Program Directory for

IBM Enterprise PL/I Value Unit Edition for z/OS

V05.03.00

Program Number 5655-EPL

FMIDs H270530, J270531

for Use with
z/OS

Document Date: September 2019

GI13-4704-01

Note

Before using this information and the product it supports, be sure to read the general information under 7.0, “Notices” on page 24.

© **Copyright International Business Machines Corporation 1999, 2019.**
US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

Contents

1.0 Introduction . . . 1
1.1 Enterprise PL/I Description . . . 1
1.2 Enterprise PL/I FMIDs . . . 2

2.0 Program Materials . . . 3
2.1 Basic Machine-Readable Material . . . 3
2.2 Optional Machine-Readable Material . . . 4
2.3 Program Publications . . . 4
2.3.1 Optional Program Publications . . . 4
2.4 Program Source Materials . . . 4
2.5 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 . . . 8
5.1 Driving System Requirements . . . 8
5.1.1 Machine Requirements . . . 8
5.1.2 Programming Requirements . . . 8
5.2 Target System Requirements . . . 9
5.2.1 Machine Requirements . . . 9
5.2.2 Programming Requirements . . . 10
5.2.2.1 Installation Requisites . . . 10
5.2.2.2 Operational Requisites . . . 10
5.2.2.3 Toleration/Coexistence Requisites . . . 11
5.2.2.4 Incompatibility (Negative) Requisites . . . 11
5.2.3 DASD Storage Requirements . . . 11
5.3 FMIDs Deleted . . . 13
5.4 Special Considerations . . . 14
5.4.1 Subcapacity Reporting Tool Registration . . . 14

6.0 Installation Instructions . . . 15
6.1 Installing Enterprise PL/I . . . 15
6.1.1 SMP/E Considerations for Installing Enterprise PL/I . . . 15
6.1.2 SMP/E Options Subentry Values . . . 15
6.1.3 Sample Jobs . . . 15

© Copyright IBM Corp. 1999, 2019

6.1.4 Set up ISPF Editor Macro (Optional) . . . 17
6.1.5 Allocate SMP/E CSI (Optional) . . . 18
6.1.6 Perform SMP/E RECEIVE . . . 18
6.1.7 Allocate SMP/E Target and Distribution Libraries . . . 18
6.1.8 Allocate, create and mount ZFS Files (Optional) . . . 19
6.1.9 Allocate File System Paths . . . 19
6.1.10 Create DDDEF Entries . . . 20
6.1.11 Perform SMP/E APPLY . . . 20
6.1.12 Run the Installation Verification Program . . . 22
6.1.13 Change the defaults for the compiler options (Optional) . . . 22
6.1.14 Perform SMP/E ACCEPT . . . 22
6.1.15 Run REPORT CROSSZONE . . . 23
6.2 Activating Enterprise PL/I . . . 23
6.2.1 File System Execution . . . 23
6.2.2 Product Customization . . . 23

7.0 Notices . . . 24
7.1 Trademarks . . . 24

Reader's Comments . . . 25

Figures

1. Program File Content . . . 3
2. Basic Material: Unlicensed . . . 4
3. Publications Useful During Installation . . . 4
4. PSP Upgrade and Subset ID . . . 5
5. Component IDs . . . 6
6. Driving System Software Requirements . . . 9
7. Target System Mandatory Operational Requisites . . . 10
8. Total DASD Space Required by Enterprise PL/I . . . 11
9. Storage Requirements for Enterprise PL/I Target Libraries . . . 13
10. Enterprise PL/I File System Paths . . . 13
11. Storage Requirements for Enterprise PL/I Distribution Libraries . . . 13
12. SMP/E Options Subentry Values . . . 15
13. Sample Installation Jobs . . . 16

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 IBM Enterprise PL/I Value Unit Edition for z/OS. This publication refers to IBM Enterprise PL/I Value Unit Edition for z/OS as Enterprise PL/I.

The Program Directory contains the following sections:

- 2.0, “Program Materials” on page 3 identifies the basic program materials and documentation for Enterprise PL/I.
- 3.0, “Program Support” on page 5 describes the IBM support available for Enterprise PL/I.
- 4.0, “Program and Service Level Information” on page 7 lists the APARs (program level) and PTFs (service level) that have been incorporated into Enterprise PL/I.
- 5.0, “Installation Requirements and Considerations” on page 8 identifies the resources and considerations that are required for installing and using Enterprise PL/I.
- 6.0, “Installation Instructions” on page 15 provides detailed installation instructions for Enterprise PL/I. It also describes the procedures for activating the functions of Enterprise PL/I, or refers to appropriate publications.

Before installing Enterprise PL/I, 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; then keep them for future 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.

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

Do not use this program directory if you install Enterprise PL/I 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 Enterprise PL/I Description

Enterprise PL/I is a leading-edge, z/OS-based compiler that helps you create and maintain mission-critical, line-of-business PL/I applications to execute on your z/OS operating systems. The applications that are created by using Enterprise PL/I can interoperate with IBM CICS, IBM Db2, IBM IMS, and other transactional and data systems.

© Copyright IBM Corp. 1999, 2019

This compiler can help facilitate your new, on-demand business endeavors by helping to integrate PL/I and web-based business processes in web services, XML, Java, and PL/I applications. This compiler's interoperability helps you capitalize on your existing IT investments while more smoothly incorporating new, web-based applications as part of your organization's infrastructure.

Version 5.3 offers the following:

- Compiler and runtime support for the IBM z15 hardware and IBM z/OS V2.4 operating system so that applications can take advantage of the latest IBM Z architecture and operating system features and capabilities.
- Supports a native datatype to process UTF-8 strings
- Supports the QUALIFY statement so that you can create namespaces for types, ordinals, and named constants
- Adds additional options to functions to increase flexibility
- Introduces new built-in functions to add more functionality
- Improves JSON functions with support for various casings
- Supports the XMLNAME attribute
- Increases usability by:
  - Limiting false positives when checking in NOLAXENTRY and NOLAXQUAL
  - Increasing maximum LINECOUNT value so there are fewer pagebreaks in the listings
  - Easing the use of value lists

Enterprise PL/I for z/OS, V5.3 reinforces the continuing IBM commitment to the PL/I programming language on the z/OS platform and the continued delivery of new features.

With Enterprise PL/I for z/OS, V5.3, you can take advantage of more than 50 years of IBM experience in PL/I compiler development.

1.2 Enterprise PL/I FMIDs

Enterprise PL/I consists of the following FMIDs:

H270530
J270531

2.0 Program Materials

An IBM program is identified by a program number. The program number for Enterprise PL/I is 5655-EPL.

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 Enterprise PL/I. 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 15 for more information about how to install the program.

You can find information about the physical media for the basic machine-readable materials for Enterprise PL/I in the *CBPDO Memo To Users Extension*.

Figure 1 describes the program file content for Enterprise PL/I. You can refer to the *CBPDO Memo To Users Extension* to see where the files reside on the tape.

Notes:

1. The data set attributes in this table must be used in the JCL of jobs that read the data sets. However, because the data sets are in IEBCOPY unloaded format, their actual attributes might be different.
2. If any RELFILEs are identified as PDSEs, ensure that SMPTLIB data sets are allocated as PDSEs.

Figure 1. Program File Content

Name	ORG	RECFM	LRECL	BLKSIZE
SMPMCS	SEQ	FB	80	6400
IBM.H270530.F1	PDSE	U	0	6144
IBM.H270530.F2	PDS	FB	80	8800
IBM.J270531.F1	PDS	VB	255	27998

© Copyright IBM Corp. 1999, 2019

2.2 Optional Machine-Readable Material

No optional machine-readable materials are provided for Enterprise PL/I.

2.3 Program Publications

The following sections identify the basic publications for Enterprise PL/I.

Figure 2 identifies the basic unlicensed publications for Enterprise PL/I. Those that are in softcopy format publications can be obtained from the IBM Publications Center website at:
http://www.ibm.com/shop/publications/order/

Figure 2. Basic Material: Unlicensed

Publication Title	Form Number	Media Format
IBM Enterprise PL/I Value Unit Edition for z/OS License Information	LC27-9031	http://www.ibm.com/software/sla/sladb.nsf

2.3.1 Optional Program Publications

No optional publications are provided for Enterprise PL/I.

2.4 Program Source Materials

No program source materials or viewable program listings are provided for Enterprise PL/I.

2.5 Publications Useful During Installation

You might want to use the publications listed in Figure 3 during the installation of Enterprise PL/I.

Figure 3. Publications Useful During Installation

Publication Title	Form Number	Media Format
IBM SMP/E for z/OS User's Guide	SA23-2277	http://www.ibm.com/shop/publications/order/
IBM SMP/E for z/OS Commands	SA23-2275	http://www.ibm.com/shop/publications/order/
IBM SMP/E for z/OS Reference	SA23-2276	http://www.ibm.com/shop/publications/order/
IBM SMP/E for z/OS Messages, Codes, and Diagnosis	GA32-0883	http://www.ibm.com/shop/publications/order/

3.0 Program Support

This section describes the IBM support available for Enterprise PL/I.

3.1 Program Services

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

3.2 Preventive Service Planning

Before you install Enterprise PL/I, 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.

If you obtained Enterprise PL/I as part of a CBPDO, HOLDDATA is included.

If the CBPDO for Enterprise PL/I 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/mysupport/s/.

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 Enterprise PL/I are included in Figure 4.

Figure 4. PSP Upgrade and Subset ID

UPGRADE	SUBSET	Description
PLIENT530	H270530	Enterprise PL/I Base
	J270531	Enterprise PL/I HFS

© Copyright IBM Corp. 1999, 2019

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 5 on page 6 identifies the component IDs (COMPID) for Enterprise PL/I.

Figure 5. Component IDs

FMID	COMPID	Component Name	RETAIN Release
H270530	5655PL500	Enterprise PL/I Base	530
J270531	5655PL500	Enterprise PL/I HFS	530

4.0 Program and Service Level Information

This section identifies the program and relevant service levels of Enterprise PL/I. 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 Enterprise PL/I have been incorporated into this release. They are listed by FMID.

- FMID H270520

PH00561	PH06470	PH12973
PH01680	PH06743	PH13266
PH02155	PH07592	PH13375
PH02572	PH07593	PH14261
PH03674	PH07608	PH14364
PH04133	PH08211	PH14493
PH04184	PH09147	PI86550
PH04915	PH09365	PI90921
PH04916	PH09497	PI95208
PH04917	PH09710	PI95232
PH04982	PH10104	PI97356
PH05369	PH10487	PI98433
PH05768	PH11006	PI98585
PH06349	PH11586	PI99464
PH06405	PH12301	PI99719

4.2 Service Level Information

No PTFs against this release of Enterprise PL/I have been incorporated into the product package.

Frequently check the Enterprise PL/I PSP Bucket for HIPER and SPECIAL attention PTFs against all FMIDs that you must install.

© Copyright IBM Corp. 1999, 2019

5.0 Installation Requirements and Considerations

The following sections identify the system requirements for installing and activating Enterprise PL/I. 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 Enterprise PL/I.

5.1.1 Machine Requirements

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

5.1.2 Programming Requirements

© Copyright IBM Corp. 1999, 2019

Figure 6. Driving System Software Requirements

Program Number	Product Name	Minimum VRM	Minimum Service Level will satisfy these APARs	Included in the shipped product?
Any **one** of the following:				
5650-ZOS	z/OS	V02.02.00	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 http://www-03.ibm.com/systems/z/os/zos/support/zos_eos_dates.html.

Enterprise PL/I is installed into a file system, either HFS or zFS. Before installing Enterprise PL/I, you must ensure that the target system file system data sets are available for processing on the driving system. OMVS must be active on the driving system and the target system file system data sets must be mounted on the driving system.

If you plan to install Enterprise PL/I in a zFS file system, this requires that zFS be active on the driving system. Information on activating and using zFS can be found in z/OS Distributed File Service zSeries File System Administration, SC24-5989.

5.2 Target System Requirements

This section describes the environment of the target system required to install and use Enterprise PL/I.

Enterprise PL/I installs in the z/OS (Z038) SREL.

5.2.1 Machine Requirements

Enterprise PL/I for z/OS, V5.3 runs and generates code that runs on the following IBM Z servers:

- IBM z15
- IBM z14
- IBM z14 ZR1
- IBM z13
- IBM z13s
- IBM zEnterprise EC12 (zEC12)
- IBM zEnterprise BC12 (zBC12)
- IBM zEnterprise 196 (z196)
- IBM zEnterprise 114 (z114)

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.

Enterprise PL/I has no mandatory installation requisites.

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.

Enterprise PL/I 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.

Figure 7. Target System Mandatory Operational Requisites

Program Number	Product Name and Minimum VRM/Service Level
5650-ZOS	z/OS V02.02.00 or higher *

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.

You may need various other products (eg. Db2, CICS or IMS) depending on the Enterprise PL/I function you are using. Please check the Software Product Compatibilty Reports (SPCR) at https://www.ibm.com/software/reports/compatibility/clarity/index.html for a list of compatible software. From the SPCR home page, click Create a report under In-depth reports, search for Enterprise PL/I for z/OS and choose Version 5.3, and then click Submit.

Note: * For UTF-8 support and 64K string support, z/OS V2.3 or above is required.

Note: ** To use all of the new features provided with Enterprise PL/I V5.3, apply the appropriate Enterprise PL/I run-time PTFs as follows:

- z/OS V2.3:
  - PH11794 for 31-bit
  - PH15397 for 64-bit

- z/OS V2.4:
  - PH15422 for 31-bit
  - PH15423 for 64-bit

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.

Enterprise PL/I 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.

Enterprise PL/I has no negative requisites.

5.2.3 DASD Storage Requirements

Enterprise PL/I libraries can reside on all supported DASD types.

Figure 8 lists the total space that is required for each type of library.

Figure 8. Total DASD Space Required by Enterprise PL/I

Library Type	Total Space Required in 3390 Trks
Target	1916 Tracks
Distribution	1944 Tracks
File System(s)	45 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 6.1.7, “Allocate SMP/E Target and Distribution Libraries” on page 18.

3. Abbreviations used for the file system path type are as follows.

   N New path, created by this product.
   X Path created by this product, but might already exist from a previous release.
   P Previously existing path, created by another product.

4. 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, except SIBMZCMP and AIBMZMOD, which must be PDSEs.

5. 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.

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

   - These data sets can be in the LPA, but they are not required to be in the LPA.
   - These data sets can be in the LNKLST.
   - These data sets are not required to be APF-authorized.
   - Enterprise PL/I requires that the SMPLTS data set must be a PDSE. If your existing SMPLTS is a PDS, you will need to allocate a new PDSE and copy your existing SMPLTS into it and then change the SMPLTS DDDEF entry to indicate the new PDSE data set.

The following figures describe the target and distribution libraries and file system paths required to install Enterprise PL/I. The storage requirements of Enterprise PL/I 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 9. Storage Requirements for Enterprise PL/I Target Libraries

Library DDNAME	Member Type	Target Volume	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
SIBMZCMP	LMOD	ANY	U	PDSE	U	0	1876	n/a
SIBMZPRC	PROC	ANY	U	PDS	FB	80	6	5
SIBMZSAM	SAMP	ANY	U	PDS	FB	80	34	5

Figure 10. Enterprise PL/I File System Paths

DDNAME	TYPE	Path Name
SIBMZHFS	X	usr/lpp/IBM/pli/v5r3/IBM

Figure 11. Storage Requirements for Enterprise PL/I Distribution Libraries

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
AIBMZHFS	U	PDS	VB	255	34	5
AIBMZMOD	U	PDSE	U	0	1876	n/a
AIBMZSRC	U	PDS	FB	80	34	7

5.3 FMIDs Deleted

Installing Enterprise PL/I 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 Enterprise PL/I 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

PDSE Considerations:

Enterprise PL/I uses the "partitioned data set extended" or PDSE format for the SIBMZCMP target library. There are some operational differences between PDS and PDSE data sets. The PDS format may be shared by more than one z/OS system and no special precautions are necessary. However the PDSE format may only be shared by z/OS systems which are part of a sysplex or which are connected using Global Resource Serialization (are in a GRS complex). If z/OS systems share use of a PDSE data set outside of a sysplex or GRS environment, you may experience severe problems when the data set is updated. This is due to the fact that PDSE directory information is cached in storage, and when the data set is updated from one system the other system(s) have no knowledge of the update, and their cached directory information will be incorrect.

You must take care not to share the SIBMZCMP data set between z/OS systems unless they are in a sysplex or are connected in a GRS complex. If you need to share the content of the SIBMZCMP data set, a separate copy must be created for each z/OS system.

5.4.1 Subcapacity Reporting Tool Registration

The Enterprise PL/I Value Unit Edition is required to be registered so that it generates the correct SMF 89 Type 1 records for subcapacity reporting.

Parmlib member IFAPRDxx needs to be updated as follows:

```
PRODUCT OWNER('IBM CORP')
NAME('IBM PL/I VUE')
ID(5655-EPL)
VERSION(05) RELEASE(*) MOD(*)
FEATURENAME('PLI-COMPLR-VUE')
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 Enterprise PL/I.

Please note the following points:

- If you want to install Enterprise PL/I 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 Enterprise PL/I

6.1.1 SMP/E Considerations for Installing Enterprise PL/I

Use the SMP/E RECEIVE, APPLY, and ACCEPT commands to install this release of Enterprise PL/I.

6.1.2 SMP/E Options Subentry Values

The recommended values for certain SMP/E CSI subentries are shown in Figure 12. 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.

Figure 12. SMP/E Options Subentry Values

Subentry	Value	Comment
DSSPACE	(200,200,500)	3390 DASD tracks
PEMAX	SMP/E Default	IBM recommends using the SMP/E default for PEMAX.

6.1.3 Sample Jobs

The following sample installation jobs are provided as part of the product to help you install Enterprise PL/I:

© Copyright IBM Corp. 1999, 2019

Figure 13. Sample Installation Jobs

Job Name	Job Type	Description	RELFILE
IBMZWEDT	MACRO	ISPF Editor macro to aid users in making changes to the sample jobs **(optional)**	IBM.H270530.F2
IBMZWSMP	SMP/E	Sample job to define and prime a new SMP/E CSI **(optional)**	IBM.H270530.F2
IBMZWRCV	RECEIVE	Sample RECEIVE job for Enterprise PL/I	IBM.H270530.F2
IBMZWALO	ALLOCATE	Sample job to allocate target and distribution libraries	IBM.H270530.F2
IBMZWZFS	ALLOCATE	Sample job to allocate new ZFS data set **(Optional)**	IBM.H270530.F2
IBMISMKD	MKDIR	Sample job to invoke the supplied IBMMKDIR EXEC to allocate HFS paths	IBM.H270530.F2
IBMZWDDF	DDDEF	Sample job to define SMP/E DDDEFs	IBM.H270530.F2
IBMZWAPL	APPLY	Sample APPLY job	IBM.H270530.F2
IBMZWIVP	IVP	Sample job to verify installation has been successful	IBM.H270530.F2
IBMZWIOP	IOP	Sample job to change default compiler options **(optional)**	IBM.H270530.F2
IBMZWACP	ACCEPT	Sample ACCEPT job	IBM.H270530.F2

You can access the sample installation jobs by performing an SMP/E RECEIVE (refer to 6.1.6, “Perform SMP/E RECEIVE” on page 18) then copy the jobs from the RELFILES to a work data set for editing and submission. See Figure 13 on page 15 to find the appropriate relfile data set.

You can also copy the sample installation jobs from the tape or product files by submitting the following job. Depending on your distribution medium, use either the //TAPEIN or the //FILEIN DD statement and comment out or delete the other statement. 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=*
//*************************************************************
//* Make the //TAPEIN DD statement below active if you install*
//* from a CBPDO tape by uncommenting the DD statement below. *
//*************************************************************
//*TAPEIN   DD DSN=IBM.H270530.F2,UNIT=tunit,
//*         VOL=SER=volser,LABEL=(x,SL),
//*         DISP=(OLD,KEEP)
//*************************************************************
//* Make the //TAPEIN DD statement below active if you install*
//* from a product tape received outside the CBPDO process    *
//* (using the optional SMP/E RECEIVE job) by uncommenting    *
```

```
//* the DD statement below.                                    *
//************************************************************
//*TAPEIN   DD DSN=IBM.H270530.F2,UNIT=tunit,
//*         VOL=SER=270530,LABEL=(3,SL),
//*         DISP=(OLD,KEEP)
//************************************************************
//* Make the //FILEIN DD statement below active for           *
//* downloaded DASD files.                                     *
//************************************************************
//*FILEIN   DD DSN=IBM.H270530.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,(20,10,5))
//SYSUT3   DD UNIT=SYSALLDA,SPACE=(CYL,(1,1))
//SYSIN    DD *
    COPY INDD=xxxxIN,OUTDD=OUT

  SELECT MEMBER=(IBMISMKD,IBMZWACP,IBMZWALO,IBMZWAPL)
  SELECT MEMBER=(IBMZWDDF,IBMZWEDT,IBMZWIOP,IBMZWIVP)
  SELECT MEMBER=(IBMZWRCV,IBMZWSMP,IBMZWZFS)
/*
```

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

TAPEIN:

tunit is the unit value that matches the product package.

volser is the volume serial that matches the product package.

x is the tape file number that indicates the location of the data set name on the tape. See the documentation that is provided by CBPDO for the location of IBM.H270530.F2 on the tape.

FILEIN:

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.

SYSIN:

xxxxIN is either TAPEIN or FILEIN depending on your input DD statement.

6.1.4 Set up ISPF Editor Macro (Optional)

To aid you in making changes to the SMP/E installation jobs (IBMISMKD, IBMZWACP, IBMZWALO, IBMZWAPL, IBMZWDDF, IBMZWIOP, IBMZWIVP, IBMZWRCV, IBMZWSMP and IBMZWZFS), an ISPF editor macro called IBMZWEDT, is supplied, which is copied to your output data set **jcl-library-name** above. (See Figure 13 on page 15).

This macro lets you substitute proper values for all of the required variables in those jobs instead of having you make the changes repeatedly by hand.

Edit macro IBMZWEDT and provide the proper values. After making the changes, either copy IBMZWEDT to any data set in your TSO logon procedure SYSEXEC concatenation, or issue the commands below to make IBMZWEDT immediately accessible to your current ISPF session:

```
From ISPF option 6, issue:

ALLOCATE FI(SYSUEXEC) DA('jcl-library-name') SHR REU
ALTLIB ACTIVATE USER(EXEC)

Then edit your installation jobs from this ISPF session.
```

Consult the instructions in the macro for more information.

6.1.5 Allocate SMP/E CSI (Optional)

If you are using an existing CSI, do not execute this job.

If you are allocating a new SMP/E data set for this install, edit and submit sample job IBMZWSMP to allocate the SMP/E data set for Enterprise PL/I. 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.

6.1.6 Perform SMP/E RECEIVE

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

You can also choose to edit and submit sample job IBMZWRCV to perform the SMP/E RECEIVE for Enterprise PL/I. 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 SMP/E Target and Distribution Libraries

Edit and submit sample job IBMZWALO to allocate the SMP/E target and distribution libraries for Enterprise PL/I. 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.

6.1.8 Allocate, create and mount ZFS Files (Optional)

This job allocates, creates a mountpoint, and mounts zFS data sets.

If you plan to install Enterprise PL/I into a new z/OS UNIX file system, you can edit and submit the optional IBMZWZFS job to perform the following tasks:

- Create the z/OS UNIX file system
- Create a mount point
- Mount the z/OS UNIX file system on the mountpoint

Consult the instructions in the sample job for more information.

The recommended z/OS UNIX file system type is *zFS*. The recommended mount point is *usr/lpp/IBM/pli/v5r3/*.

Before running the sample job to create the z/OS UNIX file system, you must ensure that OMVS is active on the driving system. zFS must be active on the driving system if you are installing Enterprise PL/I into a file system that is zFS.

If you create a new file system for this product, consider updating the BPXPRMxx PARMLIB member to mount the new file system at IPL time. This action can be helpful if an IPL occurs before the installation is completed.

```
MOUNT FILESYSTEM('#dsn')
 MOUNTPOINT('usr/lpp/IBM/pli/v5r3/')
 MODE(RDRW)        /* can be MODE(READ) */
 TYPE(ZFS) PARM('AGGRGROW') /* zFS, with extents */
```

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

#dsn is the name of the data set holding the z/OS UNIX file system.
usr/lpp/IBM/pli/v5r3/ is the name of the mount point where the z/OS UNIX file system will be mounted.

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

6.1.9 Allocate File System Paths

The target system HFS or zFS data set must be mounted on the driving system when running the sample IBMISMKD job since the job will create paths in the HFS or zFS.

Before running the sample job to create the paths in the file system, you must ensure that OMVS is active on the driving system and that the target system's HFS or zFS file system is mounted to the driving system. zFS must be active on the driving system if you are installing Enterprise PL/I into a file system that is zFS.

If you plan to install Enterprise PL/I into a new HFS or zFS file system, you must create the mountpoint and mount the new file system to the driving system for Enterprise PL/I.

The recommended mountpoint is *usr/lpp/IBM/pli/v5r3/*.

Edit and submit sample job IBMISMKD to allocate the HFS or zFS paths for Enterprise PL/I. Consult the instructions in the sample job for more information.

If you create a new file system for this product, consider updating the BPXPRMxx PARMLIB member to mount the new file system at IPL time. This action can be helpful if an IPL occurs before the installation is completed.

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

6.1.10 Create DDDEF Entries

Edit and submit sample job IBMZWDDF to create DDDEF entries for the SMP/E target and distribution libraries for Enterprise PL/I. 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.

6.1.11 Perform SMP/E APPLY

1. Ensure that you have the latest HOLDDATA; then edit and submit sample job IBMZWAPL to perform an SMP/E APPLY CHECK for Enterprise PL/I. Consult the instructions in the sample job for more information.

   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),HOLDFIXCAT) .
 ..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.

2. 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.

6.1.12 Run the Installation Verification Program

Edit and submit sample job IBMZWIVP to verify that you have installed Enterprise PL/I correctly. Consult the instructions in the sample job for more information.

Consult the instructions in the sample job for the expected output from the GO step.

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

6.1.13 Change the defaults for the compiler options (Optional)

If you want to change the supplied default compiler options, then edit and submit sample job IBMZWIOP. This job will let you specify options that will be applied before any other options, thus effectively changing the default options. This job will also let you specify options that will be applied after all other options, thus effectively changing the default options and preventing them from being overridden. Consult the instructions in the sample job for more information.

6.1.14 Perform SMP/E ACCEPT

Edit and submit sample job IBMZWACP to perform an SMP/E ACCEPT CHECK for Enterprise PL/I. Consult the instructions in the sample job for more information.

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.

6.1.15 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 Enterprise PL/I, 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.

6.2 Activating Enterprise PL/I

6.2.1 File System Execution

If you mount the file system in which you have installed Enterprise PL/I in read-only mode during execution, then you do not have to take further actions to activate Enterprise PL/I.

6.2.2 Product Customization

Enterprise PL/I is fully operational after the SMP/E installation is completed. You do not have to do further customization to activate this function.

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.

© Copyright IBM Corp. 1999, 2019

Reader's Comments

Program Directory for IBM Enterprise PL/I Value Unit Edition for z/OS, September 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.

Use one of the following methods to send us your comments:

1. Send an email to comments@us.ibm.com
2. Use the form on the Web at:

www.ibm.com/software/data/rcf

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

GI13-4704-01