



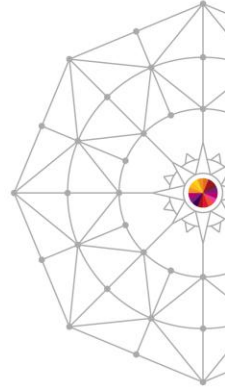
PSF for z/OS V4.5 Update

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PSF 4.5 New release

- Print Services Facility (PSF) for z/OS, V4.5 is the latest release of the IBM flagship production print product for z/OS.
- Offers support for:
 - Advanced Function Presentation (AFP) architecture
 - A number of printer standards including IPDS
 - Other important industry standards, such as XML and International Color Consortium (ICC) profiles
- GA: **May 23, 2014** 

PSF 4.5 New release

- A few highlights:
 - Improved communications capabilities for TCP/IP-attached printers
 - Extended Address Volume (EAV) support
 - Product-level enable and disable support
 - Support for additional printer functions
 - More accurate chargeback of printing
 - Document composition enhancements

Agenda

- Background on PSF and related products
- PSF and Infoprint Server
- Details on new functions and enhancements 
- Software and hardware requirements

What is PSF?

- Manages and controls data transmitted to IPDS printers that are channel-attached, SNA-attached, or TCP/IP-attached.
- Acts as the glue between an application and the printer.



- Reads and processes print data from the JES spool.
- Accesses resources from libraries.
- Uses 2-way communication to send IPDS data to printer.

- Accepts MO:DCA-P, line data, and Extensible Markup Language (XML) data streams and converts them into IPDS.

Optional features

- **Download for z/OS**

Eliminates the need for FTP by automatically transmitting line, mixed mode, XML, and MO:DCA-P data and other data streams from the JES spool to receiving systems through TCP/IP.

- **AFP Download Plus**

Eliminates the need for FTP by accepting line, XML, and MO:DCA-P data as input, **automatically transforming line and XML to MO:DCA-P**, and transmitting it from the JES spool to receiving systems through TCP/IP.

AFP Download Plus also transmits the required resources for the job.

- **AFP Upload**

Used to submit a job to InfoPrint Manager for AIX for printing on any printer that is supported by PSF for z/OS.

These optional and **separately orderable** IBM features are available with PSF for z/OS.

Jobs that are submitted to AFP Upload from InfoPrint Manager for AIX can contain any type of data stream that InfoPrint Manager for AIX can transform to MO:DCA-P except XML.

Optional features

- **ACIF**

Converts a line data, mixed data, unformatted ASCII, or XML print file into a MO:DCA-P document, retrieves resources that are used by the document, and indexes the file for later retrieval and viewing.

- **Compatibility Fonts**

Provide compatibility between PSF applications and those printers and applications that were designed for IBM typewriters, 6670 laser printers, and the IBM 3800 printing subsystem.

Included in the z/OS Font Collection, a base element of z/OS V2.1 (Program Number 5650-ZOS).

Related products

- **PPFA**
Allows you to create your own form definitions and page definitions for use with Advanced Function Presentation products.
- **Infoprint Server** (Program Number 5694-A01 or 5650-ZOS)
Manages a distributed print environment on System z, and helps consolidate network and production printing.
 - **Consists of:**
 - Print Interface
 - **Printer Inventory**
 - NetSpool
 - IP PrintWay
 - Infoprint Central
 - Windows Client
 - Transform Interface

What are you using?

- ?

What is Infoprint Server?

- **Print Interface**

- Accepts print requests from z/OS UNIX System Services and from remote systems in your network, and allocates output data sets on the JES spool for printing on local or remote printers.

- **Printer Inventory**

- Provides a single set of printer definitions that all the components of Infoprint Server use.
- **Contains printer customization information that PSF uses.**

What is Infoprint Server?

- **NetSpool™**

- Intercepts print output from VTAM applications and allocates output data sets on the JES2 or JES3 spool for printing on local or remote printers.

- **IP PrintWay™**

- Transmits output data sets from the JES2 or JES3 spool to remote printers in a TCP/IP network or SNA network.

- **Infoprint Central**

- A Web-based application that lets help desk operators and other authorized users or job submitters work with print jobs (output data sets) on the JES spool, printers controlled by IP PrintWay extended mode or PSF, and NetSpool logical units.
- Lets operators see system status and printer definitions.

What is Infoprint Server?

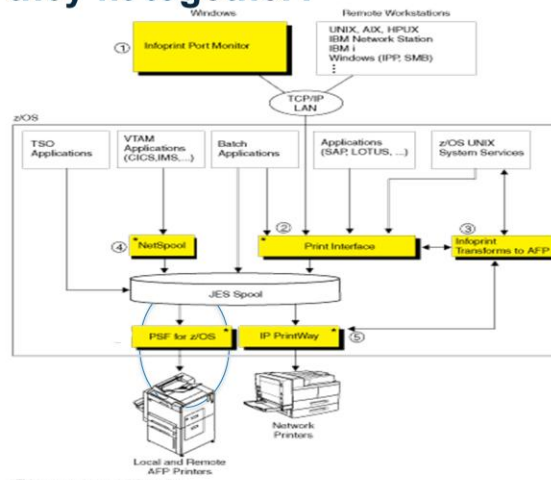
- **Windows Client**

- Infoprint Port Monitor for Windows, which transmits documents and job attributes to Infoprint Server from Windows applications.

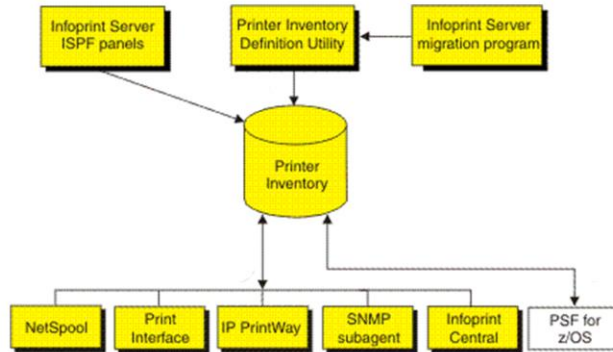
- **Transform Interface**

- Communicates with transform products that IBM and Ricoh Production Print Solutions provide. Transforms convert data from one format to another. For example, from PDF to AFP format, or from AFP to PCL format.

How do they fit together?



PSF and Infoprint Server



PSF and Infoprint Server

- The Infoprint Server Printer Inventory can define PSF and AFP Download Plus FSAs and FSSs.
- PSF integrated with Infoprint Server inventory in PSF 3.4.

Inventory can be used without Infoprint Server license in PSF 4.0 and later.

- Changing a parameter in the Printer Inventory and stopping (\$P) and starting (\$S) the FSA or FSS causes the settings to take effect.

No need to take down the entire FSS.

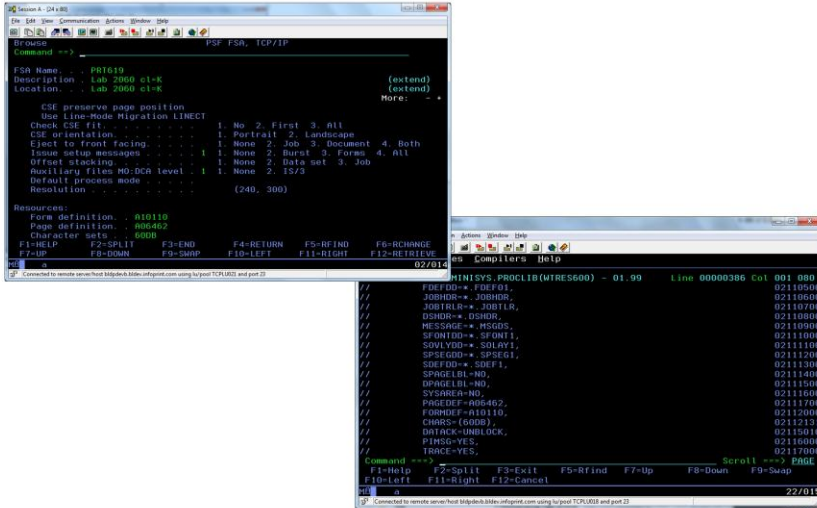
You can avoid stopping the FSS to change the PSF PROC JCL.

PSF and Infoprint Server

- You can use the Infoprint Server ISPF panels to set:
 - Most parameters with keywords in the PRINTDEV statement
 - Most flags and single values that required coding Exit 7
 - Printer initialization, tracing, and execution options
- To copy most parameters from the PRINTDEV statement, EXEC PARM statement, and AFPPARMS control statement into the Printer Inventory, use migration program **aopmig**.
- Change the printer startup procedure to specify `INV=piname` as the first parameter in the PARM field of the EXEC statement:
// EXEC PGM=APSPPIEP,PARM=('INV=AOP1')

where *piname* is the four-character name of the Printer Inventory.

PSF and Infoprint Server

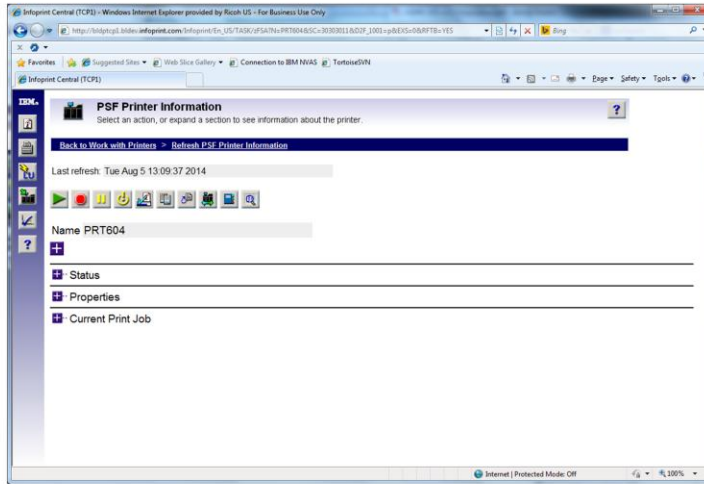


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PSF and Infoprint Server

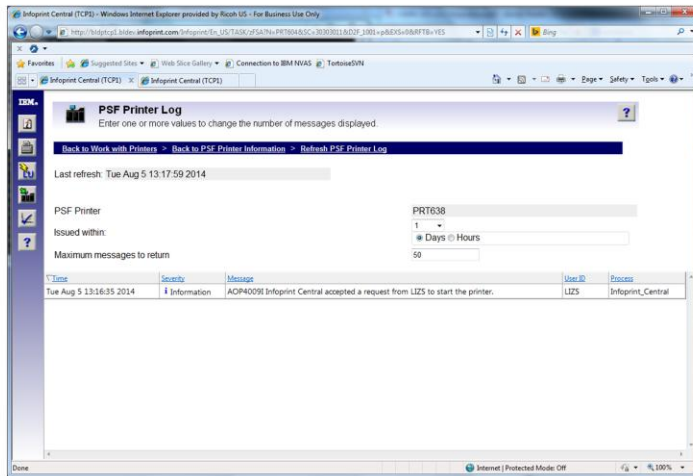
- In PSF V4.4:
If PSF is enabled to write messages to the Infoprint Server common message log, you can see PSF messages, including job messages that usually print on the trailer pages, in Infoprint Central
- View FSA and print job messages that PSF has written to the common message log.
 - Search for print jobs and view the properties for each job
 - Release held print jobs, delete jobs, change the priority of jobs, and move jobs (as long as PSF has not started processing the jobs)

PSF and Infoprint Server



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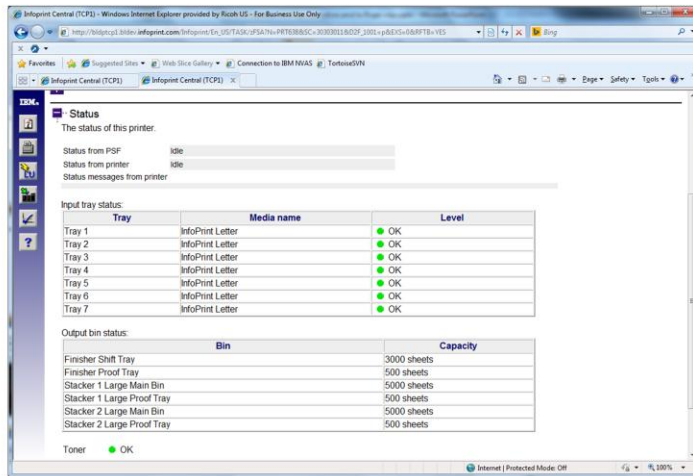
PSF and Infoprint Server



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PSF and Infoprint Server



Status
The status of this printer:

Status from PSF: idle
Status from printer: idle
Status messages from printer:

Input tray status:

Tray	Media name	Level
Tray 1	InfoPrint Letter	OK
Tray 2	InfoPrint Letter	OK
Tray 3	InfoPrint Letter	OK
Tray 4	InfoPrint Letter	OK
Tray 5	InfoPrint Letter	OK
Tray 6	InfoPrint Letter	OK
Tray 7	InfoPrint Letter	OK

Output bin status:

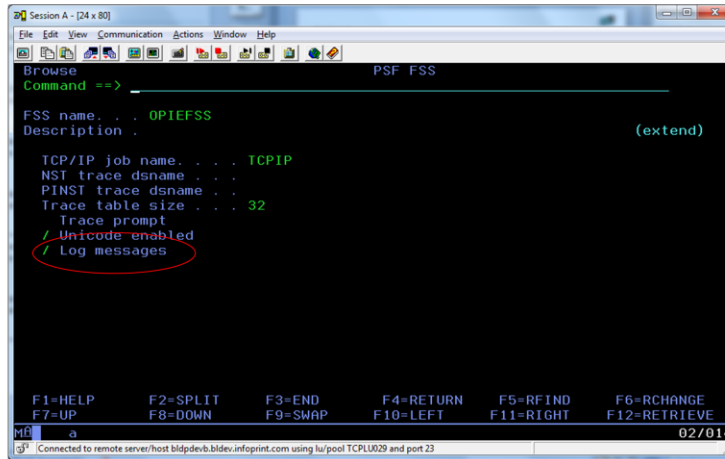
Bin	Capacity
Finisher Shift Tray	3000 sheets
Finisher Proof Tray	500 sheets
Stacker 1 Large Main Bin	5000 sheets
Stacker 1 Large Proof Tray	500 sheets
Stacker 2 Large Main Bin	5000 sheets
Stacker 2 Large Proof Tray	500 sheets

Toner: OK

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PSF 4.5 Infoprint Server Common Message Log

- To enable message-logging:



```
Session A - [24 x 80]
File Edit View Communication Actions Window Help
Browse PSF FSS
Command ==>
FSS name . . . OPIEFSS
Description . . . (extend)
TCP/IP job name . . . TCP/IP
NST trace dname . . .
PINST trace dname . . .
Trace table size . . . 32
Trace prompt
/ Unicode enabled
/ Log messages
F1=HELP F2=SPLIT F3=END F4=RETURN F5=RFIND F6=RCHANGE
F7=UP F8=DOWN F9=SWAP F10=LEFT F11=RIGHT F12=RETRIEVE
02/014
[Connected to remote server/host bldpdev.blddev.infoprint.com using lu/pool TCPLU029 and port 23]
```

z/OS Font Collection

Fonts...

MY HOBBY:
GETTING TYPOGRAPHY GEEKS
HEARTFELT CARDS PRINTED IN
"PAPYRUS" AND WATCHING THEM
STRUGGLE TO ACT GRATEFUL.



<http://xkcd.com/1396/>

Z/OS Font Collection



- **z/OS Font Collection is now a base element in z/OS V2.1**
- The z/OS Font Collection contains a comprehensive set of single and double-byte fonts, including:
 - AFP outline fonts
 - AFP raster fonts, including a complete set of IBM expanded core fonts, a set of Math, PI, and Sonoran 240-pel raster fonts, and compatibility fonts
 - TrueType and OpenType fonts, including a prebuilt resource access table (RAT) that can be used for AFP printing
- z/OS Font Collection is the recommended source of AFP fonts for printing with PSF.



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<http://pic.dhe.ibm.com/infocenter/zos/v2r1/index.jsp?topic=%2Fcom.ibm.zos.v2r1.e0zm100%2Ffontcol1.htm>

Consists of character sets, coded fonts, and AFP code pages for printing standard documents that use familiar typefaces such as Helvetica, Times NewRoman, and Courier.

z/OS Font Collection, a base element of z/OS V2.1, which contains AFP outline and raster fonts, and WorldType (TrueType and OpenType) fonts. z/OS Font Collection includes the PSF Compatibility Fonts feature and replaces the fonts from:

- AFP Font Collection
- Infoprint Fonts for z/OS
- WorldType Fonts from Infoprint Fonts for Multiplatforms

z/OS Font Collection

- If you are using PSF with z/OS V2R1, a resource installer program is not necessary because the z/OS Font Collection contains prebuilt RATs for TrueType and OpenType fonts that are installed during the z/OS V2R1 installation.
- **Make sure you have enough Space required for installing both base and language FMIDs**
 - Target Library allocation: 1855 cylinders
 - File system allocation: 2000 cylinders
 - Distribution Library allocation: 3955 cylinders

Make sure you have enough space, both on MVS (for AFP fonts) and USS (for Worldtype fonts)

New functions and enhancements

PSF 4.5 Print function enablement STM/OPC error checking

- Improved error recovery for incorrect Sense Type Model (STM) and Obtain Printer Characteristics (OPC) responses.



- PSF now checks the STM and XOH-OPC responses from the printer and verifies that the required minimum lengths are met in the self-defining fields and command set vectors, and gives more detailed error information if not.

STM=sense type model

OPC=obtain printer characteristics

PSF 4.5 Print function enablement STM/OPC error checking

```
OPCTITLE
COMMENT *****
OPCTITLE "UP3I TUPEL SELF-DEFINING FIELD"
COMMENT *****
OPCSDF X'0008001900000203'
OPCLENGTH X'0008' 8 "Length of this SDF, including itself"
TITLE PSF HAS DETECTED AN INCORRECT RESPONSE FROM YOUR PRINTER
TITLE CONCERNING ITS IPDS CAPABILITIES. THIS PROBLEM IS CAUSED
TITLE BY THE IPDS MICROCODE IN YOUR PRINTER. PLEASE CONTACT
TITLE YOUR PRINTER VENDOR HARDWARE SUPPORT AND ADVISE THEM
TITLE THAT THE IPDS XOH-OPC (EXECUTE ORDER HOMESTATE - OBTAIN
TITLE PRINTER CHARACTERISTICS) COMMAND HAS AN INVALID LENGTH IN
TITLE THIS SELF-DEFINING FIELD. PSF WILL CONTINUE TO SEND DATA TO
TITLE THE PRINTER, BUT CERTAIN PRINTER FUNCTIONS MAY NOT BE
TITLE AVAILABLE UNTIL THIS ISSUE IS RESOLVED.
```

When a bad length is detected, we will add a note to the printer information report after dumping the hex for the self-defining field or command set vector in the printer information report, and add a trace entry with info about the error.

PSF 4.5 New architecture support

- PSF has been updated to reflect several additions to the IPDS data stream that represent extensions to the AFP architecture maintained by the AFP Consortium.
- Although PSF provides infrastructure, several of these extensions also require additional software and hardware support.
- For more information about the AFP architecture, refer to AFP Consortium website at <http://www.afpcinc.org/>

In October 2004 IBM initiated the formation of the AFP Color Consortium (AFPC). The purpose was to collaboratively develop color management support in the AFP architecture. This resulted in the creation of the new AFP CMOCA (Color Management Object Content Architecture) specification, which was first published in 2006.

PSF 4.5 Printer function enablement Finishing operations

- More paper folding operations are supported:

- Center-fold out
- C-fold in and out
- Accordion-fold in and out
- Double parallel-fold in and out
- Double gate-fold in and out
- Single gate-fold in and out



- Note that these must also be supported by the printers to which output is directed.

PSF 4.5 AFP Document composition enhancements



- Expanded use of the Color Specification (x'4E') triplet for assigning a default color when a referenced container object is a bi-level or grayscale image. (PPFA function also added.)
- More control over the presentation space size of externally created PDF objects with new x'9C' triplet. (PPFA function also added.)
- PSF now allows IPDS printers to display the approximate number of pages in the current print job, if the application that creates the print file has generated the page count.
- Corresponding support required by printer/generating application.



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PSF supports the Color Specification (X'4E') triplet for assigning a default color when a referenced container object is a bi-level or grayscale image. [IPDS ACR 461](#).

[Support for a new Object Container Presentation Space Size \(X'9C'\) triplet that specifies the size of the object container presentation space for PDF objects.](#)

Support expanding the container architecture such that wherever a container object that is a bi-level or grayscale image is referenced; a default color can be assigned to the "on" pixels using the X'4E' triplet. This includes the IOB, PPO, CDD structured fields and the DO RAT. Also need to support expanding the existing default color support for bi-level IOCA to include the PPO and the DO RAT. Support the X'4E' triplet on the IDO-DODD, RPO and WOCC-OCDD commands to set a bi-level image color.

The original use of the X'4E' triplet was for coloring the object area. The user specified it in the OBD and it is placed in the WOCC-OCOC.

Expand the use of the X'4E' triplet to specify a default or initial color.

The user can specify the X'4E' triplet on the IOB and it is placed on the IDO-DODD. This triplet overrides the color specified in the CDD or RAT. The X'4E' triplet may occur only once, subsequent occurrences are ignored.

If the object is to be pre-ripped then the user may put the X'4E' triplet on the PPO and it is placed on the RPO. This triplet overrides the color specified in the CDD or RAT. The X'4E' triplet may occur only once, subsequent occurrences are ignored.

The X'4E' triplet may also be specified on the CDD and in this case it is placed on the WOCC-OCDD. The X'4E' triplet may occur only once, subsequent occurrences are ignored.

PSF 4.5 AFP Document composition enhancements Preprinted form overlay



- Support for a new overlay type that can be used to **simulate preprinted forms** by allowing the printer to merge the overlay with other presentation data (page, medium overlay, or page overlay).
- Can be better for simulating preprinted forms or colored paper than regular medium or page overlays, because **overlay data is included after all other data has been applied, and then the data is merged.**
- Corresponding printer support also needed.



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Provides better merge capabilities for input data and overlays.

Use an AFP utility that supports preprinted form overlays.

Create a form definition that identifies the overlay as a preprinted form overlay

Medium overlay: with local ID keyword X'D2' on the MMC structured field.

Page overlay: with a Resource Object Include triplet (X'6C') on the PMC structured field that is specified with a PFO object type.

For more information about preprinted form overlays, see *Mixed Object Document Content Architecture Reference*.

PSF 4.5

PARMLIB enablement/disablement

- PSF, Download for z/OS and AFP Download Plus can now use z/OS MVS™ Product Registration Services for enablement, so that PSF V4.5 can be enabled on systems on which it is licensed and disabled on systems where it is not in use.
- Support modeled after existing support for priced optional features of z/OS.
- Specify this product entry in the IFAPRDxx SYS1.PARMLIB member to enable PSF, then issue the SET PROD operator command:

```
PRODUCT OWNER('IBM CORP')
NAME('PSF for z/OS')
ID(5655-M32)
VERSION(*)
RELEASE(*)
MOD(*)
FEATURENAME('PSF for z/OS')
STATE(ENABLED)
```
- PSF direct printing, PPFA and ACIF should be installed as they were previously.

PSF 4.5 PARMLIB enablement/disablement

For Download:

```
PRODUCT OWNER('IBM CORP')  
  NAME('PSF for z/OS')  
  ID(5655-M32)  
  VERSION(*)  
  RELEASE(*)  
  MOD(*)  
  FEATURENAME('Download')  
  STATE(ENABLED)
```

PSF 4.5 PARMLIB enablement/disablement

For AFP Download Plus:

```
PRODUCT OWNER('IBM CORP')  
  NAME('PSF for z/OS')  
  ID(5655-M32)  
  VERSION(*)  
  RELEASE(*)  
  MOD(*)  
  FEATURENAME('Download Plus')  
  STATE(ENABLED)
```

PSF 4.5

PARMLIB enablement/disablement

- Update IFAPRD00, then enter the following command to set the new memory registration table:
 - **set prod=00**
- To verify the state setting for a product and its features:
 - **d prod,state,name('PSF for z/OS')**
- To verify the state of a feature:
 - **d prod,state,featurename('Download')**
- To verify the state setting for all products:
 - **d prod,state,all**

PSF 4.5

Infoprint Server Common Message Log

- You can now dynamically start and stop PSF message logging to the [Infoprint Server common message log](#), for easier use of the Infoprint Central component of Infoprint Server and more control over PSF-managed jobs.
- No need to restart PSF when :
 - **log-messages** attribute in a PSF FSS definition in the Printer Inventory is changed.
 - **log-retention** attribute is changed.
PSF no longer checks whether **log-retention** is 0 to decide whether to log PSF messages in the Infoprint Server common message log.
- PSF will now automatically pick up these changes.

PSF 4.5 Infoprint Server Common Message Log



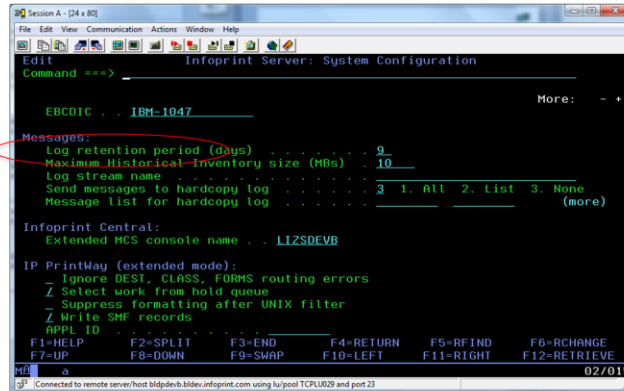
```
Session A - [24 x 80]
File Edit View Communication Actions Window Help
Browse PSF FSS
Command ==>
FSS name . . . OPIEFSS
Description . . . (extend)
TCP/IP job name . . . TCPIP
NST trace dsname . . .
PINST trace dsname . . .
Trace table size . . . 32
Trace prompt
/ Unicode enabled
/ Log messages
F1=HELP F2=SPLIT F3=END F4=RETURN F5=RFIND F6=RCHANGE
F7=UP F8=DOWN F9=SWAP F10=LEFT F11=RIGHT F12=RETRIEVE
MIP a 02/014
[Connected to remote server/host bldpdevb.bldev.infoprint.com using lu/pool TCPLU029 and port 23]
```



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PSF 4.5 Infoprint Server Common Message Log

- If Infoprint Server V2.1 and dynamic-configuration enabled:



```
Session A - [24 x 80]
File Edit View Communication Actions Window Help
Edit Infoprint Server: System Configuration
Command ==>
EBCDIC . . . IBM-1047
More: - +
Messages:
Log retention period (days) . . . 9
Maximum Historical inventory size (MBs) . . . 10
Log stream name
Send messages to hardcopy log . . . 3 1. All 2. List 3. None
Message list for hardcopy log . . . (more)
Infoprint Central:
Extended MCS console name . . . LIZSDEVB
IP PrintWay (extended mode):
Ignore DEST, CLASS, FORMS routing errors
Z Select work from hold queue
Suppress formatting after UNIX filter
Z Write SMP records
APPL ID
F1=HELP F2=SPLIT F3=END F4=RETURN F5=RFIND F6=RCHANGE
F7=UP F8=DOWN F9=SWAP F10=LEFT F11=RIGHT F12=RETRIEVE
02/015
327 Connected to remote server/host bldpde/b.blddev.infoprint.com using lu/pool TCPLU029 and port 23
```

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Set in ISPF panels, 12.8.8, Configuration object.

PSF 4.5 Infoprint Server Common Message Log

- If <Infoprint Server V2.1 or dynamic-configuration=no

Infoprint Server configuration file **aopd.conf**:

```
base-directory      = /var/Printsrv
lpd-port-number     = 730
inventory           = AOP1
job-prefix          = EA
start-daemons      = { netd lpd xfd ippd ssid subd
outd }
log-retention = 5
```

PSF 4.5 SMF6 recording improvements

- More information added to SMF Type 6 records for more billing options, and to help with accounting and chargeback activities.
- Add record counts for recording the number of sheets or physical pages in:
 - Simplex and duplex modes
 - N_UP modes
- Add a field in the File Transfer section that identifies the port number for TCPIP.
- Allow SMF6 record counting tied to physical sheet counts to occur in AFP Download Plus functional area even though no physical sheet is printed in the AFP Download Plus environment.



This allows the customer on the sending system to use their SMF6 records to verify the billing records produced from the receiving system's SMF6 records.

PSF 4.5 SMF6 recording improvements

- Whether **simplex or duplex printing** was used:
 - **SMF6DSHT** (count of duplex sheets processed)
 - **SMF6SSHT** (count of simplex sheets processed)
- Whether **1-, 2-, 3- or 4-up** printing was used for each print job. Counts number of physical sheets produced in each N_UP mode:
 - **SMF6NUP1** (count of N_UP 1 sheets processed)
 - **SMF6NUP2** (count of N_UP 2 sheets processed)
 - **SMF6NUP3** (count of N_UP 3 sheets processed)
 - **SMF6NUP4** (count of N_UP 4 sheets processed)
- Port number
 - **SMF6PORT**

File Transfer Level indicator SMF6FTL

PSF 4.5 Download for z/OS enhancements

- Better support for color printing with support for two additional OUTPUT JCL statement parameters:
 - //OUTDS OUTPUT **COLORMAP**=MYCOLORM
 - //OUTDS OUTPUT **COMSETUP**=MYCOMSET

Note that AFP Download Plus already transmits the COLORMAP value.

-ocolormap and -ocomsetup are also now supported.

COMSETUP

Specifies the member name of the object container for the microfilm setup resource. PSF uses the COMSETUP parameter only when sending output to a microfilm Device.

COLORMAP

Specifies the member name of the object container for the color mapping table resource. PSF uses the COLORMAP parameter only when sending output to a printer that supports color mapping table resources. When you send output to a printer that supports the color mapping table resource, you can specify a color mapping table to map color translations to the printer. The full name of the color mapping table is coded in the COLORMAP parameter of the OUTPUT JCL statement

PSF 4.5

Direct printing mode enhancements

- PSF 4.5 removes the requirement for specifying the UNICODE parameter and defaults to Unicode-enabled, which enables several functions for direct printing.
- Background...
PSF needs UNIX System Services for a variety of functions, including:
 - Name conversions
 - Processing path names
 - QR Code bar codes
 - Color management
 - Common message log function
 - TCP/IP
- PSF has a parameter on the EXEC statement in deferred-printing mode that enabled Unicode, but this does not apply to direct-printing mode.

```
//STEP01 EXEC  
PGM=APSPPIEP,REGION=1M,PARM=(,FULL,,999,,UNICODE)
```

PSF 4.5

Direct-printing mode enhancements

- PSF 4.5 is supported only on z/OS 1.12 later, and UNIX System Services is always enabled on these levels.
- Because UNIX System Services is always enabled in z/OS V1.12 or later, PSF now also supports these functions in direct-printing mode:
 - TrueType and OpenType fonts
 - QR Code bar codes with SOSI data
 - Resources that are defined with resource access tables (RATs), such as object containers and Color Management Resources (CMRs)
 - Extended code pages which reside in UNIX libraries

PSF 4.5 Direct-printing mode enhancements

- PSF also now supports these parameters for direct-printing mode:
 - **FONTPATH** (for font libraries)
 - **OBJCPATH** (for object container libraries)
- The UNICODE parameter may still be specified in the start-up procedure or in Printer Inventory. If so, it will just be ignored.

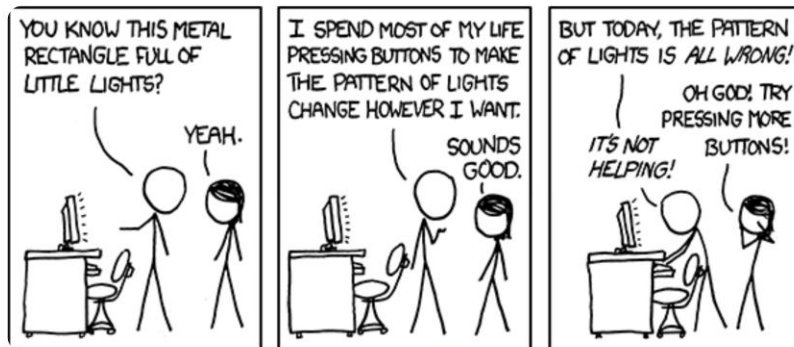
Identifies the one- to eight-character name of the DD statement that specifies the paths for object container libraries, which contain data object resources, such as color management resources (CMRs).

Syntax: **OBJCPATH=*.label**

Identifies the DD statement that specifies the font path libraries, which contain extended code pages or TrueType and OpenType fonts.

Syntax: **FONTPATH=*.label**

Intermission/questions



<http://xkcd.com/722/>

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Identifies the one- to eight-character name of the DD statement that specifies the paths for object container libraries, which contain data object resources, such as color management resources (CMRs).

Syntax: OBJCPATH=*.label

Identifies the DD statement that specifies the font path libraries, which contain extended code pages or TrueType and OpenType fonts.

Syntax: FONTPATH=*.label



PSF 4.5 EAS-eligible data sets

- PSF now supports extended addressing space (**EAS-eligible data sets**) that are supported by z/OS V1.12 or later.
- EAS-eligible data sets are ones that can be allocated anywhere on an extended address volume (EAV).
- More information on EAS volumes
 - http://publib.boulder.ibm.com/infocenter/ieduasst/stqv1r0/index.jsp?topic=/com.ibm.iea.commserv_v1/commserv/1.13z/appl/csftp/player.html
 - <https://share.confex.com/share/123/webprogram/Session15904.html>



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PSF 4.5

EAS-eligible data sets, background

- EAVs are disk volumes that can have track addresses greater than 65520 (“cylinder-managed space”).
- EAVs were first introduced in z/OS 1.10, but only VSAM files were allowed to be allocated on them.
- EAV support has been enhanced, and for z/OS 1.12, most commonly-used file types are allowed to be allocated on EAV.

PSF 4.5 EAS-eligible data sets

- Before these changes are applied, an attempt to have PSF access a data set in the EAS will result in this error message:

```
APS3002I WTRPOSE1 WTRPOSE1 *** PRT660 (TCPIP) THE OBTAIN SYSTEM  
FUNCTION WAS UNSUCCESSFUL FOR DATA SET NAME  
'PSFMVS.DEV9.DWP.FDEF.EAS' - RETURN CODE '18'X. PLEASE NOTIFY  
YOUR SYSTEM PROGRAMMER.
```

```
APS050I WTRPOSE1 WTRPOSE1 *** PRT660 (TCPIP) SYSTEM  
COMPLETION CODE '024'X, PSF ABEND REASON CODE '0525'X, HAS  
BEEN DETECTED BY APSHPEFS, ISSUED BY MODULE APSDDS.
```

- **OA42217** EAV support rolled into PSF 4.3.0/4.4.0

PSF 4.5 Printer Communication Enhancements - SNMP

- Simple Network Management Protocol (SNMP) enhancements for TCP/IP-attached printers:
 - Support provided to allow operators to forward and backward space print jobs to TCP/IP-attached printers using SNMP.
 - PSF operator commands now have faster response times with (SNMP) Version 1 implementation for TCP/IP-attached printers.



PSF 4.5 Printer Communication Enhancements - SNMP

- **Background...**

Problem:

Forward spacing (\$FPRTxxx) or backward spacing (\$BPRTxxx) channel-attached printers has been possible for a while, but not for TCP/IP-attached printers.

No HALT I/O equivalent for TCP/IP-attached printers, so no way to stop printer processing of data that has already been sent but hasn't been printed.

Solution:

SNMP. This looks like the channel scenario to the operator, and makes backward-spacing and forward-spacing possible for TCP/IP-attached printers.

- Printer must support SNMP Version 1 printer interrupt commands.

PSF 4.5 IS/3 support



- A document that is MO:DCA IS/3 compliant prints with **absolute fidelity** on any IPDS printer that supports MO:DCA IS/3 and any functions that are required to print the job, such as color and finishing.
- PTFs for D-APAR **OA37523** provided the documentation for the support for PSF 4.4 to process IS/3 compliant data.
- **PSF 4.5 adds the ability to send IS/3-compliant auxiliary pages.**
- Note that MO:DCA IS/3 data streams support only **TrueType** and **OpenType** fonts.



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To create auxiliary pages that will be IS/3 compliant:

Create or update the startup procedure to specify separator page and message OUTPUT statements with page definitions that only use TrueType and OpenType fonts (example, P1TT6462 and P1TT6483).

Recompile the form definitions specified on these OUTPUT statements with the COMPIS3 option (or use samples F1I30110 or F1I30111)

Set value of **IS3** for one of these:

Printer Inventory parameter **Auxiliary files MO:DCA level**
AFPPARMS parameter **auxiliary-files-modca-level**

Verify that the auxiliary data sets are IS/3 compliant by using the **Save Auxiliary Files** parameter and following the instructions in the AFP Download Plus manual.

PSF 4.5 IS/3 support

- The AFPSTATS report has been updated to indicate whether a file specifies that it is MO:DCA IS/3-compliant.
- New sample form definitions (formdefs) and page definitions (pagedefs) you can use to create MO:DCA-IS/3-compliant separator pages and message data sets.
- A new version of the afpconcat exit program on the z/OS receiver is designed to support the concatenation of MO:DCA IS/3-compliant files.

Formdefs are our usual defaults just recompiled with the COMPIS3 option. Available with PPFA PTF UK79320.

PSF 4.5 IS/3 support

- See PSF for z/OS: AFP Download Plus (S550-0433) for more details.
- New sample page definitions and form definitions are:
 - P1TT6462 (message data sets)
 - P1TT6483 (separator pages)
 - F1I30110 (simplex)
 - F1I30111(duplex)
- Run the MO:DCA validation tool of your choice on the saved auxiliary files to determine whether your files are compliant. The AFP Consortium, <http://www.afpcinc.org>, provides an IS/3 validation tool that can be used.

When processing auxiliary pages, PSF checks that the pages contain only TrueType and OpenType fonts. If they contain FOCA fonts, PSF stops processing the auxiliary pages and issues an error message.

ACIF and PPFA enhancements

PSF 4.5 ACIF enhancements



- Support for MO:DCA structured field changes:
 - Support for an additional color vector.
 - Support for PDF space size as specified RAT entries.



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Related support added in PSF V4.5.

ACIF Enhancements for PSF 4.5 Bi-level color

- The color specification triplet was previously used to present a color specification for IOCA objects, and has been expanded to non-IOCA objects such as TIFF and other grayscale objects.
 - Support is now included in the IOB and PPO structured fields.
 - The output creates a X'4E' triplet on the IOB and PPO structured fields for IOCA and non-IOCA objects.
 - A RAT vector X'34' has been created.

ACIF Enhancements for PSF 4.5 PDF Space size



- The PDF interface defines areas of interest in a PDF document which are used to define different portions of a document. There are 5 different page boxes that can be defined. These areas are called:
 - MediaBox
 - CropBox
 - BleedBox
 - TrimBox
 - ArtBox
- Support is now included in IOB structured field.
 - A x'9C' triplet on the IOB is created in the output, with new object presentation space size information.

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ACIF will add new object presentation space information through Data Object Resource Access Table files that contains PDF objects and has the Object Container Presentation Space Size vector 0x32 for that object. The output will be a X'9C' triplet in an IOB structured field in the output file.

PPFA New function d-APAR PI10347



- Addition of new user parameters in the page definition to support new function:
 - New PDF space size parameter for PDF objects
Presentation Space Size on object placement and object pre-rip parameters
 - Support for color on non-OCA object types
Bi-level and grayscale color on object placement and object pre-rip parameters



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Related support added in PSF V4.5.

To control the presentation space size of externally created PDF objects, use an application or product that creates a data stream in which the size of the presentation space is specified.

Presentation Space Size for PDF Objects

- MO:DCA ACR #150
- IPDS ACR #443

Color for bi-level and grayscale image (Default Color for Bi-Level non-OCA Image)

- MO:DCA ACR #156
- IPDS ACR #461

More information: <http://www-01.ibm.com/support/docview.wss?uid=swg1PI10347>

PPFA Presentation Space Size



- New parameters added to request Object Container Presentation Space Size for PDF objects
 - **OBCPSS** added to the PPFA page definition OBJECT command for placing an object
 - **RIPPSS** added to the PPFA page definition OBJECT command for defining an object
- Values for OBCPSS and RIPPSS can be:
 - *mediabox* – specifies MediaBox
 - *cropbox* – specifies CropBox
 - *bleedbox* – specifies BleedBox
 - *trimbox* – specifies TrimBox
 - *artbox* – specifies ArtBox



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New parameter OBCPSS is added to the PPFA pagedef OBJECT command for placing an object.

- This will allow Object Container Presentation Space Size to be specified for an object on PRINTLINE, LAYOUT, or XLAYOUT.

New parameter RIPPSS is added to the PPFA pagedef OBJECT command for defining an object.

- This will allow Object Container Presentation Space Size to be specified as a PRERIP parameter.

- Values for PSS can be:

media - specifies MediaBox

crop - specifies CropBox

bleed - specifies BleedBox

trim - specifies TrimBox

art - specifies ArtBox

PPFA Color Support



- Object color support now includes non-OCA object types (“OTHER”).
 - Default color on bi-level and grayscale object data
- Function added for pre-rip color for IOCA and non-OCA objects.
 - New parameter **RIPCOLOR** added to the PPFA page definition OBJECT command for defining a pre-rip color for an object.



Software and hardware requirements for PSF V4.5

PSF 4.5

Software and hardware requirements

- IBM processors capable of supporting:
 - z/OS V1.12
 - z/OS v2.1
- Operating systems with supported levels of JES2 or JES3:
 - z/OS V1.12 or later (Program Number 5694-A01)
 - z/OS V2.1 (Program Number 5650-ZOS)

(Note that this is not a comprehensive list of the requirements, but a list that highlights the changed requirements.)

PSF 4.5 Additional hardware requirements

- PSF supports printers that adhere to the IPDS specifications.
- Not all functions of PSF are supported by all IPDS printers. Several PSF V4.5 functions require corresponding printer support, such as SNMP enablement.

Contact your printer manufacturer to determine whether specific functions are available for a particular printer.

PSF 4.5

Additional software requirements

- One of these products or features, at the minimum level listed, is required for host fonts:
 - z/OS V2.1 (5655-ZOS)
 - Infoprint Fonts for z/OS V1.1 (5648-E76)
 - AFP Font Collection for z/OS V2.1.1 (5648-B33)
 - The Compatibility Fonts optional feature of PSF (*no euro support*)
 - WorldType Fonts for AFP Print Servers optional feature of Infoprint Fonts for Multiplatforms (5648-E77), for a wide selection of TrueType and OpenType fonts

V2.1 because it has the z/OS Font Collection feature of z/OS V2.1 (5655-ZOS) as a base element.

Information on the z/OS Font Collection:

<http://pic.dhe.ibm.com/infocenter/zos/v2r1/index.jsp?topic=%2Fcom.ibm.zos.v2r1.e0zm100%2Ffontcol1.htm>

PSF 4.5 Additional software requirements

- To use TrueType and OpenType fonts, you must have:
 - A product that supplies TrueType and OpenType fonts, such as the WorldType Fonts for AFP Print Servers optional feature of Infoprint Fonts for Multiplatforms or z/OS Font Collection, which is now a base element of z/OS V2.1.
 - Usually a resource installer program, such as the Font Installer optional feature of Infoprint Fonts for Multiplatforms, or the InfoPrint AFP Resource Installer (5639-EE2).

Note that a resource installer program is not required for the z/OS Font Collection.

PSF 4.5

Additional software requirements

- z/OS V1.13 or z/OS V2.1 is required to use the common message log with the Infoprint Server Printer Inventory, and the **Log messages** Infoprint Server Printer Inventory parameters.
- z/OS V2.1 is required to use the “Auxiliary files MO:DCA level” Infoprint Server Printer Inventory parameter.

PSF 4.5

Additional software requirements

- Some PSF-supported functions can be used only if the printer also supports them:
 - Using the Color Specification (X'4E') triplet to assign a default color when a container object that is a bi-level or grayscale image is referenced.
 - Preprinted form overlays.
 - Displaying the number of pages in a job.
 - Using the Object Container Presentation Space Size (X'9C') triplet to specify the presentation space size for PDF objects.
 - Faster response times for operators, using SNMP.
 - Processing MO:DCA IS/3 compliant data streams.

Additional documentation

Where to go for more information on PSF

- Our publications can be found at:
 - The IBM Publications Center: <http://www-05.ibm.com/e-business/linkweb/publications/servlet/pbi.wss?CTY=US>
 - IBM Knowledge Center: <http://www-01.ibm.com/support/knowledgecenter#!/SSLTBW/welcome>
 - z/OS Internet Library: <http://www-03.ibm.com/systems/z/os/zos/library/bkserv/>
- PDFs for PSF publications: <http://www-03.ibm.com/systems/z/os/zos/library/bkserv/v2r1pdf/#APS>
 - PSF for z/OS: Customization (S550-0427)
 - PSF for z/OS: Diagnosis (G550-0428)
 - PSF for z/OS: Download for z/OS (S550-0429)
 - PSF for z/OS: AFP Download Plus (S550-0433)
 - PSF for z/OS: Messages and Codes (G550-0432)
 - PSF for z/OS: Security Guide (S550-0434)
 - PSF for z/OS: User's Guide (S550-0435)
 - PSF for z/OS: ACIF User's Guide (S550-0436)

Where to go for more information on Infoprint Server



- PDFs for Infoprint Server publications: <http://www-03.ibm.com/systems/z/os/zos/library/bkserv/v2r1pdf/#APS>
 - z/OS Infoprint Server Customization (SA38-0691)
 - z/OS Infoprint Server Introduction (SA38-0692)
 - z/OS Infoprint Server Messages and Diagnosis (GA-32-0927)
 - z/OS Infoprint Server Operation and Administration (SA38-0693)
 - z/OS Infoprint Server Printer Inventory for PSF (SA38-0694)
 - z/OS Infoprint Server User's Guide (SA38-0695-00)
- Additional information:
 - ABCs of z/OS System Programming Volume 7 (SG24-6987)
 - z/OS Migration



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Thank you!



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