



**Program Directory for
IBM DB2 Cloning Tool for z/OS**

V03.02.00

Program Number 5655-N15

FMID HCKZ320

for Use with
z/OS

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Note

Before using this information and the product it supports, be sure to read the general information under 7.0, "Notices" on page 26.

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1.0 Introduction

This program directory is intended for system programmers who are responsible for program installation and maintenance. It contains information about the material and procedures associated with the installation of IBM DB2 Cloning Tool for z/OS. This publication refers to IBM DB2 Cloning Tool for z/OS as DB2 Cloning Tool.

The Program Directory contains the following sections:

- 2.0, “Program Materials” on page 5 identifies the basic program materials and documentation for DB2 Cloning Tool.
- 3.0, “Program Support” on page 8 describes the IBM support available for DB2 Cloning Tool.
- 4.0, “Program and Service Level Information” on page 10 lists the APARs (program level) and PTFs (service level) that have been incorporated into DB2 Cloning Tool.
- 5.0, “Installation Requirements and Considerations” on page 12 identifies the resources and considerations that are required for installing and using DB2 Cloning Tool.
- 6.0, “Installation Instructions” on page 19 provides detailed installation instructions for DB2 Cloning Tool. It also describes the procedures for activating the functions of DB2 Cloning Tool, or refers to appropriate publications.

Before installing DB2 Cloning Tool, 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 Cloning Tool 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 Cloning Tool are included on the CBPDO tape.

Do not use this program directory if you install DB2 Cloning Tool 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 Cloning Tool Description

IBM DB2 Cloning Tool for z/OS, V3.2 (5655-N15) can make it easy to clone a DB2 subsystem or DB2 table spaces. DB2 Cloning Tool for z/OS can also be used to clone non-DB2 volumes. Traditional cloning and refresh methods are time consuming, use large amounts of host processing resources, and when copying DB2 systems, require a separate LPAR to house the copy. Today's storage-based fast replication technologies provide services to copy DB2 data without using host CPU or I/O resources. DB2 Cloning

Tool for z/OS leverages these technologies to make the cloning process faster and to help reduce the costs of cloning and refreshing data.

DB2 subsystem cloning:

DB2 Cloning Tool for z/OS integrates storage system volume fast-replication and automation to clone entire DB2 subsystems within the same or a shared LPAR. DB2 Cloning Tool for z/OS renames the data sets, updates the volume identifiers, and manages the DB2 metadata to allow the data to be used by a cloned DB2 subsystem quickly.

DB2 table space refresh:

DB2 Cloning Tool for z/OS integrates storage system data set fast-replication and automation to refresh table and index spaces within the same or to a different DB2 instance. DB2 Cloning Tool for z/OS copies the data quickly, and automatically translates the object IDs that differ between source and target subsystems.

Fast replication support:

The fast replication copy services outlined below can be used to create the volume copies used for DB2 system clones, or to create the data set copies used for table space and index space refreshes. A storage blade represents fast replication copy services invoked directly by DB2 Cloning Tool for z/OS. DB2 Cloning Tool for z/OS executes the DFSMSdss blade to issue IBM FlashCopy or STK SnapShot copy commands either by volume or by data set. When cloning DB2 systems or table spaces that reside on EMC DASD, DB2 Cloning Tool uses the EMC API to invoke TimeFinder/Clone to copy the data either by volume or by data set. When cloning DB2 subsystems that reside on EMC DASD and use TimeFinder/Mirror, or that reside on Hitachi Storage Systems, an appropriate replication process is performed before DB2 Cloning Tool cloning automation is invoked and a list of copied storage volumes are passed to DB2 Cloning Tool for use in later processing steps.

The following storage blades are invoked by DB2 Cloning Tool for z/OS:

- IBM storage blades: IBM DFSMSdss blade
 - ADRDSSU utility invoked
 - Fast replication (preferred)
 - By volume or data set
 - FlashCopy V2 (IBM, EMC, HDS)
 - SnapShot (SDK, Ramac)
- EMC storage blades: EMC TimeFinder
 - TimeFinder/Clone
 - TimeFinder Consistency Groups
 - TimeFinder Dataset Snap facility

DB2 Cloning Tool for z/OS, V3.2:

- Provides cloning and refresh solutions that automate and integrate sophisticated storage processor capabilities to:
 - Copy DB2 subsystems to a consistent copy of production data without sacrificing availability

- Reduce CPU and I/O costs by using the storage processor to copy the data instead of z/OS
- Execute fast replication in a safer and more transparent manner on behalf of the DBA
- Copies can be used to:
 - Offload business processes from production to other environments. The offloaded processes can be run in parallel without affecting production DB2 systems and applications, helping to maintain high availability.
 - Stage data warehouse loads.
 - Facilitate integration to a new version of DB2 in a short time.
 - Create or refresh test or quality assurance environments.
 - Direct users to read-only clones to reduce production performance impact.
 - Troubleshoot production problems from the clone.
 - Clone from a DB2 Recovery Expert for z/OS or DB2 backup system level backup.
 - Potentially reduce the footprint of a system clone by utilizing data set copies rather than volume copies.

DB2 Cloning Tool for z/OS, V3.2 includes the following enhancements:

- Improved diagnostics capabilities by providing a way to generate a maintenance report.
- Table space cloning enhancements include:
 - Improved usability and streamlined processes
 - Reduces manual intervention by automatically handling additional target processes, such as rebuilding indexes after data masking and log apply processes.
 - Improves scalability by applying DB2 logs to objects that reside on separate LPARs.
 - Allows more choices for consistent data sources, by adding the capability to clone from image copies.
 - Facilitates the broad spectrum of DB2 object types through expanded object support such as system-period temporal table's history table.
 - Integration
 - Allows DB2 migration confidence through better support for DB2 Version 11 object types and processes, including:
 - Extended RBA support to accommodate shops that need to use 10-byte RBA/LRSN fields.
 - Improved flexibility by supporting new RESTORE SYSTEM enhancements.
 - Maintain environmental performance gains by supporting NULL index keys.
 - Facilitate the resolution of inconsistencies between source and target by utilizing new REPAIR utility enhancements.
 - Support conversions by generating a REORG utility to convert from basic to extended RBA/LRSN.
 - Performance
 - Improved throughput for multiple data set objects by processing each extent of a large object in a separate task.

- Increased flexibility to accommodate additional utility operations such as CHECK, REBUILD, REORG, QUIESCE, and RUNSTATS in order to streamline the cloning process.
- Improved throughput for customers without fast replication to clone faster with only one pass of the data.
- Reduced resources by improving memory consumption of the ISPF UI.
- Competitive advantage
 - Facilitates the transition to DB2 Cloning Tool for customers with competitive tools by providing the ability to use image copies as the source for data migration.

Subsystem cloning enhancements include:

- Usability
 - Potentially reduces the footprint of a subsystem clone by allowing the replication of an entire DB2 subsystem by data set rather than by volume copies.
 - Provides more cloning sources by allowing replication using system level backup dump tapes from the DB2 BACKUP SYSTEM utility or from DB2 Recovery Expert.
 - Improves implementation of the product in production by providing the ability to better manage the started tasks.
 - Increases awareness of the product's environment by informing the customer when DB2 fails to properly start.
- SAP-related customer enhancements
 - Streamline the system cloning process by enhancing BCSCLEAN to remove orphaned target catalog entries and other data sets by data set name or mask.

1.2 DB2 Cloning Tool FMID

DB2 Cloning Tool consists of the following FMID:

HCKZ320

2.0 Program Materials

An IBM program is identified by a program number. The program number for DB2 Cloning Tool is 5655-N15.

Basic Machine-Readable Materials are materials that are supplied under the base license and are required for the use of the product.

The program announcement material describes the features supported by DB2 Cloning Tool. 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 19 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 Cloning Tool in the *CBPDO Memo To Users Extension*.

Figure 1 describes the program file content for DB2 Cloning Tool. You can refer to the *CBPDO Memo To Users Extension* to see where the files reside on the tape.

Notes:

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

Figure 1 (Page 1 of 2). Program File Content

Name	O R G	R E C F M	L R E C L	BLK SIZE
SMPMCS	SEQ	FB	80	6400
IBM.HCKZ320.F1	PDS	FB	80	8800
IBM.HCKZ320.F2	PDS	FB	80	8800
IBM.HCKZ320.F3	PDS	FB	80	8800
IBM.HCKZ320.F4	PDS	FB	80	8800
IBM.HCKZ320.F5	PDS	FB	80	8800

Figure 1 (Page 2 of 2). Program File Content

Name	O R G	R E C F M	L R E C L	BLK SIZE
IBM.HCKZ320.F6	PDS	FB	80	8800
IBM.HCKZ320.F7	PDS	FB	80	8800
IBM.HCKZ320.F8	PDSE	U	0	6144
IBM.HCKZ320.F9	PDS	FB	80	8800
IBM.HCKZ320.F10	PDS	FB	80	8800
IBM.HCKZ320.F11	PDS	FB	80	8800
IBM.HCKZ320.F12	PDS	FB	80	8800

2.2 Optional Machine-Readable Material

No optional machine-readable materials are provided for DB2 Cloning Tool.

2.3 Program Publications

The following sections identify the basic publications for DB2 Cloning Tool.

Figure 2 identifies the basic unlicensed publications for DB2 Cloning Tool. Those that are in softcopy format publications can be obtained from the IBM Publications Center website at:
<http://www.ibm.com/shop/publications/order/>

Figure 2. Basic Material: Unlicensed

Publication Title	Form Number	Media Format
IBM DB2 Cloning Tool for z/OS License Information	GC19-3490	http://www.ibm.com/software/sla/sladb.nsf
IBM DB2 Cloning Tool for z/OS User's Guide	SC27-6556	http://www.ibm.com/support/docview.wss?uid=swg27020942

2.3.1 Optional Program Publications

No optional publications are provided for DB2 Cloning Tool.

2.4 Program Source Materials

No program source materials or viewable program listings are provided for DB2 Cloning Tool.

2.5 Publications Useful During Installation

You might want to use the publications listed in Figure 3 during the installation of DB2 Cloning Tool.

<i>Figure 3. Publications Useful During Installation</i>		
Publication Title	Form Number	Media Format
<i>IBM SMP/E for z/OS User's Guide</i>	SA23-2277	http://www.ibm.com/shop/publications/order/
<i>IBM SMP/E for z/OS Commands</i>	SA23-2275	http://www.ibm.com/shop/publications/order/
<i>IBM SMP/E for z/OS Reference</i>	SA23-2276	http://www.ibm.com/shop/publications/order/
<i>IBM SMP/E for z/OS Messages, Codes, and Diagnosis</i>	GA32-0883	http://www.ibm.com/shop/publications/order/

3.0 Program Support

This section describes the IBM support available for DB2 Cloning Tool.

3.1 Program Services

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

3.2 Preventive Service Planning

Before you install DB2 Cloning Tool, 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 22 for a sample APPLY command.

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

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

<http://www14.software.ibm.com/webapp/set2/psearch/search?domain=psp>

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

For program support, access the Software Support Website at <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 Cloning Tool are included in Figure 4.

UPGRADE	SUBSET	Description
5655N15	HCKZ320	DB2 Cloning Tool

3.3 Statement of Support Procedures

Report any problems which you feel might be an error in the product materials to your IBM Support Center. You may be asked to gather and submit additional diagnostics to assist the IBM Support Center in their analysis.

Figure 5 on page 9 identifies the component IDs (COMPID) for DB2 Cloning Tool.

<i>Figure 5. Component IDs</i>			
FMID	COMPID	Component Name	RETAIN Release
HCKZ320	5655N1000	DB2 Cloning Tool	320

4.0 Program and Service Level Information

This section identifies the program and relevant service levels of DB2 Cloning Tool. The program level refers to the APAR fixes that have been incorporated into the program. The service level refers to the PTFs that have been incorporated into the program.

4.1 Program Level Information

The following APAR fixes against previous releases of DB2 Cloning Tool have been incorporated into this release. They are listed by FMID.

- FMID HCKZ310

PI04844	PI28765	PM58081	PM70795	PM80772
PI06815	PI30448	PM58218	PM70904	PM81186
PI07687	PI30614	PM61003	PM70977	PM81581
PI08497	PI31976	PM61399	PM72156	PM81938
PI08649	PI32308	PM61402	PM72528	PM82722
PI09489	PI32842	PM61895	PM72853	PM83302
PI11395	PI33007	PM62202	PM72864	PM84516
PI11424	PI33489	PM62206	PM72866	PM85142
PI13871	PI34010	PM62208	PM73360	PM85930
PI14867	PI35614	PM62211	PM73362	PM85932
PI15215	PI37705	PM64623	PM73364	PM86668
PI16177	PI37802	PM64977	PM73372	PM86676
PI16263	PI39005	PM64980	PM74072	PM87047
PI16361	PM51055	PM64983	PM74161	PM87052
PI18970	PM51058	PM64985	PM74369	PM87056
PI21891	PM51060	PM64987	PM75103	PM88158
PI22371	PM51063	PM65962	PM75113	PM89128
PI23466	PM51064	PM66109	PM75114	PM90104
PI23630	PM53613	PM66348	PM76594	PM90404
PI26330	PM54998	PM66438	PM76597	PM94295
PI26938	PM55254	PM66444	PM76610	PM96110
PI27011	PM56812	PM67796	PM76853	PM96388
PI28650	PM57865	PM67800	PM76860	PM97146
PI28687	PM57866	PM68120	PM78305	PM97209
PI28733	PM58065	PM68124	PM78306	PM97563
PI28744	PM58076	PM68126	PM78313	PM98340
PI28759	PM58080	PM68129	PM80594	

4.2 Service Level Information

No PTFs against this release of DB2 Cloning Tool have been incorporated into the product package.

Frequently check the DB2 Cloning Tool 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-REQUIRESERVICE)** 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 Cloning Tool. The following terminology is used:

- *Driving system*: the system on which SMP/E is executed to install the program.
The program might have specific operating system or product level requirements for using processes, such as binder or assembly utilities during the installation.
- *Target system*: the system on which the program is configured and run.
The program might have specific product level requirements, such as needing access to the library of another product for link-edits. These requirements, either mandatory or optional, might directly affect the element during the installation or in its basic or enhanced operation.

In many cases, you can use a system as both a driving system and a target system. However, you can make a separate IPL-able clone of the running system to use as a target system. The clone must include copies of all system libraries that SMP/E updates, copies of the SMP/E CSI data sets that describe the system libraries, and your PARMLIB and PROCLIB.

Use separate driving and target systems in the following situations:

- When you install a new level of a product that is already installed, the new level of the product will replace the old one. By installing the new level onto a separate target system, you can test the new level and keep the old one in production at the same time.
- When you install a product that shares libraries or load modules with other products, the installation can disrupt the other products. By installing the product onto a separate target system, you can assess these impacts without disrupting your production system.

5.1 Driving System Requirements

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

5.1.1 Machine Requirements

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

5.1.2 Programming Requirements

Figure 6. Driving System Software Requirements

Program Number	Product Name	Minimum VRM	Minimum Service Level will satisfy these APARs	Included in the shipped product?
Any one of the following:				
5694-A01	z/OS	V01.13.00	N/A	No
5650-ZOS	z/OS	V02.01.00	N/A	No

Note: SMP/E is a requirement for Installation and is an element of z/OS but can also be ordered as a separate product, 5655-G44, minimally V03.06.00.

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

5.2 Target System Requirements

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

DB2 Cloning Tool installs in the DBS (P115) SREL.

5.2.1 Machine Requirements

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

5.2.2 Programming Requirements

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

Mandatory installation requisites identify products that are required on the system for the successful installation of this product.

Figure 7. Target System Mandatory Installation Requisites

Program Number	Product Name	Minimum VRM	Minimum Service Level will satisfy these APARs	Included in the shipped product?
Any one of the following:				
5605-DB2	DB2 for z/OS	V10.01.00	N/A	No
5697-P31	DB2 Value Unit Edition for z/OS	V10.01.00	N/A	No
5615-DB2	DB2 for z/OS	V11.01.00	N/A	No
5697-P43	DB2 Value Unit Edition for z/OS	V11.01.00	N/A	No

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

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.

DB2 Cloning Tool has no conditional installation requisites.

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

Mandatory operational requisites identify products that are required for this product to operate its basic functions.

Figure 8. Target System Mandatory Operational Requisites

Program Number	Product Name and Minimum VRM/Service Level
5655-V93	IBM Tools Base for z/OS V01.04.00* - HTCZ110, (IBM Tools Customizer for z/OS)

Note: * IBM Tools Base is a mandatory software operational requisite for DB2 Cloning Tool. IBM Tools Base for z/OS is a no-charge product that must be separately ordered. Tools Base contains IBM Tools Customizer for z/OS, FMID HTCZ110, which must be installed in order to customize Cloning Tool. Refer to the IBM Tools Base Program Directory (GC10-8819) for installation instructions.

Conditional operational requisites identify products that are *not* required for this product to operate its basic functions but are required at run time for this product to operate specific functions.

DB2 Cloning Tool has no conditional operational requisites.

5.2.2.3 Toleration/Coexistence Requisites: Toleration/coexistence requisites identify products that must be present on sharing systems. These systems can be other systems in a multisystem environment (not necessarily sysplex), a shared DASD environment (such as test and production), or systems that reuse the same DASD environment at different time intervals.

DB2 Cloning Tool has no toleration/coexistence requisites.

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

DB2 Cloning Tool has no negative requisites.

5.2.3 DASD Storage Requirements

DB2 Cloning Tool libraries can reside on all supported DASD types.

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

<i>Figure 9. Total DASD Space Required by DB2 Cloning Tool</i>	
Library Type	Total Space Required in 3390 Trks
Target	1670 tracks
Distribution	1920 tracks

Notes:

- 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.
- 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 6.1.8, "Allocate SMP/E Target and Distribution Libraries" on page 22.

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

- The default name of the data set can be changed.
- The default block size of the data set can be changed.
- The data set can be merged with another data set that has equivalent characteristics.
- The data set may be either a PDS or a PDSE, except for ACKZMOD and SCKZLOAD, which must be PDSEs.

4. All target libraries listed have the following attributes:

- These data sets can be SMS-managed, but they are not required to be SMS-managed.
- These data sets are not required to reside on the IPL volume.
- The values in the "Member Type" column are not necessarily the actual SMP/E element types that are identified in the SMPMCS.

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

- These data sets can be in the LPA, but they are not required to be in the LPA.
- These data sets can be in the LNKLIST.
- These data sets are not required to be APF-authorized.
- DB2 Cloning Tool requires that the SMPLTS data set must be a PDSE. If your existing SMPLTS is a PDS, you will need to allocate a new PDSE and copy your existing SMPLTS into it and then change the SMPLTS DDDEF entry to indicate the new PDSE data set.

The following figures describe the target and distribution libraries required to install DB2 Cloning Tool. The storage requirements of DB2 Cloning Tool must be added to the storage required by other programs that have data in the same library.

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

Figure 10 (Page 1 of 2). Storage Requirements for DB2 Cloning Tool Target Libraries

Library DDNAME	Member Type	Target Volume	T Y P E	O R G	R E C M	L R E C L	No. of 3390 Trks	No. of DIR Blks
SCKZBASE	SAMPLE	Any	U	PDS	FB	80	6	2
SCKZDBRM	MACRO	Any	U	PDS	FB	80	76	25

Figure 10 (Page 2 of 2). Storage Requirements for DB2 Cloning Tool Target Libraries

Library DDNAME	Member Type	Target Volume	T Y P E	O R G	R E C F M	L R E C L	No. of 3390 Trks	No. of DIR Blks
SCKZDENU	DATA5	Any	U	PDS	FB	80	26	5
SCKZEXP	PARM	Any	U	PDS	FB	80	6	5
SCKZJCL	SAMPLE	Any	U	PDS	FB	80	34	15
SCKZLOAD	LMOD	Any	U	PDSE	U	0	1376	n/a
SCKZMENU	PARM	Any	U	PDS	FB	80	10	5
SCKZPARM	PARM	Any	U	PDS	FB	80	11	2
SCKZPENU	PARM	Any	U	PDS	FB	80	118	50
SCKZSLIB	PARM	Any	U	PDS	FB	80	4	5
SCKZTENU	PARM	Any	U	PDS	FB	80	3	5

Figure 11. Storage Requirements for DB2 Cloning Tool Distribution Libraries

Library DDNAME	T Y P E	O R G	R E C F M	L R E C L	No. of 3390 Trks	No. of DIR Blks
ACKZBASE	U	PDS	FB	80	6	2
ACKZDBRM	U	PDS	FB	80	76	25
ACKZDENU	U	PDS	FB	80	26	5
ACKZEXP	U	PDS	FB	80	6	5
ACKZJCL	U	PDS	FB	80	34	15
ACKZMENU	U	PDS	FB	80	10	5
ACKZMOD	U	PDSE	U	0	1626	n/a
ACKZPARM	U	PDS	FB	80	11	2
ACKZPENU	U	PDS	FB	80	118	50
ACKZSLIB	U	PDS	FB	80	4	5
ACKZTENU	U	PDS	FB	80	3	5

5.3 FMIDs Deleted

Installing DB2 Cloning Tool 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 Cloning Tool into separate SMP/E target and distribution zones.

Note: These FMIDs are not automatically deleted from the Global Zone. If you want to delete these FMIDs from the Global Zone, use the SMP/E REJECT NOFMID DELETEFMID command. See the SMP/E Commands book for details.

5.4 Special Considerations

DB2 Cloning Tool may have some optional requisites which include appropriate Fast Replication and Splits of Continuous Mirror Tools. For example:

- IBM FlashCopy
- IBM PPRC
- STK SnapShot

PDSE Considerations:

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

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

6.0 Installation Instructions

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

Please note the following points:

- If you want to install DB2 Cloning Tool 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 Cloning Tool

6.1.1 SMP/E Considerations for Installing DB2 Cloning Tool

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

6.1.2 SMP/E Options Subentry Values

The recommended values for certain SMP/E CSI subentries are shown in Figure 12. Using values lower than the recommended values can result in failures in the installation. DSSPACE is a subentry in the GLOBAL options entry. PEMAX is a subentry of the GENERAL entry in the GLOBAL options entry. See the SMP/E manuals for instructions on updating the global zone.

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

6.1.3 SMP/E CALLLIBS Processing

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

- CSSLIB
- SCCNOBJ
- SCEECPP

- SCEELIB
- SCEELKED
- SCEELKEX
- SDSNLOAD
- SISpload

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

6.1.4 Sample Jobs

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

<i>Figure 13. Sample Installation Jobs</i>			
Job Name	Job Type	Description	RELFILE
CKZALA	SMP/E	Sample job to allocate and initialize a new SMP/E CSI data set (Optional)	IBM.HCKZ320.F2
CKZALB	SMP/E	Sample job to allocate SMP/E data sets (Optional)	IBM.HCKZ320.F2
CKZRECEV	RECEIVE	Sample RECEIVE job	IBM.HCKZ320.F2
CKZALLOC	ALLOCATE	Sample job to allocate target and distribution libraries	IBM.HCKZ320.F2
CKZDDDEF	DDDEF	Sample job to define SMP/E DDDEFs	IBM.HCKZ320.F2
CKZAPPLY	APPLY	Sample APPLY job	IBM.HCKZ320.F2
CKZACCEP	ACCEPT	Sample ACCEPT job	IBM.HCKZ320.F2

You can access the sample installation jobs by performing an SMP/E RECEIVE (refer to 6.1.7, “Perform SMP/E RECEIVE” on page 22) then copy the jobs from the RELFILES to a work data set for editing and submission. See Figure 13 to find the appropriate relfile data set.

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

```
//STEP1 EXEC PGM=IEBCOPY
//SYSPRINT DD SYSOUT=*
//*****
/* Make the //TAPEIN DD statement below active if you install*
/* from a CBPDO tape by uncommenting the DD statement below. *
//*****
/*TAPEIN DD DSN=IBM.HCKZ320.F2,UNIT=tunit,
/* VOL=SER=volser,LABEL=(x,SL),
```



```

//*          DISP=(OLD,KEEP)
/*****
/* Make the //TAPEIN DD statement below active if you install*
/* from a product tape received outside the CBPDO process   *
/* (using the optional SMP/E RECEIVE job) by uncommenting   *
/* the DD statement below.                                   *
/*****
/*TAPEIN   DD DSN=IBM.HCKZ320.F2,UNIT=tunit,
/*          VOL=SER=CKZ320,LABEL=(3,SL),
/*          DISP=(OLD,KEEP)
/*****
/* Make the //FILEIN DD statement below active for          *
/* downloaded DASD files.                                   *
/*****
/*FILEIN   DD DSN=IBM.HCKZ320.F2,UNIT=SYSALLDA,DISP=SHR,
/*          VOL=SER=filevol
//OUT      DD DSNAME=jcl-library-name,
//          DISP=(NEW,CATLG,DELETE),
//          VOL=SER=dasdvol,UNIT=SYSALLDA,
//          SPACE=(TRK,(20,10,5))
//SYSUT3   DD UNIT=SYSALLDA,SPACE=(CYL,(1,1))
//SYSIN    DD *
          COPY INDD=xxxxIN,OUTDD=OUT
/*

```

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.HCKZ320.F2 on the tape.

FILEIN:

- filevol** is the volume serial of the DASD device where the downloaded files reside.

OUT:

- jcl-library-name** is the name of the output data set where the sample jobs are stored.
- dasdvol** is the volume serial of the DASD device where the output data set resides.

SYSIN:

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

6.1.5 Allocate SMP/E CSI (Optional)

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

If you are allocating a new SMP/E data set for this install, edit and submit sample job CKZALA to allocate the SMP/E data set for DB2 Cloning Tool. Consult the instructions in the sample job for more information.

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

6.1.6 Initialize CSI zones (Optional)

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

Edit and submit sample job CKZALB to initialize SMP/E zones for DB2 Cloning Tool. Consult the instructions in the sample job for more information.

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

6.1.7 Perform SMP/E RECEIVE

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

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

6.1.8 Allocate SMP/E Target and Distribution Libraries

Edit and submit sample job CKZALLOC to allocate the SMP/E target and distribution libraries for DB2 Cloning Tool. Consult the instructions in the sample job for more information.

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

6.1.9 Create DDDEF Entries

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

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

6.1.10 Perform SMP/E APPLY

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

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

applicable HIPER or FIXCAT APARs, the APPLY CHECK will also identify fixing PTFs that will resolve the APARs, if a fixing PTF is available.

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

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

Here are sample APPLY commands:

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

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

Some HIPER APARs might not have fixing PTFs available yet. You should analyze the symptom flags for the unresolved HIPER APARs to determine if the reported problem is applicable to your environment and if you should bypass the specific ERROR HOLDS in order to continue the installation of the FMIDs.

This method requires more initial research, but can provide resolution for all HIPERs that have fixing PTFs available and are not in a PE chain. Unresolved PEs or HIPERs might still exist and require the use of BYPASS.

- b. To install the FMIDs without regard for unresolved HIPER APARs, you can add the BYPASS(HOLDCLASS(HIPER)) operand to the APPLY CHECK command. This will allow you to install FMIDs even though one or more unresolved HIPER APARs exist. After the FMIDs are installed, use the SMP/E REPORT ERRSYSMODS command to identify unresolved HIPER APARs and any fixing PTFs.

```
APPLY S(fmid,fmid,...) CHECK
FORFMID(fmid,fmid,...)
SOURCEID(RSU*)
FIXCAT(IBM.ProductInstall-RequiredService)
GROUPEXTEND
BYPASS(HOLDCLASS(HIPER),HOLDFIXCAT) .
..any other parameters documented in the program directory
```

This method is quicker, but requires subsequent review of the Exception SYSMOD report produced by the REPORT ERRSYSMODS command to investigate any unresolved HIPERs. If you have received the latest HOLDDATA, you can also choose to use the REPORT MISSINGFIX

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

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

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

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

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

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

6.1.11 Perform SMP/E ACCEPT

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

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

Before you use SMP/E to load new distribution libraries, it is recommended that you set the ACCJCLIN indicator in the distribution zone. In this way, you can save the entries that are produced from JCLIN in the distribution zone whenever a SYSMOD that contains inline JCLIN is accepted. For more information about the ACCJCLIN indicator, see the description of inline JCLIN in the SMP/E Commands book for details.

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

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

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

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

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

6.1.12 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 Cloning Tool, it is recommended that you run REPORT CROSSZONE against the new or updated target and distribution zones. REPORT CROSSZONE requires a global zone with ZONEINDEX entries that describe all the target and distribution libraries to be reported on.

For more information about REPORT CROSSZONE, see the SMP/E manuals.

6.2 Activating DB2 Cloning Tool

6.2.1 Product Customization

The publication *IBM DB2 Cloning Tool for z/OS User's Guide* (SC27-6556) contains the necessary information to customize and use DB2 Cloning Tool.

7.0 Notices

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