Before using this information and the product it supports, be sure to read the general information under 7.0, "Notices" on page 27.
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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 COBOL for z/OS. This publication refers to IBM Enterprise COBOL for z/OS as Enterprise COBOL.

The Program Directory contains the following sections:

- **2.0, “Program Materials” on page 4** identifies the basic and optional program materials and documentation for Enterprise COBOL.
- **3.0, “Program Support” on page 7** describes the IBM support available for Enterprise COBOL.
- **4.0, “Program and Service Level Information” on page 9** lists the APARs (program level) and PTFs (service level) that have been incorporated into Enterprise COBOL.
- **5.0, “Installation Requirements and Considerations” on page 10** identifies the resources and considerations that are required for installing and using Enterprise COBOL.
- **6.0, “Installation Instructions” on page 18** provides detailed installation instructions for Enterprise COBOL. It also describes the procedures for activating the functions of Enterprise COBOL, or refers to appropriate publications.

Before installing Enterprise COBOL, 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 7** tells you how to find any updates to the information and procedures in this Program Directory.

Enterprise COBOL 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 that is provided with your order. All service and HOLDDATA for Enterprise COBOL are included on the CBPDO tape.

Do not use this program directory if you install Enterprise COBOL with a SystemPac or ServerPac. When you use these offerings, use the jobs and documentation supplied with the offering. This program directory can point you to specific sections of it as required.

1.1 Enterprise COBOL Description

With IBM Enterprise COBOL for z/OS V4.2, you get more than 40 years of IBM experience in application development to facilitate your new On Demand Business endeavors. IBM Enterprise COBOL for z/OS helps you to integrate COBOL and Web-based business processes in Web services, XML, Java, and COBOL applications. This interoperability lets you capitalize on existing IT investment while smoothly incorporating new, Web-based applications as part of your organization's infrastructure.
Enterprise COBOL is a leading-edge IBM z/OS-based compiler that helps you create and maintain mission-critical, line-of-business COBOL applications, targeted to execute on your z/OS systems. It offers access to IBM DB2, IBM CICS, and IBM IMS systems, as well as other data and transaction systems.

Enterprise COBOL for z/OS V4.2 delivers:

- Further enhancements to XML parsing using the z/OS XML System Services parser
  - Users can now parse XML documents with validation against an XML schema, using the VALIDATING phrase of the XML PARSE statement.
  - Performance is improved for nonvalidating parsing.
  - Character processing is enhanced for any XML document that contains a reference to a character that is not included in the single-byte EBCDIC code page of the document.

- A new compiler option, BLOCK0, lets programs take advantage of system-determined block size for QSAM output files
  - When a program is compiled using the BLOCK0 compiler option, an implicit BLOCK CONTAINS 0 clause is activated for all eligible QSAM files in the program, which can result in enhanced processing speed and minimized storage requirements for output files.

- COBOL user-defined words can now include the underscore character (_)
  - User-defined words such as data names and program names can now include underscore characters. Underscores are also supported in the literal form of program names.

- Compiler listings display CICS options in effect
  - When applications are compiled using the integrated CICS translator, compiler listings will show the CICS options that are in effect. This facility provides the same benefit to CICS users as was previously made available to DB2 users.

- Additional SDKs supported for Java interoperability
  - Enterprise COBOL applications using object-oriented syntax for Java interoperability can now run with Java 5 or Java 6. Java SDK V1.4.2 continues to be supported.

- A new facility lets users customize message severity
  - The new MSGEXIT suboption of the EXIT compiler option lets users specify a module that will be called for each compiler diagnostic message and each FIPS (FLAGSTD) message. Using the MSGEXIT module, users can change the severity of messages, suppress messages, and convert FIPS messages into diagnostic messages.

1.2 Enterprise COBOL FMIDs

Enterprise COBOL consists of the following FMIDs:

HADB420
JADB421
JADB422
2.0 Program Materials

An IBM program is identified by a program number and feature numbers. The program number for Enterprise COBOL is 5655-S71 and the feature numbers are 5802, 5812, 6000, and 6001.

Basic Machine-Readable Materials are materials that are supplied under the base license and feature numbers, and are required for the use of the product. Optional Machine-Readable Materials are orderable under separate feature numbers, and are not required for the product to function.

The program announcement material describes the features supported by Enterprise COBOL. 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 magnetic tape 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 18 for more information about how to install the program.

Figure 1 describes the program file content for Enterprise COBOL. 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.

<table>
<thead>
<tr>
<th>Name</th>
<th>RECFM</th>
<th>LRECL</th>
<th>Blk Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMPMCS</td>
<td>SEQ</td>
<td>80</td>
<td>6400</td>
</tr>
<tr>
<td>IBM.HADB420.F1</td>
<td>PDS</td>
<td>80</td>
<td>8800</td>
</tr>
<tr>
<td>IBM.HADB420.F2</td>
<td>PDS</td>
<td>U</td>
<td>6144</td>
</tr>
<tr>
<td>IBM.JADB421.F1</td>
<td>PDS</td>
<td>80</td>
<td>8800</td>
</tr>
<tr>
<td>IBM.JADB421.F2</td>
<td>PDS</td>
<td>U</td>
<td>6144</td>
</tr>
<tr>
<td>IBM.JADB422.F1</td>
<td>PDS</td>
<td>80</td>
<td>8800</td>
</tr>
<tr>
<td>IBM.JADB422.F2</td>
<td>PDS</td>
<td>U</td>
<td>6144</td>
</tr>
<tr>
<td>IBM.JADB42H.F1</td>
<td>PDS</td>
<td>VB</td>
<td>27998</td>
</tr>
</tbody>
</table>

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2.2 Optional Machine-Readable Material

No optional machine-readable materials are provided for Enterprise COBOL.

2.3 Program Publications

The following sections identify the basic and optional publications for Enterprise COBOL.

2.3.1 Basic Program Publications

Figure 2 identifies the basic unlicensed program publications for Enterprise COBOL. One copy of each of these publications is included when you order the basic materials for Enterprise COBOL. For additional copies, contact your IBM representative.

<table>
<thead>
<tr>
<th>Publication Title</th>
<th>Form Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprise COBOL for z/OS License Information</td>
<td>GI11-7871</td>
</tr>
</tbody>
</table>

2.3.2 Optional Program Publications

Figure 3 identifies the optional unlicensed or licensed publications that are not available in hardcopy format, but are available through the internet or other media for Enterprise COBOL.

<table>
<thead>
<tr>
<th>Publication Title</th>
<th>Form Number</th>
<th>How Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprise COBOL Language Reference</td>
<td>SC23-8528</td>
<td>IBM COBOL Web site</td>
</tr>
<tr>
<td>Enterprise COBOL Compiler and Runtime Migration Guide</td>
<td>GC23-8527</td>
<td>IBM COBOL Web site</td>
</tr>
<tr>
<td>Enterprise COBOL Programming Guide</td>
<td>SC23-8529</td>
<td>IBM COBOL Web site</td>
</tr>
<tr>
<td>Enterprise COBOL Customization Guide</td>
<td>SC23-8526</td>
<td>IBM COBOL Web site</td>
</tr>
</tbody>
</table>

All IBM Enterprise COBOL V04 publications are available in displayable softcopy format (BookManager, PDF) on the IBM COBOL Web site:

http://www.ibm.com/software/awdtools/cobol/
2.4 Program Source Materials

No program source materials or viewable program listings are provided for Enterprise COBOL.

2.5 Publications Useful During Installation

You might want to use the publications listed in Figure 4 during the installation of Enterprise COBOL. To order copies, contact your IBM representative or visit the IBM Publications Center at http://www.ibm.com/shop/publications/order.

<table>
<thead>
<tr>
<th>Publication Title</th>
<th>Form Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM SMP/E for z/OS User's Guide</td>
<td>SA22-7773</td>
</tr>
<tr>
<td>IBM SMP/E for z/OS Commands</td>
<td>SA22-7771</td>
</tr>
<tr>
<td>IBM SMP/E for z/OS Reference</td>
<td>SA22-7772</td>
</tr>
<tr>
<td>IBM SMP/E for z/OS Messages, Codes, and Diagnosis</td>
<td>GA22-7770</td>
</tr>
</tbody>
</table>
3.0 Program Support

This section describes the IBM support available for Enterprise COBOL.

3.1 Program Services

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

3.2 Preventive Service Planning

Before you install Enterprise COBOL, 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 that contains HIPER and 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.

If you obtained Enterprise COBOL as part of a CBPDO, HOLDDATA is included.

If the CBPDO for Enterprise COBOL is older than two weeks old by the time you install the product materials, you should contact the IBM Support Center or use S/390 SoftwareXcel to obtain the latest PSP Bucket information. You can also obtain the latest PSP Bucket information by going to the following Web site:

https://techsupport.services.ibm.com/server/390.psp390

For program support, access the Software Support Web site at http://www-01.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 Enterprise COBOL are shown as follows:

<table>
<thead>
<tr>
<th>UPGRADE</th>
<th>SUBSET</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>COBOLZOS420</td>
<td>HADB420</td>
<td>Enterprise COBOL Base</td>
</tr>
<tr>
<td></td>
<td>JADB421</td>
<td>Enterprise COBOL US English</td>
</tr>
<tr>
<td></td>
<td>JADB422</td>
<td>Enterprise COBOL Japanese</td>
</tr>
<tr>
<td></td>
<td>JADB42H</td>
<td>Enterprise COBOL HFS</td>
</tr>
</tbody>
</table>
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 6 on page 8 identifies the component IDs (COMPID) for Enterprise COBOL.

<table>
<thead>
<tr>
<th>FMID</th>
<th>COMPID</th>
<th>Component Name</th>
<th>RETAIN Release</th>
</tr>
</thead>
<tbody>
<tr>
<td>HADB420</td>
<td>5655S7100</td>
<td>Enterprise COBOL Base</td>
<td>420</td>
</tr>
<tr>
<td>JADB421</td>
<td>5655S7100</td>
<td>Enterprise COBOL US English</td>
<td>421</td>
</tr>
<tr>
<td>JADB422</td>
<td>5655S7100</td>
<td>Enterprise COBOL Japanese</td>
<td>422</td>
</tr>
<tr>
<td>JADB42H</td>
<td>5655S7100</td>
<td>Enterprise COBOL HFS</td>
<td>42H</td>
</tr>
</tbody>
</table>
4.0 Program and Service Level Information

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

- FMID HADB400
  
<table>
<thead>
<tr>
<th>FMID</th>
<th>1st Fix</th>
<th>2nd Fix</th>
<th>3rd Fix</th>
</tr>
</thead>
<tbody>
<tr>
<td>PK42610</td>
<td>PK73098</td>
<td>PK79305</td>
<td></td>
</tr>
<tr>
<td>PK45562</td>
<td>PK73151</td>
<td>PK81307</td>
<td></td>
</tr>
<tr>
<td>PK46802</td>
<td>PK73883</td>
<td>PK81754</td>
<td></td>
</tr>
<tr>
<td>PK54632</td>
<td>PK74293</td>
<td>PK82674</td>
<td></td>
</tr>
<tr>
<td>PK56093</td>
<td>PK74928</td>
<td>PK84547</td>
<td></td>
</tr>
<tr>
<td>PK56093</td>
<td>PK78160</td>
<td>PK87082</td>
<td></td>
</tr>
<tr>
<td>PK59377</td>
<td>PK79020</td>
<td>PK89652</td>
<td></td>
</tr>
<tr>
<td>PK71640</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.2 Service Level Information

No PTFs against this release of Enterprise COBOL have been incorporated into the product tape.

It is highly recommended that you frequently check the Enterprise COBOL PSP Bucket for HIPER and SPECIAL Attention PTFs against all FMIDs that you must install.
5.0 Installation Requirements and Considerations

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

- **Driving system**: the system used to install the program; where SMP/E executes.
  
  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 access these impacts without disrupting your production system.

5.1 Driving System Requirements

This section describes the environment of the driving system that is required to install Enterprise COBOL.

5.1.1 Machine Requirements

IBM Enterprise COBOL for z/OS V4.2 will run on any z/Architecture processor that includes the z/Architecture Extended-Translation Facility 2.

5.1.2 Programming Requirements
5.2 Target System Requirements

This section describes the environment of the target system that is required to install and use Enterprise COBOL.

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

5.2.1 Machine Requirements

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

5.2.2 Programming Requirements

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

Mandatory installation requisites identify products that are required on the system for the successful installation of this product. These products are specified as PREs or REqs.
Note: Installation may 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.

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

Enterprise COBOL has no conditional installation requisites.

5.2.2.2 Operational Requisites: Operational requisites are products that are required by and must be present on the system or products that are not required by 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. These products are specified as PREs or REQs.

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

<table>
<thead>
<tr>
<th>Program Number</th>
<th>Product Name and Minimum VRM/Service Level</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>5694-A01</td>
<td>z/OS V01.09.00 or later with PTFs for APAR PK90754</td>
<td>z/OS Language Environment required to compile and run COBOL applications</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program Number</th>
<th>Product Name and Minimum VRM/Service Level</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>5694-A01</td>
<td>z/OS V01.09.00 or later with PTFs APARs OA28253 and OA28398</td>
<td>XML processing with the XMLPARSE(XMLSS) option</td>
</tr>
<tr>
<td>5798-DYR, 5798-DZX</td>
<td>COBOL Report Writer R4</td>
<td>COBOL Report Writer source programs</td>
</tr>
<tr>
<td>Program Number</td>
<td>Product Name and Minimum VRM/Service Level</td>
<td>Function</td>
</tr>
<tr>
<td>----------------</td>
<td>--------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>5668-806, 5688-087</td>
<td>VS FORTRAN V02.01.00</td>
<td>FORTRAN source programs (for interlanguage communication)</td>
</tr>
<tr>
<td>5655-H31</td>
<td>Enterprise PL/I for z/OS V3</td>
<td>PL/I source programs (for interlanguage communication)</td>
</tr>
<tr>
<td>5694-A01</td>
<td>DFSORT element of z/OS</td>
<td>COBOL applications using SORT/MERGE</td>
</tr>
<tr>
<td>5696-234</td>
<td>High Level Assembler for MVS &amp; VM &amp; VSE</td>
<td>Assembler source programs (for interlanguage communication) or customization of the compiler</td>
</tr>
<tr>
<td>5694-A01</td>
<td>z/OS - C/C++ feature of z/OS</td>
<td>C/C++ with Enterprise COBOL</td>
</tr>
<tr>
<td>5724-T07</td>
<td>IBM Rational Developer for System z, V7</td>
<td>An integrated development environment (IDE) with advanced, easy-to-use tools and features to help WebSphere, CICS, and IMS developers rapidly design, code, and deploy complex applications</td>
</tr>
</tbody>
</table>

Any one of the following:

<table>
<thead>
<tr>
<th>Program Number</th>
<th>Product Name and Minimum VRM/Service Level</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>5655-M30</td>
<td>SDK for z/OS, Java 2 Technology Edition V01.04.02 *</td>
<td>Support for object-oriented COBOL syntax (Java interoperability).</td>
</tr>
<tr>
<td>5655-N98</td>
<td>SDK for z/OS, Java 2 Technology Edition V05 *</td>
<td>Support for object-oriented COBOL syntax (Java interoperability).</td>
</tr>
<tr>
<td>5655-R31</td>
<td>SDK for z/OS, Java 2 Technology Edition V06 * with PFTs for APAR PK89762</td>
<td>Support for object-oriented COBOL syntax (Java interoperability).</td>
</tr>
</tbody>
</table>

Any one of the following:

<table>
<thead>
<tr>
<th>Program Number</th>
<th>Product Name and Minimum VRM/Service Level</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>5655-R44</td>
<td>Debug Tool for z/OS V07.01.00</td>
<td>Debugging capabilities</td>
</tr>
<tr>
<td>5655-S17</td>
<td>Debug Tool for z/OS V08.01.00</td>
<td>Debugging capabilities</td>
</tr>
<tr>
<td>5655-U27</td>
<td>Debug Tool for z/OS V09.01.00</td>
<td>Debugging capabilities</td>
</tr>
<tr>
<td>5655-S16</td>
<td>Debug Tool Utilities and Advanced Functions for z/OS V07.01.00</td>
<td>Debugging capabilities</td>
</tr>
<tr>
<td>5655-R45</td>
<td>Debug Tool Utilities and Advanced Functions for z/OS V08.01.00</td>
<td>Debugging capabilities</td>
</tr>
</tbody>
</table>

Any one of the following:

<table>
<thead>
<tr>
<th>Program Number</th>
<th>Product Name and Minimum VRM/Service Level</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>5625-DB2</td>
<td>DB2 UDB for z/OS V08.01.00</td>
<td>Support for use of national decimal host variables in EXEC SQL statements requires APAR PQ93857. Support for use of alternate DDNAME for DBRMLIB requires PTFs for DB2 APAR PK59537</td>
</tr>
</tbody>
</table>
### 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 COBOL has no toleration/coexistence requisites.

---

*NOTE:* COBOL requires a 31-bit Java SDK, 64-bit Java technology is not currently supported.

---

<table>
<thead>
<tr>
<th>Program Number</th>
<th>Product Name and Minimum VRM/Service Level</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>5635-DB2</td>
<td>DB2 UDB for z/OS V09.01.00</td>
<td>Support for use of national decimal host variables in EXEC SQL statements. Support for use of alternate DDNAME for DBRMLIB requires PTFs for DB2 APAR PK55937</td>
</tr>
<tr>
<td>5655-M15</td>
<td>CICS Transaction Server for z/OS V03.02.00 with PTFs for APAR PK91041</td>
<td>COBOL applications for CICS, and for integrated CICS Translator support</td>
</tr>
<tr>
<td>5655-S97</td>
<td>CICS Transaction Server for z/OS V04.01.00 with PTFs for APAR PK89224</td>
<td>COBOL applications for CICS, and for integrated CICS Translator support</td>
</tr>
<tr>
<td>5655-J38</td>
<td>IMS V09.01.00</td>
<td>COBOL applications with IMS</td>
</tr>
<tr>
<td>5635-A01</td>
<td>IMS V10.01.00</td>
<td>COBOL applications with IMS</td>
</tr>
<tr>
<td>5655-R46</td>
<td>IBM Fault Analyzer for z/OS, V07.01.00</td>
<td>Analyze and fix application and system failures</td>
</tr>
<tr>
<td>5655-S15</td>
<td>IBM Fault Analyzer for z/OS, V08.01.00</td>
<td>Analyze and fix application and system failures</td>
</tr>
<tr>
<td>5655-U28</td>
<td>IBM Fault Analyzer for z/OS, V09.01.00</td>
<td>Analyze and fix application and system failures</td>
</tr>
<tr>
<td>5655-R47</td>
<td>IBM File Manager for z/OS, V07.01.00</td>
<td>User-friendly tools for working with z/OS data sets, DB2 data, CICS data, or IMS data</td>
</tr>
<tr>
<td>5655-S14</td>
<td>IBM File Manager for z/OS, V08.01.00</td>
<td>User-friendly tools for working with z/OS data sets, DB2 data, CICS data, or IMS data</td>
</tr>
<tr>
<td>5655-U29</td>
<td>IBM File Manager for z/OS, V09.01.00</td>
<td>User-friendly tools for working with z/OS data sets, DB2 data, CICS data, or IMS data</td>
</tr>
</tbody>
</table>
5.2.2.4 Incompatibility (Negative) Requisites: Negative requisites identify products that must not be installed on the same system as this product.

Enterprise COBOL has no negative requisites.

5.2.3 DASD Storage Requirements

Enterprise COBOL libraries can reside on all supported DASD types.

Figure 11 lists the total space that is required for each type of library.

<table>
<thead>
<tr>
<th>Library Type</th>
<th>Total Space Required in 3390 Trks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target</td>
<td>141 Tracks</td>
</tr>
<tr>
<td>Distribution</td>
<td>203 Tracks</td>
</tr>
<tr>
<td>HFS or zFS</td>
<td>440 (512-byte units)</td>
</tr>
</tbody>
</table>

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 21.

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

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

**Note:** The data in these tables should be used when determining 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.

<table>
<thead>
<tr>
<th>Library DDNAME</th>
<th>Member Type</th>
<th>Target Volume</th>
<th>T R L No. of Trks</th>
<th>O E C No. of Dirs</th>
<th>P R F No. of Blks</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIGYCOMP</td>
<td>LMOD</td>
<td>ANY U PDS</td>
<td>U 0 101</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>SIGYMAC</td>
<td>Macro</td>
<td>ANY U PDS</td>
<td>FB 80 7</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>SIGYPROC</td>
<td>PROC</td>
<td>ANY U PDS</td>
<td>FB 80 2</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>SIGYSAMP</td>
<td>SAMP</td>
<td>ANY U PDS</td>
<td>FB 80 31</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

Enterprise COBOL Program Directory
5.3 FMIDs Deleted

Installing Enterprise COBOL 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 COBOL 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, see the SMP/E manuals for instructions.

5.4 Special Considerations

Enterprise COBOL has no special considerations for the target system.
**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 COBOL.

Please note the following:

- If you want to install Enterprise COBOL 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 COBOL**

**6.1.1 SMP/E Considerations for Installing Enterprise COBOL**

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

**6.1.2 SMP/E Options Subentry Values**

The recommended values for certain SMP/E CSI subentries are shown in Figure 15. 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.

<table>
<thead>
<tr>
<th>Subentry</th>
<th>Value</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSSPACE</td>
<td>(200,200,500)</td>
<td>3390 DASD tracks</td>
</tr>
<tr>
<td>PEMAX</td>
<td>SMP/E Default</td>
<td>IBM recommends using the SMP/E default for PEMAX.</td>
</tr>
</tbody>
</table>

**6.1.3 Sample Jobs**

The following sample installation jobs are provided as part of the product to help you install Enterprise COBOL:
You can access the sample installation jobs by performing an SMP/E RECEIVE and then copying the jobs from the relfiles to a work data set for editing and submission. See Figure 16 on page 18 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=/c5197
///c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197 ... 97/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197
///c5197TAPEIN DD DSN=IBM.HADB42/zerodot.F1,UNIT=tunit
///c5197 VOL=SER=volser,LABEL=(x,SL),
///c5197 DISP=(OLD,KEEP)
///c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197 ... 97/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197
///c5197TAPEIN DD DSN=IBM.HADB42/zerodot.F1,UNIT=tunit,
///* VOL=SER=volser,LABEL=(x,SL),
///* DISP=(OLD,KEEP)
///c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197 ... 97/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197
///*TAPEIN DD DSN=IBM.HADB420.F1,UNIT=tunit,
///* (using the optional SMP/E RECEIVE job) by uncommenting *
///* the DD statement below. *
///*TAPEIN DD DSN=IBM.HADB420.F1,UNIT=tunit,
```

### Figure 16. Sample Installation Jobs

<table>
<thead>
<tr>
<th>Job Name</th>
<th>Job Type</th>
<th>Description</th>
<th>RELFILE</th>
</tr>
</thead>
<tbody>
<tr>
<td>IGYWEDIT</td>
<td>MACRO</td>
<td>ISPF Editor macro to aid users in making changes to the sample jobs. <strong>(Optional)</strong></td>
<td>IBM.HADB420.F1</td>
</tr>
<tr>
<td>IGYWSMPE</td>
<td>SMP/E</td>
<td>Sample job to define and prime a new SMP/E CSI <strong>(Optional)</strong></td>
<td>IBM.HADB420.F1</td>
</tr>
<tr>
<td>IGYWRECV</td>
<td>RECEIVE</td>
<td>Sample RECEIVE job</td>
<td>IBM.HADB420.F1</td>
</tr>
<tr>
<td>IGYWALOC</td>
<td>ALLOCATE</td>
<td>Sample job to allocate target and distribution libraries</td>
<td>IBM.HADB420.F1</td>
</tr>
<tr>
<td>IGYISMKD</td>
<td>MKDIR</td>
<td>Sample job to invoke the supplied IGYMKDIR EXEC to allocate HFS paths</td>
<td>IBM.HADB420.F1</td>
</tr>
<tr>
<td>IGYWDDEF</td>
<td>DDDEF</td>
<td>Sample job to define SMP/E DDDEFs</td>
<td>IBM.HADB420.F1</td>
</tr>
<tr>
<td>IGYWAPLY</td>
<td>APPLY</td>
<td>Sample APPLY job</td>
<td>IBM.HADB420.F1</td>
</tr>
<tr>
<td>IGYWACPT</td>
<td>ACCEPT</td>
<td>Sample ACCEPT job</td>
<td>IBM.HADB420.F1</td>
</tr>
<tr>
<td>IGYWIVP1</td>
<td>IVP</td>
<td>Sample job to verify installation has been successful</td>
<td>IBM.HADB420.F1</td>
</tr>
<tr>
<td>IGYWIVP2</td>
<td>IVP</td>
<td>Sample job to verify installation has been successful</td>
<td>IBM.HADB420.F1</td>
</tr>
</tbody>
</table>
In the sample above, update the statements as noted below:

If using TAPEIN:
- \texttt{tunit} is the unit address where the product tape is mounted
- \texttt{volser} is the volume serial matching the product tape
- \texttt{x} is the tape file number where the data set name is on the tape
  Refer to the documentation provided by CBPDO to see where IBM.HADB420.F1 is on the tape.

If using FILEIN:
- \texttt{filevol} is the volume serial of the DASD device where the downloaded files reside.

\textbf{OUT}
- \texttt{jcl-library-name} is the name of the output data set where the sample jobs will be stored
- \texttt{dasdvol} is the volume serial of the DASD device where the output data set will reside

\textbf{SYSIN}
- \texttt{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 (IGYISMKD, IGYWACPT, IGYWALOC, IGYWAPLY, IGYWDDEF, IGYWIVP1, IGYWIVP2, IGYWRMCEV and IGYWSMPE), an ISPF editor macro, called IGYWEDIT, is supplied and is copied to your output data set \texttt{jcl-library-name} above. (See Figure 16 on page 18).

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

Edit macro IGYWEDIT and provide the proper values. Then copy it to any data set in your TSO logon procedure SYSEXEC concatenation. Consult the instructions in the macro for more information.
6.1.5 Allocate and Initialize the SMP/E Data Sets (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 have already been allocated and primed. You can go on to the next step to perform an SMP/E RECEIVE.
- To install into a new zone, use the IGYWSMPE 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 Enterprise COBOL as part of a CBPDO, use the RCVPDO job in the CBPDO RIMLIB data set to receive the Enterprise COBOL FMIDs, service, and HOLDDATA that are included on the CBPDO tape. For more information, see the documentation that is included in the CBPDO.

You can also choose to edit and submit sample job IGYWRECV to perform the SMP/E RECEIVE for Enterprise COBOL. 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 IGYWALOC to allocate the SMP/E target distribution libraries for Enterprise COBOL. 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 File System Paths

Before allocating the HFS or zFS paths and creating the DDDEF entries Enterprise COBOL, you must decide where to install the product. You can install into either the root file system or a new HFS or zFS. If you also have the option of running more than one release of COBOL concurrently.

- To install into the root file system:
  - Clone your root file system.
  - Mount it under /SERVICE, or a similar mountpoint.
  - Run the IGYISMKD job to create the subdirectories, using /SERVICE as the <PathPrefix> variable in the sample jobs IGYWDDEF and IGYISMKD.
  - You must submit this job from a userid that is either UID=0 or is permitted to the BPX.SUPERUSER facility class.
– Proceed with the SMP/E install into this newly cloned HFS.

See the UNIX System Services Planning guide for more information.

• To install into a new file system (optional):
  – Create a new HFS or zFS data set.
  – Make sure that your <PathPrefix> exists, or create if necessary.
  – Mount the new HFS on that directory.
  – Edit and submit the IGYISMKD job to create the directory, <PathPrefix>/usr/lpp/cobol, and subdirectories. Consult the instructions in the sample job for more information.
  – You must submit this job from a userid that is either UID=0 or is permitted to the BPX.SUPERUSER facility class.
  – Proceed with the SMP/E install.

See the UNIX System Services Planning guide for more information.

• To install, so that two versions of COBOL can run concurrently (optional):
  – Create a new HFS data set.
  – Make sure that your <PathPrefix> exists, or create if necessary.
  – Mount the new HFS or zFS on that directory.
  – Edit and submit the IGYISMKD job to create the directory, <PathPrefix>/usr/lpp/cobol/<Subdirectory>, and subdirectories. Change <Subdirectory> to an appropriate name that meets your installation requirements (like ecobol42). This will create a new path structure of <PathPrefix>/usr/lpp/cobol/ecobol42. Consult the instructions in the sample job for more information.
  – Ensure that the DDDEF for SIGYHFS in the IGYWDDEF job points to the correct HFS or zFS directories. In this example it would be <PathPrefix>/usr/lpp/cobol/ecobol42/bin/IBM. Consult the instructions in the sample job for more information.
  – You must submit this job from a userid that is either UID=0 or is permitted to the BPX.SUPERUSER facility class.
  – Proceed with the SMP/E install.

See the UNIX System Services Planning guide for more information.

If you plan to create a new HFS or zFS for this product, consider updating the BPXPRMxx PARMLIB member to mount the new file system at IPL. This may be helpful if an IPL occurs before the installation is complete.

**Expected Return Codes and Messages:** You will get a return code of 0 if the job runs correctly.

Consult the instructions in the sample jobs for the expected output.
6.1.9 Create DDDEF Entries

Edit and submit sample job IGYWDDEF to create DDDEF entries for the SMP/E target and distribution libraries for Enterprise COBOL. 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.

6.1.10 Perform SMP/E APPLY

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

HOLDDATA introduces ERROR HOLDs against FMIDs for HIPER APARs. Before the installation, ensure that you have the latest HOLDDATA, which is available through several different portals, including http://service.software.ibm.com/holddata/390holddata.html. Install the FMIDs regardless of the status of unresolved HIPERs. However, don't deploy the software until the unresolved HIPERs are analyzed to determine applicability.

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. This is because 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 two methods to install FMIDs when ++HOLDs for HIPERs exist for the FMIDs that you install:

a. To ensure that all recommended and critical service is installed with the FMIDs, if you are using SMP/E 3.5 or higher and have received the latest HOLDDATA, add the FIXCAT operand to the APPLY command as shown below. If you are using a prior release of SMP/E, add the SOURCEID(HIPER,RSU*) operand to the APPLY command.

If using SMP/E V3.5 or higher:

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

If using SMP/E V3.4 or prior:

   APPLY S(fmid,fmid,...)
   FORFMID(fmid,fmid,...)
   SOURCEID(HIPER,RSU+)
   GROUPEXTEND .

Some HIPER APARs might not have PTFs available yet. You have to analyze the symptom flags to determine if you want to bypass the specific ERROR HOLDs and continue the installation of the FMIDs.
This method requires more initial research, but can provide resolution for all HIPERs that have fixes 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 the HIPERs, you can add a BYPASS(HOLDCLASS(HIPER)) operand to the APPLY command. In this way, you can install FMIDs even though HIPER ERROR HOLDs against them still exist. Only the HIPER ERROR HOLDs are bypassed. After the FMIDs are installed, run the SMP/E REPORT ERRSYSMODS command to identify missing HIPER maintenance.

APPLY $({fmid,fmid,...})
FORFMID({fmid,fmid,...})
SOURCEID(RSU/c5197)
GROUPEXTEND
BYPASS(HOLDCLASS(HIPER)).
..any other parameters documented in the program directory

This method is the quicker of the two, but requires subsequent review of the REPORT ERRSYSMODS to investigate any HIPERs. If you are running SMP/E V3.5 or higher and have received the latest HOLDDATA, you can also choose to run REPORT MISSINGFIX for Fix Category IBM.ProductInstall-RequiredService to investigate missing recommended service.

If you bypass HOLDs during the installation of the FMIDs because PTFs are not yet available, you can make yourself notified when the 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 get a return code of 4, or less, if the job runs correctly. IEW2454W messages are expected and can be ignored.

6.1.11 Perform SMP/E ACCEPT

Edit and submit sample job IGYWACPT to perform an SMP/E ACCEPT CHECK for Enterprise COBOL. 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. This is because the SMP/E root cause analysis identifies the cause of only 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 manuals.

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-edits or binds 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.

### 6.1.12 Run the Installation Verification Programs

Edit and submit sample jobs IGYWIVP1 and IGYWIVP2 to verify that you have installed Enterprise COBOL correctly. Consult the instructions in the sample jobs for more information.

**Expected Return Codes and Messages:** You will get a return code of 0 from both jobs.

### 6.1.13 Run REPORT CROSSZONE

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

After you install Enterprise COBOL, 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 COBOL
6.2.1 File System Execution

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

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Reader's Comments

Program Directory for IBM Enterprise COBOL for z/OS, August 2009

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For each of the topics below please indicate your satisfaction level by circling your choice from the rating scale. If a statement does not apply, please circle N.

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<tr>
<th>Satisfaction</th>
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<th>3</th>
<th>4</th>
<th>5</th>
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<tbody>
<tr>
<td>Ease of product installation</td>
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<td>Contents of Program Directory</td>
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<td>Readability and organization of Program Directory tasks</td>
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<td>Accuracy of the definition of the installation tasks</td>
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<td>Technical level of the installation tasks</td>
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<td>Ease of getting the system into production after installation</td>
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</table>

How did you order this product?

- [ ] CBPDO
- [ ] CustomPac
- [ ] ServerPac
- [ ] Independent
- [ ] Other

Is this the first time your organization has installed this product?

- [ ] Yes
- [ ] No

Were the people who did the installation experienced with the installation of z/OS products?

- [ ] Yes
__ No __

If yes, how many years? __

If you have any comments to make about your ratings above, or any other aspect of the product installation, please list them below:

________________________________________________________________________
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Please provide the following contact information:

__________________________________________
Name and Job Title

__________________________________________
Organization

__________________________________________
Address

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Telephone

Thank you for your participation.

Please send the completed form to (or give to your IBM representative who will forward it to the IBM Enterprise COBOL for z/OS Development group):