Program Directory for
DB2 11 for z/OS

V11.01.00
Program Number 5615-DB2

for Use with
z/OS
Service Updated PDO 1328

Document Date: October 2013

GI10-8945-00
Note

Before using this information and the product it supports, be sure to read the general information under Appendix C, “Notices” on page 84.

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## Contents

1.0 Introduction  ................................................................. 1
  1.1 DB2 11 Description .................................................... 1
  1.2 DB2 11 FMIDs ............................................................. 2

2.0 Program Materials .......................................................... 3
  2.1 Basic Machine-Readable Material ....................................... 3
  2.2 Optional Machine-Readable Material .................................... 5
    2.2.1 Basic Program Publications ...................................... 5
    2.2.2 Optional Program Publications .................................. 7
  2.3 Program Source Materials ............................................. 7
  2.4 Publications Useful During Installation ............................. 7

3.0 Program Support ............................................................. 8
  3.1 Program Services ....................................................... 8
  3.2 Preventive Service Planning ........................................... 8
  3.3 Statement of Support Procedures ..................................... 9

4.0 Program and Service Level Information .................................. 11
  4.1 Program Level Information ............................................ 11
  4.2 Service Level Information ............................................ 11

5.0 Installation Requirements and Considerations .......................... 12
  5.1 Driving System Requirements ......................................... 12
    5.1.1 Machine Requirements ........................................... 12
    5.1.2 Programming Requirements ...................................... 12
  5.2 Target System Requirements ........................................... 13
    5.2.1.1 Processors .................................................... 13
    5.2.1.2 Auxiliary Storage ............................................ 14
    5.2.1.3 Data Communication Devices .................................. 14
    5.2.1.4 Function-Dependent Hardware Requirements ................. 14
    5.2.1.5 Virtual Storage Requirements ................................ 15
    5.2.2 Programming Requirements ...................................... 15
      5.2.2.1 Installation Requisites ...................................... 16
      5.2.2.2 Operational Requisites ...................................... 16
      5.2.2.3 Optional Program Requirements .............................. 19
      5.2.2.4 Toleration/Coexistence Requisites .......................... 23
      5.2.2.5 Incompatibility (Negative) Requisites ....................... 23
    5.2.3 DASD Storage Requirements ...................................... 23
  5.3 FMIDs Deleted ......................................................... 28
  5.4 Special Considerations ................................................ 28
  5.5 Migration, Fallback, and Remigration ................................ 28

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### 6.0 Installation Instructions

#### 6.1 Installing DB2 11

- **6.1.1 SMP/E Considerations for Installing DB2 11**
- **6.1.2 SMP/E Options Subentry Values**
- **6.1.3 SMP/E CALLLIBS Processing**
- **6.1.4 Sample Jobs**
  - **6.1.4.1 Special Considerations**
- **6.1.5 Allocate CSI and SMP/E Control data sets**
- **6.1.6 Perform SMP/E RECEIVE**
- **6.1.7 Allocate SMP/E Target and Distribution Libraries**
- **6.1.8 Allocate File system Paths**
- **6.1.9 Create DDDEF Entries**
- **6.1.10 Perform SMP/E APPLY**
- **6.1.11 Perform SMP/E ACCEPT**
- **6.1.12 Run REPORT CROSSZONE**
- **6.1.13 Cleaning Up Obsolete Data Sets, Paths, and DDDEFs**

#### 6.2 Activating DB2 11

- **6.2.1 File System Execution**
- **6.2.2 Set Up Controls for English Panel Selection**
  - **6.2.2.1 Logon Procedures**
  - **6.2.2.2 Language-switching CLISTs**

### Appendix A. Included PTFs for DB2 11

- **A.1 Included PTFs for FMID HDBBB10**
- **A.2 Included PTFs for FMID HIR2230**
- **A.3 Included PTFs for FMID HIYBB10**
- **A.4 Included PTFs for FMID HIZBB10**

### Appendix B. HOLD DATA for PTFs integrated in the product tape

### Appendix C. Notices

- **C.1 Trademarks**

### Reader's Comments

### Figures

1. Program File Content: DB2 Base
2. Program File Content: IRLM V02.03.00
3. Program File Content: DB2 JDBC/SQLJ
4. Program File Content: DB2 Kanji Panels
5. Basic Material: Unlicensed Publications
6. Basic Material: Licensed Publications ................................... 6
7. Basic Material: Other Unlicensed or Licensed Publications ...................... 6
8. Publications Useful During Installation .................................. 7
9. PSP Upgrade and Subset ID ........................................ 8
10. Component IDs .................................................. 10
11. Driving System Software Requirements ................................ 13
12. Target System Mandatory Installation Requisites ............................ 16
13. Target System Mandatory Operational Requisites ......................... 16
14. Target System Conditional Operational Requisites ......................... 17
15. Total DASD Space Required by DB2 11 .................................. 23
16. Storage Requirements for SMP/E Data Sets ............................... 25
17. Storage Requirements for DB2 11 Target Libraries ........................... 25
18. DB2 11 File System Paths ......................................... 26
19. Storage Requirements for DB2 11 Distribution Libraries ................. 27
20. SMP/E Options Subentry Values ..................................... 29
21. Sample Installation Jobs .......................................... 30

Figures  V
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 DB2 11 for z/OS. This publication refers to DB2 11 for z/OS as DB2 11.

The Program Directory contains the following sections:

- 2.0, “Program Materials” on page 3 identifies the basic and optional program materials and documentation for DB2 11.
- 3.0, “Program Support” on page 8 describes the IBM support available for DB2 11.
- 4.0, “Program and Service Level Information” on page 11 lists the APARs (program level) and PTFs (service level) that have been incorporated into DB2 11.
- 5.0, “Installation Requirements and Considerations” on page 12 identifies the resources and considerations that are required for installing and using DB2 11.
- 6.0, “Installation Instructions” on page 29 provides detailed installation instructions for DB2 11. It also describes the procedures for activating the functions of DB2 11, or refers to appropriate publications.

Before installing DB2 11, 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 11 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 11 are included on the CBPDO tape.

Do not use this program directory if you install DB2 11 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 11 Description

- DB2 Base

DB2 is a relational database management system for z/OS. In a relational database, data is perceived to exist in one or more tables, each containing a specific number of columns and a number of unordered rows. Each column in a row is related in some way to the other columns. Thinking of the data as a collection of tables gives you an easy way to visualize the stored data and enables you to explain your needs in easy-to-understand terms.

DB2 operates as a formal subsystem of z/OS. DB2 utilities run in the batch environment, and applications that access DB2 resources can run in the batch, TSO, IMS, WebSphere™ or CICS™
environments. Utilities can also run via stored procedure. IBM provides attachment facilities to connect DB2 to each of these environments and for distributed connections.

- **IRLM V02.03.00**
  The Internal Resource Lock Manager (IRLM) is distributed with and is required by DB2 11. IRLM is responsible for managing all requests for locks and for controlling access to both DB2 and IMS databases.

### 1.2 DB2 11 FMIDs

DB2 11 consists of the following FMIDs:

1. **Required FMIDs:**
   - HDBBB10 (DB2 Base)
   - HIYBB10 (IMS Attach - must be installed even if you do not have IMS)
   - HIZBB10 (Subsystem Initialization)
   - HIR2230 (IRLM V02.03.00)
   - HDREB10 (DB2 RACF Authorization Exit)
   - JDBBB14 (DB2 English Panels)

2. **Optional FMIDs:**
   - JDBBB12 (DB2 JDBC/SQLJ)
   - JDBBB17 (DB2 ODBC)
   - JDBBB11 (DB2 Kanji Panels, delivered with Japanese feature)
2.0 Program Materials

An IBM program is identified by a program number. The program number for DB2 11 is 5615-DB2.

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 11. 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 29 for more information about how to install the program.

You can find information about the physical media for the basic machine-readable materials for DB2 11 in the CBPDO Memo To Users Extension.

---

NOTE

If DB2 11 was shipped to you in a CBPDO, you need to refer to the CBPDO Memo To Users Extension for the physical tape layout of the basic machine-readable materials.

---

Figure 1 describes the program file content for DB2 11. 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.

---

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© Copyright IBM Corp. 1982, 2013
### Figure 1 (Page 2 of 2). Program File Content: DB2 Base

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### Figure 2. Program File Content: IRLM V02.03.00

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### Figure 3 (Page 1 of 2). Program File Content: DB2 JDBC/SQLJ

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</table>
2.2 Optional Machine-Readable Material

No optional machine-readable materials are provided for DB2 11.

2.2.1 Basic Program Publications

Figure 5 identifies the basic unlicensed program publications for DB2 11. One copy of each of these publications is included when you order the basic materials for DB2 11. These publications are also available at the Information Management Software for z/OS Solutions Information Center at URL: http://pic.dhe.ibm.com/infocenter/dzichelp/v2r2/index.jsp

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Figure 4. Program File Content: DB2 Kanji Panels

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</table>
Figure 6 on page 6 identifies the basic licensed program publication for DB2 11. The first copy is available on the DB2 for z/OS Licensed Product Kit (LK5T-8882) to licensees who ordered the basic materials for DB2 11. It is also available as member DSNDR in target library SDSNIVPD.

An asterisk (*) beside the Form Number indicates that it contains “Restricted Materials of IBM.”

<table>
<thead>
<tr>
<th>Publication Title</th>
<th>Form Number</th>
<th>Location</th>
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<tr>
<td>DB2 11 for z/OS Diagnosis Guide and Reference</td>
<td>LY37-3222*</td>
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Figure 7 identifies the basic unlicensed publications that are not available in hardcopy format, but are available through the internet or other media for DB2 11. For more information, refer to the Information Management Software for z/OS Solutions Information Center at URL: http://pic.dhe.ibm.com/infocenter/dzichelp/v2r2/index.jsp

**Note:** These publications are also provided on the “DB2 11 for z/OS Licensed Library Product Kit” CD-ROM, LKST-8882.

<table>
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<td>SC19-4050</td>
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<td>SC19-4051</td>
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<td>DB2 11 for z/OS Application Programming Guide &amp; Reference for JAVA</td>
<td>SC19-4052</td>
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<td>DB2 11 for z/OS Command Reference</td>
<td>SC19-4054</td>
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<tr>
<td>DB2 11 for z/OS Data Sharing: Planning and Administration</td>
<td>SC19-4055</td>
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<td>DB2 11 for z/OS Installation and Migration</td>
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<td>DB2 11 for z/OS IRLM Messages and Codes for IMS and DB2 for z/OS</td>
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<td>DB2 11 for z/OS pureXML Guide</td>
<td>SC19-4064</td>
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</table>
2.2.2 Optional Program Publications

No optional publications are provided for DB2 11.

2.3 Program Source Materials

No program source materials are provided for DB2 11. Users with access to View Program Listing (VPL), such as through S/390 SoftwareXcel, can use the VPL facility for online viewing of available program listings.

2.4 Publications Useful During Installation

You might want to use the publications listed in Figure 8 during the installation of DB2 11. To order copies, contact your IBM representative or visit the IBM Publications Center at http://www-05.ibm.com/e-business/linkweb/publications/servlet/pbi.wss

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<td>IBM SMP/E for z/OS Commands</td>
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<td>IBM SMP/E for z/OS Reference</td>
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<td>IBM SMP/E for z/OS Messages, Codes, and Diagnosis</td>
<td>GA22-7770</td>
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</table>
3.0 Program Support

This section describes the IBM support available for DB2 11.

3.1 Program Services

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

3.2 Preventive Service Planning

Before you install DB2 11 and IRLM 2.3, 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 34 for a sample APPLY command.

If you obtained DB2 11 as part of a CBPDO, HOLDDATA is included.

If the CBPDO for DB2 11 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 11 are included in Figure 9

<table>
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<th>UPGRADE</th>
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<td>DB2 BASE/TSO</td>
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<td>HIYBB10/1328</td>
<td>IMS ATTACH</td>
</tr>
<tr>
<td></td>
<td>HIZBB10/1328</td>
<td>DB2 SUBSYSTEM INITIALIZATION</td>
</tr>
<tr>
<td></td>
<td>HIR2230/1239</td>
<td>IRLM V02.03.00</td>
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<tr>
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<td>HDREB10</td>
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</table>
3.3 Statement of Support Procedures

The PSP SUBSET name reflects the Function Module Identifier (FMID) that was updated and the corresponding CBPDO weekly service offering used to supply the integrated PTFs.

Example: FMID/YYWW where 'YY' is the year and 'WW' is the week number the CBPDO was created.

The CBPDO weekly Service tape is the Service Level Indicator for any products updated by the Software Delivery Center (SDC) processes. If you wish to determine the latest level of PDO (Product Delivery Offering) maintenance installed in this product, please refer to the 4.0, “Program and Service Level Information” on page 11 section of this program directory.

Additionally, these upgrades contain HIPER (High Impact PERvasive) APARs and should be reviewed on a monthly basis.

Note: When pulling PTFs from IBMLink, you need to include your Service Type/Level:

Example: Service Type PDD
Service Level 1328

Authorized Program Analysis Report (APAR) fixes will be distributed as PTFs containing either object module or macro replacements with control statements used by the System Modification Program/Extended (SMP/E).

The normal process for applying maintenance to DB2 11 includes the following steps:

- Check for prerequisites and corequisites as well as additional steps that may be needed as noted in the following sections.
- Use SMP/E to receive and apply the fix.
- Perform any needed special procedures.
- Stop and start DB2 to make the fix active, as required.
- Test the fix.
- Accept the fix (after testing is complete).

Fixes to some parts of the subsystem or subsystem data may involve special procedures. For example, a BIND may be required for some changes. CLISTS and jobs that are customized during the installation process often require some additional work. When applicable, the install CLIST can be used for

<table>
<thead>
<tr>
<th>UPGRADE</th>
<th>SUBSET</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>JDBBB12</td>
<td></td>
<td>DB2 JDBC/SQLJ</td>
</tr>
<tr>
<td>JDBBB14</td>
<td></td>
<td>DB2 ENGLISH PANELS</td>
</tr>
<tr>
<td>JDBBB17</td>
<td></td>
<td>DB2 ODBC</td>
</tr>
<tr>
<td>JDBBB11</td>
<td></td>
<td>DB2 KANJI PANELS</td>
</tr>
</tbody>
</table>
customizing. If the DSN6xxxx macros are changed, the DSNZPxxx subsystem parameters load module must be reassembled and link edited. For information on assembling and link editing DSNZPxxx, refer to the description of job DSNTIJUZ in the DB2 11 for z/OS Installation and Migration.

Notification of these required special procedures will be via the SMP/E EXCLUDE list, PTF prologues, and RETAIN information. The SMP/E control statement ++HOLD will be used when there is additional work necessary to incorporate the fix into the DB2 system.

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 10 identifies the component IDs (COMPID) for DB2 11.

<table>
<thead>
<tr>
<th>Figure 10. Component IDs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FMID</strong></td>
</tr>
<tr>
<td>HDBBB10</td>
</tr>
<tr>
<td>HIYBB10</td>
</tr>
<tr>
<td>HIZBB10</td>
</tr>
<tr>
<td>HIR230</td>
</tr>
<tr>
<td>HDREB10</td>
</tr>
<tr>
<td>JDBBB12</td>
</tr>
<tr>
<td>JDBBB14</td>
</tr>
<tr>
<td>JDBBB17</td>
</tr>
<tr>
<td>JDBBB11</td>
</tr>
</tbody>
</table>

**Note:** For detailed instructions on how to use FTP to transmit documentation to/from IBM (DB2), please see APAR II11945. Additional information is also available in publication *z/OS MVS Diagnosis Tools and Service Aids* (GA22-7589).

For information about the operating system availability and withdrawal-of-service dates, please review the following web sites:

http://www-01.ibm.com/software/data/support/lifecycle/
http://www-01.ibm.com/software/support/systemsz/lifecycle/

For DB2 for z/OS specifics, please review the DB2 z/OS main Website:

http://www-01.ibm.com/software/data/db2/zos/
4.0 Program and Service Level Information

This section identifies the program and relevant service levels of DB2 11. 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.

This program is at &SER.

4.1 Program Level Information

No APARs have been incorporated into DB2 11.

4.2 Service Level Information

PTFs containing APAR fixes against this release of IRLM 2.3 have been incorporated into this product package. For a list of included PTFs, examine the ++VER statement in the product's HIR2230 SMPMCS.

Frequently check the DB2 11 PSP Bucket for HIPER and SPECIAL attention PTFs against all FMIDs that you must install. You can also receive the latest HOLDDATA, then add the FIXCAT(IBM.PRODUCTINSTALL-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 11. 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. For example, if you install DB2 11 with IRLM V2R3 in the same SMP/E zone as any version of IMS currently running with IRLM V2R2, **IRLM V2R2 will be deleted** by the installation of IRLM V2R3. IBM recommends that levels of DB2 and IMS without a note of IRLM V2R3 support in their program directory, continue to run with IRLM V2R3.

5.1 Driving System Requirements

This section describes the environment of the driving system required to install DB2 11.

5.1.1 Machine Requirements

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

5.1.2 Programming Requirements
Installation may require migration to new z/OS releases to be service supported. For more information, see http://www-03.ibm.com/systems/z/os/zos/support/index.html

5.2 Target System Requirements

This section describes the environment of the target system required to install and use DB2 11.

DB2 11 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.

5.2.1.1 Processors: DB2 11 operates on z10 or later processors running z/OS V1.13 or later. The processors must have enough real storage to satisfy the combined requirements of:

- DB2 11 for z/OS
- z/OS
- The appropriate DFSMS (tm) storage management subsystem components, access methods, telecommunications, batch requirements, and other customer required applications

DB2 11 will probably require increased real storage as compared to DB2 10 for z/OS.

The configuration must include sufficient I/O devices to support the requirements for system output, system residence, and system data sets. Sufficient disk storage must be available to satisfy the user’s information storage requirements and can consist of any direct-access facility supported by the system configuration and the programming system.
5.2.1.2 Auxiliary Storage: DB2 is independent of disk (solid state devices (SSDs)) and tape device type. You can use any magnetic, optical, or tape device that is supported by the data facilities component of DFSMS or the DB2 data sets. Tape products are not supported for databases but can be used for the DB2 archive log and utility functions.

The following DB2 data sets are supported by the following device types:

- Active recovery log data sets: disk
- Archive recovery log data sets: disk, tape
- Image copy data sets: disk, tape
- Bootstrap data sets: disk
- User data sets: disk, tape (if migrated by HSM)
- DB2 catalog data sets: disk
- Work data sets (for utilities): disk, tape

If these data sets are on disk that is shared with other z/OS systems, you should use global resource serialization to prevent concurrent access by more than one z/OS system.

The minimum disk space requirement, based on installing DB2 using the panel default values, is approximately 1.3 GB. You need additional disk space for your data.

If you use dual logging and tape for the log archiving device, you need at least two tape drives.

5.2.1.3 Data Communication Devices: DB2 operations can be controlled from:

- The system console
- Authorized IMS Transaction Manager terminals
- Authorized CICS terminals
- TSO terminals (by authorized users)

In addition to listing auxiliary storage and data communications devices, this section identifies function-dependent hardware requirements and virtual storage requirements.

5.2.1.4 Function-Dependent Hardware Requirements: Certain functions of DB2 11 for z/OS have associated hardware requirements, as specified in the following list. If you do not use these DB2 functions, the hardware requirements do not apply.

Data Sharing requires the Coupling Facility. Refer to the latest Coupling Facility (CF) level recommended for your processor at: http://www.ibm.com/systems/z/advantages/pso/cftable.html

DRDA Data Stream Encryption uses the following ICSF API's: CSNECKM, CSNERNG, CSNFPKB, CSNFPKE, CSNEENC, and CSNEDEC. Refer to z/OS ICSF Application Programmer's Guide for additional information on the usage of these API's including hardware requirements. However, if possible do not use DRDA encryption and instead secure connections by using the z/OS Communications Server IP Application Transparent Transport Layer Security (AT-TLS).
DRDA AES User ID Password Encryption uses the following ICSF API's: CSNEOWH, CSNERNG, CSNFPKB, CSNFPKE, CSNESYE, and CSNESYD. Refer to z/OS ICSF Application Programmer's Guide for additional information on the usage of these API's including hardware requirements.

DSNLEUSR uses the following ICSF API's: CSNBCKM, CSNBENC, CSNEDEC. Refer to z/OS ICSF Application Programmer's Guide for additional information on the usage of these API's including hardware requirements.

Encryption and Decryption Functions: Built-in functions for encryption and decryption require cryptographic hardware in a Cryptographic Coprocessor, Cryptographic Accelerator or Cryptographic instructions.

Group buffer pool write-around support: Group buffer pool write-around support requires coupling-facility control code (CFCC) and z/OS cross-system extended services (XES) support. The CFCC support is delivered in CFLEVEL 18 and rolled back to CFLEVEL 17. The z/OS XES support is delivered in z/OS Version 2 Release 1 and rolled back to z/OS Version 1 Release 12 and z/OS Version 1 Release 13. For z/OS Version 1 Release 13 APARs OA40966 and OA37550 are required. For more information about Coupling Facility (CF) levels, see www.ibm.com/systems/z/advantages/pso/cftable.html

2-Gigabyte frame size for buffer pools A 2-Gigabyte frame size requires zEnterprise EC12 processor and APAR OA40967 for z/OS Version 1 Release 13

Pageable 1-Megabyte large pages Pageable 1-Megabyte large pages require a zEnterprise EC12 processor and the Flash Express feature (FC 0402) plus RSM Enablement Offering (FMID JDB778H)

5.2.1.5 Virtual Storage Requirements: Most of DB2 data resides in shared memory of the DB2 address spaces, above the bar. DB2 11 requires 1 TB contiguous of 64-bit shared private storage above the 2 GB bar for each DB2 subsystem. This storage is virtual, controlled by the z/OS HVSHARE parameter in IEASYSxx. This storage is not backed at allocation, only as it is used. Most control blocks and buffers reside in the extended private area above the 2 GB bar, while modules and some data resides above the 16 MB line, but below the 2 GB bar.

The amount of space needed for the common service area (CSA) below the 16 MB line is less than 40 KB for each DB2 for z/OS subsystem and 24 KB for each IRLM subsystem. High concurrent activity, parallelism, or high contention can require more E/CSA. The amount of 64-bit above the bar common storage needed for each DB2 subsystem is a minimum of 6 GB contiguous controlled by the z/OS HVCOMMON parameter in IEASYSxx.

DB2 11 requires that data sets for the catalog and directory reside on SMS-managed storage. These data sets must belong to an SMS data class that is defined with the extended addressability (EA) attribute. See prefix.SDSNSAMP(DSNTIJSS) for a sample SMS environment.

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.

<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 this product’s shipment?</th>
</tr>
</thead>
<tbody>
<tr>
<td>5694-A01</td>
<td>z/OS (DFSMS, LE Base Services, Security Server/RACF)</td>
<td>V01.13.00</td>
<td>N/A</td>
<td>No</td>
</tr>
<tr>
<td>5650-ZOS</td>
<td>z/OS (DFSMS, LE Base Services, Security Server/RACF)</td>
<td>V02.01.00</td>
<td>N/A</td>
<td>No</td>
</tr>
</tbody>
</table>

**Note:** If DB2 11 is installed with IRLM V2R3 into the same SMP/e zone as any version of IMS with IRLM V2R2, IRLM V2R2 will be deleted during the SMP/E installation of IRLM V2R3.

**Note:** Installation might require migration to new z/OS releases to be service supported. See the following website for more information:
http://www-03.ibm.com/systems/z/os/zos/support/index.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.

DB2 11 has no conditional installation requisites.

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

Mandatory operational requisites identify products that are required for this product to operate its basic functions. These products are specified as PREs or REqs.

<table>
<thead>
<tr>
<th>Program Number</th>
<th>Product Name and Minimum VRM/Service Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>5615-DB2</td>
<td>DB2 11 for z/OS, DB2 base APAR PM93577</td>
</tr>
<tr>
<td>5615-DB2</td>
<td>DB2 11 for z/OS, IRLM 2.3, plus APARs PM84765 and PM85053</td>
</tr>
</tbody>
</table>
Note:

- New functions are available only in new-function mode (NFM) unless explicitly stated otherwise in the product documentation. A general exception exists for optimization and virtual storage.
- z/OS Unicode Services and appropriate conversion definitions are required. For additional information on Unicode conversions, please see the *DB2 11 for z/OS Installation and Migration, GC19-4056* and also *Support for Unicode: Using Conversion Services, SA22-7649*.
- Some of the basic operation of a DBMS is provided by utility functions, such as backup, recovery, reorganization, loading and unloading data, gathering statistics and checking data, indexes, and large objects. Customers should ensure that these functions are provided either by ordering DB2 Utilities Suite for z/OS, V11.1 (5655-W87) or by obtaining equivalent function elsewhere.

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 13 (Page 2 of 2). 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>Any one of the following:</td>
<td></td>
</tr>
<tr>
<td>5694-A01</td>
<td>z/OS (DFSMS, LE Base Services, Security Server/RACF) V01.13.00</td>
</tr>
<tr>
<td>5650-ZOS</td>
<td>z/OS (DFSMS, LE Base Services, Security Server/RACF) V02.01.00</td>
</tr>
</tbody>
</table>

### Figure 14 (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 V01.13.00 (LE in Base Services)</td>
<td>Application Execution: Applications written in high-level programming languages, such as applications or stored procedures written in the C language and using the ODBC or CLI interfaces to DB2</td>
</tr>
<tr>
<td>5655-N98 or 5655-N99</td>
<td>IBM SDK for z/OS, Java 2 Technology Edition V5</td>
<td>Application Execution: Applications or stored procedures written in Java, such as those using the JDBC or SQLJ interfaces to DB2</td>
</tr>
<tr>
<td>5655-N98</td>
<td>IBM SDK for z/OS, Java 2 Technology Edition</td>
<td>Decimal Float data type usage in Java (in a 31-bit environment)</td>
</tr>
<tr>
<td>5655-N99</td>
<td>IBM SDK for z/OS, Java 2 Technology Edition</td>
<td>Decimal Float data type usage in Java (in a 64-bit environment)</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>5697-A01</td>
<td>z/OS V01.13.00 APAR OA41617</td>
<td>DFSMS control block accessing support for NON_VSAM_XTIOT = YES in DEVSUPxx.</td>
</tr>
<tr>
<td>5694-A01</td>
<td>z/OS V01.13.00, APAR OA39392</td>
<td>To terminate a preemptable SRB in the -CANCEL THREAD with FORCE option</td>
</tr>
<tr>
<td>5697-A01</td>
<td>z/OS V01.13.00, APAR OA40967</td>
<td>2G page for new framesize options in DB2 11 for buffer pool</td>
</tr>
<tr>
<td>5694-A01</td>
<td>z/OS Cryptographic Services Integrated Cryptographics Service Facility (ICSF). To use Encryption you must have SCSFMODE0 in LNKLST</td>
<td>Built-in functions for Encryption and Decryption, and DRDA Data Stream Encryption</td>
</tr>
<tr>
<td>5694-A01</td>
<td>z/OS V01.13.00 -DFSMShsm -DFSMdss -FlashCopy V01 -FlashCopy V02 (required for object-level recovery from system-level backup and FlashCopy image copy)</td>
<td>System-level Point-in-Time (PIT) Backup and Recovery function</td>
</tr>
<tr>
<td>5650-ZOS</td>
<td>z/OS V02.01.00</td>
<td>Synchronous TCP/IP receive support for DB2 DDF performance improvements</td>
</tr>
<tr>
<td>5694-A01</td>
<td>z/OS V01.13.00 plus APAR OA39810</td>
<td>Synchronous TCP/IP receive support for DB2 DDF performance improvements</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>5635-A04</td>
<td>Information Management System (IMS) V13.01.00</td>
<td>Transaction Management</td>
</tr>
<tr>
<td>5635-A03</td>
<td>Information Management System (IMS) V12.01.00</td>
<td>Transaction Management</td>
</tr>
<tr>
<td>5635-A02</td>
<td>Information Management System (IMS) V11.01.00</td>
<td>Transaction Management</td>
</tr>
<tr>
<td>5655-Y04</td>
<td>Customer Information Control System (CICS) Transaction Server for z/OS V05.01.00</td>
<td>Transaction Management</td>
</tr>
<tr>
<td>5655-S97</td>
<td>Customer Information Control System (CICS) Transaction Server for z/OS V04.01.00 and V04.02.00</td>
<td>Transaction Management</td>
</tr>
<tr>
<td>5655-M15</td>
<td>Customer Information Control System (CICS) Transaction Server for z/OS V03.01.00 and V03.02.00, or later For V03.01.00 and V03.02.00, you need APAR PM01880 to return the correct Version and Release number for DB2 11</td>
<td>Transaction Management</td>
</tr>
</tbody>
</table>
5.2.2.3 Optional Program Requirements: This section describes which versions of these associated products are tolerated by DB2 11.

Connectivity:

For DB2 database applications running on Linux, UNIX, or Windows platforms, customers may access DB2 for z/OS using DB2 Connect. DB2 Connect, using either direct connection access or gateway access, provides runtime support to access DB2 by applications that use ODBC, CLI, .NET, OLE DB, PHP, Ruby, JDBC, pureQuery, JPA, SQLJ, Python, Perl, and more. They can be used alone or in combination as needed.

Accessing DB2 for z/OS using the IBM Data Server Package without the use of a DB2 Connect Server is recommended. This configuration provides significant TCO advantages along with excellent performance and improved availability for all DB2 Connect applications. To choose the right IBM Client Package for you, refer to the DB2 Connect documentation:


DB2 for z/OS supports DRDA as an open interface allowing access from any client. If you require seamless migration where your remote applications must continue to operate throughout the migration process, DB2 Connect Version 10.1 Fixpack 2 or DB2 Connect Version 9.7 Fixpack 6, or later, are recommended clients to ensure such a seamless migration when you migrate your DB2 data sharing group.

DB2 Connect Version 10.5 Fixpack 2 is the recommended level for connectivity to DB2 11 for z/OS. It is required to support some DB2 11 for z/OS features, such as:

- Array support
- Autocommit performance improvements for procedures and cursors
- Data sharing support for global variables
- Longer client information fields

DB2 11 acting as a client supports the following relational database products:

- IBM DB2 for Linux, UNIX, and Windows, 9.5 (5765-F41), or later
  - DB2 Enterprise Server (ESE) for Linux, UNIX, and Windows, V9.5 (5765-F41)
  - DB2 Express Edition for Linux, UNIX, and Windows, V9.5 (5724-E49), or later
  - Database Enterprise Developer Edition V9.5 (5724-N76), or later
- IBM DB2 for iSeries V6.1 (5761-SS1), or later
- DB2 Server for VSE & VM V7.3 (5697-F42), or later
- Any other DRDA-compliant client or relational DBMS server

Note: Any in-service level of DB2 Connect drivers or DB2 Connect server supports DB2 11 CM and DB2 11 NFM
Web connectivity is provided by any of the DB2 Connect clients using one of the IBM Data Server clients or drivers.

For DB2 support services, refer to:

http://www-zero1.ibm.com/software/data/db2/db2connect

**JDBC:**

DB2 11 supports the following JDBC Application Programming Interface specification levels:

- **JDBC 3.0 API** requires any of the following at runtime:
  - IBM 31-bit SDK for z/OS, Java 2 Technology Edition, V5 (SDK5) (5655-N98), or later
  - IBM 64-bit SDK for z/OS, Java 2 Technology Edition, V5 (SDK5) (5655-N99), or later

- **JDBC 4.0 API** requires any of the following at runtime:
  - IBM 31-bit SDK for z/OS, Java 2 Technology Edition, V6 (SDK6) (5655-R31), or later
  - IBM 64-bit SDK for z/OS, Java 2 Technology Edition, V6 (SDK6) (5655-R32), or later

For more information, refer to


**Development Tools:** The following application development tools can be used to build applications for DB2:

- InfoSphere Optim Configuration Manager for DB2 for z/OS V3.1, (5655-AA3)
- IBM Data Studio V4, available from the web at:

**Note:** The recommended no-charge query optimization and service tool for DB2 11 is Data Studio. With Data Studio, DB2 for z/OS customers have a no-charge query serviceability tool for DB2 for z/OS.

**Query support:** The following query programs work with DB2:

- DataQuant for z/OS Version 1 Release 2 (5697-N64), or later
- Query Management Facility (QMF) family of products, Version 9, 10, 11
- Cognos BI Server, Version 10 Release 2 (5724-W12)

**Programming Languages**

The following application development programming languages can be used to build applications for DB2 11:

- **Building applications by using the DB2 precompiler:**
  - **Assembler** High Level Assembler, part of the System Services element of z/OS
  - **C/C++** C/C++ (without Debug Tool), which is an optional priced feature of z/OS
  - **COBOL** Enterprise COBOL for z/OS, V3.4 (5655-G53), or Enterprise COBOL for z/OS, V4.1, (5655-S71), or later, or Enterprise COBOL for z/OS, V5.1, (5655-W32)
For Fortran, VS Fortran V2.6 (5668-806, 5688-087, 5668-805) Note: New data types and new SQL functions are not supported since DB2 9 for z/OS.

For PL/I, Enterprise PL/I for z/OS, V3.9 (5655-H31), or Enterprise PL/I for z/OS, V4.1 (5655-W67), or later

- Building applications using unsupported compilers:

  For some COBOL and PL/I compilers that are no longer supported since Version 8, you can use a DSNHPC7 version of the precompiler that allows you to precompile you to precompile applications that have dependencies on these unsupported compilers, but only use DB2 for z/OS Version 7 SQL.

  The use of DSNHPC7 is as is.

- Building applications by using the DB2 coprocessor:

  C/C++ C/C++ (without Debug Tool), which is an optional priced feature of z/OS

  COBOL Enterprise COBOL for z/OS V3.4, (5655-G53), or Enterprise COBOL for z/OS, V4.1, (5655-S71), or later, or Enterprise COBOL for z/OS, V5.1, (5655-W32)

  PL/I Enterprise PL/I for z/OS, V3.9 (5655-H31), or Enterprise PL/I for z/OS V4.1, (5655-W67), or later

- Building applications that are not supported with a precompiler or coprocessor:

  Java Applications or stored procedures written in Java, such as those using the JDBC or SQLJ interfaces to DB2, require the IBM 31-bit SDK for z/OS, Java 2 Technology Edition V5 (5655-N98), or later, at run time. Optionally, the following may be used for applications written in Java (not including Java stored procedures), IBM 64-Bit SDK for z/OS, Java 2 Technology Edition, Version 5 (SDK5, 5655-N99), or later, at run time. 5655-N98 and 5655-N99 are independent products and can co-exist on the same z/OS system.

  REXX z/OS V1R13.0 TSO/REXX Reference (5694-A01)

SQL Procedure Language

Native SQL Procedure Language

External SQL Procedure Language, which requires a C language compiler

APL2 Mainframe APL2 V2.2 (5688-228) (full APL2) or APL2 Application Environment (5688-229)

Operational Support:

The following programs provide operational support for DB2 11:

- DFSMS features, part of the Systems Management optional feature of z/OS, specifically:
  - DFSMSshsm for archiving
  - DFSMSdss for concurrent copy in Utilities

Tools Support:

Refer to the IBM Data Management Tools website for the complete list of IBM products
Refer to the Information Management Tools and DB2 11 Compatibility website for applicable tools service requirements to support DB2 11:


IBM Tools for Database Administration and System Management Support, including the following tools:

- DB2 Administration Tool for z/OS, V10.2 (5655-W34)
- DB2 Object Comparison Tool for z/OS, V10.2 (5655-W36), plus APAR PM81174
- InfoSphere Guardium Data Encryption for IMS and DB2 Databases, V1.2 (5655-P03)

IBM Tools for Database Application Management, including the following tools:

- IBM DB2 Bind Manager for z/OS, V2.4 (5655-E43), plus APAR PM78883
- IBM DB2 Path Checker for z/OS, V4.1 (5697-Q01), plus APAR PM82461
- IBM DB2 Table Editor for z/OS, V4.4 (5697-G65), plus APAR PM75144
- InfoSphere Optim pureQuery Runtime for z/OS V3.3, (5655-W92)

IBM Tools for Database Recovery, including the following tools:

- IBM DB2 Change Accumulation Tool for z/OS, V3.1 (5697-P45), plus APAR PM75396
- IBM DB2 Log Analysis Tool for z/OS, V3.4 (5655-T56)
- IBM DB2 Recovery Expert for z/OS, V3.1 (5655-W78), plus APARS PM75735 and PM82261

IBM Tools for Performance Management, including the following tools:

- DB2 Query Monitor for z/OS, V3.1 (5655-V42), plus APAR PM75732
- DB2 SQL Performance Analyzer for z/OS, V4.1 (5655-W60), plus APAR PM59925
- InfoSphere Optim Query Workload Tuner for DB2 for z/OS, V4.1, (5655-AA4)
- IBM Tivoli OMEGAMON XE for DB2 Performance Expert on z/OS, V5.1 (Modification Level 1) (5655-W37)

IBM Tools for Replication Management, including the following tools:

- IBM InfoSphere Data Replication for DB2 for z/OS, V10 (5655-DRP)

IBM Tools for Utilities Management, including the following tools:

- DB2 Automation Tool for z/OS, V4.1 (5655-E37), plus APAR PM75391
- DB2 Cloning Tool for z/OS V3.1 (5655-N15), plus APAR PM76594
- DB2 High Performance Unload for z/OS V4.2 (5655-AA1), plus APARs PM78638 and PM85014
- DB2 Sort for z/OS, V1.3 (5655-W42)
- DB2 Utilities Enhancement Tool for z/OS, V2.2 (5655-T58), plus APARs PM77500 and PM80231
- DB2 Utilities Suite for z/OS, V11.1 (5655-W87)

Other miscellaneous IBM Tools, including the following tools:

- IBM Tools Base for z/OS, V1.3 (5655-V93)
5.2.2.4 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 11 has no toleration/coexistence requisites.

5.2.2.5 Incompatibility (Negative) Requisites: Negative requisites identify products that must not be installed on the same system as this product.

DB2 11 has no negative requisites.

5.2.3 DASD Storage Requirements

DB2 11 libraries can reside on all supported DASD types.

Figure 15 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>3196 (3390 tracks)</td>
</tr>
<tr>
<td>Distribution</td>
<td>1413 (3390 tracks)</td>
</tr>
<tr>
<td>File System</td>
<td></td>
</tr>
<tr>
<td></td>
<td>usr/lpp/db2b10/base/ (73 tracks)</td>
</tr>
<tr>
<td></td>
<td>usr/lpp/db2b10/jdbc/ (201 tracks)</td>
</tr>
<tr>
<td></td>
<td>usr/lpp/db2b10/mql/ (7 tracks)</td>
</tr>
<tr>
<td></td>
<td>usr/lpp/db2b10/worf/ (23 tracks)</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 33.

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

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

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

- The default name of the data set can be changed.
- The default block size of the data set can be changed.
- The data set can be merged with another data set that has equivalent characteristics.
- The data set must be a PDS, except for ADSNLOAD, ADSNLOD2, SDSNLOAD, and SDSNLOD2, which must be PDSEs. Note: DSNALLOC, the DB2-supplied Sample job to allocate target and distribution libraries and define SMP/E DDDEFS, assumes that your local default for the DSNTYPE JCL parameter is PDS.

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.
- The following data sets must be APF-authorized:
  - SDSNEXIT
  - SDSNLINK
  - SDSNLOAD
  - SDSNLOD2
  - SDXRRESL
The following table provides an estimate of the storage needed in the SMP/E data sets for DB2 11. You must add the estimates to those of any other programs and service that you install to determine the total additional storage requirements.

DB2 11 for z/OS requires that the SMPLTS data set must be PDSE. If your existing SMPLTS is a PDS, you will need to allocate a new PDSE and copy your 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 11. The storage requirements of DB2 11 must be added to the storage required by other programs that have data in the same library or path.

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

### Figure 16. Storage Requirements for SMP/E Data Sets

<table>
<thead>
<tr>
<th>Library</th>
<th>DDNAME</th>
<th>Type</th>
<th>No. of Trks</th>
<th>No. of Blks</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMPLTS</td>
<td>U PDSE</td>
<td>U</td>
<td>1560</td>
<td>N/A</td>
</tr>
<tr>
<td>SMPMTS</td>
<td>E PDS</td>
<td>FB</td>
<td>80</td>
<td>15</td>
</tr>
<tr>
<td>SMPPTS</td>
<td>E PDS</td>
<td>FB</td>
<td>80</td>
<td>3765</td>
</tr>
<tr>
<td>SMPSCDS</td>
<td>E PDS</td>
<td>FB</td>
<td>80</td>
<td>975</td>
</tr>
<tr>
<td>SMPSTS</td>
<td>E PDS</td>
<td>FB</td>
<td>80</td>
<td>75</td>
</tr>
</tbody>
</table>

### Figure 17 (Page 1 of 2). Storage Requirements for DB2 11 Target Libraries

<table>
<thead>
<tr>
<th>Library DDNAME</th>
<th>Member Type</th>
<th>Target Volume</th>
<th>T Y O E R E C L R No. of Trks</th>
<th>No. of Blks</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDSNBASE</td>
<td>Sample</td>
<td>Any S PDS FB</td>
<td>80 10</td>
<td>4</td>
</tr>
<tr>
<td>SDSNCHDR</td>
<td>Data</td>
<td>Any S PDS FB</td>
<td>80 25</td>
<td>4</td>
</tr>
<tr>
<td>SDSNCLST</td>
<td>CLIST</td>
<td>Any S PDS FB</td>
<td>80 140</td>
<td>6</td>
</tr>
<tr>
<td>SDSNDBRM</td>
<td>Macro</td>
<td>Any S PDS FB</td>
<td>80 119</td>
<td>40</td>
</tr>
<tr>
<td>SDSNEXIT</td>
<td>Data</td>
<td>Any S PDS U</td>
<td>0 6</td>
<td>30</td>
</tr>
<tr>
<td>SDSNIVPD</td>
<td>Data</td>
<td>Any S PDS VB</td>
<td>8188 588</td>
<td>6</td>
</tr>
<tr>
<td>SDSNLINK</td>
<td>LMOD</td>
<td>Any S PDS U</td>
<td>0 4</td>
<td>5</td>
</tr>
</tbody>
</table>
The following types of data sets are created during the DB2 11 installation process. The sizes are based upon user preferences:

- CATALOG
- DIRECTORY
- LOG

**Figure 18 (Page 1 of 2). DB2 11 File System Paths**

<table>
<thead>
<tr>
<th>DDNAME</th>
<th>Type</th>
<th>Path Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDSNAHFS</td>
<td>N</td>
<td>/usr/lpp/db2b10/base/IBM/</td>
</tr>
<tr>
<td>SDSNABIN</td>
<td>N</td>
<td>/usr/lpp/db2b10/base/bin/IBM/</td>
</tr>
<tr>
<td>SDSNACLS</td>
<td>N</td>
<td>/usr/lpp/db2b10/base/classes/IBM/</td>
</tr>
<tr>
<td>SDSNALIB</td>
<td>N</td>
<td>/usr/lpp/db2b10/base/lib/IBM/</td>
</tr>
<tr>
<td>SDSNASAMP</td>
<td>N</td>
<td>/usr/lpp/db2b10/base/samples/IBM/</td>
</tr>
<tr>
<td>SDSNJBIN</td>
<td>N</td>
<td>/usr/lpp/db2b10/jdbc/bin/IBM/</td>
</tr>
<tr>
<td>SDSNJCLS</td>
<td>N</td>
<td>/usr/lpp/db2b10/jdbc/classes/IBM/</td>
</tr>
</tbody>
</table>
### Figure 18. DB2 11 File System Paths

<table>
<thead>
<tr>
<th>DDNAME</th>
<th>TYPE</th>
<th>Path Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDSNJCC</td>
<td>N</td>
<td>/usr/lpp/db2b10/jdbc/IBM/</td>
</tr>
<tr>
<td>SDSNJLIB</td>
<td>N</td>
<td>/usr/lpp/db2b10/jdbc/lib/IBM/</td>
</tr>
<tr>
<td>SDSNJSMP</td>
<td>N</td>
<td>/usr/lpp/db2b10/jdbc/samples/IBM/</td>
</tr>
<tr>
<td>SDSNMQLS</td>
<td>N</td>
<td>/usr/lpp/db2b10/mql/IBM/</td>
</tr>
<tr>
<td>SDSNWORF</td>
<td>N</td>
<td>/usr/lpp/db2b10/worf/IBM/</td>
</tr>
<tr>
<td>SDSNWLIB</td>
<td>N</td>
<td>/usr/lpp/db2b10/worf/lib/IBM/</td>
</tr>
<tr>
<td>SDSNWSCH</td>
<td>N</td>
<td>/usr/lpp/db2b10/worf/schemas/IBM/</td>
</tr>
<tr>
<td>SDSNWTLB</td>
<td>N</td>
<td>/usr/lpp/db2b10/worf/tools/lib/IBM/</td>
</tr>
</tbody>
</table>

### Figure 19. Storage Requirements for DB2 11 Distribution Libraries

<table>
<thead>
<tr>
<th>Library</th>
<th>DDNAME</th>
<th>TYPE</th>
<th>ORDER</th>
<th>Path Type</th>
<th>RECTYPE</th>
<th>LREQ</th>
<th>No. of 3390 Trks</th>
<th>No. of DIR Blks</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADSNBASE</td>
<td></td>
<td>U</td>
<td>P</td>
<td>PDS</td>
<td>FB</td>
<td>80</td>
<td>10</td>
<td>4</td>
</tr>
<tr>
<td>ADSNDKF</td>
<td></td>
<td>S</td>
<td>P</td>
<td>PDS</td>
<td>FB</td>
<td>80</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>ADSNENU</td>
<td></td>
<td>S</td>
<td>P</td>
<td>PDS</td>
<td>FB</td>
<td>80</td>
<td>17</td>
<td>8</td>
</tr>
<tr>
<td>ADSNHFS</td>
<td></td>
<td>U</td>
<td>P</td>
<td>PDS</td>
<td>VB</td>
<td>255</td>
<td>438</td>
<td>6</td>
</tr>
<tr>
<td>ADSNLOAD</td>
<td></td>
<td>S</td>
<td>P</td>
<td>PDSE</td>
<td>U</td>
<td>8188</td>
<td>551</td>
<td>6</td>
</tr>
<tr>
<td>ADSNLLOD2</td>
<td></td>
<td>S</td>
<td>P</td>
<td>PDSE</td>
<td>U</td>
<td>301</td>
<td>1903</td>
<td>120</td>
</tr>
<tr>
<td>ADSNMACS</td>
<td></td>
<td>S</td>
<td>P</td>
<td>PDS</td>
<td>FB</td>
<td>80</td>
<td>45</td>
<td>35</td>
</tr>
<tr>
<td>ADXRLOAD</td>
<td></td>
<td>S</td>
<td>P</td>
<td>PDS</td>
<td>U</td>
<td>0</td>
<td>45</td>
<td>35</td>
</tr>
<tr>
<td>ADXRSAMP</td>
<td></td>
<td>S</td>
<td>P</td>
<td>PDS</td>
<td>FB</td>
<td>80</td>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>
5.3 FMIDs Deleted

Installing DB2 11 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 11 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 DELETETFMIID command. See the SMP/E Commands book for details.

5.4 Special Considerations

DB2 11 has no special considerations for the target system.

5.5 Migration, Fallback, and Remigration

DB2 11 is upwardly compatible with earlier releases of DB2 for z/OS. Migration with full fallback protection is available for customers running on DB2 10 for z/OS. Existing customers should ensure they are successfully running on DB2 10 for z/OS (NFM) before migrating to DB2 11. For more information, see Information APAR II14660.
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 11.

Please note the following points:

- If you want to install DB2 11 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 11

6.1.1 SMP/E Considerations for Installing DB2 11

Use the SMP/E RECEIVE, APPLY, and ACCEPT commands to install this release of DB2 11.

6.1.2 SMP/E Options Subentry Values

The recommended values for certain SMP/E CSI subentries are shown in Figure 20. 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>400,400,1200</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>
<tr>
<td>UTILITY</td>
<td>IEWBLINK</td>
<td>Program Binder must be used for installation of DB2 11 JDBC/SQLJ</td>
</tr>
</tbody>
</table>
### 6.1.3 SMP/E CALLLIBS Processing

DB2 11 uses the CALLLIBS function provided in SMP/E to resolve external references during installation. When DB2 11 is installed, ensure that DDDEFs exist for the following libraries:

- CSSLIB
- LINKLIB
- SCEEBIND
- SCEEBND2
- SCEECPP
- SCEELIB
- SCEELKD
- SCEELKEX
- SCLBCPP
- SCSFMOD0

**Note:** CALLLIBS uses the previous DDDEFs only to resolve the link-edit for DB2 11. These data sets are not updated during the installation of DB2 11.

### 6.1.4 Sample Jobs

The following sample installation jobs are provided as part of the product to help you install DB2 11:

<table>
<thead>
<tr>
<th>Job Name</th>
<th>Job Type</th>
<th>Description</th>
<th>RELFILE</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSNCOJAA</td>
<td>SMP/E</td>
<td>Sample job to create the CSI and allocate the SMP/E control data sets (Optional)</td>
<td>IBM.HDBBB10.F3</td>
</tr>
<tr>
<td>DSNRECV1</td>
<td>RECEIVE</td>
<td>Sample RECEIVE job for DB2</td>
<td>IBM.HDBBB10.F3</td>
</tr>
<tr>
<td>DSNRECV2</td>
<td>RECEIVE</td>
<td>Sample RECEIVE job for IRLM</td>
<td>IBM.HDBBB10.F3</td>
</tr>
<tr>
<td>DSNRECV3</td>
<td>RECEIVE</td>
<td>Sample RECEIVE job for JDBC/SQLJ and ODBC</td>
<td>IBM.HDBBB10.F3</td>
</tr>
<tr>
<td>DSNRECV4</td>
<td>RECEIVE</td>
<td>Sample RECEIVE job for DB2 Kanji Panels (available in the Japanese feature)</td>
<td>IBM.HDBBB10.F3</td>
</tr>
<tr>
<td>DSNALLOC</td>
<td>ALLOCATE</td>
<td>Sample job to allocate target and distribution libraries</td>
<td>IBM.HDBBB10.F3</td>
</tr>
<tr>
<td>DSNASMKD</td>
<td>MKDIR</td>
<td>Sample job to invoke the supplied DSNAMEKDR EXEC to allocate file system paths for DB2 base</td>
<td>IBM.HDBBB10.F3</td>
</tr>
<tr>
<td>DSNLSMKD</td>
<td>MKDIR</td>
<td>Sample job to invoke the supplied DSNAMEKDR EXEC to allocate file system paths for MQListener</td>
<td>IBM.HDBBB10.F3</td>
</tr>
</tbody>
</table>
You can access the sample installation jobs by performing an SMP/E RECEIVE (refer to 6.1.6, “Perform SMP/E RECEIVE” on page 32) then copy the jobs from the RELFILES to a work data set for editing and submission. See Figure 21 on page 30 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
//TAPEIN DD DSN=IBM.HDBBB10.F3,UNIT=tunit,
//      VOL=SER=volser,LABEL=(x,SL),
//      DISP=(OLD,KEEP)
//FILEIN DD DSN=IBM.HDBBB10.F3,UNIT=SYSALLDA,DISP=SHR,
//      VOL=SER=filevol
//OUT DD DSNAME=jcl-library-name,
//      DISP=(NEW,CATLG,DELETE),
//      VOL=SER=dasdv01,UNIT=SYSALLDA,
//      SPACE=(TRK,(primary,secondary,dir))
//SYSUT3 DD UNIT=SYSALLDA,SPACE=(CYL,(1,1))
//SYSIN DD *
   COPY INDD=xxxxIN,OUTDD=OUT
/*
```

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

**TAPEIN:**

- **tunit** is the unit value that matches the product package.
- **volser** is the volume serial that matches the product package.
- **x** is the tape file number that indicates the location of the data set name on the tape.
- See the documentation that is provided by CBPDO for the location of IBM.HDBBB10.F3 on the tape.

### Figure 21 (Page 2 of 2). 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>DSNWSMKD</td>
<td>MKDIR</td>
<td>Sample job to invoke the supplied DSNWMKDR EXEC to allocate file system paths for WORF</td>
<td>IBM.HDBBB10.F3</td>
</tr>
<tr>
<td>DSNISMKD</td>
<td>MKDIR</td>
<td>Sample job to invoke the supplied DSNMKDIR EXEC to allocate file system paths for JDBC/SQLJ</td>
<td>IBM.HDBBB10.F3</td>
</tr>
<tr>
<td>DSNDDDEF1</td>
<td>DDDEF</td>
<td>Sample job to define SMP/E DDDEFs</td>
<td>IBM.HDBBB10.F3</td>
</tr>
<tr>
<td>DSNTIJUD</td>
<td>SMP/E</td>
<td>Clean up job (Optional)</td>
<td>IBM.HDBBB10.F3</td>
</tr>
<tr>
<td>DSNAPPL1</td>
<td>APPLY</td>
<td>Sample APPLY job</td>
<td>IBM.HDBBB10.F3</td>
</tr>
<tr>
<td>DSNACEP1</td>
<td>ACCEPT</td>
<td>Sample ACCEPT job</td>
<td>IBM.HDBBB10.F3</td>
</tr>
</tbody>
</table>
FILEIN:
  filevol is the volume serial of the DASD device where the downloaded files reside.
OUT:
  jcl-library-name is the name of the output data set where the sample jobs are stored.
  dasdvol is the volume serial of the DASD device where the output data set resides.
SYSIN:
  xxxxIN is either TAPEIN or FILEIN depending on your input DD statement.

6.1.4.1 Special Considerations

- DB2 11 and IRLM V02.03.00 are assumed to be installed into the same zones. If this is not the case you will need to modify jobs DSNALLOC, DSNDEF1 and DSNAPPL1.
- Recompile your existing Validation Exit Routines to pick up the updated version of the macro DSNDRVAL. No logic change is required. Although it is optional to recompile your Validation Exit Routine, it is recommended.

6.1.5 Allocate CSI and SMP/E Control data sets

Edit and submit optional sample job DSNTIJAA to create the desired CSI for DB2 11. Please note this job allocates some data sets in PDSE format. Consult the instructions in the sample job for more information.

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

6.1.6 Perform SMP/E RECEIVE

If you have obtained DB2 11 as part of a CBPDO, use the RCVPDO job in the CBPDO RIMLIB data set to receive the DB2 11 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 DSNRECV1 to perform the SMP/E RECEIVE for the mandatory DB2 FMIDs for DB2 11. Consult the instructions in the sample job for more information.

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

You can also choose to edit and submit sample job DSNRECV2 to perform the SMP/E RECEIVE for IRLM V02.03.00. Consult the instructions in the sample job for more information.

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

You can also choose to edit and submit sample job DSNRECV3 to perform the SMP/E RECEIVE for optional FMIDs for DB2 11. Consult the instructions in the sample job for more information.

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

You can also choose to edit and submit sample job DSNRECV4 to perform the SMP/E RECEIVE for the DB2 Kanji FMID for DB2 11. This FMID is delivered with the DB2 Japanese feature. If you did not order
the DB2 Japanese feature, then you may wish to comment out FMID JDBBB11 from the SMP/e DSNAPPL1 and DSNACEP1 jobs.

**Expected Return Codes and Messages:** You will get 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 DSNALLOC to allocate the SMP/E target and distribution libraries for DB2 11. Consult the instructions in the sample job for more information.

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

### 6.1.8 Allocate File system Paths

Mount the file system data set of the target system on the driving system when you run the sample DSNASMKD job because the job will create paths in the file system.

Before you run the sample job to create the paths in the file system, ensure that OMVS is active on the driving system and that the file system of the target system is mounted to the driving system. If you install DB2 11 into a zSeries file system (zFS), zFS must be active on the driving system.

If you plan to install DB2 11 into a new file system, create the mountpoint and mount the new file system to the driving system. For DB2 11, the recommended mountpoint is /usr/lpp/db2b10

Edit and submit sample job DSNASMKD to allocate the file system for DB2 11. Consult the instructions in the sample job for more information.

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

Edit and submit sample job DSNLSMKD to allocate the file system for DB2 11 (MQListener). Consult the instructions in the sample job for more information.

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

Edit and submit sample job DSNWSMKD to allocate the file system for DB2 11 (WORF). Consult the instructions in the sample job for more information.

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

Edit and submit sample job DSNISMKD to allocate the file system for DB2 11 (JDBC/SQLJ). Consult the instructions in the sample job for more information.

**Expected Return Codes and Messages:** You will get a condition code of 0 if the job runs correctly.
If you create a new file system for this product, consider updating the BPXPRMxx PARMLIB member to mount the new file system at IPL time. This action can be helpful if an IPL occurs before the installation is completed.

6.1.9 Create DDDEF Entries

Edit and submit sample job DSNDDEF1 to create DDDEF entries for the SMP/E target and distribution libraries for DB2 11. Consult the instructions in the sample job for more information.

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

6.1.10 Perform SMP/E APPLY

1. Ensure that you have the latest HOLDDATA; then edit and submit sample job DSNAPPL1 to perform an SMP/E APPLY CHECK for DB2 11. Consult the instructions in the sample job for more information.

Perform an SMP/E APPLY CHECK for DB2 11.

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

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

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

Here are sample APPLY commands:

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

   APPLY S(fmid, fmid,...) CHECK
   FORFMID(fmid, fmid,...)
   SOURCEID(RSU+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.

\[
\text{APPLY } S(fmid, fmid, ...) \text{ CHECK} \\
\text{FORFMID}(fmid, fmid, ...) \\
\text{SOURCEID}(RSU*) \\
\text{FIXCAT}(IBM.ProductInstall-RequiredService) \\
\text{GROUPEXTEND} \\
\text{BYPASS(HOLDCLASS(HIPER))} .
\]

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 MISSINGFIX command and specify Fix Category IBM.ProductInstall-RequiredService to investigate missing recommended service.

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

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 may receive a return code of 4 with the following warning messages which are expected: IEW2609W, GIM23913W

**Expected Return Codes and Messages from APPLY:** You may receive a return code of 4 with the following warning messages which are expected: IEW2609W, GIM23913W

### 6.1.11 Perform SMP/E ACCEPT

Edit and submit sample job DSNACEP1 to perform an SMP/E ACCEPT CHECK for DB2 11. Consult the instructions in the sample job for more information.

Perform an SMP/E ACCEPT CHECK for DB2 11.
To receive the full benefit of the SMP/E Causer SYMMD 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 11, it is recommended that you run REPORT CROSSZONE against the new or updated target and distribution zones. REPORT CROSSZONE requires a global zone with ZONEINDEX entries that describe all the target and distribution libraries to be reported on.

For more information about REPORT CROSSZONE, see the SMP/E manuals.
6.1.13 Cleaning Up Obsolete Data Sets, Paths, and DDDEFs

The following data sets, which were allocated and used by the previous release of this product, are no longer used in this release. You can delete these obsolete data sets after you delete the previous release from your system.

- There are no obsolete datasets from DB2 10 for z/OS to delete.

The following file system paths, which were created and used by previous releases of this product, are no longer used in this release. You can delete these obsolete file system paths after you delete the previous release from your system.

- /usr/lpp/db2a10/base/IBM/
- /usr/lpp/db2a10/base/bin/IBM/
- /usr/lpp/db2a10/base/classes/IBM/
- /usr/lpp/db2a10/base/lib/IBM/
- /usr/lpp/db2a10/base/samples/IBM/
- /usr/lpp/db2a10/jdbc/bin/IBM/
- /usr/lpp/db2a10/jdbc/classes/IBM/
- /usr/lpp/db2a10/jdbc/IBM/
- /usr/lpp/db2a10/jdbc/lib/IBM/
- /usr/lpp/db2a10/jdbc/samples/IBM/
- /usr/lpp/db2a10/mql/IBM/
- /usr/lpp/db2a10/worf/IBM/
- /usr/lpp/db2a10/worf/lib/IBM/
- /usr/lpp/db2a10/worf/schemas/IBM/
- /usr/lpp/db2a10/worf/tools/lib/IBM/

The following DDDEF entries, which were created and used by previous releases of this product, are no longer used in this release. You can delete these obsolete DDDEF entries after you delete the previous release from your system.

- There are no obsolete DDDEFs from DB2 10 for z/OS to delete.

6.2 Activating DB2 11

The publication *DB2 11 for z/OS Installation and Migration, GC19-4056* contains the necessary information to customize and use DB2 11.

6.2.1 File System Execution

If you mount the file system in which you have installed DB2 11 in read-only mode during execution, then you do not have to take further actions to activate DB2 11.
6.2.2 Set Up Controls for English Panel Selection

Each of the display language control techniques described below is a way to set or change the current allocation of the DD NAMES.

6.2.2.1 Logon Procedures: To switch languages, you need only change the data set allocation currently in effect under the standard ISPF panel library DDNAME. A user’s logon procedure can allocate DDNAME ISPPLIB to select the current display language. Following is an example from a logon procedure:

```c5197
// This version displays English panels */
//ISPPLIB DD DSN=DSNB1.0.SDNSPFP,DISP=SHR ENGLISH
// DD DSN=DSNB1.0.SDNSPFPE,DISP=SHR ENGLISH
```

6.2.2.2 Language-switching CLISTs: An ordinary CLIST can be used (outside of ISPF) to free and reallocate ISPPLIB. Following is an example of a CLIST:

```c5197
PROC O LANGUAGE(E) /* Execute this CLIST outside of ISPF */
FREE DD(ISPPLIB)
WRITE Do you want English or Japanese panels: Enter E or J.
READ &LANGUAGE
IF &LANGUAGE = E +
    THEN ALLOC DD(ISPPLIB) DS('DSNB1.0.SDNSPFP' 'DSNB1.0.SDNSPFPE') +
       SHR /* English */
ELSE ALLOC DD(ISPPLIB) DS('DSNB1.0.SDNSPFP' 'DSNB1.0.SDNSPFPE') +
    SHR /* Japanese */
```

Some users allocate the ISPF panel library from their DEFAULT CLIST. Allocation of DDNAME ISPPLIB controls the current language just as it does for the LOGON procedure.
Appendix A. Included PTFs for DB2 11

A.1 Included PTFs for FMID HDBBB10

- FMID HDBBB10
  
  UK92199  UK92660  UK93549  UK94245  UK95016  
  UK92200  UK92661  UK93550  UK94246  UK95017  
  UK92201  UK92662  UK93551  UK94247  UK95018  
  UK92202  UK92663  UK93947  UK94248  UK95419  
  UK92203  UK92664  UK93948  UK94655  UK95420  
  UK92204  UK93067  UK93949  UK94656  UK95421  
  UK92205  UK93068  UK93950  UK94658  UK95422  
  UK92475  UK93069  UK94242  UK94659  UK95423  
  UK92658  UK93070  UK94243  UK95015  UK95424  
  UK92659  UK93548

A.2 Included PTFs for FMID HIR2230

- FMID HIR2230
  
  UK56134  UK63651  UK66174  UK73941  UK78779  
  UK56932  UK63938  UK66260  UK73956  UK79004  
  UK58314  UK64370  UK67966  UK76155  UK79286  
  UK58653  UK65143  UK68556  UK76631  UK79364  
  UK59064  UK65150  UK68557  UK77877  UK79710  
  UK59836  UK65310  UK69954  UK77885  UK80506  
  UK60243  UK65703  UK70747  UK78206  UK80552  
  UK60507  UK65920  UK72195  UK78606  UK81454  
  UK61473  UK66052

A.3 Included PTFs for FMID HIYBB10

- FMID HIYBB10
  
  UK93071

A.4 Included PTFs for FMID HIZBB10

- FMID HIZBB10
  
  UK92665  UK95425

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Appendix B. HOLD DATA for PTFs integrated in the product tape

Below is a collection of the ++HOLD by Type and by chronological order for PTFs that have been integrated in to the refreshed DB2 product tape. See the SMPMCS file for PTFs integrated in the product tape.

HOLD TYPE=ACTION
================
PDO: 1313
<< See the following HOLD >>

TYPE: ACTION
This PTF corrects a problem that causes incorrect output from a SELECT statement that has a FOR loop that contains an SQL variable.

Example:

CREATE TYPE UT888TYPE AS TIMESTAMP(7) ARRAY??(??)#

CREATE FUNCTION MYFUNC(SEPARATOR CHAR,ARR1 UT888TYPE)
RETURNS VARCHAR(4/zerodot/zerodot)
BEGIN
   DECLARE HVARC VARCHAR(4/zerodot/zerodot);
   FOR SELECT U.C1 AS C1
      FROM UNNEST(ARR1) AS U(C1)
   DO
      SET HVARC = COALESCE(HVARC,'') ||
                  COALESCE(VARCHAR(C1),'');
      SET ARR1 = NULL;
   END FOR;
   RETURN HVARC;
END#

After the application of this PTF, you need to execute ALTER PROCEDURE REGENERATE for each native SQL procedure, or ALTER FUNCTION REGENERATE for each non-inline SQL scalar function that is affected.

<< See the following HOLD >>
This PTF provides corrects a problem with a datetime comparison in a BETWEEN predicate inside a native SQL PL procedure or function.

Example:

```sql
CREATE PROCEDURE MYPROC()
  LANGUAGE SQL
BEGIN
  DECLARE I INT;
  DECLARE V1 CHAR(10);
  DECLARE V2 CHAR(10);
  SET V1 = '2013-01-01';
  SET V2 = '2013-01-02';
  SELECT 1 INTO I
  FROM T1
  WHERE V1 BETWEEN DATE(TSCOL) AND V2;
END!
```

After the application of this PTF, you need to execute ALTER PROCEDURE REGENERATE for each native SQL procedure, or ALTER FUNCTION REGENERATE for each non-inline SQL scalar function that is affected.

<< See the following HOLD >>

This PTF updates the ERLY code. After you apply this fix, you must either re-IPL z/OS with CLPA, or issue the -REFRESH DB2 command.

The procedure for issuing the REFRESH command is:

1. Issue -STOP DB2
2. Issue MODIFY LLA,REFRESH
3. Issue -REFRESH DB2,EARLY

PDO: 1314

<< See the following HOLD >>
This PTF fixes DB2 11 migration job DSNTIJCX, which checks DB2-supplied indexes on the DB2 catalog and directory tables after migration to conversion mode. Missing CHECK INDEX statements are added and CHECK INDEX statements that refer to obsolete table spaces are removed.

If you maintain a customized copy of this job, after applying this PTF you need to refresh it as follows:
- Edit your customized copy of DSNTIJCX.
- Delete all lines and copy in the DSNTIJCX member from the prefix.SDSNSAMP library.
- Replace all instances of 'DSN!!/zerodot.SDSNEXIT' with the name of your DB2 11 exit library.
- Replace all instances of 'DSN!!/zerodot.SDSNLOAD' with the name of your DB2 11 run-time library.
- Replace all instances of 'SYSTEM=DSN' with 'SYSTEM=<x>' where <x> is the name of your DB2 11 subsystem.
- Review and make other changes as required for your site.

If you are running in DB2 11 conversion mode, you should run your updated DSNTIJCX job to check indexes on the DB2 catalog and directory table spaces that were migrated from DB2 10.

Important: Do not run this job if DB2 is already in enabling-new-function mode or new-function mode.

PDO: 1319

<< See the following HOLD >>

This PTF corrects the following problems in the installation verification jobs:
(1) Job DSNTEJ2C, job step PH02CS01 ends with return code 8 and error message DSNT408I SQLCODE = -204, ERROR: user-id.VDEPT IS AN UNDEFINED NAME
(2) Job DSNTEJ2P, job step PH02PS01 ends with return code 8 and error message DSNT408I SQLCODE = -204, ERROR: user-id.VACT IS AN UNDEFINED NAME

user-id is the user ID that was specified in the JOB statement.

After you apply this PTF, take the following actions:
For item (1), if you maintain a customized copy of DSNTEJ2C, edit job step PH02CS01. Add this line after the TABLE clause in each of the nine DCLGEN commands:
OWNER(DSN81110) +

For item (2), if you maintain a customized copy of DSNTEJ2P, edit job step PHQ02PS01. Add this line after the TABLE clause in each of the 19 DCLGEN commands.

OWNER(DSN81110) +

<< See the following HOLD >>

TYPE: ACTION

This PTF corrects a problem that causes SQLCODE -423 during execution of an SQL PL procedure or non-line scalar function that contains LOB array variables in the parameter list.

For example:
CREATE TYPE CLOBARRAY AS CLOB(10M) ARRAY§10'#

CREATE PROCEDURE PROC3(INOUT P1 INT, INOUT P2 CLOBARRAY)
LANGUAGE SQL DYNAMIC RESULT SET 1
BEGIN
    DECLARE VAR1 CLOB;
    DECLARE VAR2 CLOBARRAY;
    DECLARE CUR1 CURSOR WITH RETURN FOR SELECT P2§1'
        FROM SYSIBM.SYSDUMMY1;
    OPEN CUR1;
END#

To make the fix effective, after you apply this PTF, for each SQL PL procedure or non-inline scalar function that meets the criteria listed above, perform the following steps:
1) Execute ALTER PROCEDURE REGENERATE or ALTER FUNCTION REGENERATE to regenerate the procedure or function.
2) Rebind the packages for calling applications that use static SQL.

<< See the following HOLD >>

TYPE: ACTION

This PTF corrects a problem that causes ABEND04E at location DSNXEBR M666 during execution of an SQL PL procedure or non-inline SQL scalar function that contains a DECLARE CURSOR statement with the following characteristics:
- The ARRAY_AGG built-in function is in the SELECT list.
- The cursor definition includes the WITH ROWSET POSITIONING clause.
For example:
CREATE TYPE INTARRAY AS INTEGER ARRAY;

CREATE PROCEDURE PROC3()
LANGUAGE SQL
BEGIN
  DECLARE MYINTARRAY INTARRAY;
  DECLARE CUR1 CURSOR WITH ROWSET POSITIONING FOR
  SELECT ARRAY_AGG(SALARY) FROM ADMF001.MYEMP;
  OPEN CUR1;
  FETCH CUR1 INTO MYINTARRAY;
END;

To make the fix effective, after you apply this PTF, perform one of the following actions for each native SQL procedure that meets the criteria listed above:
- Execute DROP PROCEDURE and CREATE PROCEDURE or
  DROP FUNCTION and CREATE FUNCTION to re-create the
  procedure or function.
- Run REBIND on the procedure or function package.
- Execute ALTER PROCEDURE REGENERATE or ALTER FUNCTION
  REGENERATE to regenerate the procedure or function.

<< See the following HOLD >>

TYPE: ACTION

This PTF fixes a problem that causes SQLCODE -302 to occur
when a program calls stored procedure SQLJ.ALTER_JAVA_PATH,
and the second parameter (path) exceeds 256 bytes.

To make the fix effective, after installing this PTF, bind the DSNJAR package, using the following command:

BIND PACKAGE(DSNJAR) MEMBER(DSNX9AJP) -
  ACTION(REPLACE) ISO(CS) CURRENTDATA(YES) ENCODING(EBCDIC) -
  LIBRARY('<prefix>.SDSNDBRM')

<prefix> is the data set prefix of your DB2 Version 11 target libraries.

<< See the following HOLD >>

TYPE: ACTION

This PTF provides package version support for the packages that are used for loading data by using a cursor.
To make this change effective, bind the DSNUTIL and DSNUT111 packages after you apply this PTF.

For example:

```
BIND PACKAGE(DSNUTIL) MEMBER(DSNUGSQL) -
   ACTION(ADD) ISOLATION(CS) ENCODING(EBCDIC) -
   VALIDATE(BIND) CURRENTDATA(NO) KEEPDYNAMIC(NO) -
   LIBRARY('<prefix>.SDSNDBRM')

BIND PACKAGE(DSNUT111) MEMBER(DSNUGSQL) -
   ACTION(ADD) ISOLATION(CS) ENCODING(EBCDIC) -
   VALIDATE(BIND) CURRENTDATA(NO) KEEPDYNAMIC(NO) -
   LIBRARY('<prefix>.SDSNDBRM')
```

<prefix> is the data set prefix of your DB2 Version 11 target libraries.

PDO: 1320

<< See the following HOLD >>

TYPE: ACTION

This PTF adds a new job step, ENFM0019, to DSNTIJEN, the job for converting DB2 to enabling-new-function mode. The new job step copies the SYSUTILX table space after it has been converted for enabling-new-function mode.

After you apply this PTF, you need to perform the following actions:

1. Update your customized copy of job DSNTIJEN

   This action is required for all DB2 11 customers who maintain a customized copy of DSNTIJEN

   This PTF modifies DSNTIJEN in the SDSNSAMP target library only. After applying this PTF, update your copy of DSNTIJEN as follows:
   (a) Copy the new job step, ENFM0019, from prefix.SDSNSAMP(DSNTIJEN) into your copy of DSNTIJEN, directly after the ENFM0010 job step. When copying, be sure to include the CHCK0010 check steps that precede and follow job step ENFM0019.
   (b) In the ENFM0019 PARM string, change 'DSN' to your subsystem name.
   (c) In the ENFM0019 TEMPLATE statement, change 'DSN!!0' to the prefix you use for DSNTIJEN image copy data sets.
Also make other modifications as required, such as for modifying the device type, SMS classes, or volume/serial name.
Tip: Use the TEMPLATE statement in job step ENFM0027 as a model.
(d) Save your changes. Do not run DSNTIJEN except to convert DB2 to enabling-new-function mode.

(2) Update customized copies of DB2 installation CLIST members

This PTF modifies CLIST member DSNTINS3 in the SDSNCLST target library only.
You need to redo any record format changes and reapply any tailoring that you have done to your copies of this CLIST. You might also want to move your updated copy of DSNTINS3 to the prefix.NEW.SDSNCLST data set, where the CLISTs that are processed by job DSNTIJVC reside.

<< See the following HOLD >>

TYPE: ACTION

This PTF corrects problems in package version support for the following DB2-supplied DBRMs that may cause related function to fail with SQLCODE -805 or SQLCODE -812 after applying PTF batch 5:
- DSNUGSQL (DSNUTIL, DSNUT111)
- DSNADMVL (SYSPROC.ADMIN_DS_LIST)
- DSNACCOR (SYSPROC.DSNACCOR)
- DSNACCOX (SYSPROC.DSNACCOX)
- DSNTILS (SYSPROC.DSNUTILS)
- DSNUTILU (SYSPROC.DSNUTILU)
- DSNX9AJP (SQLJ.ALTER_JAVA_PATH)
- DSNTRIN (DSNTIJRT)

To make this change effective, bind the DSNUTIL and DSNUT111 packages after you apply this PTF.

For example:

BIND PACKAGE(DSNUTIL) MEMBER(DSNUGSQL) -
   ACTION(ADD) ISOLATION(CS) ENCODING(EBCDIC) -
   VALIDATE(BIND) CURRENTDATA(NO) KEEPDYNAMIC(NO) -
   LIBRARY('('prefix>.SDSNDBRM')
BIND PACKAGE(DSNUT111) MEMBER(DSNUGSQL) -
ACTION(ADD)  ISOLATION(CS)  ENCODING(EBCDIC) - 
VALIDATE(BIND)  CURRENTDATA(NO)  KEEP_DYNAMIC(NO) - 
LIBRARY('<prefix>.SDSNDBRM')

<prefix> is the data set prefix of your DB2 Version 11 target libraries.
In addition, run your customized copy of job DSNTIJRT to bind packages from these DBRMs.

- DSNTRIN  (DSNTIJRT)
- DSNADM DL  (SYSPROC.ADMIN_DS_LIST)
- DSNACCOR  (SYSPROC.DSNACCOR)
- DSNACCOX  (SYSPROC.DSNACCOX)
- DSNUTILS  (SYSPROC.DSNUTILS)
- DSNUTILU  (SYSPROC.DSNUTILU)
- DSNX9AJP  (SQLJ.ALTER_JAVA_PATH)

If you have previously run DSNTIJRT, rerunning with MODE(INSTALL) will cause it to detect and correct only missing and downlevel SQL objects and packages for DB2-supplied routines.

Note: Use MODE(INSTALL-PREVIEW) to obtain a report of any changes without processing them. The PREVIEW option will also generate and output a JCL job to the JCLOUT DD that contains any SQL and bind statements to be processed.
After reviewing the changes, either rerun DSNTIJRT without the PREVIEW option or customize and run the generated job.

PDO: 1322

<< See the following HOLD >>

TYPE: ACTION

This PTF performs the following actions:
- Fixes a problem that causes some directory table rows to have incorrect information when a new installation of DB2 for z/OS Version 11 is performed.
- Updates information for creating catalog tables SYSTABLESPACE, SYSTABLES, SYSCOLUMNS, and SYSKEYS.

If you did a new install or migration before you applied this PTF, follow these steps:

1. Execute the following SELECT statement:
   SELECT * FROM SYSIBM.SYSCOLUMNS
   WHERE NAME='AUXID' AND TBNAME='SYSDBD_DATA' AND TBCREATOR='SYSIBM';
If the SELECT statement returns no rows, proceed to step 2. If the SELECT statement returns at least one row, no action is necessary.

2. Run a CATMAINT job with the following control statement:

```
CATMAINT UPDATE UNLDDN DB2DEV
```

<< See the following HOLD >>

TYPE: ACTION

This PTF enhances the SYSPROC.ADMIN_COMMAND_DB2 stored procedure to return information for LOB table spaces, XML table spaces, and table spaces with an unknown type. In particular, the processing-type parameter has three new values:

- **LS**
  - Parse "-DISPLAY DATABASE(...) SPACENAM(...)" command output messages, and return LOB table spaces information.

- **XS**
  - Parse "-DISPLAY DATABASE(...) SPACENAM(...)" command output messages, and return XML table spaces information.

- **UN**
  - Parse "-DISPLAY DATABASE(...) SPACENAM(...)" command output messages, and return unknown table space information.

If you have already installed or migrated to DB2 Version 11, take one of the following actions after you apply this PTF:

- Run your customized copy of job DSNTIJRT with MODE(INSTALL) to bind the package for SYSPROC.ADMIN_COMMAND_DB2.

If you have previously run DSNTIJRT, rerunning with MODE(INSTALL) causes DSNTIJRT to detect and correct only missing and downlevel SQL objects and packages for DB2-supplied routines.

- Run DSNTIJRT with MODE(INSTALL-PREVIEW) to obtain a report of any changes without processing them. The PREVIEW option generates a JCL job to the JCLOUT DD location that contains any SQL and bind statements to be processed. After reviewing the changes, rerun DSNTIJRT without the PREVIEW option, or customize and run the generated job.

<< See the following HOLD >>

TYPE: ACTION
This PTF provides new index configuration options UPDATEAUTOCOMMIT, COMMITTYPE and COMMITCYCLES for the SYSTS_CREATE, SYSTS_UPDATE and SYSTS_ALTER stored procedures.

If you have already installed or migrated to DB2 Version 11, and you use IBM Text Search for DB2 for z/OS, take one of the following actions after you apply this PTF:

- Run your customized copy of job DSNTIJRT with MODE(INSTALL) to bind the package for SYSPROC.ADMIN_COMMAND_DB2.

  If you have previously run DSNTIJRT, rerunning with MODE(INSTALL) causes DSNTIJRT to detect and correct only missing and downlevel SQL objects and packages for DB2-supplied routines.

- Run DSNTIJRT with MODE(INSTALL-PREVIEW) to obtain a report of any changes without processing them. The PREVIEW option generates a JCL job to the JCLOUT DD location that contains any SQL and bind statements to be processed. After reviewing the changes, rerun DSNTIJRT without the PREVIEW option, or customize and run the generated job.

<< See the following HOLD >>

TYPE: ACTION

This PTF modifies installation job DSNTIJTM to create a versioned DBRM when the DSNTIAD dynamic SQL processor program is precompiled.

The following action is required after you apply the PTF.

---------------------------------------------------------------
Update customized copies of DB2 installation CLIST members
---------------------------------------------------------------

===> This action is required for all V11 customers.

This PTF modifies CLIST member DSNTINS1 in the prefix.SDSNCLST target library only. You need to modify this new version of DSNTINS1 to redo any record format changes and reapply any tailoring that you did to your old copies of this CLIST.

You might also want to move the new version of DSNTINS1 to the prefix.NEW.SDSNCLST data set, where the CLISTS processed by job DSNTIJVC reside.
The following action can be performed at any time.

---

Modify your customized copy of job DSNTIJTM

---

==> This action is required for customers who maintain a customized copy of job DSNTIJTM.

This PTF modifies installation job DSNTIJTM in the SDSNSAMP target library only. To modify your customized copy of DSNTIJTM, add VERSION(AUTO) to the list of precompiler options specified in job step DSNTIAD. For example, change this:

//DSNTIAD EXEC DSNHASM, MEM=DSNTIAD, 
   // PARM.PC='HOST(ASM),STDSQL(NO)'

To this:

//DSNTIAD EXEC DSNHASM, MEM=DSNTIAD, 
   // PARM.PC='HOST(ASM),STDSQL(NO),VERSION(AUTO)'

PDO: 1325

<< See the following HOLD >>

TYPE: ACTION

This PTF changes the value of the FOREIGNKEY column from 'S' to 'B' in the SYSIBM.SYSCOLUMNS catalog table for some columns in the SYSIBM.SYSLGRNX directory table.

If you have already installed or migrated to DB2 11 for z/OS, you need to perform the following steps after you apply this PTF:

1. Execute the following query:
   SELECT FOREIGNKEY FROM SYSIBM.SYSCOLUMNS
   WHERE NAME IN('LGRDBID','LGRPSID','LGRSRBA',
   'LGRSPBA','LGRSLSRN','LGRLELSRN') AND
   TBCREATOR = 'SYSIBM' AND TBNAME = 'SYSLGRNX';

2. If the FOREIGNKEY column contains any instances of the value 'S', run the following CATMAINT control statement:

   CATMAINT UPDATE UNLDDN DB2DEV

   If the FOREIGNKEY column contains only the value 'B', you do not need to run the CATMAINT control statement.
TYPE: ACTION

This PTF modifies the values of the TYPE column in catalog table SYSIBM.SYSSTATFEEDBACK, and in EXPLAIN table DSN_STAT_FEEDBACK.

To maintain consistency in the data in these tables, you need to delete all rows from the tables after you apply this fix. To do that, follow these steps:

1. If you need to collect statistics that are represented by existing rows in SYSIBM.SYSSTATFEEDBACK or DSN_STAT_FEEDBACK, collect those statistics.
2. Execute the following SQL statement to delete all rows from SYSIBM.SYSSTATFEEDBACK:
   ```sql
   DELETE FROM SYSIBM.SYSSTATFEEDBACK;
   ```
3. Execute the following SQL statement to delete all rows from DSN_STAT_FEEDBACK:
   ```sql
   DELETE FROM schema.DSN_STAT_FEEDBACK;
   ```
   Replace schema with the schema of your DSN_STAT_FEEDBACK table.

TYPE: ACTION

This PTF fixes the problem of receiving an unexpected abend 04E-00E70005,LOC=DSNXGRDS.DSNXOV M200 when a view created in Version 11 is referenced in Version 10. This can happen with either coexistence with Version 11 or fallback from V11 where the view was created in a V11 system. For any existing views that are having this abend, this PTF will not be able to fix them. If the use of Version 11 created views in a Version 10 system is necessary, you may use a query to identify all views created by the Version 11 system by checking the RELCREATED field in SYSVIEWS. The following is a sample query to identify all views created on a Version 11 system:

```sql
SELECT * FROM SYSIBM.SYSVIEWS
WHERE RELCREATED = 'P';
```

Once this PTF is applied, you may do one of the following to repair the affected views:

1. On a Co-existence system, run an ALTER VIEW REGENERATE statement from the Version 11 system. This should fix the affected views. If not, user will have to drop and recreate the affected view.
2. On a fallback system that is now in Version 10 mode, you will have to drop and recreate the affected views.

<< See the following HOLD >>

TYPE: ACTION

This PTF modifies the DSNUTILU stored procedure. After applying this PTF, you need to take the following actions:
1. Invoke the following command to suspend DSNUTILU activity:
   -STOP PROCEDURE(SYSPROC.DSNUTILU)
   Change - to the appropriate subsystem command prefix.
2. BIND the package for DSNUTILU. For example:
   BIND PACKAGE(DSNUTILU) MEMBER(DSNUTILU) -
   ACTION(ADD) ISOLATION(CS) ENCODING(EBCDIC) -
   VALIDATE(BIND) CURRENTDATA(NO) -
   LIBRARY('prefix.SDSNDBRM')
   Change prefix to the prefix of your target library name.
3. Invoke the following command to resume DSNUTILU activity:
   -START PROCEDURE(SYSPROC.DSNUTILU)
   Change - to the appropriate subsystem command prefix.

<< See the following HOLD >>

TYPE: ACTION

This PTF modifies the DBRM for program DSNTXAZP, the CLIST data (DSNTIDxx) member refresh tool. If you have already installed or migrated to DB2 11, after applying this PTF, you need to bind a new package for DSNTXAZP. You can use the following command:

BIND PACKAGE(DSNTXAZP) MEMBER(DSNTXAZP) -
   ACTION(ADD) ENCODING(EBCDIC) -
   LIBRARY('prefix.SDSNDBRM')

prefix is the prefix of your DB2 11 target libraries.

<< See the following HOLD >>

TYPE: ACTION

This PTF modifies installation job DSNTIJCX to use dynamic allocation for sort work data sets. The following changes were made to the job:
- All SORTWKxx and SYSUT1 DD statements were removed.
- SORTDEVT SYSDA was added to each CHECK INDEX statement.
These changes allow the utilities to determine the optimal number of sort work data sets.
If you maintain a customized copy of DSNTIJCX for DB2 11, you need to make the following changes:
1. Remove all SORTWKxx and SYSUT1 DD statements.
2. Add SORTDEVT SYSDA to each CHECK INDEX statement.
   If necessary, you can replace SYSDA with another device type.

<< See the following HOLD >>

TYPE: ACTION

This PTF adds DB2 11 pre-migration reports to job DSNTIJPM:
- Report 5: Packages that are autobind candidates in DB2 11
  -> The report now includes the CONTOKEN and LASTUSED setting for each package.
- Report 11: Use of simple table spaces
  -> The report now excludes DB2 directory and work file table spaces.
  -> The report now warns that dropped simple table spaces cannot be recreated. (The warning previously stated that such table spaces cannot be recovered.)
- Report 17: Package dependencies on table spaces that are affected by enabling-new-function mode
  -> The report is clarified to note that some table spaces are replaced by new table spaces during enabling-new-function mode.
- Report 19: Reports orphaned rows in the SYSIBM.SYSTABSTATS catalog table
- Report 20: Reports orphaned rows in the SYSIBM.SYSCOLAUTH catalog table
- Report 21: Lists tables with inconsistent version numbers in the DB2 catalog.

If you maintain a customized copy of DSNTIJPM, after applying this PTF, you need to refresh it as follows:
1. Edit your customized copy of DSNTIJPM.
2. Delete all lines, and copy in the contents of the DSNTIJPM member from the prefix.SDSNSAMP library.
3. Follow the directions in the job prologue to customize it for your DB2 subsystem.
4. If you are preparing to migrate to DB2 V11, run the updated, customized job to check for conditions that might affect your migration.

<< See the following HOLD >>

TYPE: ACTION
This PTF modifies the DSNTINST installation CLIST in the prefix.SDSNCLST target library only. You need to redo any record format changes and reapply any tailoring that you have done to your copy of this CLIST. You might also want to move your tailored copy of the updated DSNTINST member to the prefix.NEW.SDSNCLST data set, where the CLISTS that are processed by job DSNTIJVC reside.

<< See the following HOLD >>

TYPE: ACTION

This PTF externalizes DB2 subsystem parameter PKGREL_COMMIT on installation panel DSNTIP8, as field PACKAGE RELEASE COMMIT. PKGREL_COMMIT specifies whether, at COMMIT or ROLLBACK, a persistent DB2 thread releases a package that is active on that thread when certain DB2 operations are waiting for exclusive access to that package. Possible values are:

* YES: For packages that are bound with the RELEASE(DEALLOCATE) option, the following operations are permitted at COMMIT or ROLLBACK while the package is active and allocated by DB2 for a persistent DB2 thread:
  - BIND REPLACE PACKAGE and REBIND PACKAGE requests, including automatic rebind online schema changes for tables and indexes that are statically referenced by the package
  - Online REORG operations that materialize pending definition changes for objects that are statically referenced by the package

  YES is the default setting.

* NO : DB2 does not implicitly release an active package at COMMIT or ROLLBACK for a persistent DB2 thread.

If you use the installation CLIST to install or migrate a data sharing group, this change will not be present if your TSO session allocates a SDSNSPFP library that does not have this PTF applied.

The following action is required if you maintain copies of the DB2 installation panels outside of SMP/E:

This PTF modifies DB2 installation panel DSNTIP8 in the prefix.SDSNSPFP target library. If you have already installed or migrated to DB2 11 for z/OS, after applying this PTF, you need to copy the updated installation panel DSNTIP8 to your alternative SDSNSPFP library.
NOTE: This PTF supersedes the following list of PTFs:
UK94655, UK94656, UK94658, UK94659, UK94660. The following
HOLD data is reproduced from the superseded PTFs. If the
HOLD actions have been performed at the time that the
superseded PTFs were applied, these actions need not be
done again.

<< See the following HOLD >>

TYPE: ACTION

This PTF performs the following actions:
- Fixes a problem that causes some directory table rows to
  have incorrect information when a new installation of DB2 for
  z/OS Version 11 is performed.
- Updates information for creating catalog tables SYSTABLESPACE,
  SYSINDEXES, SYSTABLES, SYSCOLUMNS, and SYSKEYS.

If you did a new install or migration before you applied this
PTF, follow these steps:

1. Execute the following SELECT statement:
SELECT * FROM SYSIBM.SYSCOLUMNS
   WHERE NAME='AUXID' AND TBNAME='SYSDBD_DATA' AND
   TBCREATOR='SYSIBM';

If the SELECT statement returns no rows, proceed to step 2.
If the SELECT statement returns at least one row, no action
is necessary.

2. Run a CATMAINT job with the following control statement:
   CATMAINT UPDATE UNLDDN DB2DEV

<< See the following HOLD >>

TYPE: ACTION

This PTF enhances the SYSPROC.ADMIN_COMMAND_DB2 stored procedure
to return information for LOB table spaces, XML table spaces,
and table spaces with an unknown type. In particular, the
processing-type parameter has three new values:
LS
Parse "-DISPLAY DATABASE(...) SPACENAM(...)" command output
messages, and return LOB table spaces information.
XS
Parse "-DISPLAY DATABASE(...) SPACENAM(...)" command output
messages, and return XML table spaces information.
UN
Parse "-DISPLAY DATABASE(...) SPACENAM(...)" command output
messages, and return unknown table space information.

If you have already installed or migrated to DB2 Version 11, take one of the following actions after you apply this PTF:

- Run your customized copy of job DSNTIJRT with MODE(INSTALL)
to bind the package for SYSPROC.ADMIN_COMMAND_DB2.

If you have previously run DSNTIJRT, rerunning with
MODE(INSTALL) causes DSNTIJRT to detect and correct only
missing and down-level SQL objects and packages for
DB2-supplied routines.

- Run DSNTIJRT with MODE(INSTALL-PREVIEW) to obtain a
report of any changes without processing them. The PREVIEW
option generates a JCL job to the JCLOUT DD location that
contains any SQL and bind statements to be processed.
After reviewing the changes, rerun DSNTIJRT without
the PREVIEW option, or customize and run the generated job.

<< See the following HOLD >>

TYPE: ACTION

This PTF provides new index configuration options
UPDATEAUTO COMMIT, COMMITTYPE and COMMITCYCLES
for the SYSTS_CREATE, SYSTS_UPDATE and SYSTS_ALTER
stored procedures.

If you have already installed or migrated to DB2 Version 11,
and you use IBM Text Search for DB2 for z/OS, take one of
the following actions after you apply this PTF:

- Run your customized copy of job DSNTIJRT with MODE(INSTALL)
to bind the package for SYSPROC.ADMIN_COMMAND_DB2.

If you have previously run DSNTIJRT, rerunning with
MODE(INSTALL) causes DSNTIJRT to detect and correct only
missing and down-level SQL objects and packages for
DB2-supplied routines.

- Run DSNTIJRT with MODE(INSTALL-PREVIEW) to obtain a
report of any changes without processing them. The PREVIEW
option generates a JCL job to the JCLOUT DD location that
contains any SQL and bind statements to be processed.
After reviewing the changes, rerun DSNTIJRT without
the PREVIEW option, or customize and run the generated job.

<< See the following HOLD >>

TYPE: ACTION

This PTF modifies installation job DSNTIJTM to create a versioned DBRM when the DSNTIAD dynamic SQL processor program is precompiled.

The following action is required after you apply the PTF.

-------------------------------------------------------------------------------
Update customized copies of DB2 installation CLIST members
-------------------------------------------------------------------------------

==> This action is required for all V11 customers.

This PTF modifies CLIST member DSNTINS1 in the prefix.SDSNCLST target library only. You need to modify this new version of DSNTINS1 to redo any record format changes and reapply any tailoring that you did to your old copies of this CLIST.

You might also want to move the new version of DSNTINS1 to the prefix.NEW.SDSNCLST data set, where the CLISTS processed by job DSNTIJVC reside.

The following action can be performed at any time.

-------------------------------------------------------------------------------
Modify your customized copy of job DSNTIJTM
-------------------------------------------------------------------------------

==> This action is required for customers who maintain a customized copy of job DSNTIJTM.

This PTF modifies installation job DSNTIJTM in the SDSNSAMP target library only. To modify your customized copy of DSNTIJTM, add VERSION(AUTO) to the list of precompiler options specified in job step DSNTIAD. For example, change this:

//DSNTIAD EXEC DSNHASM, MEM=DSNTIAD,
// PARM.PC='HOST(ASM),STDSQL(NO)'

to this:

//DSNTIAD EXEC DSNHASM, MEM=DSNTIAD,
// PARM.PC='HOST(ASM),STDSQL(NO),VERSION(AUTO)'

Appendix B. HOLD DATA for PTFs integrated in the product tape 57
PDO: 1326

<< See the following HOLD >>

TYPE: ACTION

This PTF adds 3 DB2 11 premigration reports to job DSNTIJPM:
- Report 22: Identifies plans that will be invalidated when job DSNTIJEN is run.
- Report 23: Identifies packages that will be invalidated when job DSNTIJTC is run.
- Report 24: Identifies plans that will be invalidated when job DSNTIJTC is run.

This PTF also updates the query for report 17, which identifies packages that will be invalidated when job DSNTIJEN is run.

If you maintain a customized copy of DSNTIJPM, after applying this PTF, refresh it by following these steps:
1. Edit your customized copy of DSNTIJPM.
2. Delete all lines and copy in the DSNTIJPM member from the prefix.SDSNSAMP library.
3. Follow the directions in the job prolog to customize it for your DB2 subsystem.

If you are preparing to migrate to DB2 V11, run the updated, customized job to check for conditions that might affect your migration.

<< See the following HOLD >>

TYPE: ACTION

This PTF enhances stored procedure SYSPROC.SET_PLAN_HINT to support extended optimization.

If you have already installed or migrated to DB2 V11, you need to run installation job DSNTIJRT to bind and create the new objects that are introduced for SET_PLAN_HINT to support the new capability.

Detailed guidance for this action follows:

Run your customized copy of job DSNTIJRT with MODE(INSTALL) to perform the following actions:
- Bind SET_PLAN_HINT package DSNADM.DSNADMHS with RELEASE(DEALLOCATE).
- Bind SET_PLAN_HINT packages DSNADM.DSNADMGU,
DSNADM.DSNADMHO, and DSNADM.DSHADMHU.
- Create table DSN8BQRY.DSN_PREDICAT_TABLE and its indexes.
- Create table DSN8BQRY.DSN_PREDICATE_SELECTIVITY and its index.
- Bring the tables DSN8BQRY.PLAN_TABLE and DSN8BQRY.DSN_USERQUERY_TABLE into current-release format.
- Grant access to tables DSN8BQRY.DSN_PREDICAT_TABLE and DSN8BQRY.DSN_PREDICATE_SELECTIVITY.
- Grant the EXECUTE privilege on package DSNADM.DSNADMHO.

If you have previously run DSNTIJRT, rerunning with MODE(INSTALL) causes DSNTIJRT to detect and correct only missing and downlevel SQL objects and packages for DB2-supplied routines.

You can run DSNTIJRT with MODE(INSTALL-PREVIEW) to obtain a report of any changes without processing them. The PREVIEW option also generates a JCL job to the JCLOUT DD destination that contains any SQL and bind statements to be processed. After reviewing the changes, rerun DSNTIJRT without the PREVIEW option or customize and run the generated job.

<< See the following HOLD >>

**TYPE: ACTION**

This PTF adds support for program authorization. Program authorization is the process of verifying that an application program is authorized to execute a specified plan. New BIND PLAN and REBIND PLAN option PROGAUTH with values ENABLE or DISABLE specifies whether program authorization is enabled. PROGAUTH(DISABLE) is the default.

For any plan that is bound with PROGAUTH(ENABLE), a row must exist in new user-defined table SYSIBM.DSNPROGAUTH. The description of SYSIBM.DSNPROGAUTH follows.

**SYSIBM.DSNPROGAUTH description**

<table>
<thead>
<tr>
<th>Column Name</th>
<th>Data type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROGNAME</td>
<td>VARCHAR(24)</td>
<td>Name of the application program that runs the plan.</td>
</tr>
<tr>
<td>PLANNAME</td>
<td>VARCHAR(24)</td>
<td>Name of the application plan that the program can execute.</td>
</tr>
<tr>
<td>PROGMDCVAL</td>
<td>CHAR(16)</td>
<td>Not yet used.</td>
</tr>
</tbody>
</table>
FOR BIT DATA
NOT NULL
WITH DEFAULT
X'0000000000000000000000000000000000'

PROGMDCPAD CHAR(1) Not yet used.
NOT NULL
WITH DEFAULT '2'

ENABLED CHAR(1) Indicates whether program
NOT NULL authorization is enabled. This
WITH DEFAULT 'N' column can have one of the
following values:
- Y Program authorization is
  enabled
- N Program authorization is
  disabled

CREATOR VARCHAR(128) Authorization ID that inserted
NOT NULL or last modified the row.

CREATETS TIMESTAMP Time when the row was inserted
NOT NULL or updated.

REMARKS VARCHAR(762) Comments about this program
authorization record.

Before you can enable program authorization, you need to create
database DSNMDCDB, table space DSNMDCTS, table
SYSIBM.DSNPROGAUTH, and index SYSIBM.DSNPROGAUTH_IDX1.
This PTF adds a new job step, DSNTIJP, to job DSNTIJSG to
create those objects.

If you have already installed or migrated to DB2 11, after
applying this PTF, you need to update your customized copy of
DSNTIJSG as follows:
1. Copy job step DSNTIJP from the DSNTIJSG template job in
the SDSNSAMP target library to your copy of DSNTIJSG.
2. Modify job step DSNTIJP as follows:
   (a) Change DSN SYSTEM(DSN) to specify the name of your
       DB2 subsystem.
   (b) Change PLAN(DSNTIA!!) to specify the name of the plan
       for program DSNTIAD.
   (c) Change LIBRARY('DSN!!.RUNLIB.LOAD') to specify the
       name of the library where the DSNTIAD module resides.
   (d) Change SET CURRENT SQLID = 'SYSADM' to specify the
       SQL ID that is to be used to create the program
       authorization database.
3. Make any other site-specific changes to job step DSNTIJP.
4. Run the updated job step DSNTIJP to create the program
authorization database.

<< See the following HOLD >>

TYPE: ACTION

This PTF updates DB2 installation job DSNTIJSG to bind and grant access to DSNX9LDJ, the package for the DB2 stored procedures Java class loader.

If you have already installed or migrated to DB2 Version 11, you need to take the following actions after applying this PTF:
1. Update private copies of the installation CLIST.
2. Update your customized copy of job DSNTIJSG.
3. Grant the EXECUTE privilege on package DSNX9LDJ.

Detailed guidance for these actions follows:

----------------------------------------------------------------
1. Update private copies of the installation CLIST:
   => This action is required for all DB2 11 customers.
   This PTF modifies DB2 installation CLIST member DSNTINS1 in the prefix.SDSNCLST target library. After applying this PTF, you need to redo any record format changes and reapply any tailoring that you have done to your copies of DSNTINS1. You might also want to move your tailored copy of the updated DSNTINS1 member to the prefix.NEW.SDSNCLST data set, where the CLISTs that are processed by job DSNTIJVC reside.
----------------------------------------------------------------
2. Update your customized copy of job DSNTIJSG:
   => This action is required for all DB2 11 customers who maintain a private copy of DSNTIJSG.
   a. Add the following BIND command in job step DSNTIRU:

   ```
   BIND PACKAGE(DSNJAR) MEMBER(DSNX9LDJ) -
   ACTION(ADD) ISO(CS) CURRENTDATA(YES) -
   ENCODING(EBCDIC) -
   LIBRARY('prefix.SDSNDBRM')
   
   <prefix> is the high-level qualifier for the target DB2 subsystem.
   ```
   
   b. Add the following GRANT statement in step DSNTIJG:

   ```
   GRANT EXECUTE ON PACKAGE DSNJAR.DSNX9LDJ TO PUBLIC;
   ```
If you do not want all users to execute the package, change PUBLIC to one or more authorization IDs that need to use Java stored procedures.

3. Grant execute access on package DSNX9LDJ.
   
   => This action is required for all DB2 11 customers who need to use Java stored procedures.

   Submit a job that contains the following GRANT statement:
   GRANT EXECUTE ON PACKAGE DSNJAR.DSNX9LDJ TO PUBLIC;

   If you do not want all users to execute the package, change PUBLIC to one or more authorization IDs that need to use Java stored procedures.

   If the above GRANT statement fails with SQLCODE -2/zerodot4, package DSNX9LDJ in collection DSNJAR does not exist. Run the following BIND command to bind the package:

   BIND PACKAGE(DSNJAR) MEMBER(DSNX9LDJ) -
   ACTION(ADD) ISO(CS) CURRENTDATA(YES) -
   ENCODING(EBCDIC) -
   LIBRARY('prefix.SDSNDRM')

   <prefix> is the high-level qualifier for the target DB2 subsystem.

   After you bind the package, execute the GRANT statement again.

   << See the following HOLD >>

   TYPE: ACTION

   This PTF changes the value of the FOREIGNKEY column from 'S' to 'B' in the SYSIBM.SYSCOLUMNS catalog table for column LGRMEMB in the SYSIBM.SYSLGRNX directory table.

   If you have already installed or migrated to DB2 11 for z/OS new-function mode, you need to perform the following steps after you apply this PTF:
   1. Execute the following query:
      SELECT FOREIGNKEY FROM SYSIBM.SYSCOLUMNS
         WHERE NAME IN('LGRMEMB') AND
         TBCREATOR = 'SYSIBM' AND TBNAME = 'SYSLGRNX';

   2. If the FOREIGNKEY column contains any instances of the value 'S', run the following CATMAINT control statement:
If you have not yet migrated to DB2 Version 11, the column values will be corrected when you run job DSNTIJEN to convert to enabling-new-function mode.

<< See the following HOLD >>

TYPE: ACTION

This PTF modifies job DSNTIJCV, which converts DB2 for z/OS catalog and directory objects to extended RBA or LRSN format. This PTF adds job step JCVCPY01, which takes an image copy of the DSNDB01.SYSPINGX table space immediately after the table space has been converted to extended RBA or LRSN format.

Job DSNTIJCV already creates image copies for all other DB2 catalog and directory table spaces through in inline copies that are taken when REORG is run for conversion to extended format.

If you have already installed or migrated to DB2 11, after applying this PTF, you need to take the following actions:

1. Update customized copies of DB2 installation CLIST members.
2. Update your customized copy of job DSNTIJCV.

Detailed guidance for these actions follows:

1. Update customized copies of DB2 installation CLIST members.
   => This action is required for all DB2 11 customers.

   This PTF modifies CLIST member DSNTINS3 in the prefix.SDSNCLST target library only. You need to redo any record format changes and reapply any tailoring that you have done to your copies of this CLIST.
   You might also want to move your tailored copy of the updated DSNTINS3 member to the prefix.NEW.SDSNCLST data set, where the CLISTs that are processed by job DSNTIJCV reside.

2. Update your customized copy of job DSNTIJCV.
   => This action is required for all DB2 11 customers who maintain a customized copy of DSNTIJCV.

   This PTF modifies job DSNTIJCV in the prefix.SDNSAMP target library only. You need to edit and update your customized...
copy as follows:
(1) After job step JCVCVT01, and before job step JCVCOPY02,
insert the following JCL:

```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

** */
**/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

//JCVCPY01 EXEC JCVPROC,UID='DSNTIJCV.CPY01',COND=(4,LT)
//SYSIN DD */

SYSCOPY
DSN(DSN!!/zerodot.&SN..D&JU..&UQ.)
DISP (NEW,CATLG,CATLG)
UNIT SYSDA
COPY TABLESPACE DSNDBO1.SYSUTILX SHRLEVEL CHANGE
COPYDDN(SYSCOPY) FULL YES
***/
```

(2) Modify the TEMPLATE utility control statement in the new job step. You can use the TEMPLATE statement in job step JCVCPY02 as a model. At a minimum, you need to change 'DSN!!0' to the prefix for DB2 image copy data sets at your site.

If you have already run DSNTIJCV, you do not need to rerun it after making these modifications.

-----------------------------------------------------------------
<< See the following HOLD >>

TYPE: ACTION

This PTF fixes a problem in job DSNTIJPM that causes premigration report 20 to fail with SQLCODE -104 when DSNHDECP.DECIMAL=COMMA.

If you maintain a customized copy of DSNTIJPM, after applying this PTF, refresh it by following these steps:
1. Edit your customized copy of DSNTIJPM.
2. Delete all lines and copy in the DSNTIJPM member from the prefix.SDSNSAMP library.
3. Follow the directions in the job prolog to customize it for your DB2 subsystem.

If you are preparing to migrate to DB2 V11, run the updated, customized job to check for conditions that might affect your migration.

<< See the following HOLD >>
This PTF fixes the following problems:

- A problem that causes a SELECT of character columns from SYSIBM.SYSLGRNX to return SQLSTATE 01517, and to convert some characters in the output to substitution character X'3F'.

- A problem that prevents the following CATMAINT control statement from running in Version 11 conversion mode:
  
  CATMAINT UPDATE UNLDDN DB2DEV

This PTF changes the value of the FOREIGNKEY column from 'S' to 'B' in the SYSIBM.SYSCOLUMNS catalog table for some columns in the SYSIBM.SYSLGRNX directory table.

If you have already installed or migrated to DB2 11 for z/OS, you need to perform the following steps after you apply this PTF:

1. Execute the following query:

   ```sql
   SELECT FOREIGNKEY FROM SYSIBM.SYSCOLUMNS
   WHERE NAME IN('LGRDBID','LGRPSID','LGRSRBA','LGRSPBA','LGRSLRSN','LGRELRSN') AND TBCREATOR = 'SYSIBM' AND TBNAME = 'SYSLGRNX';
   ```

2. If the FOREIGNKEY column contains any instances of the value 'S', run the following CATMAINT control statement:

   CATMAINT UPDATE UNLDDN DB2DEV

   If the FOREIGNKEY column contains only the value 'B', you do not need to run the CATMAINT control statement.

<< See the following HOLD >>

This PTF corrects the following errors in DSNTSMFD, a sample program for decompressing compressed DB2 SMF records:

- The DSNTSMFD report shows incorrect sizes for input and output records.
- The DSNTSMFD report shows invalid compression percentages.

Applying this PTF updates only the DSNTSMFD source code. The updates do not affect your current DSNTSMFD load module until you rebuild it as follows:

- If you use DSNTSMFD as supplied by DB2, run job steps ASM
and LKED of your customized copy of job DSNTEJDS to assemble and link-edit the load module for DSNTSMFD.
- If you have modified the DSNTSMFD source code, redo your modifications in the source code that was shipped with this PTF. Then run job steps ASM and LKED from your customized copy of job DSNTEJDS to assemble and link-edit the load module for DSNTSMFD.

<< See the following HOLD >>

TYPE: ACTION

This PTF adds new option 4 to DB2 subsystem parameter DSN6SPRM.QUERY_ACCEL_OPTIONS. DSN6SPRM.QUERY_ACCEL_OPTIONS specifies additional types of SQL queries that are to be processed by an accelerator.

The description of option 4 is as follows:

Queries that reference an expression with a DATE data type that uses a LOCAL format are not blocked from executing on an accelerator. The accelerator uses the dd/mm/yyyy format as the LOCAL format.

Specify option 4 only when the DATE FORMAT field of installation panel DSNTIP4 specifies LOCAL, or when application programs that process SQL on the DB2 subsystem have been precompiled with the DATE(LOCAL) option. In either case, the LOCAL date exit routine must also define the dd/mm/yyyy date format. If the LOCAL format is not defined as dd/mm/yyyy, queries might return unpredictable results.

In a data sharing environment, if you specify option 4 on any member, you should specify option 4 on all members.

NONE remains the default setting for QUERY_ACCEL_OPTIONS and is mutually exclusive with all other settings. The options can be specified individually or together. Some examples are:

QUERY_ACCEL_OPTIONS=NONE
QUERY_ACCEL_OPTIONS=1
QUERY_ACCEL_OPTIONS=3
QUERY_ACCEL_OPTIONS=(1,2)
QUERY_ACCEL_OPTIONS=(1,3)
QUERY_ACCEL_OPTIONS=(1,2,4)

Actions to take after applying this PTF:
=> Perform steps 1 through 4 only if all of the these conditions are true:
   - In a DB2 data sharing environment, this PTF has been
applied to all members of the group.
- The DSN6SPRM.ACCEL subsystem parameter is set to AUTO or
  COMMAND to enable query acceleration.
- The DSNHDECP.DATE subsystem parameter is set to LOCAL, and
  the local date exit defines the dd/mm/yyyy date format.

1. In your customized copy of job DSNTIJUZ, add or update
keyword parameter QUERY_ACCEL_OPTIONS. Insert or update text
like this in the invocation of the DSN6SPRM macro:
QUERY_ACCEL_OPTIONS=<y>
<y> is 4, or a list form such as (1,2,3,4). Add a comma
at the end of the text and a continuation character in column
72 if needed. If your DSNTIJUZ job does not include
QUERY_ACCEL_OPTIONS, that parameter is set to the default of
NONE when you assemble the DSNZPxxx module.
2. Run the first two steps of the DSNTIJUZ job that you
modified.
3. After the job completes, run the -SET SYSPARM command,
or stop and restart DB2 for the change to take effect.
4. If you added or modified the setting for QUERY_ACCEL_OPTIONS,
add or update the entry for it in all private copies of your
CLIST output DSNTIDxx member. In each such copy, add or
update the following line:
QUERY_ACCEL_OPTIONS CHAR M NONE NONE <y>
Change <y> to the value that you specified for
QUERY_ACCEL_OPTIONS in step 1, above.
5. Update customized copies of DB2 installation CLIST members.

===> This step is required for all V11 customers.

This PTF modifies CLIST member DSNTINST in the SDSNCLST
target library only. You need to redo any record format
changes and reapply any tailoring that you have done to your
copies of this CLIST. You might also want to move your
tailored copy of the updated DSNTINST member to the
prefix.NEW.SDSNCLST data set, where the CLISTs that are
processed by job DSNTIJVC reside.

6. Copy updated DB2 installation panels to alternative
libraries.

===> This step is required for all V11 customers who maintain
copies of the DB2 installation panels outside of SMP/E:

This PTF modifies DB2 installation panel DSNTIP8A in the
prefix.SDSNSPFP target library.
If you keep the DB2 installation panels in a different library, after applying this PTF, you need to copy the updated panel to that library.

<< See the following HOLD >>

TYPE: ACTION

This PTF fixes a problem in CREATE PROCEDURE that allows a user to create a native SQL procedure with the AUTONOMOUS option, and the DYNAMIC RESULT SETS option with a non-zero value. That combination should be prohibited, because the caller of a procedure that is defined in this way cannot access the result sets.

This PTF disallows CREATE PROCEDURE with AUTONOMOUS and DYNAMIC RESULT SETS n, where n>0. However it does not fix existing native SQL procedures that are defined in this way. After you apply this PTF, follow these instructions to identify and fix existing native SQL procedures:

1. Execute the following query to identify the SQL procedures that are affected:

   ```sql
   SELECT SCHEMA, NAME, SPECIFICNAME, VERSION,
       COMMIT_ON_RETURN, RESULT_SETS
   FROM SYSIBM.SYSROUTINES
   WHERE COMMIT_ON_RETURN = 'A' AND RESULT_SETS <> 0;
   ```

2. For the identified stored procedures, execute
   ```sql
   ALTER PROCEDURE with DYNAMIC RESULT SETS 0 for the affected versions of the SQL procedure.
   ```

<< See the following HOLD >>

TYPE: ACTION

This PTF adds support for array parameters to DB2 supplied database metadata stored procedure SYSIBM.SQLPROCEDURECOLS. After this PTF is applied, SYSIBM.SQLPROCEDURECOLS returns data type information for array parameters in stored procedures.

******************************************************************************
Actions for customers who are already using DB2 V11:
******************************************************************************

If you have already installed or migrated to DB2 V11, you need to take the following actions after applying this feature:
1. Run installation job DSNTIJRT to rebind DBRM DSNAPCOU.
2. Refresh the WLM environment.

Detailed guidance for these actions follows:
---------------------------------------------

1. Run installation job DSNTIJRT to rebind DBRM DSNAPCOU:

Run your customized copy of job DSNTIJRT with MODE(INSTALL) to bind the DBRM DSNAPCOU.

If you have previously run DSNTIJRT, rerunning with MODE(INSTALL) causes DSNTIJRT to detect and correct only missing and downlevel SQL objects and packages for DB2-supplied routines.

You can run DSNTIJRT with MODE(INSTALL-PREVIEW) to obtain a report of any changes without processing them. The PREVIEW option also generates a JCL job to the JCLOUT DD destination that contains any SQL and bind statements to be processed. After reviewing the changes, rerun DSNTIJRT without the PREVIEW option or customize and run the generated job.

2. Refresh the WLM environment:

Issue the following VARY MVS command to refresh the WLM application environment

VARY WLM,APPLENV=<wlmenv>,REFRESH

<wlmenv> is the name of the WLM application environment in which procedure SYSIBM.SQLPROCEDURECOLS runs.

<< See the following HOLD >>

TYPE: ACTION

This PTF adds an online-changeable subsystem parameter to DSN6SPRM named CACHE_DEP_TRACK_STOR_LIM. This subsystem parameter specifies the amount of storage in gigabytes that DB2 allocates for hashing entries in the dynamic statement cache. The value must be an integer in the range 2 to 10. The default is 2.

If you have already installed or migrated to DB2 Version 11, you need to take the following actions after applying this PTF:
1. Update customized copies of DB2 installation CLIST members.
2. Update your customized copy of job DSNTIJUZ.
3. Update private copies of the DSNTIDxx CLIST input member.
4. Bind a new package for program DSNTXAZP.

Detailed guidance for these actions follows:

----------------------------------------------------------------
1. Update customized copies of DB2 installation CLIST members:

This PTF modifies CLIST member DSNTINST in the prefix.SDSNCLST target library only. You need to redo any record format changes and reapply any tailoring that you have done to your copies of this CLIST. You might also want to move your tailored copy of the updated DSNTINST member to the prefix.NEW.SDSNCLST data set, where the CLISTs that are processed by job DSNTIJVC reside.

----------------------------------------------------------------
2. Update your customized copy of job DSNTIJUZ:

This PTF modifies DB2 installation job DSNTIJUZ in the prefix.SDSNSAMP target library. After applying this PTF, you need to update your customized copy of DSNTIJUZ as follows:

a. Add the keyword parameter CACHE_DEP_TRACK_STOR_LIM=<x>, where <x> is an integer from 2 to 10, to the invocation of the DSN6SPRM macro. Add a comma at the end of the text and a continuation character in column 72 if needed. If you do not add CACHE_DEP_TRACK_STOR_LIM here, the value is set to the default of 2 when you assemble the DSNZPxxx module.

b. Run the first two steps of the DSNTIJUZ job that you modified.

c. After the job completes, run the -SET SYSPARM command, or stop and restart DB2 for the change to take effect.

----------------------------------------------------------------
3. Update private copies of the DSNTIDxx CLIST input member:

This PTF adds an entry for CACHE_DEP_TRACK_STOR_LIM to the CLIST default input member, DSNTIDXA, in the prefix.SDSNSAMP target library. You need to add this entry to all private copies of your CLIST output DSNTIDxx member. In each such copy, add the following line:

CACHE_DEP_TRACK_STOR_LIM NUM M 2 10 <x>
Change &lt;x&gt; to the value that you specified for
CACHE_DEP_TRACK_STOR_LIM in step 2, above.

-----------------------------------------------
4. Bind a new package for program DSNTXAZP:

This PTF modifies the DBRM for program DSNTXAZP, the CLIST
data (DSNTIDxx) member refresh tool. Use the following
command to bind a package from that DBRM:

```
BIND PACKAGE(DSNTXAZP) MEMBER(DSNTXAZP) -
    ACTION(ADD) ENCODING(EBCDIC) -
    LIBRARY('prefix.SDSNDBRM')
```

prefix is the prefix of your DB2 Version 11 target libraries.

<< See the following HOLD >>

TYPE: ACTION

This PTF updates the source code for the DSNTEP2 and DSNTEP4
programs, and the shipped object decks (DSNTEP2L and DSNTEP4L)
and shipped DBRMs (DSN@EP2L and DSN@EP4L). These changes
do not become effective until you rebuild the load modules
and rebind their plans.

For DB2 Version 11 systems that are in new-function mode, take
one of the following actions:
- If you use DSNTEP2 or DSNTEP4 as supplied DB2, run
  installation verification job DSNTEJ1L to relink the load
  modules from the shipped object modules and bind the
  plans from the shipped DBRMs.
- If you use a modified version of DSNTEP2 or DSNTEP4, redo
  your modifications in the updated source code that is
  shipped with this PTF, and run installation verification
  job DSNTEJ1P to recompile and link-edit the load modules
  and bind the plans for DSNTEP2 and DSNTEP4.

For DB2 Version 11 systems that are in conversion mode or
enabling-new-function mode, no action is required after you
apply this PTF. The updated programs are used when you run
the DB2 Version 11 installation verification jobs after DB2
enters new-function mode.

<< See the following HOLD >>

TYPE: ACTION
This PTF fixes a problem that causes the DCLGEN tool to fail with SQLCODE -495 because a resource limit was exceeded.

If you have already installed or migrated to DB2 11 for z/OS, after applying this PTF, you need to bind the DCLGEN package again. Use the following command:

```sql
BIND PACKAGE(DSNEDCL) MEMBER(DSNECP68) -
   ACTION(ADD) ISOLATION(CS) ENCODING(EBCDIC) -
   LIBRARY('prefix.SDSNDBRM')
```

prefix is the prefix of your DB2 Version 11 target libraries.

HOLD TYPE=DOC

=*=*=*=*=*

PDO: 1314
<< See the following HOLD >>

TYPE: DOC

This PTF for APAR PM76266 adds new message DSNU3346I. The text is as follows:

```
DSNU3346I REAL-TIME STATISTICS INFORMATION MISSING FOR obj-type
obj-qual.obj-name. SAMPLING RATE CHANGED TO 1/zerodot/zerodot.
```

Explanation: The utility could not read necessary information from real-time statistics tables for the object.
obj-type: The type of object.
obj-qual.obj-name: The name of the object, as a qualified name.

System action: RUNSTATS sets the sampling rate to 100, and continues to run.

System programmer response: If a sampling rate of 100 is appropriate, no action is required. Otherwise, run the REORG TABLESPACE utility on the specified object to re-establish values in the real-time statistics tables. Then run RUNSTATS with TABLESAMPLE SYSTEM n again.

Severity: 4 (warning)

PDO: 132/zerodot

<< See the following HOLD >>
This PTF adds support for static SQL package invalidation, if an access control authorization exit is used. A package is invalidated when a privilege that is required by the package is revoked in RACF, and subsystem parameter AUTEXIT_CACHEREFRESH is set. Package invalidation is supported when profiles with discrete names are revoked in RACF, and the profiles are not in the DSNADM class.

New messages DSNX236I and DSNX237I are added:

DSNX236I

A RESOURCE resource-name TYPE OF RESOURCE resource-type FOR PROCESSING ENF SIGNAL FOR AUTHID authid OPERATION operation ON OBJECT object-name IS NOT AVAILABLE FOR REASON reason-code. ENF SIGNALS RECEIVED FOR CLASS class-name ARE NOT PROCESSED FOR PACKAGE INVALIDATION.

Explanation: The ENF signal process for package invalidation has failed because a required resource resource-name is not available. The ENF signals received for the class class-name are not processed.

resource-name
  The name of the resource.
resource-type
  The type of the resource.
authorization-ID
  The authorization identifier that is identified in the message. The authorization-ID can be a role.
operation
  The operation that is performed.
object-name
  The name of the object. If the operation is EXECUTE PACKAGE, the object name consists of the collection ID and the package name. For all other operations, the object name consists of the schema name and the object name.
reason-code
  A numeric value that indicates the reason for the failure of the operation.
class-name
  The name of the RACF resource class for DB2 objects and administrative authorities.
System Action: The ENF processing continues.

System Administrator Response: Ensure that the required resource is available for the ENF signal process. Manually restart the package invalidation process. Notify the security administrator.

Security Administrator Response: Identify the RACF commands that were issued to remove resource access for the specified RACF class. Permit the user access to the identified resources and then delete the permissions in RACF.

Operator response: No action is required.

DSNX237I
AN ABEND HAS OCCURRED DURING ENF SIGNAL PROCESSING. ENF SIGNALS RECEIVED FOR CLASS class-name ARE NOT PROCESSED.

Explanation: An abend has occurred in DB2, when processing the ENF signal received from the security server. The ENF signals received for the class-name are not processed.

class-name
RACF resource class for DB2 objects and administrative authorities

System Action: The ENF signal processing continues.

System Administrator Response: Manually restart the cache refresh and package invalidation processes. Notify the security administrator.

Security Administrator Response: Identify the RACF commands that were issued to remove resource access for the specified RACF class. Permit the user access to the identified resources and then delete the permissions in RACF.

<< See the following HOLD >>

TYPE: DOC and AO

In DB2 for z/OS V10, a user with EXPLAIN privilege, running an application attempting to execute an SQL statement that he does not have authority to execute will receive warning message with SQLCODE +4726, SQLSTATE 0168Z followed by SQLCODE -551, SQLSTATE 42501 instead of SQLCODE -514 or SQLCODE -518.

The documentation for following SQL codes are updated as below:
-514:
THE CURSOR cursor-name IS NOT IN A PREPARED STATE

Explanation:
The application program has tried to use a cursor, 'cursor-name'
that is not in a prepared state.
The cursor is associated with a statement that:
1. Was never prepared.
2. Was invalidated by a commit or rollback operations

System action:
The statement cannot be processed.

Programmer response:
For case 1, ensure that you prepare the statement that is named
in the DECLARE CURSOR statement for 'cursor-name' before you
try to open the cursor.
For case 2, take one of the following actions:
- Use the WITH HOLD option of DECLARE CURSOR.
- Do not execute a commit or rollback operation until you are
  finished using the cursor.
- Prepare the statement again after the commit or rollback.

SQLSTATE
26501

-518:
THE EXECUTE STATEMENT DOES NOT IDENTIFY A VALID PREPARED
STATEMENT.

Explanation:
One of the following conditions exists:
- The statement identified in the EXECUTE statement has not
  been prepared.
- The statement identified in the EXECUTE statement identifies
  a SELECT, or ASSOCIATE LOCATORS statement.
- The statement identified in the EXECUTE IMMEDIATE statement
  identifies a SELECT or ASSOCIATE LOCATORS statement.

System action:
The statement cannot be processed.

Programmer response:
Ensure that you prepare the statement prior to EXECUTE. Also,
ensure that the statement prepared is not:
- A SELECT statement.
- An ASSOCIATE LOCATORS statement.
SQLSTATE
07003

HOLD TYPE=MULTSYS
==============

PDO: 1317

<< See the following HOLD >>

TYPE: MULTSYS

This PTF corrects a problem that occurs for a data sharing group in V10 and V11 coexistence mode. Incorrect LRSNs are transferred between members when V10 members are migrated to V11. During automatic group RECOVER-pending, ABEND04E RC00D1032A at location DSNJL002.DSNJR003+0A8A results.

To make this fix effective, you need to apply the PTF to all DB2 Version 11 members of the data sharing group.

HOLD TYPE=AO
============

PDO: 1314

<< See the following HOLD >>

TYPE: DOC and AO

In DB2 for z/OS V10, a user with EXPLAIN privilege, running an application attempting to execute an SQL statement that he does not have authority to execute will receive warning message with SQLCODE +4726, SQLSTATE 0168Z followed by SQLCODE -551, SQLSTATE 42501 instead of SQLCODE -514 or SQLCODE -518.

The documentation for following SQL codes are updated as below:

-514:
THE CURSOR cursor-name IS NOT IN A PREPARED STATE

Explanation:
The application program has tried to use a cursor, 'cursor-name' that is not in a prepared state.
The cursor is associated with a statement that:
1. Was never prepared.
2. Was invalidated by a commit or rollback operations
System action:
The statement cannot be processed.

Programmer response:
For case 1, ensure that you prepare the statement that is named in the DECLARE CURSOR statement for 'cursor-name' before you try to open the cursor.
For case 2, take one of the following actions:
- Use the WITH HOLD option of DECLARE CURSOR.
- Do not execute a commit or rollback operation until you are finished using the cursor.
- Prepare the statement again after the commit or rollback.

SQLSTATE 26501

-518:
THE EXECUTE STATEMENT DOES NOT IDENTIFY A VALID PREPARED STATEMENT.

Explanation:
One of the following conditions exists:
- The statement identified in the EXECUTE statement has not been prepared.
- The statement identified in the EXECUTE statement identifies a SELECT, or ASSOCIATE LOCATORS statement.
- The statement identified in the EXECUTE IMMEDIATE statement identifies a SELECT or ASSOCIATE LOCATORS statement.

System action:
The statement cannot be processed.

Programmer response:
Ensure that you prepare the statement prior to EXECUTE. Also, ensure that the statement prepared is not:
- A SELECT statement.
- An ASSOCIATE LOCATORS statement.

SQLSTATE 07003

PDO: 1320

<< See the following HOLD >>

TYPE: AOA

This fix corrects information in certain IFCID 0002 and IFCID 0225 trace records. The fix causes incompatible changes
because some 4-byte fields are no longer being used, and 8-byte fields are being added to provide the same information.

The following is a list of the old and new fields:

<table>
<thead>
<tr>
<th>IFCID</th>
<th>Old field</th>
<th>New field</th>
</tr>
</thead>
<tbody>
<tr>
<td>0002</td>
<td>QISEKSPA</td>
<td>QISEKSPA8</td>
</tr>
<tr>
<td>0225</td>
<td>QW0225SC</td>
<td>QW0225SC8</td>
</tr>
<tr>
<td>0225</td>
<td>QW0225LS</td>
<td>QW0225LS8</td>
</tr>
<tr>
<td>0225</td>
<td>QW0225SX</td>
<td>QW0225SX8</td>
</tr>
<tr>
<td>0225</td>
<td>QW0225HS</td>
<td>QW0225HS8</td>
</tr>
</tbody>
</table>

Applications that refer to the old fields need to be changed to refer to the new fields. Refer to members DSNQISE and DSNDQW03 in data set prefix.SDSNMACS for the complete mappings.

HOLD TYPE=DB2BIND
=*=*=*=*=*=*=*=*=*=

PDO: 1313
<< See the following HOLD >>

Type: DB2BIND

This PTF corrects a problem that causes ABEND04E RC00C90101 in DSNIPSFI :5007 during execution of an SQL statement that contains a user-defined function with the DISALLOW PARALLEL parameter while parallelism is enabled.

To make this fix effective for a static application, rebind the application after application of this PTF.

<< See the following HOLD >>

Type: DB2BIND

This PTF includes the following updated DBRM for the ODBC executable modules DSNAOCLI, DSNAOCLX, and DSNAO64C:

DSNCLIQR

After applying the PTF, all customers who use these modules need to bind a package from the DBRM listed above. For example:

\[\text{BIND PACKAGE (<location-name>\.DSNAOCLI) MEMBER(DSNCLIQR)}\]
\[\quad \text{ACTION(ADD) ENCODING(EBCDIC)}\]

where \(<location-name>\) is the location of the DBMS where
the package binds and where the description of the package resides.

Failure to bind the required package could result in SQLCODE=-805 at application run time.

Also, refer to the prolog of the CLI sample bind job DSNTIJCL in your SDSNSAMP data set for specific instructions on how to customize the BIND command for binding the DBRMs/packages and the application plan at your site.

*** Attention: DB2 data sharing customers need to bind the package only once, after applying the PTF on the first member.

PDO: 1314

<< See the following HOLD >>

TYPE: DB2BIND

This PTF corrects a problem that causes matching index access to be incorrectly used for an SQL statement that contains a predicate with both of the following characteristics:
- The predicate contains an expression of this form:
  non-column-expression CONCAT empty-string
- The column that is compared to this expression has the TIMESTAMP data type.

To make this fix effective for a static application, rebind the affected application packages after application of this PTF.

<< See the following HOLD >>

TYPE: DB2BIND

This PTF corrects a problem that causes ABEND04E RC00E72088 at location DSNXGRDS DSNXSINE OFFSET3196. The problem can happen during execution of an INSERT with SELECT statement that contains a LOB column in the SELECT list and an ORDER BY clause.

To make this fix effective for a static application, rebind the affected application packages after application of this PTF.

<< See the following HOLD >>

TYPE: DB2BIND
This PTF corrects a problem that causes incorrect output when a NOT BETWEEN predicate is used in a query that is in a native SQL routine. Fewer than the expected number of rows are returned.

To make this fix effective for a static application, you need to rebind affected application packages after application of this PTF.

PDO: 1319

<< See the following HOLD >>

TYPE: DB2BIND

This PTF corrects a problem that causes DB2 to incorrectly discard an access path that contains a sparse index.

Determine the affected applications by looking in the PLAN_TABLE for applications that use nested loop join and a table space scan on the inner table (METHOD=1 and ACCESSTYPE='R').

To make this fix effective for static applications, rebind the application packages after you apply this PTF.

<< See the following HOLD >>

TYPE: DB2BIND

This PTF corrects a problem that causes ABEND0C4 PIC11 at location DSNIDM DSNOPUFF OFFSET02BA during execution of an SQL statement that contains a recursive common table expression with a LOB expression in its SELECT list.

After this PTF is applied, more storage is used to store LOB values for the recursive common table expression.

To make this fix effective for a static application, rebind the application after application of this PTF.

PDO: 1320

<< See the following HOLD >>

TYPE: DB2BIND

This PTF changes the way in which DB2 processes the following types of SQL statements:
Statements with a period specification on an application-period temporal table, a system-period temporal table, or an archive-enabled table
- DROP VARIABLE statements
- DESCRIBE statements that describe SELECT statements that reference global variables

Examples of the affected statements are:
EXEC SQL
SELECT COUNT(*) INTO HVINT
FROM TB_BITEMPORAL
FOR BUSINESS_TIME AS OF '2011-04-05'
WHERE GLOBALVAR_INT=1;
EXEC SQL
DROP VARIABLE GLOBALVAR_INT;

To make this fix effective for a static application, you need to rebind the affected application packages after you apply this PTF.

PDO: 1322
<< See the following HOLD >>

TYPE: DB2BIND

This PTF corrects a problem that causes incorrect output or ABEND04E RC00E72018 during execution of an SQL statement that has both of the following characteristics:
- The SQL statement contains an aggregate function in an ORDER BY clause.
- The aggregate function has an argument that references a SELECT list item that is not a simple column or a literal constant.

To make this fix effective for static applications, rebind the application packages after you apply this PTF.

PDO: 1325
<< See the following HOLD >>

TYPE: DB2BIND

This PTF fixes a problem that causes a SELECT of character columns from SYSIBM.SYSLGRNX to return SQLSTATE 01517, and to convert some characters in the output to substitution character X'3F'.
This PTF corrects a problem that causes incorrect output or ABEND04E RC00E72018 during execution of an SQL statement that has both of the following characteristics:
- The SQL statement contains an aggregate function in an ORDER BY clause.
- The aggregate function has an argument that references a SELECT list item that is not a simple column or a literal constant.

To make this fix effective for static applications, rebind the application packages after you apply this PTF.

PDO: 1326

This PTF corrects a problem that causes SQLCODE -443 and SQLSTATE=3836/E to be returned when a SELECT statement references a user-defined function that is defined with RETURNS GENERIC TABLE.

The following example is a SELECT statement for which the problem occurs:

```
SELECT * FROM TABLE(
  HDFS_READ(
    JAQL_SUBMIT(
      'read(lines(location="/syslog")) ->
      write(lines(location="/syslog2"));',
      'HTTP://9.30.179.181:8080/data/controller/dfs/syslog2',
      'HTTP://9.30.179.181:8080', ''),
    )))
AS T1(C1 SMALLINT, C2 INTEGER, C3 INTEGER, C4 INTEGER);
```

HDFS_READ is a user-defined function that is defined with RETURNS GENERIC TABLE. User-defined function JAQL_SUBMIT is called for each row that is returned by HDFS_READ. Without this fix, when the SELECT statement executes, the following SQL error is returned:

```
DB2 SQL Error: SQLCODE=-443, SQLSTATE=38360,
SQLERRMC=JAQL_SUBMIT;
JAQL_SUBMIT;Error due to socket timeout, DRIVER=3.63.74
```
To make this fix effective for a static application, rebind the application after application of this PTF.

<< See the following HOLD >>

TYPE: DB2BIND

This PTF corrects a problem that causes incorrect output for a query that contains a NOT DISTINCT predicate with a correlated subquery. DB2 might not qualify a row with a NOT DISTINCT predicate when a column on the left side is null, and the correlated subquery on the right side is empty.

To make this fix effective for a static application, rebind the application after application of this PTF.
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Program Directory for DB2 11 for z/OS, October 2013

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<th>RATING SCALE</th>
</tr>
</thead>
<tbody>
<tr>
<td>very satisfied</td>
</tr>
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<td>&lt;=============</td>
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<tr>
<th>Satisfaction</th>
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</thead>
<tbody>
<tr>
<td>Ease of product installation</td>
</tr>
<tr>
<td>Contents of Program Directory</td>
</tr>
<tr>
<td>Installation Verification Programs</td>
</tr>
<tr>
<td>Time to install the product</td>
</tr>
<tr>
<td>Readability and organization of Program Directory tasks</td>
</tr>
<tr>
<td>Necessity of all installation tasks</td>
</tr>
<tr>
<td>Accuracy of the definition of the installation tasks</td>
</tr>
<tr>
<td>Technical level of the installation tasks</td>
</tr>
<tr>
<td>Ease of getting the system into production after installation</td>
</tr>
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