# Chapter 2. Using the Infoprint Server for iSeries PDF transform

Infoprint Server for iSeries, 5722-IP1, enables the production of Adobe Portable Document Format (PDF) files from any iSeries output at V5R1. PDF files are probably the most common document type on the Internet and company intranets. Even personal PC users generally have access to the free Adobe Acrobat Reader software required for viewing. Add to this the ability to read PDF documents on Apple Mac and UNIX systems, and the business case for producing PDF files from your iSeries server becomes very strong.

This chapter answers the following questions:

- Why use the Infoprint Server PDF transform?
- How does it work?
- Setting up your PDF virtual printer
- How do I use the PDF transform to:
- Creating a PDF file for storing on an output queue
- E-mail a single PDF file
- Creation of multiple PDF files
- Additional considerations
- Compare AFP and PDF files
- Viewing an AFP indexed file
- Viewing and indexing PDF Files with Adobe Acrobat

To use the PDF transform on the iSeries, you require only Infoprint Server for iSeries, 5722-IP1

This product has a minimum OS/400 level of Version 5 Release 1. It is sold with a One-Time Charge (OTC), priced by system processor size (one of six software groups) and requires only one licence per system.

Infoprint Server is one of the products delivered as iSeries Keyed Media. This means that the product is available on a 70-day trial basis, and is shipped with every copy of the OS/400 V5R1 media. After 70 days a Software License Key is required to continue to use the product. If this is not ordered, received and installed within the 70 days, further use of the product is disabled.

## 2.1 Why use the Infoprint Server PDF transform

As business applications are transformed to e-business implementations, the traditional print and distribute process needs to give way to electronic distribution (with printing optionally taking place at the point of use). "E-output" is a good descriptive term that for this transformation. Infoprint Server for iSeries provides two formats for the electronic distribution of output -- PDF and portable AFP. Portable AFP is enabled with the Create AFP Data (CRTAFPDTA) and is discussed in Chapter 1, "Infoprint Server for iSeries - CRTAFPDTA" on page 3. This section addresses the use of PDF. Using the PDF and integrated e-mail functions, the following kinds of "e-output" applications can be implemented:

- **Inbound electronic access**: Monthly sales reports have normally been printed, burst, and mailed in hard copy format to the sales regions.   The desired transformation would be to continue to produce the sales report in the iSeries output queue but in lieu of printing, convert it to PDF, and place in the Integrated File System (IFS) for web or client access.

- **Outbound electronic distribution**: Consider the same sales reporting application. The current process produces one print file that contains reports for multiple sales regions. The desired transformation is to electronically segment the reports for the individual regions, and e-mail them as PDF files to the each region's sales manager.

- **Outbound distribution with segmentation**: Order entry has been web-enabled. Producing hard copy order confirmations defeats the purpose of taking the order process online. The desired transformation is to produce order confirmations as PDF documents and e-mail them automatically to each customer.

- **PDF printing**: Any standard iSeries print file can be transformed to PDF and re-queue to an iSeries output queue. This would enable printing on PDF-capable printers.

The integrated PDF and e-mail subsystem provided with Infoprint Server has a number of characteristics that are important in implementing these kinds of applications:

- **Input spool file type and complexity**: PDF transform services provides for the transformation of any standard iSeries (AS/400) output format into PDF. This includes standard SCS (SNA Character Set, or line mode), extended SCS (for example, OV/400 formats), AFP, mixed mode AFP, IPDS, and line data spooled files. The one format that is not handled (and is not strictly standard) is USERASCII. The supported list comprises all levels of document complexity up to and including AFP.

- **PDF fidelity**: Several emulation modes and the manner is which the input data stream is transformed work to ensure accurate fidelity in the output PDF.

- **Performance options**: Options, such as whether or not to embedded fonts within the PDF, can be used to balance system and network performance. Embedded fonts ensure accurate fidelity but these fonts can be dropped if the receiving browser or client PC has equivalent fonts available.

- **PDF format**: The PDF produced by Infoprint Server is text-based, fully navigable, and high-performance. This means that the output data encoded in EBCDIC is converted to ASCII but remains data, not a bitmap.

- **Distribution options**: The PDF server is designed to provide three destination options. Once the PDF file is generated, it can be:
  – Passed to the integrated e-mail function
  – Written to the Integrated File System (IFS)
  – Written back to an output queue

  This enables "outbound" electronic distribution via e-mail, "inbound" electronic distribution via browser or client access to the IFS, or direct printing of PDF to PDF-capable printers.

- **Integrated e-mail**: One of the output options is e-mail. This is an integrated function that occurs automatically based on the PDF subsystem setup.

- **Segmentation**: Segmentation is the capability to create multiple PDF files out of a single output file. This "electronic burst and bind" is the function we referenced earlier in the sales report scenario. With V5R1, there are several new techniques, including changes to DDS (Data Description Specifications) group keywords by which you can insert triggers into a spool file that signal to the PDF server that you want multiple PDF files created. The multiple output

PDF files can be passed to e-mail, written to IFS, or written back to output queues.

- **Customization**: A user exit built into the PDF processing provides for making file placement or e-mail decisions "on-the-fly". For example, the user exit can take some element of data (for example, customer number) and do a lookup in the database for e-mail ID.

## 2.2 How Infoprint Server PDF transform works

PDF support is integrated into the iSeries output architecture by using a virtual printer technique. This section provides an introduction to the different components that comprise the PDF subsystem and how your PDF applications flow through them.

Several various components, including the printer file, DDS (Data Description Specifications), PSF configuration object, and customer exit programs, control exactly how the PDF transformation process flows.

These components determine whether single or multiple PDF files are created, where the PDF file(s) are routed after transformation (directly to e-mail, to IFS, or back to an output queue), and any customization (e-mail content, e-mail ID, IFS file naming, error tracking) that is required.

A PSF configuration object linked to an IPDS device description is used to specify the PDF transform. Any spooled file that is placed the output queue for this device is processed to PDF format.

Integrating the PDF support as a virtual printer enables OS/400 (specifically, PSF/400) to pre-process different types of spooled file formats supported on the iSeries to a common format -- IPDS -- prior to passing to the PDF transform subsystem. The PDF transform subsystem, therefore, is an IPDS to PDF transform.

> **Note**
>
> PSF/400 is an integral part of this process but a license for PSF/400 is not required. A license for PSF/400 is only required if PSF/400 is driving and managing real IPDS printers.

Common documents formats are gaining importance in the IT world. The IBM AFP architecture is one of the important portable document formats supported on different operating systems. Use the PDF transform to take advantage of both architecture.

Let's use Figure 10 to take a closer look at how the PDF and e-mail processes work.
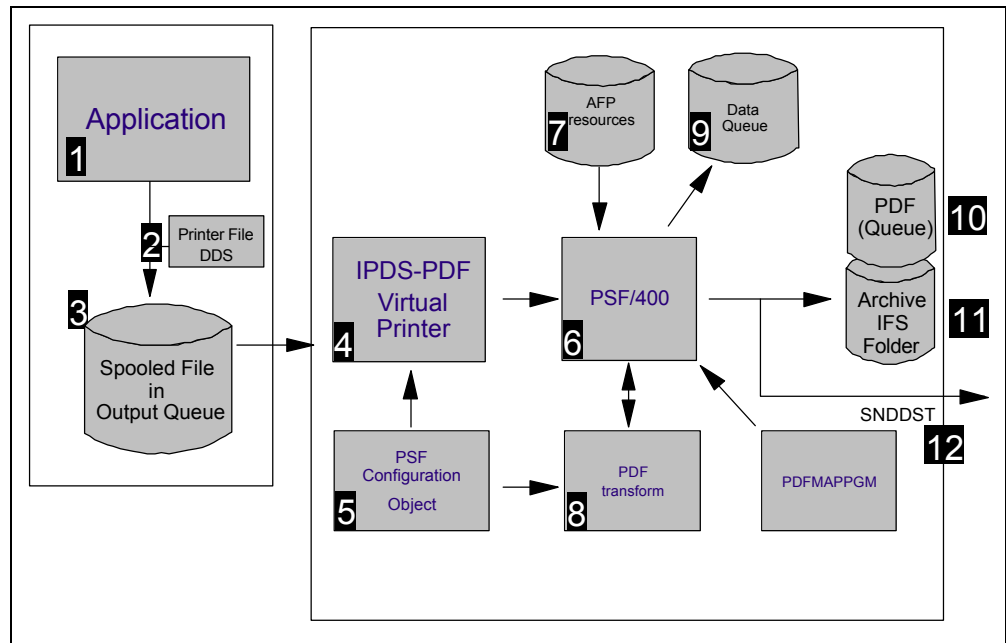
*Figure 10. PDF transform flow*

The numbers of the flow in Figure 10 correspond to the numbers in the following explanation:

1. An application program creates output, normally using either program-described (internal to the program) or externally-described (DDS) output specifications. The application program could also produce simple output and rely on external formatting objects (AFP formatting resources such as page definitions and form definitions) to complete the final output data stream.

2. Every iSeries program that creates output has an associated printer file. The printer file determines many aspects of what is actually written to the output queue, including data stream type (AFPDS, IPDS, SCS, line data, AFP mixed mode), page characteristics, and even detailed page formatting characteristics (if page/form definitions are referenced). Specific printer file parameters or DDS keywords may be used to:
   Directly specify the target e-mail ID for a spooled file using the User Defined Data (USRDFNDTA) parameter of the printer file.
   Optionally, the printer file can include DDS specifications. Changes to the DDS keywords Start Page Group (STRPAGGRP) and End Page Group (ENDPAGGRP) with V5R1 can be used to specify the breaks or "triggers" for segmenting the pages in a spooled file. This parameters can also be used to provide indexing and addressing for e-mail. A typical example is to group several pages related to an invoice for a unique customer. A single PDF for a group and sent to a dedicated e-mail address. Chapter 14, "End-to-end example" on page 243, provides an example how to use most of the Infoprint Server components.

3. All iSeries spooled file are written to an output queue and all spooled file types except USERASCII are supported by the Infoprint Server PDF transform. These iSeries spooled files types include:

   • IPDS

- AFP
- Line data
- AFP mixed mode
- SCS, including DBCS and OV/400 extensions to SCS

There are some printer-specific applications that use embedded printer commands (escape sequences) in the supported spooled file types. These embedded commands are not supported with the PDF transform.

The transform process is invoked as soon as a supported spooled file appear as "Ready" in the Output Queue.

4. As the PDF transform subsystem works as an virtual IPDS printer, a printer device description needs to be created for each different PDF process.   A specific loopback address is used in place of a standard TCP/IP address. A PSF configuration object is linked to the device description using the user defined object parameter. Those will influence the exact appearance of the resulting PDF file(s). How to create and seupt a virtual printers is describe in 2.3, "Setting up your PDF virtual printer" on page 38

5. With V5R1, the PSF configuration object has been expanded to include a series of additional parameters that are used to define and control how the PDF transform operates. Those parameters include:

   - Destination of the generated PDF file to- e-mail, IFS, or output queue
   - PDF device emulation type
   - PDF paper size drawer 1 and drawer 2
   - Single or multiple PDF files
   - PDF data queue
   - Sender of e-mail
   - PDF user exit program
   - Generate PDF output

6. Print Services Facility 400 (PSF/400) is the overall manager of the PDF and e-mail process. As the PDF transform functions as a virtual printer, the same interfaces that PSF/400 manages in printing to a real IPDS printer (for example, PSF configuration object, printer file, AFP resource objects) are used.   Management of the actual PDF transform process is an added task. Licensing of PSF/400 is not required when PSF/400 is used in this role.

7. The integrated AFP architecture on iSeries uses a series of resource objects external to the print data stream to produce the final output.   Again, PSF/400 manages the retrieval and processing of the AFP resources to compose the IPDS data stream. This IPDS data stream will be pass from PSF/400 to the PDF transform with all required AFP resources as:

   - Coded fonts
   - Font character sets
   - Code pages
   - Page segments
   - Overlays
   - Form definitions
   - Page definitions

8. This is the actual PDF transform component, converting input IPDS to PDF output. Transform services include EBCDIC to ASCII translation, AFP to Adobe Type 1 dynamic font transformation, image conversion, and

single/multiple PDF file creation. The PDF data are returned to PSF/400 after the transform process is completed.

9. Data queue where the PDF and e-mail process will log completion data.

10. Writing the resulting PDF file(s) back to an iSeries output queue is one of three options with the PDF transform. This would enable spooled files to be sent directly to PDF-capable printers.

11. Writing the resulting PDF file(s) to an integrated file system (IFS) directory is another option. Using *STMF as the PDFGEN parameter in the PSF configuration object will control this action.

12. E-Mail Passing the resulting PDF file(s) to the e-mail process is the third option. Using *MAIL as the PDFGEN parameter in the PSF configuration object triggers this result. The Send Distribution (SNDDST) e-mail server function is automatically invoked for the physical e-mail operation

    An optional feature of the e-mail process is the insertion of e-mail exit program (PDFMAPPGM). This program is used to lookup a valid e-mail ID based on data in the USRDTA field or data within the Start Page Group keyword in DDS.

PDF (portable data format) may be used to distribute informations in common format. PDF is viewable with the Adobe Acrobat Reader. The Adobe Acrobat can be used to add information like Annotations or index to your PDF files. Following spooled files elements may be converted:

- Text
- Graphics
- Images
- Bar codes (see Barcode displayed in a PDF file)
- Color elements and resources

## 2.3 Setting up your PDF virtual printer

The PDF transform works as an virtual IPDS printer. PSF/400 (Print Service Facility 400) is used to invoke the transform process. From an user point of view, the transform looks like an IPDS printer.

Some of the characteristics of the virtual printer are used to create the PDF document. This section show how to create the virtual printer description used by the PDF transform. A minimum of one description is required.

We can speak from different possible process using the transform. For each possible destination as an Output Queue, IFS or e-mail, the original spooled data may be split into different PDF files regarding the group information created with STRPAGGRP ENDPAGGRP keyword in DDS. The PSF configuration options have to be defined to activate the destination.

Figure 11 on page 39 represent the relation between the IPDS virtual printer, the PSF configuration object and the PDF destination.

Figure 11 on page 39 represents a typical implementation of multiple PDF functions. Each PDF output queue and printer device description is set up for a different function. In this example, PDF queue 1 is set up to take input spooled files, convert them to PDF, and re-queue them to an iSeries output queue. PDF

queue 2 is set up to write single or multiple PDF files to IFS, And, PDF queue 3 is set up to produce single or multiple PDF files and automatically e-mail them using the Send Distribution e-mail function. Since different applications might have different PDF and e-mail requirements, you might set up multiple PDF queues for e-mail, each differing in set-up parameters or in which e-mail exit program is used.
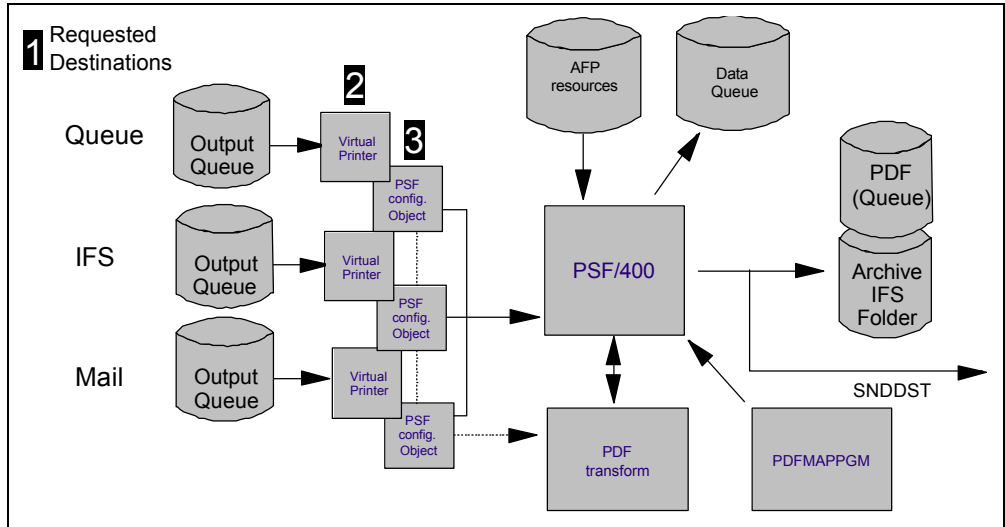


*Figure 11.  Multiple PDF virtual printer*

Note the following explanations for Figure 11:

1. Any supported spooled file may place in the appropriate output queue. The different setting defined in the PSF configuration object are use to place the PDF file in the correct destination.

2. Virtual printers. A device description is linked to the PSF configuration object. Section 2.3.1, "Creating the virtual printer device description" on page 39, offers additional informations.

3. The PSF configuration object is used to specify IPDS printer characteristics

### 2.3.1  Creating the virtual printer device description

The printer device description will be created as a virtual printer. You need to create at least one PDF printer device description on your system for each PDF destination desired (IFS, output queue, e-mail). The user-defined object in the printer device description should reference the name of the PDF configuration object that has the detailed PDF creation options.

The transform emulates an IPDS printer and use following hardware IPDS configuration settings:

    vpa chk=off
    x offset=0
    y offset=0
    page=whole
    edge-edge=on
    font sub=on
    gcs=char scal
    bar code=auto

box draw=off

Use the PDFDEVTYPE option in the PSF configuration object to further specify IPDS printer characteristics. Section 9.1.4, "PDF transform options" on page 157, provides additional information about the PSF configuration object related to IPDS/AFP to PDF transform.

Figure 12 shows the first screen of the create device description (CRTDEVPRT) command.

```
                    Create Device Desc (Printer) (CRTDEVPRT)

 Type choices, press Enter.

 Device description . . . . . . . > IPDS2PDFName
 Device class . . . . . . . . . . > *LAN        *LCL, *RMT, *VRT, *SNPT, *LAN
 Device type  . . . . . . . . . . > *IPDS       3287, 3812, 4019, 4201...
 Device model . . . . . . . . . . > 0           0, 1, 2, 3, 4, 10, 13, 301...
 LAN attachment . . . . . . . . . > *IP      *LEXLINK, *IP, *USRDFN
 Advanced function printing . . . > *YES        *NO, *YES
 Port number  . . . . . . . . . . > 5002        0-65535
 Online at IPL  . . . . . . . . .   *YES         *YES, *NO
 Font:
   Identifier . . . . . . . . . . > 011         3, 5, 11, 12, 13, 18, 19...
    Point size . . . . . . . . . .   *NONE       000.1-999.9, *NONE
 Form feed  . . . . . . . . . . .   *TYPE       *TYPE, *CONT, *CONT2, *CUT...
 Separator drawer . . . . . . . .   *FILE       1-255, *FILE
 Separator program  . . . . . . .   *NONE       Name, *NONE
  Library  . . . . . . . . . . .               Name, *LIBL, *CURLIB
 Printer error message  . . . . .   *INQ        *INQ, *INFO
                                                                       More...
 F3=Exit   F4=Prompt   F5=Refresh   F12=Cancel   F13=How to use this display
 F24=More keys
```

*Figure 12. Create Device Description*

Set the required options for the virtual device description as follow:

**Device description:** Define the name of the virtual printer

**Device class**: Type *LAN for the virtual IPDS printer

**Device type**: Type *IPDS

**Device model:** The device is always 0 for an IPDS printer

**Advanced function printing:** AFP(*NO).

**Port number:** Specifies a unique port number for each virtual printer.Valid value range from 0 through 65535. We do not recommend port 5001 who is normally used for IPDS printers.

**Font identifier:** Specify a default font to be used with this device.

Press page down to access to the next options as shown in Figure 13.

```
                   Create Device Desc (Printer) (CRTDEVPRT)

  Type choices, press Enter.

  Message queue  . . . . . . . . .   *CTLD         Name, *CTLD, *SYSOPR, QSYSOPR
    Library  . . . . . . . . . . .                 Name, *LIBL, *CURLIB
  Activation timer . . . . . . . .   170           1-2550, *NOMAX
  Image configuration  . . . . . .   *NONE         *NONE, *IMGA01, *IMGA02...
  Maximum pending requests . . . .   6             1-31
  Print while converting . . . . .   *YES          *NO, *YES
  Print request timer  . . . . . .   *NOMAX        1-3600, *NOMAX
  Form definition  . . . . . . . .   F1C10110      Name
    Library  . . . . . . . . . .      *LIBL        Name, *LIBL, *CURLIB
  Remote location:
    Name or address  . . . . . . .      127.0.0.1



  User-defined options . . . . . .   *NONE         Character value, *NONE
                + for more values
                                                                        More...
  F3=Exit    F4=Prompt    F5=Refresh    F12=Cancel    F13=How to use this display
  F24=More keys
```

*Figure 13.  Specifying the remote location name*

To define this printer device description as a PDF virtual printer, the remote
location must contain the TCP/IP loopback address "127.0.0.1. Figure 14 shows
the next screen of the create device description.

```
                   Create Device Desc (Printer) (CRTDEVPRT)

  Type choices, press Enter.

  User-defined object:
    Object . . . . . . . . . . . .   MYPSFCFG      Name, *NONE
      Library  . . . . . . . . . .   JHO           Name, *LIBL, *CURLIB
    Object type  . . . . . . . . .   *PSFCFG       *DTAARA, *DTAQ, *FILE...
  Data transform program . . . . .   *NONE         Name, *NONE
    Library  . . . . . . . . . . .                 Name, *LIBL, *CURLIB
  User-defined driver program  . .   *NONE         Name, *NONE
    Library  . . . . . . . . . . .                 Name, *LIBL, *CURLIB
  Publishing information:
    Support duplex . . . . . . . .   *UNKNOWN      *UNKNOWN, *SIMPLEX, *DUPLEX
    Support color  . . . . . . . .   *UNKNOWN      *UNKNOWN, *NOCOLOR, *COLOR
    Pages per minute black . . . .   *UNKNOWN      1-32767, *UNKNOWN
    Pages per minute color . . . .   *UNKNOWN      1-32767, *UNKNOWN
    Location . . . . . . . . . . .   *BLANK
  Text 'description' . . . . . . .   *BLANK

                                                                        More...
  F3=Exit    F4=Prompt    F5=Refresh    F12=Cancel    F13=How to use this display
  F24=More keys
```

*Figure 14.  User defined object*

**User-defined object:** Specify the name of the PSF configuration object. A
unique object can be defined for a printer description.

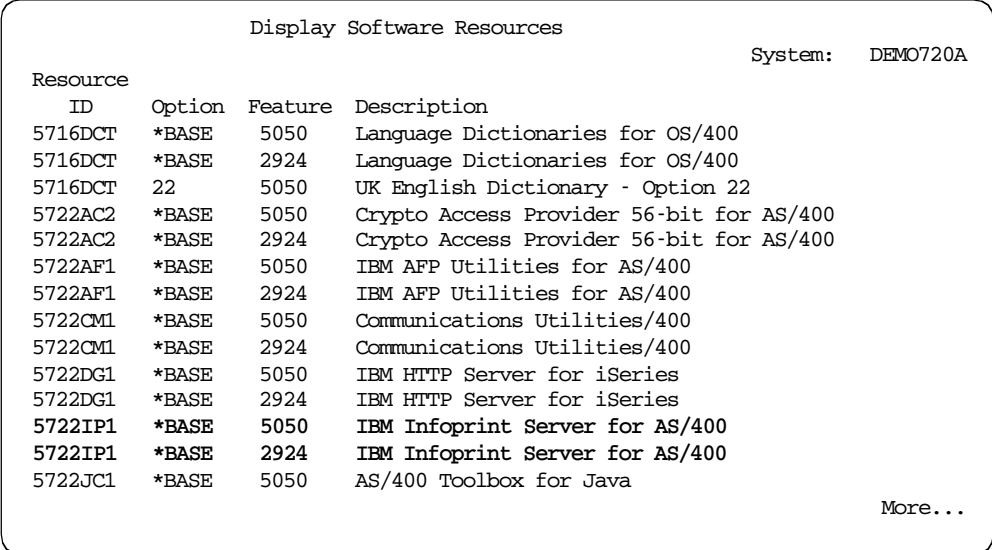**Library:**              The Library where the PSF configuration object is stored

**Object type:** Indicate the object specified as User-defined object is a PSF configuration object.

If you try to generate the virtual device description before the PSF configuration has been created, a message appears that indicates that the object is missing.

The PSF configuration object is used to set the IPDS/AFP to PDF transform parameters. It is not possible to change these parameters with an temporary command as an overwrite. You will need to create a printer device description and a PSF configuration object for each different setting of the IPDS/AFP to PDF transform.

## 2.4  Installation and Planning the PDF transform

With the appropriate OS/400 media loaded, type GO LICPGM and take option 11 (Install licensed programs). Infoprint Server for iSeries is product ID 5722IP1. To verify if your system has the product installed, either use option 10 (Display installed licensed programs) from the GO LICPGM menu, or type DSPSFWRSC and look for a display similar to the example in Figure 15.

```
                      Display Software Resources
                                                       System:    DEMO720A
        Resource
           ID      Option   Feature   Description
        5716DCT    *BASE    5050      Language Dictionaries for OS/400
        5716DCT    *BASE    2924      Language Dictionaries for OS/400
        5716DCT    22       5050      UK English Dictionary - Option 22
        5722AC2    *BASE    5050      Crypto Access Provider 56-bit for AS/400
        5722AC2    *BASE    2924      Crypto Access Provider 56-bit for AS/400
        5722AF1    *BASE    5050      IBM AFP Utilities for AS/400
        5722AF1    *BASE    2924      IBM AFP Utilities for AS/400
        5722CM1    *BASE    5050      Communications Utilities/400
        5722CM1    *BASE    2924      Communications Utilities/400
        5722DG1    *BASE    5050      IBM HTTP Server for iSeries
        5722DG1    *BASE    2924      IBM HTTP Server for iSeries
        5722IP1    *BASE    5050      IBM Infoprint Server for AS/400
        5722IP1    *BASE    2924      IBM Infoprint Server for AS/400
        5722JC1    *BASE    5050      AS/400 Toolbox for Java
                                                                    More...
```

*Figure 15.  Using the DSPSFWRSC command to verify Infoprint Server for iSeries installation*

Use of the F11 key on this screen also identifies the product library: QIPS.

### 2.4.1  Determine the use of your PDF files

Before you continue the configuration, you must decide what purpose the PDF file will serve. Section 2.1, "Why use the Infoprint Server PDF transform" on page 33, outlines some of these uses. It is important you clearly identify the use of the PDF file as this determines the steps you will take to create it.

The most likely scenarios are:

- Store a PDF file(s) in the iSeries Integrated File System (IFS)
- Placing a PDF file back on an OS/400 output queue
- E-mail of a single PDF file
- E-mail multiple PDF files

The following sections cover the steps you must take to achieve these scenarios.

## 2.5 Creating a PDF file for storing in the IFS

Producing a PDF file and storing it in the iSeries IFS means that iSeries output is available for applications and users in a convenient, easily-viewable format. Users' access methods might include file sharing via iSeries NetServer or through a company intranet and web browser. Applications can take the PDF file and send it to other systems, such as those for e-mail or archive.

### 2.5.1 Creating directories to store the PDF file

PDF files are of ASCII format, stored on the iSeries as *stream files*. Stream files have no internal structure recognized by the OS/400 operating system (contrast with the files / member / fields structure of the traditional OS/400 library system). Perhaps a more familiar example of stream files is OS/400 documents stored in the document library file system. The Integrated File System is simply a way of accessing these different file systems. Examples include:

- **QDLS:** The Document Library Services file system - traditional OS/400 documents in folders
- **QSYS.LIB:** The "traditional" OS/400 library file system
- **root:** The "root" file system, the one most often associated with use of the IFS

Before we create PDF files we must first decide which file system we wish to use, and then create one or more directories within it. The two possibilities are described below.

#### 2.5.1.1 Using the root file system

To create a directory called *reports* in the root file system, type the following command on an OS/400 command line:

```
CRTDIR reports
```

You can also use the equivalent MKDIR command. The **reports** directory is created within your current directory. The latter can be determined by using the DSPCURDIR command. For access to the many useful interactive commands necessary for IFS navigation, type:

```
GO FILESYS
```

The directory in which the PDF file will be stored is identified in the PDFDIR parameter in the PSF configuration object (see 2.5.2, "Creating a PSF configuration object" on page 46). The syntax is:

```
/directory-name
```

But, the actual resulting location is:

```
/directory-name/job-name/job-user
```

Consider this example:

```
/reports/QPADEV00B/SIMON
```

The actual PDF file name is then stored in the last named subdirectory. It's file name is in the format:

```
job-number_spooled-file-number_spooled-file-name_date_sequence-number.
pdf
```

This format is made up of the following elements:

**job-number**          The job number of the original spooled file

**spooled-file-number**          The file number of the original spooled file

**spooled-file-name**          The original spooled file name

**date**          The two digit month appended to the two digit day appended to the four digit year when the PDF transform completed. (Note the latter - it is *not* the date that the original spooled file was created)

**sequence-number**          A six character sequence number. It is set to 000001 if PDFMULT is *NO. If PDFMULT is *YES, the sequence number is increased to uniquely identify each PDF file generated for the job.

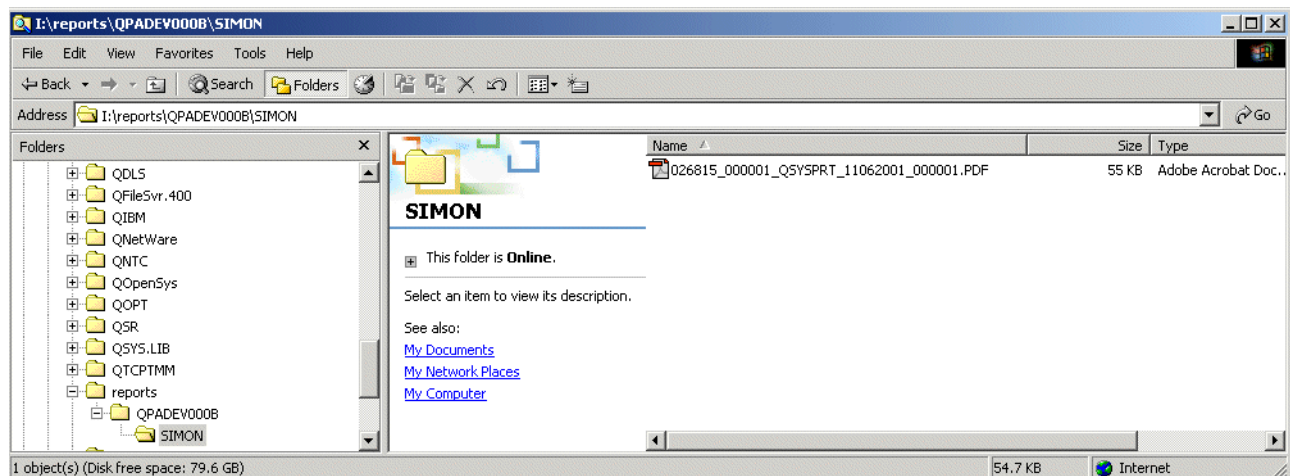Figure 16 shows an example of the naming convention resulting from the creation of a PDF file.



*Figure 16. Naming convention for a PDF file created using Infoprint Server for iSeries*

In this example, the following filename has been created:

**job-number**          026815

**spooled-file-number**          000001

**spooled-file-name**          QSYSPRT

**date**          11062001

**sequence-number**          000001

together with the "PDF" suffix.

You can also use the WRKLNK command to verify the above results using a 5250 interface. Navigate to the **reports** directory, then use option 5 to display the

successive subdirectories until you reach the PDF file. Note it's file type of STMF (stream file).

```
                        Work with Object Links

 Directory  . . . . :    /reports/QPADEV000B/SIMON

 Type options, press Enter.
   2=Edit   3=Copy   4=Remove   5=Display   7=Rename   8=Display attributes
   11=Change current directory ...

 Opt   Object link          Type     Attribute    Text
       026815_000001_QSYS >  STMF




                                                                    Bottom
 Parameters or command
 ===>
 F3=Exit   F4=Prompt   F5=Refresh   F9=Retrieve   F12=Cancel   F17=Position to
 F22=Display entire field            F23=More options
```

*Figure 17.  Locating the PDF file using the WRKLNK command*

### 2.5.1.2  Using the QDLS file system
To create a directory called *emails* in the QDLS file system, type the following command on an OS/400 command line:

```
CRTFLR emails
```

You can use the WRKFLR command to confirm this.

The principal reason for using the QDLS is for e-mail purposes at a later time - the SNDDST process expects to find PDF output files stored in the shared folders directory (QDLS/directory-name). However if you simply wish to create and e-mail PDF files in one operation, it is *not* necessary to use a QDLS directory.

You must also make the directory accessible to other users (specifically the print writer) else the PDF file will not be written into this directory. The reason for this is that QDLS folders are normally created with *PUBLIC *EXCLUDE authority. If the PDF transform cannot write to the folder, the process will fail with reason code 21 (Security violation). Use the EDTDLOAUT command to change the authority, for example set the Public authority to *USE.

When the PDF transform runs, the resulting PDF file is actually stored in the following location:

/QDLS/directory-name/*job-name*/*job-number*[2]/job-user-name/
sequence-number/spooled-file-name/date

**Notes:**
- The *job-name* is truncated to eight characters.

- The last two characters of the *job-name* are added to the beginning of the *job-number*.

The PDF file name is much simpler than before, consisting only of a six-character sequence number. It will be set to 000001 if PDFMULT is *NO. If PDFMULT is *YES, the sequence number is increased to uniquely identify each PDF file generated for the job.

For example:

`/QDLS/emails/QPADEV00/0C028555/SIMON/`

`000003/QSYSPRT/11092001/000001.pdf`

The resulting directory structure and file name is shown in Figure 18.
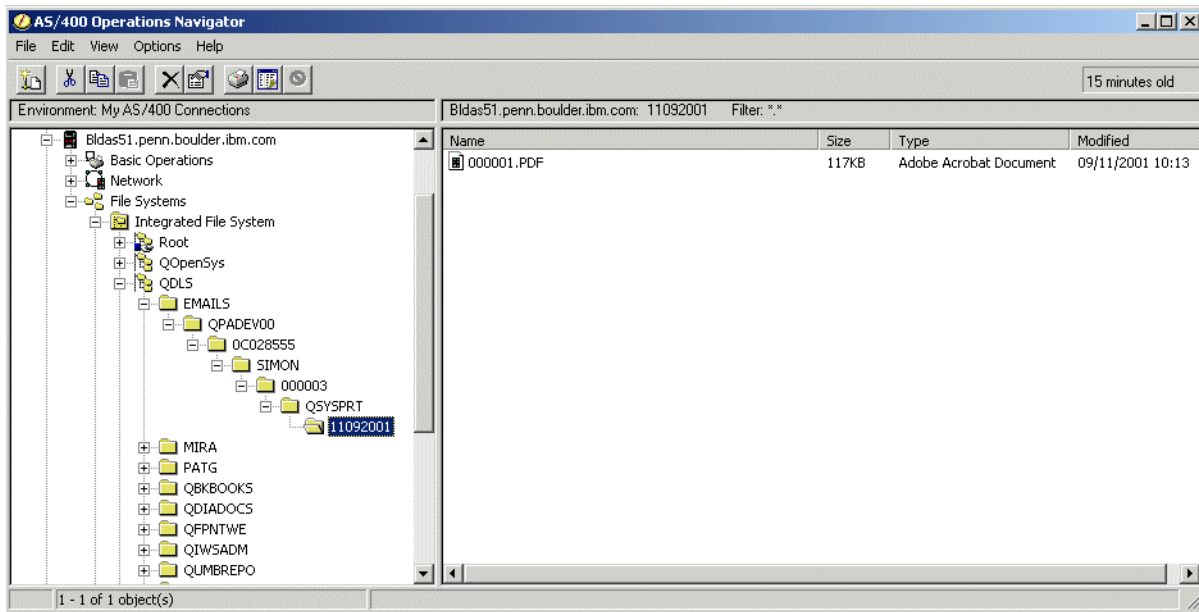


*Figure 18. PDF file stored in QDLS directory structure*

The naming conventions for the different file systems may seem complex, but if you are creating and storing PDF files on a daily basis, for example, you have a ready-made filing system for storing the files. The /root file system stores most of the variable information in the PDF file name, the QDLS file system stores this information in the form of successive subdirectories. These two differences may influence which file system you use.

### 2.5.2 Creating a PSF configuration object

We suggest you create a PSF configuration object for each specific task you want to perform. For example, to convert iSeries output to PDF files stored in the IFS, first create a PSF configuration object called PDF2IFS. You might also have another PSF configuration object called PDF2EMAIL for example.

Chapter 9, "PSF configuration object" on page 147 shows you how to use Client Access Operations Navigator to create PSF configuration objects using a Windows GUI view. Alternatively, use the following native OS/400 command in a 5250 session:

CRTPSFCFG

Then press F4 (Prompt). A screen like the example in Figure 19 is displayed.

```
                     Create PSF Configuration (CRTPSFCFG)

 Type choices, press Enter.

 PSF configuration  . . . . . . . > PDF2IFS        Name
   Library  . . . . . . . . . . .    QGPL          Name, *CURLIB
 User resource library list . . .   *JOBLIBL      *JOBLIBL, *CURLIB, *NONE
 Device resource library list . .   *DFT          Name, *DFT
                 + for more values
 IPDS pass through  . . . . . . .   *NO           *NO, *YES
 Activate release timer . . . . .   *NORDYF       *NORDYF, *IMMED...
 Release timer  . . . . . . . . .   *NOMAX        1-1440, *NOMAX, *SEC15...
 Restart timer  . . . . . . . . .   *IMMED        1-1440, *IMMED
 APPC and TCP/IP retry count  . .   15            1-99, *NOMAX
 Delay between APPC retries . . .   90            0-999
 Acknowledgment frequency . . . .   100           1-32767
 Printer response timer . . . . .   *NOMAX        5-3600, *NOMAX
 Generate PDF output  . . . . . .   *STMF         *NONE, *SPLF, *STMF, *MAIL




                                                                     Bottom
```

*Figure 19.  Need figure caption here!!!!*

**PSF configuration**        Type a convenient name (for example "PDF2IFS") and library (for example QGPL).

**Generate PDF output**     To place the PDF output into the IFS, type *STMF ("Stream File")

Press Enter and change the new parameters as shown in Figure 20.

```
                     Create PSF Configuration (CRTPSFCFG)

 Type choices, press Enter.

 PSF configuration  . . . . . . . > PDF2IFS        Name
   Library  . . . . . . . . . . . >  QGPL          Name, *CURLIB
 User resource library list . . .   *JOBLIBL      *JOBLIBL, *CURLIB, *NONE
 Device resource library list . .   *DFT          Name, *DFT
                 + for more values
 IPDS pass through  . . . . . . .   *NO           *NO, *YES
 Activate release timer . . . . .   *NORDYF       *NORDYF, *IMMED...
 Release timer  . . . . . . . . .   *NOMAX        1-1440, *NOMAX, *SEC15...
 Restart timer  . . . . . . . . .   *IMMED        1-1440, *IMMED
 APPC and TCP/IP retry count  . .   15            1-99, *NOMAX
 Delay between APPC retries . . .   90            0-999
 Acknowledgment frequency . . . .   100           1-32767
 Printer response timer . . . . .   *NOMAX        5-3600, *NOMAX
 Generate PDF output  . . . . . . > *STMF         *NONE, *SPLF, *STMF, *MAIL
 PDF device emulation type  . . .   *IP40300      *IP40240, *IP40300, *P4028...
 PDF paper size drawer 1  . . . .   *LETTER       *LETTER, *LEGAL...
                                                                     More...
```

*Figure 20.  Need caption here!!!!*

**PDF device emulation type**       Set this to *IP40300 for most cases

**PDF paper size drawer 1**      Set this as required (usually *LETTER or *A4).
                                 This defines the paper size for drawer 1 that
                                 will be used in creating the PDF file.

Now press the Page Down key and set the remaining parameters as shown in
Figure 21.

```
                    Create PSF Configuration (CRTPSFCFG)

 Type choices, press Enter.

 PDF paper size drawer 2  . . . .    *LETTER        *LETTER, *LEGAL...
 Multiple PDF files . . . . . . .    *NO            *NO, *YES
 PDF data queue . . . . . . . . .    *NONE          Name, *NONE
   Library  . . . . . . . . . . .                   Name, *CURLIB
 PDF directory  . . . . . . . . . >  /REPORTS



 Text 'description' . . . . . . . >  'PSFCFG to create & store PDFs in "REPORTS"'






                                                                        Bottom
```

*Figure 21.  Need caption here!!!!*

**PDF paper size drawer 2**      This will be used only if your original spooled file
                                 referenced a page picked from drawer 2. You will
                                 usually set it to match the value for drawer 1.

**PDF directory**                Enter a directory name here. The directory must
                                 already exist. See 2.5.1, "Creating directories to
                                 store the PDF file" on page 43.

## 2.6  Creating a PDF file for placing on an output queue

PDF files are normally printed from a Windows application, via an ASCII print
driver, most commonly a PCL or PostScript printer driver. In other words, the PDF
file is transformed into either PCL or PostScript by the print driver and sent to the
printer. This is actually an overhead on the PC processing. It is possible to send
PDF files directly to some printers - those that are "PDF-capable". Typically the
latter printers have a hard disk onto which to receive (spool) the PDF file, from
where the PDF is rasterized into the format necessary for printing.

Printers from IBM that are PDF-capable include the Infoprint 21 and Infoprint 70.

If you have a PDF-capable printer and you access it from the iSeries, it follows
that we can send the PDF files to the printer, as well as storing them in a file
system. To do this, change the PSF configuration object parameters as follows
(or, more likely, use a dedicated PSF configuration object for this purpose):

**PDFGEN**        *SPLF

**PDFOUTQ**     output-queue-name

It is important that the target printer is PDF-capable. Otherwise, you may receive garbage output.

## 2.7  E-mail of a single PDF file

The setup tasks for generating PDF files as e-mail attachments are similar to the tasks for saving the files in the IFS or creating new spooled files in an output queue, with the added step of determining how to associate an e-mail address to a given spooled file or segment.

There are a number of different approaches you may take depending on the type of spooled file you are dealing with, what you want to do with it, and whether you have access to modify application objects.

The first important consideration is how you are sending your PDF file:

- Sending the entire file as one PDF to one destinations

- Segmenting the original spooled file into smaller PDF files to be sent to multiple different destinations. An example of doing this is the case where you have a spooled file containing invoices or statements for multiple different customers, and each customer is to receive only the pages that apply.

The other consideration is the degree to which you have access to make changes to the application, such as:

- Changing or overriding the printer file
- Modifying the DDS
- Generating the spooled file as *AFPDS
- Generating applications using the AFP Toolbox

Figure 22 illustrates the various methods of specifying the e-mail address for the PDF file(s). This section describes options (A) and (B) for sending single files. The choice between the two options depends on whether you can change or override the printer file.

Refer to 2.8, "Creating multiple PDF files" on page 57, for details on how to specify the e-mail address when you are breaking one large spooled file into multiple separate PDF file to e-mail to different destinations. The use of the AFP Toolbox (not shown on the decision tree) is also described as an alternative for setting addresses for a multiple PDF scenario.
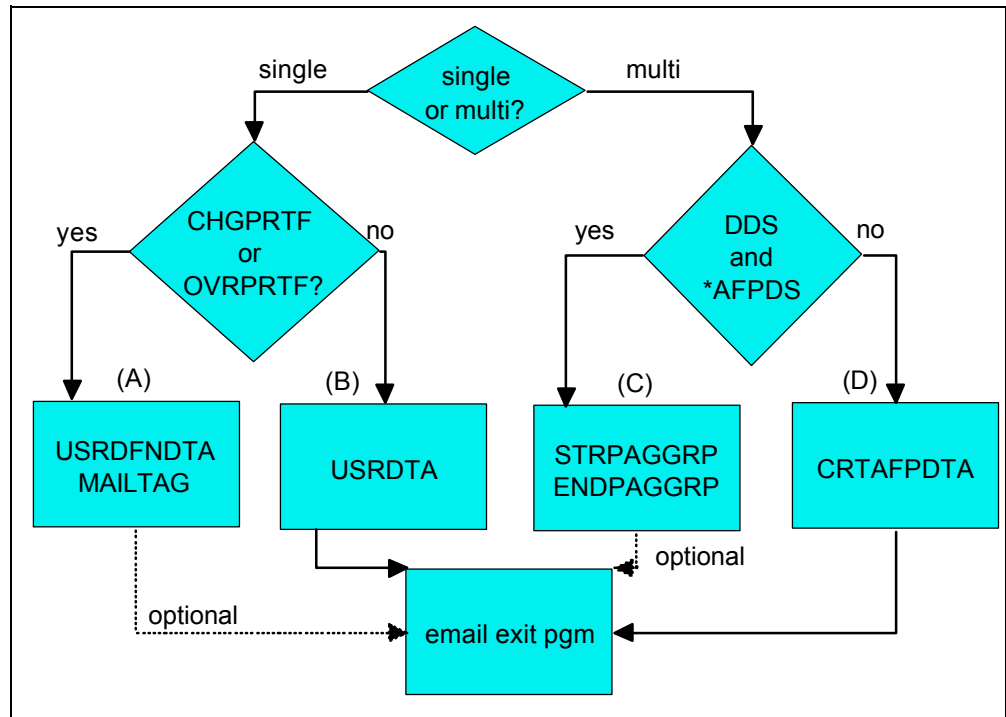
*Figure 22. Options for specifying the e-mail address*

### 2.7.1 Using USRDFNDTA to specify e-mail address

There are new options available with V5R1 within the USRDFNDTA parameter in the Create, Change, or Override Printer File commands. If you have access to change your printer file, or if you can issue an Override Printer File prior to generating the spooled file, use this parameter to address your e-mail. In doing so you may avoid the requirement of an e-mail exit program.

This corresponds to branch (A) in Figure 22.

#### 2.7.1.1 PSFCFG for single e-mails, no exit program

Figure 23 contains an example of the Create PSF Configuration that is used to send your spooled files as single PDF e-mail attachments, if you are not using an e-mail program. (Only those parameters pertaining to PDF creation are shown.)

```
                     Create PSF Configuration (CRTPSFCFG)

  Type choices, press Enter.

  PSF configuration . . . . . . . > EMAIL1        Name
    Library . . . . . . . . . . .     QGPL        Name, *CURLIB

  Generate PDF output  . . . . . . > *MAIL        *NONE, *SPLF, *STMF, *MAIL
  PDF device emulation type  . . . > *IP40300     *IP40240, *IP40300, *P4028...
  PDF paper size drawer 1  . . . .   *LETTER      *LETTER, *LEGAL...
  PDF paper size drawer 2  . . . .   *LETTER      *LETTER, *LEGAL...
  Multiple PDF files . . . . . . .   *NO          *NO, *YES
  PDF data queue . . . . . . . . . > PDFDTAQ      Name, *NONE
    Library . . . . . . . . . . . >   QGPL        Name, *CURLIB
  Sender of electronic mail  . . . > EMAILMGR     Name, *SPLFOWN, QSPLJOB
  PDF user program . . . . . . . .   *NONE        Name, *NONE
    Library . . . . . . . . . . .                 Name, *CURLIB
  Text 'description' . . . . . . . > 'Email PDF files as single file'
```

*Figure 23.  PSF Configuration object for single e-mail, no user exit program*

| | |
|---|---|
| **Generate PDF output** | (PDFGEN) Specify *MAIL to tell Infoprint Server for iSeries to generate the PDF file as an e-mail attachment |
| **PDF device emulation type** | (PDFDEVTYPE) IBM recommends setting this to *IP40300, which corresponds to the functions of an IBM Infoprint 40 set to 300 dots per inch. |
| **PDF paper size drawer 1 / 2** | (PDFPPRDWR1 / 2) Set to the paper size used by the application. |
| **Multiple PDF files** | (PDFMULT) Set to *NO to send each file as a single e-mail. |
| **PDF data queue** | (PDFDTAQ) Specifies the name and library of the data queue where PDF logs the transformation completion notifications. If you specify this parameter, the data queue must exist and have a minimum length of 752 characters. See Chapter F.2, "PDF data queue structure" on page 308 for additional information. |
| **Sender of electronic mail** | (PDFSENDER) Specifies the user from whom the PDF output file is e-mailed. The sender must be a valid user profile and be enrolled in the system distribution directory. Any non-delivery messages caused by invalid e-mail addresses is sent to this user. For additional information on non-delivery messages see Chapter 14, "End-to-end example" on page 243. |
| **PDF user program** | (PDFMAPPGM) Set to *NONE to indicate that an e-mail exit program is not necessary. Valid e-mail addresses *must* be supplied by the USRDFNDTA parameter. |

### 2.7.1.2  Printer DEVD for single e-mail, no exit program

Create a device description that uses this PSF Configuration object by specifying:

```
CRTDEVPRT   DEVD(EMAIL1)
              DEVCLS(*LAN)
              TYPE(*IPDS)
              MODEL(0)
              LANATTACH(*IP)
              AFP(*YES)
              PORT(5003)
              FONT(416 12)
              RMTLOCNAME('127.0.0.1')
              USRDFNOBJ(QGPL/EMAIL1 *PSFCFG)
              TEXT('Use for PDF email, single files, no exit pgm')
```

### 2.7.1.3  Using USRDFNDTA

To use this combination of PSF configuration object and device description to send your e-mail, you must be able to perform one of the following actions to set the address:

- Create a new printer file using CRTPRTF, or change an existing printer file using CHGPRTF.

- Modify the CL used to run program to insert an Override Printer File (OVRRPRTF) command. This must be done prior to running the application program that generates the spooled file.

- Interactively override the printer file prior to running the program.

An example of using the Change Printer File command with the User Defined Data, USRDFNDTA, parameter:

```
CHGPRTF mylib/myprtf OUTQ(EMAIL1) USRDFNDTA('MAILTAG(jacques_h@organic.ch)
MAILSENDER(MSHNIER)')
```

The same parameters may be specified on the CRTPRTF or OVRPRTF commands.

In this example the output is directed to the output queue, EMAIL1, where it is picked up by Infoprint Server and sent as a PDF attachment in an e-mail to jacques_h@organic.ch.

The optional MAILSENDER value, if specified, overrides the value set in the PSF Configuration object for the PDFSENDER parameter. In this example the sender is MSHNIER instead of EMAILMGR. As with the PDFSENDER, MAILSENDER must be a valid user profile and must have a directory entry in the system distribution directory.

---
**Note**

With V5R1, the USRDFNDTA parameter is not available in the Change Spooled File Attributes, CHGSPLFA, Command. It *must* be used at the printer file level, prior to generating the spooled file.

---

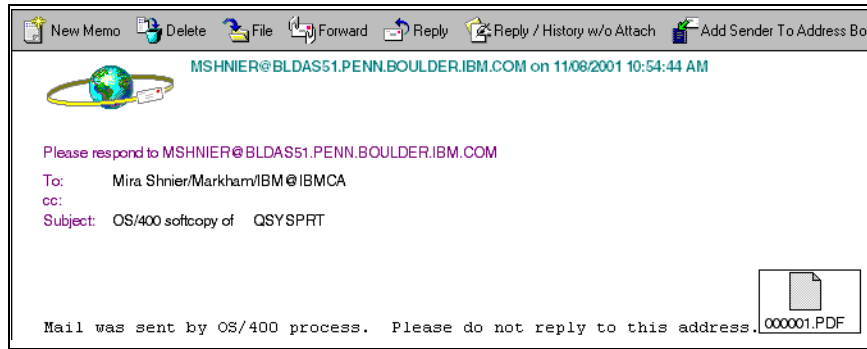Figure 24 shows an example of an e-mail received by a Lotus notes user.

*Figure 24. Lotus note with PDF attachment*

Note the following features:

- The sender name, in this case MSHNIER, was specified using the USRDFNDTA keyword. BLDAS51.PENN.BOULDER.IBM.COM is the iSeries from which this e-mail was sent.

- The subject line contains the name of the original spooled file, in this case QSYSPRT.

- The mail message was not customized. This is the default message that is generated.

- The PDF attachment is given the name 000001.PDF.

- The original mail had been sent to an address in the format user@company. Lotus Notes converts that address into its own format.

Clicking on the attachment icon launches Adobe Acrobat. The document, as shown in Figure 25, is displayed. The document used in this case was a simple screen print.
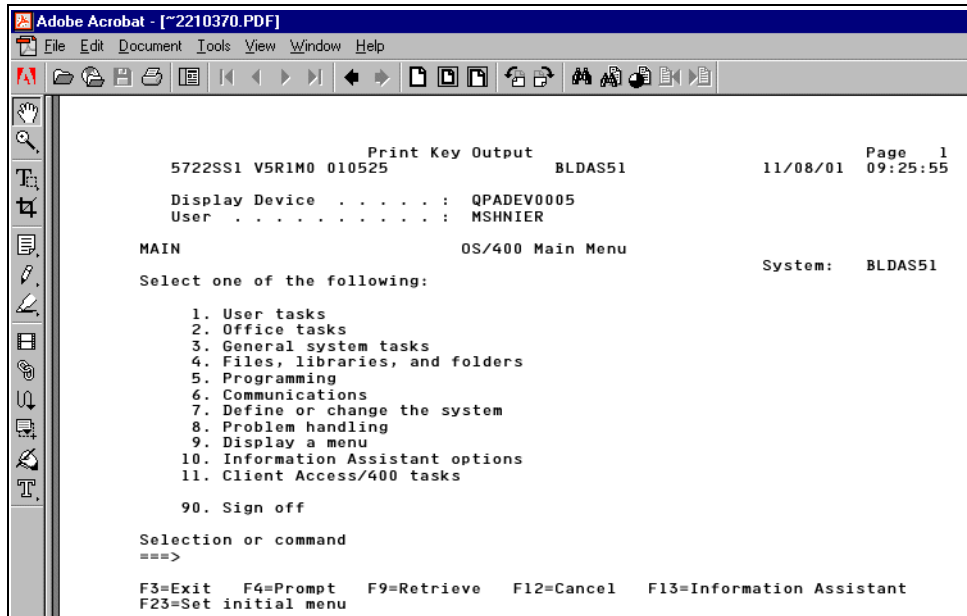


*Figure 25. Sample PDF of a sample screen print*

### 2.7.2  Addressing your e-mail with USRDTA and an e-mail exit program.

In the previous section, it was indicated that in V5R1, the USRDFNDTA parameter must be specified in the printer file before running the application. It is not available for use in the Change Spooled File Attribute, CHGSPLFA, Command.

If you do not have access to make the required application changes prior to creating the spooled file, there is an alternate technique you can use. This involves entering a unique value in the USRDTA parameter of the spooled file. This parameter is available from the CHGSPLFA Command, as well as the CRTPRTF, CHGPRTF, or OVRPRTF. This method requires the use of an e-mail exit program to convert the 10-character value used in the USRDTA parameter to a valid e-mail address.

This corresponds to branch (B) in Figure 22.

#### 2.7.2.1  PSFCFG for single e-mails, with exit program

Figure 26 illustrates the parameters used by Create PSF Configuration that are used to send single e-mail files if use an e-mail exit.

```
                   Create PSF Configuration (CRTPSFCFG)

 Type choices, press Enter.

 PSF configuration  . . . . . . . >  EMAIL1EXIT     Name
   Library  . . . . . . . . . . .      QGPL         Name, *CURLIB

 Generate PDF output  . . . . . . >  *MAIL          *NONE, *SPLF, *STMF, *MAIL
 PDF device emulation type  . . . >  *IP40300       *IP40240, *IP40300, *P4028...
 PDF paper size drawer 1  . . . .    *LETTER        *LETTER, *LEGAL...
 PDF paper size drawer 2  . . . .    *LETTER        *LETTER, *LEGAL...
 Multiple PDF files . . . . . . .    *NO            *NO, *YES
 PDF data queue . . . . . . . . . >  PDFDTAQ        Name, *NONE
   Library  . . . . . . . . . . . >    QGPL         Name, *CURLIB
 Sender of electronic mail  . . . >  EMAILMGR       Name, *SPLFOWN, QSPLJOB
 PDF user program . . . . . . . .    EXIT1          Name, *NONE
   Library  . . . . . . . . . . .      QGPL         Name, *CURLIB
 Text 'description' . . . . . . . >  'Email PDF files as single file with exit'
```

*Figure 26.  PSF Configuration object for single e-mail, no user exit program*

**Generate PDF output**          (PDFGEN) Specify *MAIL to generate the PDF file as an e-mail attachment

**PDF device emulation type**    (PDFDEVTYPE) IBM recommends setting this to *IP40300, which corresponds to the functions of an IBM Infoprint 40 set to 300 dots per inch.

**PDF paper size drawer 1 / 2**  (PDFPPRDWR1/2) Set to the paper size used by the application.

**Multiple PDF files**           (PDFMULT) Set to *NO to send each file as a single e-mail.

**PDF data queue**               (PDFDTAQ) Specifies the name and library of the data queue where PDF logs the transformation completion notifications. If you specify this parameter, the data queue must exist and have a

minimum length of 752 characters. See Appendix F.2, "PDF data queue structure" on page 308 for additional information.

**Sender of electronic mail** (PDFSENDER) Specifies the sender from whom the PDF output file is e-mailed. The sender must be a valid user profile and be enrolled in the system distribution directory. Any non-delivery messages caused by invalid e-mail addresses is sent to this user. For additional information on non-delivery messages see Chapter 14, "End-to-end example" on page 243.

**PDF user program** (PDFMAPPGM) Specify the name and library of the user e-mail exit program. This program is used to lookup a valid e-mail address based on the information in the USRDTA field.

### 2.7.2.2  Printer DEVD for single e-mail, with exit program

Create a device description that uses this PSF Configuration object by specifying:

```
CRTDEVPRT   DEVD(EMAIL1EXIT)
            DEVCLS(*LAN)
            TYPE(*IPDS)
            MODEL(0)
            LANATTACH(*IP)
            AFP(*YES)
            PORT(5004)
            FONT(416 12)
            RMTLOCNAME('127.0.0.1')
            USRDFNOBJ(QGPL/EMAIL1EXIT *PSFCFG)
            TEXT('Use for PDF email, single files, with exit pgm')
```

### 2.7.2.3  Changing the value for USRDTA

The User Data field may be modified using Change Spooled File Attributes (CHGSPLFA). You may specify up to 10 characters. A quick way is to do this interactively. Display a list of your spooled files using a command such as WRKSPLF or WRKOUTQ. Then enter option 2 next to the desired spooled file and type the USRDTA information on the command line.

In Figure 27, you see an example of the Work with All Spooled Files, WRKSPLF, screen. The User Data for the first spooled file has already been set. The process is about to be repeated for the second spooled file.

```
                        Work with All Spooled Files

Type options, press Enter.
  1=Send    2=Change    3=Hold    4=Delete    5=Display    6=Release    7=Messages
  8=Attributes          9=Work with printing status

                              Device or                    Total    Cur
Opt  File        User        Queue        User Data   Sts  Pages    Page   Copy
     EMAIL       MSHNIER      MSHNIER      CUST000426  RDY     8               1
  2  EMAIL       MSHNIER      MSHNIER                  RDY     8               1

                                                                    Bottom
Parameters for options 1, 2, 3 or command
===> usrdta(CUST000136)
F3=Exit    F10=View 4    F11=View 2    F12=Cancel    F22=Printers    F24=More keys
```

*Figure 27. Changing USRDTA value for a spooled file*

From within a program you can override or change the USRDTA field by placing a CALL to the system program QCMDEXC.

### 2.7.2.4  Exit program to map USRDTA

The name and library of the e-mail exit program is specified in the PSF Configuration object. Each time Infoprint Server process a PDF file that is to be sent as an e-mail, the exit program is called.

Information about the input spooled file is passed to the exit program via the input data structure. The program uses this information to lookup or generate a valid e-mail address. In addition, the exit program may also be used to build a message of up to 255 characters. This message appears in the body of the e-mail along with the PDF attachment. The e-mail address and message are passed back to Infoprint Server via an output data structure.

In this scenario, we use the value from the USRDTA field which is made available to the program via positions 647 to 656 of the input data structure. This value is used in a lookup operation to an external file to obtain the e-mail address and optionally other information that may be used in the custom message.

A sample of a e-mail exit program is found in Appendix F.1, "E-mail exit program" on page 305. Along with the generation of the e-mail address and message, it also performs some additional tasks in the case of a failure of the lookup operation. It may be used as a template for addressing using USRDTA with some minor modifications. Consider the following points:

- Note that the USRDTA field is made available to the exit program in positions 647 to 656 of the Input Data Structure, INPUTDS.

- The existing sample uses the first 6 characters from the MAILTAG field as key to the lookup operation. Modify the program to use the 10 character USRDTA field.

- Modify the LOOKUP file to match the expected data from the USRDTA field. In particular, change the length of the key field.

- The result of the LOOKUP program returns one or more e-mail address, which you pass via the ADDRESS field in Output Data Structure, OUTDS, starting in

position 288. In the sample program a length of 255 was assigned to this field. If necessary, the length may be changed, and may be to up to 16MB long.

- Customize the Message and not-found actions to suit your specific application needs.

## 2.8  Creating multiple PDF files

In previous sections we describe how to set up the PSF Configuration object to generate single files on the IFS, single spooled files, or single e-mails. Infoprint Server for iSeries enhances these operations by providing the means to take one original spooled file and generate multiple PDF files in the IFS, multiple new PDF spooled files, or multiple files being directed to different e-mail destinations.

You may need to do this is if your application generates one spooled file containing multiple customer statements. You want to segment it on statement boundary in order to generate multiple PDF files.

### 2.8.1  PSF Configuration Object for multiple PDF files

The PSF Configuration object used to create multiple files for print, storage or e-mail is similar to the corresponding PSF Configuration object used for single files for each of the three file types. The main difference is the parameter Multiple PDF files (PDFMULT), is now set to *YES. Figure 28 shows an example of the parameters used to create a PSF Configuration object to generate multiple PDF files. In this particular case, the files are to be sent via e-mail, and a user exit program is specified.

```
                      Create PSF Configuration (CRTPSFCFG)

 Type choices, press Enter.

 PSF configuration  . . . . . . . > EMAILMULT      Name
   Library  . . . . . . . . . .      QGPL          Name, *CURLIB


 Generate PDF output  . . . . . . > *MAIL          *NONE, *SPLF, *STMF, *MAIL
 PDF device emulation type  . . . > *IP40300       *IP40240, *IP40300, *P4028...
 PDF paper size drawer 1  . . . .   *LETTER        *LETTER, *LEGAL...
 PDF paper size drawer 2  . . . .   *LETTER        *LETTER, *LEGAL...
 Multiple PDF files . . . . . . .   *YES           *NO, *YES
 PDF data queue . . . . . . . . . > PDFDTAQ        Name, *NONE
   Library  . . . . . . . . . . >   QGPL          Name, *CURLIB
 Sender of electronic mail  . . . > EMAILMGR       Name, *SPLFOWN, QSPLJOB
 PDF user program . . . . . . . .   EXITMULT       Name, *NONE
   Library  . . . . . . . . . .      QGPL          Name, *CURLIB
 Text 'description' . . . . . . . > 'Email PDF files as multiples'
```

*Figure 28.  PSF Configuration object for multiple PDF file*

To generate the multiple PDF spooled files or multiple files on the IFS refer to the PSF Configuration objects described Section 2.5, "Creating a PDF file for storing in the IFS" on page 43. To generate multiple files, change the value for "Multiple PDF Files" from *NO to *YES.

### 2.8.2  Printer file for multiple PDF file

Create a device description that uses the PSF Configuration object for creating multiple PDF files by specifying:

```
CRTDEVPRT   DEVD(EMAILMULT)
               DEVCLS(*LAN)
               TYPE(*IPDS)
               MODEL(0)
               LANATTACH(*IP)
               AFP(*YES)
               PORT(5005)
               FONT(416 12)
               RMTLOCNAME('127.0.0.1')
               USRDFNOBJ(QGPL/EMAILMULT *PSFCFG)
               TEXT('Use for PDF email, single files, with exit pgm')
```

### 2.8.3  Segmenting the spooled file

Whether you are generating multiple PDF files to be re-spooled in an output queue, place in the IFS, or sent as an e-mail, you need a way to tell the PDF subsystem of Infoprint Manager for iSeries how you want it to break up the original spooled file. This is done by inserting *group tag* records into the spooled file.

There are three ways to generate applications with group tags:

- Using DDS printer file keywords
- Using the Infoprint Server Create AFP Data (CRTAFPDTA) command to generate index information
- Using the AFP Toolbox APIs

In the case of e-mail delivery, you need to provide valid e-mail addresses to the PDF subsystem. The information provided by the group tag record may contain a valid address, in which case an e-mail exit program may not be necessary. If the tag is more generic, for example a customer number, you must use the e-mail exit program to lookup the e-mail address.

This section describes the three methods of inserting the group tag records used by all three delivery methods. It also covers specific information on specifying an e-mail address, with and without the use of an e-mail exit program. Referring back to the addressing decision tree in Figure 22 on page 50, this section covers the branches labeled (C) and (D).

### 2.8.4  Using DDS printer file for indexing

If you have access to the original application program and DDS, *and* are in a position where you can generate your spooled files as AFPDS, you can use the DDS record-level keywords, STRPAGGRP and ENDPAGGRP, to tell Infoprint Server for iSeries how to break the original file into groups of pages.

This corresponds to branch (C) in Figure 22 on page 50.

One PDF file is generated between every STRPAGGRP and ENDPAGGRP keyword pair. If you choose to specify groups, all of the data must be inside a group. Groups of pages cannot be nested or overlapped, each group must be ended with the ENDPAGGRP keyword before another can begin.

The group name should be unique within a document. The maximum number of characters in the group name is 250.

The group name may be hard coded into the DDS. However, it is more likely that it would be passed as a variable using Program-to-System fields. Program-to-system fields are defined by entering a "P" in position 38 of the DDS specification for the field. The program would supply the value which in turn would be used as a parameter for the STRPAGGRP keyword.

The examples in Figure 29 show how to specify the STRPAGGRP and ENDPAGGRP keywords.

```
|...+....1....+....2....+....3....+....4....+....5....+....6....+....7....+....
     A     R RECORD1
     A                                       STRPAGGRP('CUST68839')
     A
     A     R RECORD2
     A                                       STRPAGGRP('simon_h@uk.ibm.com')
     A
     A     R RECORD3                         STRPAGGRP(&GROUP)
     A       GROUP          50A  P

     A     R RECORD4                         ENDPAGGRP
```

*Figure 29.  Examples of STRPAGGRP and ENDPAGGRP keyword*

In the example, the STRPAGGRP keyword in RECORD1 contains a valid e-mail address. An e-mail exit program is not necessary if this format is used.

RECORD2 starts a group named CUST68839. If this tag were used for an e-mail application, an exit program must be used to map that to a valid e-mail address.

RECORD3 illustrates the use of a program-to-system field. The program would assign a value to the field GROUP, just as it would any other field you would normally print. The difference is that there is a "P" in position 38 of the specifications. This tells DDS not to print the field, but rather, to use it as a variable in one of the other keywords, in this case, STRPAGGRP. The use of an exit program would be determined by whether the value for GROUP was a valid e-mail address, or just a key to a lookup file.

RECORD4 uses the ENDPAGGRP keyword to end a group that had been previously started with the STRPAGGRP keyword.

In the example of an invoice or statement, consider using the STRPAGGRP keyword immediately after writing the invoice header or address information, and the ENDPAGGRP after writing the totals or summary information.

### 2.8.4.1  Using the exit program with STRPAGGRP keyword

If you are generating your PDF files for the e-mail function, and the value used in the STRPAGGRP keyword is a valid e-mail address, you do not necessarily need an e-mail exit program. You may choose to use one if you want to add a message to the body of the e-mail.

You may find it convenient to keep the maintenance and selection of e-mail addresses separate from the application program that generates the spooled file.

For example, an invoice program already has the customer number available, so the modifications to output it with the STRPAGGRP keyword are not extensive. A separate set of programs and files can then be used to maintain the e-mail address lists. The e-mail exit program is then used to map the tag used in STRPAGGRP with the valid address.

The e-mail exit program sample in the Appendix F.1, "E-mail exit program" on page 305 may be used as a template. The value provided by STRPAGGRP is available as the Mail Tag field of the input data structure. Use this (or a substring) to lookup the e-mail address.

## 2.8.5  Using CRTAFPDTA indexing

The Create AFP Data (CRTAFPDTA) command may be an alternative to using the DDS keywords STRPAGGRP and ENDPAGGRP to segment the spooled file. These DDS keywords require that you be able to generate spooled files that are in AFPDS format, and that you can modify the DDS. There are a number of common scenarios where these conditions may not be met:

- If the spooled file is generated as Line data and uses a page definitions for formatting. This is the case for users of Infoprint Designer for iSeries using the Layout tool.

- The spooled files are generated using program defined printer files. This is common if the application was originally written for the IBM System/36.

- The spooled files are generated by a purchased package and you do not have the ability or access to make the required modifications to the program and DDS source.

If you find that any of the above conditions apply, you need an alternate method to instruct Infoprint Server how to break up your file, and to whom the segments are to be mailed. The CRTAFPDTA command, which is another component of Infoprint Server for iSeries may be the solution.

This corresponds to branch (D) in Figure 22 on page 50.

### 2.8.5.1  Requirements for using CRTAFPDTA

The CRTAFPDTA command has two important requirements that must be met, in order to use it to generate the index records:

- The input spooled file must be in line data format.

- The information used to generate the index information must be in predictable positions within the printer file.

### *Line data*

If you are using Infoprint Designer for iSeries to create your application, you are generating line data in order to use the page definitions generated by the Layout function.

Many other applications on the iSeries generate SCS data stream. These are often heritage applications originally written for the S/36, or ERP applications which do not provide any formatting capability. Line data is very similar to SCS. If you have the ability to change or override the printer file, it is an easy task to convert it to produce line data instead.

```
CHGPRTF mylib/myprtfile DEVTYPE(*LINE)
```

or

```
OVRPRTF mylib/myprtfile DEVTYPE(*LINE)
```

Section 11.15.1, "Change printer file to *LINE data" on page 210 describes a technique to create a separate printer file with the appropriate parameters, and placing it higher up in the library list. This technique might help you generate line data for use with CRTAFPDTA.

### Predictable data positions

The indexing function of CRTAFPDTA needs to be able to know where to look in the spooled file for the information it needs to identify the break points between the different parts of the spooled data. If the file is to be sent as an e-mail, you need to provide meaningful data, such as customer number to use for the lookup operation in the e-mail exit program.

Refer to the Chapter 2, "Using the Infoprint Server for iSeries PDF transform" on page 33 and to Chapter 1, "Infoprint Server for iSeries - CRTAFPDTA" on page 3 for a detailed explanation on how to setup the CRTAFPDTA command to identify the segments of the spooled file and add index records.

### 2.8.5.2  Using CRTAFPDTA for PDF creation

The CRTAFPDTA command generates output on the IFS. If the target directory is in the QSYS.LIB subsystem, the data can be accessed as a physical file member.

The PDF generation in Infoprint Server works on spooled files. The data in the physical file created by CRTAFPDTA must be re-spooled using the Print AFP Data command, PRTAFPDTA before it is converted to PDF.

Chapter 14, "End-to-end example" on page 243  describes a complete scenario from developing an application using Infoprint Designer to sending multiple PDF files as e-mail attachments. It includes detailed step-by-step instructions for each stage of the process:

- Modifications to the Infoprint Designer project (if necessary)
- A single, one-time modification to the application (if necessary)
- Using CRTAFPDTA to index the data
- Using PRTAFPDTA to re-spool the indexed file
- Viewing the indexed spooled file with the AFP viewer
- Creating a PSF configuration object and an output queue for PDF conversion
- Creating an exit program to lookup e-mail addresses
- Monitoring for undeliverable mail
- Other maintenance tasks

If you are using CRTAFPDTA to index your spooled in order to generate multiple PDF files, please refer that the appropriate sections of that chapter.

### 2.8.5.3  Using the e-mail exit program with CRTAFPDTA

The exit program in the Appendix F.1, "E-mail exit program" on page 305 was designed to be used with the index keys generated by CRTAFPDTA. Customize it to suite your individual requirements.

The data generated as the key tag field has an 8-character numeric string appended to ensure that the keys are unique. You need to perform a substring

operation to separate out the key, such as the customer number, prior to performing the lookup function.

## 2.8.6  Using the AFP Toolbox

The AFP Toolbox is a package containing procedure function calls to be included in an RPG, COBOL or C++ program. It is intended for a highly skilled programmer to build AFPDS applications directly. See Section 1.1.5, "AFP PrintSuite - AFP Toolbox" on page 11 for more information.

The AFP Toolbox includes procedures for Begin Group and End Group, which work in a similar fashion to the DDS keywords STRPAGGRP and ENDPAGGRP. For Specific syntax information, see the *IBM AFP Toolbox for Multiple Operating Systems User's Guide*, S544-5292.

Use of the AFP Toolbox was not described in Figure 22 on page 50. If it is used by the developer, the group procedures allow them to segment the file for generating multiple PDF files if necessary.

### 2.8.6.1  e-mail exit considerations AFP Toolbox

As with the DDS implementation, it may not be necessary to use an e-mail exit program if you use valid e-mail address when you generate the spooled data. However, you may choose to use an exit to customize the e-mail message.

## 2.8.7  Naming convention for multiple files

When multiple PDF files are generated, they are assigned sequential names, depending on the type of file being generated.

### *Multiple files on the IFS*

In the case of storing the files on the IFS refer to  Section 2.5, "Creating a PDF file for storing in the IFS" on page 43 for information on the complete directory structure. If the files are being generated in the QDLS directory, the files will be named 000001.PDF, 000002.PDF, and so on. If the /root directory is being used, the file name will contain other information, but the last ten characters will be 000001.PDF and so on.

If you are implementing an application based on storing files in the IFS, you can use information that is logged in the PDF Data Queue to help match up these sequential names with the information from the index tag that is used to segment the file, such as invoice number.

### *Multiple files for e-mail*

The name of the PDF attachment used for e-mail follows the same naming convention as is used for storing the files on the IFS, namely 000001.PDF, 000002.PDF, and so on. The subject line of the e-mail will contain the name of the original file. It is recommended that a meaningful message be generated using the e-mail exit.

## 2.8.8  Results of sending multiple e-mails with user exit

In the example shown in Figure 30, a spooled file containing multiple invoices is segmented and each component is sent to a different address. An exit program is used to map the mail tag to a valid e-mail address. A custom message is generated based on information provided from a lookup file.
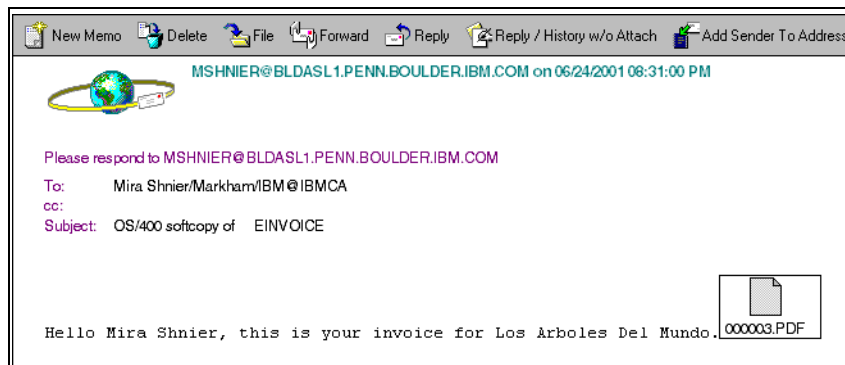
*Figure 30. Lotus notes e-mail with PDF attachment and custom message*

Note the following features:

- The sender name, in this case MSHNIER, was specified using the USRDFNDTA keyword. BLDASL1.PENN.BOULDER.IBM.COM is the iSeries from which this e-mail was sent.

- The subject line contains the name of the original spooled file, in this case EINVOICE.

- The mail message is customized.

- The PDF attachment is given the name 000003.PDF. This invoice was the third of many invoices in the original spooled file. The other invoices from the same spooled file were sent to different addresses.

- The original mail had been sent to an address in the format user@company. Lotus Notes converts that address into its own format.

Clicking the attachment icon launches Adobe Acrobat. The invoice document, shown in Figure 31, is displayed.
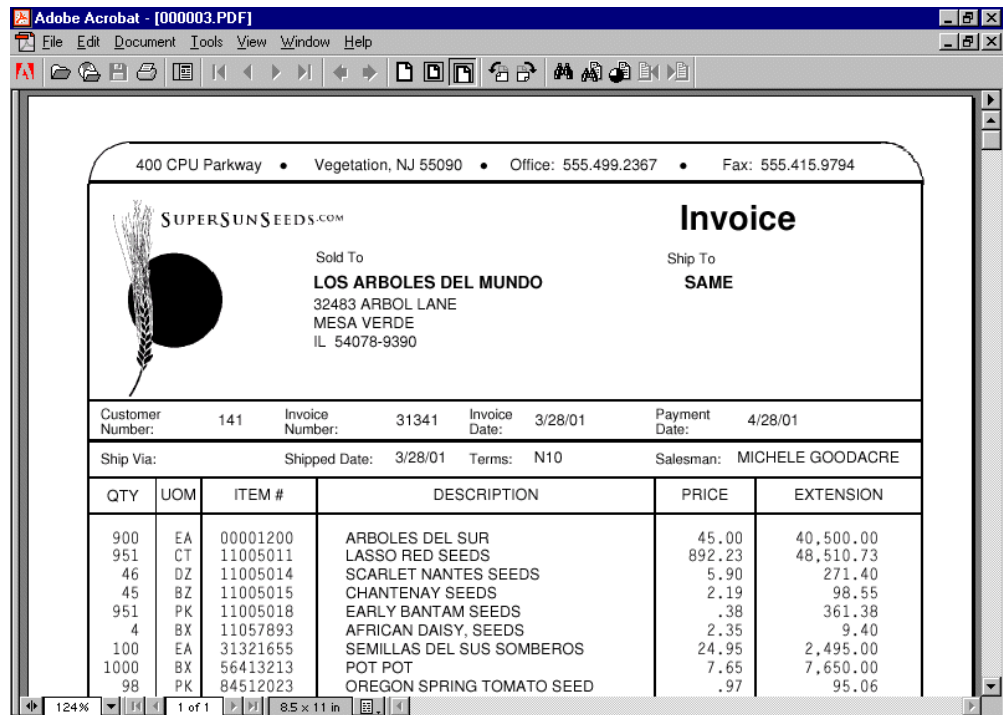
*Figure 31. PDF of invoice attachment*

## 2.9 Additional considerations

This section describes additional information you may wish to consider when designing your PDF generation application.

### 2.9.1 Other documentation.

Please refer to the *Usage Notes* and *Error recovery* sections of the *Infoprint Server for iSeries User's Guide*, G544-5775, for additional considerations that affect the transform and how you use the transformed data. Topics covered include:

• Bar Codes
• Color
• Error Checking
• File Size (see also 2.9.2, "PDF file size" on page 64, in this document)
• Find Function
• Fonts
• Other Unsupported IPDS Functions
• Page Numbering
• Printing Considerations
• User of Printer Features
• Viewing Considerations
• Messages
• Troubleshooting

### 2.9.2 PDF file size

In order to ensure document fidelity when a PDF is generated, Adobe fonts are built based on the AFP fonts used, and are included in the document. This allows

the document to be generated as text as opposed to a raster image. As indicated in the User's Guide, the PDF generated will be increased in size by approximately 110 KB for each fonts referenced in the input document.

During testing, the results shown in Table 9 were observed.

*Table 9. Need caption here*

| File Description | number of pages | Size of PDF |
|---|---|---|
| Short JOBLOG | 2 | 58 KB |
| Medium JOBLOG | 19 | 94 KB |
| Long JOBLOG | 217 | 493 KB |
| Single Invoice | 1 | 328 KB |
| Multiple Invoices | 6 | 337 KB |

The JOBLOGS only used one font, whereas the Invoice application used three different outline fonts.

Some users have expressed concern regarding the overhead caused by using multiple fonts in terms of storage space and line traffic. A PTF is being generated to give those users an alternative. With this new function you specify PDFINCFNT(*NO) as a PSF Defined Option on the PSF configuration object. If the PDF device type is IP40300 or IP40240, then the fonts will not be included inline.

If the user chooses not to have the fonts embedded, the IPDS Type 1 font name character string is moved to the PDF font controls. When the document is viewed the Acrobat Reader will map IBM's core font names to the equivalent Adobe/client environment set of core fonts. For any font name character strings that Acrobat does not have an equivalent for, Acrobat will use the Adobe multi master font substitution program to select the available font that will constitute the "best fit".

### 2.9.3  E-mail exit extras

The primary purpose of the e-mail exit program is to convert a mail tag or the USRDTA field to a valid address for an e-mail. Creating a custom message to display with the PDF attachment comes a close second.

With the information provided to the exit program in the Input data structure there are a number of other things you may consider doing the following actions:

- If the lookup fails, send a message to an operator

- If the lookup fails, copy the PDF file to an area on the IFS

- Write a record to a log file containing information about the status of each PDF file processed. This may contain information that is not normally written to the data queue, such as the message text. You may find such a file may be easier to manage than the data queue.

- Use other information such as the Job name or file name to build the e-mail address or user message

- Choose not to send a given e-mail

### 2.9.4 Using the e-mail exit to customize storage on the IFS

The Infoprint Server function which creates PDF files on the IFS uses a particular directory and file naming convention in an attempt to make the files identifiable and unique. The files and directories created by the PDF transform are owned by the spooled file owner and have a public authority of *EXCLUDE.

This may not suite the needs of all customers. As an alternative, it is possible to set up the PDF transform as if you are going to perform the *MAIL function and specify the use of an e-mail exit program. In that program, you can:

- Have complete control over the target directory structure
- Rename the PDF file
- Change the object authorization of the PDF file

Under normal circumstances, when you select *MAIL, the e-mail process cleans up the PDF files it generates once the it is finished processing the entire spooled file. However, at the point in time when the exit program is running, the PDF file is accessible. Its name and path are passed to the program as part of the input data area. The trick is to "grab" these files in the using the exit program and store them in a manner of your own choosing, before they are erased.

In exit program Appendix F.1, "E-mail exit program" on page 305, the file is only copied if the e-mail address lookup fails. You can modify that program to copy all files that it processes, instead of sending them as e-mails. At that point you can change the security settings, or give it a new name.

### 2.9.5 Other information available in the exit

The earlier discussions in other parts of this chapter focused on using the Mail Tag field (as set by the STRPAGGRP keyword or CRTAFPDTA), or the USRDATA field as the key to the address lookup operation.

The input data structure also contains the job name, number and user, and the original spooled file name and number. This information can also be used as part of the address lookup, message customization, or other processing of the PDF file.

You can take this one step further and use this information to call system API QUSRSPLA programs that let you retrieve the entire spooled file attributes. That gives you additional information, such as the formtype, or the program used to create the file. For more information about QUSRSPLA, see *AS/400 System API Reference*, SC41-5801, or the iSeries Information Center on the Web.

### 2.9.6 Sending a file to multiple destinations

It is possible to use USRDFNDTA or STRPAGGRP to specify multiple destination addresses for a given e-mail. There is a limit of 250 characters to the length of the values that each of those support.

If you choose to maintain the list of addresses elsewhere, the list can be imported by the e-mail exit. The address field that is available in the output data structure may be as long as 16 MB if you require.

If you specify multiple addresses in the exit program, each one must be delimited by single quotation marks, for example:

```
'bill_s@last.leaf.com' 'lee_s@paydaypete.com'
```

An example of using this technique may be to periodically distribute a company financial report to a number of its executives. You don't want to have to modify the e-mail exit program every time an employee changes. Use a separate application to maintain the names. Place the name of the distribution list in the USRDTA field. The e-mail exit can then import the current list of addresses as needed.

### 2.9.7 Using Open and Close to Segment a spooled file

Generally speaking, the iSeries works more efficiently if large spooled files remain intact. There is a certain amount of overhead if you are printing or managing multiple small files versus one large file. Nevertheless, if you are not able to use the DDS keywords to insert the group tags, and the data is not predictable enough for CRTAFPDTA, the final solution may be to modify the application program simply close and open the printer file at each group boundary. This generates multiple spooled files which are then be converted to PDF independently.

Specify a value of *NO for the *Multiple PDF output* parameter in the PSF configuration object if you are breaking up the file within the application before you pass it to the PDF output queue.

### 2.9.8 Profilerations of PSF configuration object and device description

Some consideration needs to be given to the proliferation of PSF Configuration objects and printer device descriptions needed for the various PDF creation tasks you wish to do. Clearly the single versus multiple files have to go to separate queues, as do files that are stored on the IFS using the *STMF function versus those files being sent by e-mail.

Beyond that, you may choose to create different configurations to deal with different applications. For example, you may want to put a marketing message on your invoice e-mails, but not on purchase orders.

### 2.9.9 Using the PDF data queue

The IPDS to PDF process creates entries in a data queue object if you specify one in the PDFDTAQ parameter in the PSF Configuration object. To use this function, the data queue must exist and have a minimum length of 752 characters. Use the iSeries API called QRCVDTAQ to read the entries. For more information on QRCVDTAQ, see the iSeries Information Center on the Internet.

Using the data queue helps you identify other types of problems that may occur. For example, if you forget the single quotes on the e-mail address in the LOOKUP table, it is treated as an invalid address and the file is not sent. A return value of '05' is logged in the data queue.

You can use the information in the data queue as a trigger to begin a secondary process if you store the file on the IFS. For example once you know a file has been successfully placed in the IFS, use the information in the data queue to post it on a web site.

The layout of the fields in the data queue can be found in Appendix F.2, "PDF data queue structure" on page 308

### 2.9.10 Other e-mail solutions

Infoprint Server for iSeries uses the SNDDST command to perform its e-mail functions. It addresses the document, adds message text and attaches the PDF file.

There are other tools available on the iSeries that add more sophistication to the e-mail function. You may choose to store the PDF files on the IFS for subsequent processing by one of these other methods.

- Lotus Domino for AS/400 provides a rich application development environment that tightly integrates mail, workflow, document management and many other important features.

- The Java Mail API is used to create a mail client capable of sending multimedia mail messages, as well as enabling a full fledged IMAP (Internet Mail Access Protocol) implementation supporting folders, authentication, and attachment handling. The JavaMail implementation provides MIME encoding and decoding capabilities natively, allowing developers to focus on content and business logic, not data conversion.

- The QTMMSENDMAIL system API is used to enable mail applications. It is quite powerful but may require a moderate to extensive programming effort.

## 2.10 Comparing AFP and PDF indexed files

Infoprint Server for iSeries can generate PDF files and AFP portable format. This section provides information about viewing the capabilities of the Adobe Acrobat and the AFP Workbench.

From a more general point of view, Adobe Acrobat and Adobe Acrobat Reader have created to work with structured document as a book. The AFP Workbench is designed to work with AFP resources documents and files. This section may be used to define which document format may be used.

### 2.10.1 Considerations choosing the file format

The most important point is to determine the file format you want use. The file format required by a customer may depend of the use and of the integration in his IT solution.

- **Adobe Acrobat**: Acrobat may be used to view and modify document appearance. Additional elements as notes or bookmarks may be added with Acrobat as shown in 2.12, "Viewing and indexing PDF files with Adobe Acrobat" on page 72. Acrobat does not provide an automatic way to define a single bookmark at the same place across several pages.

- **Adobe Acrobat Reader**: Adobe Acrobat Reader has the same viewing capabilities as Adobe Acrobat. However, you cannot modify the document appearance or add bookmarks or notes.

- **AFP Workbench:** AFP Workbench or called AFP Viewer is part of Client Access and may be used to see AFP spooled files, AFP resources. In addition, the AFP viewer support AFP indexed spooled. AFP spooled files may be indexed on zSeries, pSeries, and iSeries.

Depending on your environment, the AFP Workbench or the Adobe Acrobat may fit your requirements. Indexing information share used for archiving purpose. If

your archiving environment uses the AFP architecture (see Chapter 16, "Using Content Manager OnDemand for iSeries" on page 271, for more information), the AFP Workbench offers better capabilities.

Due to the popularity of the Adobe Acrobat Reader, the PDF format offers a good way to make information available. Table 10 provides some comparison between Adobe Acrobat 4.5 and the AFP Workbench 1.54. These may be different depending of the release of the product.

*Table 10. Adobe Acrobat comparison*

| Functions | Adobe Acrobat | AFP Workbench |
|---|---|---|
| Indexing manually | You can create a bookmark in a PDF files. See 2.12.2, "Creating a new bookmark" on page 74, for additional information. | You cannot create an index with the AFP Workbench. AFP Workbench work with index information created with the Group DDS keyword or using their CRTAFPDTA capabilities of the Infoprint Server |
| Indexing automatically | Bookmarks may not be created automatically across the document | You cannot create an index with the AFP Workbench. AFP Workbench work with index information created with the Group DDS keyword or using their CRTAFPDTA capabilities of the Infoprint Server |
| Find | PDF files may be scanned with the "find" option to search specific text stream. | AFP files may be scanned with the "find" option to search specific text stream. |
| Search indexed information | Bookmarks are displayed in a navigation pane. The navigation pane can be activated by pressing the corresponding icon | Indexed information may be found with "Find Group" icon or option.The group information are displayed an additional window. |
| Security | The appearance of PDF files may be changed with Adobe Acrobat. Other tools or utilities may be used to changed the appearance of the document and text. A Password may be set to the PDF file to enhance the security. | The AFP data stream cannot be modified with AFP Workbench or other IBM utility. The AFP architecture provide |
| Size | The size of PDF files appear to be much bigger as the same data in an AFP indexed format. See 2.9.2, "PDF file size" on page64. | |

## 2.11  Viewing AFP indexed files with AFP Workbench Viewer

The Advanced Function Presentation (AFP) Workbench for Windows is a platform for the integration of AFP-enabling applications and services. AFP

Workbench is part of Client Access/400. The Viewer provides the ability to browse the following types of files residing on your workstation or network:

- AFP documents, such as those generated by IBM's Document Composition Facility (DCF) and BookMaster for AFP device types

- AFP documents created by AFP Conversion and Indexing Facility (ACIF), which processes S/390, RS/6000 or from iSeries line data using a page definition (PAGEDEF)

- AFP overlays and page segments, such as those created by IBM's Overlay Generation Language (OGL)

- Output from workstation applications that is converted to an AFP document using the IBM AFP Printer Driver for Windows (supplied with Workbench)

- Displaying page segments and overlays referenced by an AFP file where those resources are either contained in the file or located in the resource directories defined on the More Preferences dialog box

This section provide a short introduction about how to work with groups information and how to navigate in an indexed AFP document.

### 2.11.1  Index an AFP file

They are several methods to create indexed files on the iSeries. Two methods are available to create AFP indexed files:

- Using DDS group keyword
- Using CRTAFPDTA

AFP files created and indexed on S/390 or AIX systems are supported as well. In this case it is important that all resources are included in the file.

### 2.11.2  Using AFP Workbench with indexed AFP files

The AFP Workbench is able to display indexed AFP files. Group and trigger may be used to navigate in the file. A group is collection of pages that form a subset of a document. You may use one of the following ways to open an indexed file:

- Open Operation Navigator. Expand the system environment structure and select the Basic Operation to access to the Output Queue containing the spooled files. Double click the AFP spooled file to invoke the AFP Viewer. Note that the AFP resources have to assessable to the AFP Viewer.

- Use CRTAFPDTA to produced a portable AFP files with all resources included.

Figure 32 shows an indexed AFP file displayed with AFP Workbench.

*Figure 32. AFP Workbench*

The AFP workbench is working with group. A *group* is named collection of pages that form a logical subset of a document. Groups are identified in an AFP document using the indexing functions of the AFP Conversion and Indexing Facility (ACIF) or AFP Application Programming Interface (AFP API) programs.

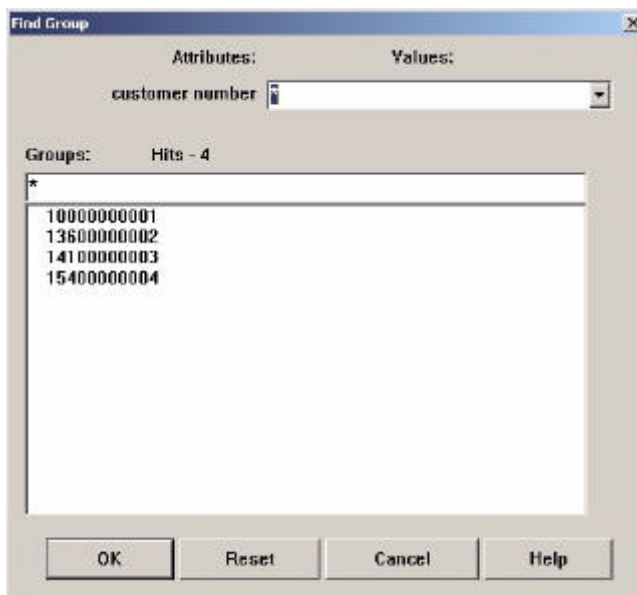From this point, you may be able to select the Group icon to access to the indexed information as shown in Figure 33.



*Figure 33. Find Group*

Use the Find Group dialog box to view the first page in a group of pages. A group of pages is defined by indexing tags included in an AFP document file. This function is not available if the file does not contain group-level indexing tags.

Select an attribute value to display a list of groups that have been tagged with the selected value for the attribute. Select additional attributes and associated values to limit the list of groups as shown in Figure 34.
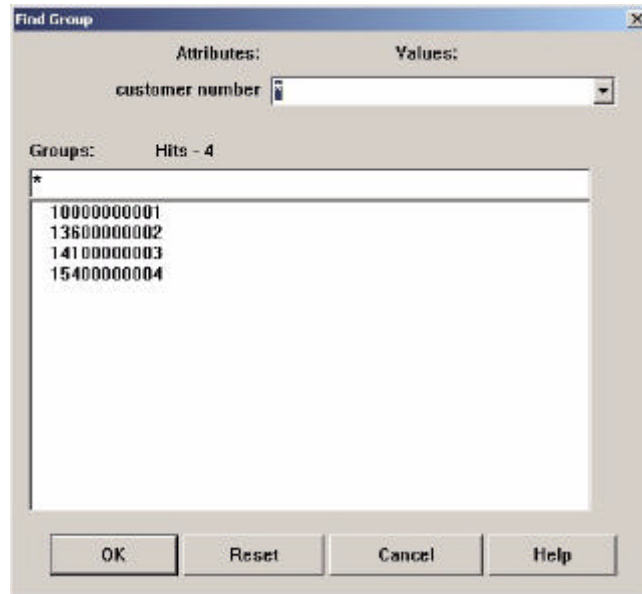


*Figure 34. Groups attributes*

A list of attributes appear as defined in the file. The values for the selected attribute are displayed in the Value list. Select a value for one of the listed attributes as explained here:

1. Select the arrow an choice the value you want to show. The groups that have been tagged with the selected values are displayed.

2. Select a group from the list and click OK. Or double-click a group in the list to select the group and display the first page in the group.

## 2.12 Viewing and indexing PDF files with Adobe Acrobat

Infoprint Server create full text searchable PDF. As example the text available in the document may search to find specific word or part of a text, or to find a specific page. An other example is to place bookmarks in our document. This helps the user to navigate in a PDF document.

Infoprint Server does not have the ability to place Bookmarks automatically in the PDF file. Adobe Acrobat may be used to add Bookmarks as explained in the following sections.

### 2.12.1 Introduction

A bookmark is a type of link with representative text in the navigation pane of Adobe Acrobat or Acrobat reader. Each bookmark in the navigation pane goes to a different view or page in the document. You can use electronic bookmarks as

you would paper bookmarks, to mark a place in a document to which you want to return. You can also use bookmarks to modify the view of its destination, thus directing your reader's attention where you want it. Bookmarks allow you to jump within a PDF document, to another document (PDF or non-PDF), or to a Web page. They can also perform actions, such as playing a movie or sound, executing a menu item, or submitting a form.

Bookmarks maybe used to navigate in a PDF document using Adobe Acrobat or Adobe Acrobat Reader. Adobe Acrobat Reader does not have the ability to add or organize Bookmarks.

Figure 35 shows an example of a small indexed PDF file.
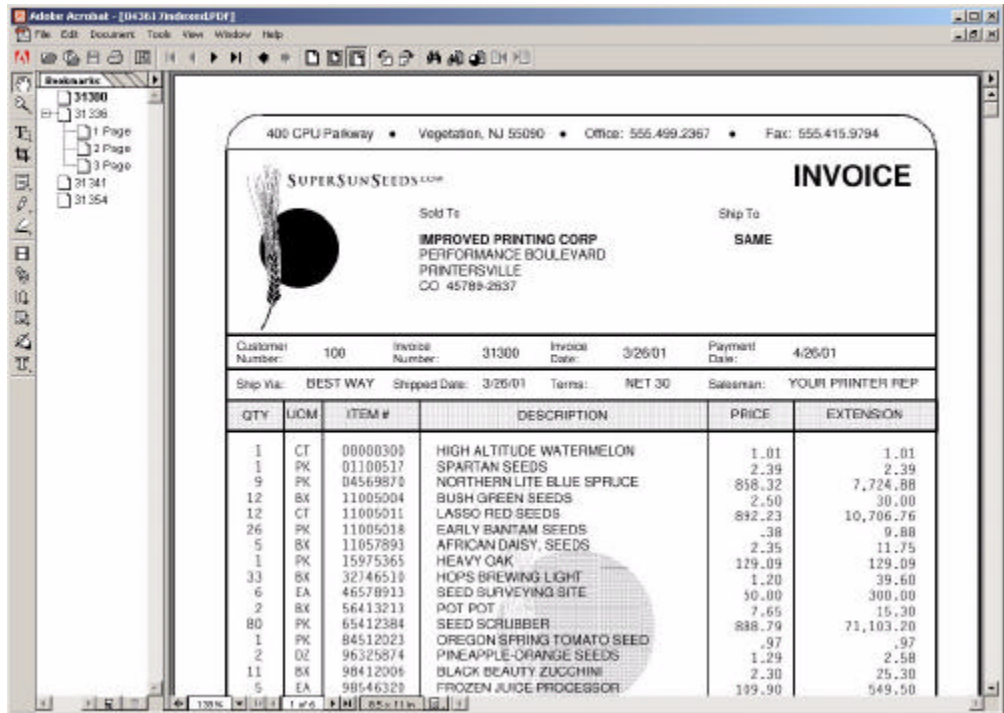


*Figure 35. Indexing your PDF files with Adobe Acrobat*

Figure 36 shows an Acrobat window. The right part of the window shown a document page with some of the supported elements, like the logo (image) line box and text.

Adobe Acrobat has been used to mark the invoice number as Bookmark. The indexed invoices numbers are displayed left pane of Figure 36 as a organized structure. This structure may be use to navigate in the document from one invoice to the other one.

The tree structure have been organized as a hierarchy to show that an invoice contain several pages. In this case, a second bookmark have been created and in a second level hierarchy.

You may note the difference between Adobe Acrobat and Adobe Acrobat Reader. The reader can read and display the complete PDF file. You may use the tree structure and search capability but Adobe Acrobat is required to create bookmarks as shown in this following sections.

> **Barcode displayed in a PDF file**
>
> You may note that most of Bar code symbology are supported by the IPDS/AFP transform. The transform converts the barcode as an image placed in the PDF file to be displayed. The quality of this image depends on the transform configuration set in the PSF configuration object and may not be used by a scanning device like a regular printed barcode.

### 2.12.2 Creating a new bookmark

This section describes how to create new bookmark in a PDF document using Adobe Acrobat Version 4.05c. Different version of Acrobat may require different functions or tasks.

Open the PDF file with Adobe Acrobat to start. The PDF file is displayed in the Acrobat window as shown in Figure 36.
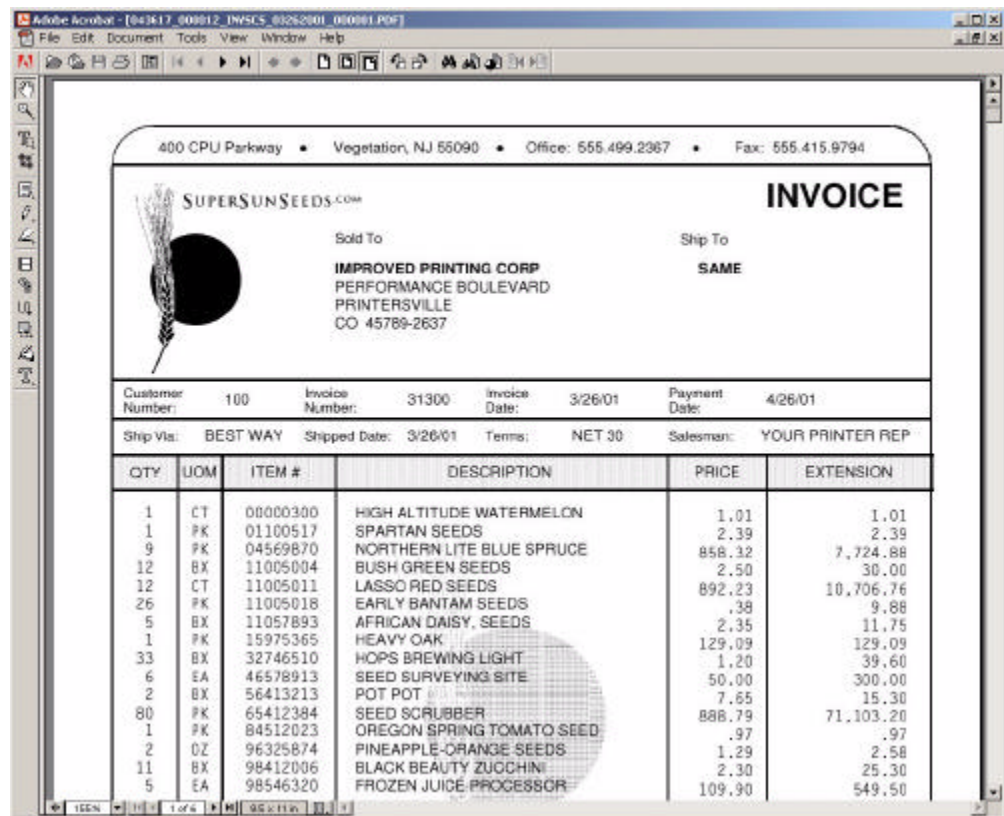


*Figure 36. Adobe Acrobat window*

Select the hide/show bookmarks icon to open the navigation pane as shown in Figure 37.
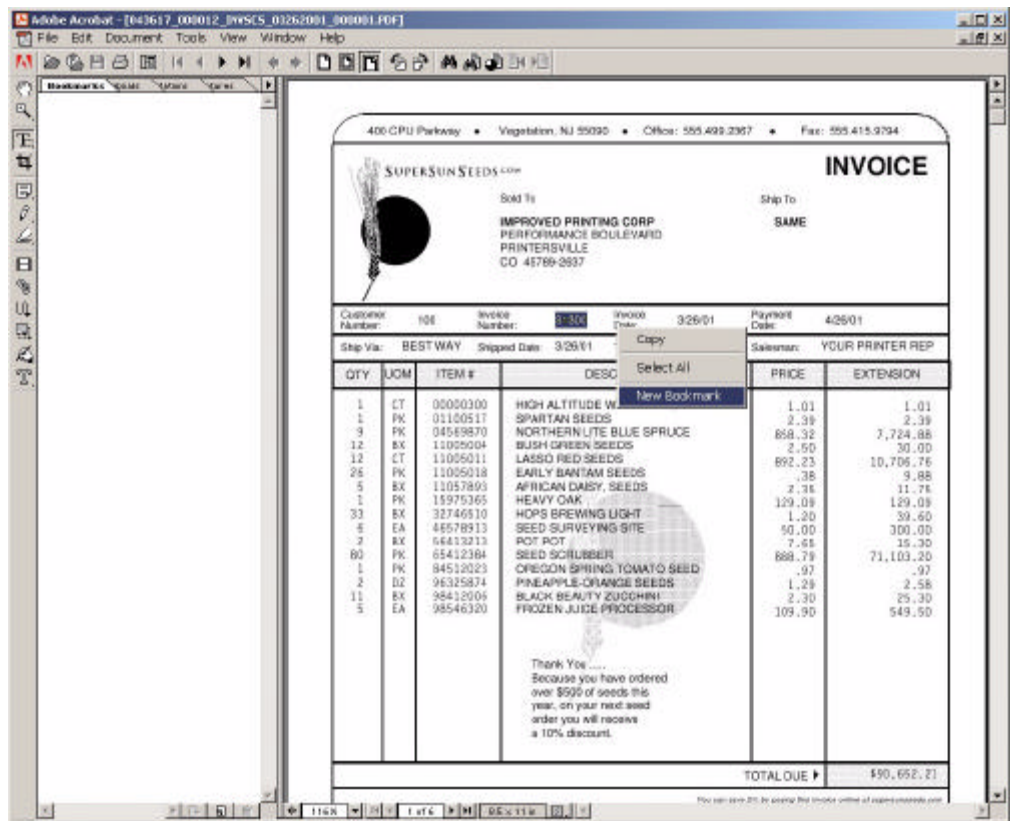
*Figure 37. Adobe Acrobat navigation pane*

Click the **Bookmarks** tab in the navigation pane to bring the Bookmarks palette to the front.

Use the Text select tool to mark the text you want use as bookmark label and click the right mouse button. Select the **New Bookmark** option. The new Bookmark appearS in the navigation pane. Repeat the previous action for any additional Bookmark.

After all Bookmarks have been create you can edit and change the bookmark label. Select the bookmark and click with the mouse pointer on the hi lighted bookmark label. The label appears to be surrounded, which indicates that the label is in edit mode. At this point, you can add, remove, or complete the label.

Make sure the correct location and magnification are set, go to another page in the document, and then test the bookmark.

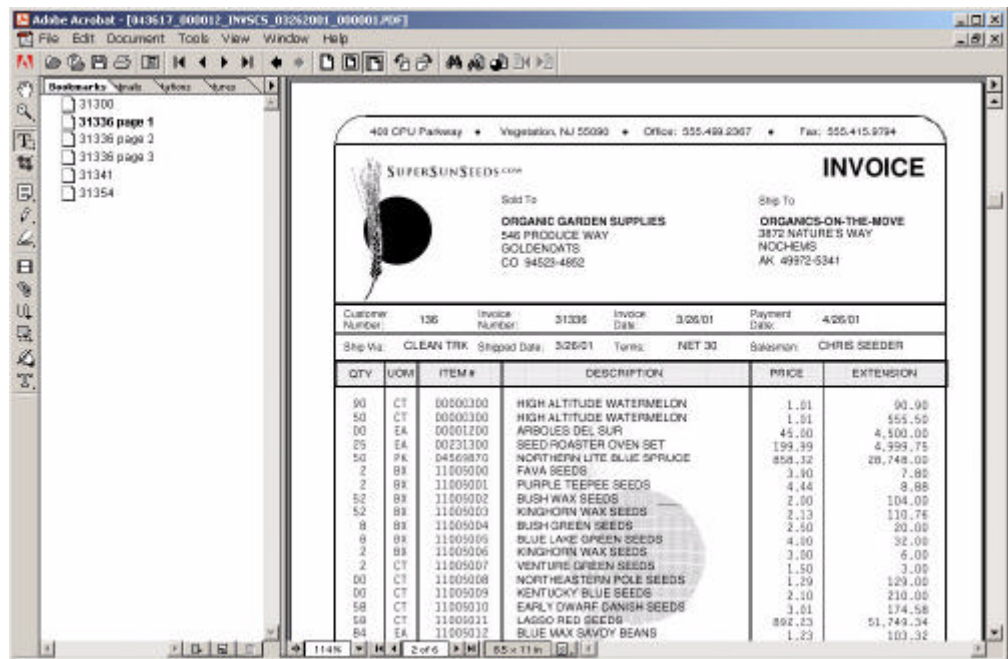Figure 38 shows the Adobe Acrobat window with the additional Bookmarks in the navigation pane.

*Figure 38. Adobe Acrobat with additional Bookmarks*

In the example displayed in Figure 38, the invoice number is marked on each page as a bookmark.

The three bookmarks for the invoice 31336 have been edited and the page information has been added manually.

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**Adobe Acrobat Bookmarks**

Unfortunately it is not possible to add multiple bookmarks for a unique field (the invoice number in the example) across the document with Adobe Acrobat.

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### 2.12.3 Adobe bookmark hierarchy

Give an additional professional touch to your PDF files and give a hierarchy structure to your bookmarks.

You can nest a list of bookmarks to show a relationship between the common pages of invoice 31336 as described in 2.12.2, "Creating a new bookmark" on page 74. Nesting creates a parent/child relationship, and you can expand and collapse this hierarchical list as desired.

To nest a bookmark under another bookmark, follow these steps:

1. Click the bookmark or range of bookmarks you want to nest.

2. Drag the icon or icons underneath the first letter in the parent bookmark; a black bar shows the position of the icons.

3. Click **OK**. The bookmark is nested; however, the actual pages remain in their original location in the document.

Regarding the invoice example, begin with the last page of the invoice page set. In this example the page 3 of invoice 31336 then page 2 and 1. Because the last

move is placed above the last bookmark inside a hierarchy, the bookmark will be in the correct sequence.

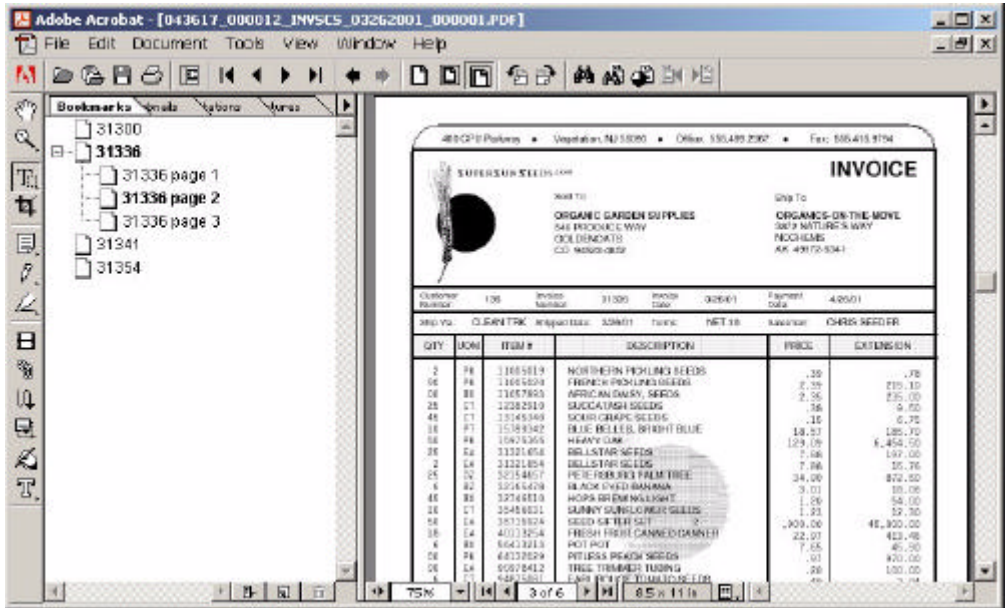Figure 39 shows how the bookmark hierarchy is displayed in Adobe Acrobat.



*Figure 39. Nesting a bookmark*

In this example, an additional bookmark is created for the invoice 31336 page 1. This have the advantage to show a complete hierarchy structure in the second level and the invoice number with a + when the structure is collapsed. Note that the page indication have not been added for the first structure level.