -> 8

**Example:** environment = {AOP\_RECLEN -> 16}

### AOP\_RESOURCE\_PATH

The directories that contains fonts and other transform resources. If the fonts and other resources are in more than one directory, list all directories separated by a colon. The directories are searched in the order that they are listed. Do not list the default resource directories because the transform always searches these directories last. For more information, see “Adding fonts” on page 69.

**Default:**

AOP\_RESOURCE\_PATH -> /usr/lpp/Printsrv/ps2afpv2.2/lib:/usr/lpp/Printsrv/ps2afpv2.2/Resource/Init:/usr/lpp/Printsrv/ps2afpv2.2/Resource

**Example:**

environment = {AOP\_RESOURCE\_PATH -> /etc/Printsrv/ps2afpv2.2/fonts}

### AOP\_TRAILER\_ERROR\_PAGE

Specifies whether the transform writes messages for transform warnings and data stream errors to a trailer error page. The trailer error page is the last page in the output document. Warnings can indicate degraded output.

Valid values are:

**error** The transform writes error messages, but not warning messages, to a trailer error page. This option does not apply when AOP\_FAIL\_ON\_ERROR-> error or AOP\_FAIL\_ON\_ERROR->warning because no output document is created when an error occurs.

**no** The transform does not write messages to a trailer error page.

**warning**

The transform writes warning and error messages to a trailer error page. This option does not apply when AOP\_FAIL\_ON\_ERROR->warning because no output document is created when an error or warning occurs. This is the default.

**Tips:**

- The **trailer-transform-error-page** job attribute and the **Trailer error page** field in the printer definition override this value.
- You can specify the value using lowercase or uppercase letters (for example, no or NO).

**Default:** AOP\_TRAILER\_ERROR\_PAGE -> warning

**Example:** environment = {AOP\_TRAILER\_ERROR\_PAGE -> error}

### AOPTRACEDIR

The full path name of the directory where the transform writes trace information. You can specify the same directory for different transform classes. The name of the trace file identifies the transform and transform class, and contains a timestamp.

**Default:** AOPTRACEDIR -> /var/Printsrv/trace

**Examples:**

```
environment = {AOPTRACEDIR -> /var/Printsrv/xfd}
environment = {AOPTRACEDIR -> .}
```

**AOPTRACEON**

Turns tracing on. The transform traces all transform requests that use this transform class. Any value turns tracing on. To turn tracing off, do not specify this environment variable. Specify this environment variable only if IBM directs you to do so. Tracing can adversely affect performance.

**Default:** Tracing is turned off.

**Example:** environment = {AOPTRACEON -> 1}

**AOP\_TRIM**

Indicates whether the transform creates trimmed AFP images or full-page AFP images. Trimmed AFP images are smaller than full-page AFP images. Therefore, AFP output files that contain trimmed AFP images are smaller and can be transmitted more quickly over a network.

In contrast to full-page AFP images, trimmed AFP images do not include any white space that surrounds the data on the page. The transform positions trimmed AFP images on the page so that the data prints in the correct position on the page. For example, if a page is 8 1/2 by 11 inches and has a 1 inch margin on all sides:

- A trimmed AFP image is 6 1/2 x 9 inches. It is positioned at offset 1 inch (x), 1 inch (y) on the page.
- A full-page AFP image is 8 1/2 by 11 inches. It is positioned at offset 0 (x), 0 (y) on the page.

AFP documents print the same whether you specify AOP\_TRIM = yes or AOP\_TRIM = no. However, AFP overlays and AFP page segments typically print differently because trimmed AFP images are smaller than full-page AFP images. A page segment that contains a trimmed AFP image typically prints higher and to the left on a page. (The **-t** transform option determines the type of output. For example, **-t pagesegment** creates a page segment.)

Values are:

**yes** The transform creates trimmed AFP images (default).

**no** The transform creates full-page AFP images.

The V1 transforms always create full-page AFP images. To create full-page AFP images in V2, you must specify the AOP\_TRIM=no environment variable.

**Tip:** In addition to the environment variables listed in this section, you can specify other environment variables. For example, you can specify the \_CEE\_RUNOPTS environment variable. For information, see “Changing Language Environment run-time options.”

**Changing Language Environment run-time options**

The transform sets these run-time options for the Language Environment (LE):

- ALL31(ON)
- ANYHEAP(16K,8K,ANYWHERE,FREE)
- BELOWHEAP(8K,4K,FREE)
- DEPTHCONDLMT(10)
- ERRCOUNT(0)

- HEAP(512K,512K,ANYWHERE,FREE)
- LIBSTACK(8K,4K,FREE)
- STACK(128K,128K,ANYWHERE,KEEP,512K,128K)
- STORAGE(NONE,NONE,NONE,8K)
- TERMTHDACT(DUMP)
- THREADHEAP(8K,8K,ANYWHERE,KEEP)
- THREADSTACK(OFF)
- TRAP(ON,SPIE)

If you need to change any of these options, you can specify a new value by setting the `_CEE_RUNOPTS` environment variable in the transform configuration file, `aopxfd.conf`.

For example, to change the `ERRCOUNT` value, specify this environment variable:  
`_CEE_RUNOPTS -> 'ERRCOUNT(4)'`

**Guideline:** Do not specify smaller initial allocation sizes in the `ANYHEAP`, `HEAP`, `STACK`, and `THREADSTACK` options. Setting smaller values can cause severe performance degradation.

For more information, see *z/OS XL C/C++ Programming Guide*

## Examples -- Transform configuration file entries for the PDF to AFP and PostScript to AFP transforms

This section shows sample transform entries in the Infoprint Server transform configuration file (`aopxfd.conf`) for the PDF to AFP and PostScript to AFP transforms.

**Specify a transform resource path:** This transform specifies a resource directory that your installation created to contain custom fonts. This transform does not create a transform class. Therefore, to use this transform, do not specify a transform class in the `-c` transform option.

```
transform ps2afp
  start-command = ps2afpd
  maximum-active = 2
  maximum-idle-time = 300 # 5 minutes
  minimum-active = 1
  environment = {
    _BPX_JOBNAME -> PS2AFPD
    _CEE_DMPTARG -> . # CEEDUMPs in current working directory
    AOP_RESOURCE_PATH -> /etc/Printsrv/ps2afpv2.2/fonts
  }
;
```

**Trace the transform:** This transform entry traces transform jobs and writes the trace to the `/var/Printsrv/xfd/ps2afp.#.d` directory. This transform entry creates transform class "trace". To use this transform class, specify the class in the `-c` transform option as shown in these two examples:

```
pdf2afp -c trace -o myfile.afp myfile.pdf
lp -o "filter-options='-c trace'" -d myprinter myfile.pdf
```

```
transform ps2afp_trace
  start-command = ps2afpd
  maximum-active = 2
  maximum-idle-time = 300 # 5 minutes
  minimum-active = 1
  environment = {
    _BPX_JOBNAME -> PS2AFPD
```

```

        _CEE_DMPTARG -> . # CEEDUMPs in current working directory
        AOPTRACEON ->1
        AOPTRACEDIR -> .
    }
;

```

## Starting Infoprint Server with sufficient memory

The region size available for Infoprint Server must be at least 10M larger than the number of bytes specified in the **-m** option in the transform configuration file. For information about the **-m** option, see “Creating an entry in the transform configuration file” on page 59. (The default minimum region size in the **-m** option is 246M.) IBM recommends a region size of 256 MB or more so that you can transform large or complex data streams.

To make sure that sufficient memory is available when you start the transform:

- In the AOPSTART procedure, specify a region size of at least 256 MB in the REGION parameter on the EXEC statement. If the REGION parameter is not specified, the default region size defined for your installation is used.
- Make sure the maximum address space size for Infoprint Server is at least 256 MB.

You can set the system-wide maximum address space size in the BPXPRMxx member or with the SETOMVS command.

### Examples:

- This statement in the BPXPRMxx member sets the maximum region size to 256 MB:

```
MAXASSIZE(268435456) /* 256*1024*1024 = 256MB */
```

- This command sets the maximum region size to 256 MB:

```
SETOMVS MAXASSIZE=268435456
```

- This command checks the MAXASSIZE value from the operator console:

```
d omvs,o
```

You can set the maximum address space for Infoprint Server higher than the system-wide maximum address in the ASSIZEMAX parameter of the RACF ADDUSER and ALTUSER command for the user that starts Infoprint Server. The ASSIZEMAX value overrides the MAXASSIZE value.

If you enter the **aopstart** command from the z/OS UNIX command line during a TSO session, the SIZE parameter on the TSO/E LOGON panel determines the maximum region size for an address space. Specify a SIZE parameter of at least 256 MB.

- The z/OS IEFUSI user exit can modify the region size of an address space. IBM strongly discourages you from altering the region size of address spaces in the OMVS subsystem category. For more information about the IEFUSI exit, see *z/OS MVS Installation Exits*.

## Setting up security

Security checking done in the transform requires that the user identifier (UID) of the executable file for the transform, **ps2afpd**, *not* be 0 (zero). When it is installed, file **ps2afpd** has a UID of 0. Therefore, you must change the owner of the file. The new owner must have a UID that is *not* 0 and *not* the default UID. Also, the set-user-ID flag for the file must be turned on.

First use the Resource Access Control Facility (RACF), or another program that follows system authorization facility (SAF) protocol, to create a user and group profile for the owner of **ps2afpd**. Then, change the owner of **ps2afpd** and turn on the set-user-ID flag.

**Steps for establishing security:**

**1.** Define a group to RACF.

The group profile must have an OMVS segment and a group identifier (GID). You can use any group name. IBM recommends that you do not give this group any authority to the z/OS file system.

This group must not have any additional authority, such as authority to BPX.SUPERUSER or BPX.DAEMON.

For example, this RACF command defines group PS2AFPDG. For *ps2afpdg-gid*, specify an integer that is different from other GIDs in your installation:

```
ADDGROUP (PS2AFPDG) OMVS(GID(ps2afpdg-gid))
```

---

**2.** Define a user to RACF as a z/OS UNIX user.

This user will be the owner of **ps2afpd**. The transform, as well as PostScript jobs being transformed, run with the UID of this user. For complete information about how to define z/OS UNIX users to RACF, see *z/OS UNIX System Services Planning*.

The user profile must have an OMVS segment. Its UID must (1) *not* be 0 and (2) *not* be the default UID, which is defined in the BPX.DEFAULT.USER profile in the RACF FACILITY class. You can use any user name. For example, you can use PS2AFPD.

IBM recommends that you do not give this user authority to the z/OS file system. However, if any PostScript jobs to be transformed require access to certain files, you can give this user access to the required files or connect this user to another group (or groups) that has access to the required files.

This user must not have any additional authority, such as authority to BPX.SUPERUSER or BPX.DAEMON.

For example, this RACF command defines user PS2AFPD. For *ps2afpd-uid*, specify an integer that is different from other UIDs in your installation:

```
ADDUSER (PS2AFPD) OMVS(UID(ps2afpd-uid))
```

---

**3.** Connect the user to the group.

Connect the user defined in step 2 to the group defined in step 1. For example, this RACF command connects user PS2AFPD to the PS2AFPDG group:

```
CONNECT (PS2AFPD) GROUP(PS2AFPDG)
```

---

**4.** Switch to an effective UID of 0:

```
su
```

**Tip:** To use the **su** command, you must be permitted to the BPX.SUPERUSER profile in the FACILITY class in RACF.

---

**5.** Assign the user as the owner of file **ps2afpd**.

Use the **chown** command to assign the user defined in step 2 as the owner of **ps2afpd**. For example, type this command on the z/OS UNIX command line to assign user PS2AFPD as the owner:

```
chown PS2AFPD /usr/lpp/Printsrv/bin/ps2afpd
```

---

**6.** Turn the set-user-ID flag on for file **ps2afpd**.

The **chown** command turns off the set-user-ID flag. Therefore, use the **chmod** command to turn this flag on again. For example, type this command on the z/OS UNIX command line:

```
chmod u+s /usr/lpp/Printsrv/bin/ps2afpd
```

---

**7.** If you switched to an effective UID of 0 in step 4, switch back to your own UID:

```
exit
```

---

After doing these steps, you can use the **ls** command to list the owner of **ps2afpd** and to verify that the set-user-ID flag is on. For example, type on the z/OS UNIX command line:

```
ls -l /usr/lpp/Printsrv/bin/ps2afpd
```

Assuming that you assigned user PS2AFPD as the owner of **ps2afpd**, output from the **ls** command should look like this:

```
-rws----- 1 PS2AFPD PS2AFPDG ... /usr/lpp/Printsrv/bin/ps2afpd
```

The lowercase letter *s* in the owner permissions section indicates that the set-user-ID flag is on and that the owner has permission to execute the file.

For more information about RACF, see *z/OS Security Server RACF Security Administrator's Guide*. For more information about the **chown**, **chmod**, and **ls** commands, see *z/OS UNIX System Services Command Reference*.

## Adding fonts

The PDF to AFP and PostScript to AFP transforms provide fonts in the **/usr/lpp/Printsrv/ps2afpv2.2/Resource/Font** directory. If the PDF and PostScript files you transform use other fonts, you can add the fonts to the transforms. You can add these types of fonts:

- Type 0, 1, 3, 4, and 42 fonts
- MultiMaster fonts

### Rules:

- Fonts must be in ASCII representation. Postscript font files in both PFA and PFB format are supported.
- The font file name can have a suffix. However, a suffix is not required.
- If the font file name is not exactly the same as the font name, you must specify the font file name in the **Fontmap** file. (If the font file name is the same as the font name, the transform finds the font even if the font name is not in the **Fontmap** file.)
- The data in the **Fontmap** file must be in ASCII representation.

### Steps for adding fonts:

1. Create a directory for the fonts. Set the z/OS UNIX permissions so that the owner can read, write, and access the directories, and everyone can read and access them. For example:

```
mkdir /etc/Printsrv/ps2afpv2.2
chmod 755 /etc/Printsrv/ps2afpv2.2
mkdir /etc/Printsrv/ps2afpv2.2/fonts
chmod 755 /etc/Printsrv/ps2afpv2.2/fonts
```

---

2. Add fonts to the fonts directory created in step 1. Set the z/OS UNIX permissions so that the owner can read and write the font files, and everyone can read them. For example:

```
chmod 644 /etc/Printsrv/ps2afpv2.2/fonts/*
```

---

3. (Optional) If the names of the font files are not the same as the font names, edit the **Fontmap** file. First, copy the file from directory **/usr/lpp/Printsrv/ps2afpv2.2/Resource/Init** to the fonts directory created in step 1. For example:

```
cp /usr/lpp/Printsrv/ps2afpv2.2/Resource/Init/Fontmap /etc/Printsrv/ps2afpv2.2/fonts/Fontmap
```

Then follow the instructions in the file to specify the names and file names of the fonts you added.

**Tip:** The data in the **Fontmap** file must be in ASCII representation. To edit this file in EBCDIC on the z/OS system, you can use the **iconv** command to convert between ASCII and EBCDIC. These examples show how to use the **alias** command to create **a2e** and **e2a** commands that convert data between EBCDIC and ASCII code pages, and then use these commands to convert data in the **Fontmap** file:

- a. Convert data in **Fontmap** from ASCII to EBCDIC and create file **Fontmap.e**:

```
alias a2e="iconv -f iso8859-1 -t ibm-1047"
a2e Fontmap > Fontmap.e
```

- b. Edit file **Fontmap.e**.

- c. Convert data in **Fontmap.e** from EBCDIC to ASCII and replace data in file **Fontmap**:

```
alias e2a="iconv -f ibm-1047 -t iso8859-1"
e2a Fontmap.e > Fontmap
```

---

4. Specify the directory that contains the fonts you added and the modified **Fontmap** file in the **AOP\_RESOURCE\_PATH** environment variable in the transform configuration file, **aopxfd.conf**. For example:

```
environment = {AOP_RESOURCE_PATH -> /etc/Printsrv/ps2afpv2.2/fonts}
```

---

5. Restart the Transform Manager to pick up the changes to the **Fontmap** and **aopxfd.conf** files. For example, use the **AOPSTOP** and **AOPSTART JCL** procedures:

```
START AOPSTOP,OPTIONS='-d xfd'
START AOPSTART
```

---

## Customizing the SAP to AFP transform

To customize the SAP to AFP transform, do the tasks listed in this table. Required tasks are required by all installations. Optional tasks are required only if the listed condition applies to your installation.

Task	Condition	See page
Creating an entry in the transform configuration file	Required	71
Customizing SAP to AFP configuration files	Optional: To customize the SAP to AFP transform	76
Customizing multibyte conversion tables	Optional: To customize multibyte conversion tables	90

### Creating an entry in the transform configuration file

You must create at least one transform entry in the Infoprint Server transform configuration file (**aopxfd.conf**) for the SAP to AFP transform. In the transform entry, you specify:

- Environment variables that control the transform
- Attributes that control how the Infoprint Server Transform Manager manages the transform

For information about how to create or edit the Infoprint Server transform configuration file, see “Creating the transform configuration file (aopxfd.conf)” in *z/OS Infoprint Server Customization*. After you update the transform configuration file, you must restart the Infoprint Server Transform Manager.

**Tip:** After you restart the Transform Manager, check for error messages in the transform’s **stderr** file. If you find any error messages, fix the errors and restart the Transform Manager. For more information about how to find the transform message logs, see “Finding the transform stderr file” on page 107.

#### Transform classes

If you want to specify different transform options or environment variable for different print applications, you can create different classes of the transform. For each transform class, you must create a separate transform entry. You select a name for the transform class in the transform entry (see the **transform** attribute).

To use a transform class, job submitters must specify the class name in the **-c** option on the **sap2afp** transform command or in the **filter-options** job attribute, and administrators must specify the class name in the **-c** filter option in the printer definition. For example, these z/OS UNIX commands use the “myfonts” transform class:

```
sap2afp -c myfonts -o myfile.afp myfile.pcl  
lp -d myprinter -o "filter-options='-c myfonts'" myfile.pcl
```

**Tip:** The sample transform configuration file, **/usr/lpp/Printsrv/samples/aopxfd.conf**, shows examples of transform entries with different transform classes. Also, see “Examples -- Transform configuration file entries for the SAP to AFP transform” on page 76.

#### Format of an SAP to AFP transform entry

The format of an SAP to AFP transform entry in the transform configuration file (**aopxfd.conf**) is:

```

transform sap2afp[_transformclass]
  start-command = "sap2afpd "
  [ environment = {name -> value [ name -> value]... } ]
  [ maximum-active = number ]
  [ maximum-idle-time = seconds ]
  [ minimum-active = number ]
  ;

```

**transform sap2afp**[\_transformclass]

This statement indicates the beginning of a transform entry.

**sap2afp**

The name of the transform.

*transformclass*

The name of an optional transform class. Specify from 1 to 63 characters, including letters, numbers, or special characters. The name of the transform class is case-sensitive.

**Default:** No transform class.

**Examples:**

```

transform sap2afp
transform sap2afp_myfonts

```

**start-command = sap2afpd**

This attribute names the transform daemon.

**sap2afpd**

The name of the transform daemon. If the transform daemon is not in a directory identified in the PATH environment variable in the **aopstart** EXEC, specify the full directory path name of the daemon. (The **sap2afpd** daemon is installed in **/usr/lpp/Printsrv/bin.**) This attribute is required.

**environment = {name -> value [name -> value]... }**

Environment variables that specify transform options. Enclose the entire set of environment variables in braces. The values in these environment variables override environment variables with the same name that are set in the **aopstart** EXEC. If a value contains special characters or spaces, enclose the value in single or double quotation marks.

For information about the environment variables you can specify, see "Environment variables for the SAP to AFP transform" on page 73.

**Default:** None.

**Example:**

```

environment = {AOP_SAP2AFP_RESOURCES -> /etc/Printsrv/sap2afpv2.2/res}

```

**maximum-active = number**

The maximum number of transform daemons that the Transform Manager activates concurrently. Specify a number greater than 0 and greater than or equal to the number specified in the **minimum-active** attribute. For more information, see "Format of a transform entry" in *z/OS Infoprint Server Customization*.

**Default:** No maximum number. Transform daemons are started when needed.

**maximum-idle-time = seconds**

The number of seconds before the Transform Manager shuts down an idle

transform daemon and system resources are freed. Specify a number greater than 0. For more information, see “Format of a transform entry” in *z/OS Infoprint Server Customization*.

**Default:** Idle transform daemons are not shut down.

**minimum-active** = *number*

The minimum number of transform daemons that the Transform Manager activates concurrently. Specify a number less than or equal to the number specified in the **maximum-active** attribute. For more information, see “Format of a transform entry” in *z/OS Infoprint Server Customization*.

**Default:** minimum-active = 0

## Environment variables for the SAP to AFP transform

Environment variables let you specify:

- Transform job name
- Error handling option
- Resource path
- Tracing options
- Whether the transform fails when warnings or data stream errors occur
- Whether the transform writes messages to a trailer error page

You can specify these environment variables. All environment variables are optional.

### \_BPX\_JOBNAME

The job name for this transform. When you assign a different job name to each class of transform, the operator can manage the transform daemons more effectively. Specify a job name of 1 to 8 alphanumeric characters. Incorrect job names are ignored. For more information about the \_BPX\_JOBNAME variable, see *z/OS UNIX System Services Planning*.

**Default:** The job name is AOPXFD.

**Example:** environment = {\_BPX\_JOBNAME -> SAP2AFPD}

### AOP\_FAIL\_ON\_ERROR

Specifies whether the transform stops processing when a warning or data stream error occurs during the transform. Warnings can indicate degraded output.

Valid values are:

**error** The transform fails when a data stream error occurs and does not create an output document. However, the transform continues if warnings occur.

**no** The transform continues processing when a warning or data stream error occurs and creates an output document. This is the default.

#### **warning**

The transform fails when a warning or data stream error occurs and does not create an output document.

#### **Tips:**

- For backward compatibility, value **yes** is allowed and is equivalent to **error**.
- The **fail-on-transform-error** job attribute and the **Fail on error** field in the printer definition override this value.

- You can specify the value using lowercase or uppercase letters (for example, no or NO).

**Default:** AOP\_FAIL\_ON\_ERROR -> no

**Example:** environment = {AOP\_FAIL\_ON\_ERROR -> error}

### AOP\_RECLEN

The length of the output records that the transform creates.

Valid values are from 8 to 32, in units of 1,000 bytes. For example, 8 = 8,000.

**Tip:** The default value is suitable for most installations. However, a larger record length might improve performance.

**Default:** AOP\_RECLEN -> 8

**Example:** environment = {AOP\_RECLEN -> 16}

### AOP\_SAP2AFP\_ICU

The directory that contains all of the SAP to AFP transform double-byte conversion tables. You can specify only one directory name. If the conversion tables are in the default directory, **/usr/lpp/Printsrv/sap2afpv2.2/icu**, you do not need to set this environment variable.

**Default:** AOP\_SAP2AFP\_ICU -> /usr/lpp/Printsrv/sap2afpv2.2/icu

**Example:**

environment = {AOP\_SAP2AFP\_ICU -> /etc/Printsrv/sap2afpv2.2/icu}

### AOP\_SAP2AFP\_RESOURCES

The directory that contains all of the SAP to AFP transform resources, such as configuration files. You can specify only one directory name. If the Infoprint Server Transforms resources are in the default directory, **/usr/lpp/Printsrv/sap2afpv2.2/res**, you do not need to set this environment variable.

**Default:** AOP\_SAP2AFP\_RESOURCES -> /usr/lpp/Printsrv/sap2afpv2.2/res

**Example:**

environment = {AOP\_SAP2AFP\_RESOURCES -> /etc/Printsrv/sap2afpv2.2/res}

### AOP\_TRAILER\_ERROR\_PAGE

Specifies whether the transform writes messages for transform warnings and data stream errors to a trailer error page. The trailer error page is the last page in the output document. Warnings can indicate degraded output.

Valid values are:

**error** The transform writes error messages, but not warning messages, to a trailer error page. This option does not apply when AOP\_FAIL\_ON\_ERROR-> error or AOP\_FAIL\_ON\_ERROR->warning because no output document is created when an error occurs.

**no** The transform does not write messages to a trailer error page.

#### warning

The transform writes warning and error messages to a trailer error page. This option does not apply when AOP\_FAIL\_ON\_ERROR->warning because no output document is created when an error or warning occurs. This is the default.

**Tips:**

- The **trailer-transform-error-page** job attribute and the **Trailer error page** field in the printer definition override this value.

- You can specify the value using lowercase or uppercase letters (for example, no or NO).

**Default:** AOP\_TRAILER\_ERROR\_PAGE -> warning

**Example:** environment = {AOP\_TRAILER\_ERROR\_PAGE -> error}

### AOPTRACEDIR

The full path name of the directory where the transform writes trace information. You can specify the same directory for different transform classes. The name of the trace file identifies the transform and transform class, and contains a timestamp.

This directory must already exist. If the directory does not exist, the transform writes trace information to the transform's **stderr** file. For information about how to find the **stderr** file, see "Finding the transform stderr file" on page 107.

**Default:** AOPTRACEDIR -> /var/Printsrv/trace

#### Examples:

```
environment = {AOPTRACEDIR -> /var/Printsrv/xfd}
environment = {AOPTRACEDIR -> .}
```

### AOPTRACEON

Turns tracing on. The transform traces all transform requests that use this transform class. Any value turns tracing on. To turn tracing off, do not specify this environment variable. Specify this environment variable only if IBM directs you to do so. Tracing can adversely affect performance.

**Default:** Tracing is turned off.

**Example:** environment = {AOPTRACEON -> 1}

**Tip:** In addition to the environment variables listed in this section, you can specify other environment variables. For example, you can specify the **\_CEE\_RUNOPTS** environment variable. For information, see "Changing Language Environment run-time options."

## Changing Language Environment run-time options

The transform sets these run-time options for the Language Environment (LE):

- ALL31(ON)
- ANYHEAP(16K,8K,ANYWHERE,FREE)
- BELOWHEAP(8K,4K,FREE)
- DEPTHCONDLMT(10)
- ERRCOUNT(0)
- HEAP(512K,512K,ANYWHERE,FREE)
- LIBSTACK(8K,4K,FREE)
- STACK(128K,128K,ANYWHERE,KEEP,512K,128K)
- STORAGE(NONE,NONE,NONE,8K)
- TERMTHDACT(DUMP)
- THREADHEAP(8K,8K,ANYWHERE,KEEP)
- THREADSTACK(OFF)
- TRAP(ON,SPIE)

If you need to change any of these options, you can specify a new value by setting the **\_CEE\_RUNOPTS** environment variable in the transform configuration file, **aopxfd.conf**.

For example, to change the ERRCOUNT value, specify this environment variable:  
`_CEE_RUNOPTS -> 'ERRCOUNT(4)'`

**Guideline:** Do not specify smaller initial allocation sizes in the ANYHEAP, HEAP, STACK, and THREADSTACK options. Setting smaller values can cause severe performance degradation.

For more information, see *z/OS XL C/C++ Programming Guide*

## Examples -- Transform configuration file entries for the SAP to AFP transform

This example shows a transform entry in the Infoprint Server transform configuration file (`aopxfd.conf`) for the SAP to AFP transform. This entry does not create a transform class.

```
transform sap2afp
  start-command = sap2afpd
  maximum-active = 2
  maximum-idle-time = 300 # 5 minutes
  minimum-active = 1
  environment = {
    _BPX_JOBNAME -> SAP2AFPD
  }
;
```

This example shows how to specify the `AOP_SAP2AFP_RESOURCES` environment variable in the transform entry. This example assumes that the transform configuration files are in directory `/etc/Printsrv/sap2afpv2.2/res`. This entry does not create a transform class.

```
transform sap2afp
  start-command = sap2afpd
  maximum-active = 2
  maximum-idle-time = 300 # 5 minutes
  minimum-active = 1
  environment = {
    _BPX_JOBNAME -> SAP2AFPD
    _AOP_SAP2AFP_RESOURCES -> /etc/Printsrv/sap2afpv2.2/res
  }
;
```

## Customizing SAP to AFP configuration files

Table 8 lists the SAP to AFP transform configuration files that you can customize.

*Table 8. SAP to AFP transform configuration files*

Configuration file	Purpose	SAP data stream
barcode.tab	Maps SAP OTF bar code names to Bar Code Object Content Architecture (BCOCA) bar codes.	OTF data only
defcp.tab	Maps single-byte ASCII code points to EBCDIC code points.	ABAP data only
fonts.tab	Maps the fonts used in the OTF data stream to AFP fonts.	OTF data only
image.tab	Defines values used to print image data.	OTF data only

Table 8. SAP to AFP transform configuration files (continued)

Configuration file	Purpose	SAP data stream
pagedef.tab	For SAP R/3 Format names, specifies the page definition, form definition, and ABAP coded fonts.	ABAP and OTF data
xxxx0000.tab	Maps SAP code pages to AFP code pages.	OTF data only
6400fonts.tab	Lists raster fonts that apply exclusively to the InfoPrint 6400 printer with the appropriate character set and code page.	OTF data only
userenv	Specifies the character set.	ABAP and OTF data

**Rules:**

- All configuration files must reside in the same directory.
- If the configuration files are not in the default directory, `/usr/lpp/Printsrv/sap2afpv2.2/res`, environment variable `AOP_SAP2AFP_RESOURCES` must specify the directory name.

**Steps for customizing SAP to AFP transform configuration files**

1. Create a new directory.  
IBM recommends that you do *not* change files that reside in the `/usr/lpp/Printsrv/sap2afpv2.2/res` directory. You should create a new resource directory. For example, you can create directory `/etc/Printsrv/sap2afpv2.2/res`.

---

2. Copy all configuration files to the new directory or use symbolic links.  
All configuration files must reside in the same directory. However, if you do not want to customize some files, you can use symbolic links to the `/usr/lpp/Printsrv/sap2afpv2.2/res` directory for those files.

---

3. Change to the new directory.

---

4. Convert the files that you want to customize from ASCII to EBCDIC.

---

5. Edit the files and save them.

---

6. Convert the edited files from EBCDIC to ASCII.

---

7. Specify the directory that contains all the configuration files in the `AOP_SAP2AFP_RESOURCES` environment variable in the Infoprint Server transform configuration file, `aopxfd.conf`.  
**Tip:** You can also specify the `AOP_SAP2AFP_RESOURCES` environment variable in the `AOPSTART EXEC`. The `aopxfd.conf` file takes precedence over the `AOPSTART EXEC`.

---

## 8. Restart the Infoprint Server Transform Manager.

For example, use the AOPSTOP and AOPSTART JCL procedures:

```
START AOPSTOP,OPTIONS='-d xfd'  
START AOPSTART
```

**Tip:** After you restart the Infoprint Server Transform Manager, check for error messages in the transform's **stderr** file. If you find any error messages, fix the errors and restart the Infoprint Server Transform Manager. For information about how to find the transform message logs, see "Finding the transform stderr file" on page 107.

---

### barcode.tab configuration file

The **barcode.tab** configuration file maps SAP R/3 Output Text Format (OTF) bar code names to AFP Bar Code Object Content Architecture (BCOCA) bar codes.

You need to edit this file in these situations:

- If you define a new OTF user bar code, you must add the bar code name to this file and map it to a BCOCA bar code.
- If you want to print an OTF bar code with a different width or wide-to-narrow ratio, you can specify the **ModWidth** and **Ratio** keywords for the SAP bar code.

You can specify these keywords and values in file **barcode.tab** file:

**BarCode** = *name*

This required keyword specifies the OTF bar code name (SAPBARCODE parameter of the BC OTF command). The maximum length of this field is 8 bytes. It can contain any value.

**Type** = *nnn*

This required keyword specifies the AFP bar code type as defined in *Data Stream and Object Architectures: Bar Code Object Content Architecture Reference* for the **Barcode Type** parameter of the **Barcode Data Descriptor** structured field. This value can be any decimal value between 0 and 999. The transform does not verify that this value maps to a valid hexadecimal barcode type.

**Mode**=*nnn*

This required keyword specifies the modifier byte in the **Barcode Modifier** parameter of the **Barcode Data Descriptor** structured field. Any numeric value between 0 and 999 is accepted.

**Flag** = [0 | 128]

This required keyword controls the printing of the Human Readable Interface (HRI) character. Specify one of these values:

0        Prints the HRI characters

128     Does not print the HRI characters

**FlagPdf**=*nnn*

This optional keyword is used only for PDF417 bar codes (Type = 030). The value is byte 5 of the Bar Code Symbol Data (BSA) from PDF417 Special-Function parameters. For information, see *Bar Code Object Content Architecture Reference*.

**ModWidth** = *nnn*

This optional keyword specifies the width of the narrowest defined bar code element (bar or space) in mils (that is, thousandths of an inch – 1/1000). Allowed values are 1– 254.

For bar code types that explicitly specify the module width, such as POSTNET and RM4SCC, this field is ignored.

**Default:** The printer default ModWidth

**Ratio = *nnn*** This optional keyword specifies the ratio of the width of wide bar code elements to narrow bar code elements, when only two different size elements exist, that is, for a two-level bar code type. Express the ratio as a percentage. Allowed values are 100 – 500. However, the value should usually be between 200 and 300. For example: 200 represents a ratio of 2 to 1, and 250 represents a ratio of 2.5 to 1.

Specify a value that is appropriate for the bar code type and for your printer. Many bar codes do not support ratio values, and other bar codes require that the ratio value fall within a specific range. If you specify a ratio value that is not appropriate for the printer, error messages are sent at printing time.

For bar code types that explicitly specify the module width, such as POSTNET and RM4SCC, this field is ignored.

**Default:** The default ratio for the bar code type.

**Note:** Verify any values you enter in this table. The transform does not verify values, and values that are not valid might result in errors.

Figure 4 on page 80 shows the SAP bar codes defined in the default **barcode.tab** configuration file.

```

BarCode = ARTNR      Type = 017 Mode = 002 Flag = 000
BarCode = AUFNR      Type = 017 Mode = 002 Flag = 000
BarCode = BARCLVS    Type = 001 Mode = 001 Flag = 000
BarCode = BC_C128B   Type = 017 Mode = 002 Flag = 128
BarCode = BC_CD39    Type = 001 Mode = 001 Flag = 128
BarCode = BC_CD39C   Type = 001 Mode = 002 Flag = 128
BarCode = BC_EAN13   Type = 009 Mode = 000 Flag = 128
BarCode = BC_EAN8    Type = 008 Mode = 000 Flag = 128
BarCode = BC_EANH    Type = 017 Mode = 002 Flag = 128
BarCode = BC_I25     Type = 012 Mode = 001 Flag = 128
BarCode = BC_I25C    Type = 012 Mode = 002 Flag = 128
BarCode = BC_MSI     Type = 002 Mode = 001 Flag = 128
BarCode = BC_MSIC    Type = 002 Mode = 002 Flag = 128
BarCode = BC_MSIC1   Type = 002 Mode = 003 Flag = 128
BarCode = BC_MSIC2   Type = 002 Mode = 005 Flag = 128
BarCode = BC_PSN5    Type = 024 Mode = 000 Flag = 128
BarCode = BC_PSN9    Type = 024 Mode = 001 Flag = 128
BarCode = C128A_00   Type = 017 Mode = 002 Flag = 000
BarCode = C128A_01   Type = 017 Mode = 002 Flag = 000
BarCode = C128B_00   Type = 017 Mode = 002 Flag = 000
BarCode = C128B_01   Type = 017 Mode = 002 Flag = 000
BarCode = CD39C_00   Type = 001 Mode = 002 Flag = 000
BarCode = CD39C_01   Type = 001 Mode = 002 Flag = 000
BarCode = CD39_00    Type = 001 Mode = 001 Flag = 000
BarCode = CD39_01    Type = 001 Mode = 001 Flag = 000
BarCode = KUNAUNR    Type = 017 Mode = 002 Flag = 000
BarCode = KUNAUPS    Type = 017 Mode = 002 Flag = 000
BarCode = MBBARC     Type = 017 Mode = 002 Flag = 000
BarCode = MBBARC1   Type = 008 Mode = 000 Flag = 000
BarCode = RSNUM      Type = 017 Mode = 002 Flag = 000
BarCode = RSPOS      Type = 017 Mode = 002 Flag = 000
BarCode = RUECKNR    Type = 017 Mode = 002 Flag = 000
BarCode = ZBC39      Type = 001 Mode = 001 Flag = 000
BarCode = ZBC39N     Type = 001 Mode = 001 Flag = 000
BarCode = ZINT25NC   Type = 012 Mode = 001 Flag = 000
BarCode = ZINT25     Type = 012 Mode = 001 Flag = 000
BarCode = ZBC128N    Type = 017 Mode = 002 Flag = 000
BarCode = ZBC128     Type = 017 Mode = 002 Flag = 000
BarCode = ZBC128U    Type = 017 Mode = 002 Flag = 000
BarCode = ZPDF2      Type = 030 Mode = 000 Flag = 000 FlagPdf = 128
BarCode = ZPDF3      Type = 030 Mode = 000 Flag = 000 FlagPdf = 128
BarCode = ZPDF4      Type = 030 Mode = 000 Flag = 000 FlagPdf = 128
BarCode = ZPDF1      Type = 030 Mode = 000 Flag = 000 FlagPdf = 128
BarCode = ZPDF1      Type = 030 Mode = 000 Flag = 000 FlagPdf = 000
BarCode = ZBC93      Type = 033 Mode = 000 Flag = 000
BarCode = ZBC93N     Type = 033 Mode = 000 Flag = 000

```

Figure 4. Default **barcode.tab** configuration file

**Examples:**

- To shorten an existing bar code named BC\_CD29, specify this line in the barcode.tab file:  
BarCode=BC\_CD39 Type=001 Mode=001 Flag=128 Ratio=200 ModWidth=10
- To map a new user OTF bar code named ZDOBAR to a BCOCA bar code, add this line in the barcode.tab file:  
BarCode=ZDOBAR Type=017 Mode=002 Flag=128

For instructions about customizing SAP configuration files, see “Steps for customizing SAP to AFP transform configuration files” on page 77.

## defcp.tab configuration file

The **defcp.tab** configuration file maps single-byte ASCII code points to EBCDIC code points. The SAP to AFP transform uses this file for ABAP data conversion.

The left column in the file is the ASCII code, while the right column contains the corresponding EBCDIC code. The transform checks the values for a decimal numeric value between 0 and 255.

Figure 5 shows the default **defcp.tab** file.

```
// Linedata CodePage
//-----
// This file is used internally by sap2afp, as well as to convert ABAP
// data to linedata.

// Format : Ascii=EbcDic

// T1000819 + box characters -> T1DABASE

000 = 064
001 = 064
002 = 064
003 = 064
004 = 055
  :
250 = 222
251 = 219
252 = 208
253 = 064
254 = 062
255 = 223
```

Figure 5. Default **defcp.tab** configuration file

For instructions about customizing SAP configuration files, see “Steps for customizing SAP to AFP transform configuration files” on page 77.

## fonts.tab configuration file

The **fonts.tab** configuration file maps the fonts used in the SAP OTF data stream to AFP fonts. If you add an OTF user font, you must add a new entry in the **fonts.tab** configuration file for the new OTF font.

These font families are predefined with SAP R/3:

Font Family	Font
CNHEI	Simplified Chinese double-byte font (People's Republic of China)
CNKAI	Simplified Chinese double-byte font (People's Republic of China)
CNSONG	Chinese double-byte standard font (People's Republic of China)
COURCYR	COURCYR Cyrillic font, non-proportional (Russia), ISO 8859/5
COURIER	Courier
DBGOTHIC	Heisei Gothic
DBMINCHO	Heisei Mincho
HELVCYR	Cyrillic font, proportional (Russia), ISO 8859/5
HELVE	Helvetica
JPMINCHO	Heisei Mincho

KPSAMMUL	Double-byte standard font (South Korea)
LETGOTH	Letter Gothic
LNPRINT	Line Print
OCRA	Optical Character Recognition A
OCRB	Optical Character Recognition B
TIMECYR	Cyrillic font, proportional (Russia), ISO 8859/5
TIMES	Times New Roman
TWSONG	Traditional Chinese double-byte standard font (Taiwan)

**Tip:** JPMINCHO and DBMINCHO are different names for the same font.

A font named **BARCODE** must be defined for the **HRI** character of a bar code.

These attributes in the **fonts.tab** configuration file set the format of the fonts you use to print with R/3:

**DefCodePage** Specifies the default SBCS code page used if no **FC OTF** command is given or if the requested font is not found in the **fonts.tab** table.

**DefCharSet** Specifies the default SBCS character set used if no **FC OTF** command is given or if the requested font is not found in the **fonts.tab** table.

**DBDefCodePage** Specifies the default DBCS code page used if no **FC OTF** command is given or if the requested font is not found in the **fonts.tab** table.

**DBDefCharSet** Specifies the default DBCS character set used if no **FC OTF** command is given or if the requested font is not found in the **fonts.tab** table.

**SBDefCodePage** Specifies the default SBCS code page used for half-width characters in DBCS fonts if no **FC OTF** command is given or if the requested font is not found in the **fonts.tab** table.

**SBDefCharSet** Specifies the default SBCS character set used for half-width characters in DBCS fonts if no **FC OTF** command is given or if the requested font is not found in the **fonts.tab** table.

**Font** Describes the font family (**FONTFAMILY** parameter of the **FC OTF** command). The maximum size is 8 bytes and content is not verified.

**Size** Specifies the font size in 1/10 of a point (**FONT SIZE** parameter of the **FC OTF** command). The value must be numeric and is not verified.

**Type** Defines the font type (**BOLD** and **ITALIC** parameter of the **FC OTF** command). **Type=0** is normal, **Type=1** is italic, **Type=2** is bold, and **Type=3** is italic bold. Any other value is not valid.

**CodePage** Specifies the code page and requires a valid AFP code page name (8 bytes). The value is not verified. A name that is not valid can result in an error message.

**CharSet** Specifies the AFP font character set. The content is not verified.

**CodedFont** Specifies the AFP coded font. The content is not verified.

<b>DB</b>	Specifies whether the font is an SBCS font ( <b>DB=0</b> ) or a DBCS font ( <b>DB=1</b> ).
<b>SBCodePage</b>	Specifies the single-byte code page used for half-width characters in DBCS fonts. The value is not verified. A name that is not valid can result in an error message.
<b>SBCharSet</b>	Specifies the AFP single-byte font character set used for half-width characters in DBCS fonts. The content is not verified.
<b>SBCodedFont</b>	Specifies the AFP single-byte coded font used for half-width characters in DBCS fonts. The content is not verified.

If an SBCS font that matches the **Font**, **Size**, and **Type** values is not found, the code page and font character set from the **DefCodePage** and **DefCharSet** attributes are used. A warning message is sent.

If a DBCS font that matches the **Font**, **Size**, and **Type** values is not found, the code pages and font character sets from the **DBDefCodePage**, **SBDDefCodePage**, **DBDefCharSet**, and **SBDDefCharSet** attributes are used. A warning message is sent.

The SAP device types **IBMAFP** and **IBMAFP3** support the predefined font families. These font families are also supported as IBM Expanded Core Fonts or IBM Japanese Fonts.

For ABAP listings, use the Letter Gothic Latin1 font provided with the AFP Font Collection V2 (program number 5648-B33). If you choose not to install the AFP Font Collection and plan to use the Gothic Text fonts provided with the IBM Compatibility Fonts, adjust the font names in the **pagedef.tab** configuration file.

Figure 6 on page 84 and Figure 7 on page 84 show sections of the **fonts.tab** configuration file.

```

DefCodePage = T1V10273
DefCharSet = C0420000
DBDefCodePage = T10300
DBDefCharSet = CZJHMN
SBDefCodePage = T1H01027
SBDefCharSet = CZJHMN
// Courier
Font=COURIER Size=070 Type=0 CodePage=T1V10273 CharSet=C0420070 DB=0
Font=COURIER Size=070 Type=1 CodePage=T1V10273 CharSet=C0430070 DB=0
Font=COURIER Size=070 Type=2 CodePage=T1V10273 CharSet=C0440070 DB=0
Font=COURIER Size=070 Type=3 CodePage=T1V10273 CharSet=C0450070 DB=0
Font=COURIER Size=080 Type=0 CodePage=T1V10273 CharSet=C0420080 DB=0
Font=COURIER Size=080 Type=1 CodePage=T1V10273 CharSet=C0430080 DB=0
Font=COURIER Size=080 Type=2 CodePage=T1V10273 CharSet=C0440080 DB=0
Font=COURIER Size=080 Type=3 CodePage=T1V10273 CharSet=C0450080 DB=0
Font=COURIER Size=100 Type=0 CodePage=T1V10273 CharSet=C0420000 DB=0
Font=COURIER Size=100 Type=1 CodePage=T1V10273 CharSet=C0430000 DB=0
Font=COURIER Size=100 Type=2 CodePage=T1V10273 CharSet=C0440000 DB=0
Font=COURIER Size=100 Type=3 CodePage=T1V10273 CharSet=C0450000 DB=0
Font=COURIER Size=120 Type=0 CodePage=T1V10273 CharSet=C04200B0 DB=0
Font=COURIER Size=120 Type=1 CodePage=T1V10273 CharSet=C04300B0 DB=0
Font=COURIER Size=120 Type=2 CodePage=T1V10273 CharSet=C04400B0 DB=0
Font=COURIER Size=120 Type=3 CodePage=T1V10273 CharSet=C04500B0 DB=0
Font=COURIER Size=140 Type=0 CodePage=T1V10273 CharSet=C04200D0 DB=0
Font=COURIER Size=140 Type=1 CodePage=T1V10273 CharSet=C04300D0 DB=0
Font=COURIER Size=140 Type=2 CodePage=T1V10273 CharSet=C04400D0 DB=0
Font=COURIER Size=140 Type=3 CodePage=T1V10273 CharSet=C04500D0 DB=0
Font=COURIER Size=200 Type=0 CodePage=T1V10273 CharSet=C04200J0 DB=0
Font=COURIER Size=200 Type=1 CodePage=T1V10273 CharSet=C04300J0 DB=0
Font=COURIER Size=200 Type=2 CodePage=T1V10273 CharSet=C04400J0 DB=0
Font=COURIER Size=200 Type=3 CodePage=T1V10273 CharSet=C04500J0 DB=0

```

Figure 6. Courier portion of default **fonts.tab** configuration file

```

// Japanese Gothic
Font=DBGOTHIC Size=060 Type=0 CodePage=T10300 CharSet=CZJHKG DB=1 SBCodePage=T1H01027 SBCharSet=CZJHKG
Font=DBGOTHIC Size=080 Type=0 CodePage=T10300 CharSet=CZJHKG DB=1 SBCodePage=T1H01027 SBCharSet=CZJHKG
Font=DBGOTHIC Size=100 Type=0 CodePage=T10300 CharSet=CZJHKG DB=1 SBCodePage=T1H01027 SBCharSet=CZJHKG
Font=DBGOTHIC Size=100 Type=1 CodePage=T10300 CharSet=CZJHKG DB=1 SBCodePage=T1H01027 SBCharSet=CZJHKG
Font=DBGOTHIC Size=120 Type=0 CodePage=T10300 CharSet=CZJHKG DB=1 SBCodePage=T1H01027 SBCharSet=CZJHKG
Font=DBGOTHIC Size=140 Type=0 CodePage=T10300 CharSet=CZJHKG DB=1 SBCodePage=T1H01027 SBCharSet=CZJHKG
Font=DBGOTHIC Size=160 Type=0 CodePage=T10300 CharSet=CZJHKG DB=1 SBCodePage=T1H01027 SBCharSet=CZJHKG
Font=DBGOTHIC Size=180 Type=0 CodePage=T10300 CharSet=CZJHKG DB=1 SBCodePage=T1H01027 SBCharSet=CZJHKG

```

Figure 7. Heisei Gothic portion of default **fonts.tab** configuration file

| For instructions about customizing SAP configuration files, see “Steps for  
| customizing SAP to AFP transform configuration files” on page 77.

### image.tab configuration file

The **image.tab** configuration file defines values used to print image data. It contains these parameters:

- DEFRES** Specifies the default resolution used for printing image data if you do not specify a resolution in the printer definition and the job submitter does not specify a resolution in the **-r** option on the **lp** or **sap2afp** command. Valid values are **240**, **300**, **480**, and **600**.
- Width** Specifies the width of the dither matrix.
- Height** Specifies the height of the dither matrix.

**Cell** Specifies the values for the dither matrix.  
**Transform** Specifies 256 grayscale correction values.

These are the **image.tab** files. To use one of these files, rename it to **image.tab**:

- **image.tab** - same as **image.tab.85lr**
- **image.tab.141ap** - 141 lines/inch AppleWriter grayscale emulation
- **image.tab.141dt** - 141 lines/inch Xerox DocuTech grayscale emulation
- **image.tab.141lr** - 141 lines/inch linear gamma correction
- **image.tab.85ap** - 85 lines/inch AppleWriter grayscale emulation
- **image.tab.85dt** - 85 lines/inch Xerox DocuTech grayscale emulation
- **image.tab.85lr** - 85 lines/inch linear gamma correction

Figure 8 shows the default **image.tab** configuration file.

```
// image.tab
//
// This file is used to determine the dither matrix and the
// grayscale correction values.
// Define the default output resolution
DEFRES = 600
// Define the dither matrix
Width = 78
Height = 78
Cell =
  15  63 184 219 249 240 158 109  98  54  82 118 133 113  75  64
  87 104 166 215 234 229 179  62  38  4  15  59 186 220 246 240
166 123  87  61  65 108 133 118  78  64 100 105 167 219 234 230
  :
  28  73 193 223 253 247 199  76  31  8  20  93 148 156 203 178
136 126 144 186 201 155 151  90  43  24  28  75 199 222 254 251
196  79  31  7
//
// Grayscale correction values
//
Transform =
0
1
2
:
248
252
255
```

Figure 8. Default **image.tab** configuration file

| For instructions about customizing SAP configuration files, see “Steps for  
| customizing SAP to AFP transform configuration files” on page 77.

### **pagedef.tab configuration file**

The **pagedef.tab** configuration file maps SAP R/3 Format names to the names of AFP form definitions, AFP page definitions, and fonts. The SAP to AFP transform uses the form definition name when it transforms either SAP OTF or ABAP data. However, the transform uses the page definition and font names only for SAP ABAP data.

Every SAP R/3 document to be printed is associated with an SAP R/3 Format, for example the X\_65\_80 Format for ABAP data or the LETTER format for OTF data. If you define user Formats to SAP R/3, you must add it to the **pagedef.tab** file.

A form definition lets you specify electronic overlays, portrait or landscape presentation mode, the paper source, simplex or duplex printing, and so on. By default, the transform uses the F1A10111 form definition, which specifies no electronic overlays, portrait presentation, the primary paper source, and duplex printing. You can change the form definition in the **pagedef.tab** file to another form definition that PSF provides. For information about form definitions that PSF provides, see *PSF for z/OS: User's Guide*.

For example, to print in the landscape orientation you could define new user Formats to SAP R/3 (for example ZLAND for ABAP data and Z\_65\_255 for OTF data), and then map the new user Formats to form definition F1C10110 in the **pagedef.tab** file. F1C10110 is a form definition with landscape presentation mode specified that PSF provides.

File **pagedef.tab** contains these parameters:

<b>Paper</b>	Specifies the name of the SAP R/3 format. This is the value of the OTF print option parameter <b>PJFORM</b> or <b>PJPAPER</b> .
<b>FormDef</b>	Specifies the name of the form definition to be used for printing both OTF and ABAP reports. An error results if PSF cannot find the form definition during printing.
<b>PageDef</b>	Specifies the name of the page definition to be used for printing ABAP reports. An error results if PSF cannot find the page definition during printing.
<b>FontNorm</b>	Specifies the normal coded font used for printing ABAP data.
<b>FontBold</b>	Specifies the bold coded font used for printing ABAP data..

Figure 9 on page 87 shows the default **pagedef.tab** configuration file.

```

// PageDef table
//-----
// This table allows users to configure resource selection based on a
// Format in the SAP system. Thus a format, say ZCHECK, could be set-up
// to use a Formdef that would invoke an Overlay for checks.
//
// Although all paper types are defined in the same format, conventions
// on the SAP system should be observed as follows:
// + ABAP user defined formats should be in the form Z_ROWS_COLUMNS or
//   Z_ROWS_COLUMNS_EXTRA-ID. An example of a user defined ABAP format
//   would be Z_65_132_MYABAP.
// + Formats for OTF in the SAP system are formats listed that do not
//   start with a X (i.e. LEGAL). An example of a user defined OTF format
//   would be ZMYFORMAT.
// + Do NOT copy ABAP formats as OTF formats or OTF formats as ABAP formats!
//
// Resource selection is done as follows:
// + For ABAP data, all entries (FormDef, PageDef, FontNorm, FontBold)
//   are used.
// + For OTF data, only the FormDef value is used. However, the other
//   field values must be defined.
//-----
// Format : Paper=X_65_132 FormDef=F1A10111 PageDef=P1V06683 FontNorm=GT2B
//         FontBold=GB2B
// Notes:
// =====
// 1) the pagedefs apply to letter size paper.
//    A4 paper size may require modifying the PageDef field.
// 2) Z_INCH12 is a sample for a user specification
// 3) A format (Paper) must not exceed 16 characters.
//-----

// ABAP Formats
Paper=X_65_132 FormDef=F1A10111 PageDef=P1V06683 FontNorm=GT2B FontBold=GB2B
Paper=X_44_120 FormDef=F1A10111 PageDef=P1V06683 FontNorm=GT2B FontBold=GB2B
Paper=X_58_170 FormDef=F1A10111 PageDef=P1V06683 FontNorm=GT8B FontBold=GT8B
Paper=X_65_255 FormDef=F1A10111 PageDef=P1V06683 FontNorm=GT2B FontBold=GT2B
Paper=X_65_80 FormDef=F1A10111 PageDef=P1C09182 FontNorm=GT2B FontBold=GB2B
Paper=X_90_120 FormDef=F1A10111 PageDef=P1C09182 FontNorm=GT5B FontBold=GT5B
Paper=X_PAPER FormDef=F1A10111 PageDef=P1C09182 FontNorm=GT2B FontBold=GB2B

// OTF Formats
Paper=DINA3 FormDef=F1A10111 PageDef=P1V06683 FontNorm=GT2B FontBold=GB2B
Paper=DINA4 FormDef=F1A10111 PageDef=P1V06683 FontNorm=GT2B FontBold=GB2B
Paper=DINA5 FormDef=F1A10111 PageDef=P1V06683 FontNorm=GT2B FontBold=GB2B
Paper=EXECUTIV FormDef=F1A10111 PageDef=P1V06683 FontNorm=GT2B FontBold=GB2B
Paper=INCH4 FormDef=F1A10111 PageDef=P1V06683 FontNorm=GT2B FontBold=GB2B
Paper=INCH6 FormDef=F1A10111 PageDef=P1V06683 FontNorm=GT2B FontBold=GB2B
Paper=INCH7 FormDef=F1A10111 PageDef=P1V06683 FontNorm=GT2B FontBold=GB2B
Paper=INCH8 FormDef=F1A10111 PageDef=P1V06683 FontNorm=GT2B FontBold=GB2B
Paper=INCH11 FormDef=F1A10111 PageDef=P1V06683 FontNorm=GT2B FontBold=GB2B
Paper=INCH12 FormDef=F1A10111 PageDef=P1V06683 FontNorm=GT2B FontBold=GB2B
Paper=LEGAL FormDef=F1A10111 PageDef=P1V06683 FontNorm=GT2B FontBold=GB2B
Paper=LETTER FormDef=F1A10111 PageDef=P1V06683 FontNorm=GT2B FontBold=GB2B
Paper=LINE_21 FormDef=F1A10111 PageDef=P1V06683 FontNorm=GT2B FontBold=GB2B
Paper=LINE_22 FormDef=F1A10111 PageDef=P1V06683 FontNorm=GT2B FontBold=GB2B

//Example of a user-defined pagedef entry:
//Paper=Z_INCH12 FormDef=F1A10111 PageDef=P1SAPPD FontNorm=GT2B FontBold=GB2B

```

Figure 9. Default **pagedef.tab** configuration file

For instructions about customizing SAP configuration files, see “Steps for customizing SAP to AFP transform configuration files” on page 77.

## xxxx0000.tab configuration file

These configuration files contain tables that map characters of an individual SAP code page into an AFP code page:

Table 9. SAP code page configuration files

File name	SAP R/3 input code page	Description of input code page	AFP output code page	Description of output code page
00000000.tab	T1000819	Latin-1 ISO ANSI 8-bit (ASCII)	T1V10273	Germany F.R./Austria-CECP
11000000.tab	T1000819	Latin-1 ISO ANSI 8-bit (ASCII)	T1V10273	Germany F.R./Austria-CECP
15000000.tab	T1000915	Cyrillic ISO 8859/5	T1001172	Cyrillic Multilingual with Box Draw
40010000.tab	T1000876 <sup>1</sup>	OCR-A (ASCII)	T1000892	OCR-A
40040000.tab	T1000877 <sup>1</sup>	OCR-B (ASCII), MICR_C, MICR_E	T1000893	OCR-B
80000000.tab	IBM-943C	Japanese ISO Shift-JIS	IBM-1399-SAP2AFP	Japanese
83000000.tab	8300	Traditional Chinese ISO Big5	IBM-937-SAP2AFP	Traditional Chinese
84000000.tab	8400	Simplified Chinese ISO GB2312	IBM-1388-SAP2AFP	Simplified Chinese
85000000.tab	8500	Korean ISO KSC 5601	IBM-933-SAP2AFP	Korean
86000000.tab	8600	Thai ISO TIS620–2529	T1000874	Thai

1. The input OCR-A and the OCR-B code pages are equivalent to ISO-8859-1 with the special characters **hook**, **fork**, and **chair**.

Asian versions of SAP R/3 use special coding to represent double-byte special characters. Therefore, the **80000000.tab** file must indicate the SAP R/3 system code page and the output code page. These parameters in the table specify the input and output code pages:

- CONVERT FOR=xxxx  
xxxx is the SAP R/3 system code page.
- CONVERT TO=yyyyyyyyyy  
yyyyyyyyyy is the output code page conversion table.

Figure 10 shows the default **80000000.tab** configuration file used for the SAP R/3 system code page 8000 (Japanese).

```
CONVERT FOR=8000
CONVERT TO=ibm-1399-sap2afp
```

Figure 10. Default **80000000.tab** configuration file

For instructions about customizing SAP configuration files, see “Steps for customizing SAP to AFP transform configuration files” on page 77.

## 6400fonts.tab configuration file

The **6400fonts.tab** configuration file maps Output Text Format (OTF) fonts to fonts in an InfoPrint 6400 printer. The printer must support the graphics object content architecture (GOCA) feature.

You can edit the **6400fonts.tab** file to resize an OTF font. To do this, you specify the **SIZE** and **CPI** parameters.

Parameters in the configuration file are:

**CharSet**

Specifies the AFP font character set.

**CodedFont**

Specifies the AFP coded font. The content is not verified.

**CodePage**

Specifies the AFP code page name (8 bytes).

**CPI**

Specifies the horizontal width (in characters per inch) to which the 6400 printer-resident fonts should be scaled. The smaller the number you specify, the wider the font you receive.

**DB**

Specifies whether the font is an SBCS font (**DB=0**) or a DBCS font (**DB=1**).

**Font**

Describes the font family (**FONTFAMILY** parameter of the **FC OTF** command). The maximum size is 8 bytes.

**SBCharSet**

Specifies the AFP single-byte font character set used for half-width characters in DBCS fonts.

**SBCodedFont**

Specifies the AFP single-byte coded font used for half-width characters in DBCS fonts.

**SBCodePage**

Specifies the single-byte code page used for half-width characters in DBCS fonts.

**Size**

Specifies the height (in points) to which the 6400 printer-resident font should be scaled. Because there are 72 points in an inch, 720 indicates a height of an inch.

**Type**

Defines the font type. Valid values are: **Type=0** is normal, **Type=1** is italic, **Type=2** is bold, and **Type=3** is italic bold.

**Examples:**

- For fonts that print one inch high, specify this line in the **6400fonts.tab** configuration file:  
Font=TIMES Size=720 Type=3 CodePage=T1V10273 CharSet=C0S0ESTR DB=0
- For fonts that print one inch wide, specify this line in the **6400fonts.tab** configuration file:  
Font=TIMES Size=360 Type=3 CodePage=T1V10273 CharSet=C0S0ESTR DB=0 CPI=1
- For fonts that print one-half inch wide, specify this line in the **6400fonts.tab** configuration file:  
Font=TIMES Size=360 Type=3 CodePage=T1V10273 CharSet=C0S0ESTR DB=0 CPI=2

**Note:** After you edit the **6400fonts.tab** file, access the Print Screen List window on the SAP R/3 graphical user interface and specify 6400 in the **Title** field of the Spool request pane.

For instructions about customizing SAP configuration files, see “Steps for customizing SAP to AFP transform configuration files” on page 77.

### **userenv configuration file**

The **userenv** configuration file, provided in **/usr/lpp/Printsrv/sap2afpv2.2/res**, specifies the character-set encoding of SAP OTF and ABAP files. To enable the SAP to AFP transform for non-Latin character sets, you must edit the **userenv** configuration file to specify the character set. Valid values in **userenv** are:

<b>Value</b>	<b>Character set</b>
<b>CYRILLIC</b>	Cyrillic
<b>KOREAN</b>	Korean
<b>JAPANESE</b>	Japanese (Shift-JIS encoding)
<b>NORMAL</b>	Latin
<b>SPCHINESE</b>	Simplified Chinese
<b>TDCHINESE</b>	Traditional Chinese
<b>UNICODE</b>	Unicode, or a mixture of ASCII and Unicode

The SAP to AFP transform can automatically detect Unicode in SAP OTF and ABAP files. Therefore, to transform Unicode files, the **userenv** file does not need to specify UNICODE. However, to transform SAP ASCII files that contain Unicode data, the **userenv** file must specify UNICODE. If the **userenv** file specifies UNICODE, all SAP files must contain Unicode data or ASCII with Unicode.

The SAP to AFP transform supports the non-Latin character sets through the use of the **uconv** utility. To use this support, you must run the SAPGOF (or a compatible) device type on an SAP R/3 system at Release 4.0A or later.

To print the AFP data, you must install the required fonts in the PSF font library:

- ABAP data requires raster fonts.
- OTF data can be printed with either raster or outline fonts.
- Unicode data requires the AFP Unicode Migration Fonts product.

For instructions about customizing SAP configuration files, see “Steps for customizing SAP to AFP transform configuration files” on page 77.

## **Customizing multibyte conversion tables**

To transform and print SAP R/3 data streams that contain multibyte special characters, you might need to customize the conversion tables for the code pages that the SAP to AFP transform uses.

You can edit the source files that the transform provides in the **/usr/lpp/Printsrv/sap2afpv2.2/icu** directory, and then use the z/OS UNIX **makeconv** command to compile them. These source files define the mapping between UCS-2 and multibyte code sets:

- Japanese: **ibm-939-sap2afp.ucm**
- Japanese: **ibm-1399-sap2afp.ucm**
- Korean: **ibm-933-sap2afp.ucm**
- Simplified Chinese: **ibm-1388-sap2afp.ucm**
- Traditional Chinese: **ibm-937-sap2afp.ucm**

### Steps for customizing conversion tables:

1. Create a new directory for the conversion tables. For example, you can create directory `/etc/Printsrv/sap2afpv2.2/icu`.

IBM recommends that you do *not* change files that reside in the `/usr/lpp/Printsrv/sap2afpv2.2/icu` directory.

---

2. Copy all files from directory `/usr/lpp/Printsrv/sap2afpv2.2/icu` to the new directory or use symbolic links.

All `.cnv` conversion tables must in the same directory. However, if you do not want to customize some files, you can use symbolic links to the `/usr/lpp/Printsrv/sap2afpv2.2/icu` directory for those files.

---

3. Change to the new directory. For example:

```
cd /etc/Printsrv/sap2afpv2.2/icu
```

---

4. Edit the `.ucm` file and save it.
- 

5. Use the z/OS UNIX `makeconv` command to compile the `.ucm` file and create a `.cnv` file. For example:

```
makeconv -p ICUDATA ibm-1388-sap2afp.ucm
```

---

6. Change the access permissions of the `.cnv` file to give everyone permission to read the file. For example:

```
chmod 644 ibm-1388-sap2afp.cnv
```

---

7. Specify the new directory that contains the conversion tables in the `AOP_SAP2AFP_ICU` environment variable in the SAP to AFP transform entry of the Infoprint Server transform configuration file.

**Tip:** You can also specify the `AOP_SAP2AFP_RESOURCES` environment variable in the AOPSTART EXEC. The `aopxfd.conf` file takes precedence over the AOPSTART EXEC.

---

8. Restart the Infoprint Server Transform Manager.

For example, use the AOPSTOP and AOPSTART JCL procedures:

```
START AOPSTOP,OPTIONS='-d xfd'  
START AOPSTART
```

**Tip:** After you restart the Transform Manager, check for error messages in the transform's `stderr` file. If you find any error messages, fix the errors and restart the Transform Manager. For more information about how to find the transform message logs, see "Finding the transform stderr file" on page 107.

---



---

## Chapter 4. Administering transforms

This chapter describes how Infoprint Server administrators can set up printer definitions in the Infoprint Server Printer Inventory so that Infoprint Server automatically transforms documents to AFP format before writing them to the JES spool or sending them to other print servers or e-mail destinations.

Task	See page
Requesting the PCL to AFP transform	93
Requesting the PDF to AFP transform	96
Requesting the PostScript to AFP transform	99
Requesting the SAP to AFP transform	102

---

### Requesting the PCL to AFP transform

This section describes how you can set up your printer definitions so that Infoprint Server automatically calls the PCL to AFP transform when it processes PCL documents.

#### PCL to AFP transform filter

In the printer definitions for AFP printers, you can specify the PCL to AFP transform filter and associate it with the PCL data format. (A filter is a program that modifies the input data before it is sent to the printer.) When you associate the transform filter with the PCL data format, Infoprint Server automatically calls the PCL to AFP transform when it processes a document with the PCL data format.

Table 10 shows the filter name and filter options that you can specify in the **Filter** field of a printer definition.

Table 10. PCL to AFP filter name and filter options

Field name (attribute name)	Filter name	Filter options
Filter (filters)	pcl2afp.dll	[%filter-options] [-a <i>imagetype</i> ] [-c <i>transformclass</i> ] [-l <i>length</i> ] [-p <i>pagerange</i> ] [-r <i>resolution</i> ] [-t <i>outputtype</i> ] [-w <i>width</i> ] [-x <i>xmargin</i> ] [-y <i>ymargin</i> ] [-T]

The filter options mean:

#### %filter-options

Causes options that are specified in the **filter-options** job attribute to be passed to the transform.

You can type the **%filter-options** option in any position relative to the other filter options. If you specify filter options to the right of **%filter-options**, those options override the same options specified in the **filter-options** job attribute.

#### -c *transformclass*

Specifies the name of a transform class that is defined in the transform configuration file, **aopxfd.conf**. The name is case-sensitive. The job submitter can also specify this option in the **filter-options** job attribute.

-alprtwxyT

For a description of these options, see “pcl2afp—Transform PCL data to AFP data” on page 13.

## Steps for editing printer definitions for the PCL to AFP transform

To edit printer definitions, use either Infoprint Server ISPF panels or the Printer Inventory Definition Utility (PIDU) program. This section describes how to use the ISPF panels. For information about the PIDU program, see “Using the PIDU program to manage the Printer Inventory” in *z/OS Infoprint Server Operation and Administration*.

**Before you begin:** You must be authorized to edit the Printer Inventory. You must have UPDATE access to the AOP.ADMINISTRATOR profile in the RACF PRINTSRV class.

### Steps for editing printer definitions:

1. (Optional) Create a Processing component. If you need to specify the PCL to AFP transform in a large number of printer definitions, a component can simplify administration. If you need to change your transform filter in the future, you can make the change in your Processing component.

---
2. On the Processing panel of either the printer definition or the component, select the **PCL** data format.  
**Tip:** In PSF printer definitions, also select the **Line data**, **MO:DCA-P**, and **Text** data formats. PSF can print line data and MO:DCA-P data on AFP printers, and Infoprint Server automatically converts text data to line data.

---
3. Next to the **PCL** data format, specify the **pcl2afp.dll** filter and filter options in the **Filter** field. Type the absolute pathname if the filter is not in a directory named in the LIBPATH environment variable. For filter options, see “PCL to AFP transform filter” on page 93.

---
4. In PSF printer definitions, do not select the **Resubmit for filtering** field.

---
5. (Optional) In the **Fail on error** field, select whether you want the transform to fail when a transform warning or data stream error occurs during the transform. When a transform fails, the transform does not produce an output document.  
The Infoprint Server **fail-on-transform-error** job attribute overrides this field. If you do not select an option in this field and **fail-on-transform-error** is not specified, the AOP\_FAIL\_ON\_ERROR environment variable determines when the transform fails.

---
6. (Optional) In the **Trailer error page** field, select the type of messages you want the transform to write on a page at the end of the AFP output (called the **trailer error page**).  
The Infoprint Server **trailer-transform-error-page** job attribute overrides this value.

If you do not select an option in this field, the AOP\_TRAILER\_ERROR\_PAGE environment variable determines the type of messages the transform writes.

7. (Optional) If you created a Processing component, specify the name of the Processing component in the **Component name** field on the PSF printer definition panel. Do this in all printer definitions to which the transform applies.

After you include a Processing component, check the Processing panel in the printer definition to make sure the transform is specified correctly. You might need to remove (space over) any filters that are specified on the Processing panel of the printer definition itself. If any filters are specified in the printer definition, the filters specified in the component are not used.

8. (Optional) On the Allocation panel, you can specify the name of the form definition that PSF is to use when it prints the AFP image data that the transform creates.

## Example -- ISPF Processing panel for the PCL to AFP transform

This ISPF panel shows how to specify the PCL to AFP transform in a printer definition for a PSF printer. Only a portion of the Processing panel is shown.

```
Processing
Printer definition name . afp-printer
:
Supported data formats and associated filters:
Data format: Filter:
/ Line data _____ (extend)
/ MO:DCA-P _____ (extend)
- PostScript _____ (extend)
/ Text _____ (extend)
/ PCL pcl2afp.dll -c letter_300 %filter-options _____ (extend)
- PDF _____ (extend)
- SAP _____ (extend)
- XML _____ (extend)
- Other _____ (extend)
_ Resubmit for filtering

Transforms to AFP:
Fail on error . . . . 2 1. No 2. Error 3. Warning
Trailer error page. . 1 1. No 2. Error 3. Warning
:
```

Explanation of fields:

- The **PCL** data format is selected because the **pcl2afp2.dll** filter can transform PCL documents to AFP format. The transform options are:
  - The **-c** filter option causes the transform to use the **letter\_300** transform class, which is defined in the transform configuration file.

Because the **-c** option is specified to the *left* of **%filter-options**, any **-c** option specified in the **filter-options** job attribute overrides the **-c** option specified in the printer definition.

- The **%filter-options** filter option causes the transform to use transform options specified in the **filter-options** job attribute.
- The **Line data** and **MO:DCA-P** data formats are selected because PSF can print these data formats on AFP printers.
- The **Text** data format is selected because Infoprint Server automatically converts text data to line data when processing data for PSF printers.
- In the **Fail on error** field, option **Error** is selected. If a data stream error occurs during the transform, the transform fails and does not create an output document.
- In the **Trailer error page** field, option **No** is selected. The transform does not write any warning or error messages to a trailer error page.

---

## Requesting the PDF to AFP transform

This section describes how you can set up your printer definitions so that Infoprint Server automatically calls the PDF to AFP transform when it processes PDF documents.

### PDF to AFP transform filter

In the printer definitions for AFP printers, you can specify the PDF to AFP transform filter and associate it with the PDF data format. (A filter is a program that modifies the input data before it is sent to the printer.) When you associate the transform filter with the PDF data format, Infoprint Server automatically calls the PDF to AFP transform when it processes a document with the PDF data format.

Table 11 shows the filter name and filter options that you can specify in the **Filter** field of a printer definition.

**Tip:** The same **ps2afp.dll** filter transforms both PostScript and PDF documents to AFP format, but the filter options are different for each data format.

Table 11. PDF to AFP filter name and filter options

Field name (attribute name)	Filter name	Filter options
Filter (filters)	ps2afp.dll	[%filter-options] [-a <i>imagetype</i> ] [-c <i>transformclass</i> ] [-l <i>length</i> ] [-p <i>pagerange</i> ] [-r <i>resolution</i> ] [-t <i>outputtype</i> ] [-w <i>width</i> ] [-x <i>xmargin</i> ] [-y <i>ymargin</i> ] [-T]

The filter options mean:

#### **%filter-options**

Causes options that are specified in the **filter-options** job attribute to be passed to the transform.

You can type the **%filter-options** option in any position relative to the other filter options. If you specify filter options to the right of **%filter-options**, those options override the same options specified in the **filter-options** job attribute.

#### **-c transformclass**

Specifies the name of a transform class that is defined in the transform configuration file, **aopxfd.conf**. The name is case-sensitive. The job submitter can also specify this option in the **filter-options** job attribute.

-alprtwxyT

For a description of these options, see “ps2afp—Transform PostScript data to AFP data” on page 30.

## Steps for editing printer definitions for the PDF to AFP transform

To edit printer definitions, use either Infoprint Server ISPF panels or the Printer Inventory Definition Utility (PIDU) program. This section describes how to use the ISPF panels. For information about the PIDU program, see “Using the PIDU program to manage the Printer Inventory” in *z/OS Infoprint Server Operation and Administration*.

**Before you begin:** You must be authorized to edit the Printer Inventory. You must have UPDATE access to the AOP.ADMINISTRATOR profile in the RACF PRINTSRV class.

### Steps for editing printer definitions:

1. (Optional) Create a Processing component. If you need to specify the PDF to AFP transform in a large number of printer definitions, a component can simplify administration. If you need to change your transform filter in the future, you can make the change in your Processing component.

- 
2. On the Processing panel of either the printer definition or the component, select the **PDF** data format.

**Tip:** In PSF printer definitions, also select the **Line data**, **MO:DCA-P**, and **Text** data formats. PSF can print line data and MO:DCA-P data on AFP printers, and Infoprint Server automatically converts text data to line data.

- 
3. Next to the **PDF** data format, specify the **ps2afp.dll** filter and filter options in the **Filter** field. Type the absolute pathname if the filter is not in a directory named in the LIBPATH environment variable. For filter options, see “PDF to AFP transform filter” on page 96.

- 
4. In PSF printer definitions, do not select the **Resubmit for filtering** field.

- 
5. (Optional) In the **Fail on error** field, select whether you want the transform to fail when a transform warning or data stream error occurs during the transform. When a transform fails, the transform does not produce an output document.

The Infoprint Server **fail-on-transform-error** job attribute overrides this field.

If you do not select an option in this field and **fail-on-transform-error** is not specified, the AOP\_FAIL\_ON\_ERROR environment variable determines when the transform fails.

- 
6. (Optional) In the **Trailer error page** field, select the type of messages you want the transform to write on a page at the end of the AFP output (called the **trailer error page**).

The Infoprint Server **trailer-transform-error-page** job attribute overrides this value.

If you do not select an option in this field, the AOP\_TRAILER\_ERROR\_PAGE environment variable determines the type of messages the transform writes.

7. (Optional) If you created a Processing component, specify the name of the Processing component in the **Component name** field on the PSF printer definition panel. Do this in all printer definitions to which the transform applies.

After you include a Processing component, check the Processing panel in the printer definition to make sure the transform is specified correctly. You might need to remove (space over) any filters that are specified on the Processing panel of the printer definition itself. If any filters are specified in the printer definition, the filters specified in the component are not used.

8. (Optional) On the Allocation panel, you can specify the name of the form definition that PSF is to use when it prints the AFP image data that the transform creates.

## Example -- ISPF Processing panel for the PDF to AFP transform

This ISPF panel shows how to specify the PDF to AFP transform in a printer definition for a PSF printer. Only a portion of the Processing panel is shown.

```

                                Processing

Printer definition name . afp-printer
:
Supported data formats and associated filters:
Data format:  Filter:

/ Line data      _____ (extend)
/ MO:DCA-P      _____ (extend)
- PostScript    _____ (extend)
/ Text          _____ (extend)
- PCL           _____ (extend)
/ PDF           ps2afp.dll %filter-options -r 300 (extend)
- SAP           _____ (extend)
- XML           _____ (extend)
- Other         _____ (extend)

_ Resubmit for filtering

Transforms to AFP:
  Fail on error . . . . 2  1. No  2. Error  3. Warning
  Trailer error page. . 1  1. No  2. Error  3. Warning
:

```

Explanation of fields:

- The **PDF** data format is selected because the **ps2afp2.dll** filter can transform PDF documents to AFP format. The transform options are:
  - The **%filter-options** filter option causes the transform to use transform options specified in the **filter-options** job attribute.
  - The **-r** option causes the transform to format the output for a 300-pel resolution printer.
 Because the **-r** option is specified to the *right* of **%filter-options**, the transforms ignore the **-r** option specified in the **filter-options** job attribute.

- The **Line data** and **MO:DCA-P** data formats are selected because PSF can print these data formats on AFP printers.
- The **Text** data format is selected because Infoprint Server automatically converts text data to line data when processing data for PSF printers.
- In the **Fail on error** field, option **Error** is selected. If a data stream error occurs during the transform, the transform fails and does not create an output document.
- In the **Trailer error page** field, option **No** is selected. The transform does not write any warning or error messages to a trailer error page.

---

## Requesting the PostScript to AFP transform

This section describes how you can set up your printer definitions so that Infoprint Server automatically calls the PostScript to AFP transform when it processes PostScript documents.

### PostScript to AFP transform filter

In the printer definitions for AFP printers, you can specify the PostScript to AFP transform filter and associate it with the PostScript data format. (A filter is a program that modifies the input data before it is sent to the printer.) When you associate the transform filter with the PostScript data format, Infoprint Server automatically calls the PostScript to AFP transform when it processes a document with the PostScript data format.

Table 12 shows the filter name and filter options that you can specify in the **Filter** field of a printer definition.

**Tip:** The same **ps2afp.dll** filter transforms both PostScript and PDF documents to AFP format but the filter options are different for each data format.

Table 12. PostScript to AFP filter name and filter options

Field name (attribute name)	Filter name	Filter options
Filter (filters)	ps2afp.dll	[%filter-options] [-a <i>imagetype</i> ] [-c <i>transformclass</i> ] [-i <i>initializationfile</i> ] ... [-l <i>length</i> ] [-r <i>resolution</i> ] [-t <i>outputtype</i> ] [-w <i>width</i> ] [-x <i>xmargin</i> ] [-y <i>ymargin</i> ] [-T]

The filter options mean:

#### %filter-options

Causes options that are specified in the **filter-options** job attribute to be passed to the transform.

You can type the **%filter-options** option in any position relative to the other filter options. If you specify filter options to the right of **%filter-options**, those options override the same options specified in the **filter-options** job attribute.

#### -c *transformclass*

Specifies the name of a transform class that is defined in the transform configuration file, **aopxfd.conf**. The name is case-sensitive. The job submitter can also specify this option in the **filter-options** job attribute.

#### -ailrtwxyT

For a description of these options, see “ps2afp—Transform PostScript data to AFP data” on page 30.

## Steps for editing printer definitions for the PostScript to AFP transform

To edit printer definitions, use either Infoprint Server ISPF panels or the Printer Inventory Definition Utility (PIDU) program. This section describes how to use the ISPF panels. For information about the PIDU program, see “Using the PIDU program to manage the Printer Inventory” in *z/OS Infoprint Server Operation and Administration*.

**Before you begin:** You must be authorized to edit the Printer Inventory. You must have UPDATE access to the AOP.ADMINISTRATOR profile in the RACF PRINTSRV class.

### Steps for editing printer definitions:

1. (Optional) Create a Processing component. If you need to specify the PostScript to AFP transform in a large number of printer definitions, a component can simplify administration. If you need to change your transform filter in the future, you can make the change in your Processing component.

- 
2. On the Processing panel of either the printer definition or the component, select the **PostScript** data format.

**Tip:** In PSF printer definitions, also select the **Line data**, **MO:DCA-P**, and **Text** data formats. PSF can print line data and MO:DCA-P data on AFP printers, and Infoprint Server automatically converts text data to line data.

- 
3. Next to the **PostScript** data formats, specify the **ps2afp.dll** filter and filter options in the **Filter** field. Type the absolute pathname if the filter is not in a directory named in the LIBPATH environment variable. For filter options, see “PostScript to AFP transform filter” on page 99.

- 
4. In PSF printer definitions, do not select the **Resubmit for filtering** field.

- 
5. (Optional) In the **Fail on error** field, select whether you want the transform to fail when a transform warning or data stream error occurs during the transform. When a transform fails, the transform does not produce an output document.

The Infoprint Server **fail-on-transform-error** job attribute overrides this field. If you do not select an option in this field and **fail-on-transform-error** is not specified, the AOP\_FAIL\_ON\_ERROR environment variable determines when the transform fails.

- 
6. (Optional) In the **Trailer error page** field, select the type of messages you want the transform to write on a page at the end of the AFP output (called the **trailer error page**).

The Infoprint Server **trailer-transform-error-page** job attribute overrides this value.

If you do not select an option in this field, the AOP\_TRAILER\_ERROR\_PAGE environment variable determines the type of messages the transform writes.

7. (Optional) If you created a Processing component, specify the name of the Processing component in the **Component name** field on the PSF printer definition panel. Do this in all printer definitions to which the transform applies.

After you include a Processing component, check the Processing panel in the printer definition to make sure the transform is specified correctly. You might need to remove (space over) any filters that are specified on the Processing panel of the printer definition itself. If any filters are specified in the printer definition, the filters specified in the component are not used.

8. (Optional) On the Allocation panel, you can specify the name of the form definition that PSF is to use when it prints the AFP image data that the transform creates.

## Example -- ISPF Processing panel for the PostScript to AFP transform

This ISPF panel shows how to specify the PostScript to AFP transform in a printer definition for a PSF printer. Only a portion of the Processing panel is shown.

```

                                Processing

Printer definition name . afp-printer
:
Supported data formats and associated filters:
Data format:  Filter:

/ Line data          _____ (extend)
/ MO:DCA-P          _____ (extend)
/ PostScript ps2afp.dll %filter-options -r 300 _____ (extend)
/ Text              _____ (extend)
- PCL                _____ (extend)
- PDF                _____ (extend)
- SAP                _____ (extend)
- XML                _____ (extend)
- Other              _____ (extend)

_ Resubmit for filtering

Transforms to AFP:
  Fail on error . . . . 2  1. No  2. Error  3. Warning
  Trailer error page. . 1  1. No  2. Error  3. Warning
:

```

Explanation of fields:

- The **PostScript** data format is selected because the **ps2afp2.dll** filter can transform PostScript documents to AFP format. The transform options are:
  - The **%filter-options** filter option causes the transform to use transform options specified in the **filter-options** job attribute.
  - The **-r** option causes the transform to format the output for a 300-pel resolution printer.
 

Because the **-r** option is specified to the *right* of **%filter-options**, the transforms ignore the **-r** option specified in the **filter-options** job attribute.
- The **Line data** and **MO:DCA-P** data formats are selected because PSF can print these data formats on AFP printers.

- The **Text** data format is selected because Infoprint Server automatically converts text data to line data when processing data for PSF printers.
- In the **Fail on error** field, option **Error** is selected. If a data stream error occurs during the transform, the transform fails and does not create an output document.
- In the **Trailer error page** field, option **No** is selected. The transform does not write any warning or error messages to a trailer error page.

---

## Requesting the SAP to AFP transform

This section describes how you can set up your printer definitions so that Infoprint Server automatically calls the SAP to AFP transform when it processes SAP documents.

### SAP to AFP transform filter

In the printer definitions for AFP printers, you can specify the SAP to AFP transform filter and associate it with the PCL data format. (A filter is a program that modifies the input data before it is sent to the printer.) When you associate the transform filter with the SAP data format, Infoprint Server automatically calls the SAP to AFP transform when it processes a document with the SAP data format.

Table 13 shows the filter name and filter options that you can specify in the **Filter** field of a printer definition.

Table 13. SAP to AFP filter name and filter options

Field name (attribute name)	Filter name	Filter options
Filter (filters)	sap2afp.dll	[%filter-options] [-c <i>transformclass</i> ] [-r <i>resolution</i> ] [-s] [-T]

The filter options mean:

#### %filter-options

Causes options that are specified in the **filter-options** job attribute to be passed to the transform.

You can type the **%filter-options** option in any position relative to the other filter options. If you specify filter options to the right of **%filter-options**, those options override the same options specified in the **filter-options** job attribute.

#### -c *transformclass*

Specifies the name of a transform class that is defined in the transform configuration file, **aopxfd.conf**. The name is case-sensitive. The job submitter can also specify this option in the **filter-options** job attribute.

**-rsT** For a description of these options, see “sap2afp—Transform SAP OTF or ABAP data to AFP data” on page 38.

## Steps for editing printer definitions for the SAP to AFP transform

To edit printer definitions, use either Infoprint Server ISPF panels or the Printer Inventory Definition Utility (PIDU) program. This section describes how to use the

ISPF panels. For information about the PIDU program, see “Using the PIDU program to manage the Printer Inventory” in *z/OS Infoprint Server Operation and Administration*.

**Before you begin:** You must be authorized to edit the Printer Inventory. You must have UPDATE access to the AOP.ADMINISTRATOR profile in the RACF PRINTSRV class.

**Steps for editing printer definitions:**

1. (Optional) Create a Processing component. If you need to specify the SAP to AFP transform in a large number of printer definitions, a component can simplify administration. If you need to change your transform filter in the future, you can make the change in your Processing component.

- 
2. On the Processing panel of either the printer definition or the component, select the **SAP** data format.

**Tip:** In PSF printer definitions, also select the **Line data**, **MO:DCA-P**, and **Text** data formats. PSF can print line data and MO:DCA-P data on AFP printers, and Infoprint Server automatically converts text data to line data.

- 
3. Next to the **SAP** data format, specify the **sap2afp.dll** filter and filter options in the **Filter** field. Type the absolute pathname if the filter is not in a directory named in the LIBPATH environment variable. For filter options, see “SAP to AFP transform filter” on page 102.

- 
4. In PSF printer definitions, do not select the **Resubmit for filtering** field.

- 
5. (Optional) In the **Fail on error** field, select whether you want the transform to fail when a transform warning or data stream error occurs during the transform. When a transform fails, the transform does not produce an output document.

The Infoprint Server **fail-on-transform-error** job attribute overrides this field. If you do not select an option in this field and **fail-on-transform-error** is not specified, the AOP\_FAIL\_ON\_ERROR environment variable determines when the transform fails.

- 
6. (Optional) In the **Trailer error page** field, select the type of messages you want the transform to write on a page at the end of the AFP output (called the **trailer error page**).

The Infoprint Server **trailer-transform-error-page** job attribute overrides this value.

If you do not select an option in this field, the AOP\_TRAILER\_ERROR\_PAGE environment variable determines the type of messages the transform writes.

- 
7. (Optional) If you created a Processing component, specify the name of the Processing component in the **Component name** field on the PSF printer definition panel. Do this in all printer definitions to which the transform applies.

After you include a Processing component, check the Processing panel in the printer definition to make sure the transform is specified correctly. You might need to remove (space over) any filters that are specified on the Processing panel of the printer definition itself. If any filters are specified in the printer definition, the filters specified in the component are not used.

**Tip:** The SAP to AFP transform determines the appropriate form definition, page definition, and fonts to use from its own configuration files and overrides any form definition, page definition, and fonts specified on the Allocation panel or in job attributes.

## Example -- ISPF Processing panel for the SAP to AFP transform

This ISPF panel shows how to specify the SAP to AFP transform in printer definition for a PSF printer. Only a portion of the Processing panel is shown.

```

                                Processing
Printer definition name . afp-printer
:
Supported data formats and associated filters:
Data format: Filter:

/ Line data _____ (extend)
/ MO:DCA-P _____ (extend)
- PostScript _____ (extend)
/ Text _____ (extend)
- PCL _____ (extend)
- PDF _____ (extend)
/ SAP sap2afp.dll %filter-options -r 300 (extend)
- XML _____ (extend)
- Other _____ (extend)

_ Resubmit for filtering
Transforms to AFP:
Fail on error . . . . 2 1. No 2. Error 3. Warning
Trailer error page. . 1 1. No 2. Error 3. Warning
:

```

Explanation of fields:

- The **SAP** data format is selected because the **sap2afp2.dll** filter can transform SAP documents to AFP format. The transform options are:
  - The **%filter-options** filter option causes the transform to use transform options specified in the **filter-options** job attribute.
  - The **-r** option causes the transform to format the output for a 300-pel resolution printer.

Because the **-r** option is specified to the *right* of **%filter-options**, the transforms ignore the **-r** option specified in the **filter-options** job attribute.
- The **Line data** and **MO:DCA-P** data formats are selected because PSF can print these data formats on AFP printers.
- The **Text** data format is selected because Infoprint Server automatically converts text data to line data when processing data for PSF printers.
- In the **Fail on error** field, option **Error** is selected. If a data stream error occurs during the transform, the transform fails and does not create an output document.

|  
|

- In the **Trailer error page** field, option **No** is selected. The transform does not write any warning or error messages to a trailer error page.



---

## Chapter 5. Diagnosing errors

This chapter describes the diagnostic facilities that the transforms provide.

---

### Submitting APARs

Report any difficulties using the transforms to your IBM Support Center. If an APAR is required, the Support Center can tell you where to send the required diagnostic information.

When submitting an APAR, use the component ID **5655N6001**.

---

### Using error messages

The transforms write error messages to these locations:

- **Trailer error page:** The trailer error page is a page that the transforms add to the end of the AFP output when a warning or data stream error occurs during the transform. The trailer error page contains warning and error messages from the transform to help you diagnose problems.

To print AFP output without transform messages, you can suppress all messages on the trailer error page. Or, you can choose to suppress only transform warning messages. The transform always writes warning and error messages to the Infoprint Server common message log and the transform's **stderr** file so that you can find messages even if the transform does not write a trailer error page.

You can use these methods to suppress messages on a trailer error page:

- Specify the Infoprint Server **trailer-transform-error-page** job attribute with the print request.
- Set the **Trailer error page** field in the printer definition used to print the document.
- Set the **AOP\_TRAILER\_ERROR\_PAGE** environment variable in the Infoprint Server transform configuration file, **aopxfd.conf**.
- **Infoprint Server common message log:** The transforms write all warning and error messages to the Infoprint Server common message log if the common message log is enabled in Infoprint Server.
- **Transform stderr file:** The transform's **stderr** file is a file that Infoprint Server administrators can access. In general, the transforms write messages in both the **stderr** file and the Infoprint Server common message log.

For some error conditions, the PCL to AFP transform writes more detailed error messages to the transform's **stderr** file when tracing is turned on. If you have trouble diagnosing a problem, you can turn tracing on and look for additional messages in the **stderr** file.

---

### Finding the transform stderr file

You can find a transform's **stderr** file in the directory named *base-directory/xfd*, where *base-directory* is determined by the value of the **base-directory** attribute in the Infoprint Server configuration file, **aopd.conf**. The default base directory is named **/var/Printsrv**.

The **stderr** file-naming convention is:

<code>transform[_class].#.stderr</code>	
<code>transform</code>	Specifies the transform name, which is defined in the Infoprint Server Transform Manager configuration file, <b>aopxfd.conf</b> . For example, <b>pcl2afp</b> .
<code>class</code>	Specifies the transform class, which is specified in the <b>-c</b> option when the transform is called. Transform classes are defined in the Infoprint Server Transform Manager configuration file, <b>aopxfd.conf</b> .
<code>#</code>	A unique number that the transform assigns. This number is incremented each time a new transform is started.

**Tip:** To read the transform's **stderr** file, you must be a member of the AOPADMIN group. For information about how to establish security for Infoprint Server administrators, see *z/OS Infoprint Server Customization*.

---

## Running traces

This section describes how to run a trace of a transform. The service representative in the IBM Support Center might ask you to run a trace to aid in diagnosing a problem. If so, the representative will tell you how and where to send the trace information. You do not have to interpret the trace. Send it to your service representative.

### Tracing the transforms

This section describes how to run a trace of a transform. Tracing can slow performance considerably. Turn tracing on for only as long as necessary to capture the error.

**Tip:** For some error conditions, the PCL to AFP transform writes more detailed error messages to the transform's **stderr** file when tracing is turned on. If you have trouble diagnosing a problem, you can turn tracing on and look for additional messages in the **stderr** file.

To trace transforms, you can either specify the **-T** transform option or set the AOPTRACEON environment variable:

- Specify the **-T** option to trace a specific transform request, or to trace all transform requests for a specific printer.
- Set the AOPTRACEON environment variable to trace all transform requests, or to trace all transforms that use a transform class that you configure for tracing.

You can specify the **-T** option in these ways:

- On the **pcl2afp**, **pdf2afp**, **ps2afp** or **sap2afp** command.
- In the **filter-options** job attribute on a print command. The **lp** command, the Infoprint Port Monitor for Windows, and some other print commands let job submitters specify Infoprint Server job attributes.
- In the **Filter options** field in a printer definition in the Printer Inventory.

When you request a trace using either the **-T** option or the AOPTRACEON environment variable, the transform writes the trace in a file in the directory specified in the AOPTRACEDIR environment variable or to the default directory (`/var/Printsrv/trace`). One trace file can contain trace information for multiple print jobs because each instance of a transform appends trace information to the same trace file. The transform's **stderr** file contains the name of the trace file.

These environment variables in the Infoprint Server transform configuration file, **aopxfd.conf**, turn tracing on and specify where the trace is written:

#### **AOPTRACEON**

Set this variable to any value to turn tracing on. The transform traces all transform requests that use this transform class. Any value turns tracing on. To turn tracing off, do not specify this environment variable.

**Default:** Tracing is turned off.

**Example:** environment = {AOPTRACEON -> 1}

#### **AOPTRACEDIR**

Specify the full path name of the directory where the transform writes trace information. You can specify the same directory for different transform classes. The name of the trace file identifies the transform and transform class, and contains a timestamp.

This directory must already exist. If the directory does not exist, the transform writes trace information to the transform's **stderr** file. For information about how to find the **stderr** file, see "Finding the transform stderr file" on page 107.

**Default:** AOPTRACEDIR -> /var/Printsrv/trace

#### **Examples:**

```
environment = {AOPTRACEDIR -> /var/Printsrv/xfd}
environment = {AOPTRACEDIR -> .}
```

For an example of a transform entry in the transform configuration file that specifies these variables, see "Trace the transform" on page 66.

#### **Tip:**

Using **AOPTRACEDIR -> .** has these benefits and limitations:

- The trace is recorded in the transform's working directory. This keeps the trace closely associated with any other items that might be produced when the job runs (for example, a dump). Because the trace might contain sensitive information, this keeps the trace in a secure location.
- The trace is automatically cleaned up when you restart the Transform Manager.
- However, when you restart the Transform Manager, the transform's working directory and its contents are deleted. Be sure to look in all the active transform directories to find the trace that you are interested in.

#### **Examples of tracing transforms:**

1. To request a trace by specifying the **-T** option on a transform command:

```
pdf2afp -o outputfile -T myfile.pdf
```

2. To request a trace by specifying the **-T** option on a transform command when you use the AOPBATCH program:

```
//AOPBATCH JOB ...
//TRANSFRM EXEC PGM=AOPBATCH,PARM='/ps2afp -T -o //DD:OUTPUT DD:INPUT'
//INPUT DD DSN=HLQ.INPUT.PS,DISP=SHR
//OUTPUT DD DSN=HLQ.OUTPUT.AFP,DISP=(NEW,CATLG,DELETE),
// DCB=(RECFM=VBM,LRECL=32756,BLKSIZE=32760),SPACE=(CYL,(1,1))
//STDOUT DD SYSOUT=*
//STDERR DD SYSOUT=*
```

**Note:** To continue the PARM parameter:

- Extend the parameter to column 71. Do not code an apostrophe in column 71.
  - Code // in columns 1 and 2 of the following statement.
  - Continue the parameter in column 16 of the following statement even if this splits the parameter.
3. To request a trace by specifying the **-T** option on an **lp** command:  
`lp -d myprinter -o "filter-options='-T'" myfile.pdf`
  4. To request a trace by specifying the **-T** option in a printer definition:

```
Processing
```

```
Supported data formats and associated filters:
Data format:  Filter:
/ PostScript  ps2afp.dll %filter-options -T_____ (extend)
/ PCL         pcl2afp.dll %filter-options -T_____ (extend)
/ PDF         pdf2afpdll %filter-options -T_____ (extend)
/ SAP         sap2afpdll %filter-options -T_____ (extend)
```

5. To submit a transform request to a transform class that specifies the AOPTRACEON environment variable. If the administrator defined a transform class called "trace" in the Infoprint Server transform configuration file (aopxfd.conf), use these commands to submit a trace request to it.  
`pdf2afp -c trace -o myfile.afp myfile.pdf`  
`lp -o "filter-options='-c trace'" -d myprinter myfile.pdf`

---

## Chapter 6. Messages

This chapter describes the messages that the transforms produce.

For information about all the messages from Infoprint Server, including messages that are related to transforms, see *z/OS Infoprint Server Messages and Diagnosis*.

---

### Message format

The messages have this format:

**AOP***nnmnt*

**AOP** Identifies messages from Infoprint Server

*nnn* The message number

*t* One-character type code:

Type code	Meaning
E	An error occurred.
I	Information message.
W	A warning situation occurred.

*message\_text*

The text of the message.

---

### Messages

---

**AOP2061E** The document contains EBCDIC data.  
The SAP to AFP transform can only transform ASCII SAP data.

| **Explanation:** The SAP to AFP transform detected  
| EBCDIC data. The transform accepts only ASCII or  
| Unicode data.

**System action:** The request is not completed.

| **User response:** In the SAP R/3 output device, select  
| either SAPGOF (Generic Output Format) or SAPGOFU  
| (Unicode encoded data).

**System programmer response:** Not applicable.

**Problem determination:** Not applicable.

**Source:** Infoprint Transforms to AFP for z/OS

**Module:** Not applicable.

**Routing code:** Not applicable.

**Descriptor code:** Not applicable.

**Automation:** Not applicable.

---

**AOP2201E** The effective UID of this program must not be 0.

**Explanation:** The Infoprint Server Transform Manager

attempted to start a transform daemon. However, for security reasons, the Transform Manager requires that (1) the owner of the executable file for the transform *not* have a UID of 0 and (2) the set-user-ID flag for the file is turned on. The message contains the name of the executable file.

**System action:** The Infoprint Server Transform Manager does not start the transform daemon. The Transform Manager attempts to start other transform daemons configured in the transform configuration file, **aopx<sub>fd</sub>.conf**.

**User response:** Contact your system programmer.

**System programmer response:** Use the **ls** command to list the owner of the file and to verify that the set-user-ID flag is on:

```
ls -l /usr/lpp/Printsrv/bin/ps2afpd
```

Output from the **ls** command should look like this, assuming that the owning user name is NOBODY and that the owning group name is NOGROUP:

```
-rws----- 1 NOBODY NOGROUP ...
```

The lowercase letter **s** in the owner permissions section indicates that the set-user-ID flag is on and that the owner has permission to execute the file. Use the **id** command to determine the UID of the user.

If the user has a UID of 0, enter the z/OS UNIX **chown** command to change the owner of the file. For example, to change the owner of file **ps2afpd** to NOBODY, type:  
`chown NOBODY /usr/lpp/Printsrv/bin/ps2afpd`

If the set-user-ID flag is off, or if you entered the **chown** command, use the **chmod** command to turn on the set-user-ID flag. For example, to turn the flag on for file **ps2afpd**, type:

```
chmod u+s /usr/lpp/Printsrv/bin/ps2afpd
```

For more information, see “Customizing the PDF to AFP and PostScript to AFP transforms” on page 59.

**Problem determination:** Not applicable.

**Source:** Infoprint Transforms to AFP for z/OS

**Module:** Not applicable.

**Routing code:** Not applicable.

**Descriptor code:** Not applicable.

**Automation:** Not applicable.

---

**AOP2500W Font substitution information:** *date-time*

**Explanation:** The PDF to AFP or PostScript to AFP transform did not find one or more fonts that a document requested, so it substituted similar fonts. To determine the substitute fonts, the transform used a font-substitution algorithm that you cannot modify.

In the message text, *date-time* is the date and time the message was written.

The text that follows this message identifies the fonts that the document requested and the fonts that the transform substituted.

The AOP\_FONT\_SUBSTITUTION\_MESSAGES environment variable determines whether the transform writes this message when it substitutes fonts in a document if no other errors occurred.

**System action:** The document is transformed without error.

**User response:** None.

**System programmer response:** In most cases, the substitute font results in acceptable output and no response is necessary. However, if the output is not acceptable, you might be able to add the original font to the transform. For information, see “Adding fonts” on page 69.

If you added a font to the transform and the transform still substitutes another font, make sure that you specified the correct name of the font directory in the AOP\_RESOURCE\_PATH environment variable in the transform configuration file, **aopxfd.conf**. For information, see Appendix B, “Environment variables,” on page 131.

**Problem determination:** Not applicable.

**Source:** Infoprint Transforms to AFP for z/OS

**Module:** Not applicable.

**Routing code:** Not applicable.

**Descriptor code:** Not applicable.

**Automation:** Not applicable.

---

**AOP2501E The transform detected an error in the input datastream, or an error occurred while transforming the document. No output was produced.**

**Explanation:** A transform error occurred.

**System action:** The transform request was not completed. No output was produced.

**Operator response:** None.

**User response:** If there is an error in the input data stream to be transformed, correct the error. If the input data stream is correct, notify the system programmer that this error occurred. After the error is corrected, resubmit the transform request.

**System programmer response:** For information about the transform problem, see the accompanying messages from the transform. After you correct the problem, you might need to restart the Infoprint Server Transform Manager daemon.

If you do not want transform requests to fail when this type of error occurs, set the AOP\_FAIL\_ON\_ERROR -> no environment variable for the transform instance in the transform configuration file, **aopxfd.conf**. If AOP\_FAIL\_ON\_ERROR->no, the return code from the transform is 0. For information about how to edit the transform configuration file, see Chapter 3, “Customizing transforms,” on page 51.

**Problem determination:** Not applicable.

**Source:** Infoprint Transforms to AFP for z/OS

**Module:** Not applicable.

**Routing code:** Not applicable.

**Descriptor code:** Not applicable.

**Automation:** Not applicable.

---

**AOP2502I The transform attempted to convert the document to AFP format. The input data stream might not be valid. Diagnostic information from transform *transform* follows.**

**Explanation:** The information that follows this message is from the transform. You can use this information to diagnose the problem. In the message text, *transform* is the name of the transform in the format: *transform\_class.#*.

| **System action:** Processing continues if possible.

**User response:** Use the diagnostic information to correct any data stream errors.

**System programmer response:** If no data stream error is found, contact an IBM service representative.

**Problem determination:** Not applicable.

**Source:** Infoprint Transforms to AFP for z/OS

**Module:** Not applicable.

**Routing code:** Not applicable.

**Descriptor code:** Not applicable.

**Automation:** Not applicable.

---

**AOP2503I** The transform attempted to convert the document to AFP format. Trace information from transform *transform* follows.

**Explanation:** The diagnostic information that follows this message is from the transform. IBM can use this information to diagnose the transform problem. In the message text, *transform* is the name of the transform in the format: *transform\_class.#*.

**System action:** Processing continues if possible.

**User response:** Notify your system programmer.

**System programmer response:** If you cannot correct the error, contact an IBM service representative. Provide the diagnostic information to IBM.

**Problem determination:** Not applicable.

**Source:** Infoprint Transforms to AFP for z/OS

**Module:** Not applicable.

**Routing code:** Not applicable.

**Descriptor code:** Not applicable.

**Automation:** Not applicable.

---

**AOP2504E** The transform initialization failed. Diagnostic information from transform *transform* follows.

**Explanation:** The transform could not be initialized. In the message text, *transform* is the name of the transform in the format: *transform\_class.#*.

**System action:** The transform request was not completed.

**User response:** Notify your system programmer.

**System programmer response:** Contact an IBM service representative. Report the diagnostic information to IBM.

**Problem determination:** Not applicable.

**Source:** Infoprint Transforms to AFP for z/OS

**Module:** Not applicable.

**Routing code:** Not applicable.

**Descriptor code:** Not applicable.

**Automation:** Not applicable.

---

**AOP2505E** Not enough memory is available to transform the data stream. Increase the memory available to this transform in the Infoprint Server transform configuration file. Also, make sure the region size is large enough.

**Explanation:** The transform could not obtain enough memory to convert the data stream. The data stream might be large or complex.

**System action:** The transform request is not completed. No output is produced.

**User response:** Notify your system programmer. After the problem is corrected, resubmit the transform or print request.

**System programmer response:** Increase the amount of storage available to the transform:

- Increase the amount of storage in the Infoprint Server transform configuration file, **aopxfd.conf**. Specify up to 1024M in the **-m** option of the entry for this transform. For example: `start-command="ps2afpd -m 1024M"`
- Specify a region size that is at least 10M greater than the value in the **-m** option:
  - If you use the AOPSTART JCL procedure to start Infoprint Server, specify the region size in the REGION parameter of the EXEC statement.
  - If you issue the **aopstart** command from the z/OS UNIX command line during a TSO session, specify the region size in the SIZE option on the logon panel or logon procedure for the TSO user ID.
- Make sure the maximum address space size for Infoprint Server is at least 10M greater than the value in the **-m** option:
  - Check the MAXASSIZE value in the BPXPRMxx member of SYS1.PARMLIB. MAXASSIZE sets the system-wide maximum address space size. You can set MAXASSIZE dynamically with the SETOMVS command. You can check MAXASSIZE from the operator console with this Display command: `d omvs,0`
  - Check the RACF ASSIZEMAX value for the user ID that starts Infoprint Server. ASSIZEMAX overrides the MAXASSIZE value. You can increase the ASSIZEMAX value on the RACF ALTUSER command.
- If you have IEFUSI exits that limit region sizes, make sure the limits in the IEFUSI exits do not apply to OMVS. Enter one of these commands:
  - If you do not want any exits to apply to OMVS: `SETSMF SUBSYS(OMVS,NOEXITS)`

- If you need some exits to apply to OMVS:  
SETSMF SUBSYS(OMVS,EXITS(*exits*))

In the EXITS parameter, specify the exits to apply to OMVS, but do not specify IEFUSI.

For more information about the IEFUSI exit, see z/OS *MVS Installation Exits*.

**Problem determination:** Not applicable.

**Source:** Infoprint Transforms to AFP for z/OS

**Module:** Not applicable.

**Routing code:** Not applicable.

**Descriptor code:** Not applicable.

**Automation:** Not applicable.

---

**AOP2506W** The transform converted the first page of the input file to a page segment or overlay because no page number was specified in the -p option.

**Explanation:** The transform request specified the -t pagesegment or -t overlay option to convert the input file to an AFP page segment or overlay. The transform can create an AFP page segment or overlay for only one page in the input file. Because the transform request did not identify which page in the input file to use for the page segment or overlay, the transform used the first page.

**System action:** The transform completed successfully.

**User response:** If the transform did not create a page segment or overlay of the correct page, resubmit the request and specify the page in the transform -p option.

**System programmer response:** None.

**Problem determination:** Not applicable.

**Source:** Infoprint Transforms to AFP for z/OS

**Module:** Not applicable.

**Routing code:** Not applicable.

**Descriptor code:** Not applicable.

**Automation:** Not applicable.

---

## Chapter 7. Migrating to Infoprint Transforms to AFP V2.2

This chapter describes how to migrate to Infoprint Transforms V2.2 from one of these products:

- Infoprint Transforms to AFP Version 2 Release 1 (V2.1) for z/OS
- z/OS Infoprint Server Transforms Version 1 Release 1 (V1.1)

It describes the actions you need to take:

- When you migrate from V2.1 to V2.2
- When you migrate from V1.1 to V2.2
- To use the new functions introduced in V2.2
- To use the new functions introduced in V2.1

---

### Migrating from V2.1 to V2.2

Table 14 lists the tasks you might need to do when you migrate from Infoprint Transforms to AFP V2.1 to V2.2. Required tasks are required by all installations. Optional tasks are required only if the listed condition applies to your installation. The table also indicates whether you can do each task before you install V2.2.

*Table 14. Tasks for migrating from Infoprint Transforms V2.1 to V2.2*

Task	Condition	When to do the task	See page
Removing the PCL to AFP, PDF to AFP, and PostScript to AFP V2.1 resource directories	Required if you use the PCL, PDF, or PostScript to AFP transform	After installing V2.2	116
Changing the SAPGOF_E output device type	Required if you use the SAP to AFP transform and the SAP R/3 client uses the SAPGOF_E device type	Before installing V2.2	116
Configuring Infoprint Server for the SAP to AFP transform	Required if you use the SAP to AFP transform	After installing V2.2	117
Customizing SAP to AFP transform configuration files	Required if you use the SAP to AFP transform and you customized SAP transform configuration files	After installing V2.2	117
Customizing multibyte conversion tables for the SAP to AFP transform	Required if you use the SAP to AFP transform and you installed custom multibyte conversion tables	After installing V2.2	118
Removing the SAP to AFP V2.1 default resource directory	Required if you use the SAP to AFP transform	After installing V2.2	119
Removing the -p option from the sap2afp transform command and filter	Required if you use the <b>sap2afp</b> command with the <b>-p</b> option to print a page range	After installing V2.2	119

Table 14. Tasks for migrating from Infoprint Transforms V2.1 to V2.2 (continued)

Task	Condition	When to do the task	See page
Replacing the -t option on the sap2afp transform command and filter	Required if you use the <b>sap2afp</b> command with the <b>-t</b> option to trace the transform	After installing V2.2	119

## Removing the PCL to AFP, PDF to AFP, and PostScript to AFP V2.1 resource directories

In V2.2, PCL to AFP, PDF to AFP, and PostScript to AFP transform resources are installed in different directories. Table 15 lists the resource directories.

Table 15. PCL, PDF, and PostScript transform resource directories in V2.1 and V2.2

Transform	V2.1 resource directory	V2.2 resource directories
PCL to AFP	/usr/lpp/Printsrv/pcl2afpv2	/usr/lpp/Printsrv/pcl2afpv2.2/fonts
PDF to AFP	/usr/lpp/Printsrv/ps2afpv2	/usr/lpp/Printsrv/ps2afpv2.2/lib /usr/lpp/Printsrv/ps2afpv2.2/Resource/Init /usr/lpp/Printsrv/ps2afpv2.2/Resource
PostScript to AFP	/usr/lpp/Printsrv/ps2afpv2	/usr/lpp/Printsrv/ps2afpv2.2/lib /usr/lpp/Printsrv/ps2afpv2.2/Resource/Init /usr/lpp/Printsrv/ps2afpv2.2/Resource

To remove the PCL to AFP, PDF to AFP, and PostScript to AFP V2.1 resource directories:

1. If the AOP\_RESOURCE\_PATH environment variable in the transform configuration file, **aopxfd.conf**, specifies the name of a V2.1 resource directory, delete the directory name. You do not need to specify the default resource directory in AOP\_RESOURCE\_PATH because the transforms always look for resources in the default directory.

2. Restart the Infoprint Server Transform Manager to pick up the changes to the transform configuration file.

For example, use the AOPSTOP and AOPSTART JCL procedures:

```
START AOPSTOP,OPTIONS='-d xfd'
START AOPSTART
```

3. Delete the V2.1 resource directories because the install process does not delete them (the install usually deletes the files in the directories):

```
su
rm -r /usr/lpp/Printsrv/pcl2afpv2
rm -r /usr/lpp/Printsrv/ps2afpv2
```

## Changing the SAPGOF\_E output device type

In V2.1, the SAP to AFP transform can transform ASCII or EBCDIC data streams. In V2.2, the SAP to AFP transform can only transform ASCII data streams. Therefore, in V2.2, the SAP to AFP transform does not support the SAPGOF\_E output device type.

In the SAP R/3 client, change the output device type to one of these:

- SAPGOF (ASCII)
- SAPGOFU (Unicode UTF-16 big-endian)

## Configuring Infoprint Server for the SAP to AFP transform

In V2.2, Infoprint Server manages the SAP to AFP transform. Therefore, you must add at least one entry for the SAP to AFP transform to the Infoprint Server transform configuration file, **aopxfd.conf**.

To configure Infoprint Server to manage the SAP to AFP transform:

1. Edit the Infoprint Server transform configuration file, **aopxfd.conf**. For information, see “Creating an entry in the transform configuration file” on page 71.

2. Restart the Infoprint Server Transform Manager to pick up the changes.

For example, use the AOPSTOP and AOPSTART JCL procedures:

```
START AOPSTOP,OPTIONS='-d xfd'
START AOPSTART
```

**Tip:** After you restart the Infoprint Server Transform Manager, check for error messages in the transform’s **stderr** file. If you find any error messages, fix the errors and restart the Infoprint Server Transform Manager. For information about how to find the transform message logs, see “Finding the transform stderr file” on page 107.

## Customizing SAP to AFP transform configuration files

In V2.1, the SAP to AFP transform configuration files are all in EBCDIC representation. In V2.2, the transform configuration files are all in ASCII representation. In addition, in V2.2, some transform configuration files have other changes. Table 16 lists the changes to the configuration files.

Table 16. Changes to V2.1 SAP to AFP configuration files in V2.2

Configuration file	Description	V2.1	Change in V2.2
barcode.tab	Maps SAP OTF bar code names to Bar Code Object Content Architecture (BCOCA) bar codes.	<ul style="list-style-type: none"> <li>• EBCDIC representation</li> </ul>	<ul style="list-style-type: none"> <li>• ASCII representation</li> <li>• Additional bar codes</li> </ul>
defcp.tab	Maps single-byte ASCII code points in ABAP data streams to EBCDIC code points.	<ul style="list-style-type: none"> <li>• EBCDIC representation</li> <li>• Hexadecimal code-point mappings</li> </ul>	<ul style="list-style-type: none"> <li>• ASCII representation</li> <li>• Decimal code-point mappings</li> </ul>
defcp.tab.japan	Maps single-byte ASCII code points in ABAP data streams to EBCDIC code points.	<ul style="list-style-type: none"> <li>• EBCDIC representation</li> <li>• Hexadecimal code-point mappings</li> </ul>	<ul style="list-style-type: none"> <li>• ASCII representation</li> <li>• Decimal code-point mappings</li> </ul>
fonts.tab	Maps the fonts used in the OTF data stream to AFP fonts.	<ul style="list-style-type: none"> <li>• EBCDIC representation</li> </ul>	<ul style="list-style-type: none"> <li>• ASCII representation</li> <li>• Additional font families</li> </ul>
image.tab image.tab.xxx	Define values used to print image data.	<ul style="list-style-type: none"> <li>• EBCDIC representation</li> </ul>	<ul style="list-style-type: none"> <li>• ASCII representation</li> </ul>

Table 16. Changes to V2.1 SAP to AFP configuration files in V2.2 (continued)

Configuration file	Description	V2.1	Change in V2.2
pagedef.tab	For SAP R/3 Format names, specifies the page definition, form definition, and ABAP coded fonts.	<ul style="list-style-type: none"> <li>EBCDIC representation</li> </ul>	<ul style="list-style-type: none"> <li>ASCII representation</li> </ul>
pagedef.tab.japan	For SAP R/3 Format names, specifies the page definition, form definition, and ABAP coded fonts.	<ul style="list-style-type: none"> <li>EBCDIC representation</li> </ul>	<ul style="list-style-type: none"> <li>ASCII representation</li> <li>Additional paper sizes</li> </ul>
00000000.tab 40010000.tab 40040000.tab 11000000.tab	Map SAP code pages to AFP code pages.	<ul style="list-style-type: none"> <li>EBCDIC representation</li> <li>Hexadecimal code-point mappings</li> </ul>	<ul style="list-style-type: none"> <li>ASCII representation</li> <li>Decimal code-point mappings</li> </ul>
80000000.tab 83000000.tab 84000000.tab 85000000.tab 86000000.tab	Map SAP code pages to AFP code pages.	<ul style="list-style-type: none"> <li>EBCDIC representation</li> </ul>	<ul style="list-style-type: none"> <li>ASCII representation</li> <li>ICU conversion files</li> </ul>
01200000.tab 11000000.tab.japan	Map SAP code pages to AFP code pages.		Deleted

To customize SAP to AFP transform configuration files:

- If you have customized any of these configuration files in V2.1, convert the files to ASCII:
  - image.tab
  - image.tab.xxx
  - pagedef.tab
  - barcode.tab
  - fonts.tab
  - pagedef.tab.japan
- If you have customized these transform configuration files, copy the V2.2 configuration files to your SAP to AFP resource directory and edit them to make the same changes to the files. After you edit them, convert the files to ASCII:
  - defcp.tab
  - defcp.tab.japan
  - xxxx0000.tab

For information about how to edit the V2.2 transform configuration files, see “Customizing SAP to AFP configuration files” on page 76.

**Note:** In V2.2, you can specify the AOP\_SAP2AFP\_RESOURCES environment variable in the SAP to AFP entry in the transform configuration file, **aopxfd.conf** or in the AOPSTART EXEC. The **aopxfd.conf** file takes precedence over the AOPSTART EXEC.

## Customizing multibyte conversion tables for the SAP to AFP transform

In V2.2, the SAP to AFP transform uses different conversion tables for multibyte fonts. If you customized the multibyte conversion tables for the V2.1 SAP to AFP

transform, you need to customize the V2.2 multibyte conversion tables. For information, see “Customizing multibyte conversion tables” on page 90.

## Removing the SAP to AFP V2.1 default resource directory

In V2.2, the resources that the SAP to AFP transform uses are installed in a different default resource directory. Table 17 lists the resource directories.

Table 17. SAP transform resource directories in V2.1 and V2.2

Transform	V2.1 resource directory	V2.2 resource directory
SAP to AFP	/usr/lpp/Printsrv/sap2afp	/usr/lpp/Printsrv/sap2afpv2.2/res

To remove the SAP to AFP V2.1 default resource directory:

1. If the AOP\_SAP2AFP\_RESOURCES environment variable in the AOPSTART EXEC specifies the name of the V2.1 default resource directory, delete the environment variable. It is not necessary to specify this environment variable if the SAP to AFP resources are in the default resource directory.

---
2. Delete the V2.1 default resource directory because the install process does not delete it:  

```
su  
rm -r /usr/lpp/Printsrv/sap2afp
```

**Tip:** To use the **su** command, you must be permitted to the BPX.SUPERUSER profile in the FACILITY class in RACF.

## Removing the -p option from the sap2afp transform command and filter

In V2.1, the SAP to AFP transform does not let you specify which pages to include in the AFP output in the **-p** command option and filter option.

To remove the **-p** option:

1. On the **sap2afp** command, remove the **-p** option.

---
2. On the Processing panel of your printer definitions, in the **Filter** field for the **SAP** data format, remove the **-p** option if specified.

---

## Replacing the -t option on the sap2afp transform command and filter

In V2.1, to trace the SAP to AFP transform, you specify the **-t** option. In V2.2, to trace the transform, you can specify the **-T** option or the AOPTRACEON environment variable.

To replace the **-t** option:

1. On the **sap2afp** command, change the **-t** option to **-T**.

---
2. On the Processing panel of your printer definitions, in the **Filter** field next to the **SAP** data format, change the **-t** option to **-T**.

- 
3. For information about how to use the AOPTRACEON environment variable, see “Tracing the transforms” on page 108.
- 

## Migrating from V1.1 to V2.2

Table 18 lists the tasks you might need to do when you migrate from z/OS Infoprint Server Transforms to AFP V1.1 to Infoprint Transforms to AFP V2.1 for z/OS. Required tasks are required by all installations. Optional tasks are required only if the listed condition applies to your installation. Table 18 also indicates whether you can do each task before you install V2.2.

**Note:** In addition to these migration tasks, if you use the SAP to AFP transform, you must do the migration actions described in “Migrating from V2.1 to V2.2” on page 115.

*Table 18. Tasks for migrating from Infoprint Server Transforms to AFP V1.1*

Task	Condition	When to do the task	See page
Setting up security for the PDF to AFP and PostScript to AFP transform	Required	After installing V2.2	120
Removing the PCL to AFP, PDF to AFP, and PostScript to AFP V1.1 resource directories	Required	After installing V2.2	121
Transforming selected pages	Optional: To transform pages	Before installing V2.2	121
Adding fonts to the PDF to AFP and PostScript to AFP transform	Optional: To add fonts	After installing V2.2	122
Removing environment variables for the PDF to AFP transform	Optional: To improve performance and clean up variables	After installing V2.2	122
Creating full-page AFP images	Optional: To create full-page AFP images	Before installing V2.2	123

## Setting up security for the PDF to AFP and PostScript to AFP transform

After you install V2.2 of the transform, you must set up security for the PDF to AFP and the PostScript to AFP transform. Security checking done in the transform requires that the user identifier (UID) of the executable file for the transform, **ps2afpd**, *not* be 0 (zero). Also, the set-user-ID flag for the file must be turned on.

When it is installed, file **ps2afpd** has a UID of 0. The new owner must have a UID that is *not* 0 and *not* the default UID.

To set up security, follow the steps in “Setting up security” on page 67.

## Removing the PCL to AFP, PDF to AFP, and PostScript to AFP V1.1 resource directories

In V2.2, PCL to AFP, PDF to AFP, and PostScript to AFP transform resources are installed in different directories. Table 19 lists the resource directories.

Table 19. PCL, PDF, and PostScript transform resource directories in V1.1 and V2.2

Transform	V1.1 resource directory	V2.2 resource directories
PCL to AFP	<code>/usr/lpp/Printsrv/pcl2afp</code>	<code>/usr/lpp/Printsrv/pcl2afpv2.2/fonts</code>
PDF to AFP	<code>/usr/lpp/Printsrv/ps2afp</code>	<code>/usr/lpp/Printsrv/ps2afpv2.2/lib</code> <code>/usr/lpp/Printsrv/ps2afpv2.2/Resource/Init</code> <code>/usr/lpp/Printsrv/ps2afpv2.2/Resource</code>
PostScript to AFP	<code>/usr/lpp/Printsrv/ps2afp</code>	<code>/usr/lpp/Printsrv/ps2afpv2.2/lib</code> <code>/usr/lpp/Printsrv/ps2afpv2.2/Resource/Init</code> <code>/usr/lpp/Printsrv/ps2afpv2.2/Resource</code>

To remove the PCL to AFP, PDF to AFP, and PostScript to AFP V1.1 resource directories:

1. If the `AOP_RESOURCE_PATH` environment variable in the transform configuration file, `aopxfd.conf`, specifies the name of a V1.1 resource directory, delete the directory name. You do not need to specify the default resource directory in `AOP_RESOURCE_PATH` because the transforms always look for resources in the default directory.

---

```
START AOPSTOP,OPTIONS='-d xfd'
```

```
START AOPSTART
```
2. Restart the Infoprint Server Transform Manager to pick up the changes to the transform configuration file.  
For example, use the `AOPSTOP` and `AOPSTART` JCL procedures:

---

```
su
```

```
rm -r /usr/lpp/Printsrv/pcl2afp
```

```
rm -r /usr/lpp/Printsrv/ps2afp
```
3. Delete the V1.1 directories because the install process does not delete them (the install usually deletes the files in the directories):

---

```
su
```

```
rm -r /usr/lpp/Printsrv/pcl2afp
```

```
rm -r /usr/lpp/Printsrv/ps2afp
```

## Transforming selected pages

In V1.1, the transforms to AFP let you specify which pages to include in the AFP output. You can specify an individual page number or a range of pages (for example, pages 1 through 10).

In V2.2:

- The PCL to AFP and the PDF to AFP transforms let you specify only one page or range of pages. You can specify the `-p pagerange` option only one time. If you specify `-p` multiple times, the transform uses only the last option.  
In addition, you cannot specify the `odd` and `even` values in the `-p` option.
- The PostScript to AFP transform does not let you specify pages at all. You cannot specify the `-p pagerange` and `-g pagerange` options.

To change how you specify pages:

1. On the **pcl2afp** and **pdf2afp** commands, remove multiple instances of the **-p** option. Remove the **-p** option if it specifies the **odd** or **even** value.

---
2. On the **ps2afp** command, remove the **-p** and **-g** options.

---
3. On the Processing panel of your printer definitions, make these changes to the **Filter** field:
  - Next to the **PCL** and **PDF** data formats, remove multiple instances of the **-p** option. Remove **-p** options that specify the **odd** or **even** value.
  - Next to the **PostScript** data format, remove the **-p** and **-g** options.

---

## Adding fonts to the PDF to AFP and PostScript to AFP transform

In V2.2, the PDF to AFP and the PostScript to AFP transforms provide different fonts than in V1.1. If your PDF and PostScript documents use fonts that the transform does not provide in V2.2 and that are not embedded in the PDF or PostScript documents, you can add these fonts to the transform.

You can add the same fonts as you added in V1.1. However, the way you add fonts in V2.2 is different from V1.1. So, if you added fonts in V1.1, you must add them again in V2.2 after you install the new transforms.

These differences exist in V2.2:

- If the file name for the font is not exactly the same as the font name in the PDF or PostScript document, you must specify the file name in the **Fontmap** file.
- The transform does not use the **preload.ps** file.

To add fonts:

1. Review the fonts that are provided with the transform to see which fonts you need to add, if any. For information, see “PDF to AFP and PostScript to AFP transform fonts” on page 133.

---
2. If you need to add fonts, follow the steps in “Adding fonts” on page 69.

---

## Removing environment variables for the PDF to AFP transform

In V2.2, the PDF to AFP transform:

- Ignores the **AOP\_BATCH\_PAGE\_SIZE** environment variable. Therefore, you should remove this environment variable.
- Specifies LE run-time options that are suitable for the transform. Therefore, if you have specified the **\_CEE\_RUNOPTS** environment variable in V1.1, remove it unless the default run-time options that the transform sets in V2.1 are not suitable for your installation. For information, see “Changing Language Environment run-time options” on page 65.

You can remove these environment variables from the transform configuration file (**aopxfd.conf**) after you install V2.1 transforms.

To remove the environment variables:

1. Remove the environment variables from all transform entries in the transform configuration file, `aopxfd.conf`.

2. Restart the Infoprint Server Transform Manager to pick up the changes. For example, use the AOPSTOP and AOPSTART JCL procedures:

```
START AOPSTOP,OPTIONS='-d xfd'
START AOPSTART
```

## Creating full-page AFP images

The V1.1 PCL to AFP, PostScript to AFP, and PDF to AFP transforms always create full-page AFP images. To create full-page AFP images in V2.2, you must specify the `AOP_TRIM=no` environment variable. For more information, see the description of the `AOP_TRIM` environment variable in Chapter 3, “Customizing transforms,” on page 51.

## Using new functions introduced in V2.2

Table 20 lists the customization tasks that you must do to use new functions introduced in Infoprint Transforms to AFP V2.2 and whether you can do each task before or after you install V2.2. These tasks are optional. Do them only if you want to use the new functions.

Table 20. Tasks required to use new functions in V2.2

Task	Condition	When to do the task	See page
Creating AFP records larger than 8K in the SAP to AFP transform	Optional: To improve performance	After installing V2.2	124
Stopping the transform	Optional: To stop processing when warnings occur	After installing V2.2	124
Suppressing messages on the trailer error page	Optional: To suppress transform messages from the AFP output	After installing V2.2	125
Using MVS return codes	Optional: To receive MVS return codes (0, 4, 8) from the transform	Before installing V2.2	125
Transforming SAP R/3 files with non-Latin or Unicode character sets	Optional: To transform SAP files with non-Latin character sets	After installing V2.2	126
Resizing fonts for printing on InfoPrint 6400 printers	Optional: To resize fonts when printing on InfoPrint 6400 printers	After installing V2.2	126

## Creating AFP records larger than 8K in the SAP to AFP transform

In V2.2, the SAP to AFP transform can create AFP records with a length up to 32 kilobytes. The default record length is 8K. However, a larger record length might improve performance. In V2.1, the SAP to AFP transform always creates 8K records.

To create records larger than 8K:

1. Specify the record size in the AOP\_RECLEN environment variable in the transform configuration file, **aopxfd.conf**. For example, to create 32K byte records specify:  
environment = {AOP\_RECLEN -> 32}
2. Restart the Infoprint Server Transform Manager to pick up the changes to the configuration file.

For example, use the AOPSTOP and AOPSTART JCL procedures:

```
START AOPSTOP,OPTIONS='-d xfd'  
START AOPSTART
```

---

## Stopping the transform

In V2.2, you can tell the PCL to AFP, PDF to AFP, PostScript to AFP, and SAP to AFP transforms to fail when a warning or data stream error occurs during the transform. When the transform fails, no output document is created. By default, the transforms continue processing when warning and data stream errors occur.

In V2.2, you can tell the transforms when to fail by setting a new field in printer definitions, by specifying a new job attribute, and by setting new values in the AOP\_FAIL\_ON\_ERROR environment variable.

To stop the transform when a warning or error occurs, do one of these:

1. Specify the AOP\_FAIL\_ON\_ERROR environment variable:
    - a. Add the AOP\_FAIL\_ON\_ERROR environment variable in one or more transform entries in the Infoprint Server transform configuration file, **aopxfd.conf**. Specify one of these:  
environment = {AOP\_FAIL\_ON\_ERROR -> warning}  
environment = {AOP\_FAIL\_ON\_ERROR -> error}
    - b. Restart the Infoprint Server Transform Manager to pick up the changes.  
For example, use the AOPSTOP and AOPSTART JCL procedures:  
START AOPSTOP,OPTIONS='-d xfd'  
START AOPSTART
- 

For information about the environment variable, see Chapter 3, "Customizing transforms," on page 51.

2. Specify the **Fail on error** field in the Processing section or Processing component of the printer definitions in the Infoprint Server Printer Inventory. For information, see Chapter 4, "Administering transforms," on page 93.
3. When you submit a print request, specify the Infoprint Server **fail-on-transform-error** job attribute.

For information about job attributes, see *z/OS Infoprint Server User's Guide*.

## Suppressing messages on the trailer error page

In V2.2, you can suppress warning or error messages on the **trailer error page**, a page that the transform can add to the end of the AFP output. By default, the transforms write warning and data stream error messages on a trailer error page.

To suppress messages on the trailer error page, do one of these:

1. Specify the `AOP_TRAILER_ERROR_PAGE` environment variable:
  - a. Add the `AOP_TRAILER_ERROR_PAGE` environment variable in one or more transform entries in the Infoprint Server transform configuration file, **aopxfd.conf**. Specify one of these environment variables:

```
environment = {AOP_TRAILER_ERROR_PAGE -> error}  
environment = {AOP_TRAILER_ERROR_PAGE -> no}
```

- b. Restart the Infoprint Server Transform Manager to pick up the changes.

For example, use the AOPSTOP and AOPSTART JCL procedures:

```
START AOPSTOP,OPTIONS='-d xfd'  
START AOPSTART
```

---

For information about the environment variable, see Chapter 3, “Customizing transforms,” on page 51.

2. Specify the **Trailer error page** field in the Processing section or Processing component of the printer definitions in the Infoprint Server Printer Inventory. For information about the field, see Chapter 4, “Administering transforms,” on page 93.
3. When you submit a print request, specify the Infoprint Server **trailer-transform-error-page** job attribute. For information about the job attribute, see *z/OS Infoprint Server User's Guide*.

## Using MVS return codes

In V2.2, the transforms can return MVS return codes (0, 4, 8) instead of UNIX exit values (0, 1). MVS return codes let you determine whether a warning or error occurred during the transform. MVS return codes are useful when you use the AOPBATCH JCL procedure to run a transform and want a subsequent step in the job to run only if the transform step was successful.

To use MVS return codes:

1. In the AOPBATCH procedure, specify the `AOP_MVS_RETURN_CODES` environment variable. For an AOPBATCH example, see “Transform and print data sets only if the transform is successful” on page 45.
2. On the z/OS UNIX command line, specify the `AOP_MVS_RETURN_CODES` environment variable before the transform command. For command examples, see
  - “Examples -- pcl2afp” on page 20
  - “Examples -- pdf2afp” on page 28
  - “Examples -- ps2afp” on page 36

- “Examples -- sap2afp” on page 40

For information about the environment variable, see “AOP\_MVS\_RETURN\_CODES environment variable” on page 48.

**Tip:** In V2.1 and V1, the transforms ignore the AOP\_MVS\_RETURN\_CODES environment variable. Therefore, you can specify the environment variable before you install V2.2.

## Transforming SAP R/3 files with non-Latin or Unicode character sets

In V2.2, the SAP to AFP transform lets you transform SAP R/3 files that use these non-Latin character sets: Cyrillic, Japanese, Korean, Simplified Chinese, Traditional Chinese, and Unicode. For information about how to configure the SAP to AFP transform to use non-Latin character sets, see “userenv configuration file” on page 90.

## Resizing fonts for printing on InfoPrint 6400 printers

In V2.2, the SAP to AFP transform lets you resize fonts for printing on InfoPrint 6400 printers. For information about how to resize fonts, see “6400fonts.tab configuration file” on page 88.

---

## Using new functions introduced in V2.1

Table 21 lists the tasks you must do to use new functions introduced in Infoprint Transforms to AFP V2.1 for z/OS and whether you can do each task before or after you install V2.2. These tasks are optional. Do them only if you want to use the new functions.

*Table 21. Tasks required to use new functions in V2.1*

Task	Condition	When to do the task	See page
Creating AFP records larger than 8K in the PCL to AFP, PDF to AFP and PostScript to AFP transforms	Optional: To improve performance	Before installing V2.2	126
Tracing transforms	Optional: To trace transforms	After installing V2.2	127
Stopping processing on error	Optional: To stop processing when errors occur	Before installing V2.2	127
Disabling font-substitution messages	Optional: To disable font-substitution messages	Before installing V2.2	127

## Creating AFP records larger than 8K in the PCL to AFP, PDF to AFP and PostScript to AFP transforms

In V2.1, the PCL to AFP, PDF to AFP, and PostScript to AFP transforms can create AFP records with a length up to 32 kilobytes. The default record length is 8K. However, a larger record length might improve performance. In V1.1, the transforms always create 8K records.

To create records larger than 8K:

1. Specify the record size in the AOP\_RECLEN environment variable in the transform configuration file, **aopxfd.conf**. For example, to create 32K byte records specify:

```
environment = {AOP_RECLEN -> 32}
```

---

2. Restart the Infoprint Server Transform Manager to pick up the changes to the configuration file. For example, use the AOPSTOP and AOPSTART JCL procedures:

```
START AOPSTOP,OPTIONS='-d xfd'  
START AOPSTART
```

---

**Tip:** In V1.1, the transforms ignore this environment variable. Therefore, you can make this change before you install V2.2.

## Tracing transforms

In V2.1, you can trace the PCL to AFP, PDF to AFP, and PostScript to AFP transforms. In V1.1, you cannot trace these transforms.

To trace a transform, you can specify the **-T** transform option or the AOPTRACEON environment variable. The AOPTRACEDIR environment variable specifies the directory where the transforms write the trace file. For information, see “Tracing the transforms” on page 108.

## Stopping processing on error

In V2.1, the PCL to AFP, PDF to AFP, and PostScript to AFP transforms let you control whether the transform stops processing when an error occurs during the transform. By default, the transform continues processing when errors occur.

To enable the transform to stop processing on error:

1. Add the AOP\_FAIL\_ON\_ERROR environment variable in one or more transform entries in the transform configuration file, **aopxfd.conf**.
- 

2. Restart the Infoprint Server Transform Manager to pick up the changes. For example, use the AOPSTOP and AOPSTART JCL procedures:

```
START AOPSTOP,OPTIONS='-d xfd'  
START AOPSTART
```

---

**Tip:** In V1.1, the transforms ignore this environment variable. Therefore, you can make this change before you install V2.2.

## Disabling font-substitution messages

In V2.1, the PDF to AFP, and PostScript to AFP transforms let you control whether the transform writes a message (AOP2500W) in the transform’s **stderr** file when it substitutes fonts in a document. By default, the PDF to AFP, and PostScript to AFP transforms write font-substitution messages.

**Note:** The PCL to AFP transform does not write any font-substitution messages and does not support the AOP\_FONT\_SUBSTITUTION\_MESSAGES environment variable.

To disable font-substitution messages:

1. Add the AOP\_FONT\_SUBSTITUTION\_MESSAGES environment variable in all transform entries in the transform configuration file, **aopxfd.conf**. Specify:  
environment = {AOP\_FONT\_SUBSTITUTION\_MESSAGES -> no}
- 

2. Restart the Infoprint Server Transform Manager to pick up the changes. For example, use the AOPSTOP and AOPSTART JCL procedures:

```
START AOPSTOP,OPTIONS='-d xfd'  
START AOPSTART
```

---

**Tip:** In V1.1, the transforms ignore this environment variable. Therefore, you can make this change before you install V2.2.

---

## Appendix A. Accessibility

Publications for this product are offered in Adobe Portable Document Format (PDF) and should be compliant with accessibility standards. If you experience difficulties when using PDF files, you may view the information through the z/OS Internet Library Web site or the z/OS Information Center. If you continue to experience problems, send an e-mail to [mhvrcfs@us.ibm.com](mailto:mhvrcfs@us.ibm.com) or write to:

IBM Corporation  
Attention: MHVRCFS Reader Comments  
Department H6MA, Building 707  
2455 South Road  
Poughkeepsie, NY 12601-5400  
U.S.A.

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use software products successfully. The major accessibility features in z/OS enable users to:

- Use assistive technologies such as screen readers and screen magnifier software
- Operate specific or equivalent features using only the keyboard
- Customize display attributes such as color, contrast, and font size

---

### Using assistive technologies

Assistive technology products, such as screen readers, function with the user interfaces found in z/OS. Consult the assistive technology documentation for specific information when using such products to access z/OS interfaces.

---

### Keyboard navigation of the user interface

Users can access z/OS user interfaces using TSO/E or ISPF. Refer to *z/OS TSO/E Primer*, *z/OS TSO/E User's Guide*, and *z/OS ISPF User's Guide Vol I* for information about accessing TSO/E and ISPF interfaces. These guides describe how to use TSO/E and ISPF, including the use of keyboard shortcuts or function keys (PF keys). Each guide includes the default settings for the PF keys and explains how to modify their functions.

---

### z/OS information

z/OS information is accessible using screen readers with the BookServer or Library Server versions of z/OS books in the Internet library at:

<http://www.ibm.com/systems/z/os/zos/bkserv/>



## Appendix B. Environment variables

Table 22 lists all the environment variables the transforms use and indicates which transforms support the variable. For information about these environment variables, see:

- “Environment variables for the PCL to AFP transform” on page 53
- “Environment variables for the PDF to AFP and PostScript to AFP transforms” on page 62
- “Environment variables for the SAP to AFP transform” on page 73

Table 22. Environment variables the transforms support

Environment variable	PCL to AFP transform	PDF to AFP transform	PostScript to AFP transform	SAP to AFP transform
_BPX_JOBNAME	Yes	Yes	Yes	Yes
_CEE_DMPTARG	Yes	Yes	Yes	Yes
AOP_FAIL_ON_ERROR	Yes	Yes	Yes	Yes
AOP_FONT_SUBSTITUTION_MESSAGES	No	Yes	Yes	No
AOP_HORIZONTAL_MARGINS	Yes	No	No	No
AOP_MVS_RETURN_CODES (see <b>Note</b> )	Yes	Yes	Yes	Yes
AOP_PAGE_HEIGHT	Yes	No	No	No
AOP_PAGE_WIDTH	Yes	No	No	No
AOP_RECLLEN	Yes	Yes	Yes	Yes
AOP_RESOLUTION	Yes	No	No	No
AOP_RESOURCE_PATH	Yes	Yes	Yes	No
AOP_TRAILER_ERROR_PAGE	Yes	Yes	Yes	Yes
AOP_TRIM	Yes	Yes	Yes	No
AOP_SAP2AFP_ICU	No	No	No	Yes
AOP_SAP2AFP_RESOURCES	No	No	No	Yes
AOP_VERTICAL_MARGINS	Yes	No	No	No
AOPTRACEDIR	Yes	Yes	Yes	Yes
AOPTRACEON	Yes	Yes	Yes	Yes
<b>Note:</b> Do not specify AOP_MVS_RETURN_CODES in the Infoprint Server transform configuration file as you do the other environment variables. For information about where to specify this environment variable, see “AOP_MVS_RETURN_CODES environment variable” on page 48.				



## Appendix C. Fonts

This appendix lists the fonts that the PCL to AFP, PDF to AFP, and PostScript to AFP transforms support.

### PCL to AFP transform fonts

Table 23 lists the Monotype MicroType fonts that are built in to the PCL to AFP transform.

Table 23. PCL to AFP transform built-in fonts

Albertus Extra Bold	Clarendon Condensed Bold	Symbol
Albertus Medium	Coronet	Times New Roman
Antique Olive	Courier	Times New Roman Bold
Antique Olive Bold	Courier Bold	Times New Roman Bold Italic
Antique Olive Italic	Courier Bold Italic	Times New Roman Italic
Arial	Courier Italic	Univers Bold
Arial Bold	Garamond Antiqua	Univers Bold Italic
Arial Bold Italic	Garamond Halbfett	Univers Condensed Bold
Arial Italic	Garamond Kursiv	Univers Condensed Bold Italic
CG Omega	Garamond Kursiv Halbfett	Univers Condensed Medium
CG Omega Bold	Letter Gothic	Univers Condensed Medium Italic
CG Omega Bold Italic	Letter Gothic Bold	Univers Medium
CG Omega Italic	Letter Gothic Italic	Univers Medium Italic
CG Times	Marigold	WingDings
CG Times Bold		
CG Times Bold Italic		
CG Times Italic		

### PDF to AFP and PostScript to AFP transform fonts

Table 24 lists the Ghostscript fonts that the PDF to AFP and PostScript to AFP transforms use. The Ghostscript fonts are functional equivalents of the corresponding PostScript fonts in that the typeface styles are similar and the font metrics are identical to provide the same pagination and line endings.

Table 24. PDF to AFP and PostScript to AFP transform fonts

For this PostScript font:	The transform uses this Ghostscript font:
NewCenturySchlbk-BoldItalic	CenturySchL-BoldItal
NewCenturySchlbk-Bold	CenturySchL-Bold
NewCenturySchlbk-Italic	CenturySchL-Ital
NewCenturySchlbk-Roman	CenturySchL-Roma
ZapfDingbats	Dingbats
Courier-BoldOblique	NimbusMonL-BoldObli
Courier-Bold	NimbusMonL-Bold
Courier-Oblique	NimbusMonL-ReguObli
Courier	NimbusMonL-Regu
Times-BoldItalic	NimbusRomNo9L-MediItal
Times-Bold	NimbusRomNo9L-Medi

Table 24. PDF to AFP and PostScript to AFP transform fonts (continued)

<b>For this PostScript font:</b>	<b>The transform uses this Ghostscript font:</b>
Times-Italic	NimbusRomNo9L-ReguItal
Times-Roman	NimbusRomNo9L-Regu
Helvetica-Narrow-BoldOblique	NimbusSanL-BoldCondItal
Helvetica-Narrow-Bold	NimbusSanL-BoldCond
Helvetica-BoldOblique	NimbusSanL-BoldItal
Helvetica-Bold	NimbusSanL-Bold
Helvetica-Narrow-Oblique	NimbusSanL-ReguCondItal
Helvetica-Narrow	NimbusSanL-ReguCond
Helvetica-Oblique	NimbusSanL-ReguItal
Helvetica	NimbusSanL-Regu
Symbol	StandardSymL
Bookman-DemiItalic	URWBookmanL-DemiBoldItal
Bookman-Demi	URWBookmanL-DemiBold
Bookman-LightItalic	URWBookmanL-LighItal
Bookman-Light	URWBookmanL-Ligh
ZapfChancery-MediumItalic	URWChanceryL-MediItal
AvantGarde-BookOblique	URWGothicL-BookObli
AvantGarde-Book	URWGothicL-Book
AvantGarde-DemiOblique	URWGothicL-DemiObli
AvantGarde-Demi	URWGothicL-Demi
Palatino-BoldItalic	URWPalladioL-BoldItal
Palatino-Bold	URWPalladioL-Bold
Palatino-Italic	URWPalladioL-Ital
Palatino-Roman	URWPalladioL-Roma

---

## Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that *only* that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property rights may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing  
IBM Corporation  
North Castle Drive  
Armonk, NY 10594-1785  
U.S.A.

For license inquiries regarding double-byte (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:

Intellectual Property Licensing  
Legal and Intellectual Property Law  
IBM Japan, Ltd.  
3-2-12, Roppongi, Minato-ku, Tokyo 106-8711  
Japan

**The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law:** IBM PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

IBM Corporation  
Department 11PA Building 002S  
PO Box 1900  
Boulder, CO 80301-9270  
U.S.A.

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this document and all licensed material available for it are provided by IBM under terms of the IBM Customer Agreement, IBM International Program License Agreement or any equivalent agreement between us.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurement may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

All statements regarding IBM's future direction or intent are subject to change or withdrawal without notice, and represent goals and objectives only.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

If you are viewing this information softcopy, the photographs and color illustrations may not appear.

---

## Policy for unsupported hardware

Various z/OS elements, such as DFSMS™, HCD, JES2, JES3, and MVS, contain code that supports specific hardware servers or devices. In some cases, this device-related element support remains in the product even after the hardware devices pass their announced End of Service date. z/OS may continue to service element code; however, it will not provide service related to unsupported hardware devices. Software problems related to these devices will not be accepted for service, and current service activity will cease if a problem is determined to be associated with out-of-support devices. In such cases, fixes will not be issued.

---

## Trademarks

IBM, the IBM logo, and [ibm.com](http://ibm.com) are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both. If these and other IBM trademarked terms are marked on their first occurrence in this information with a trademark symbol (® or ™), these symbols indicate U.S. registered or common law trademarks owned by IBM at the time this information was published. Such trademarks may also be registered or common law trademarks in other countries. A current list of IBM trademarks is available on the Web at “Copyright and trademark information” at [www.ibm.com/legal/copytrade.shtml](http://www.ibm.com/legal/copytrade.shtml)

These terms are trademarks or registered trademarks of Ricoh Co., Ltd., in the United States, other countries, or both:

- Advanced Function Presentation
- AFP
- Bar Code Object Content Architecture
- BCOCA
- InfoPrint
- Infoprint
- Intelligent Printer Data Stream
- IPDS
- MO:DCA
- Ricoh

Adobe and PostScript are either registered trademarks or trademarks of Adobe Systems Incorporated in the United States and/or other countries.

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Microsoft and Windows are trademarks of Microsoft Corporation in the United States, other countries, or both.

UNIX is a registered trademark of The Open Group in the United States and other countries.

Other company, product, or service names may be trademarks or service marks of others.



---

## Index

### Special characters

- `_BPX_JOBNAME` environment variable 53, 62, 73
- `_CEE_DMPTARG` environment variable 62
- `_CEE_RUNOPTS` environment variable 59, 66, 75
- `%filter-options` option 93
  - PCL to AFP transform 93
  - PDF to AFP transform 99
  - PostScript to AFP transform 96
  - SAP to AFP transform 102

### Numerics

- 00000000.tab file 88
- 11000000.tab file 88
- 40010000.tab file 88
- 40040000.tab file 88
- 6400.tab file 88
- 80000000.tab file 88

### A

- accessibility 129
- `AOP_BATCH_PAGE_SIZE` environment variable 122
- `AOP_FAIL_ON_ERROR` environment variable 53, 63, 73
- `AOP_FONT_SUBSTITUTION_MESSAGES` environment variable 63
- `AOP_HORIZONTAL_MARGINS` environment variable 54
- `AOP_MVS_RETURN_CODES` environment variable 48
- `AOP_PAGE_HEIGHT` environment variable 54
- `AOP_PAGE_WIDTH` environment variable 55
- `AOP_RECLLEN` environment variable 55, 63, 74
- `AOP_RESOLUTION` environment variable 55
- `AOP_RESOURCE_PATH` environment variable 55, 64
- `AOP_SAP2AFP_ICU` environment variable 74
- `AOP_SAP2AFP_RESOURCES` environment variable 74
- `AOP_TRAILER_ERROR_PAGE` 56, 64, 74
- `AOP_VERTICAL_MARGINS` environment variable 56
- AOPBATCH
  - DD statements 43
  - examples 44
  - exit values 46
  - parameters 42
  - program 42
- `AOPTRACEDIR` environment variable 56, 64, 75, 109
- `AOPTRACEON` environment variable 57, 65, 75, 109
- `AOPTRIM` environment variable 57, 65
- aopxfd.conf
  - maximum-active attribute 53, 61, 72
  - maximum-idle-time attribute 53, 61, 72
  - minimum-active attribute 53, 62, 73
  - PCL to AFP transform entry 51
  - PCL to AFP transform examples 57
  - PDF to AFP transform entry 59
  - PDF to AFP transform examples 66
  - PostScript to AFP transform entry 59
  - PostScript to AFP transform examples 66
  - SAP to AFP transform example 76
- APARs, submitting 107

### B

- bar codes, mapping to BCOCA for SAP to AFP transform 78
- barcode.tab configuration file 78

### C

- classes of transforms
  - PCL to AFP transform 51
  - PDF to AFP transform 60
  - PostScript to AFP transform 60
  - SAP to AFP transform 71
- code pages, SAP to AFP transform 11
- color limitation
  - PCL to AFP transform 8
  - PDF to AFP transform 9
  - PostScript to AFP transform 10
- configuration file 6400fonts.tab 88
- configuration file aopxfd.conf
  - maximum-active attribute 53, 61, 72
  - maximum-idle-time attribute 53, 61, 72
  - minimum-active attribute 53, 62, 73
  - PCL to AFP transform entry 51
  - PCL to AFP transform examples 57
  - PDF to AFP transform entry 59
  - PDF to AFP transform examples 66
  - PostScript to AFP transform entry 59
  - PostScript to AFP transform examples 66
  - SAP to AFP transform example 76
- configuration file barcode.tab 78
- configuration file defcp.tab 81
- configuration file fonts.tab 81
- configuration file image.tab 84
- configuration file pagedef.tab 85
- configuration file xxxx0000.tab 88
- configuration files for SAP to AFP transform 76

### D

- DBCS
  - mapping SAP code pages to AFP code pages 88
  - PCL to AFP transform support 7
  - PDF to AFP transform support 9
  - PostScript to AFP transform support 10
- defcp.tab configuration file 81
- diagnosing errors 107
- disability 129

### E

- environment variables
  - `_BPX_JOBNAME` 53, 62, 73
  - `_CEE_DMPTARG` 62
  - `_CEE_RUNOPTS` 59, 66, 75
  - `AOP_BATCH_PAGE_SIZE` 122
  - `AOP_FAIL_ON_ERROR` 53, 63, 73
  - `AOP_FONT_SUBSTITUTION_MESSAGES` 63
  - `AOP_HORIZONTAL_MARGINS` 54
  - `AOP_MVS_RETURN_CODES` variable 48
  - `AOP_PAGE_HEIGHT` 54

- environment variables (*continued*)
  - AOP\_PAGE\_WIDTH 55
  - AOP\_RECLEN 55, 63, 74
  - AOP\_RESOLUTION 55
  - AOP\_RESOURCE\_PATH 55, 64
  - AOP\_SAP2AFP\_ICU 74
  - AOP\_SAP2AFP\_RESOURCES 74
  - AOP\_TRAILER\_ERROR\_PAGE 56, 64, 74
  - AOP\_VERTICAL\_MARGINS 56
  - AOPTRACEDIR 56, 64, 75
  - AOPTRACEON 57, 65, 75
  - AOPTRIM 57, 65
  - PCL to AFP transform 53
  - PDF to AFP transform 62
  - PostScript to AFP transform 62
  - SAP to AFP transform 73
  - summary 131
- error messages 107
- errors, diagnosing 107
- errors, failing on error 53, 63, 73
- examples
  - AOPBATCH 44
  - ISPF panel for PCL to AFP transform 95
  - ISPF panel for PDF to AFP transform 98
  - ISPF panel for PostScript to AFP transform 101
  - ISPF panel for SAP to AFP transform 104
  - lprafp command 47
  - PCL to AFP configuration file entry 57
  - PCL to AFP transform 20
  - PDF to AFP configuration file entry 66
  - PDF to AFP transform 28
  - PostScript to AFP configuration file entry 66
  - PostScript to AFP transform 36
  - SAP to AFP configuration file entry 76
  - SAP to AFP transform 40
  - subsystem 46

**F**

- filter options
  - PCL to AFP transform 13, 93
  - PDF to AFP transform 22, 96
  - PostScript to AFP transform 30, 99
  - SAP to AFP transform 38, 102
- font substitution
  - PDF to AFP transform 63
  - PostScript to AFP transform 63
- Fontmap file 70
- fonts supported
  - adding to the PDF to AFP transform 69
  - adding to the PostScript to AFP transform 69
  - PCL to AFP transform 7
  - PCL to AFP transform, list 133
  - PDF to AFP transform 8
  - PDF to AFP transform, list 133
  - PostScript to AFP transform 9
  - PostScript to AFP transform, list 133
- fonts.tab file 81
- form definitions, mapping to SAP Format names 85
- Format names, mapping to page and form definitions 85
- FS45 image object 8, 9, 10, 12

## H

- height of page, specifying
  - PCL to AFP transform (height) 54

- height of page, specifying (*continued*)
  - PCL to AFP transform (length) 14
  - PDF to AFP transform (length) 23
  - PostScript to AFP transform (length) 31
- human readable interface (HRI) character 78

## I

- image data in SAP to AFP transform 84
- image.tab file 84
- ISPF panels
  - PCL to AFP transform, editing 94
  - PCL to AFP transform, example 95
  - PDF to AFP transform, editing 97, 98
  - PostScript to AFP transform, editing 101
  - PostScript to AFP transform, example 100
  - SAP to AFP transform, editing 102
  - SAP to AFP transform, example 104

## J

- JCL parameters, continuing 46

## K

- keyboard 129

## L

- Language Environment run-time options
  - PCL to AFP transform 58
  - PDF to AFP transform 65
  - PostScript to AFP transform 65
  - SAP to AFP transform 75
- length of page, specifying
  - PCL to AFP transform (height) 54
  - PCL to AFP transform (length) 14
  - PDF to AFP transform (length) 23
  - PostScript to AFP transform (length) 31
- licensed program specifications xii
- limitations
  - PCL to AFP transform 8
  - PDF to AFP transform 9
  - PostScript to AFP transform 10
  - SAP to AFP transform 12
- lprafp command 47

## M

- makeconv command 90
- margins, specifying
  - PCL to AFP transform 18, 54
  - PDF to AFP transform 26, 27
  - PostScript to AFP transform 34, 35
- MAXASSIZE parameter 67
- maximum-active attribute 53, 61, 72
- maximum-idle-time attribute 53, 61, 72
- messages 111
- migrating from Infoprint Transforms V2.1 115
- minimum-active attribute 53, 62, 73
- ModWidth keyword 78
- MVS data set
  - size 47
  - specifying (AOPBATCH) 42
  - specifying (PCL to AFP transform) 15

MVS data set (*continued*)  
specifying (PDF to AFP transform) 24  
specifying (PostScript to AFP transform) 32  
specifying (SAP to AFP transform) 38

## O

OTF data, converting fonts in 81

## P

page definitions, mapping to SAP Format names 85  
pagedef.tab file 85

PCL to AFP transform

- command 13
- customizing 51
- environment variables 53
- fonts supported 7
- ISPF panels 94
- Language Environment run-time options 58
- limitations 8
- list of fonts 133
- overview 7
- performance considerations 7
- printer definitions 93
- printing scenario 2
- software requirements 6
- tracing 108
- transform classes 51
- transform configuration file entry 51

pcl2afp command

- description 13
- environment variables 21
- examples 20
- exit values 21, 29
- files 21
- format 13
- operands 19
- options 13
- usage notes 20

PDF to AFP transform

- command 22
- customizing 59
- environment variables 62
- fonts supported 8
- ISPF panels 97
- Language Environment run-time options 65
- limitations 9
- list of fonts 133
- overview 8
- performance considerations 7
- printer definitions 96
- printing scenario 3
- setting up security 67
- software requirements 6
- specifying transform options 59
- starting Infoprint Server with sufficient memory 67
- tracing 108
- transform classes 60
- transform configuration file entry 60

pdf2afp command

- description 22
- environment variables 29
- examples 28
- exit values 29
- files 29

pdf2afp command (*continued*)

- format 22
- operands 28
- options 22
- usage notes 28

performance considerations 7

PostScript to AFP transform

- command 30
- environment variables 62
- fonts supported 9
- ISPF panels 100
- Language Environment run-time options 65
- limitations 10
- list of fonts 133
- overview 9
- performance considerations 7
- printer definitions 99
- setting up security 67
- software requirements 6
- specifying transform options 59
- starting Infoprint Server with sufficient memory 67
- tracing 108
- transform classes 60
- transform configuration file entry 60

Print Interface subsystem 46

printer definitions 93

- PCL to AFP transform 93
- PDF to AFP transform 96
- PostScript to AFP transform 99
- SAP to AFP transform 102

program directories xiii

ps2afp command

- description 30
- environment variables 37
- examples 36
- exit values 37
- files 37
- format 30
- operands 36
- options 30
- usage notes 36

PS2AFPDG group 68

PSP bucket xi

## R

RACF

- PostScript and PDF to AFP transform 67

Ratio keyword 79

record length of AFP images 55, 63, 74

remote transforms 9, 10

requirements, software 6

resolution, specifying

- PCL to AFP transform 16, 55
- PDF to AFP transform 24
- PostScript to AFP transform 32
- SAP to AFP transform 39
- SAP to AFP transform, default 84

Resource Access Control Facility (RACF)

- PostScript and PDF to AFP transform 67

resource path, specifying

- PCL to AFP transform 55
- PDF to AFP transform 64
- PostScript to AFP transform 64
- SAP to AFP transform 74

## S

- SAF (system authorization facility)
  - PostScript and PDF to AFP transform 67
- SAP to AFP transform
  - code pages, input 11
  - command 38
  - configuration files 76
  - customizing 71
  - environment variables 73
  - ISPF panels 102
  - Language Environment run-time options 75
  - limitations 12
  - mapping bar codes to BCOCA 78
  - mapping Format names to page and form definitions 85
  - mapping SAP code pages to AFP code pages 88
  - mapping SAP OTF fonts to AFP fonts 81
  - modifying printed fontss on a 6400 printer 88
  - overview 10
  - performance considerations 7
  - printer definitions 102
  - printing image data 84
  - printing scenario 4
  - resolution default 84
  - software requirements 6
  - tracing 108
  - transform classes 71
- sap2afp command
  - description 38
  - environment variables 41
  - examples 40
  - exit values 41
  - files 41
  - format 38
  - operands 40
  - options 38
- security
  - PostScript and PDF to AFP transform 67
- shortcut keys 129
- size of AFP data stream 47
- software requirements 6
- STDENV DD name 43
- STDERR DD name 43
- stderr file 107
- STDOUT DD name 43
- submitting APARs 107
- subsystem 46
- system authorization facility (SAF)
  - PostScript and PDF to AFP transform 67

## T

- tracing
  - specifying trace directory 109
  - specifying trace directory for PCL to AFP transform 56
  - specifying trace directory for PDF to AFP transform 64
  - specifying trace directory for PostScript to AFP transform 64
  - specifying trace directory for SAP to AFP transform 75
  - transforms 108
  - turning on 109
  - turning on for PCL to AFP transform 57
  - turning on for PDF to AFP transform 62, 65
  - turning on for PostScript to AFP transform 62, 65
  - turning on for SAP to AFP transform 75
- trademarks 137
- trailer error page 56, 64, 74

- trailer error page, suppressing 107
- transform classes
  - PCL to AFP transform 51
  - PDF to AFP transform 60
  - PostScript to AFP transform 60
  - SAP to AFP transform 71
- transform configuration file, aopxfd.conf
  - maximum-active attribute 53, 61, 72
  - maximum-idle-time attribute 53, 61, 72
  - minimum-active attribute 53, 62, 73
  - PCL to AFP transform entry 51
  - PCL to AFP transform examples 57
  - PDF to AFP transform entry 59
  - PDF to AFP transform examples 66
  - PostScript to AFP transform entry 59
  - PostScript to AFP transform examples 66
  - SAP to AFP transform example 76
- transform stderr, finding 107

## U

- usage notes 36

## W

- width of barcode 78
- width of page, specifying
  - PCL to AFP transform 17, 55
  - PDF to AFP transform 25
  - PostScript to AFP transform 33

## X

- xxxx0000.tab file 88





Program Number: 5655-N60

Printed in USA

G550-0443-04

