

Infoprint Server for iSeries



# Introduction and Planning Guide

*Version 5, Release 30*



Infoprint Server for iSeries



# Introduction and Planning Guide

*Version 5, Release 30*

**Note**

Before using this information and the product it supports, be sure to read the general information in "Notices" on page 27.

**Third Edition (April 2004)**

This edition applies to the IBM Infoprint Server for iSeries Version 5 Release 3 Modification 0 licensed program, Program Number 5722-IP1, and to all subsequent releases and modifications until otherwise indicated in new editions or technical newsletters. Be sure to use the correct edition for the level of the product.

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# About Infoprint Server for iSeries: Introduction and Planning Guide (G544–5774)

This publication provides an overview of Infoprint Server for iSeries Version 5 Release 3 (licensed program number 5722-IP1). The term "iSeries 400" refers to the system formerly called AS/400. The term "OS/400" refers to the operating system of the iSeries 400.

This introduction includes an overview of Infoprint Server for iSeries, explains its benefits, describes how you can use Infoprint Server for iSeries, describes how Infoprint Server for iSeries works, and introduces some products you can use with Infoprint Server for iSeries. This publication is organized into chapters to help you obtain the information you need about Infoprint Server for iSeries. Instead of reading the entire publication, you can read only those chapters that apply to you:

- **Chapter 1, "What Infoprint Server Can Do for You"** is intended for managers and system administrators. The chapter describes the overall benefits that Infoprint Server for iSeries provides and lists the hardware and software needed to use this product.
- **Chapter 2, "Using Infoprint Server"** is intended for managers, operators, and system administrators. It provides a number of scenarios that show how you can use Infoprint Server for iSeries in various printing situations.
- **Chapter 3, "Related Products"** describes some IBM products that you can use with Infoprint Server for iSeries.

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## Who Should Read This Book

This publication is intended for people who need to understand the benefits and capabilities of Infoprint Server for iSeries.

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## Prerequisite and Related information

Use the iSeries Information Center as your starting point for looking up iSeries technical information.

You can access the Information Center two ways:

- From the following Web site:  
<http://www.ibm.com/eserver/iseries/infocenter>
- From the *iSeries Information Center*, SK3T-4091-04 CD-ROM. This CD-ROM ships with your new iSeries hardware or IBM Operating System/400 software upgrade order. You can also order the CD-ROM from the IBM Publications Center:  
<http://www.ibm.com/shop/publications/order>

The iSeries Information Center contains new and updated iSeries information such as software and hardware installation, Linux, WebSphere, Java, high availability, database, logical partitions, CL commands, and system application programming interfaces (APIs). In addition, it provides advisors and finders to assist in planning, troubleshooting, and configuring your iSeries hardware and software.

With every new hardware order, you receive the *iSeries Setup and Operations CD-ROM*, SK3T-4098-02. This CD-ROM contains IBM @server iSeries Access for Windows and the EZ-Setup wizard. iSeries Access Family offers a powerful set of

client and server capabilities for connecting PCs to iSeries servers. The EZ-Setup wizard automates many of the iSeries setup tasks.

The Printing Systems iSeries Products Web page contains information about this product. See this Web page:

<http://www.ibm.com/printers/R5PSC.NSF/Web/as400overview>

For other related information, see the “Bibliography” on page 37.

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# Summary of Changes

## **Summary of Changes for Infoprint Server for iSeries: Introduction and Planning Guide, G544-5774-02**

This publication contains additions and changes to information previously presented in *Infoprint Server for iSeries: Introduction and Planning Guide, G544-5774-01*, which supports Infoprint Server for iSeries Version 5 Release 2.0. The technical additions and changes for the second draft are marked with 2 in the left margin.

These changes have been made throughout the book:

- OS/400 V5R1 is no longer supported. References to it have been removed.
- The PostScript, PDF, and PCL to AFP transforms are now a priced feature of Infoprint Server.

The following information is new or updated:

- “Return on Investment with Infoprint Server” on page 8 has been added.
- “What’s New in Infoprint Server Version 5.3?” on page 6 has been updated.
- New scenarios; “Intelligent Routing” on page 13 and “Accessing the PDF Subsystem with iSeries Navigator and iSeries Access for Web” on page 15, have been added.
- Chapter 3 “Understanding the components of Infoprint Server” has been removed. The information has been added to Chapter 1, “What Infoprint Server Can Do for You,” on page 1.



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## Chapter 1. What Infoprint Server Can Do for You

Infoprint<sup>®</sup> Server for iSeries<sup>™</sup> (hereafter referred to as Infoprint Server) is a separately orderable program for OS/400<sup>®</sup>. Infoprint Server focuses on the network, extending the considerable capabilities of the iSeries beyond printing to the management and dissemination of output. As business applications are re-engineered into e-business applications, the output of those applications might need to change and flow electronically to the consumer of that output.

For enterprise printing requirements, Infoprint Server delivers improved efficiency, improved reliability, and lower overall printing costs. It does this by applying iSeries printing management and iSeries-attached printers to the task of handling all of the essential printing generated across the network.

This chapter describes how output and printing requirements are changing. It explains how Infoprint Server fits into this changing environment and how implementing Infoprint Server can benefit you.

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### How Output Requirements Are Changing

With the advent of a fully electronic computing environment, which includes local area networks and the Internet, standard server-centric business applications are being re-engineered into e-business applications. In many cases, this has ramifications for the output that those applications produce. For example:

#### **Companies require more electronic output**

Businesses need to implement business-to-business and business-to-customer applications that have electronic output distribution instead of paper creation. The traditional output model of "print and distribute" is changing to one of "distribute (electronically), then (maybe) print". Electronic output reduces costs, decreases cycle time, improves competitiveness, and increases customer satisfaction.

#### **Network-centered printing is inadequately managed and costly**

Many key applications within an iSeries extended environment now reside outside the iSeries server. Printing to personal or LAN-attached printers is usually far costlier and far less reliable than printing from the iSeries. Companies would like to apply iSeries print management and iSeries printers to this task. In addition, many new applications that are client-server in implementation, such as enterprise resource planning (ERP) and independent software vendor (ISV) solutions, create ASCII output because it is a common denominator across clients and servers. Transforming these data streams to the Advanced Function Presentation<sup>™</sup> (AFP<sup>™</sup>) Data Stream enables robust iSeries print management.

#### **Output applications need to be portable across different systems**

Many line-of-business applications, such as statements, invoices, and policies, need to have the flexibility to print on servers other than the server where the data resides. In order to do this, the print file needs to be packaged with all of the resources, such as fonts, overlays, and images that are needed for printing.

#### **New output formatting on iSeries needs additional printing and viewing capabilities**

While the majority of iSeries output applications are formatted with Data Description Specifications (DDS), the iSeries also offers an application-independent formatting approach: iSeries page definitions and

form definitions. This separates page formatting from the line-of-business application. In addition, with Infoprint Designer for iSeries, you have a graphical design interface for these applications. Infoprint Server addresses the requirement to take print applications with page definition and form definition formatting and transform them into final-form AFP. This lets them be easily printed and viewed by "downstream" processes.

### **Workstation users want to integrate Web and client images into iSeries applications**

Workstation users want to be able to use images from the Web or their workstation in GIF, TIFF, and JPEG format in their OS/400 documents. This saves time by allowing the user to create the image in only one format.

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## **How to Handle the Changing Output Requirements**

Print server consolidation is the best way to handle the changing printing requirements. Why? One central print server in a network is more cost effective than a distributed solution with printers attached to many different LAN servers or local desktop computers. Consolidating onto a central print server lets you use the right printer for specific print jobs. OS/400 with Infoprint Server lets you consolidate your print workload from many servers to a central OS/400 print server. OS/400 handles high volume printing, logs accounting histories, and provides data security and recovery. With OS/400, you can control host and LAN printing. You do not need to continually upgrade your server so it can handle more print requests.

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## **How Infoprint Server Fits in with OS/400 Printing**

Infoprint Server significantly expands the possibilities of print and electronic output in an iSeries environment, integrating new capabilities within the existing print framework. Let's take a closer look and see how. The existing output subsystem is generally print-centric. Figure 1 on page 3 depicts the flow within this subsystem. Any OS/400 application that creates print uses a printer file to provide job-level control information as the data is written to the output queue. DDS keywords can be used to define how application and static information is placed on each page. With these instructions, the application places print data (a spooled file) on an OS/400 output queue. The print data on the queue is usually either SCS (SNA Character Set) for simple line-mode output or AFP with graphics. With AFP print data, there are frequently embedded references to external print resources, such as fonts, overlays, and page segments.

Once the print data resides on the OS/400 output queue, there are three drivers that can route the print data to a printer. The driver is automatically selected based on the type of target printer. Base OS/400 print management includes the driver for printing to SCS printers. Host Print Transform is the driver for ASCII printers, principally PCL printers. When a PCL printer is selected by the print writer, the print file (either SCS or AFP) is passed to Host Print Transform. Host Print Transform then transforms the print data into ASCII and sends it to the printer. When an Intelligent Printer Data Stream™ (IPDS™) printer is started, Print Services Facility™ (PSF) for OS/400 is automatically invoked and interactively manages the entire printing process with the printer. When PSF for OS/400 manages AFP print data, it ensures that any external resources required, such as fonts, overlays, and images, are in printer memory when needed.

There are two additional types of external resources: page definitions and form definitions. These resources are a standard part of the AFP architecture and enable the pages to be formatted independently of the application program. Infoprint

Designer for iSeries is a fully graphical output composition program that uses these resources to design new applications or re-engineer existing ones.

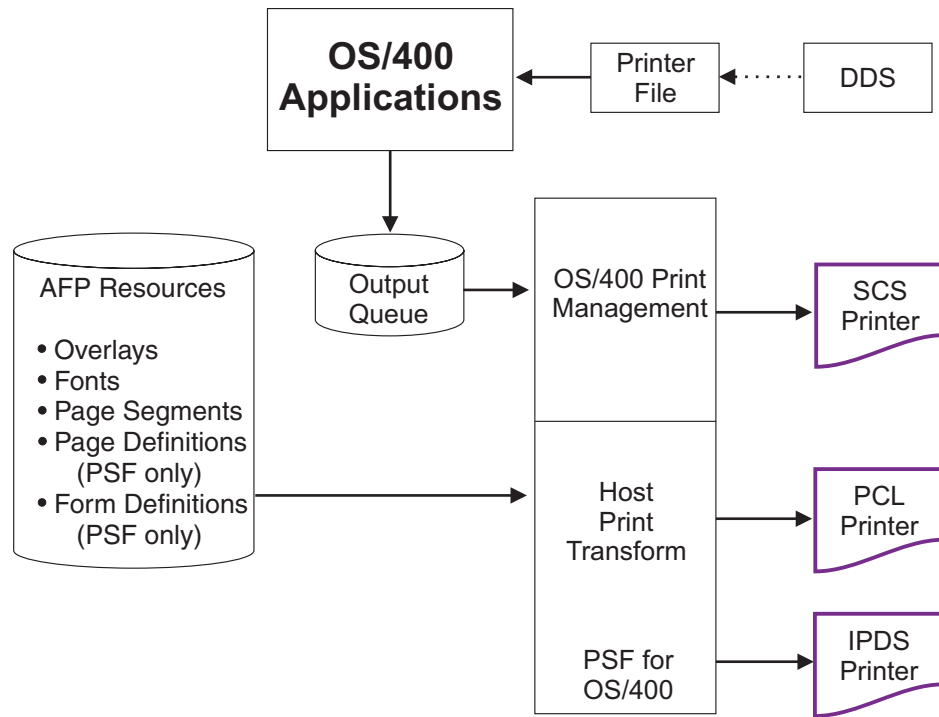


Figure 1. iSeries Printing without Infoprint Server

Infoprint Server opens up this print architecture. Figure 2 on page 6 shows the functional elements that Infoprint Server adds to the picture. The general focus is in two major areas: (1) projecting OS/400 output to the network, and (2) incorporating the network into the OS/400 print functions.

Infoprint Server has five functional components:

- PDF services for iSeries
- Intelligent Routing, including e-mail, Web, and file requeue
- Print file segmentation, AFP indexing, and portable AFP (Create AFP Data command)
- PDF, PostScript, and PCL to AFP data stream transforms (priced feature number 5101 for PostScript and PDF and 5102 for PCL)
- Image transforms for GIF, TIFF, and JPEG to iSeries format

Let's go through the Infoprint Server functional components one by one.

### PDF Services

A central component of Infoprint Server is the PDF subsystem. This subsystem enables the conversion of any standard OS/400 output data stream (SCS, AFP, IPDS, mixed data, line data, or even OfficeVision/400™ extended formats) to Adobe PDF. The transform creates a native, text-based ASCII PDF data file (assuming the input to the transform is a non-image print file). Highly integrated, the PDF subsystem is deployed as a virtual printer device. This facilitates seamless flow and the handling of the widest variety of input print formats.

Besides producing high-fidelity, text-based PDF, the PDF subsystem supports many advanced PDF features. PDF security functions such as encryption, password protection, and change protection can be selected. Advanced AFP page features, such as 2D bar codes and full color images, are supported in the PDF transform. iSeries print file indexing, available through DDS or the Create AFP Data command, can be used in the created PDF as bookmarks.

iSeries print file indexing is used in another significant manner, for *segmentation*. Segmentation uses the electronic “triggers” placed in the print file by DDS or the Create AFP Data command to segment the print file. For example, a monthly sales report can be electronically segmented into regional report segments. In a hardcopy context, this is called “burst and bind”. Each segment is handled separately by the PDF subsystem, resulting in a separate PDF file being produced for each segment. The segmentation triggers can also contain key variable data that determines the routing or disposition of the segment. See *Intelligent Routing* for more information about working with segments.

There are a number of interface points with PDF services. PDF processing options can be defined in the printer file, the PDF mapping object, or a PDF exit program. This would be the normal, batch application flow. In addition, both iSeries Access and iSeries Access for Web have interfaces to PDF services. The Operations Navigator component of iSeries Access provides a set of interactive panels to define “ad hoc” PDF and intelligent routing operations. iSeries Access for Web uses the PDF subsystem to bring selected print files to the browser within Adobe Acrobat. There is also a copy spooled file Java™ method that can be used to build custom access to PDF services.

### **Intelligent Routing**

Central to Infoprint Server is its “e-delivery” or routing capabilities. Working in conjunction with the PDF subsystem, print files or print file segments can be profiled, identified, transformed, and routed as required. A print file or print file segment can be converted to PDF and routed to e-mail, an integrated file system directory, or an output queue. In addition, a print file or print file segment can be re-queued in iSeries format (AFP) for other routing or delivery functions.

With Intelligent Routing, any combination of the transform and distribution options listed above can be applied to a print file or print file segment. Essential to this flow are the interfaces that provide the “action” information. Those interfaces include the application printer file, the PDF mapping object, and the PDF exit program. With the printer file, the User defined data parameter can be used to define action. With the PDF mapping object and the PDF exit program, the target print file or print file segment is identified and the desired action is defined. With segmented print files, the routing ID on each segment is used to drive the routing actions. The PDF mapping object is a data structure that is maintained by a set of iSeries commands. With the PDF mapping object, there is no programming required. With the PDF exit interface, the program communicates directly with the Intelligent Routing subsystem and provides the required “action” or delivery information.

### **Indexing, Bookmarking, and Portable AFP**

PDF is one approach to electronic distribution of output, and is clearly the standard of Internet delivery. AFP is another standard, and is a natural for intranet delivery of output. The AFP Viewer is built into iSeries Access and an AFP Viewer plug-in is available for Netscape Navigator or Internet Explorer. Because AFP files can have external resources, it is essential that any AFP to be sent for viewing is sent with



those external resources included. Infoprint Server provides the ability to convert an AFP input file to fully portable format. The resources are embedded within the data. This is accomplished with the Create AFP Data (CRTAFPDTA) command. In addition, this command can also add indexing to the AFP file. This facilitates easy navigation by the person viewing the data. This same indexing function can be used in conjunction with PDF delivery to segment print files or to provide bookmarking within a PDF file.

### **PDF, PostScript, and PCL to AFP Transforms**

Infoprint Server includes an integrated set of transforms to convert ASCII print data – PDF, PostScript, and PCL – to AFP for management and further processing by OS/400. These transforms are available with optional features 5101 and 5102 of Infoprint Server. OS/400 Transform Manager automatically detects ASCII print format, invokes the required transform, and places the resulting AFP file on an OS/400 output queue. This enables most ASCII output created on OS/400 or on the network to be put in native OS/400 format (AFP). This lets users take advantage of the OS/400 print or output management capabilities.

### **Image Transforms**

The final component of Infoprint Server is its image transforms. These transforms, which run on a Windows® PC, convert industry standard image formats (GIF, TIFF, and JPEG) into AFP page segments or overlays on your PC. You can use the AFP Manager component of iSeries Navigator or OS/400 commands to create the page segment or overlay on your OS/400. This lets you use an image in a client or network application and then embed it in an OS/400 application.

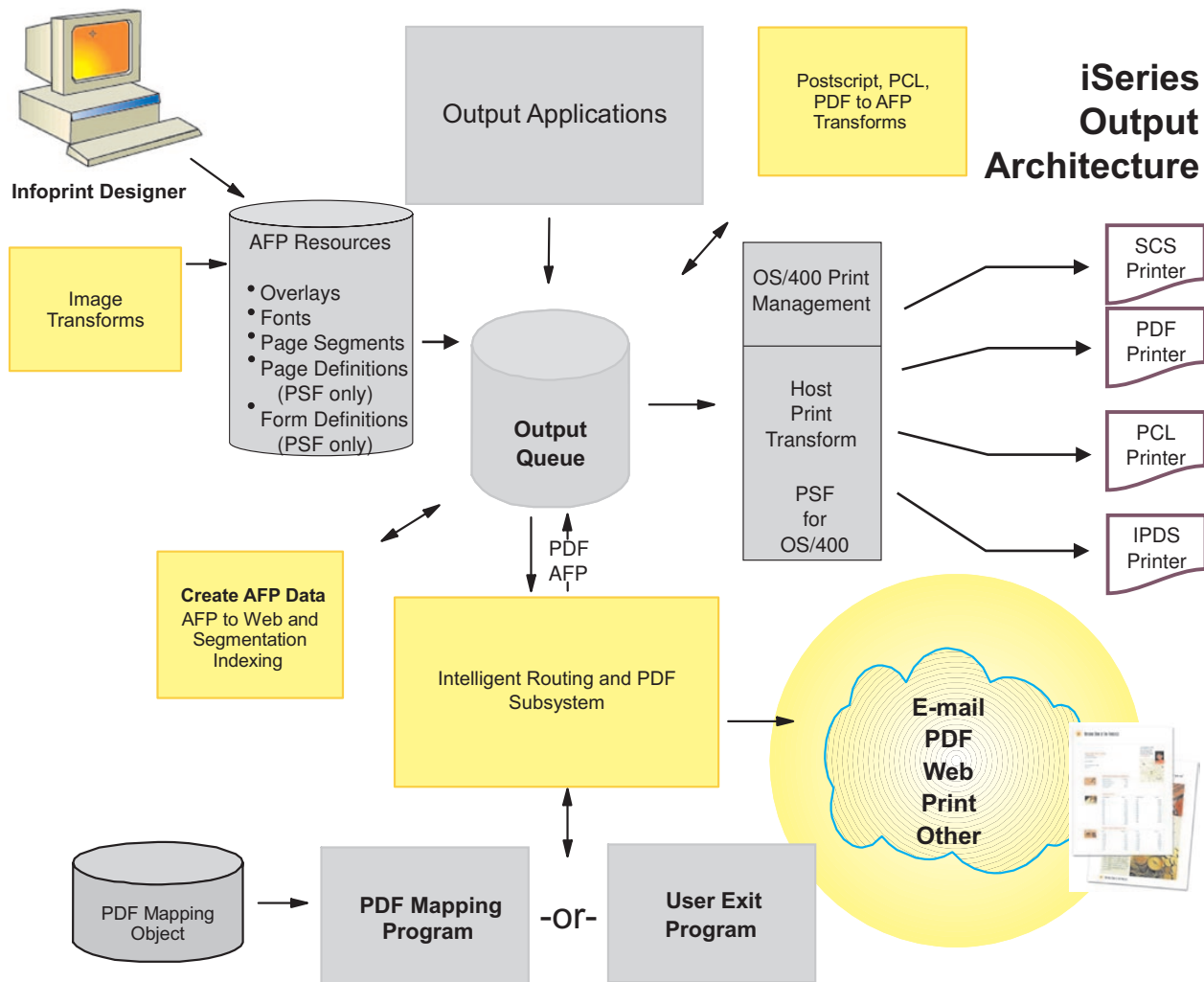


Figure 2. iSeries Output Management with Infoprint Server

See Chapter 2, “Using Infoprint Server,” on page 11 for examples that show how you can use the Infoprint Server components in different printing scenarios.

## What’s New in Infoprint Server Version 5.3?

Infoprint Server 5.3 provides these enhancements:

- **Create a PDF mapping object instead of writing a PDF mapping program:**

This release of Infoprint Server includes a new object called a *PDF mapping object*. You use menu-driven commands or APIs to specify the PDF customization options to the PDF mapping object. The options you specify to the PDF mapping object are used to customize the IBM-supplied PDF mapping program. This lets you control almost every option available in the PDF mapping program without having to program anything.

- **IBM-supplied PDF mapping program**

The IBM-supplied PDF mapping program supplied with this release is for use with a PDF mapping object. Using these together gives you a simple way to customize Infoprint Server’s PDF output.

- **Intelligent routing for PDF files**

Prior to this version, you could transform a spooled file to PDF then e-mail it, spool it to an output queue, or store it as a stream file in the integrated file system. Now you can do any combination of those with any given PDF file. Additionally, if you use a segmented spooled file, you can route each generated PDF file differently.

- **Respool a spooled file as AFP**

This function lets you specify that a spooled file that will undergo a transform to IPDS is respooled as AFP. You can respool the whole file, or you can use it with the PDF subsystem to respool one segment of a spooled file, along with the rest of the intelligent routing options.

- **Specify a PDF administrator**

Changes to the PSF configuration object let you specify an administrator for the PDF subsystem. The PDF administrator is an e-mail address that is notified when there is a problem with the PDF conversion or distribution. When there is an error, such as a missing routing tag for a segment of a spooled file, an e-mail is sent to the PDF administrator with the PDF file attached. This is beneficial because you do not have to reprocess the entire spooled file when just a few segments were not distributed correctly.

- **Enhancements to the PDF subsystem**

- Output is automatically rotated for portrait or landscape presentation, as appropriate
- Smaller PDF file size
- Accepts 2D bar codes PDF417, Maxicode, and Data Matrix, as well as Planet bar code
- Accepts full color images in FS45 format
- Accepts GIF, TIFF, JPEG, and single page PDF objects in the input spooled file

- **Enhancements to the PDF mapping program**

You can specify these new options to the PDF mapping program:

- Can specify options for all PDF files, not just those being e-mailed
- PDF output file's name
- Respool a segment of the input spooled file as AFP or respool the entire input spooled file as AFP
- Intelligent routing of PDF output
- Security options for the PDF output when e-mailing, including encryption, public authority level, passwords, and more
- Accessibility options for the PDF file, when e-mailing
- Specify the PDF output file's location, when storing in the integrated file system - Infoprint Server will not append a series of directories to the location you specify using a PDF mapping program
- Specify the output queue for PDF output on a per-file basis, when spooling the PDF file

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## Benefits of Using Infoprint Server

Users and applications in the typical iSeries enterprise environment can take full advantage of Infoprint Server's many benefits, including:

**Electronic Output** In order to stay competitive, companies need to cut costs and decrease cycle time by creating electronic output instead of hardcopy production and distribution. Infoprint Server supports both PDF and AFP electronic document

formats. The PDF and Intelligent Routing subsystem component of Infoprint Server lets you move output internal or external to the organization electronically or in hardcopy. Routing functions such as e-mail, Web access, PDF re-queue, and AFP re-queue can be used individually and in combination to create the desired or most effective delivery of documents and reports.

**Segmentation and Intelligent Routing** Using these functions together provides a powerful capability to reengineer output processes. A high level of iSeries integration means that application document flow can be changed to dynamically pass both segmentation and routing information that can be used, in turn, to drive a “profiled” delivery process.

**Printing consolidation** In today’s iSeries network environments, non-iSeries format print jobs can be produced on the workstation, the LAN server, and the iSeries server. Normally, these print jobs are in one of three ASCII formats – PCL, PostScript, and PDF. And, quite often, these print jobs are routed to a wide range of widely-deployed desktop ASCII printers. With integrated ASCII transforms, Infoprint Server provides the mechanism to convert these print jobs to iSeries format (AFP) and enable consolidated printing on iSeries-attached IPDS printers. And, because print jobs are now managed by OS/400 (and PSF/400), all the reliability, security, and error recovery advantages of iSeries-managed printing now applies.

**Printing Flexibility** With Infoprint Server, you now have three major printer types that you can support – IPDS, PCL, and PDF. With PDF and AFP re-queue, segments of print files can be broken out for separate printing. Many current printers support direct printing of PDF and this can offer potential performance or fidelity advantages over printing with PCL. Certainly, with print jobs that are mission-critical, or high-volume, or a combination of both, IPDS remains the best hardcopy choice.

**Easier Navigation of Large Files** As businesses increase electronic document use, it becomes necessary to be able to quickly navigate those files. For example, an application might create customer statements. Infoprint Server gives you the ability to index the statement file so that customer service representatives can quickly find and view a customer’s statement. This indexing can be used directly in portable AFP format or as bookmarking with PDF format.

**Create AFP Output from Images on Windows** Infoprint Server lets you convert the most common image formats (GIF, TIFF, and JPEG) to AFP. This simplifies graphics maintenance by letting you use the same graphics in your OS/400 documents, workstation documents, and Web presentation.

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## Return on Investment with Infoprint Server

A core function of Infoprint Server is the reengineering of hardcopy output to electronic delivery. As a result of the costs involved in hardcopy delivery and the advantages in leveraging intranet and Internet networks, the typical return on investment (ROI) for this kind of investment can be very high. It is clear that Web reengineering of key application processes has substantial ROI. Likewise, it is not surprising that reengineering of the output process is similarly beneficial. Let’s look at some of the ROI elements in Infoprint Server implementations.

**Hardcopy production savings** Costs associated with printing documents and reports include preprinted forms, printing supplies, production, post-production (such as bursting and decollation), reprint, and delivery. There are also additional costs with preprinted forms. Infoprint Server does not directly offset the substantial costs

of designing, producing, and managing preprinted forms, but electronic documents and reports are a prerequisite to getting into “e-delivery” and can add substantial overall cost justification.

**Mail savings** Mailing documents such as invoices and statements costs a company in preparation and postage.

**Offset to EDI and fax costs** Where appropriate, electronic delivery (e-mail and Web access) can offset costs where present communications use EDI or fax.

**Increased productivity** Time and energy focused on hardcopy printing and distribution can be redirected to other areas. Recipients do not need to spend time tracking down the documents or reports they need.

**Increased service levels** Electronic presentation and delivery gets the information to the customer or end user in a fraction of the time. Monthly reports that were delayed for days are now available as soon as the monthly close is run.

**Opportunity for new applications** Using electronic documents and distribution opens up additional opportunities. For example, electronic documents can also flow to archival systems for archive and retrieval operations or customer service applications. Functions that integrate documents and processing, such as electronic bill presentment and payment (EBPP) can be implemented.

**Competitive advantage** Timeliness of documents to customers as well as the ability to offer customers their choice of methods for receiving key communications can be a major advantage against competitors trying to reach your customers.

**Printing consolidation** An additional function of Infoprint Server is the ability to transform PCL, PostScript, and PDF print jobs to iSeries format, enabling printing consolidation on iSeries. Printing expenses include the obvious hardware, maintenance, toner, consumables, and paper. Printing with client or LAN attached desktop laser printers is usually a very expensive proposition. With high supplies costs, the price per page can be far higher than with higher-speed printers.

Printing expenses also include the costs associated with managing the print process. The desktop printing process is (1) send the job, (2) physically determine if the job printed completely, (3) resend the job if necessary. With iSeries printing, the printing process is completely system managed and this can reduce total operational costs while increasing service levels.

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## Hardware Requirements

OS/400 5.3 runs on these iSeries systems:

- Model 170 with processor feature 22xx or 23xx
- Model 270
- Model 7xx
- Model 8xx

The PASE environment requires an AS/400® or @server iSeries model 600 or higher.

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## Software Requirements

In order to run Infoprint Server for iSeries, you need OS/400 5.2 or higher. A PSF for OS/400 license is not required.

To print the PDF output from the PDF subsystem requires Acrobat Reader 5.0. You can download it free from the Adobe Web site:  
<http://www.adobe.com/products/acrobat/main.html>.

The Font Downloader feature of Infoprint Server requires a PC running Infoprint Manager for Windows (Program Number 5639-N49), DBCS Font Downloader feature (LCD4-5884-00), or an AIX<sup>®</sup> system running Infoprint Manager for AIX (Program Number 5765-E42), DBCS Font Downloader feature (LCD4-5884-00).

In order to use the PCL, PDF, or PostScript to AFP transform, you need Infoprint Server Feature number 5101 for PostScript and PDF, 5102 for PCL, and OS/400 5.2 or higher with the PASE feature installed. Printing to an IPDS printer requires PSF for OS/400.

The image transforms (GIF, JPEG, and TIFF to AFP) require a PC running Windows 95, Windows 98, Windows 2000, or Windows NT<sup>®</sup> with service pack 4 installed.

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## Compatibility

Infoprint Server 5.3 for iSeries is upwardly compatible with Infoprint Server 5.2 for iSeries.

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## Chapter 2. Using Infoprint Server

This chapter describes how you can use Infoprint Server in your particular environment to meet your printing needs. It includes the following scenarios:

- “Publishing iSeries Output Electronically” on page 12
- “Electronic Report Distribution” on page 16
- “Intelligent Routing” on page 13
- “Accessing the PDF Subsystem with iSeries Navigator and iSeries Access for Web” on page 15
- “Printing Enterprise Print Output on IPDS Printers” on page 18
- “Integrating Web and Network Images into iSeries Applications” on page 19
- “Indexing Data for Navigation” on page 20
- “Distributing AFP Output Electronically” on page 21

These scenarios are examples of printing situations, but do not represent all situations that exist. Each scenario includes a figure that shows which Infoprint Server components are used. The components are shaded in the figures.

## Publishing iSeries Output Electronically

A company currently generates monthly reports and distributes them in hardcopy format. They want to produce these reports in electronic format and make them available for client or browser online access.

Here is how this company can use the Infoprint Server components to meet its requirements:

1. An OS/400 application creates the report and writes it to an output queue.
2. A system administrator sets up a printer device description for a virtual printer that performs PDF processing. This device description references a PSF configuration object.
3. The system administrator creates a PSF configuration object. This object provides additional parameters for PDF processing, including a reference to a PDF mapping object, if one is used.
4. The system administrator can create a PDF mapping object. The PDF mapping object describes how to identify the target file and the actions to perform on it. In this case, the action is to give the PDF file a specific name and write it to the integrated file system in a specific directory.
5. Alternatively, the system administrator can write a PDF mapping program that identifies the input file, specifies the action to perform, and provides the output file name and directory.
6. If neither the PDF mapping object nor the PDF mapping program is used, the PDF subsystem creates a unique file name based on the input spooled file attributes.
7. Once the input spooled file is moved to the queue for PDF processing, the desired processing takes place. Using default values, the PDF mapping object, or the PDF mapping program, the monthly report spooled file is converted to PDF and written to the specified directory with the defined file name.
8. The PDF file is available for access with a Web browser or client PC.

Figure 3 shows how Infoprint Server lets you distribute AFP output.

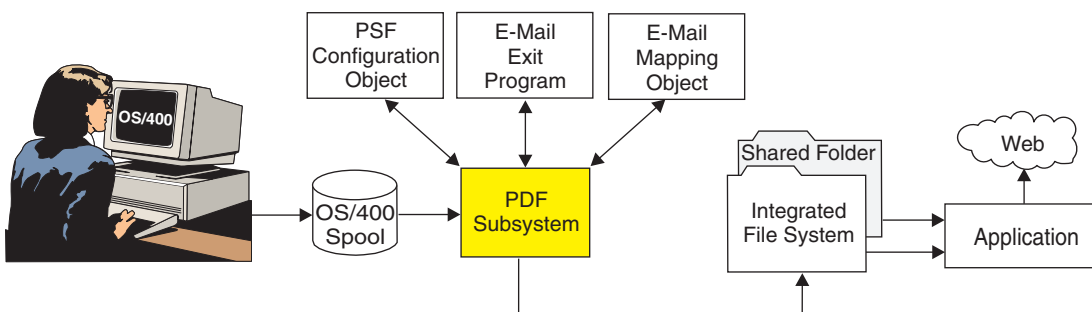


Figure 3. Publishing iSeries Output Electronically



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## Intelligent Routing

Intelligent Routing refers to the ability in document workflow to route output to the target recipient in the desired format or set of formats. In a typical application scenario, a company has recently moved their order entry process to the Web. The result of the order entry process – a document such as the order confirmation – is printed and mailed hardcopy. Costs and delays in hardcopy distribution can offset some of the advantages to moving to the Web in the first place.

The company wants to change the current order confirmation process and let their customers decide how this information will be delivered. They would like to offer hardcopy, e-mail, Web access, and links to fax as options. And, a given customer could select multiple options. For example, Customer A might choose to have a copy of the order confirmation faxed and another copy placed where they can access it electronically with a browser. Customer B might choose to have their order confirmation e-mailed to three different e-mail IDs. Customer C might still want the order confirmation mailed in hardcopy format.

Here is how this company can use Intelligent Routing functions to reengineer the order confirmation delivery process:

1. Order confirmations are produced in a spooled file. Data Description Specifications (DDS) keywords or the Create AFP Data (CRTAFPDTA) command is used to insert electronic routing IDs to delineate each customer's order confirmation pages.
2. Profile information for routing (how to select the spooled file and what to do with each segment) can be set up in a PDF mapping object using the set of commands that support mapping objects or the PDF map APIs. Alternatively, a PDF mapping program can be implemented that will communicate directly with Infoprint Server as the order confirmations are being processed.
3. The order confirmation spooled file is processed in an Infoprint Server queue. This queue has been set up with a virtual printer device description and a PSF configuration object. The PSF configuration object contains some of the general parameters necessary for the PDF conversion and distribution process. For example, one parameter indicates that the incoming spooled file is set up with routing tags that delineate multiple segments.

**Note:** Although the PDF and intelligent routing subsystem interacts with PSF, you do not need a PSF license to use the PDF subsystem.

4. Once the process has started, the PDF and intelligent routing subsystem will look to the PDF mapping object or the exit program for file and segment level information. Using the PDF mapping object, key field identifiers (including the routing tag that identifies the customer number for each order confirmation) with each print file or print file segment are matched to entries in the mapping object. When a match is found, the "action" entries are read to determine what actions to take with this file or segment.

If the PDF mapping program is used, then the PDF and intelligent routing subsystem looks to the PDF mapping program to provide action information at each change in customer order confirmation. The PDF mapping program can access database files dynamically in order to provide data such as e-mail IDs and content.

5. Possible actions on each order confirmation include e-mail, write to the integrated file system, write to an output queue as PDF, and re-queue as AFP. Combinations of these options are supported. If the action is re-queue as AFP,

then that order confirmation can be printed, faxed (with link to a fax program), added to an archive, or similar “downstream” function.

**Note:** Re-queuing as AFP requires a licence for PSF for OS/400.

Figure 4 shows the Intelligent Routing flow.

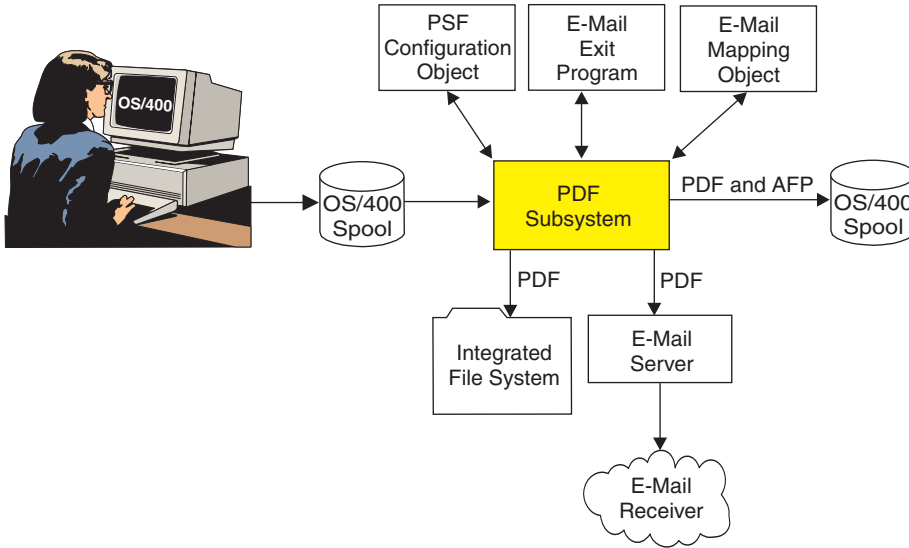


Figure 4. Intelligent Routing

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## Accessing the PDF Subsystem with iSeries Navigator and iSeries Access for Web

There are many situations when it would be desirable to route documents or reports on an ad hoc or immediate basis. For example, a company might use this function to produce a draft copy of billing notices before running the job. This lets the person responsible process the spooled file and view it before sending out the actual bills.

iSeries Navigator and iSeries Access for Web have interfaces that use Infoprint Server functions. With iSeries Navigator, you can specify PDF routing options directly for a target spooled file. With iSeries Access for Web, you can view a spooled file from a Web browser in PDF format (automatically using Adobe Acrobat).

This is how you can use iSeries Navigator to access Infoprint Server output distribution functions:

1. An application creates the document or report as a spooled file in iSeries output queue.
2. On iSeries Navigator, you select the spooled files then use the Convert to PDF dialog to select the routing mode (send e-mail, write to integrated file system, or save to output queue) and the various parameters required for each mode. For example, if you want to e-mail the selected document, you would specify the e-mail address.
3. The files are passed to the PDF subsystem and processed. For example, if you specified that you wanted a spooled file e-mailed, then that file is converted to PDF and e-mailed automatically.

Figure 5 shows how this process works.

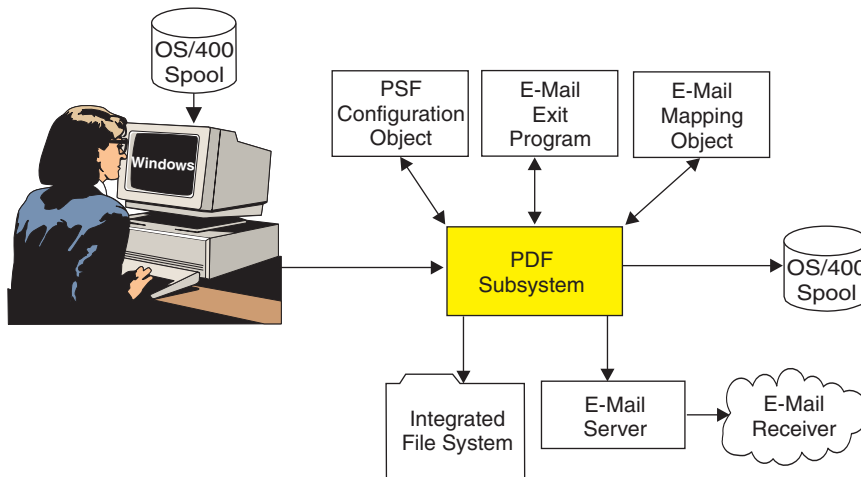


Figure 5. Accessing the PDF Subsystem from iSeries Navigator

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## Electronic Report Distribution

In this scenario, a company wants to distribute its monthly sales reports to regional managers. Currently, the reports are generated on an OS/400, printed, manually separated, and sent hardcopy to the managers. The company wants to automate this process, sending only the appropriate regional report to each manager. Using Infoprint Server, the spooled file can be electronically segmented then passed to PDF processing.

Here is how this company can use the Infoprint Server components to meet its requirements:

1. The sales report application produces one large spooled file containing reports for each of the regions.
2. There are many ways to insert the segmentation *triggers* that delineate the regional reports. Within the application itself, you can use DDS keywords (Start and End Page Group) for explicit control. Alternatively, after the application has run, you can use the Create AFP Data command (CRTAFPDTA) against the spooled file to insert the triggers. There are also other tools, such as AFP Toolbox, with which you can insert the segmentation triggers.
3. The PDF queue is set up by creating a virtual printer device and an associated PSF configuration object.
4. The PSF configuration object specifies that the data is to be transformed into multiple PDF files and e-mailed to each regional recipient.
5. The PDF subsystem splits the document at the routing tags (triggers) and creates a PDF file from each segment. This creates one PDF file for each regional office.
6. The PDF subsystem uses either a PDF mapping object or a PDF mapping program to receive the parameters needed for each regional report.
7. The segmentation trigger can contain an actual e-mail address or some data that is mapped to e-mail addresses.
8. In this application, the trigger could contain the region number and this number can be used in either the PDF mapping object or a PDF mapping program to define the information required for that region. In this case, you can specify multiple actions for each segment, see "Intelligent Routing" on page 13 for more information. Also, Infoprint Server can send each regional report to multiple e-mail addresses. You can also customize the subject text, message text, and other data elements within an e-mail.

Infoprint Server supports any SMTP mail server to send the e-mail.

Figure 6 on page 17 shows how Infoprint Server lets you send multiple PDF files as e-mail.

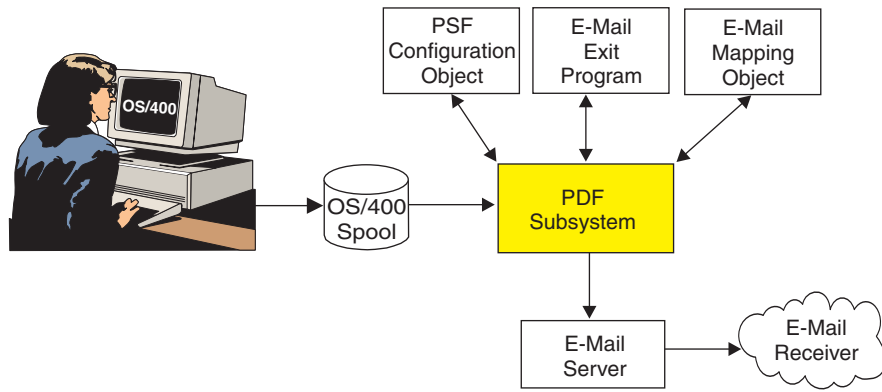


Figure 6. Electronic Report Distribution

## Printing Enterprise Print Output on IPDS Printers

In this application, a business uses an enterprise resource planning (ERP) software package to create and print its output. However, the output is generated in PCL format, not in iSeries format (AFP). The business wants to route this job to their iSeries IPDS printers, both for higher speeds and for full OS/400 print management and error recovery.

Infoprint Server has integrated transforms, available as separate features, that take ASCII output data streams (PCL, PostScript, and PDF) and convert them to AFP format for printing.

Here is how this business can use the Infoprint Server components to meet its requirements:

1. From a Windows workstation, a user submits the document or report for printing on an IPDS printer using a printer shared through NetServer.
2. Alternatively, the application might run on the iSeries directly and create a USERASCII spooled file in an iSeries output queue.
3. Once routed to a queue supporting the IPDS printer, OS/400 Transform Manager is automatically invoked and runs the data stream conversion to AFP.
4. PSF is invoked to manage the print process to the IPDS printer. Printing on an IPDS printer requires a licence for PSF for OS/400.

An API is available to convert the job to AFP but not route it to print.

Figure 7 shows how Infoprint Server lets you print PCL, PDF, or PostScript documents from your workstation on IPDS printers.

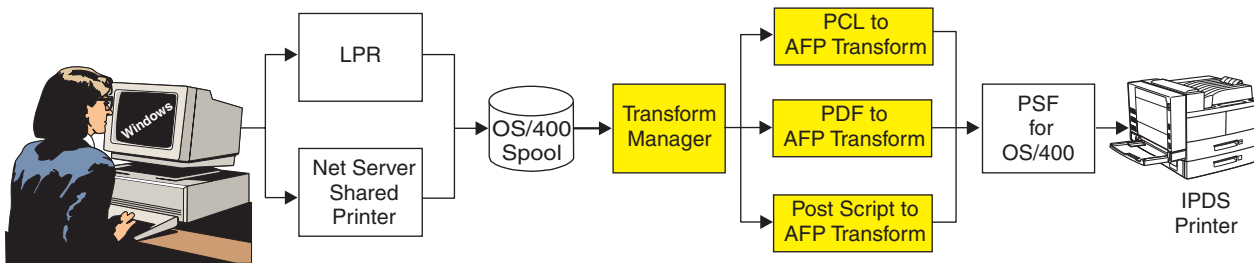


Figure 7. Printing documents from a Workstation on IPDS Printers

## Integrating Web and Network Images into iSeries Applications

A manufacturer has a imaging application on Windows that creates engineering drawings in JPEG format. The manufacturer wants to use the same drawing on a work order, but the work order is a line of business document produced by the iSeries.

Infoprint Server has a series of image transforms to convert ASCII image formats (JPEG, TIFF, and GIF) to iSeries format (IOCA page segments).

Here is how the manufacturer can use Infoprint Server components to meet its requirements:

1. The user invokes the Windows image transform to convert the JPEG file to an IOCA page segment.

This process could be automated by using the OS/400 Start PC Command (STRPCCMD) command that runs Windows commands from OS/400.

2. The user could use the AFP Manager component of iSeries Navigator to create the page segment on the iSeries. Alternatively, the user could use a network drive mapped to an iSeries to put the AFP output file in a shared folder, then use OS/400 commands to create it as a page segment on the iSeries.
3. A user application creates a spooled file that uses the new page segment.
4. The spooled file can now be sent to an IPDS printer or through Host Print Transform to a PCL printer. Through Infoprint Server, you could also send the job to a PDF printer or any of the many distribution options supported by Infoprint Server.

**Note:** Instead of creating a page segment from these images, GIF, TIFF, JPEG, and single page PDF objects can be included in the spooled file and sent to the PDF subsystem.

Figure 8 shows how Infoprint Server can transform images into AFP files.

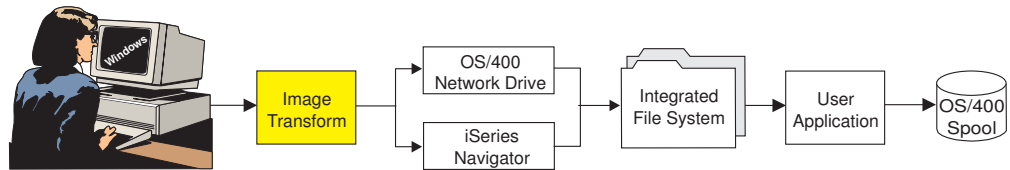


Figure 8. Transforming images into OS/400 resources

## Indexing Data for Navigation

A telephone company creates customer statements by using the external formatting capabilities on the iSeries (page definitions and form definitions designed by Infoprint Designer) together with AFP; this is called mixed data. This company wants its customer service representatives to be able to view the statements in the same format that the customer receives them. The company also wants the customer service representatives to be able to use the customer's name or phone number to quickly locate a customer's statement.

Here is how this company can use the Infoprint Server components to meet its requirements:

1. An application creates the data and puts it on the OS/400 spool.
2. The Create AFP Data (CRTAFPDTA) command:
  - a. Generates the document as an AFP stream file.
  - b. Puts the indexing information in an index object stream file.

**Note:** The indexing information can also be used as routing tags with the PDF subsystem for segmentation or PDF bookmarking.

- c. Gathers all of the needed resources into a resource stream file.
  - d. Concatenates all three stream files into a merged stream file.
3. Users can now view the indexed file on their workstation.

Figure 9 shows how you can use Infoprint Server to index data.

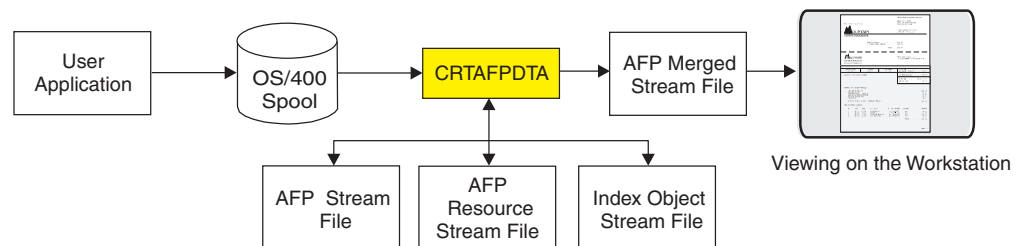


Figure 9. Indexing line, mixed, or AFP data



## Distributing AFP Output Electronically

A company creates complex documents that contain page segments, overlays, and bar codes. The documents are then printed and distributed to users within their network and external clients. This company wants to be able to distribute the documents electronically. However, because the documents use the structured architecture of AFP, there are external resources, such as fonts, images, and overlays that are not within the spooled file. The company wants a “portable” AFP file that can be moved and viewed around their company intranet.

Here is how this company can use the Infoprint Server components to meet its requirements:

1. An application creates the data and puts it on the OS/400 spool.
2. The Create AFP Data (CRTAFPDTA) command:
  - a. Generates the document as an AFP stream file.
  - b. Gathers all of the needed resources into a resource stream file.
  - c. Concatenates all three stream files into a merged stream file.
3. Users can now view the merged file on their workstation, use the file on another system, or archive the file. They can also use the AFP Viewer plug-in to view the file from a browser.

Figure 10 shows how you can use Infoprint Server to distribute AFP output electronically.

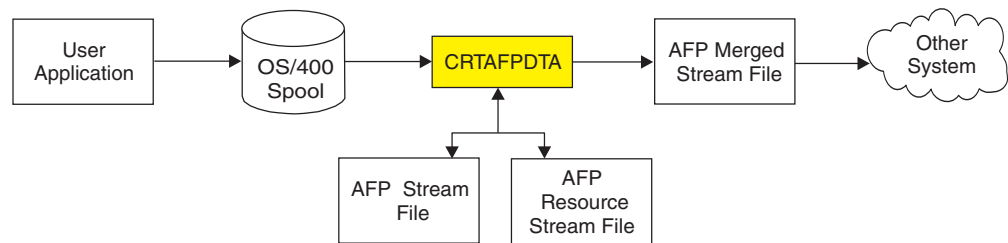


Figure 10. Packaging AFP data with its resources for electronic distribution



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## Chapter 3. Related Products

Following are some of the IBM products you can use with Infoprint Server:

- “Advanced Print Utility”
- “AFP Font Collection”
- “AFP Toolbox”
- “AFP Utilities” on page 24
- “AFP Viewer Plug-in” on page 24
- “Infoprint Designer for iSeries” on page 24
- “IBM Infoprint Fonts for Multiplatforms” on page 24
- “iSeries Access” on page 25

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### Advanced Print Utility

IBM Advanced Print Utility (APU) for iSeries (Program Number 5798-AF3) is a feature of AFP PrintSuite and Utilities for iSeries. It lets you transform your existing printed documents into dynamic electronic applications without making programming changes to your applications. APU is an application-independent tool that lets end-users convert SCS applications through a graphical interface.

For more information about APU, refer to this Web page:

<http://www.ibm.com/printers/R5PSC.NSF/Web/APU400Home>. For more information about AFP PrintSuite and Utilities for iSeries, refer to this Web page:  
<http://www.ibm.com/printers/R5PSC.NSF/Web/AFPPrintSuiteHome>.

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### AFP Font Collection

The IBM AFP Font Collection (Program Number 5648-B33) contains a wide selection of AFP fonts.

<http://www.ibm.com/printers/R5PSC.NSF/Web/AFPFontHome>.

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### AFP Toolbox

AFP Toolbox (Program Number 5798-AF2) is a feature of AFP PrintSuite and Utilities for iSeries. It helps application programmers format printed output. Without requiring knowledge of the AFP data stream, AFP Toolbox provides access to sophisticated AFP functions through a callable C, C++, COBOL, or RPG interface. With AFP Toolbox you can accomplish these tasks:

- Combine variable data with electronic forms, electronic signatures, and images.
- Define variable length paragraphs.
- Draw boxes that have fixed or variable depth and width.
- Generate bar code objects.
- Draw horizontal and vertical fixed or variable length lines.
- Include indexing tags for use in viewing, archiving, and retrieving documents.
- Accent printed output with color and shading.
- Dynamically control fonts, including user-defined fonts.
- Precisely position and align text anywhere on a page in a wide variety of fonts.
- Create graphical data objects such as pie charts and bar charts.
- Create tables of any complexity.

- Draw circles, partial circles, ellipses, and partial ellipses.

AFP Toolbox is available on OS/390, z/OS, AIX, and OS/400 platforms.

For more information about AFP Toolbox, refer to this Web page:  
<http://www.ibm.com/printers/R5PSC.NSF/Web/AFPToolHome>. For more information about AFP PrintSuite and Utilities for iSeries, refer to this Web page:  
<http://www.ibm.com/printers/R5PSC.NSF/Web/AFPPrintSuiteHome>.

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## AFP Utilities

AFP Utilities for iSeries (Program Number 5769-AF1) can simplify the creation of advanced design documents. AFP Utilities is made up of three interactive, menu-driven utilities: Overlay, Print Format, and Resource Management. Overlay Utility lets you design AFP electronic forms directly on an OS/400. Print Format Utility lets you build AFP reports without any application program. Resource Management Utility helps manage electronic forms and image resources.

For more information about AFP Utilities for iSeries, refer to this Web page:  
<http://www.ibm.com/printers/R5PSC.NSF/Web/AFPutilitiesHome>.

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## AFP Viewer Plug-in

The AFP Viewer plug-in displays documents that are in AFP format, such as documents downloaded from the OS/390 host or from the Web.

The AFP Viewer plug-in is available for Windows 95/98, Windows 2000, and Windows NT, and requires Netscape Navigator (Version 3.01 or higher) or Microsoft Internet Explorer (Version 3.01, Level 4.70.1215 or higher). You can obtain the AFP Viewer plug-in at no charge from the IBM Printing Solutions for iSeries Web page:  
<http://www.ibm.com/printers/r5psc.nsf/web/as400overview>.

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## Infoprint Designer for iSeries

Infoprint Designer for iSeries (Program Number 5733-ID1) is designed to create electronic output that optimizes customer and mission-critical communications such as statements, invoices, labels, and supply chain management documents. The product makes it easy to change documents and customer communications quickly, which helps you be responsive to customer needs. For more information, refer to this Web page: <http://www.ibm.com/printers/R5PSC.NSF/Web/ipdesignerHome>.

Infoprint Designer runs on Windows 95, Windows 98, Windows NT, and Windows 2000.

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## IBM Infoprint Fonts for Multiplatforms

IBM Infoprint Fonts for Multiplatforms (Program Number 5648-E77) includes the outline fonts available with AFP Font Collection for Workstations and OS/400 and the Type Transformer and Utilities optional feature, which enables you to edit and manage fonts. This product contains enhancements to the GUIs available with AFP Font Collection and Type Transformer, as well as enhancements for Eastern European and Asia Pacific languages and more support for China and Japan.

For more information about Infoprint Fonts for Multiplatforms, refer to this Web page:

<http://www.ibm.com/printers/R5PSC.NSF/Web/ipfontshome>

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## iSeries Access

IBM iSeries Access for Windows (Program Number 5722-XW1) provides PC-to-iSeries connectivity. It provides a single solution to meet the desktop user's needs, such as working with databases or other data stored on the server, running 5250 applications, or administering the iSeries environment. Through the iSeries Navigator and AFP Workbench Viewer components, you can manage AFP resources and view AFP files. For more information, refer to this Web page: <http://www.ibm.com/servers/eserver/iseries/access/>.

iSeries Access runs on Windows 2000, Windows XP, and Windows NT.

## iSeries Navigator

iSeries Navigator, a component of iSeries Access, is the graphical user interface for managing your iSeries servers. iSeries Navigator makes operation and administration of the server easier and more productive. For instance, you can copy a user onto another system by dragging the user from one server to the other. Wizards guide you through setting up security, TCP/IP, and more.

The AFP Manager plug-in to iSeries Navigator lets you manage your AFP resources, PSF configuration objects, and font mapping tables. iSeries Navigator gives you one-step access to the Infoprint Manager PDF subsystem. This lets you convert a spooled file to PDF and e-mail it, store it as a stream file, or put it on an output queue. For more information about iSeries Navigator, refer to this Web page <http://www-1.ibm.com/servers/eserver/iseries/navigator/>.

iSeries Navigator runs on Windows XP Professional, Windows 2000, Windows ME, Windows98, Windows NT 4.0, and Windows 95.



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# Glossary

This glossary defines technical terms and abbreviations used in Infoprint Server documentation. If you do not find the term you are looking for, refer to the index of this publication or view *IBM Dictionary of Computing*, located at:

<http://www.ibm.com/networking/nsg/nsgmain.htm>

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Definitions that are specific to IBM products are so labeled—for example, “In SNA,” or “In the 3820 printer.”

These cross-references are used in this glossary:

- **Contrast with.** Refers to a term that has an opposite or substantively different meaning.
- **See.** Refers to multiple-word terms in which this term appears.
- **See also.** Refers to related terms that have similar, but not synonymous, meanings.
- **Synonym for.** Appears in the commentary of a less desirable or less specific term and identifies the preferred term that has the same meaning.

- **Synonymous with.** Appears in the commentary of a preferred term and identifies less desirable or less specific terms that have the same meaning.

## A

**Advanced Function Presentation (AFP).** A set of licensed programs, together with user applications, that use the all-points-addressable concept to print on presentation devices. AFP includes creating, formatting, archiving, retrieving, viewing, distributing, and printing information. See *presentation device*.

**AFP.** See *Advanced Function Presentation*.

**AFP data stream.** A presentation data stream that is processed in the AFP environment. MO:DCA-P is the strategic AFP interchange data stream. IPDS is the strategic AFP printer data stream.

**AFP Workbench Viewer.** (1) An OS/2 or Windows IBM-licensed PC product that lets you see AFP output in a WYSIWYP (what-you-see-is-what-you-print) format. (2) An OS/2 or Windows platform for the integration of AFP-enabling applications and services.

**AFPDS.** A term formerly used to identify the composed page, MO:DCA-P-based data stream interchanged in AFP environments.

**anchor.** The point in a document that signals to CRTAFPDTE the beginning of a group of pages, after which it adds indexing structured fields to delineate this group.

**architecture.** The set of rules and conventions that govern the creation and control of data types such as text, image, graphics, font, fax, color, audio, bar code, and multimedia.

**ASCII.** American National Standard Code for Information Interchange data encoding, which is the normal (default) type of data encoding in an AIX environment. Contrast with *EBCDIC*.

## B

**Bar Code Object Content Architecture (BCOCA).** An architected collection of control structures used to interchange and present bar code data.

**BCOCA.** See *Bar Code Object Content Architecture*.

**bin.** A paper supply on a cut-sheet printer. See also *cassette*.

## C

**carriage control character.** An optional character in an input data record that specifies a write, space, or skip operation.

**cassette.** In a cut-sheet printer, a movable enclosure for paper supply. See also *bin*.

**character.** (1) A symbol used in printing. For example, a letter of the alphabet, a numeral, a punctuation mark, or any other symbol that represents information. (2) A byte of data.

**coded font.** A font library member that associates a code page and a font character set. For double-byte fonts, a coded font associates more than one pair of code pages and font character sets.

**code page.** A font component that associates code points with character identifiers. A code page also identifies how undefined code points are handled.

**code point.** A one-byte code representing one of 256 potential characters.

**concatenate.** (1) To link together. (2) To join two character strings.

**concatenated data set.** In iSeries 400, a group of logically connected data sets that are treated as a single data set for the duration of a job step. See also *data set*.

**continuous forms.** A series of connected forms that feed continuously through a printing device. The connection between the forms is perforated to enable a user to tear them apart. Before printing, the forms are stacked, folded along the perforations. Contrast with *cut-sheet paper*.

**control character.** A character that starts, changes, or stops any operation that affects recording, processing, transmitting, or interpreting data (such as carriage return, font change, and end of transmission).

**cut-sheet paper.** Paper that is cut into separate sheets before it is printed on. Contrast with *continuous-forms paper*.

## D

**data description specifications.** A description of the user's database or device files that is entered into the system in a fixed form. The description is then used to create files.

**data set.** A named set of records stored and processed as a unit. Synonym for *file*.

**data stream.** (1) All information (data and control commands) sent over a data link, usually in a single

read or write operation. (2) A continuous stream of data elements being transmitted, or intended for transmission, in character or binary-digit form, using a defined format.

**default.** An attribute, value, or option that is assumed when none is explicitly specified. (1)

**DDS.** See data description specifications

**document.** (1) A publication or other written material pertaining to a specific subject or related subjects. (2) In word processing, a collection of one or more lines of text that can be named and stored as a separate entity.

**double-byte coded font.** A font in which each character is defined by two bytes, of which the first defines a coded font section, and the second defines a code point in that section. Double-byte coded fonts are needed for the support of languages requiring more than 256 graphic characters; two bytes are required to identify each graphic character. Kanji is printed by using a double-byte font. Contrast with *single-byte coded font*.

**download.** To transfer data from a processing unit to an attached device such as a microcomputer for processing.

**duplex printing.** Printing on both sides of a sheet of paper. Contrast with *simplex printing*.

## E

**EBCDIC.** Extended binary-coded decimal interchange code.

**electronic overlay.** A collection of constant data, such as lines, shading, text, boxes, or logos, that is electronically composed in the host processor and stored in a library, and that can be merged with variable data during printing. Contrast with *page segment*. See also *overlay*.

**enabled.** (1) Pertaining to a state of the processing unit that allows certain types of interruption. (2) A condition of the printer (physically selected) in which the printer is available to the host processor for normal work. Contrast with *disabled mechanism*.

**end-user interface.** A method by which a customer can obtain the services of a product, for example, coding samples, commands and command lists. Every product does not have an end-user interface; some products provide their services through programming interfaces, some provide services through a command line interface, and others provide their services only to other products.

**escape character.** The control character X'2BD3' in a text-control sequence that indicates the beginning of the sequence and the end of any preceding text.

**euro.** The monetary unity of the European Monetary Union (EMU), introduced alongside national currencies on the first of January, 1999.

**EuroReady product.** A product is EuroReady if the product, when used in accordance with its associated documentation, is capable of correctly processing monetary data in the euro denomination, respecting the euro currency formatting conventions (including the euro sign). This assumes that all other products (for example, hardware, software, and firmware) that are used with this product are also EuroReady. IBM hardware products that are EuroReady might or might not have an engraved euro sign key on their keyboards.

**exception.** A condition that exists when the printer:

- Detects an invalid or unsupported command, order, control, or parameter value from the host
- Finds a condition of which the host system must be notified
- Detects a condition that requires the host system to re-send data

**exception highlighting.** The markings placed on the printed page to indicate the location of an error in the data stream.

**execution.** The process of carrying out an instruction or instructions of a computer program by a computer. (I) (A)

**extended binary-coded decimal interchange code (EBCDIC).** A coded character set of 256 eight-bit characters.

## F

**font.** A family or assortment of characters of a given size and style; for example, 9-point Bodoni Modern. (A)

**font character set.** Synonym for *character set*.

**form.** A division of the physical medium; multiple forms can exist on a physical medium. For example, a roll of paper might be divided by a printer into rectangular pieces of paper, each representing a form. An envelope is an example of a physical medium that has only one form. The IPDS architecture defines 4 types of form: cut-sheets, continuous forms, envelopes, and computer output on microfilm. Each type of form has a top edge, a front side, and a back side. Synonymous with *sheet*.

**format.** (1) A specified arrangement of such things as characters, fields, and lines, usually used for displays, printouts, or files. (2) To arrange such things as characters, fields, and lines. (3) To prepare a document for printing in a specified format.

**form definition.** A resource that PSF uses to define the characteristics of a form; it specifies overlays to be used (if any), paper source (for cut-sheet printers),

duplex printing, text suppression, the position of MO:DCA data on the form, and the number of copies and modifications of a page.

## G

**GOCA.** See *Graphic Object Content Architecture*.

**Graphic Object Content Architecture (GOCA).** An architecture that provides a collection of graphics values and control structures used to interchange and present graphics data.

**group.** A named collection of sequential pages that form a logical subset of a document.

## H

**hardcopy.** (1) A copy of a display image that is generated on an output device such as a printer or plotter and that can be carried away. (T) (2) A printed copy of machine output in a visually readable form, for example, printed reports, listings, documents, and summaries.

**hexadecimal.** Pertaining to a numbering system with base of 16; valid numbers use the digits 0 through 9 and characters A through F, where A represents 10 and F represents 15.

**host font.** See *host resource*.

**host processor.** The processing unit to which the page printers are attached through a data-transfer interface.

**host resource.** A resource found in a system library, in a user library, or inline in the print data set.

**host system.** (1) A data processing system that prepares programs and operating environments for another computer or controller. (2) The data processing system to which a network is connected and with which the system can communicate.

## I

**image.** A pattern of toned and untoned pels that form a picture.

**image data.** A pattern of bits, with values of 0 and 1, that defines the pels in an image. (A 1-bit is a toned pel.)

**Image Object Content Architecture (IOCA).** An architected collection of constructs used to interchange and present images.

**indexing.** In CRTAFPDTA, a process of matching reference points within a file and creating structured field tags within the MO:DCA document and the separate index object file.

**indexing with data values.** Adding indexing tags to a MO:DCA document using data that is already in the document and that is consistently located in the same place in each group of pages.

**indexing with literal values.** Adding indexing tags to a MO:DCA document by assigning literal values as indexing tags, because the document is not organized such that common data is located consistently throughout the document.

**index object file.** A file created by CRTAFPDTA that contains Index Element (IEL) structured fields, which identify the location of the tagged groups in the AFP file. The indexing tags are contained in the Tagged Logical Element (TLE) structured fields.

**Infoprint Manager for iSeries 400.** A software component of IBM Infoprint. IBM Infoprint Manager for iSeries 400 handles the scheduling, archiving, retrieving, and assembly of a PCL, PDF, or PostScript to AFP transform job and its related resource files.

**IOCA.** See *Image Object Content Architecture*.

**initialize.** (1) In programming languages, to give a value to a data object at the beginning of its lifetime. (I) (2) To set counters, switches, addresses, or the contents of storage to zero or other starting values at the beginning of, or at prescribed points in the operation of, a computer routine. (A) (3) To prepare for use; for example, to initialize a diskette.

**inline.** The direction of successive characters in a line of text. Synonymous with *inline direction*.

**inline direction.** The direction of successive characters in a line of text.

**inline resource.** A resource contained in the print data set.

**input/output (I/O).** Pertaining to a device whose parts can perform an input process and an output process at the same time. (I)

**Intelligent Printer Data Stream (IPDS).** (1) The data stream generated by PSF to send to an IPDS page printer. (2) An all-points-addressable data stream that enables users to position text, images, and graphics at any defined point on a printed page.

**interface.** A shared boundary. An interface can be a hardware component used to link two devices, or it can be a portion of storage or registers accessed by two or more computer programs.

**I/O.** Input/output.

**IPDS.** See *Intelligent Printer Data Stream*.

## L

**library.** A file or a set of related files, for example, a page definition library containing one or more page definition files.

**licensed program.** A utility that performs a function for the user and usually interacts with and relies upon system control programming or some other IBM-provided control program. A licensed program contains logic related to the user's data and is usable or adaptable to meet specific requirements.

**line data.** Data prepared for printing on a line printer such as an IBM 3800 Printing Subsystem Model 1. Line data is usually characterized by carriage control characters and table reference characters. Contrast with *MO:DCA-P*. It is externally formatted with page definitions and form definitions.

**line printer.** A device that prints a line of characters as a unit. (I) (A) Contrast with *page printer*.

**logical page.** A presentation space. One or more object areas or data blocks can be mapped to a logical page. A logical page is rectangular and has specifiable characteristics such as size, shape, orientation, and offset. Orientation and offset are specified relative to a coordinate system for the medium.

**logical page origin.** (1) The point on the logical page from which the positions of images, graphics, page overlays, and text with 0-degree inline direction are measured. (2) The point on the logical page represented by Xp=0, Yp=0 in the Xp coordinate system.

## M

**macro.** Synonym for *macroinstruction*.

**macroinstruction.** An instruction that causes the execution of a predefined sequence of instructions.

**Microfilm device.** An output device that presents a hardcopy on microfilm.

**migration.** Activities that relate to the installation of a new version or release of a program to replace an earlier level. Completion of these activities ensures that the applications and resources on your system will function correctly at the new level.

**Mixed Object Document Content Architecture.** A strategic, architected, device-independent data stream for interchanging documents.

**MO:DCA.** See *Mixed Object Document Content Architecture*.



**MO:DCA data.** Print data that has been composed into pages. Text-formatting programs such as DCF can produce composed text data consisting entirely of structured fields.

**MO:DCA data page.** A page of print data consisting entirely of structured fields.

**MO:DCA print data set.** A print data set consisting entirely of structured fields.

**MO:DCA-P.** Mixed Object Document Content Architecture for Presentation.

## N

**nested resource.** A resource mapped in an overlay.

## O

**OS/400.** The iSeries operating system.

**outline font.** A font technology in which the graphic character shapes are represented in digital form by a series of mathematical expressions that define the outer edges of the strokes. The resulting graphic character shapes can be either solid or hollow. Outline fonts can be scaled (sized) to any size. The IBM outline font character sets have a prefix of CZ. Contrast with *raster font*.

**overlay.** See *electronic overlay*.

## P

**page.** A collection of data that can be printed on a physical sheet of paper.

**page segment.** A resource containing MO:DCA data and images, prepared before formatting and included as part of the input for a print job.

**parameter.** (1) A variable that is given a constant value for a specified application and that may denote the application. (I) (A) (2) An item in a menu for which the user specifies a value or for which the system provides a value when the menu is interpreted. (3) Data passed between programs or procedures.

**pel.** See *picture element*.

**physical medium.** A physical entity on which information is presented. Examples of physical media are display screens, paper, foils, microfilm, and labels.

**picture element.** An element of a raster pattern about which a toned area on the photoconductor might appear. See also *raster pattern*. Synonym for *pel*.

**point.** A unit of measurement about 1/72 of an inch; used in measuring the height of a font. Contrast with *pitch*.

**point size.** The height of a font in points.

**print job.** The data that a user submits to PSF for printing.

**Print Services Facility (PSF).** PSF is a licensed IBM program that manages and controls the input data stream and output data stream required by supported IBM page printers. PSF manages printer resources such as fonts, images, electronic forms, form definitions, and page definitions, and provides error recovery for print jobs.

When printing line data, PSF supports external formatting using page definitions and form definitions. This external formatting extends page printer functions such as electronic forms and use of typographic fonts without any change to applications programs.

**printable area.** The area on a sheet of medium on which print can be placed.

**printer.** A presentation device that produces hardcopy output. See *presentation device*.

**processor.** In a computer, a functional unit that interprets and executes instructions. (I) (A)

**PSF.** See *Print Services Facility*.

## R

**raster font.** A font technology in which the graphic characters are defined directly by the raster bit map. Contrast with *outline font*.

**record format line data.** A form of line data where each record is preceded by a 10-byte identifier.

**resolution.** In computer graphics, a measure of the sharpness of an image, expressed as the number of lines and columns on the display screen or the number of pels per unit of linear measure.

**resource.** (1) A collection of printing instructions used by PSF in addition to the print data set to produce printed output. PSF resources include coded fonts, font character sets, code pages, page segments, overlays, form definitions, and page definitions. (2) Any source of aid used for performing a task, such as disk storage space, computer processing time, and communication lines.

**resource name.** The name under which a resource object is stored, the first two characters of which indicate the resource type:

<b>X0-XG,XZ</b>	Coded font
<b>T1</b>	Code page
<b>C0-CG,CZ</b>	Font character set

<b>S1</b>	Page segment
<b>F1</b>	Form definition
<b>P1</b>	Page definition
<b>O1</b>	Overlay
<b>H1</b>	Recommended for microfilm

**rotation.** The number of degrees a graphic character is turned relative to the page coordinates.

## S

**segment.** Synonym for *page segment*.

**sheet.** A division of the physical medium on which data is presented. The IPDS architecture defines 4 types of sheet: cut-sheet forms, continuous forms, envelopes, and computer output on microfilm. Each sheet has a front side and a back side. Some types of media consist of multiple sheets; for example, a roll of continuous forms can be divided at the perforations into rectangular sheets. Each sheet usually has carrier or tractor-feed strips, also. Microfilm is another example of a medium comprising multiple sheets, whereas an envelope has only one sheet. Synonymous with *form*.

**simplex printing.** Printing on only one side of the paper. Contrast with *duplex printing*.

**single-byte coded font.** A font in which the characters are defined by a one-byte code point. A single-byte coded font contains only one coded font section. Contrast with *double-byte coded font*.

**spooled file.** A file created by an application program that contains the actual information to be printed and some of the data that controls the format of the printing. Spooled files can contain MO:DCA-P data, line data, or a combination of MO:DCA-P and line data.

**structured field.** A self-identifying, variable-length, bounded record that can have a content portion that provides control information, data, or both.

**syntax.** The rules and keywords that govern the use of a programming language.

## T

**table reference characters (TRC).** An optional control character in an input record that identifies the font with which the record is to be printed. The table reference character corresponds to a font number defined in a page definition font list or to the order of font names listed in the CHARS parameter in the JCL.

**tag.** A type of structured field used for indexing in an AFP document. Tags associate an index attribute - value pair with a specific page or group of pages in a document.

**terminate.** (1) To stop the operation of a system or device. (2) To stop execution of a program.

**text.** A graphic representation of information on an output medium. Text can consist of alphanumeric characters and symbols arranged in paragraphs, tables, columns, or other shapes.

**token ring.** A network configuration in which tokens are passed in a circuit from node to node. A node that is ready to send can capture the token and insert data for transmission.

**trace.** A record of the execution of a computer program. It exhibits the sequences in which the instructions were executed. (A)

**TRC.** See *table reference character*.

**trigger.** Data values for which CRTAFPDTA searches, to delineate the beginning of a new group of pages. The first trigger is then the anchor point from which CRTAFPDTA locates the defined index values. See *anchor point*.

## U

**upload.** (1) To transfer programs or data from a connected device, typically a personal computer, to a computer with greater resources. (T) (2) To transfer data from a device, such as a workstation or a microcomputer, to a computer. Contrast with *download*.

## V

**Viewer.** See *AFP Workbench Viewer*.

## X

**X-axis.** In printing, an axis perpendicular to the direction in which the paper moves through the printer. See also *Y-axis*.

**X-extent.** A measurement along the X-axis.

## Y

**Y-axis.** In printing, an axis parallel to the direction in which the paper moves through the printer. See also *X-axis*.

**Y-extent.** A measurement along the Y-axis.



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## Bibliography

This bibliography lists the titles of publications containing additional information about Infoprint Server for iSeries, the OS/400 operating system, Advanced Function Presentation, and related products.

The titles and order numbers may change from time to time. To verify the current title or order number, consult your IBM marketing representative.

You can obtain many of the publications listed in this bibliography from the Printing Systems Digital Library: <http://www.ibm.com/printers/r5psc.nsf/web/manuals> or the Online Publications Website: <http://publib.boulder.ibm.com/>

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### Infoprint Server

Publication	Order Number
<i>Infoprint Server for iSeries: User's Guide</i>	G544-5775-03
<i>Infoprint Server for iSeries: Introduction and Planning Guide</i>	G544-5774-02

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### Advanced Function Presentation (AFP)

Publication	Order Number
<i>iSeries Guide to Output</i>	S544-5319-05
<i>Printing and Publishing Cluster Collection CD-ROM</i>	SK2T-2921

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### Infoprint Designer

Publication	Order Number
<i>Infoprint Designer for iSeries: Getting Started</i>	G544-5773-03

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### OS/400

Publication	Order Number
<i>iSeries Guide to Output</i>	S544-5319-05
<i>CL Programming</i>	<i>CL Programming</i>
<i>Printer Device Programming</i>	SC41-5713-06
<i>Install, upgrade, or delete OS/400 and related software</i>	SC41-5120-07

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## Printers

Publication	Order Number
<i>IBM Printing Systems: Printer Summary</i>	S544-5749
<i>IBM Printing Systems: Printer Information</i>	S544-5750

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## PrintSuite

Publication	Order Number
<i>Advanced Print Utility for iSeries: User's Guide</i>	S544-5351-03
<i>iSeries: Printing with SAP R/3</i>	S544-5412-02
<i>Page Printer Formatting Aid: User's Guide</i>	S544-5284-07
<i>AFP Toolbox for Multiple Operating Systems: User's Guide</i>	S544-5292-04

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## Redbooks

Publication	Order Number
<i>IBM AS/400 Printing V</i>	SG24-2160
<i>IBM @server iSeries Printing VI: Delivering the Output of e-business</i>	SG24-6250

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## TCP/IP

Publication	Order Number
<i>Internetworking with TCP/IP, Principles, Protocols, and Architecture</i>	SC31-6144
<i>TCP/IP Tutorial and Technical Reference</i>	GG24-3376
<i>TCP/IP Configuration and Reference</i>	SC41-5420-04

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Introduction and Planning Guide  
Version 5, Release 3.0

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