

## IBM i Printing Update

Common Luxembourg

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## Agenda

- • I5/OS Printing architecture
- • Printer file
- • PDF support
- • ASCII Printers (PCL, PostScript...)
- • Host Print Transform
- • AFP / IPDS
- • PSF

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## I5/OS Printing Architecture

- • Application
- Data base → Program → Printer File  
→ Spooled File
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- • Operation
- Spooled file → output queue → writer  
→ Printer

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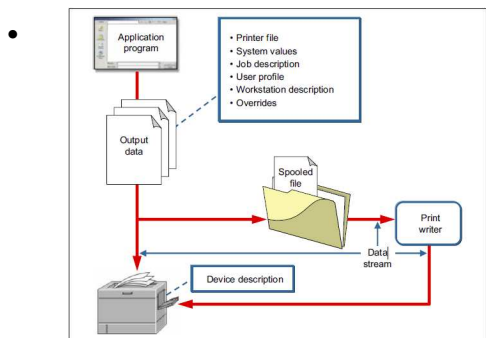
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### Printing process



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### Spooled File

- SCS  
Line printer (SNA Character String) limited presentation (CPI, bold,..)
- AFPDS  
Graphics document oriented
- IPDS  
≈ AFPDS Graphics printer oriented
- ASCII  
Printer Oriented

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### AFPDS Components

- IOCA/GOCA/BOCA IBM document architecture
- Fonts
  - Overlay
  - Page segments
  - Lines
  - BarCode
  - Gray zone
  
  - Logos
  - Signatures

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### DDS Keywords

- Basics... for SCS printer
  - SKIPA SKIPB SPACEA SPACEB
- Basics... for matrix printer
  - CPI LPI CHRISZ
  - HIGHLIGHT UNDERLINE PRTQLTY
- Advanced.. For matrix printers
  - DFNCHR COLOR
- For special printers
  - TRANSPY

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### DDS Keywords

- for AFP/IPDS printers
  - FONT FNTCHRSET CDEFNT
  - LINE BOX
  - BARCODE
  - DRAWER DUPLEX OUTBIN
- Advanced
  - POSITION TXTRTT
  - OVERLAY PAGRTT PAGSEG

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### DDS Keywords

- For AFP documents
  - DOCIDXTAG
  - DTASTMCMD (AFP NOP code)
  - STRPAGGRP ENDPAGGRP
  - INVDTAMAP INVMMAP

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### PRTF

- Type (\*AFPDS) required for advanced functions
  - Usefull values in V6R1 for **PDF...**
    - Stream file name to store the pdf...
  - (no LPP and no config required)...  
OVRPRTF STMF()...
- Available in CRTPRTF, CHGPRT and OVRPRTF...

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### Host Print Transform

- +/- like a printer driver
- The spooled file is stored in an output queue in an internal i5/OS format
- The spooled file is transformed into a data stream (printer language) depending on the printer type and model
  - PCL, PostScript,... but also PDF, TIFF,...
- Use standard format or custmized through WSCT object.

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### WSCST

- • WORKSTATION Customization Table
- A language to define printer driver.
- For each printer command name, define the HEX string.
  
- <http://www.ibm.com/support/docview.wss?uid=nas8N1010140>

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### BarCodes

- A barcode is just a font... so a DDS keyword...
- Barcodes are standard in i5/OS
  - 1D barcodes (EAN, Code 39, Interleave 2of5, CODE 128, etc..)
  - 2D barcodes (PDF417.. QR Code)

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### BARCODE keyword

- BARCODE(bar-code-ID [height] [[\*HRZ | \*VRT] [\*HRI | \*HRITOP | \*NOHRI] [\*AST | \*NOAST] [modifier] [unit-width] [wide/narrow-ratio]])
- Barcode-ID :
  - CODE128 CODE3OF9 EAN13 INTERL2OF5...

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### BARCODE Keyword

- Height
  - Either number of lines : 1 – 9 lines
  - LPI(6) → 6 = 1 inch
  - OR x \*UOM
  - Refer to UOM keyword in PRTF : \*CM/\*INCH..  
x can be any value between .1 and 10 inches or .25 and 25.40 cm
- Orientation
  - \*HRZ or \*VRT
- Include readable information
  - \*HRI / \*NOHRI
  - Where to include \*HRITOP
- Include the asterisks for Code3of9
  - \*AST / \*NOAST

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### BARCODE Keyword

- Width of the line/bar/space... (narrow)
  - \*WIDTH (from 0.007 to 0.208)
  - Ex (\*WIDTH &width)
- Ratio between narrow and wide bar
  - \*RATIO (from 2.00 to 3.00)
- Position in Line/Column is the upperleft position of the BarCode

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### BARCODE Keyword

- (\*PDF417 row-size number-rows security [escape-indicator] [\*MACRO(&data-fieldname)])
  - Row size (between 1 & 30 characters)
  - Number-rows (between 3 & 90 OR \*MIN)
  - Security (between 1& 8 ~= added checksum)
  - Escape \*ESCAPE or \*NOESCAPE \ is escape
  - \*MACRO = Control Block coding...

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### LINE Keyword

- LINE(position-down | &position-down-field position-across | &position-across-field line-length | &line-length-field line-direction line-width | &line-width-field [line-pad] [color value])

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### LINE Keyword

- Position (down& across), length, direction and width are required.
- Can be constant or variable.
- Program to System fields
  - Type S
  - Usage P
  - Len 5 dec 3
- Value between .001 and 22,75 inches or .001 and 57,79 CM.
- Special values:
  - \*NARROW = 12/1440 in.
  - \*MEDIUM = 24/1440 in.
  - \*WIDE = 36/1440 in.

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### LINE Keyword

- Line Direction : \*HRZ / \*VRT
- Line Pad : \*BOT/\*TOP or \*RIGHT/\*LEFT
  - Default to \*BOT/\*RIGHT
- COLOR can be
  - (\*COLOR BLU/BLK/BRN/GRN/PNK/RED/TRK/YLW)
  - (\*COLOR \*RGB Rval Gval Bval)
  - (\*COLOR \*CYMK Cval Yval Mval Kval)
- IF LINE is used, all fields in the RCDFMT must have the POSITION keyword.

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### BOX Keyword

- BOX(first-corner-down | &first-corner-down-field  
 first-corner-across | &first-corner-across-field  
 diagonal-corner-down | &diagonal-corner-downfield  
 diagonal-corner-across | &diagonal-corneracross-field  
 line-width | &line-width-field  
 [color value]  
 [shading])

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### BOX Keyword

- Indicate coordinates in X/Y..
- Line width
- Color
- Shade in % or KWD and color
  - XLIGHT/\*LIGHT/\*MEDIUM/\*DARK/\*XDARK)
  - (\*SHADE \*MEDIUM (\*COLOR BLU))

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### OVERLAY

- Create an overlay...
  - Easy when you know..
  - Just use the CRTQVL command
- Install the AFP printer driver on your PC
- Use any windows application to design your overlay.. (word, paint, publisher...)
- Print it using the print driver →(print to file)
- Transfer the file to a PF in the IBM i
- Create overlay ...

<http://www-01.ibm.com/support/docview.wss?uid=nas8N1018625>

- [http://www.youtube.com/watch?feature=player\\_embedded&v=tdO9FMHA9ko](http://www.youtube.com/watch?feature=player_embedded&v=tdO9FMHA9ko)

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### Overlay

- Step by step
- Install the AFP printer driver
  - From iSeries access for windows...
- Print to file using the AFP driver
  - Specify output as overlay
- Create a PF on the i
  - **CRTPF FILE(COMMONxx/AFPRES)**  
**RCDLEN(32766) MAXMBRS(\*NOMAX)**  
**LVLCHK(\*NO)**

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### OVERLAY

- CRTOVL OVL(COMMON/COMMONC)  
FILE(COMMON/AFPRES) MBR(COMMONC)  
DATATYPE(\*AFPDS)  
TEXT('Common Luxembourg Overlay Col')
- CHGPRTF FILE(SMPOVL)  
DEVTYPE(\*AFPDS)  
PAGESIZE(72 120 \*ROWCOL)  
CPI(15)  
FRONTOVL(COMMON/COMMONC \*SAME \*SAME)  
OUTQ(\*LIBL/COMMON00)

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### Page Segment

- Is just an image (logo signature...)
- PAGSEG(library-name | &library-name-field/  
page-segment-name | &page-segment-name-field  
position-down | &position-down-field  
position-across | &position-across-field  
[(\*SIZE height | height-field width | &width-field)]  
[(\*ROTATION rotation | &rotation)]

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### Fonts

- Use WRKFNTRSC command
- Naming... is a \*FNTRSC object but
  - An IBM font starts with C0
  - An IBM character set starts with T1
  - An IBM coded font name starts with X0

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## PRINTER

- Connexions
  - Direct
    - Twinax...
    - ASCII
  - Remote
    - LAN attached
    - [http://www.youtube.com/watch?feature=player\\_embedded&v=qO\\_owb79QOs](http://www.youtube.com/watch?feature=player_embedded&v=qO_owb79QOs)
  - PC attached
    - USB/Parallel/serial

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## NetServer Printer

- Create a Share for your PC...
- <http://www-01.ibm.com/support/docview.wss?uid=nas8N1019655>
- evrything is also in QUSRTOOL.. (SS1 option7)
- GO NETS
- [http://www.youtube.com/watch?feature=player\\_embedded&v=jljwnnrFrH0](http://www.youtube.com/watch?feature=player_embedded&v=jljwnnrFrH0)

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## PDF using PSF

- Create PDF using a 'virtual' printer
  - Create a pdf printer...
  - Using a wizard from iSeries Navigator

OR

```

CRTPSFCFG PSFCFG(COMMON/PRTPDF)
  PDFGEN(*STMF)  PDFDEVTYPE(*IP40300)
  PDFPPRDWR1(*A4) PDFPPRDWR2(*A4)
  PDFSENDER(*SPLFOWN)  PDFDIR('/home/ROPA')

CRTDEVPRT DEVD(COMMONPDF)
  DEVCLS(*LAN)  TYPE(*IPDS) MODEL(0) LANATTACH(*IP)
  AFP(*YES) PORT(22000)  FONT(11)
  ACTTMR(*NOMAX) RMTLOCNAME('127.0.0.1')
  USRDFNOBJ(COMMON/PRTPDF *PSFCFG)
VARY on ... STRPRTWTR ...
    
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MAIL AS PDF

- CRTPSFCFG PSFCFG(COMMON/MAILPDF) PDFGEN(\*MAIL)  
PDFDEVTYPE(\*IP40300) PDFPPDWR1(\*A4)  
PDFPPRDWR2(\*A4) PDFMAILSVR(relaysmtp.real.net)  
PDFSENDER(QSPLJOB) PDFDIR('/home/ROPA')  
TEXT('transform to PDF')
- CRTDEVPRD DEVD(COMMONMAIL) DEVCLS(\*LAN)  
TYPE(\*IPDS) MODEL(0) LANATTACH(\*IP) AFP(\*YES)  
PORT(22002) FONT(11) TRANSFORM(\*N)  
RMTLOCNAME('127.0.0.1') USRDFNOBJ(COMMON/MAILPDF  
\*PSFCFG)
- OVRPRTF FILE(QPDSNET)  
USRDFNDDTA('MAILTAG(paul.roy@real.lu') OPNSCOPE(\*JOB)
- dspneta output(\*PRINT)

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Print as PDF

- From V6R1
  - OVRPRTF FILE(QPRTLIBL)  
DEVTTYPE(\*AFPDS)  
TOSTMF('/home/Ropa/test.pdf')  
WSCST(\*PDF)  
OPNSCOPE(\*JOB)
  - DSPLIBL OUTPUT(\*PRINT)
- ➔ No spooled file, only PDF stream file

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PDF output

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5770881 V7R1M0 100423          Library List          27/02/14 11:26:01

Library  Type   ASP  Device Text Description
-----  -
QSYS     SYS     SYS              System Library
QSYS2    SYS     SYS              System Library for C/1's
QUSPYS   SYS     SYS              System Library for Users
QSYS1    PRD     SYS
COMMON   USR     SYS              General Purpose Library
QDFL     USR     SYS
QDFG     USR

***** END OF LISTING *****
  
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### PDF V7R1

- DSPNETA \*PRINT
- CPYSPLF FILE(QPDSPNET)
  - TOFILE(\*TOSTMF)
  - TOSTMF('/home/ropa/dspneta.pdf')
  - WSCST(\*PDF)

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### News from 6.1

- Use UTC for spool file date and time
- System i Navigator : Add Printer Wizard
- Generate PFD from applications with minor change to PRTF
  - 5761TS1 - option 1 Transform service
  - PRTF parameter

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### Printing NEW for V7R1

- PDF from CPYSPLF
- New QIBM\_QSP\_SECURITY exit point
- Encryption of PDF output (Infoprint Server LP)
- PSF extension
  - Disabling offset stacking and edge mark printing
  - Specifying public data authority for directories that are created by PSF.
  - Improved PSF debugging capabilities

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### Printing references

- Redbooks
  - REDP3752.PDF Printing VII and the predecessors...
- IBM Support web site with many How to's and youtube videos
- IBM developers wiki
- IBM i information Center
- Google is your friends

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### Thank you

- For any question send a pdf e-mail to [paul.roy@real.lu](mailto:paul.roy@real.lu).

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