



Program Directory for Print Services Facility for z/OS

V04.07.00

Program Number 5655-M32

FMID HPRF470

for Use with
z/OS

Document Date: December 2019

GI13-3005-02

Note

Before using this information and the product it supports, be sure to read the general information under 7.0, "Notices" on page 29.

A form for reader's comments appears at the back of this publication. When you send information to IBM, you grant IBM a nonexclusive right to use or distribute the information in any way it believes appropriate without incurring any obligation to you.

Copyright International Business Machines Corporation 1983, 2019.

Note to U.S. Government Users — Documentation related to restricted rights — Use, duplication or disclosure is subject to restrictions set forth in GSA ADP Schedule Contract with IBM Corp.

Contents

1.0 Introduction	1
1.1 PSF 4.7.0 Description	1
1.2 PSF 4.7.0 FMID	2
2.0 Program Materials	3
2.1 Basic Machine-Readable Material	3
2.2 Program Publications	3
2.3 Program Source Materials	4
2.4 Publications Useful During Installation	4
3.0 Program Support	5
3.1 Program Services	5
3.2 Preventive Service Planning	5
3.3 Statement of Support Procedures	6
4.0 Program and Service Level Information	7
4.1 Program Level Information	7
4.2 Service Level Information	7
5.0 Installation Requirements and Considerations	9
5.1 Driving System Requirements	9
5.1.1 Machine Requirements	9
5.1.1.1 General Attachment Information and Notes	9
5.1.2 Programming Requirements	10
5.2 Target System Requirements	10
5.2.1 Machine Requirements	10
5.2.2 Programming Requirements	10
5.2.2.1 Installation Requisites	10
5.2.2.2 Operational Requisites	11
5.2.2.3 Toleration/Coexistence Requisites	11
5.2.2.4 Incompatibility (Negative) Requisites	11
5.2.3 DASD Storage Requirements	12
5.3 FMIDs Deleted	14
5.4 Special Considerations	15
5.4.1 Installing PSF 4.7.0 on z/OS	15
5.4.2 Installing PSF 4.7.0 into the Link Pack Area	15
5.4.3 Migration Considerations	15
5.4.3.1 Resources Provided with PSF 4.7.0	15
5.4.3.2 Installation Exits Provided with PSF 4.7.0	16
5.4.3.3 Startup Procedures Provided with PSF 4.7.0	16
5.4.4 SYS1.PARMLIB member IFAPRD00	16

6.0 Installation Instructions	19
6.1 Installing PSF 4.7.0	19
6.1.1 SMP/E Considerations for Installing PSF 4.7.0	19
6.1.2 SMP/E Options Subentry Values	19
6.1.3 SMP/E CALLLIBS Processing	20
6.1.4 Sample Jobs	20
6.1.5 Perform SMP/E RECEIVE	21
6.1.6 Allocate SMP/E Target and Distribution Libraries	21
6.1.7 Allocate File System Paths	21
6.1.8 Create DDDEF Entries	21
6.1.9 Perform SMP/E APPLY	21
6.1.10 Perform I/O Configuration	23
6.1.11 Modify the System Environment for PSF 4.7.0	23
6.1.12 Perform SMP/E ACCEPT	23
6.1.13 Run REPORT CROSSZONE	24
6.1.14 Dynamic Enablement - Update PARMLIB	24
6.2 Activating PSF 4.7.0	25
6.2.1 Installation Verification Procedure	25
6.2.1.1 IVP Job for JES Environment	26
6.2.1.2 IVP Job for Direct-Attach Environment	27
7.0 Notices	29
7.1 Trademarks	29
Reader's Comments	33

--- **Figures**

1. Basic Material: Unlicensed Publications	3
2. Publications Useful During Installation	4
3. PSP Upgrade and Subset ID	5
4. Component IDs	6
5. Driving System Software Requirements	10
6. Target System Mandatory Installation Requisites	11
7. Total DASD Space Required by PSF 4.7.0	12
8. Storage Requirements for PSF 4.7.0 Target Libraries	13
9. Storage Requirements for PSF 4.7.0 Distribution Libraries	14
10. SMP/E Options Subentry Values	19
11. Sample Installation Jobs	20

1.0 Introduction

This program directory is intended for system programmers who are responsible for program installation and maintenance. It contains information about the material and procedures associated with the installation of Print Services Facility for z/OS. This publication refers to Print Services Facility for z/OS as PSF 4.7.0.

The Program Directory contains the following sections:

2.0, "Program Materials" on page 3 identifies the basic program materials and documentation for PSF 4.7.0.

3.0, "Program Support" on page 5 describes the IBM support available for PSF 4.7.0.

4.0, "Program and Service Level Information" on page 7 lists the APARs (program level) and PTFs (service level) that have been incorporated into PSF 4.7.0.

5.0, "Installation Requirements and Considerations" on page 9 identifies the resources and considerations that are required for installing and using PSF 4.7.0.

6.0, "Installation Instructions" on page 19 provides detailed installation instructions for PSF 4.7.0. It also describes the procedures for activating the functions of PSF 4.7.0, or refers to appropriate publications.

Before installing PSF 4.7.0, read the *CBPDO Memo To Users* and the *CBPDO Memo To Users Extension* that are supplied with this program in softcopy format and this program directory; after which, keep the documents for your reference. Section 3.2, "Preventive Service Planning" on page 5 tells you how to find any updates to the information and procedures in this program directory.

PSF 4.7.0 is supplied in a Custom-Built Product Delivery Offering (CBPDO, 5751-CS3). The program directory that is provided in softcopy format on the CBPDO is identical to the hardcopy format if one was included with your order. All service and HOLDDATA for PSF 4.7.0 are included on the CBPDO.

Do not use this program directory if you install PSF 4.7.0 with a SystemPac or ServerPac. When you use one of those offerings, use the jobs and documentation supplied with the offering. The offering will point you to specific sections of this program directory as needed.

1.1 PSF 4.7.0 Description

The Advanced Function Presentation (AFP) architecture and its software and hardware implementations have become the standard for production printing whenever high-volume output, superior reliability, page-level recovery and accountability, and end-to-end automation of system processes are required. Print Services Facility (PSF) is the printing subsystem in z/OS that manages print jobs, resources, and printers to provide access to AFP printing and print-related functions.

The following separately orderable features are available with PSF 4.7.0:

AFP Download Plus

AFP Download Plus accepts line data, XML data, and MO:DCA-P data as input. It automatically transforms line data and XML data to MO:DCA-P, and can optionally include all required resources and transmits the output to receiving systems using TCP/IP. This eliminates the need for manual print file transfer using File Transfer Protocol (FTP) and duplicating the required resources on the receiving system. A cooperating print server running on a receiving system receives the data sets for printing, e-mailing, or faxing with PSF for z/OS, and AIX, Linux, or Windows print servers. AFP Download Plus provides high-speed data transfer, JES scheduling, job management, data integrity, and job accounting for distributed production print management.

Download for z/OS

Download for z/OS automatically transmits line data, mixed mode, XML data, MO:DCA-P data, and many other data streams from the JES spool to receiving systems using TCP/IP. This eliminates the need for manual print file transfer using File Transfer Protocol (FTP). A cooperating print server or archive server running on a receiving system receives the data sets for printing with PSF for z/OS, or AIX, or Linux, or Windows print servers, or for archiving with Content Manager OnDemand. Download for z/OS provides high-speed data transfer, JES scheduling, job management, data integrity, and job accounting for distributed production print management.

AFP Conversion and Indexing Facility (ACIF)

ACIF is a tool that lets you convert a line data, mixed data, unformatted ASCII, or XML print file into a MO:DCA-P document, retrieve resources used by the document, and index the file for later retrieval and viewing. ACIF provides these functions across systems and operating systems:

- Converts traditional and record format line data, mixed data, and XML print files to MO:DCA-P documents.
- Creates a separate index object file from the indexing tags in a MO:DCA-P document.
- Retrieves and packages AFP resources needed for printing or viewing a MO:DCA-P document.

AFP Upload for AIX

AFP Upload receives print data from AIX and places it on the JES spool for printing on any printer that is supported by PSF for z/OS. Jobs that are submitted to AFP Upload can contain any type of data stream that the print server can transform to MO:DCA-P, except XML.

1.2 PSF 4.7.0 FMID

PSF 4.7.0 consists of the following FMID:

HPRF470

2.0 Program Materials

An IBM program is identified by a program number. The program number for PSF 4.7.0 is 5655-M32.

Basic Machine-Readable Materials are materials that are supplied under the base license and are required for the use of the product.

The program announcement material describes the features supported by PSF 4.7.0. Ask your IBM representative for this information if you have not already received a copy.

2.1 Basic Machine-Readable Material

The distribution medium for this program is physical media or downloadable files. This program is in SMP/E RELFILE format and is installed by using SMP/E. See 6.0, "Installation Instructions" on page 19 for more information about how to install the program.

You can find information about the physical media for the basic machine-readable materials for PSF 4.7.0 in the *CBPDO Memo To Users Extension*.

2.2 Program Publications

The following sections identify the basic publications for PSF 4.7.0.

Figure 1 identifies the basic unlicensed publications for PSF 4.7.0. Those that are in softcopy format publications can be obtained from the IBM Publications Center website at <https://www.ibm.com/support/knowledgecenter>.

<i>Figure 1 (Page 1 of 2). Basic Material: Unlicensed Publications</i>		
Publication Title	Form Number	Media Format
<i>Print Services Facility for z/OS: Introduction</i>	G550-0430	https://www.ibm.com/support/knowledgecenter
<i>Print Services Facility for z/OS: Licensed Programming Specifications</i>	G550-0431	https://www.ibm.com/support/knowledgecenter
<i>Print Services Facility for z/OS: User's Guide</i>	S550-0435	https://www.ibm.com/support/knowledgecenter
<i>Print Services Facility for z/OS: Customization</i>	S550-0427	https://www.ibm.com/support/knowledgecenter
<i>Print Services Facility for z/OS: Messages and Codes</i>	G550-0432	https://www.ibm.com/support/knowledgecenter

Figure 1 (Page 2 of 2). Basic Material: Unlicensed Publications

Publication Title	Form Number	Media Format
<i>Print Services Facility for z/OS: Diagnosis</i>	G550-0428	https://www.ibm.com/support/knowledgecenter
<i>Print Services Facility for z/OS: AFP Download Plus</i>	S550-0433	https://www.ibm.com/support/knowledgecenter
<i>Print Services Facility for z/OS: Download for z/OS</i>	S550-0429	https://www.ibm.com/support/knowledgecenter
<i>Print Services Facility for z/OS: AFP Conversion and Indexing Facility User's Guide</i>	S550-0436	https://www.ibm.com/support/knowledgecenter
<i>Upload Configuration Guide for SNA</i>	S544-5422	
<i>Upload Configuration Guide for TCP/IP</i>	S544-5423	
<i>Print Services Facility for z/OS: Security Guide</i>	S550-0434	https://www.ibm.com/support/knowledgecenter

2.3 Program Source Materials

No program source materials or viewable program listings are provided for PSF 4.7.0.

2.4 Publications Useful During Installation

You might want to use the publications listed in Figure 2 during the installation of PSF 4.7.0.

Figure 2. Publications Useful During Installation

Publication Title	Form Number	Media Format
<i>IBM SMP/E for z/OS User's Guide</i>	SA23-2277	https://www.ibm.com/support/knowledgecenter
<i>IBM SMP/E for z/OS Commands</i>	SA23-2275	https://www.ibm.com/support/knowledgecenter
<i>IBM SMP/E for z/OS Reference</i>	SA23-2276	https://www.ibm.com/support/knowledgecenter
<i>IBM SMP/E for z/OS Messages, Codes, and Diagnosis</i>	GA32-0883	https://www.ibm.com/support/knowledgecenter
<i>z/OS Planning for Installation</i>	GA32-0890	https://www.ibm.com/support/knowledgecenter

3.0 Program Support

This section describes the IBM support available for PSF 4.7.0.

3.1 Program Services

Contact your IBM representative for specific information about available program services.

3.2 Preventive Service Planning

Before you install PSF 4.7.0, make sure that you have reviewed the current Preventive Service Planning (PSP) information. Review the PSP Bucket for General Information, Installation Documentation, and the Cross Product Dependencies sections. For the Recommended Service section, instead of reviewing the PSP Bucket, it is recommended you use the IBM.PRODUCTINSTALL-REQUIREDSERVICE fix category in SMP/E to ensure you have all the recommended service installed. Use the **FIXCAT(IBM.PRODUCTINSTALL-REQUIREDSERVICE)** operand on the **APPLY CHECK** command. See 6.1.9, “Perform SMP/E APPLY” on page 21 for a sample APPLY command

If you obtained PSF 4.7.0 as part of a CBPDO, HOLDDATA is included.

If the CBPDO for PSF 4.7.0 is older than two weeks by the time you install the product materials, you can obtain the latest PSP Bucket information by going to the following website:

<http://www14.software.ibm.com/webapp/set2/psearch/search?domain=psp>

You can also use S/390 SoftwareXcel or contact the IBM Support Center to obtain the latest PSP Bucket information.

For program support, access the Software Support Website at <https://www.ibm.com/products/software/>.

PSP Buckets are identified by UPGRADEs, which specify product levels; and SUBSETs, which specify the FMIDs for a product level. The UPGRADE and SUBSET values for PSF 4.7.0 are included in Figure 3.

<i>Figure 3. PSP Upgrade and Subset ID</i>		
UPGRADE	SUBSET	Description
PSFMVS470	HPRF470	PSF for z/OS

3.3 Statement of Support Procedures

Report any problems which you feel might be an error in the product materials to your IBM Support Center. You may be asked to gather and submit additional diagnostics to assist the IBM Support Center in their analysis.

Figure 4 on page 6 identifies the component IDs (COMPID) for PSF 4.7.0.

<i>Figure 4. Component IDs</i>			
FMID	COMPID	Component Name	RETAIN Release
HPRF470	5655M3201	PSF for z/OS	470

4.0 Program and Service Level Information

This section identifies the program and relevant service levels of PSF 4.7.0. The program level refers to the APAR fixes that have been incorporated into the program. The service level refers to the PTFs that have been incorporated into the program.

4.1 Program Level Information

The following APAR fixes against previous releases of PSF 4.7.0 have been incorporated into this release. They are listed by FMID.

FMID HPRF460

OA54895
OA55579
OA56163

OA55902
OA55648
OA58260

OA54593
OA56072

4.2 Service Level Information

No PTFs against this release of PSF 4.7.0 have been incorporated into the product package.

Frequently check the PSF 4.7.0 PSP Bucket for HIPER and SPECIAL attention PTFs against all FMIDs that you must install. You can also receive the latest HOLDDATA, then add the **FIXCAT(IBM.PRODUCTINSTALL-REQUIRDSERVICE)** operand on your **APPLY CHECK** command. This will allow you to review the recommended and critical service that should be installed with your FMIDs.

5.0 Installation Requirements and Considerations

The following sections identify the system requirements for installing and activating PSF 4.7.0. The following terminology is used:

Driving system: the system on which SMP/E is executed to install the program.

The program might have specific operating system or product level requirements for using processes, such as binder or assembly utilities during the installation.

Target system: the system on which the program is configured and run.

The program might have specific product level requirements, such as needing access to the library of another product for link-edits. These requirements, either mandatory or optional, might directly affect the element during the installation or in its basic or enhanced operation.

In many cases, you can use a system as both a driving system and a target system. However, you can make a separate IPL-able clone of the running system to use as a target system. The clone must include copies of all system libraries that SMP/E updates, copies of the SMP/E CSI data sets that describe the system libraries, and your PARMLIB and PROCLIB.

Use separate driving and target systems in the following situations:

When you install a new level of a product that is already installed, the new level of the product will replace the old one. By installing the new level onto a separate target system, you can test the new level and keep the old one in production at the same time.

When you install a product that shares libraries or load modules with other products, the installation can disrupt the other products. By installing the product onto a separate target system, you can assess these impacts without disrupting your production system.

5.1 Driving System Requirements

This section describes the environment of the driving system required to install PSF 4.7.0.

5.1.1 Machine Requirements

The driving system can run in any hardware environment that supports the required software.

5.1.1.1 General Attachment Information and Notes

PSF supports printing on IBM and non-IBM AFP printers that adhere to the IPDS specifications. Not all functions of PSF are supported by all IPDS printers. Refer to your printer documentation for detailed information regarding each printer type and supported functions.

Refer to *PSF for z/OS: Customization, S550-0427*, for information on attaching any of the printers supported by PSF 4.7.0.

5.1.2 Programming Requirements

Figure 5. Driving System Software Requirements

Program Number	Product Name	Minimum VRM	Minimum Service Level will satisfy these APARs	Included in the shipped product?
5650-ZOS	z/OS	V02.02.00 or higher	N/A	No

Note: SMP/E is a requirement for Installation and is an element of z/OS but can also be ordered as a separate product, 5655-G44, minimally V03.06.00.

Note: Installation might require migration to new z/OS releases to be service supported. See https://www-01.ibm.com/software/support/lifecycle/index_z.html.

5.2 Target System Requirements

This section describes the environment of the target system required to install and use PSF 4.7.0.

PSF 4.7.0 installs in the z/OS (Z038) SREL.

5.2.1 Machine Requirements

The target system can run in any hardware environment that supports the required software.

5.2.2 Programming Requirements

5.2.2.1 Installation Requisites

Installation requisites identify products that are required and *must* be present on the system or products that are not required but *should* be present on the system for the successful installation of this product.

Mandatory installation requisites identify products that are required on the system for the successful installation of this product. These products are specified as PREs or REQs.

Figure 6. Target System Mandatory Installation Requisites

Program Number	Product Name	Minimum VRM	Minimum Service Level will satisfy these APARs	Included in the shipped product?
5650-ZOS	z/OS	V02.02.00 or higher	N/A	No

Conditional installation requisites identify products that are *not* required for successful installation of this product but can resolve such things as certain warning messages at installation time. These products are specified as IF REQs.

PSF 4.7.0 has no conditional installation requisites.

5.2.2.2 Operational Requisites

Operational requisites are products that are required and *must* be present on the system or products that are not required but *should* be present on the system for this product to operate all or part of its functions.

Mandatory operational requisites identify products that are required for this product to operate its basic functions.

PSF 4.7.0 has no mandatory operational requisites.

Conditional operational requisites identify products that are *not* required for this product to operate its basic functions but are required at run time for this product to operate specific functions. These products are specified as IF REQs.

PSF 4.7.0 has no conditional operational requisites.

5.2.2.3 Toleration/Coexistence Requisites

Toleration/coexistence requisites identify products that must be present on sharing systems. These systems can be other systems in a multisystem environment (not necessarily sysplex), a shared DASD environment (such as test and production), or systems that reuse the same DASD environment at different time intervals.

PSF 4.7.0 has no toleration/coexistence requisites.

5.2.2.4 Incompatibility (Negative) Requisites

Negative requisites identify products that must *not* be installed on the same system as this product.

PSF 4.7.0 has no negative requisites.

5.2.3 DASD Storage Requirements

PSF 4.7.0 libraries can reside on all supported DASD types.

Figure 7 on page 12 lists the total space that is required for each type of library.

<i>Figure 7. Total DASD Space Required by PSF 4.7.0</i>		
Library Type	Total Space Required in 3390 Trks	Description
Target	255 tracks	
Distribution	330 tracks	

Notes:

1. For non-RECFM U data sets, IBM recommends using system-determined block sizes for efficient DASD utilization. For RECFM U data sets, IBM recommends using a block size of 32760, which is most efficient from the performance and DASD utilization perspective.
2. Abbreviations used for data set types are shown as follows.

- U** Unique data set, allocated by this product and used by only this product. This table provides all the required information to determine the correct storage for this data set. You do not need to refer to other tables or program directories for the data set size.
- S** Shared data set, allocated by this product and used by this product and other products. To determine the correct storage needed for this data set, add the storage size given in this table to those given in other tables (perhaps in other program directories). If the data set already exists, it must have enough free space to accommodate the storage size given in this table.
- E** Existing shared data set, used by this product and other products. This data set is *not* allocated by this product. To determine the correct storage for this data set, add the storage size given in this table to those given in other tables (perhaps in other program directories). If the data set already exists, it must have enough free space to accommodate the storage size given in this table.

If you currently have a previous release of this product installed in these libraries, the installation of this release will delete the old release and reclaim the space that was used by the old release and any service that had been installed. You can determine whether these libraries have enough space by deleting the old release with a dummy function, compressing the libraries, and comparing the space requirements with the free space in the libraries.

For more information about the names and sizes of the required data sets, see 6.1.6, "Allocate SMP/E Target and Distribution Libraries" on page 21.

3. All target and distribution libraries listed have the following attributes:

- The default name of the data set can be changed.
- The default block size of the data set can be changed.
- The data set can be merged with another data set that has equivalent characteristics.

The data set can be either a PDS or a PDSE, with some exceptions. If the value in the "ORG" column specifies "PDS", the data set must be a PDS. If the value in "DIR Blks" column specifies "N/A", the data set must be a PDSE.

4. All target libraries listed have the following attributes:

These data sets can be SMS-managed, but they are not required to be SMS-managed.

These data sets are not required to reside on the IPL volume.

The values in the "Member Type" column are not necessarily the actual SMP/E element types that are identified in the SMPMCS.

5. All target libraries that are listed and contain load modules have the following attributes:

These data sets can not be in the LPA, with some exceptions. If the value in the "Member Type" column specifies "LPA", it is advised to place the data set in the LPA.

These data sets can be in the LNKLIST.

These data sets are not required to be APF-authorized, with some exceptions. If the value in the "Member Type" column specifies "APF", the data set must be APF-authorized.

The following figures describe the target and distribution libraries and file system paths required to install PSF 4.7.0. The storage requirements of PSF 4.7.0 must be added to the storage required by other programs that have data in the same library or path.

Note: Use the data in these tables to determine which libraries can be merged into common data sets. In addition, since some ALIAS names may not be unique, ensure that no naming conflicts will be introduced before merging libraries.

Figure 8 (Page 1 of 2). Storage Requirements for PSF 4.7.0 Target Libraries

Library DDNAME	Member Type	Target Volume	T Y P E	O R G	R E C F M	L R E C L	No. of 3390 Trks	No. of DIR Blks
FDEFLIB	Formdef	TVOL2	S	PDS	VBM	8205	4	8
LINKLIB	LMOD	TVOL1	E	PDS	U	0	101	8
MACLIB	Macro	TVOL2	E	PDS	FB	80	7	1
OVERLIB	Overlay	TVOL2	S	PDS	VBM	8205	1	1
PDEFLIB	Pagedef	TVOL2	S	PDS	VBM	8205	12	6
PROCLIB	Proc	TVOL1	E	PDS	FB	80	3	1
PSEGLIB	PSEG	TVOL2	S	PDS	VBM	8205	1	1
SAMPLIB	Sample	TVOL2	E	PDS	FB	80	88	8
SAPSDAT0	Data	TVOL2	U	PDS	VBM	8205	7	2
SAPSEXEC	EXEC	TVOL2	U	PDS	FB	80	4	1
SAPSHDR	Macro	TVOL2	U	PDS	FB	80	10	2

Figure 8 (Page 2 of 2). Storage Requirements for PSF 4.7.0 Target Libraries

Library DDNAME	Member Type	Target Volume	T Y P E	O R G	R E C F M	L R E C L	No. of 3390 Trks	No. of DIR Blks
SAPSPDFD	Source	TVOL2	U	PDS	FB	80	23	19

Figure 9. Storage Requirements for PSF 4.7.0 Distribution Libraries

Library DDNAME	T Y P E	O R G	R E C F M	L R E C L	No. of 3390 Trks	No. of DIR Blks
AAPSDAT0	U	PDS	VBM	8205	7	2
AAPSHDR	U	PDS	FB	80	10	2
AAPSMOD0	S	PDS	U	0	170	110
AAPSPDFD	U	PDS	FB	80	23	19
AFDEFLIB	S	PDS	VBM	8205	4	8
AAPSEXEC	U	PDS	FB	80	4	1
ALINKLIB	E	PDS	U	0	2	1
AMACLIB	E	PDS	FB	80	7	1
AOVERLIB	S	PDS	VBM	8205	1	1
APDEFLIB	S	PDS	VBM	8205	12	6
APROCLIB	E	PDS	FB	80	3	1
APSEGLIB	S	PDS	VBM	8205	1	1
ASAMPLIB	E	PDS	FB	80	82	6

5.3 FMIDs Deleted

Installing PSF 4.7.0 might result in the deletion of other FMIDs. To see which FMIDs will be deleted, examine the ++VER statement in the SMPMCS of the product.

If you do not want to delete these FMIDs at this time, install PSF 4.7.0 into separate SMP/E target and distribution zones.

Note: These FMIDs are not automatically deleted from the Global Zone. If you want to delete these FMIDs from the Global Zone, use the SMP/E REJECT NOFMID DELETEFMID command. See the SMP/E Commands book for details.

5.4 Special Considerations

5.4.1 Installing PSF 4.7.0 on z/OS

For this release of PSF for z/OS, an IPL is not required to activate the product. PSF for z/OS no longer installs in the system library SYS1.NUCLEUS. The modules that releases earlier than PSF 4.5.0 for z/OS installed in SYS1.NUCLEUS were moved from PSF to the Infoprint Server element of z/OS since V02.01.00 with PTF UA69864. As a result, the target library NUCLEUS and the distribution libraries ANUCLEUS and AOSC5 are no longer used and the DDDEFs for these libraries are no longer required for installing PSF for z/OS.

5.4.2 Installing PSF 4.7.0 into the Link Pack Area

PSF 4.7.0 performance may be improved if many functional subsystems (FSS) are defined and PSF 4.7.0 is installed into LPA. For deferred printing, certain load modules can be installed into LPA. For information on deferred printing, see *Print Services Facility for z/OS: Customization*. Some high usage modules are listed below which are good candidates to be placed into the MVS LPA and ELPA to obtain performance improvements.

- APSPPIEP (aliases APSAFSA, APSGAD31, APSPPFSA, APSPPNST, APSZCMND, APSZRSTR) - ELPA
- APSGBTL - LPA
- DCKVTBL, if you use SNA printers - ELPA.

If PSF 4.7.0 will be used in direct printing mode, then PSF 4.7.0 **cannot** be installed into LPA.

5.4.3 Migration Considerations

5.4.3.1 Resources Provided with PSF 4.7.0

AFP resources are provided with PSF 4.7.0 in the FDEFLIB, PDEFLIB, OVERLIB, and PSEGLIB libraries. If you have modified your IBM-supplied resources and want to save them, copy them to a temporary data set so that they are not overwritten by the resources provided by PSF 4.7.0. After the Installation Verification Procedure is completed, copy the resources back to their proper resource libraries.

The names of the resources provided with PSF 4.7.0 can be found by listing the SMPMCS file. Refer to *Print Services Facility for z/OS: User's Guide* for more information regarding resources and their use.

Note: All PSF resource libraries should be excluded from migration, compaction and defragmentation, by other products while the PSF FSS is active. Refer to the section entitled Maintaining Resource Integrity in *Print Services Facility for z/OS: Customization* for details.

5.4.3.2 Installation Exits Provided with PSF 4.7.0

Sample installation exits are provided in C and assembler language and can be written in either.

If you would like to keep the installation exits from your previous release of PSF, then copy the installation exits from the SAMPLIB data set to a temporary data set so that they are not overwritten when PSF 4.7.0 is installed.

After the installation verification procedure is completed, copy the saved members back to the PSF 4.7.0 SAMPLIB data set.

If you want to use your existing exits, they must be reassembled prior to using them with PSF 4.7.0.

5.4.3.3 Startup Procedures Provided with PSF 4.7.0

If you would like to keep the startup procedures from your previous release of PSF, then copy the startup procedures from the PROCLIB data set to a temporary data set so that they are not overwritten when PSF 4.7.0 is installed. Startup procedures for PSF 4.7.0 are as follows:

- APSWPROA
- APSWPROB
- APSWPROC
- APSWPROF
- APSWPROM
- APSWPROR
- APSWPROT

Note: The sample startup procedures specify coded font X060D8 in its 4 character form 60D8 as the default font for Job Headers, Job Trailers, Dataset Headers, and Dataset Trailers. This font is provided in z/OS V02.01.00 and higher.

After the installation verification procedure is completed, copy these members back to the PROCLIB data set.

5.4.4 SYS1.PARMLIB member IFAPRD00

The SYS1.PARMLIB member, IFAPRD00, may have been customized by IBM to enable the IBM products and optional integrated features specifically ordered by you.

Please verify that the SYS1.PARMLIB member IFAPRD00 contains the following information for PSF and add if necessary.

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

6.0 Installation Instructions

This chapter describes the installation method and the step-by-step procedures to install and to activate the functions of PSF 4.7.0.

Please note the following points:

If you want to install PSF 4.7.0 into its own SMP/E environment, consult the SMP/E manuals for instructions on creating and initializing the SMPCSI and the SMP/E control data sets.

You can use the sample jobs that are provided to perform part or all of the installation tasks. The SMP/E jobs assume that all DDDEF entries that are required for SMP/E execution have been defined in appropriate zones.

You can use the SMP/E dialogs instead of the sample jobs to accomplish the SMP/E installation steps.

6.1 Installing PSF 4.7.0

6.1.1 SMP/E Considerations for Installing PSF 4.7.0

Use the SMP/E RECEIVE, APPLY, and ACCEPT commands to install this release of PSF 4.7.0.

6.1.2 SMP/E Options Subentry Values

The recommended values for certain SMP/E CSI subentries are shown in Figure 10. Using values lower than the recommended values can result in failures in the installation. DSSPACE is a subentry in the GLOBAL options entry. PEMAX is a subentry of the GENERAL entry in the GLOBAL options entry. See the SMP/E manuals for instructions on updating the global zone.

<i>Figure 10. SMP/E Options Subentry Values</i>		
Subentry	Value	Comment
DSSPACE	(155,10,150) TRK	Recommended value for PSF 4.7.0
PEMAX	SMP/E Default	IBM recommends using the SMP/E default for PEMAX.

6.1.3 SMP/E CALLLIBS Processing

PSF 4.7.0 uses the CALLLIBS function provided in SMP/E to resolve external references during installation. When PSF 4.7.0 is installed, ensure that DDDEFs exist for the following libraries:

CSSLIB
SCEELKED
SCEEBND2

Note: CALLLIBS uses the previous DDDEFs only to resolve the link-edit for PSF 4.7.0. These data sets are not updated during the installation of PSF 4.7.0.

6.1.4 Sample Jobs

The following sample installation jobs are provided as part of the product to help you install PSF 4.7.0:

<i>Figure 11. Sample Installation Jobs</i>			
Job Name	Job Type	Description	RELFILE
APSWALOC	ALLOCATE	Sample job to allocate target and distribution libraries	IBM.HPRF470.F2
APSWDDEF	DDDEF	Sample job to define SMP/E DDDEFs	IBM.HPRF470.F2

You can access the sample installation jobs by performing an SMP/E RECEIVE (refer to 6.1.5, “Perform SMP/E RECEIVE” on page 21) then copy the jobs from the RELFILES to a work data set for editing and submission. See Figure 11 to find the appropriate relfile data set.

You can also copy the sample installation jobs from the product files by submitting the following job. Before you submit the job, add a job card and change the lowercase parameters to uppercase values to meet the requirements of your site.

```
//STEP1      EXEC PGM=IEBCOPY
//SYSPRINT DD SYSOUT=*
//IN         DD DSN=IBM.HPRF470.F2,UNIT=SYSALLDA,DISP=SHR,
//           VOL=SER=filevol
//OUT        DD DSNAME=jcl-library-name,
//           DISP=(NEW,CATLG,DELETE),
//           VOL=SER=dasdvol,UNIT=SYSALLDA,
//           SPACE=(TRK,(2,1,2))
//SYSUT3     DD UNIT=SYSALLDA,SPACE=(CYL,(1,1))
//SYSIN      DD *
            COPY INDD=IN,OUTDD=OUT
            SELECT MEMBER=APSWALOC
            SELECT MEMBER=APSWDDEF
/*
```

See the following information to update the statements in the previous sample:

IN:

filevol is the volume serial of the DASD device where the downloaded files reside.

OUT:

jcl-library-name is the name of the output data set where the sample jobs are stored.

dasdvol is the volume serial of the DASD device where the output data set resides.

6.1.5 Perform SMP/E RECEIVE

If you have obtained PSF 4.7.0 as part of a CBPDO, use the RCVPDO job in the CBPDO RIMLIB data set to receive the PSF 4.7.0 FMIDs, service, and HOLDDATA that are included on the CBPDO package. For more information, see the documentation that is included in the CBPDO.

Expected Return Codes and Messages: You will receive a return code of 0 if this job runs correctly.

6.1.6 Allocate SMP/E Target and Distribution Libraries

Edit and submit sample job APSWALOC to allocate the SMP/E target and distribution libraries for PSF 4.7.0. Consult the instructions in the sample job for more information.

Expected Return Codes and Messages: You will receive a return code of 0 if this job runs correctly.

6.1.7 Allocate File System Paths

6.1.8 Create DDDEF Entries

Edit and submit sample job APSWDDEF to create DDDEF entries for the SMP/E target and distribution libraries for PSF 4.7.0. Consult the instructions in the sample job for more information.

Expected Return Codes and Messages: You will receive a return code of 0 if this job runs correctly.

6.1.9 Perform SMP/E APPLY

Perform an SMP/E APPLY CHECK for PSF 4.7.0.

The latest HOLDDATA is available through several different portals, including <http://service.software.ibm.com/holdata/390holddata.html>. The latest HOLDDATA may identify HIPER and FIXCAT APARs for the FMIDs you will be installing. An APPLY CHECK will help you determine if any HIPER or FIXCAT APARs are applicable to the FMIDs you are installing. If there are any applicable HIPER or FIXCAT APARs, the APPLY CHECK will also identify fixing PTFs that will resolve the APARs, if a fixing PTF is available.

You should install the FMIDs regardless of the status of unresolved HIPER or FIXCAT APARs. However, do not deploy the software until the unresolved HIPER and FIXCAT APARs have been analyzed to determine their applicability. That is, before deploying the software either ensure fixing PTFs are applied to resolve all HIPER or FIXCAT APARs, or ensure the problems reported by all HIPER or FIXCAT APARs are not applicable to your environment.

To receive the full benefit of the SMP/E Causer SYSMOD Summary Report, do *not* bypass the PRE, ID, REQ, and IFREQ on the APPLY CHECK. The SMP/E root cause analysis identifies the cause only of *errors* and not of *warnings* (SMP/E treats bypassed PRE, ID, REQ, and IFREQ conditions as warnings, instead of errors).

Here are sample APPLY commands:

- a. To ensure that all recommended and critical service is installed with the FMIDs, receive the latest HOLDDATA and use the APPLY CHECK command as follows

```
APPLY S(fmid,fmid,...) CHECK
FORFMID(fmid,fmid,...)
SOURCEID(RSU*)
FIXCAT(IBM.ProductInstall-RequiredService)
GROUPEXTEND .
```

Some HIPER APARs might not have fixing PTFs available yet. You should analyze the symptom flags for the unresolved HIPER APARs to determine if the reported problem is applicable to your environment and if you should bypass the specific ERROR HOLDS in order to continue the installation of the FMIDs.

This method requires more initial research, but can provide resolution for all HIPERs that have fixing PTFs available and are not in a PE chain. Unresolved PEs or HIPERs might still exist and require the use of BYPASS.

- b. To install the FMIDs without regard for unresolved HIPER APARs, you can add the BYPASS(HOLDCLASS(HIPER)) operand to the APPLY CHECK command. This will allow you to install FMIDs even though one or more unresolved HIPER APARs exist. After the FMIDs are installed, use the SMP/E REPORT ERRSYSMODS command to identify unresolved HIPER APARs and any fixing PTFs.

```
APPLY S(fmid,fmid,...) CHECK
FORFMID(fmid,fmid,...)
SOURCEID(RSU*)
FIXCAT(IBM.ProductInstall-RequiredService)
GROUPEXTEND
BYPASS (HOLDCLASS (HIPER)) .
..any other parameters documented in the program directory
```

This method is quicker, but requires subsequent review of the Exception SYSMOD report produced by the REPORT ERRSYSMODS command to investigate any unresolved HIPERs. If you have received the latest HOLDDATA, you can also choose to use the REPORT MISSINGFIX command and specify Fix Category IBM.PRODUCTINSTALL-REQUIREDSERVICE to investigate missing recommended service.

If you bypass HOLDS during the installation of the FMIDs because fixing PTFs are not yet available, you can be notified when the fixing PTFs are available by using the APAR Status Tracking (AST) function of ServiceLink or the APAR Tracking function of ResourceLink.

1. After you take actions that are indicated by the APPLY CHECK, remove the CHECK operand and run the job again to perform the APPLY.

Note: The GROUPEXTEND operand indicates that SMP/E applies all requisite SYSMODs. The requisite SYSMODS might be applicable to other functions.

Expected Return Codes and Messages from APPLY CHECK: You will receive a return code of 0 if this job runs correctly.

Expected Return Codes and Messages from APPLY: You will receive a return code of 0 if this job runs correctly.

6.1.10 Perform I/O Configuration

An I/O configuration must be performed for printers that are channel-attached to the host and new printers that are added to your system by using Hardware Configuration Dialog (HCD). Refer to the section entitled "Defining Channel-Attached Printers" in *Print Services Facility for z/OS: Customization* for information on configuration definitions.

6.1.11 Modify the System Environment for PSF 4.7.0

The installation of PSF 4.7.0 may require that the system environment be modified before PSF 4.7.0 can be used. The system environment, in this case, is the z/OS system libraries, JES, and VTAM. The modifications required depend upon whether PSF has been installed before, what printers will be used, and whether the printers will be controlled with a job entry subsystem (JES) or not.

Refer to *Print Services Facility for z/OS: Customization* for information on changing the system environment.

Note: If you are using TCP/IP attached printers, C exits, TrueType fonts, QR Barcodes, CMR's, Infoprint Server common message log, or AFP Download Plus, then the RACF USERID associated with the PSF startup procedure must be defined to include an OMVS segment and a home directory.

6.1.12 Perform SMP/E ACCEPT

Perform an SMP/E ACCEPT CHECK for PSF 4.7.0.

To receive the full benefit of the SMP/E Causer SYSMOD Summary Report, do *not* bypass the PRE, ID, REQ, and IFREQ on the ACCEPT CHECK. The SMP/E root cause analysis identifies the cause of *errors* but not *warnings* (SMP/E treats bypassed PRE, ID, REQ, and IFREQ conditions as warnings rather than errors).

Before you use SMP/E to load new distribution libraries, it is recommended that you set the ACCJCLIN indicator in the distribution zone. In this way, you can save the entries that are produced from JCLIN in the distribution zone whenever a SYSMOD that contains inline JCLIN is accepted. For more information about the ACCJCLIN indicator, see the description of inline JCLIN in the SMP/E Commands book for details.

After you take actions that are indicated by the ACCEPT CHECK, remove the CHECK operand and run the job again to perform the ACCEPT.

Note: The GROUPEXTEND operand indicates that SMP/E accepts all requisite SYSMODs. The requisite SYSMODS might be applicable to other functions.

Expected Return Codes and Messages from ACCEPT CHECK: You will receive a return code of 0 if this job runs correctly.

If PTFs that contain replacement modules are accepted, SMP/E ACCEPT processing will link-edit or bind the modules into the distribution libraries. During this processing, the Linkage Editor or Binder might issue messages that indicate unresolved external references, which will result in a return code of 4 during the ACCEPT phase. You can ignore these messages, because the distribution libraries are not executable and the unresolved external references do not affect the executable system libraries.

Expected Return Codes and Messages from ACCEPT: You will receive a return code of 0 if this job runs correctly.

6.1.13 Run REPORT CROSSZONE

The SMP/E REPORT CROSSZONE command identifies requisites for products that are installed in separate zones. This command also creates APPLY and ACCEPT commands in the SMPPUNCH data set. You can use the APPLY and ACCEPT commands to install those cross-zone requisites that the SMP/E REPORT CROSSZONE command identifies.

After you install PSF 4.7.0, it is recommended that you run REPORT CROSSZONE against the new or updated target and distribution zones. REPORT CROSSZONE requires a global zone with ZONEINDEX entries that describe all the target and distribution libraries to be reported on.

For more information about REPORT CROSSZONE, see the SMP/E manuals.

6.1.14 Dynamic Enablement - Update PARMLIB

To enable PSF 4.7.0, to run with z/OS, the following entry must be in the IFAPRDxx PARMLIB member:

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

6.2 Activating PSF 4.7.0

The publication *PSF for z/OS: Customization, S550-0427* contains the step-by-step procedures to activate the functions of PSF 4.7.0. This includes:

Defining printers

- Channel-attached
- SNA-attached
- TCP/IP-attached

Enabling deferred-printing mode

- Defining FSSs and FSAs to JES
- Creating PSF startup procedures
- Using the Infoprint Server Printer Inventory with PSF

Enabling direct-printing mode

Installing exits (optional)

If you are using exits from a previous release of PSF, they must be reassembled prior to using them with PSF 4.7.0.

Using TrueType and OpenType fonts

Using resources for color management

Information on defining the PRTINFO DD statement used in the PSF startup procedure and defining this PDSE data set.

- Used in Requesting Printer Information
- And used for the point counting tool APSGPPCT
- IBM recommends configuring PRTINFO in the PSF startup procedure

6.2.1 Installation Verification Procedure

To verify that PSF 4.7.0 has been installed correctly, IVP procedures are provided in either a JES environment (for all printers supported by PSF 4.7.0) or in direct-attach mode.

The IVP consists of an IEBGENER job that prints a single page called *APSIVPPS*. *APSIVPPS* was placed on your system during the installation of PSF 4.7.0.

The logical-page size needed for any printer for this IVP is 8.5 inches wide by 11 inches long.

6.2.1.1 IVP Job for JES Environment

Perform the following steps if PSF 4.7.0 will be used in a JES environment:

1. Submit the APSIVP job in the data set *SYS1.SAMPLIB(APSIVP)*. The job submits the member *SYS1.SAPSDAT0(APSIVPPS)* for output on the printer.

The output class in the SYSUT2 DD statement for the printer in the job is class A. If this class is incorrect for your installation, the output class should be changed to the correct value.

If PSF 4.7.0 will be used to print on an IBM 3800, this job must be modified according to the comments within the job.

2. Set up and start the printer. To use PSF 4.7.0 to print the output of the job APSIVP, the printer must be set up with the correct output class (class A).

Startup procedure APSWPROA is for channel-attached printers.

Startup procedure APSWPROB is for SNA-attached printers.

Startup procedure APSWPROC is for the IBM 3800 Printer.

Startup procedure APSWPROF is for printers that support TrueType and OpenType Fonts, Data Object Resources or Color Management Resources.

Startup procedure APSWPROM is for microfilm printer support.

Startup procedure APSWPROR is for PSF multiple resolution attached devices.

Startup procedure APSWPROT is for TCP/IP attached devices.

JES2 setup: To set up for printing under JES2, change the printer settings, and start the printer using the following commands:

```
$TPRTnn, Q=A
$SPRTnn
```

where *nn* is the printer number set up in the JES2 INIT deck as a page printer.

JES3 set up: To set up for printing under JES3, change the printer settings, and start the printer using the following commands:

```
V jname ON
S jname, WC=A
```

where *jname* is the printer name as specified in the JES3 INISH deck.

Refer to the appropriate JES2 or JES3 Commands publication for additional information about the JES commands to use when starting a printer.

Note: The sample startup procedures specify coded font X060D8 in its 4 character form 60D8 as the default font for Job Headers, Job Trailers, Dataset Headers, and Dataset Trailers. This font is provided in z/OS V02.01.00 and higher. This font must be available to the PSF startup JCL procedure for correct functioning of the APSIVP job at runtime when separator pages are specified.

3. The expected result of the IVP is a frame with the letters *IBM* placed at an angle in the left corner of the frame, the words *Print Services Facility* in the middle of the frame, and the words *Advanced*

Function Printing rotated 90 degrees at the bottom of the frame. Refer to *Print Services Facility for z/OS: Customization* for an example of the IVP frame.

6.2.1.2 IVP Job for Direct-Attach Environment

Perform the following steps if PSF 4.7.0 will be used in a direct-attach environment:

1. Set aside the printer in direct-attach mode. The printer cannot be allocated to other applications on the system if it is running in direct-attach mode.
2. Submit the APSIVPDA job in the data set *SYS1.SAMPLIB(APSIVPDA)*. The job submits the member *SYS1.SAPDAT0(APSIVPPS)* for output on the printer.

If you plan to print on an IBM 3800, this job must be modified according to the comments within the job.

3. Refer to *Print Services Facility for z/OS: Customization* for an example of the IVP frame. The expected result of the IVP is a frame with the letters *IBM* placed at an angle in the left corner of the frame, the words *Print Services Facility* in the middle of the frame, and the words *Advanced Function Printing* rotated 90 degrees at the bottom of the frame.

7.0 Notices

This information was developed for products and services offered in the U.S.A. IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

APAR numbers are provided in this document to assist in locating PTFs that may be required. Ongoing problem reporting may result in additional APARs being created. Therefore, the APAR lists in this document may not be complete. To obtain current service recommendations and to identify current product service requirements, always contact the IBM Customer Support Center or use S/390 SoftwareXcel to obtain the current "PSP Bucket".

IBM may have patents or pending patent applications covering subject matter in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to the

IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, New York 10504-1785
USA

For license inquiries regarding double-byte (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:

Intellectual Property Licensing
Legal and Intellectual Property Law
IBM Japan, Ltd.
19-21, Nihonbashi-Hakozakicho, Chuo-ku
Tokyo 103-8510, Japan

7.1 Trademarks

IBM, the IBM logo, and ibm.com are trademarks or registered trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the Web at "Copyright and trademark information" at www.ibm.com/legal/copytrade.shtml.

Reader's Comments

Program Directory for Print Services Facility for z/OS, December 2019

We appreciate your input on this publication. Feel free to comment on the clarity, accuracy, and completeness of the information or give us any other feedback that you might have.

Send your comments by emailing us at ibmkc@us.ibm.com, and include the following information:

Your name and address Your email address Your telephone or fax number The publication title and order number The topic and page number related to your comment The text of your comment

When you send information to IBM, you grant IBM a nonexclusive right to use or distribute the information in any way it believes appropriate without incurring any obligation to you.

IBM or any other organizations will only use the personal information that you supply to contact you about the issues that you submit.

Thank you for your participation.



Printed in USA

GI13-3005-02

