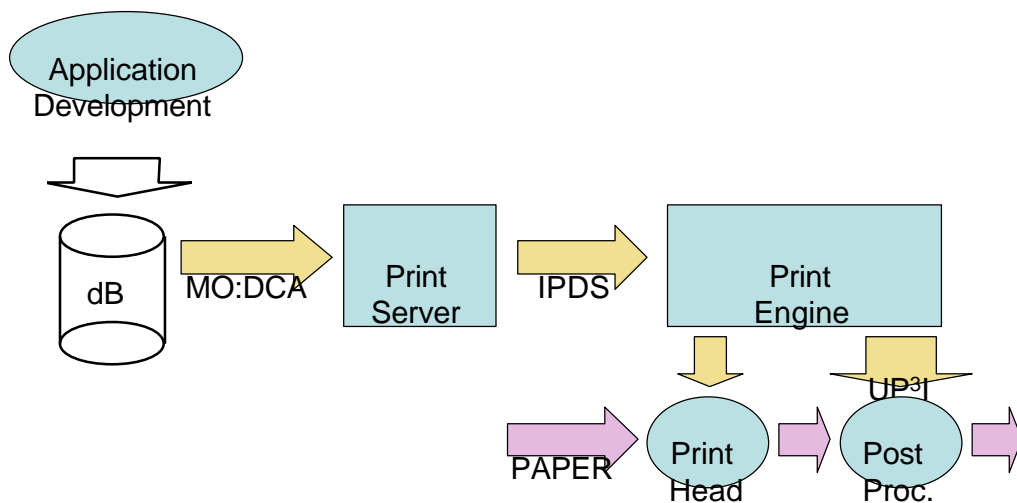


Printing on a Post Processor Using UP³I in an AFP Environment

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AFP -> UP³I Printing



Terminology

- **AFP**: IBM's Advanced Function Printing
- **MO:DCA**: IBM's Mixed Object Document Content Architecture (received by host)
- **IPDS**: IBM's Intelligent Printer Data Stream (received by printer)
- **UP³I**: Universal Printer Pre- and Post-Processing Interface (www.up3i.org)
 - Duplo, Hunkeler, IBM, Stralfors, Oce, Xerox
 - V1.03 on web; v1.04 has new print data stuff

Simple Existing Solutions

- Print MICR using Type 2 Interface
 - Data format is a private understanding between printer & post processor
 - Send location and text_string
 - Font & font size are fixed
 - Trigger: MICR flag on font
- Print bar codes with invisible ink
 - Use MICR solution shown above
 - Encode bar code info in text string
 - Trigger: MICR data & BROWN color

Post Processor Capabilities

- MICR
- Highlight Color
- Invisible Ink
- Store images; print based on ID & location
- Interpret limited parts of IPDS (barcode)
- Can print in all or in limited locations

Application Needs

- Bar codes
- Logos & icons (single-color image)
- Canned text for headers, marketing message (image)
- Variable text
- Rectangles: separating bars, text highlight

Problems

- How to identify data for post processor
 - Special color?
 - New flag?
- New post processor capability requires change to printer code – new release
- Fast printing ✍ little processing in post processor
- Extendable for future requirements
- Need **flexible**, **transparent** solution

Solution: AFP Object Containers

- AFP objects: image, graphics, barcode
- AFP object containers
 - PS & PDF
 - Data inside object container is not understood by main rasterizer
 - Data is handed off to another process
 - OID (object ID) identifies type of data inside container
 - Has CONTROL INFO and DATA parts

AFP Object Container: CONTROL

- OID that says this is post processor data
- Object Area
 - Location (I-units, related to page origin)
 - Rotation (0, 90, 180, 270)
 - Width & height
 - Object area color (optional)
- Object Presentation Space
 - Mapping option: position & trim; scale to fit
 - [* defined by UP3I Print Data Format ID]

AFP Object Container: Data

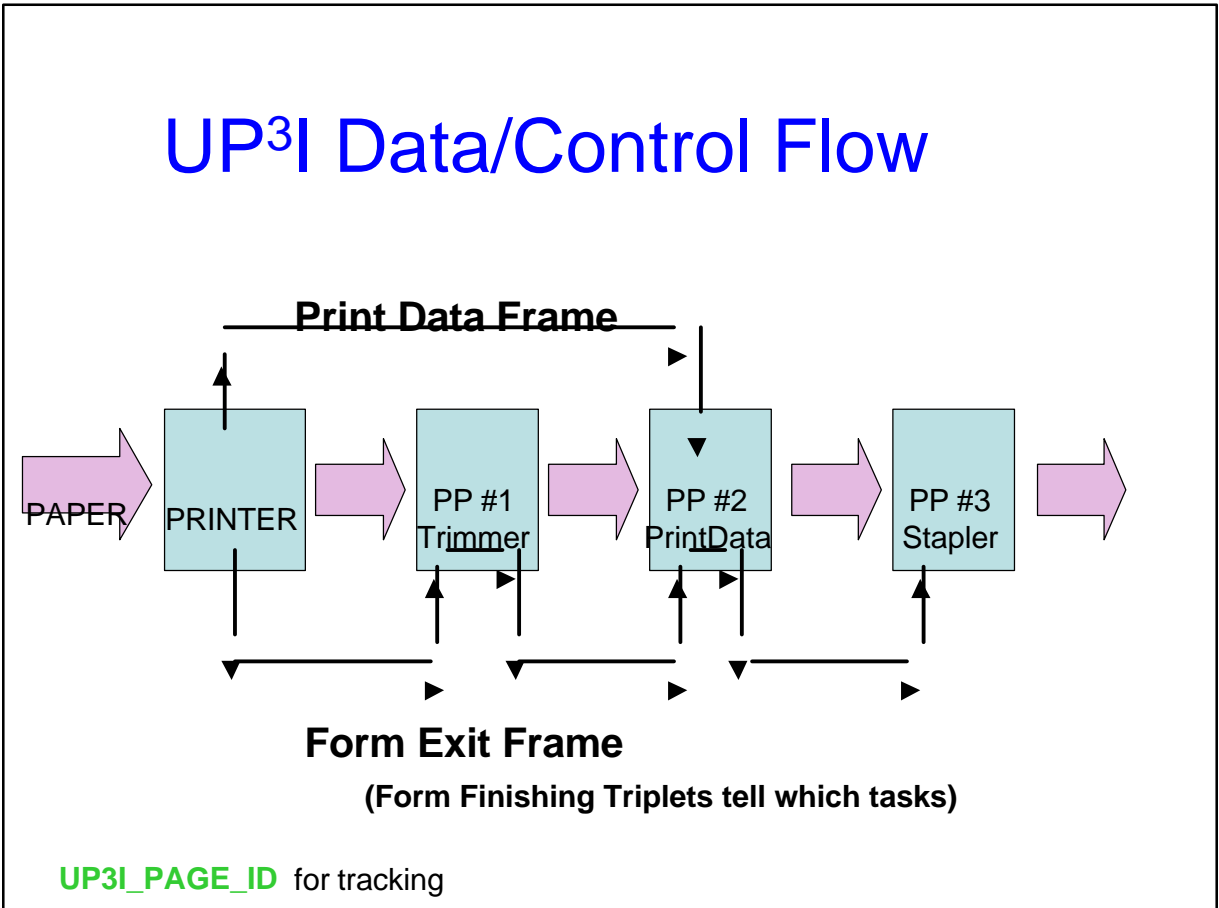
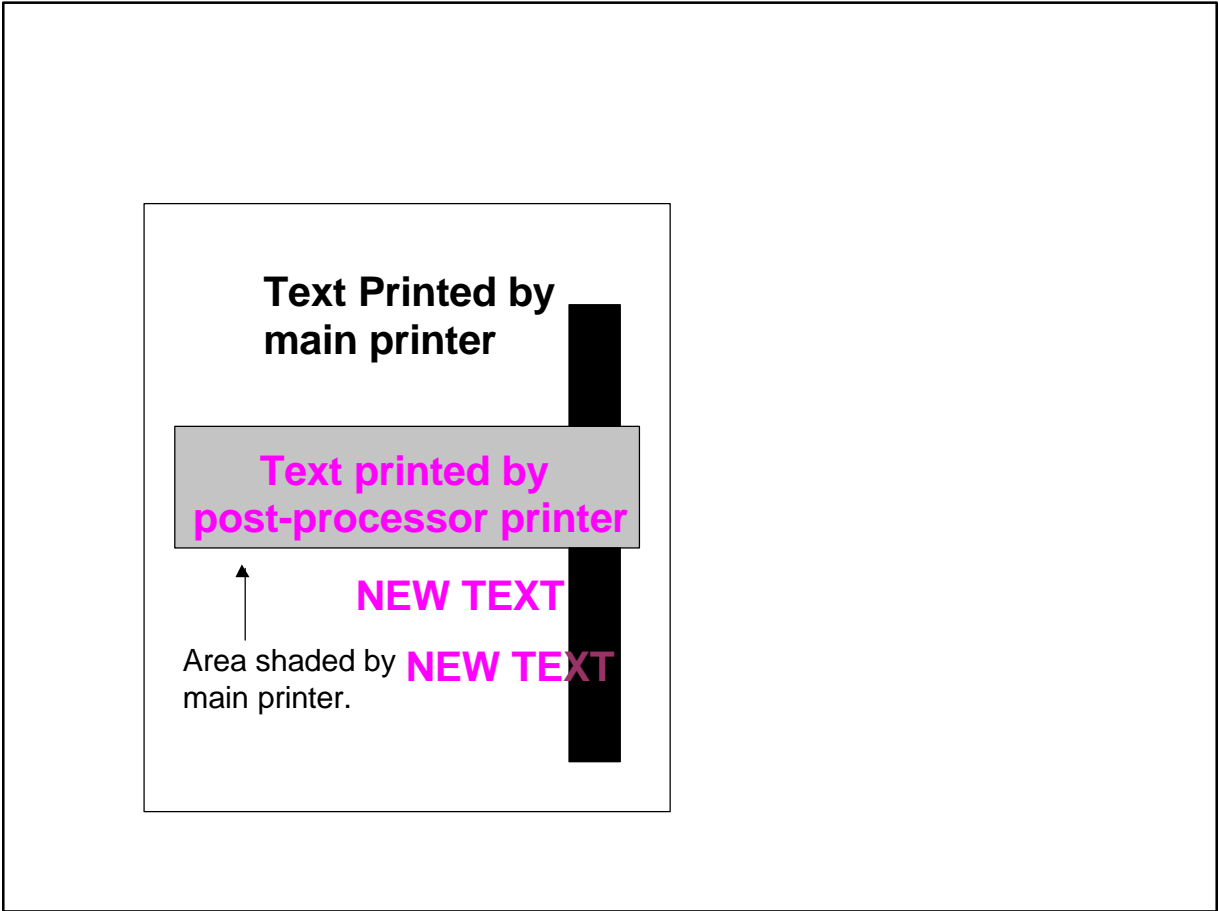
- Format ID that tells how to interpret data
 - Bar code or image ID or text or
 - Output is MICR or invisible or highlight ink
 - Format ID is registered in UP³I spec
- Actual data

AFP Mixing Rules

- Options: underpaint, overpaint
- Post processor cannot mix following AFP rules
- New rule for UP³I container: Data “mixes in a manner that is defined by the print data format”
- Implicit mixing:
 - Invisible ink: underpaint
 - MICR: opaque \neq overpaint
 - Transparent ink: blend

AFP Mixing – Who processes?

- **Object Area** color (optional) is processed by the printer.
 - It mixes with other data on the page according to AFP rules.
- **Object Presentation Space** holds the data that gets sent to the post processor.
 - It mixes according to the UP³I Print Format ID.



UP³I Form Exit Frame

- Form Size Triplet: paper length & width
- UP3I_PAGE_ID
- Form Finishing Triplets
 - ID of the post processor
 - Operation type: staple, trim, print data

UP³I Print Data Frame

- Paper Sequence ID Triplet
- Ids of sending & destination devices
- UP3I_PAGE_ID
- Print Location Triplet
 - Location in 1/72000 inch in relation to UP³I sheet
 - Interpretation of location depends on the post processor
 - Front/back side flag
 - (also area size & orientation)
- Print Data Triplet
 - UP³I Print Data Format ID (PDFID)
 - Print Data – must be small

Printer Tasks

- Identify ID of the targeted post processor
- Put a Form Finishing Triplet for print data into the Form Exit Frame.
- Create a Print Data Frame
 - Translate location: units & reference origin
 - Translate height & width (units)
 - Identify whether data is for front or back side
 - Copy object container DATA into UP³I's Print Data triplet (format ID & data)

Post Processor Identification

- Post Processor announces presence to printer
 - Post processor ID
 - Type: front or back print data
- Printer tells host
- Host confirms job's dependencies
- Printer can route print data to Front vs Back

Conclusion

- Flexible solution: multiple formats
- Application talks to post processor
- Print Server, Printer, UP³I interface do NOT change for new format
- Printer does minimal work
 - Setup control info
 - Conversion of location
 - Copy PDFID and data
- Extendable for future requirements