Program Directory for
IBM DB2 Recovery Expert for z/OS

V03.01.00
Program Number 5655-W78
FMIDs H30R310, H30RKN0
for Use with
z/OS

Document Date: May 2012
Note

Before using this information and the product it supports, be sure to read the general information under 7.0, “Notices” on page 28.

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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 DB2 Recovery Expert for z/OS. This publication refers to IBM DB2 Recovery Expert for z/OS as DB2 Recovery Expert.

The Program Directory contains the following sections:

- **2.0, “Program Materials” on page 4** identifies the basic and optional program materials and documentation for DB2 Recovery Expert.
- **3.0, “Program Support” on page 8** describes the IBM support available for DB2 Recovery Expert.
- **4.0, “Program and Service Level Information” on page 10** lists the APARs (program level) and PTFs (service level) that have been incorporated into DB2 Recovery Expert.
- **5.0, “Installation Requirements and Considerations” on page 12** identifies the resources and considerations that are required for installing and using DB2 Recovery Expert.
- **6.0, “Installation Instructions” on page 20** provides detailed installation instructions for DB2 Recovery Expert. It also describes the procedures for activating the functions of DB2 Recovery Expert, or refers to appropriate publications.

Before installing DB2 Recovery Expert, 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 8** tells you how to find any updates to the information and procedures in this Program Directory.

DB2 Recovery Expert 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 DB2 Recovery Expert are included on the CBPDO tape.

Do not use this program directory if you install DB2 Recovery Expert 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 DB2 Recovery Expert Description

**IBM DB2 Recovery Expert for z/OS, V3.1 (5655-W78)** provides a simple, self-managing recovery solution that enables database recovery operations with minimal disruption. DB2 Recovery Expert for z/OS enables intelligent analysis of altered, incorrect, or missing database assets, including table spaces, tables, indexes, and data. It automates the process of rebuilding these assets to a specified point in time, often without taking the database or the business operations offline.

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DB2 Recovery Expert supplies a high availability solution that companies require for 24x7 operations. By taking advantage of the latest storage system replication features, DB2 Recovery Expert can perform system-level backups quickly with little or no impact on running applications. Valuable host CPU and I/O time is saved by using the storage processor to make the copy instead of z/OS.

DB2 Recovery Expert:
- Provides backup and recovery solutions that exploit sophisticated storage processor capabilities enabling:
  - High application availability while data is quickly backed up to a consistent copy of production data.
  - Reduction of CPU and I/O costs by using the storage processor to copy the data instead of z/OS.
  - Reduced database administrator time and effort while executing fast replication processing.
  - Automated validation at the time of backup to confirm the recovery of all objects or the complete DB2 subsystem.
- Provides automated recovery features that:
  - Save valuable time when recovering entire DB2 subsystems from system backups created using fast replication.
  - Significantly reduce downtime and the associated costs of this downtime when recovering database objects or groups of objects to a specific point in time from fast replication backups.
  - Simplify DB2 subsystem disaster recovery and restart.
- Provides an "intelligent recovery manager" that significantly reduces recovery time and effort by providing the information users need to quickly decide the best recovery point and the best recovery method. The intelligent recovery manager can help users to:
  - Easily recover dropped objects including recovering data to a point in time before the drop.
  - Reduce manual efforts by identifying recovery points. The recovery manager analyzes the DB2 log to find quiet times or points of consistency for single or groups of objects that can be used for recovery points.
  - Generate SQL-based recoveries that can roll-forward or back-out changes to individual tables or groups of objects, a recovery process that is unique among IBM DB2 recovery tools.
  - Simplify the process of recovering an object or application set of objects to a prior version, even if the object's DDL has changed.
  - Quickly choose the most appropriate and cost efficient method of recovery by analyzing all recovery assets and presenting several recovery "plans" or methods with an estimated cost for each method.

DB2 Recovery Expert v3.1 includes the following enhancements:
- Streamlined product installation and customization using IBM Tools Customizer for z/OS, a product that provides a single interface and process for installing and customizing products that belong to the IBM DB2 Tools family.
• Extended the recovery capabilities of the V2.2 GUI to the ISPF interface for ease of use. The enhanced ISPF interface now includes dropped object recovery, versioned object recovery, SQL undo/redo recovery, and log analysis functionality.

• Eliminated the need to separately install a local version of the graphical interface for each user by redesigning it to run within a web browser.

• Simplified the recovery process for dropped objects, in both the ISPF and browser client, by adding the ability to read DB2 log records when recreating the object's image to a point in time eliminating the need to update the schema level repository.

• Automated the process to restore object authorizations when recovering dropped objects.

• Automated the process of binding plans and packages when recovering objects and dropped objects.

• Expanded the types of objects that can be recovered to include indexes, views, synonyms, aliases, data types, triggers, functions, stored procedures, sequences, and roles.

• Help for administrators to better plan when they create copies by adding the ability to update Real-Time Statistics (RTS) when creating fast-replication image copies.

• Added the ability to generate DDL for an object or group of objects as they currently exist or as they existed at some historical point in time.

• Seamlessly use the latest technology with IPv6, now a supported communication protocol between Recovery Expert's server, agent, and user interface tiers.

1.2 DB2 Recovery Expert FMIDs

DB2 Recovery Expert consists of the following FMIDs:

H30R310
H30RKN0
2.0 Program Materials

An IBM program is identified by a program number and a feature number. The program number for DB2 Recovery Expert is 5655-W78 and its feature number is 5802.

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 DB2 Recovery Expert. 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 20 for more information about how to install the program.

Figure 1 describes the program file content for DB2 Recovery Expert. 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>ORG</th>
<th>RECF</th>
<th>LRECF</th>
<th>BLK SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMPMCS</td>
<td>SEQ</td>
<td>FB</td>
<td>80</td>
<td>6400</td>
</tr>
<tr>
<td>IBM.H30R310.F1</td>
<td>PDS</td>
<td>FB</td>
<td>80</td>
<td>8800</td>
</tr>
<tr>
<td>IBM.H30R310.F2</td>
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<td>U</td>
<td>0</td>
<td>6144</td>
</tr>
<tr>
<td>IBM.H30R310.F3</td>
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<td>FB</td>
<td>80</td>
<td>8800</td>
</tr>
<tr>
<td>IBM.H30R310.F4</td>
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<td>80</td>
<td>8800</td>
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<td>8800</td>
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<td>IBM.H30R310.F7</td>
<td>PDS</td>
<td>FB</td>
<td>80</td>
<td>8800</td>
</tr>
</tbody>
</table>
2.2 Optional Machine-Readable Material

No optional machine-readable materials are provided for DB2 Recovery Expert.

2.3 Program Publications

The following sections identify the basic and optional publications for DB2 Recovery Expert.

2.3.1 Basic Program Publications

Figure 3 identifies the basic unlicensed program publications for DB2 Recovery Expert. One copy of each of these publications is included when you order the basic materials for DB2 Recovery Expert. Additional copies can be obtained from the IBM Publications Website at URL: http://www.ibm.com/shop/publications/order/ Contact your IBM representative for further assistance.
Figure 4 identifies the basic unlicensed or licensed publications that are not available in hardcopy format, but are available through the internet or other media for DB2 Recovery Expert.

<table>
<thead>
<tr>
<th>Publication Title</th>
<th>Form Number</th>
<th>How Available</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB2 Recovery Expert for z/OS License Information</td>
<td>GC19-3685</td>
<td></td>
</tr>
</tbody>
</table>

Figure 4. Basic Material: Other Unlicensed or Licensed Publications

<table>
<thead>
<tr>
<th>Publication Title</th>
<th>Form Number</th>
<th>How Available</th>
</tr>
</thead>
</table>

- z/OS Software Products Collection, SK3T-4270
- z/OS and Software Products DVD Collection, SK3T-4271*
  *requires a DVD drive in DVD-9 (single-sided, dual-layer) format

2.3.2 Optional Program Publications

No optional publications are provided for DB2 Recovery Expert.

2.4 Program Source Materials

No program source materials or viewable program listings are provided for DB2 Recovery Expert.

2.5 Publications Useful During Installation

You might want to use the publications listed in Figure 5 during the installation of DB2 Recovery Expert. 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>Publication Title</td>
<td>Form Number</td>
</tr>
<tr>
<td>-------------------------------------------------------</td>
<td>-------------</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 DB2 Recovery Expert.

3.1 Program Services

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

3.2 Preventive Service Planning

Before you install DB2 Recovery Expert, make sure that you have reviewed the current Preventive Service Planning (PSP) information. Review the PSP Bucket for General Information, Installation Documentation, and the Cross Product Dependencies sections. For the Recommended Service section, instead of reviewing the PSP Bucket, it is recommended you use the IBM.ProductInstall-RequiredService fix category in SMP/E to ensure you have all the recommended service installed. Use the FIXCAT(IBM.ProductInstall-RequiredService) operand on the APPLY CHECK command. See 6.1.10, "Perform SMP/E APPLY" on page 24 for a sample APPLY command.

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 DB2 Recovery Expert as part of a CBPDO, HOLDDATA is included.

If the CBPDO for DB2 Recovery Expert is older than two weeks by the time you install the product materials, you can obtain the latest PSP Bucket information by going to the following website:


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

For program support, access the Software Support Website at 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 DB2 Recovery Expert are included in Figure 6.

<table>
<thead>
<tr>
<th>UPGRADE</th>
<th>SUBSET</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5655W78</td>
<td>H30R310</td>
<td>DB2 Recovery Expert for z/OS</td>
</tr>
<tr>
<td>5655W78</td>
<td>H30RKN0</td>
<td>DB2 Recovery Expert for z/OS Edition Identifier</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 7 on page 9 identifies the component IDs (COMPID) for DB2 Recovery Expert.

<table>
<thead>
<tr>
<th>FMID</th>
<th>COMPID</th>
<th>Component Name</th>
<th>RETAIN Release</th>
</tr>
</thead>
<tbody>
<tr>
<td>H30R310</td>
<td>5697H7400</td>
<td>DB2 Recovery Expert for z/OS</td>
<td>310</td>
</tr>
<tr>
<td>H30RKN0</td>
<td>5697H7400</td>
<td>DB2 Recovery Expert for z/OS Edition Identifier</td>
<td>KN0</td>
</tr>
</tbody>
</table>
### 4.0 Program and Service Level Information

This section identifies the program and relevant service levels of DB2 Recovery Expert. 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 DB2 Recovery Expert have been incorporated into this release. They are listed by FMID.

- FMID H30R220

<table>
<thead>
<tr>
<th>PK92322</th>
<th>PM12911</th>
<th>PM29223</th>
</tr>
</thead>
<tbody>
<tr>
<td>PK94250</td>
<td>PM13435</td>
<td>PM29312</td>
</tr>
<tr>
<td>PK94365</td>
<td>PM13559</td>
<td>PM30094</td>
</tr>
<tr>
<td>PK94367</td>
<td>PM13819</td>
<td>PM30099</td>
</tr>
<tr>
<td>PK97669</td>
<td>PM14259</td>
<td>PM31828</td>
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<tr>
<td>PM03796</td>
<td>PM14686</td>
<td>PM31829</td>
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<tr>
<td>PM05613</td>
<td>PM15337</td>
<td>PM31836</td>
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<tr>
<td>PM05645</td>
<td>PM15340</td>
<td>PM34963</td>
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<td>PM05646</td>
<td>PM16236</td>
<td>PM37035</td>
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<td>PM05647</td>
<td>PM18452</td>
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<tr>
<td>PM06332</td>
<td>PM18456</td>
<td>PM42633</td>
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<td>PM06670</td>
<td>PM18458</td>
<td>PM45324</td>
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<tr>
<td>PM06773</td>
<td>PM19251</td>
<td>PM46546</td>
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<tr>
<td>PM06871</td>
<td>PM20090</td>
<td>PM48434</td>
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<td>PM09802</td>
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<td>PM10075</td>
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<td>PM10106</td>
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<td>PM56354</td>
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<td>PM10296</td>
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<td>PM59394</td>
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<td>PM11728</td>
<td>PM26057</td>
<td>PM59944</td>
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<tr>
<td>PM12867</td>
<td>PM29134</td>
<td>PM62005</td>
</tr>
<tr>
<td>PM12907</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4.2 Service Level Information

No PTFs against this release of DB2 Recovery Expert have been incorporated into the product package.

Frequently check the DB2 Recovery Expert PSP Bucket for HIPER and SPECIAL attention PTFs against all FMIDs that you must install. You can also receive the latest HOLDDATA, then add the \texttt{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 DB2 Recovery Expert. 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 DB2 Recovery Expert.

5.1.1 Machine Requirements

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

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

5.2 Target System Requirements

This section describes the environment of the target system required to install and use DB2 Recovery Expert.

DB2 Recovery Expert installs in the DBS (P115) SREL.

5.2.1 Machine Requirements

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

5.2.2 Programming Requirements

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

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

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.

DB2 Recovery Expert has no mandatory installation requisites.

DB2 Recovery Expert has no conditional installation requisites.

<table>
<thead>
<tr>
<th>Program Number</th>
<th>Product Name</th>
<th>Minimum VRM</th>
<th>Minimum Service Level will satisfy these APARs</th>
<th>Included in the shipped product?</th>
</tr>
</thead>
<tbody>
<tr>
<td>5694-A01</td>
<td>z/OS</td>
<td>V01.11.00</td>
<td>N/A</td>
<td>No</td>
</tr>
<tr>
<td>5655-G44</td>
<td>IBM SMP/E for z/OS</td>
<td>V03.05.00</td>
<td>N/A</td>
<td>No</td>
</tr>
</tbody>
</table>

### Figure 8. Driving System Software Requirements
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. These products are specified as PREs or REQs.

Figure 9. Target System Mandatory Operational Requisites

<table>
<thead>
<tr>
<th>Program Number</th>
<th>Product Name and Minimum VRM/Service Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>5655-V93</td>
<td>IBM Tools Base For z/OS V01.03.00* - HTCZ110, (IBM Tools Customizer for z/OS)</td>
</tr>
<tr>
<td>Any one of the following:</td>
<td></td>
</tr>
<tr>
<td>5625-DB2</td>
<td>DB2 V08.01.00</td>
</tr>
<tr>
<td>5697-N29</td>
<td>DB2 VUE V08.01.00</td>
</tr>
<tr>
<td>5635-DB2</td>
<td>DB2 V09.01.00</td>
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<td>5697-P31</td>
<td>DB2 VUE V10.01.00</td>
</tr>
<tr>
<td>Any one of the following:</td>
<td></td>
</tr>
<tr>
<td>5655-K61</td>
<td>DB2 Utilities Suite V08.01.00 If running DB2 V08.01.00</td>
</tr>
<tr>
<td>5655-N97</td>
<td>DB2 Utilities Suite V09.01.00 If running DB2 V09.01.00</td>
</tr>
<tr>
<td>5655-V41</td>
<td>DB2 Utilities Suite V10.01.00 If running DB2 V10.01.00</td>
</tr>
</tbody>
</table>

Note: *IBM Tools Base for z/OS, (5655-V93) is a mandatory operational requisite for DB2 Recovery Expert. IBM Tools Base for z/OS is a no-charge product that must be separately ordered. Tools Base contains IBM Tools Customizer for z/OS, FMID HTCZ110, which must be installed in order to customize DB2 Recovery Expert. Refer to the IBM Tools Base for z/OS, Program Directory (GI10-8819) for installation instructions.

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.

Figure 10 (Page 1 of 2). Target System Conditional Operational Requisites

<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 V01.11.00 or higher, DFSMShsm, DFSMSdss and FlashCopy V01.00.00</td>
<td>Use of FlashCopy system level backups requires FlashCopy 1</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.

DB2 Recovery Expert has no toleration/coexistence requisites.

### 5.2.2.4 Incompatibility (Negative) Requisites:

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

DB2 Recovery Expert has no negative requisites.

### 5.2.3 DASD Storage Requirements

DB2 Recovery Expert libraries can reside on all supported DASD types.

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

---

**Figure 10 (Page 2 of 2). Target System Conditional Operational Requisites**

<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 V01.11.00 or higher, DFSMShsm, DFSMSdss and FlashCopy V02.00.00</td>
<td>z/OS 1.11 is required for object level recovery using system level backups (DB2 System Backup and FlashCopy Backups). Object Level Recovery using FlashCopy system level backups require FlashCopy 2.</td>
</tr>
<tr>
<td>5694-A01</td>
<td>z/OS V01.11.00 or higher, DFSMSdss Encryption Facility</td>
<td>DFSMSdss requirement to perform encryption during offloads</td>
</tr>
<tr>
<td>5694-A01</td>
<td>z/OS V01.11.00 or higher, IBM Cryptographic Services Facility (ICSF)</td>
<td>DFSMSdss requirement to perform encryption during offloads</td>
</tr>
<tr>
<td>n/a</td>
<td>EMC Symmetrix 6 or later running with microcode 5x67 or later</td>
<td>Required for BVC and SNAP backups</td>
</tr>
<tr>
<td>n/a</td>
<td>Microcode 5x67 with patch 14882, 5x68 with patch 18954, or 5x69, or later, for use of Enginuity Consistency Assist (ECA).</td>
<td>Required for BVC and SNAP backups</td>
</tr>
<tr>
<td>n/a</td>
<td>The EMC SNAP library must be level 5.5, or later, to use ECA with SNA</td>
<td>Required for BVC and SNAP backups</td>
</tr>
<tr>
<td>5655-T59</td>
<td>DB2 Automation Tool V03.01 or later</td>
<td></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 Figure 12 on page 17 and Figure 13 on page 18.

3. All target and distribution libraries listed have the following attributes:
   - The default name of the data set can be changed.
   - The default block size of the data set can be changed.
   - The data set can be merged with another data set that has equivalent characteristics.
   - The data set can be either a PDS or a PDSE, except for SARYLOAD and AARYLOAD, which must be PDSEs.

4. All target libraries listed have the following attributes:
   - These data sets can be SMS-managed, but they are not required to be SMS-managed.
   - These data sets are not required to reside on the IPL volume.

---

<table>
<thead>
<tr>
<th>Library Type</th>
<th>Total Space Required in 3390 Trks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target</td>
<td>5474</td>
</tr>
<tr>
<td>Distribution</td>
<td>6599</td>
</tr>
</tbody>
</table>

DB2 Recovery Expert Program Directory
The values in the "Member Type" column are not necessarily the actual SMP/E element types that are identified in the SMPMCS.

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

- These data sets can 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.
- DB2 Recovery Expert requires that the SMPLTS data set must be a PDSE. If your existing SMPLTS is a PDS, you will need to allocate a new PDSE and copy your existing SMPLTS into it and then change the SMPLTS DDDEF entry to indicate the new PDSE data set.

The following figures describe the target and distribution libraries and file system paths required to install DB2 Recovery Expert. The storage requirements of DB2 Recovery Expert 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.

<table>
<thead>
<tr>
<th>Library DDNAME</th>
<th>Member Type</th>
<th>Target Type</th>
<th>Target Volume</th>
<th>R E C M</th>
<th>L E C M</th>
<th>No. of Trks</th>
<th>No. of Blks</th>
</tr>
</thead>
<tbody>
<tr>
<td>SARYDBRM</td>
<td>MAC</td>
<td>Any</td>
<td>U PDS FB</td>
<td>80</td>
<td>93</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>SARYDENU</td>
<td>SAMP</td>
<td>Any</td>
<td>U PDS FB</td>
<td>80</td>
<td>101</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>SARYEXP</td>
<td>DATA</td>
<td>Any</td>
<td>U PDS FB</td>
<td>80</td>
<td>59</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>SARYGUIW</td>
<td>DATA</td>
<td>Any</td>
<td>U PDS FB</td>
<td>80</td>
<td>63</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>SARYLOAD</td>
<td>MOD</td>
<td>Any</td>
<td>U PDSE U</td>
<td>0</td>
<td>4751</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>SARYMENU</td>
<td>MSG</td>
<td>Any</td>
<td>U PDS FB</td>
<td>80</td>
<td>28</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>SARYNOTC</td>
<td>DATA</td>
<td>Any</td>
<td>U PDS VB</td>
<td>133</td>
<td>11</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>SARYPENU</td>
<td>PNL</td>
<td>Any</td>
<td>U PDS FB</td>
<td>80</td>
<td>195</td>
<td>117</td>
<td></td>
</tr>
<tr>
<td>SARYSAMP</td>
<td>SAMP</td>
<td>Any</td>
<td>U PDS FB</td>
<td>80</td>
<td>142</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>SARYSLIB</td>
<td>SKL</td>
<td>Any</td>
<td>U PDS FB</td>
<td>80</td>
<td>25</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>SARYTENU</td>
<td>TBL</td>
<td>Any</td>
<td>U PDS FB</td>
<td>80</td>
<td>6</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>
5.3 FMIDs Deleted

Installing DB2 Recovery Expert 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 DB2 Recovery Expert 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

Non-z/OS Hardware and Software Requirements: Refer to the DB2 Recovery Expert for z/OS User’s Guide, SC19-3687 for detailed information about the non-z/OS hardware and software requirements for this product.

Note: DB2 Recovery Expert uses the "partitioned data set extended" or PDSE format for our SARYLOAD target library. There are some operational differences between PDS and PDSE data sets. The PDS format may be shared by more than one z/OS system and no special precautions are necessary. However the PDSE format may only be shared by z/OS systems which are part of a sysplex or which are connected using Global Resource Serialization or GRS ring. If z/OS systems share use of a PDSE data
set outside of a sysplex or GRS environment, you may experience severe problems when the data set is updated. This is due to the fact that PDSE directory information is cached in storage, and when the data set is updated from one system the other system(s) have no knowledge of the update, and their cached directory information will be incorrect.

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

**Note:** If DB2 Recovery Expert for z/OS V03.01.00 is being installed into an SMP/E zone that contains an earlier version of DB2 Recovery Expert for z/OS and the same data set names are being used then the following data sets must be reallocated with larger space allocation sizes:

- SARYEXP
- AARYEXP
- SARYPENU
- AARYPENU

Also the following data set must be reallocated with new DCB attributes:

- SARYGUIW
6.0 Installation Instructions

This chapter describes the installation method and the step-by-step procedures to install and to activate
the functions of DB2 Recovery Expert.

Please note the following points:

- If you want to install DB2 Recovery Expert 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 DB2 Recovery Expert

6.1.1 SMP/E Considerations for Installing DB2 Recovery Expert

Use the SMP/E RECEIVE, APPLY, and ACCEPT commands to install this release of DB2 Recovery
Expert.

6.1.2 SMP/E Options Subentry Values

The recommended values for certain SMP/E CSI subentries are shown in Figure 14. 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 SMP/E CALLLIBS Processing

DB2 Recovery Expert uses the CALLLIBS function provided in SMP/E to resolve external references during installation. When DB2 Recovery Expert is installed, ensure that DDDEFs exist for the following libraries:

- SCEELKED
- SCEEBND2
- SCEELIB
- SCEEOBJ
- SCEECPP
- SCSFMOD0
- SCLBSID
- CSSLIB
- SISPLOAD

Note: CALLLIBS uses the previous DDDEFs only to resolve the link-edit for DB2 Recovery Expert. These data sets are not updated during the installation of DB2 Recovery Expert.

6.1.4 Sample Jobs

The following sample installation jobs are provided as part of the product to help you install DB2 Recovery Expert:

<table>
<thead>
<tr>
<th>Job Name</th>
<th>Job Type</th>
<th>Description</th>
<th>RELFILE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARYALA</td>
<td>SMP/E</td>
<td>Sample job to allocate and initialize a new SMP/E CSI data set (Optional)</td>
<td>IBM.H30R310.F4</td>
</tr>
<tr>
<td>ARYALB</td>
<td>SMP/E</td>
<td>Sample job to allocate SMP/E data sets (Optional)</td>
<td>IBM.H30R310.F4</td>
</tr>
<tr>
<td>ARYRECEV</td>
<td>RECEIVE</td>
<td>Sample RECEIVE job</td>
<td>IBM.H30R310.F4</td>
</tr>
<tr>
<td>ARYREC1</td>
<td>RECEIVE</td>
<td>Sample RECEIVE job for Edition identifier module</td>
<td>IBM.H30RKN0.F3</td>
</tr>
<tr>
<td>ARYALLOC</td>
<td>ALLOCATE</td>
<td>Sample job to allocate target and distribution libraries</td>
<td>IBM.H30R310.F4</td>
</tr>
<tr>
<td>ARYDDDEF</td>
<td>DDDEF</td>
<td>Sample job to define SMP/E DDDEFs</td>
<td>IBM.H30R310.F4</td>
</tr>
<tr>
<td>ARYAPPLY</td>
<td>APPLY</td>
<td>Sample APPLY job</td>
<td>IBM.H30R310.F4</td>
</tr>
<tr>
<td>ARYAPP1</td>
<td>APPLY</td>
<td>Sample APPLY job for Edition identifier module</td>
<td>IBM.H30RKN0.F3</td>
</tr>
<tr>
<td>ARYACCEP</td>
<td>ACCEPT</td>
<td>Sample ACCEPT job</td>
<td>IBM.H30R310.F4</td>
</tr>
<tr>
<td>ARYACC1</td>
<td>ACCEPT</td>
<td>Sample ACCEPT job for Edition identifier module</td>
<td>IBM.H30RKN0.F3</td>
</tr>
</tbody>
</table>
You can access the sample installation jobs by performing an SMP/E RECEIVE (refer to 6.1.7, “Perform SMP/E RECEIVE” on page 23) then copy the jobs from the RELFILES to a work data set for editing and submission. See Figure 15 to find the appropriate relfile data set.

You can also copy the sample installation jobs from the tape or product files by submitting the following job. Depending on your distribution medium, use either the //TAPEIN or the //FILEIN DD statement and comment out or delete the other statement. Before you submit the job, add a job card and change the lowercase parameters to uppercase values to meet the requirements of your site.

```plaintext
//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.H30R310.F4,UNIT=tunit, 
//* VOL=SER=volser,LABEL=(x,SL), 
//* DISP=(OLD,KEEP) 
//TAPEIN2 DD DSN=IBM.H30RKNO.F3,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.H30R310.F4,UNIT=tunit, 
//* VOL=SER=(30R310,30R31A),LABEL=(5,SL), 
//* DISP=(OLD,KEEP) 
//TAPEIN2 DD DSN=IBM.H30RKNO.F3,UNIT=tunit, 
//* VOL=SER=30RKNO,LABEL=(4,SL), 
//* DISP=(OLD,KEEP)

//******************************************************************************
// Make the //FILEIN DD statement below active for * 
// downloaded DASD files. *
//******************************************************************************
//FILEIN DD DSN=IBM.H30R310.F4,UNIT=SYSALLDA,DISP=SHR, 
//* VOL=SER=filevol 
//FILEIN2 DD DSN=IBM.H30RKNO.F3,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)) 
//SYSSIN DD *
COPY INDD=xxxxIN,OUTDD=OUT
SELECT MEMBER=(ARYACCEP,ARYALA,ARYALB,ARYALLOC,ARYAPPLY)
```
In the sample above, update the statements as noted below:

If using TAPEIN/TAPEIN2:

- **tunit** is the unit address where the product tape is mounted
- **volser** is the volume serial matching the product tape
- **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.H30R310.F4 and IBM.H30RKN0.F3 are on the tape.

If using FILEIN/FILEIN2:

- **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 will be stored
- **dasdvol** is the volume serial of the DASD device where the output data set will reside

**SYSIN**

- **xxxxIN** is either TAPEIN or FILEIN depending on your input DD statement.
- **yyyyIN2** is either TAPEIN2 or FILEIN2 depending on your input DD statement.

### 6.1.5 Allocate SMP/E CSI (Optional)

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

If you are allocating a new SMP/E data set for this install, edit, and submit sample job ARYALA to allocate the SMP/E data set for DB2 Recovery Expert. 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 Initialize CSI zones (Optional)

Edit and submit sample job ARYALB to initialize SMP/E zones for DB2 Recovery Expert. 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 Perform SMP/E RECEIVE

If you have obtained DB2 Recovery Expert as part of a CBPDO, use the RCVPDO job in the CBPDO RIMLIB data set to receive the DB2 Recovery Expert 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 ARYRECEV to perform the SMP/E RECEIVE for DB2 Recovery Expert. Consult the instructions in the sample job for more information.
6.1.8 Allocate SMP/E Target and Distribution Libraries

Edit and submit sample job ARYALLOC to allocate the SMP/E target and distribution libraries for DB2 Recovery Expert. Consult the instructions in the sample job for more information.

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

6.1.9 Create DDDEF Entries

Edit and submit sample job ARYDDDEF to create DDDEF entries for the SMP/E target and distribution libraries for DB2 Recovery Expert. 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 jobs ARYAPPLY and ARYAPP1 to perform an SMP/E APPLY CHECK for DB2 Recovery Expert and DB2 Recovery Expert Edition Identifier Module, respectively. Consult the instructions in the sample jobs for more information.

The latest HOLDDATA is available through several different portals, including http://service.software.ibm.com/holddata/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

```plaintext
APPLY S(fmid,fmid,...) CHECK
FORFMID(fmid,fmid,...)
SOURCEID(RSU/c5197)
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.

```plaintext
APPLY S(fmid,fmid,...) CHECK
FORFMID(fmid,fmid,...)
SOURCEID(RSU/c5197)
FIXCAT(IBM.ProductInstall-RequiredService)
GROUPEXTEND
BYPASS(HOLDCLASS(HIPER)).
```

This method is the 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 MISSINFIX 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.

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.
6.1.11 Perform SMP/E ACCEPT

Edit and submit sample jobs ARYACCEP and ARYACC1 to perform an SMP/E ACCEPT CHECK for DB2 Recovery Expert and DB2 Recovery Expert Edition Identifier Module, respectively. Consult the instructions in the sample jobs 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 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 Commands book for details.

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

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

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

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

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

6.1.12 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 DB2 Recovery Expert, 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 DB2 Recovery Expert

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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7.2 Other Notices

NOTICES.TXT can be found in member ARYNOTEC in the SARYNOTC data set.
**Reader’s Comments**

**Program Directory for IBM DB2 Recovery Expert for z/OS, May 2012**

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<table>
<thead>
<tr>
<th>RATING SCALE</th>
<th>very satisfied</th>
<th>very dissatisfied</th>
<th>not applicable</th>
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<tr>
<th>Satisfaction</th>
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<tr>
<td>Ease of product installation</td>
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<tr>
<td>Contents of Program Directory</td>
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<tr>
<td>Installation Verification Programs</td>
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<td>Time to install the product</td>
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<td>Readability and organization of Program Directory tasks</td>
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<td>Necessity of all 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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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?

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No

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