

iSeries Printing Enhancements

2001 Announcements
ITSO Technical Overview
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Infoprint Server for iSeries V5R1

- Strategic new LP for enterprise, e-business output management
 - AS/400 output transform to PDF
 - Integrated e-mail of spooled files in PDF format
 - PCL, Postscript, and PDF transforms into AS/400 output queues
 - Fully resolved AFP output for electronic distribution
 - Image formats (TIF, GIF, JPEG) to iSeries page segments

Infoprint Designer for iSeries V5R1

- New design system provides integrated, high-precision front-end for AS/400 documents and reports
 - Image and Overlay design editors
 - Layout editor for final page composition
 - Integrates fully into the iSeries and AS/400 printing architecture



Notes: iSeries Print and e-Print V5R1

V5R1 provides significant changes to iSeries-AS/400 printing and "e-output" capabilities. Although the changes are wide-ranging, the primary focus is "e-output". E-output refers to the ability to create information output and deliver it to the required destination in the format desired. The "e" in e-output hints that e-business re-engineering is driving the process. Where business processes typically printed then distributed information in hard copy, e-business processes quite frequently require information to be delivered electronically.

The new print and e-print functionality in V5R1 is delivered through a number of products, including:

- Infoprint Server for iSeries
- Infoprint Designer for iSeries
- PSF/400 V5R1
- OS/400 V5R1
- Content Manager Common Server

The net effect of V5R1 is to take the very strong core print architecture of the iSeries-AS/400 and expand its front-end and back-end. Front-end refers to the creation or composition of output. The new Infoprint Designer and new Java print architectures fit in here. This front-end also now includes the network where pages composed in ASCII formats (PCL, Postscript, PDF) can be pulled in and managed by the iSeries-AS/400. The "back-end" refers to the capabilities to deliver pages once they are created, normally going beyond print. This is the area of electronic delivery and of archival/retrieval, CRM, etc.

(continued)

Notes: iSeries Print and e-Print V5R1

Let's take a quick snapshot at two of the new software products for V5R1 - Infoprint Server and Infoprint Designer. Infoprint Server is focused on enterprise and e-business-driven output management. On the e-output side, Infoprint Server provides PDF and portable AFP support for the iSeries. Any standard iSeries-AS/400 output format can be transformed into PDF. The PDF is text-based, fully navigable, high-performance. In addition, enhancements to DDS (OS/400) enable you to segment an output file, triggering the PDF server to create multiple PDF files - this is an "electronic burst and bind" function. More than this, e-mail of output (via PDF) has been integrated and automated into this process. Output files can be transformed to PDF and automatically sent to any destination .

AFP output can be treated similarly. Today's output is highly complex, highly graphical. AFP organizes that complexity by keeping the core output small and managing fonts, images, graphics, and overlays separately. However, when you want to send output electronically, you want those resources. Infoprint Server enables you to create fully resolved AFP print files for network distribution, viewing, etc.

The other key focus of Infoprint Server is iSeries management of network output. Infoprint Server provides transforms for PCL, Postscript, and PDF into AFP so output generated in those formats can be brought into the iSeries and effectively managed to the printer.

Infoprint Designer for iSeries is an all-new, fully graphical design system for iSeries. The design interface runs on Windows with tight integration with the iSeries. Infoprint Designer does the complete job, designing the image and overlay content, then automatically pulling in the application data and putting all the elements together in the final page layout. Infoprint Designer creates standard iSeries-AS/400 resources, including the standard resources (page and form definitions) that enable the separation of page formatting from the application program. Once the design is complete, a simple change or override to the printer file and your application is transformed.

Print Services Facility (PSF) for iSeries V5R1

- Integrated feature of OS/400 providing AFP and IPDS printing management
- V5R1 enhancements include:
 - Integrated e-mail of iSeries-AS/400 output files
 - Support for new Java AFP print architecture
 - Enhanced formatting with iSeries-AS/400 page and form definitions
 - Enhancements to DDS output formatting
 - Support for new iSeries-AS/400 printers
 - Enhanced color output support

OS/400 V5R1

- iSeries as IPP server
- Java AFP print architecture
- Unicode
- AFP resolution of applications formatted with page and form definitions



Notes: iSeries Print and e-Print V5R1

Two additional, key components in the print, e-output transformation with V5R1 are PSF/400 and OS/400.

PSF/400 is a feature of OS/400 and provides AFP system management and IPDS print management. PSF/400 addresses two key elements in e-business-driven transformations. First, printers have moved to the network and PSF/400 (via IPDS) means that the assured delivery and printer management characteristic of twinax printers is also true of those network-attached printers (assuming they are IPDS). Second, more complex, graphical output is the norm today. The iSeries-AS/400 creates those pages of output in AFP and PSF/400 is in the center of the process of pulling those pages together for printing or electronic distribution.

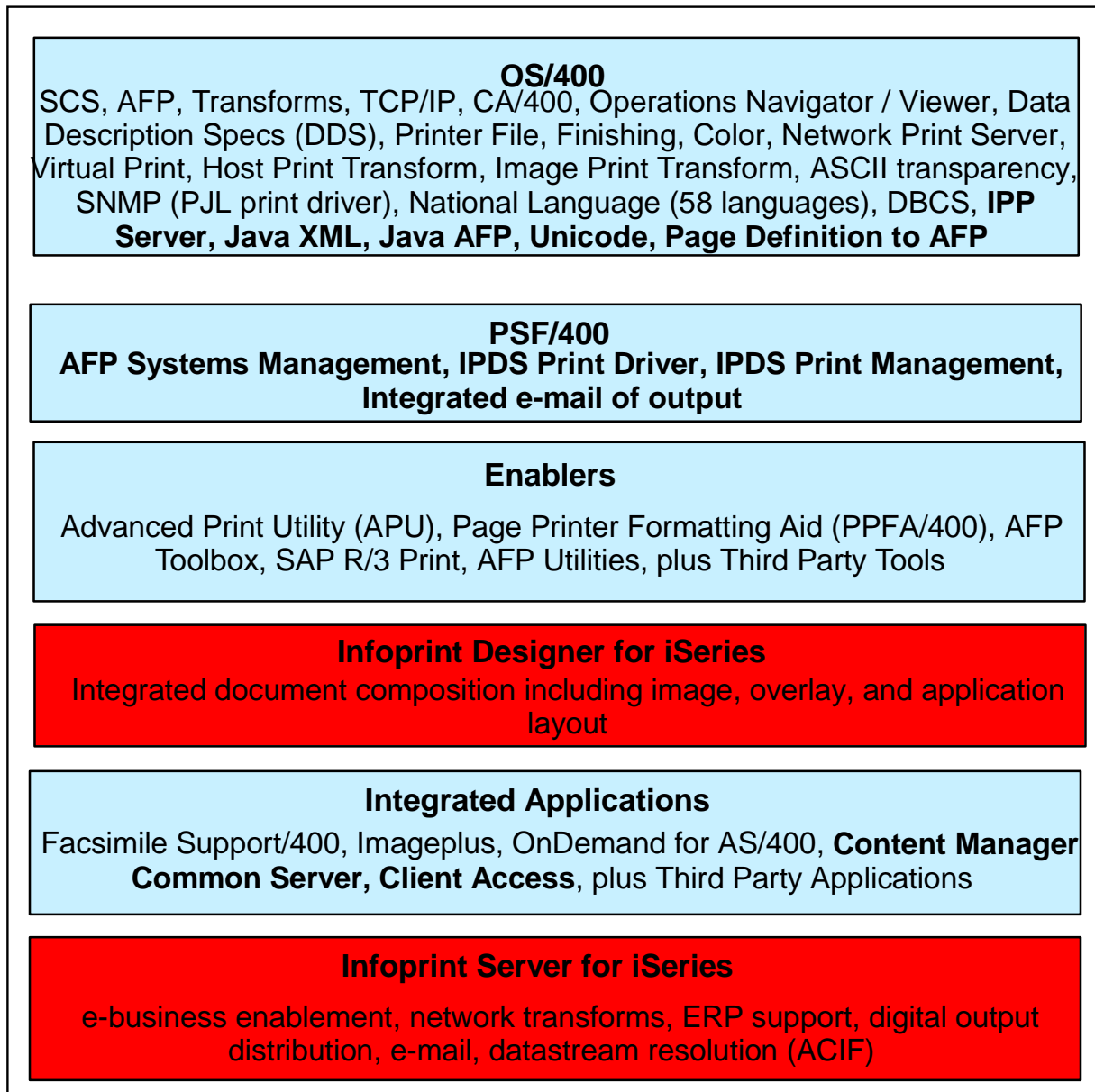
For V5R1, PSF/400 is enhanced on many fronts. PSF/400 supports the new automatic e-mail of output (PDF) function. PSF/400 expands the capability of iSeries page definitions for output formatting. HLL applications can output records of output data (via DDS) or classes of output data (Java) that flow to the new page definition record format interface. By the way, the new Infoprint Designer is creating page definitions so all of these changes in design and application interfaces integrate. PSF/400 supports a new print architecture for Java, more on this in a bit. There are also substantial changes in DDS page composition keywords with V5R1 that enhance the ability to create the page content required in today's output applications. These changes include enhanced color support.

OS/400 V5R1 has a number of enhancements in printing support but the changes in e-business, e-output support take center stage. First, with V5R1, the iSeries becomes an IPP (Internet Print Protocol) server. IPP is the emerging standard for Internet printing. In essence, this means you can submit print jobs anywhere to a URL. The iSeries takes that URL requests and maps it to an iSeries-defined printer. Second, two new print architectures for Java server printing are announced, one that is XML-based for simple reports and one that is AFP-based for complex documents. Third, the iSeries now supports Unicode-encoded data. Unicode is the key to worldwide applications that are National Language-independent. Finally, OS/400 provides for writing applications formatted with page definitions to the output queue in AFP. This ensures that those applications can be viewed and if required, printed to PCL printers. Note that both Infoprint Designer and Java are driving page definition formatting.

Technical Overview Charts

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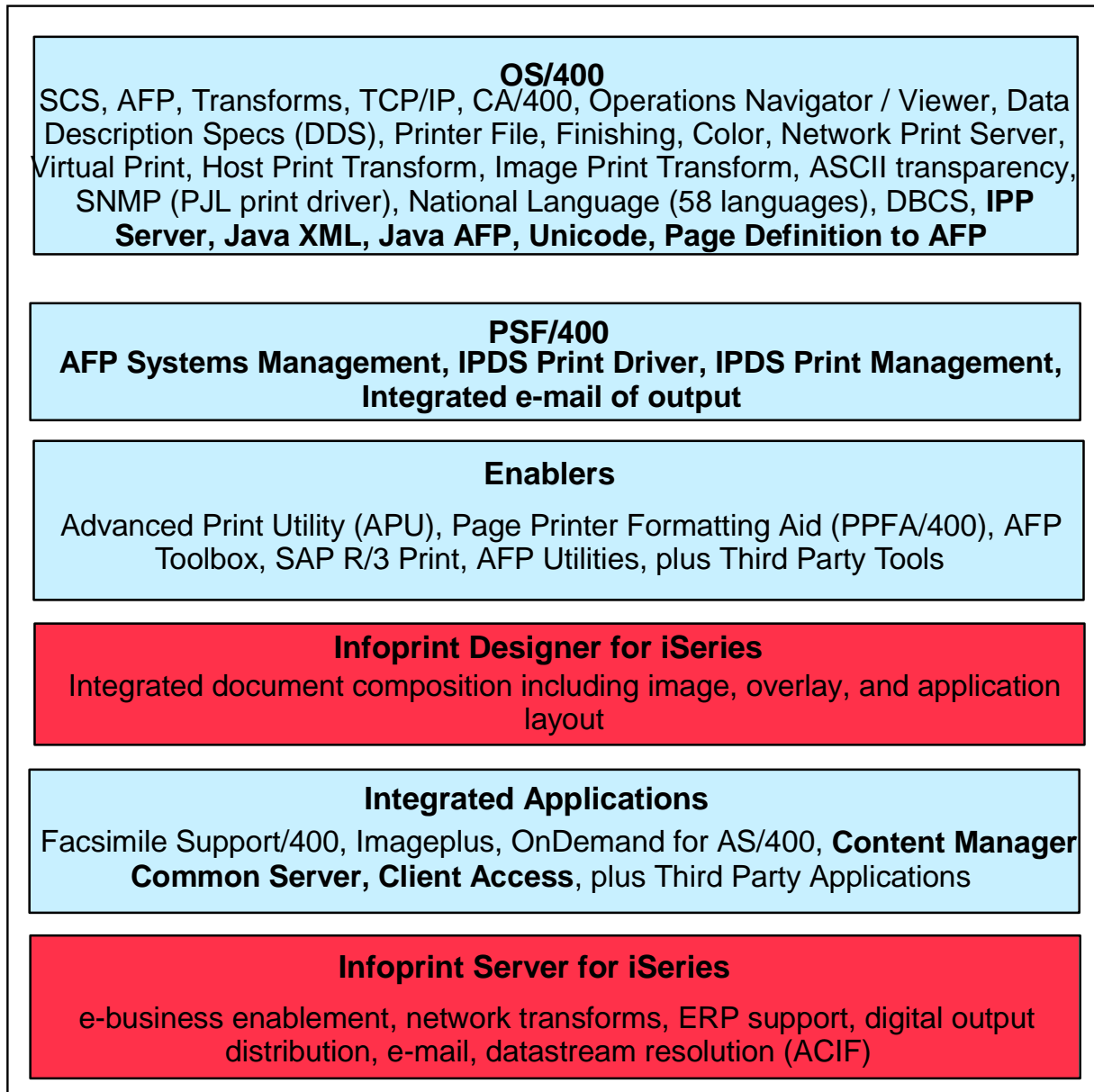
iSeries Print and e-Print Structure



New with V5R1:

- Infoprint Server for iSeries
- Infoprint Designer for iSeries
- PSF/400 V5R1
- OS/400 V5R1
- Content Manager Common Server

iSeries Print and e-Print Structure



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Notes: iSeries Print and e-Print Structure

The composition and delivery of output on the iSeries is the result of a set of capabilities that are delivered both within OS/400 and within a set of integrated program products. This chart shows the structure of these elements in logical groupings. The areas of new functionality are highlighted in bold. The new software products are in the red boxes.

These products and functions provide the capabilities to create pages of output, to print those pages, and to deliver those pages electronically. Let's consider a simple scenario - invoice pages. Infoprint Designer is used to compose the application, to design the invoice. OS/400 will ensure that the application, in production, will write fully resolved AFP pages to the output queue. OS/400 (via Host Print Transform) will also provide for PCL printing. CA/400 will enable fully graphical viewing. PSF/400 manages printing to IPDS printers. Infoprint Server will enable the invoice print file to be transformed to PDF. Once in PDF, it can be cataloged to IFS for web application access, printed directly to PDF-capable printers, or automatically e-mailed. PSF/400 again gets involved to facilitate the e-mail function. Alternatively, the AFP invoice output can be converted to AFP portable format (via Infoprint Server) and either placed in IFS for web access or electronically delivered. An AFP browser plug-in provides for viewing or printing of the file. The invoice output can also be captured in an archive (OnDemand or the new follow-on to OnDemand - Content Manager Common Server). With archival, you get organization, indexing and the retrieval access (client or web) needed in customer service applications or CRM.

As you flow critical information through your enterprise, a number of functions get into the act.

Focus of Infoprint Server

- Electronic Distribution of output
- iSeries management of network print

iSeries support for PDF

- Transform services for any iSeries standard output (AFP, IPDS, SCS, even OV/400)
- PDF output to e-mail, IFS, or PDF printer
- High-function PDF Server
- Segmentation - "Electronic Burst and Bind"

Integrated e-mail of output

- PDF output can be automatically e-mailed
- Multiple e-mails based on segmentation
- Exits for customization

iSeries as a network print server

- PCL, Postscript, and PDF to AFP
- Postscript and PDF transform is IBM-Adobe full-function Level 3

Portable AFP

- Add external resources to AFP data for portability
- Add indexing for navigation

Image transforms

- GIF, TIF, and JPEG transforms to IOCA
- Windows-based

Notes: Infoprint Server for iSeries V5R1

Infoprint Server for iSeries (hereafter called Infoprint Server) is a separately orderable program for V5R1 (5722-IP1). The focus of Infoprint Server is on the network, extending the considerable capabilities of the iSeries beyond printing to the management and dissemination of output. As business applications are re-engineered into e-business applications, the output of those applications may need to change and flow electronically to the consumer of that output.

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

On the e-output side, Infoprint Server provides PDF and portable AFP support for the iSeries. Any standard iSeries-AS/400 output format can be transformed into PDF. The PDF is text-based, fully navigable, high-performance. In addition, enhancements to DDS (OS/400) enable you to segment an output file, triggering the PDF server to create multiple PDF files - this is an "electronic burst and bind" function. More than this, e-mail of output (via PDF) has been integrated and automated into this process. Output files can be transformed to PDF and automatically sent to any destination. Integrated e-mail also provides user exits for customization (ie. using the trigger field - a customer number for instance - to look up an e-mail ID in an address book)

AFP output can be treated similarly. A new command - Create AFP Data (CRTAFPDTA) provides three critical functions: (1) convert print formatted with page definitions to AFP, (2) create a portable file by pulling in external fonts, page segments, and overlays, and (3) insert indexing to facilitate easy navigation when viewing the print file.

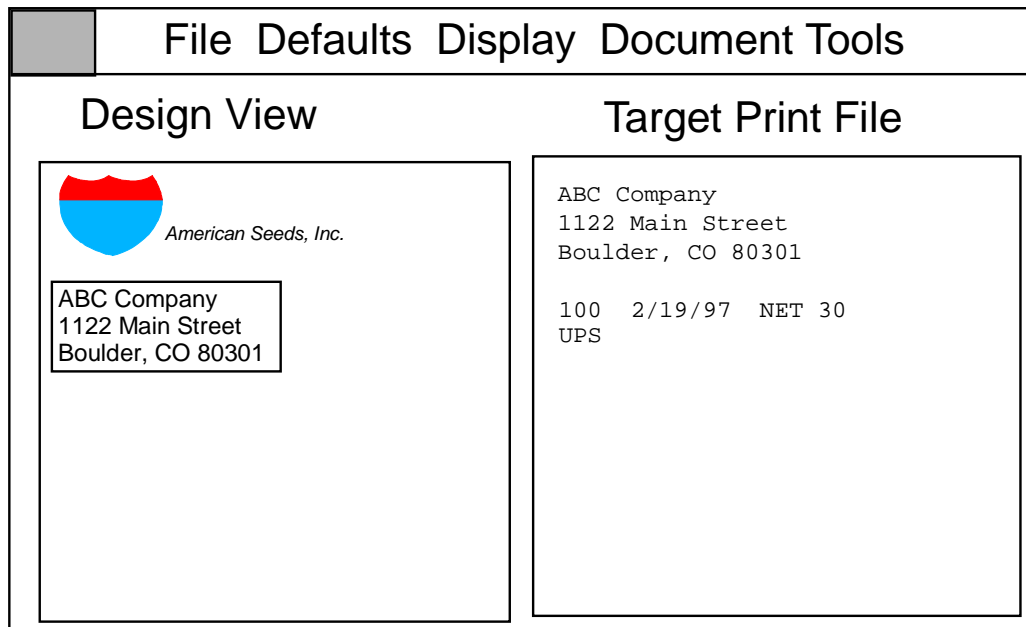
The other key focus of Infoprint Server is iSeries management of network output. Infoprint Server provides transforms for PCL, Postscript, and PDF into AFP so output generated in those formats can be brought into the iSeries and effectively managed to the printer. The Postscript and PDF transforms are the result of joint development by IBM and Adobe and deliver full-function Level 3 capability.

Finally, the standard web, e-business image formats are GIF, TIF, and JPEG. Infoprint Server provides transforms (Windows-based) to convert those to iSeries-AS/400 image (IOCA - page segments)

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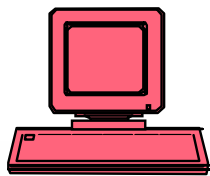
Product Summary

- State of the art design front-end to the robust, integrated AFP/IPDS print/presentation subsystem on AS/400



Key Features

- Integrated for design operations, integrated for print operations
- Overlay Design editor for designing electronic forms
- Image Design editor for designing images
- Layout Design editor for designing the complete application
- Creates standard AS/400 print resources
- Windows design functions integrated with upload/download for ease of design and production
- Professional, high-precision system geared to the demands of business communications
- Existing applications can be redesigned without application changes
- Entire AFP Font Collection integrated into Infoprint Designer
- Design platform for new Java print architecture



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Infoprint Designer for iSeries provides a fully-graphical document composition interface to the iSeries-AS/400 printing and e-output system. It supports the requirements of today's complex documents and reports, producing fully electronic documents combining data, text, electronic forms, graphics, image, bar coding, and typographic fonts. Infoprint Designer for iSeries can be used for the design of new output applications or the re-engineering of existing applications.

Infoprint Designer for iSeries consists of three components:

- Infoprint Overlay Editor designs overlays (electronic forms) to be used in the print application
- Infoprint Image Editor designs the images to be used in the print application
- Infoprint Layout Editor puts all the design components together into the final document or report

With Infoprint Designer for iSeries, you can build complex print applications easily. It enables you to design image components, design electronic forms, automatically retrieve current application data or spooled files, design the final page layout, and upload all component resources to the iSeries-AS/400 so the application can be put into production. The entire interface is designed for a non-technical user.

You really need a demo to appreciate the ease of use, power, precision, and integration of Infoprint Designer. Infoprint Designer is integrated in three ways, (1) design functions are integrated with automatic retrieval of application data and automatic upload and creation of print resources, (2) you are designing iSeries page resources in native formats, and (3) the application resources enable the designed print application to be put into production with a simple printer file change.

Under the covers, Infoprint Designer defines the format of pages with page and form definition resource objects. These are part of the iSeries-AS/400 print architecture. Designing with these resources is application-independent (unlike DDS). They are also compatible with existing or new applications that define output data with DDS. With V5R1, OS/400 will automatically write these applications as full AFP (ensuring viewing and PCL support). In addition, the new Java print architecture with V5R1 uses page and form definitions as the page interface.

Automatic e-mail enablement

Enhanced Formatting (Page Definitions)

- Support for DDS record formats or Java applications via object classes

Enhanced DDS page formatting

- Enhanced color support
 - Color keyword, box and line parameters
- Constant text, specify by POSITION keyword
- New group keywords for e-mail, segmentation
- Outline fonts, specify both horizontal and vertical sizing
- Support for shading within boxes
- Barcode, specify height directly (inches or centimeters), plus support for Australian and Dutch postal bar codes

Enhancements to TCP/IP management of printers

Printer speed ranges expanded

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Print Services Facility/400 (PSF/400) V5R1 is enhanced on many fronts.

PSF/400 supports the new automatic e-mail of output (PDF) function. As covered, Infoprint Server provides the PDF server functions and handles the transformation of iSeries output to PDF format. The start page group and end page group keywords in DDS (OS/400) provide the triggers for PDF segmentation (multiple PDF files from one input print file). The multiple PDF files can be e-mailed to different IDs. User exits provide for customization and address book lookup.

PSF/400 expands the capability of iSeries page definitions for output formatting. HLL applications can output records of output data (via DDS) or classes of output data (Java) that flow to the new page definition record format interface. The new Infoprint Designer provides the design platform for creating page definitions so all of these changes in design and application interfaces integrate.

There are also substantial changes in DDS page composition keywords with V5R1 that enhance the ability to create the page content required in today's output applications. These changes include enhanced color specification (more than 8 colors) as well as color for line and box elements. Constant text can be "placed" on the page by POSITION, making it much easier to use. Use of outline fonts now support both horizontal and vertical scaling (meaning you can create short fat or tall skinny characters). DDS now supports shading within boxes. With V5R1, it is easier to control the size of a bar code (plus two additional postal codes are added).

PSF/400 also includes some additional options that provide better management of TCP/IP-attached IPDS printers.

Finally, the printer speed ranges for PSF/400 have expanded. The entry tier is 1-45 pages per minute (PPM), the second tier is 1-100 PPM, and the third tier is "Anyspeed". You can run unlimited numbers of printers within the speed range you sign up for.

Internet Print Protocol (IPP)

- iSeries is now an IPP server

Java Print Classes

- New Java print classes for reports, using XML and XSL
- New Java print classes for AFP pages, with a record format interface to the iSeries page definition

Unicode

Additional printing enhancements

- Increase number of spool files per job
- Greater ease in retrieving spool file IDs

Notes: OS/400 V5R1 Print Enhancements

With V5R1 OS/400, the iSeries is now an IPP server. First, what is IPP? IPP, or Internet Print Protocol, is the emerging standard for printing across the Internet. Current TCP/IP network printing - using LPR (remote output queue) is very limited and most importantly, requires a path to TCP/IP address. With IPP, you simply print to a URL. The iSeries as an IPP server means network jobs submitted by an IPP client (to a URL) will come to the iSeries - the iSeries is an abstraction of the URL. It receives the print file and queues it to the iSeries-connected printer that is mapped by that URL. IPP uses the HTTP transport layer.

It is anticipated IPP will replace the commonly used LPD/LPR printer protocol now commonly used.

OS/400 V5R1 also architects two print structures for Java. The first, geared for more business documents, is AFP-based. Java output classes map to record formats within a page definition. The page definition provides the physical page formatting. Infoprint Designer is the new GUI design platform for these applications. The second Java structure is XML/XSL based and is geared for simpler reports. XML is the Internet standard for data and XSL (extensible style language) is an emerging standard for placement on XML data on the page (any kind of page - a web page, printed page, etc).

Unicode encoded data can now be printed on OS/400. Unicode addresses the problem of worldwide software applications and national language support. Unicode provides a code page (table cross-referencing the data's hexadecimal code and the character to be printed or displayed). With Unicode, that code page can accommodate 64K code points or generally most of the characters required across all national languages.

OS/400 also provides some additional enhancements to the core printing subsystem. For example, individual jobs can now create 999,999 print files (from 9999). Also, spool file attributes can now be stored in a data queue, making it much easier to identify target spool files.

iSeries, AS/400 Printers

AS/400 Printer	Type	Speed	Data Stream
Infoprint 12	Laser CS	12 ppm	PCL, PS
Infoprint 20	Laser CS	20 ppm	IPDS, PCL, PS
Infoprint 21	Laser CS	21 ppm	IPDS, PCL, PS
Infoprint 32	Laser CS	32 ppm	IPDS, PCL, PS
Infoprint 40	Laser CS	40 ppm	IPDS, PCL, PS
Infoprint 62	Laser CS	62 ppm	IPDS
Infoprint 70	Laser CS	70 ppm	IPDS, PCL, PS
Infoprint 2000	Laser CS	110 ppm	IPDS
Infoprint 3000	Laser CF	344 ppm	IPDS
Infoprint 4000 Hires	Laser CF	708 ppm	IPDS
Infoprint 4000	Laser CF	1002 ppm	IPDS
IBM 4400	Thermal CS	10 ips	IPDS, PGL
IBM 4230	Matrix CF	600 cps	IPDS, ASCII
IBM 4232	Matrix CF	600 cps	ASCII
IBM 4247	Matrix CF	700 cps	IPDS, ASCII
IBM 6400	Matrix CF	1500 LPM	IPDS, ASCII
Infoprint Color 8	Laser CS	8 ppm	PCL, PS
Infoprint 4000 HiLite	Laser CF	354 ppm	IPDS

What's New

- IPP printers
- PDF printers
- Embedded web printers
- Thermal
- High-speed production cutsheet
- Entry desktop laser



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iSeries and AS/400 printers are not normally announced with new releases. This chart summarizes what has happened with iSeries-AS/400 printers since V4R5 (most of the announcements were in October 2000). The newest generation of IBM iSeries-AS/400 embed a web server within the printer controller. This means the printer has an URL and will support IPP - Internet Print Protocol. Submitted IPP print jobs can be sent to these printers via the printer's URL. The printers with this new controller are the Infoprint 21 and Infoprint 70. These printers also support direct PDF printing. This means PDF files can be sent directly to the printer (they don't have to be opened up and printed through a driver). In addition, these printers can be accessed and managed (printer administration) from any web client.

Thermal printing comes to the iSeries-AS/400 with the IBM 4400 Thermal Laser Printer. Thermal printers are a mainstay of many applications requiring barcoded labels (Supply Chain, for example). While there are many different protocols for thermal printing, the IBM 4400 makes it easy by supporting IPDS (it supports other data streams as well). IPDS support means you simply code your label with DDS and you're ready to go.

The IBM Infoprint 2000 brings a high-quality, high-speed cutsheet production printer to the iSeries environment. The IBM Infoprint 2000 is 110 pages per minute. It is a full IPDS printer, with the standard AFCCU (Advanced Function Common Control Unit) found on all IBM high-end printers.

The Infoprint 12 provides a low-cost desktop laser printer (\$400 range). 12 pages per minute. Postscript and PCL (no IPDS). Can be used with Host Print Transform in PCL mode.