Program Directory for

IBM Open Enterprise SDK for Go

V1.17.0

Program Number 5655-GOZ

FMIDs HAMF1H0

for Use with
z/OS

Document Date: December, 2021

GI13-5515-02

Note

Before using this information and the product it supports, be sure to read the general information under 7.0, “Notices” on page 25.

Contents

Figures

1.0 Introduction

This program directory is intended for the system programmers who are responsible for program installation and maintenance. It contains information about the material and procedures associated with the installation of the IBM Open Enterprise SDK for Go. This publication refers to IBM Open Enterprise SDK for Go as Open Enterprise SDK for Go.

The Program Directory contains the following sections:

- 2.0, “Program Materials” on page 4 identifies the basic program materials and documentation for Open Enterprise SDK for Go.
- 3.0, “Program Support” on page 6 describes the IBM support available for Open Enterprise SDK for Go.
- 4.0, “Program and Service Level Information” on page 8 lists the APARs (program level) and PTFs (service level) that have been incorporated into Open Enterprise SDK for Go.
- 5.0, “Installation Requirements and Considerations” on page 9 identifies the resources and considerations that are required for installing and using Open Enterprise SDK for Go.
- 6.0, “Installation Instructions” on page 16 provides detailed installation instructions for Open Enterprise SDK for Go. It also describes the procedures for activating the functions of Open Enterprise SDK for Go, or refers to appropriate publications.

Before installing Open Enterprise SDK for Go, 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 6 tells you how to find any updates to the information and procedures in this program directory.

Open Enterprise SDK for Go 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 Open Enterprise SDK for Go are included on the CBPDO tape.

Do not use this program directory if you install Open Enterprise SDK for Go 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 Open Enterprise SDK for Go Description

IBM Open Enterprise SDK for Go

Open Enterprise SDK for Go 1.17 is an industry-standard Go compiler for the z/OS platform. This offering makes available the popular Go programming language to z/OS application developers. It brings a powerful framework for quickly building scalable applications to the z/OS platform. A simple programming

syntax, rich ecosystem of packages, capability to interact with other languages and platforms, and strong community support across multiple industries are driving the popularity of Go.

IBM Open Enterprise SDK for Go enables z/OS customers to add new workloads and connect z/ OS to their private cloud, strengthening z/OS as a first-class hybrid cloud platform.

Modernization is about delivering the best value to your customers, more quickly. This includes reducing the cost of maintaining your existing applications by updating or extending them. With the latest version of IBM Open Enterprise SDK for Go, IBM brings the benefits of the popular Go language to accelerate in-place modernization on z/OS. Go's lightweight characteristics enable application modernization and development of cloud native applications in addition to optimizing performance. IBM Open Enterprise SDK for Go 1.17 brings several significant features from the community. These include support for lazy module loading to avoid processing irrelevant dependencies, new functions for safer pointer arithmetic and numerous additional improvements and bug fixes.

In addition, this Go on z/OS release comes with support for access to VSAM, PDS/PDSE, and Sequential Data Sets so that clients can access their existing record data where ever it may reside.

Open Enterprise SDK for Go 1.17 enables IBM Z clients to take advantage of this burgeoning technology to power digital transformation on the IBM Z platform. Because of its relatively easy-to-learn syntax, it enables clients to access a wide variety of new talent for application development and modernization. The rich Go ecosystem of packages enables clients to develop and run applications, especially those that enable the cloud on z/OS. Because of the ecosystem of Go modules and the small size of the language's syntax, application developers typically can deliver Go applications in a shorter time and with fewer new lines of code, resulting in lower costs.

As global economic conditions continue to accelerate the need for businesses to focus on digital transformation, the demand for fast, secure, and modern cloud-native applications on the platform continues to increase. This offering enables organizations to add new workloads and connect z/OS to their private cloud, accelerating their digital transformation and journey to hybrid cloud.

Go has emerged as the language of choice for many cloud-native operations. It forms the foundation for container orchestration such as Kubernetes, containerization technology such as Open Container Initiative, and container application platforms such as Red Hat OpenShift.

Open Enterprise SDK for Go 1.17 is available without charge from Shopz and is downloadable and installable via the familiar System Modification Program Extended (SMP/E) install tool. There is an option to receive service and support by ordering IBM Subscription and Support for a charge. The ability to obtain service and support means Open Enterprise SDK for Go can be used for production environments.

This delivery demonstrates the longstanding support for open source software by IBM and its commitment to delivering enterprise-level compiler offerings. It also reflects IBM's ongoing effort to advance the z/OS platform.

IBM Open Enterprise SDK for Go enables z/OS customers to add new workloads and connect z/ OS to their private cloud, strengthening z/OS as a first-class hybrid cloud platform

1.2 Open Enterprise SDK for Go FMID

Open Enterprise SDK for Go consists of the following FMID:

HAMF1H0

2.0 Program Materials

An IBM program is identified by a program number. The program number for Open Enterprise SDK for Go is 5655-GOZ.

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 Open Enterprise SDK for Go. 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 16 for more information about how to install the program.

You can find information about the physical media for the basic machine-readable materials for Open Enterprise SDK for Go in the *CBPDO Memo To Users Extension*.

Figure 1 describes the program file content for Open Enterprise SDK for Go. 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.HAMF1H0.F1	PDS	FB	80	6160
IBM.HAMF1H0.F2	PDS	VB	255	27998

2.2 Optional Machine-Readable Material

No optional machine-readable materials are provided for Open Enterprise SDK for Go.

2.3 Program Publications

This section identifies the basic and optional publications for Open Enterprise SDK for Go.

2.3.1 Optional Program Publications

No optional publications are provided for Open Enterprise SDK for Go.

2.4 Program Source Materials

No program source materials or viewable program listings are provided for Open Enterprise SDK for Go.

2.5 Publications Useful During Installation

You might want to use the publications listed in Figure 2 during the installation of Open Enterprise SDK for Go.

Figure 2. Publications Useful During Installation

Publication Title	Form Number	Media Format
IBM SMP/E for z/OS User's Guide	SA23-2277-02	http://www.ibm.com/shop/publications/order/
IBM SMP/E for z/OS Commands	SA23-2275-05	http://www.ibm.com/shop/publications/order/
IBM SMP/E for z/OS Reference	SA23-2276-02	http://www.ibm.com/shop/publications/order/
IBM SMP/E for z/OS Messages, Codes, and Diagnosis	GA32-0883-04	http://www.ibm.com/shop/publications/order/

3.0 Program Support

This section describes the IBM support available for Open Enterprise SDK for Go.

3.1 Program Services

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

3.2 Preventive Service Planning

Before you install Open Enterprise SDK for Go, make sure that you have reviewed the current Preventive Service Planning (PSP) information. The PSP Buckets maintain current lists (which have been identified since the package was created) of any recommended or required service for the installation of this package. This service includes software PSP information (5655GOZ PSP Bucket, subset HAMF1H0) that contains HIPER, and/or required PTFs against the base release.

Although SW, HW, and functional PSP Buckets might have overlap, review all that apply to this package to ensure that you identify all the known service that is required for your installation of this package.

For program support, access the Software Support website at http://www.ibm.com/software/support/.

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 Open Enterprise SDK for Go is shown in Figure 3

Figure 3. PSP Upgrade and Subset ID

UPGRADE	SUBSET	Description	FMID
5655GOZ	HAMF1H0	IBM Open Enterprise SDK for Go	HAMF1H0

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 lists the component IDs (COMPID) for Open Enterprise SDK for Go.

Figure 4. Component IDs

FMID	COMPID	Component Name	RETAIN Release
HAMF1H0	5655GOZ00	IBM Open Enterprise SDK for Go	1H0

4.0 Program and Service Level Information

This section identifies the program and relevant service levels of Open Enterprise SDK for Go. 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 Open Enterprise SDK for Go have been incorporated into this release. They are listed by FMID:

- HAMF1G0

  PH40803

4.2 Service Level Information

No PTFs against this release of Open Enterprise SDK for Go have been incorporated into the product package.

Frequently check the Open Enterprise SDK for Go PSP Bucket for HIPER and SPECIAL attention PTFs against all FMIDs that you must install. You can also receive the latest HOLDDATA, and then add the **FIXCAT(IBM.PRODUCTINSTALL-REQUIREDSERVICE)** 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 Open Enterprise SDK for Go. 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 Open Enterprise SDK for Go.

5.1.1 Machine Requirements

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

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	V2.4.0 or later	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 V3.6.0.

Note: Installation might require migration to new z/OS releases to be service supported. See z/OS Support Lifecycle at http://www-03.ibm.com/systems/z/os/zos/support/zos_eos_dates.html.

Open Enterprise SDK for Go is installed into a file system, either HFS or zFS. Before installing Open Enterprise SDK for Go, 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 data sets must be mounted on the driving system.

If you plan to install Open Enterprise SDK for Go in a zFS file system, this procedure/process 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 Open Enterprise SDK for Go.

Open Enterprise SDK for Go installs in the z/OS (Z038) SREL.

5.2.1 Machine Requirements

Open Enterprise SDK for Go V1.17.0 will run on the following IBM Z servers:

- z15™
- z14® or z14 model ZR1
- z13® or z13s®
- zEnterprise® EC12 or zEnterprise BC12

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.

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	V2.4.0 or later	N/A	No

Note: Installation might require migration to new z/OS releases to be service supported. See http://www.ibm.com/systems/z/os/zos/support/zos_eos_dates.html.

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.

Open Enterprise SDK for Go 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	Function
5650-ZOS	z/OS V2.4.0 or higher with PTFs UJ03480 (OA59780), UI72893 (PH30936)	
5650-ZOS	UNIX System Service for z/OS V2.4.0 or higher	

Note: Rocket bash 4.x or later is required. It is available for download at https://www.rocketsoftware.com/product-categories/mainframe/bash-zos on the Rocket website.

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.

Figure 8. Target System Conditional Operational Requisites		
Program Number	**Product Name and Minimum VRM/Service Level**	**Function**
5650-ZOS	XL C/C++ V2.4.1 for z/OS V2.4 with PTF UI70470 (PH27303)	For using cgo (CGO_ENABLED=1)

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.

Open Enterprise SDK for Go has no toleration or 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.

Open Enterprise SDK for Go has no negative requisites.

5.2.3 DASD Storage Requirements

Open Enterprise SDK for Go libraries can reside on all supported DASD types.

Figure 9 lists the total space that is required for each type of library.

Figure 9. Total DASD Space Required by Open Enterprise SDK for Go	
Library Type	**Total Space Required in 3390 Trks**
Target	6
Distribution	5265
File System	19000

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 19.

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.

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.
   - Open Enterprise SDK for Go 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.

7. The total space required listed in Figure 9 on page 12 for File System is accounted sufficiently for Open Enterprise SDK for Go at base release. On the other hand, due to the natural growth in size for Open Enterprise SDK for Go during PTFs to avoid encountering insufficient space quota problems, it is advised to allocate File Systems that can be auto-extended.

The following figures describe the target and distribution libraries and file system paths required to install Open Enterprise SDK for Go. The storage requirements of Open Enterprise SDK for Go 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 10. Storage Requirements for Open Enterprise SDK for Go Target Libraries

Library DDNAME	Member Type	Target Volume	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
SCVGJCL	SAMP	ANY	U	PDS	FB	80	6	3

Figure 11. Open Enterprise SDK for Go File System Paths

DDNAME	TYPE	Path Name
SCVGH1H	N	/usr/lpp/IBM/cvg/v1r17/IBM/

Figure 12. Storage Requirements for Open Enterprise SDK for Go Distribution Libraries

Library DDNAME	TYPE	ORG	RECFM	LRECL	No. of 3390 Trks	No. of DIR Blks
ACVGSR1	U	PDS	FB	80	15	5
ACVGSR2	U	PDS	VB	255	5250	50

5.3 FMIDs Deleted

Installing Open Enterprise SDK for Go 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 Open Enterprise SDK for Go 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

There are no special considerations for this product

6.0 Installation Instructions

This chapter describes the installation method and the step-by-step procedures to install and to activate the functions of Open Enterprise SDK for Go.

Notes:

- 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 Open Enterprise SDK for Go

6.1.1 SMP/E Considerations for Installing Open Enterprise SDK for Go

Use the SMP/E RECEIVE, APPLY, and ACCEPT commands to install this release of Open Enterprise SDK for Go.

Note: The default High Level Qualifier prefix used in the install JCL for SMP/E datasets, distribution libraries, and target libraries is CBC.HAMF1H0, change this if you have chosen a different SMPPRFX, DSTPRFX, or TGTPRFX respectively. The recommended default high level directory name for zFS path is root "/", update #PathPrefix in the respective install JCL sample respectively or change this if you have chosen a different directory path. If a non-default prefix is chosen for the #PathPrefix for zFS directory, make sure to prepend the paths in the IVT steps in 6.1.12 with the chosen #PathPrefix

6.1.2 SMP/E Options Subentry Values

The recommended values for certain SMP/E CSI subentries are shown in Figure 13. 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 13. SMP/E Options Subentry Values

Subentry	Value	Comment
DSSPACE	(4500,500,500)	3390 DASD tracks
PEMAX	SMP/E Default	IBM suggests using the SMP/E default for PEMAX.

6.1.3 SMP/E CALLLIBS Processing

Open Enterprise SDK for Go uses the CALLLIBS function provided in SMP/E to resolve external references during installation.

6.1.4 Sample Jobs

The following sample installation jobs are provided as part of the product to help you install Open Enterprise SDK for Go:

Figure 14. Sample Installation Jobs

Job Name	Job Type	Description	RELFILE
CVGWSMPE	SMP/E	Sample job to define and prime a new SMP/E CSI **(Optional)**	IBM.HAMF1H0.F1
CVGWRECV	RECEIVE	Sample RECEIVE job	IBM.HAMF1H0.F1
CVGWALOC	ALLOCATE	Sample job to allocate target and distribution libraries	IBM.HAMF1H0.F1
CVGWZFS	ALLOMZFS	Sample job to allocate, create mountpoint, & mount zFS data sets **(Optional)**	IBM.HAMF1H0.F1
CVGISMKD	MKDIR	Sample job to invoke the supplied CVGMKDIR EXEC to allocate file system paths	IBM.HAMF1H0.F1
CVGWDDEF	DDDEF	Sample job to define SMP/E DDDEFs	IBM.HAMF1H0.F1
CVGWAPLY	APPLY	Sample APPLY job	IBM.HAMF1H0.F1
CVGWACPT	ACCEPT	Sample ACCEPT job	IBM.HAMF1H0.F1

You can access the sample installation jobs by performing an SMP/E RECEIVE (refer to 6.1.6, “Perform SMP/E RECEIVE” on page 19) then copy the jobs from the RELFILES to a work data set for editing and submission. See Figure 14 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.HAMF1H0.F1,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.HAMF1H0.F1,UNIT=tunit,
//*         VOL=SER=AMF1H0,LABEL=(2,SL),
//*         DISP=(OLD,KEEP)
//************************************************************
//* Make the //FILEIN DD statement below active for           *
//* downloaded DASD files.                                    *
//************************************************************
//*FILEIN   DD DSN=IBM.HAMF1H0.F1,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=(CVGISMKD,CVGWACPT,CVGWALOC,CVGWAPLY)
  SELECT MEMBER=(CVGWDDEF)
  SELECT MEMBER=(CVGWRECV,CVGWSMPE,CVGWZFS)
/*
```

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.HAMF1H0.F1 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.

6.1.5 Allocate and Initialize the SMP/E CSI (Optional)

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

If you install into existing SMP/E data sets, make sure that you have enough space.

If you plan to install into an existing zone, the cluster should already have been allocated and primed. You can go on to the next step to perform a SMP/E RECEIVE.

To install into a new zone, use the CVGWSMPE sample job to allocate and prime the SMPCSI cluster. 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 Open Enterprise SDK for Go as part of a CBPDO, use the RCVPDO job in the CBPDO RIMLIB data set to receive the Open Enterprise SDK for Go 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 CVGWRECV to perform the SMP/E RECEIVE for Open Enterprise SDK for Go. Consult the instructions in the sample job for more information.

Note: By default the RECEIVE job will look for the relfiles under IBM.HAMF1H0. If instead they are stored under #relhlq.IBM.HAMF1H0.*, RFPREFIX(#relhlq) will need to be added to the RECEIVE job. For example: RECEIVE S(HAMF1H0 /* IBM Python - z/OS BASE */*
) RFPREFIX(#relhlq) SYSMODS LIST.

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 CVGWALOC to allocate the SMP/E target and distribution libraries for Open Enterprise SDK for Go. 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 Open Enterprise SDK for Go into a new z/OS UNIX file system, you can edit and submit the optional CVGWZFS 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/cvg/v1r17*.

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 Open Enterprise SDK for Go 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/cvg/v1r17')
 MODE(RDWR)        /* 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/cvg/v1r17 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 CVGISMKD 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 Open Enterprise SDK for Go into a file system that is zFS.

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

The recommended mountpoint is */usr/lpp/IBM/cvg/v1r17*.

Edit and submit sample job CVGISMKD to allocate the HFS or zFS paths for Open Enterprise SDK for Go. 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 CVGWDDEF to create DDDEF entries for the SMP/E target and distribution libraries for Open Enterprise SDK for Go. 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 CVGWAPLY to perform an SMP/E APPLY CHECK for Open Enterprise SDK for Go. 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 Programs

Set up the environment

Note: If using cgo first export COMPILER_PATH=, with the path to the optional compiler prerequisite XL C/C++ V2.4.1 e.g export COMPILER_PATH=#PathToCompilerInstall/bin

```
source /usr/lpp/IBM/cvg/v1r17/go/etc/envsetup
```

or

```
. /usr/lpp/IBM/cvg/v1r17/go/etc/envsetup
```

Expected Return Codes and Messages: You will receive output starting with the line "set up environment for zos" and ending with the line "Done!", and the return code will be 0 if this job runs correctly.

Run a simple test to emit the version numbers for Go.

```
go version
```

Expected Return Codes and Messages: You will receive the correct version number and the return code will be 0 if this job runs correctly.

Run a simple fibonacci test

```
go run /usr/lpp/IBM/cvg/v1r17/go/doc/play/fib.go
```

Expected Return Codes and Messages: You will receive the output "1 1 2 3 5" and the return codes will be 0 if this job runs correctly.

More samples can be found under /usr/lpp/IBM/cvg/v1r17/go/doc/play/

6.1.13 Perform SMP/E ACCEPT

Edit and submit sample job CVGWACPT to perform an SMP/E ACCEPT CHECK for Open Enterprise SDK for Go. 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.

7.0 Notices

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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".

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Reader's Comments

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